Stay Young
Live HEALTHY and Long

by John M. “Johnny” Adams
with Lord Lee-Benner, M.D., F.A.C.E.

Proven Methods to:
- Stay Young, Live HEALTHY and Long
- Feel Great
  - Be Happier-
  - Stay Mentally Sharper
- Have More Energy
- Live with Love and Compassion

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Friends, Healthy Productive Life's Just Too Short!

Helplessly witness the slow decline of someone you truly love as they become old, frail and ill. Or stand face to face with eternity with a serious illness. Then you will know the naked truth: Growing old can be a ghastly, brutal and frightening experience. Debilitating errors creep into our bodies and minds. Then poorer quality of life and illness. We have less energy, and life just isn’t that great anymore.

Scientists call it entropy -- a decrease in order. I just call it disintegration. If your body is abused or neglected this will happen a lot sooner and the decline will last a lot longer.

When you've lost your youth along with your health -- and the two go together -- there go your vigor and joy, your ability to learn, your cherished memories. And there goes your sex life -- at least it's not like it used to be. Declining health, loss of life's luster, disease, forfeiture of freedom, probably pain. An old, fraying appearance, diminished brainpower and too often befuddlement and anguish. The deletion of cherished memories can be subtle -- a few go at first, then entire chapters. "Tabula rasa" or a blank slate -- but it can't be written on anymore.

What will your lifetime accumulation of possessions, money, power and prestige be worth to you then? You will have already left behind those you love. By then you've lost everything that's really important in life.

If you have yet to experience your first unaccounted ache, a so-called "senior moment" (what a disparaging phrase) or brush with illness, just ask some really old folks what they think of being really old. You'll hear things like "Don't care for it much" or "Things don't work like they used to", or "I can't get it up anymore", or "I just don't feel as good or as happy as I used to". Or "My knees ache", "I can't remember things like I used to", "Did I turn off the stove before I left the house?" or "I spend all my time at the doctors", or . . . "I've been going to a lot of funerals lately."

Like Jack Lemmon said in Grumpy Old Men: "He died in his sleep." Walter Matthau replied "In his sleep? . . . lucky bastard."

So when we reach a point in life where things start to get really interesting and we're beginning to get it figured out, are we supposed to just shuffle off, meet our maker, let our physical bodies diffuse back into the earth, water and air from which we came -- in other words, decline then just die?

I don't think so.

That means NO!

I'm burning my AARP card in protest!

Aging later is better than sooner -- much later.

So let's do something about it. READ ON . . .
And you know what? The same goes for the healthy, happy part of life that is not filled with joy and fun, and not filled with love and compassion, or lived to anything less than full potential right now on our home, playground, educational institution, heaven and hell we call earth.

Aging doesn't have to turn out so badly. You can increase the healthy portion of your life, and delay the slow the process of aging. You can slow or reverse mental decline, immune decline, weakness and frailty, as well as maintain a more youthful appearance and looking better, and other effects of aging.

The Aging Intervention Foundation provides education, and conducts advanced scientific research to develop new technologies to slow and reverse the underlying causes of aging. The goal is to eventually control the processes of aging, reverse its effects, and stay younger longer . . .

How long? Envision added years, decades or more of health span added to your life – time spent to enjoy doing the things and being with the people you love. But why stop there? How about MUCH longer life using advanced scientific methods that are under development today in biotech companies and research labs around the world?

Most importantly, it's about increasing the quantity and quality of your life now and in the future.

This manual can show you how. It's about living longer and better. And it's about filling your life with joy, love and compassion.

You can make profound improvements in your life no matter what your age with the system in this manual.

By all that raving at the start you've probably guessed that I don't care for growing old at all. Just telling the aging thing like it is. And if you haven't already noticed the aches and memory lapses, consider them a little wake-up call, and take action to reverse these effects now.

Well, my own approach to life is usually lighthearted & upbeat, not all woeful as that the opening rant may have sounded. Like you probably do, I have a thirst for life and have always been fond of a good time. But by all means, don't take it all too seriously and spend your time worrying about how short it is. Whether its 10 years or 10,000, do your best to make it better and longer, but make the most of what you have.

I love HEALTHY life. Gimme more.

Do you feel the same way? This manual offers you vital information and a scientifically proven system so you can enjoy a longer and better life -- and stay younger, be happier and live longer.

Read on . . . for something positive and uplifting

The Vision of How Long and Youthful Your Life Can Be

My goal for you is to be dancing joyfully on this beautiful earth to the sweet music of life for a great many years to come. You'll be enjoying your best health ever -- vibrant, perfect health, no matter what your chronological age. Your many interesting activities reflect your love of life!
With energy soaring, you're leading an exciting life, doing the things you love -- and feeling great all the while.

Your admiring friends tell you how fit and trim -- and how young you look. Your mind remains clear as you solve problems and create new ideas. You remain highly productive in your work, while learning, growing, enjoying new experiences, delighting in beautiful things, and having fun!

You have more time to indulge your senses -- to stop and smell the roses along the way, to savor your favorite healthy gourmet meal, to listen to the birds singing in the distance in the morning, to feel the breeze against your skin throughout the day, and take in the blue sky and red sun of a spectacular sunset at dusk with a refreshing beverage in hand and a soothing serenade playing in the air.

You maintain your strength and toughness, and travel a path of wisdom and truth. And most importantly, your life is filled with meaning and purpose. You're living with love, compassion, while helping build a better world -- for years, or decades of healthy time – time spent to enjoy doing the things and being with the people you love -- added to your lifespan using the methods in this manual. But why stop there? How about 120 years or so? And eventually centuries of robust, quality life using advanced scientific methods that are under development today in biotech companies and research labs around the world.

Most importantly, it's about increasing the quantity and quality of your life now and in the future.

How? First of all, for now get into and stay in as good condition as possible using the advanced methods in this manual – until new technologies to treat and prevent disease are developed, and are combined with medical technology to intervene in the aging process -- repairing and re-engineering our cells, DNA, proteins and other components of our bodies and reset the aging clock.

Your body is immensely complex, and extending our "maximum" lifespan out to the multicentenarian mark will be the greatest challenge ever. And we're working on it. We're not just sitting around waiting for it to happen -- we're making it happen. This grand plan starts with a vision, then a goal, and then a plan based on the latest, most comprehensive and accurate information -- and finally, putting the plan into action.

And may I suggest to you that with greatly extended, quality life comes a responsibility to help make our world a better place, free from so much misery?

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By the way -- the following, the material up until the start of Chapter 2 -- Nutrition is very useful and intended to be interesting. But I don't want you to get bogged down and not make it to the most important part of the manual -- your system for staying younger, longer. So if you get tired of reading and want to jump ahead, that's OK and you can come back to this part later -- but please read the legal disclaimer on page 55. And if you don't have any background in molecular biology or chemistry be sure to read at least the first pages of Chapter 1 (Background). And no matter what your level of experience, definitely read the section on free radicals. A close study of those sections is really recommended, and a summary appears at the end of the manual.

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So far life's been pretty darn good to me and I hope it's been good to you. So far it's
gone by in the blink of an eye. Blink and you're old, again and you're very old, again and
it's over. To paraphrase (OK, to mangle) Dickens, "Please Sir, may I have some more
blinks?"

Well, if you don't start doing something about it now, by the time you get around to it
they just might be shoveling dirt on you.

The information in this manual is for people who don't want to just feel or grow old and
die any time soon -- and for those who want to reverse the effects of aging if they're
already feeling them. It's for people who want to remain healthy, happy, productive,
learning, growing, having new experiences, leading an exciting life while helping make the
world a better place for a very long time. For years, decades, maybe even centuries.

Most of us wiser as we grow older. But I'd rather have my wisdom (such as it is)
preserved in the body of a twenty year old. I like my present form, thank you very much.
And sure, sooner or later we all take the big sleep. But later is better than sooner -- much
later. We're working on the "much later" part.

So let's fight aging, while greatly improving the quality of life in the present with the
scientifically designed and precision, scientifically designed nutrition, exercise, stress
reduction, reducing risks, appropriate amounts of well-designed nutritional supplements,
and other methods you will learn about in this manual. Because you're looking this over
you're probably a lot like me in that you are willing to do something about it.

The system beginning in chapter three is for those who want to be the olympians of
health, fitness, & aging intervention. This information can help you stay younger, healthier
and happier, for longer.

Read on . . .
"Life's Tragedy is that we get old too soon and wise too late."
Benjamin Franklin

This manual will show you valuable and scientifically proven system to stay younger, be happier and live longer.

There are no magic potions, but I offer you solutions that can get the you very best results possible so that you can live a youthful, joyous life, for a very long time -- until advanced therapeutics are eventually developed to intervene in the aging process.

My goals are:

1) To offer you methods that are available now to slow the process of aging, and slow or reverse mental decline, immune decline, weakness and frailty and other functions, as well as maintain a more youthful appearance and looking better, and other effects of aging. These are methods I have used with excellent results and are in the information I provide. They include precision, scientifically designed nutrition, exercise, stress reduction, appropriate amounts of well-designed nutritional supplements, reducing risks, among others.

-- and --

2) To develop new therapeutics to intervene in the underlying causes of aging, as well as treat the diseases of aging. We age for many reasons, and some of these therapies will be to prevent oxidative stress (or free radical damage) with therapeutics that mimic caloric restriction, to reverse the glycation of proteins, to repair and prevent DNA breakage and inappropriate protein unfolding, and others.

The purpose is to live a youthful, joyous life for a very long time -- and build a better world.

I am basically a guy with a vision of how long and truly great life can be -- and a plan to make it happen, and I am uniquely qualified to guide you in this endeavor.

Probably like you, I'm an aging intervention consumer, patient and explorer. I have studied and practiced health, fitness and antiaging since 1979, and have been at the forefront of biotechnology and other medical technologies. I'm equal parts visionary, biological technology specialist, businessperson and lab rat.

When starting out in aging intervention I was causing myself a lot of damage while engaging in an overly aggressive, misguided and naïve program. I began to feel like an experimental lab rat because of all the worthless and dangerous products I was taking at the time. All this was under the guidance of an M.D. who appeared to have excellent credentials, but didn't have the in-depth expertise I now have access to. It took me years of perseverance to separate truth from all the hype. People need to know about this, so they will NOT repeat my mistakes.

The precision, scientifically designed core components of the manual, such as nutrition and exercise information, are unique, and have been adapted from the antiaging system developed for me by Lord Lee-Benner, M.D. F.A.C.E., "The AntiAging Doctor". Dr. Lee-Benner is the foremost authority on clinical methods to treat and prevent the many negative changes that come with aging.
More About This System and What You Can Get From It

The information in this manual is based on the latest and most credible and effective scientific advances. By following this system you can expect better quality of life that comes from better health. The benefits to expect include much better health, more joy and happiness, greater energy, a clearer mind with better concentration and improved problem solving abilities, greater depth and richness of life, a more carefree attitude, and a renewed enjoyment and spark of enthusiasm for life. Expect a better personal appearance and beauty, higher consciousness with a greater understanding of and capacity for spirituality and for making contributions to others and to the world. But be aware that this "higher consciousness" may bring up a lot of new questions about the nature of spirituality, the soul and the self.

If you tend to become a little depressed at times, expect the emotional lows not to be as low. Trouble sleeping? You'll sleep better. Holiday blues? Recession slowing down your lifestyle? Life thrown you a curve? You'll take it all more in stride. Also will come a more joyous sex life (whoopee!). And a more keen wit (I amuse the heck out of myself these days, anyway, so who cares). Chronic maladies may subside as your body makes repairs and adjusts naturally. You will find that you have the ability to work longer, harder and smarter in your work, increasing your ability to make money (or perhaps an increased satisfaction with life itself, and a decreased need for the material).

Some Mistakes You Can't Afford to Make

Some of the most important parts of an aging intervention, antiaging and life enhancement system are things you can't buy (and things someone can't SELL you).

Common mistakes include investing your time and money in things that aren't particularly beneficial -- or are downright harmful. Another mistake is implementing an overly aggressive and misguided vitamin, nutritional supplement and hormone regimen while ignoring proper nutrition, exercise, stress reduction, and some other items you can't buy. And still another mistake is going on a program without proper guidance, and trusting an inadequately trained doctor to provide that guidance.

When most people think of aging intervention therapy they think of some youth potion. There has always been a lot of misinformation, opportunism, exploitation and snake oil associated with aging intervention therapies. Methods of reducing the effects of aging does not come in a pill. There are all kinds of people out there willing to sell you all kinds of supplements and treatments. Some of them can be very good for you. Some of them do nothing. Some are downright dangerous.

Youth doesn't come in a bottle.

Some health, fitness and aging intervention programs will be good for one person, but not another. And the same program may be good for you at one time, but not another time. Some of these treatments, at best, will do absolutely nothing. But others will hurt you. And by investing your hard-earned dollars and your valuable time in therapies that don't work you are not spending your money and your time in things that will. You need guidance.

On the flip side, there are an awful lot of skeptics and cynics with dubious opinions of all forms of aging intervention medicine. Many of these opinions are earned because there are "anti-aging doctors" out there who don't know what they're doing and cause more harm than good. The long-term effects of many therapies are largely unknown. It is important for anyone on an aggressive aging intervention program to be monitored by a doctor who is
highly experienced in aging intervention medicine and can detect negative side effects before they become serious.

Many vitamins are cheaply manufactured and ineffective. And over-supplementation (megadosing) with many different supplements, or using what are the wrong supplements for your body, or interactions with over-the-counter supplements and prescription "anti-aging" drugs with each other or with prescription drugs can carry potential side effects and be disastrous to your health.

Vitamins and nutrients can be a valuable part of your aging intervention system. But they must be treated as just one component. Other components are nutrition, exercise and stress reduction, among some others.

**Questionable Expertise**

You wouldn't do your own brain surgery, would you? When I got really, really, really serious about aging intervention, I began to recognize my own limitations in separating fact from fiction in all the literature and products, and the contradictions, in the health and aging intervention information out there. So I attempted to seek the guidance of some M.D.s and experts with a lot of experience in health, fitness and aging intervention. I had located and had consultations with 8 M.D.s and a PhD from a directory. They had varying degrees of experience, and I learned at least something useful from each of them. One of them told me to find some information and bring it in and he would look it over and possibly write a prescription. This is not the kind of "expertise" I was looking for, and paying for. And one M.D. had me on the overly aggressive program that made me ill.

**You Can Learn From My HUGE Mistakes**

For a while when I was first getting started I was engaging in a very aggressive, misguided and naive nutritional and hormone supplementation program under the guidance of a physician who appeared to be an "expert", but just didn't know what he was doing. At that time I was swallowing, inhaling, rubbing on and injecting large amounts of more than 148 vitamins & nutrients (many separately, many in mixes of about 20 to 30 or so), hormones (testosterone, hGH, DHEA, pregnenolone, melatonin -- both prescription & non-prescription), and even a prescription drug to block the side effects of the hormones. Also thrown into this mix were precursors to neurotransmitters, prescription “smart drugs” (not necessarily a smart thing to do), compounds to “detoxify” the body and the liver, mostly from all the gunk that was being throwing into it. And I was using prescription drugs obtained from here in the US and from offshore sources. These sources kept moving around and changing their names because of FDA busts.

And I was taking all these in large amounts. Now I know that this regimen was making me sick and possibly would have eventually killed me. Excessive supplementation and combining all this stuff is toxic. Almost certainly I would have sustained liver damage over time. And toxins surely were damaging my cells and wedging between or rewriting the letters of the DNA causing it to mutate, with the possibility (actually the likelihood) of the developing cancer of the brain, pancreas, testes, prostate, you name it.

Properly designed nutrition and exercise, appropriate amounts of water, stress reduction, spirituality, and other key components were missing from that dangerous program. For example, I was working out with weights for about 2 hours on 3 days a week. "Barbarian" workouts, as I called them. I would take testosterone and get revved up beforehand and do, for example, about 12 or 15 sets of intense chest exercises with about 1/2 minute between sets. I wasn’t getting enough protein to support that strenuous routine.
No wonder I my body didn't develop muscle or improve definition. And, vital aerobic exercise necessary for cardiovascular health and the health of the entire body was almost avoided. This not only counterproductive to optimal health, but destructive.

I wanted to feel good. Much of the time I felt kind of bad. Once my friend Shannon, a yoga instructor with a vivacious attitude and Shirley MacLaine spirituality asked "But how do you feel?" Without even thinking I blurted: "Like shit!" This is verbatim and I really didn't mean to put it like that. A part of my brain must have been screaming to be heard. But I was "committed", and carried on believing it was the right thing to do, and believing it was under expert guidance. It was a kind of determined, wacko, no pain, no gain state of mind.

Medical side effects of this ill-conceived, overly aggressive, misguided and naïve effort included overwhelming the liver in processing all this stuff, often feeling run-down and ill, neuropathy (nerve problems, mostly in the extremities) and gastro-intestinal irritation with frequent indigestion and gas. Also I had protein deficiency -- my body was screaming for protein, resulting in bad skin tone from a depleted understructure and washed out appearance. Under the microscope my white blood cells were just not as active as they should have been. My eyes seemed overly sensitive to bright light. And, I felt very emotional and angry, and had mood swings -- the testosterone I was taking was being converted to estrogen -- I had PMS! There were several medical measurements that I should have been paying attention to. And, I really should have noticed the fact that I just didn't feel well. I was starting to look bad. Once my friend LeAnn, an artistic spirit with owl-wise perception described me as “fading”.

One big wake-up call was an increasing soreness "down below" that was starting to interfere with my work life and my love life. Precise medical term I devised: “sorenütz”. Probably a result of referred pain from all the irritants I was discharging and prostatism (non-specific inflammation) from all the hormones. And after discontinuing the hormones, there was hypogonadism (testicular hypertrophy) for a while. Thank God I wasn't a candidate for Viagra!

I could have been a poster child for bad anti-aging medicine.

I must have pretty good tolerance for all this because others have become a lot more ill on smaller amounts. And this was under the direction of an M.D. who appeared to have excellent credentials. I just didn't have enough experience at the time to evaluate a practitioner's experience.

Human growth hormone is often wrongfully praised of being the ultimate anti-aging elixir. Once another anti-aging M.D. with a great overhead projector presentation sold me some sublingual hGH spray (cost: $120) -- also an IGF-1 test (the measure of growth hormone effectiveness, cost: $40) which proved the sublingual spray did absolutely nothing to raise my IGF-1 level! But in fairness I must say that he also had me take "Genox" oxidative stress test, which showed that the extreme quantities of antioxidants did not result in particularly low measurements of oxidative stress. (However, I am unaware of any studies that have been conducted to correlate this laboratory test with any real-life benefits).

But I came back. The results of my current system are extremely positive and have reversed the downward slide of the regimen described above.

Now I'm taking an approach that's more moderate, intelligent and based upon in-depth experience. Now I'm getting it right and experiencing the benefits. You can have the same in the system that follows.
I am telling you all this so that you will learn from these mistakes.

If you are presently going down this path, or on some other crank program BEWARE!

The most powerful aging intervention drugs don't come from pills -- they are produced by your own body. Your body is equipped with an extraordinary and elegant pharmacy which is capable of manufacturing drugs and delivering them to the target locations in just the right amounts. But it needs to right raw materials and conditions, so we need to not place too much of the burden on the body with stress and toxins. The methods in the system that follows will help you make that happen.

Moving Forward . . .

As a result of the system described in this manual, my mind is clearer than ever and I'm usually living with energy and passion. Life just seems more interesting. I make smarter decisions. I feel lighter. I treat others better and feel a greater sense of social responsibility. My values are higher, and I hardly ever make dumb mistakes. The smell of the trees and the ocean more (and auto exhaust when it's around) is more noticeable. I have become better able to gather my thoughts and crystallize complex technical concepts, then communicate them more clearly and in greater detail.

On the system described in this manual I have found that I can work faster and harder for longer, often into the evening after a busy day, and really get more done (although I have also learned the value of avoiding this kind of stress and not going at it too frequently). I'm thinking "outside the box" more. I have also become better equipped to recognize and seize opportunity when it comes my way. And more opportunity is coming my way – in fact, the preparation of this information is the result of having the clarity and energy to gather this experience and communicate it to you is a result of being on this system.

Sure, life still has a few ups and downs -- but the ups are higher and last longer, and the lows are less low and I usually bounce back much more quickly.

Although I'm downright happier in general, sometimes when I hear a bouncy song or view a beautiful natural scene, or architecture or a work of art, I sometimes experience a sense of joy that swells up from inside my chest that I have never experienced in the past. (Gee, I can almost feel a rush of endorphins and a squirt of diazepam[the real valium] tickling my brain). And at times I have felt so good that I seemed to be surrounded by an ethereal sense of well being.

One time shortly after starting this system I was walking down an outdoor stairway and looking around at the buildings and the sky and the grass and thinking, “Wow – this is my playground!” Just last week when driving to work and looking around at the trees and
sky, kind of awestruck, the words “Beautiful earth, I love it so.” just popped into my head. No kidding!

Personally, I plan to remain healthy, happy, productive, learning, growing, having new experiences, leading an exciting life while helping make the world a better place for a very long time. How long? At least a couple of centuries, and in exceptional health and happiness. Why so long? I figure it'll probably take me that long to get life right.

But enough about me. Do you want to feel this good? Who wouldn't?

The reason I'm telling you all this is so you can have the same.

So read on . . .

A Healthy Brain is a Happy Brain

It doesn’t matter if you have a healthy 120 year-old body if you don’t know who or where you are. This system is designed to keep your brain and mind healthy, as well as your body.

Your brain structure and mental abilities and health are affected by nutrition, exercise, nutritional supplements, what you think, and other factors that are within your control right now. Mood is set by what you eat. And it has even been found that some parts of the brain really do grow new cells.

A neurotransmitter is a chemical that's released from a nerve cell and transmits an impulse from the cell to another nerve, muscle, organ, or other tissue. Their production declines with the age. But lots of other detrimental things are going on in the brain as it ages that can be slowed or reversed. Details later.

So an important component of this system is to keep your brain and mind healthy, happy and nurtured, as well as your body.

In a later chapter we'll talk about finding more happiness and reducing or eliminating fear and depression. Too many people are depressed. Aging intervention done correctly is also antidepressing, as well as spiritually uplifting.

How This Developed -- and a Little More About Me

I am basically a guy with a vision of how long and truly great life can be -- and a plan to make it happen. I am uniquely qualified in this endeavor. I'm an aging intervention therapy patient, and the ultimate aging intervention consumer. I've been at the forefront of biotechnology and other medical technologies, and studied and practiced health, fitness and aging intervention since 1979. I have an MBA from USC, and have developed high level expertise, and technical and computer skills that complement and add to the efforts of research scientists.

When starting out in aging intervention I was causing myself a lot of damage while engaging in an overly aggressive, misguided and naïve program. I began to feel like an experimental lab rat because of all the worthless and dangerous products I was taking at the time. All this was under the guidance of an M.D. who appeared to have excellent credentials, but didn't have the in-depth expertise I now have access to. You need to know about this, so they will NOT repeat my mistakes. It took me years of perseverance to separate truth from all the hype.

Each month I attend meetings & conferences, research and review books, journals, web sites and articles, talk with experts in the field of aging intervention, and write on the
subject. I've been active in organizations devoted to the aging intervention and have spent many thousands of dollars in the development of my personal system and learning.

It took me years of perseverance to separate truth from all the hype -- and get the lowdown on the useless and dangerous products out there. I wrote this manual to share the information with you.

You don't have to be a biologist to understand the material in this manual. It was written as though I were writing for myself 20 years ago. The cliche "If I only knew then what I know now" rings true. It is intended to inform you, and to motivate you to take action to achieve great results.

I have found a lot of articles and texts on various biomedical topics, often written by doctors and biologists, either lacking in specifics, or a little difficult to understand and including too much detail. They sometimes leave out key minor points that would help make it understandable and concrete to someone without a degree in biology. Conversely, some scientific and medical writers lack specific technical expertise and are considerable off-point in their articles.

You'll find this manual answers a lot of questions and sheds light on many issues that are unclear or not fully explained in a lot of the material that is out there. For example, I often wondered what the heck's an "omega-3 fatty acid"? (this will be described in the chapter on nutrition) Sure, I could find lots of people telling me that it's really good and that I should buy some from them. But I had to kind of dig to find what it is, why it's called that, what it does in the body and why a modest amount from a natural source like cold-water fish is better than capsules people are trying to sell me. And you will find information on some other issues, like free radicals and why they are so bad, as well as the biology of aging and how we're fighting it.

I have also been active in many areas of medical technology including the biotech industry, and am using this knowledge in developing new therapeutics to intervene in the aging process. Biomedical skills include bioinformatics and protein informatics (the application of computer technology to genomic, proteomic [protein] disciplines), drug design (with emphasis in computer-aided drug discovery and development), the analysis and reporting of clinical trial information, medical devices and management. This background is vital to the aging research, and complements the skills of the team of molecular biologists, medicinal chemists and other professionals I am assembling for research and development in the area. I was on the organizing committee for a landmark conference to companies active in the creation of new aging intervention therapeutics. My background is diverse, my bachelors degree is in psychology (emphasis in physiological) and I have an MBA from the University of Southern California.

**SuperCentenarians**

"If you want to know how to do something, find out from someone who has done it" is the concept behind the SuperCentenarian Research Project. It analyzes factors that have made super-centenarians (people who have lived 110 years or more) so long-lived. The Centenarian Research Project will focus on genetic, proteomic and other biological factors in order to apply what is learned to develop new therapeutics to intervene in the aging processes and treat the diseases of aging -- and further enrich the health and lives of super centenarians. You will find some interesting information on centenarians on the Gerontology Research Group (GRG) web site at [www.grg.org/calment.html](http://www.grg.org/calment.html)

I wrote a computer program and handle the processing of various tables presenting data on centenarians for the GRG which can be found here: Chronological Listing Of All Supercentenarians [www.grg.org/Adams/A.HTM](http://www.grg.org/Adams/A.HTM)
Here's some information and definitions for the areas in which I have been active:

**Aging Intervention/Anti-aging**

**Drug defined:**
Substance that has an effect on the body (therapeutic -- treat a "disease" condition)

**Biotechnology defined (a number of definitions and interpretations):**
1. Biotechnology Industry Association definition:
   - bio — the use of biological processes; and
   - technology — to solve problems or make useful products.
2. Creation, development, and marketing of a variety of products through the manipulation, on a molecular level, of life forms or utilization of knowledge pertaining to living systems.
3. The industrial use of biological techniques (or living organisms). Biotechnology products include antibiotics, insulin, interferon, recombinant DNA, and techniques such as waste recycling. Much older forms of biotechnology include breadmaking, cheesemaking and brewing wine and beer.

**Bioinformatics/Protein Informatics defined:**
The National Institutes of Health defines bioinformatics as “research, development, or application of computational tools and approaches for expanding the use of biological, medical, behavioral or health data, including those to acquire, store, organize, archive, analyze, or visualize such data”. A simpler definition would be computational and informational approaches to biology.
Using computational and informational approaches to analyze and process genome and protein information to make it available and useful -- to answer questions and solve problems.
Examples:
- Molecular modeling
- Structure -- how is it composed
- Function -- what does it do
- Categorization (into families, SCOP, CATH, DALI, etc.)
- Phylogenetic trees -- graphical representation of related genes or proteins
- Homology modeling and analysis -- analyzes similar structures and functions

**Genomics:** Study the structure and function of genes.

**Proteomics:** Study the structure and function of proteins.

Computational tools allow parallel and simultaneous analysis of thousands of different types of genes and proteins.

**Some of my scientific and commercial interests in aging intervention:**
1) Currently available methods to slow the process of aging, and slow or reverse mental decline, immune decline, weakness and frailty and other functions, as well as maintain a more youthful appearance and looking better, and other effects of aging.-- precision, scientifically designed nutrition, exercise, stress reduction, reducing risks, appropriate amounts of well-designed nutritional supplements, among others.
2) New therapeutics to treat the diseases of aging, or improve on existing drugs.
3) Therapies to slow and reverse the underlying causes of aging. Categories and causes include:
- Oxidative stress -- therapeutics to mimic caloric restriction, among others
- Protein unfolding
- Heat shock proteins
- Stimulate the reversal of cholesterol transport
- Uncoupling proteins
- Vascular endothelial function
- Reversing the glycation of proteins
- Telomere shortening
- DNA double strand breakage
- Stem Cells
  and many others

4) Gene therapy

Johnny Adams Aging Biotech Background
(requires Adobe Acrobat reader)

Why I Wrote This

I sincerely want to help you and others lead longer, richer, healthier lives, to exceed your present full potential and build a better world. I approached this project with a great sense of responsibility. This manual is likely to be referenced for a very long time, and a source of life-changing information for people who are willing to make a commitment to improvement. It is as comprehensive and effective as possible, and is intended to serve the greater good by helping people raise their consciousness, thereby bringing more love and compassion to the world. I endeavored to make this the very best information and system available anywhere.

I felt that immersion in the subject of aging intervention would be the best way to arm myself with the tools to reach my own rather ambitious goals. I wanted to share this journey with others involved in the cutting-edge aging intervention therapies, and to have the time to spend investigating new ideas and treatments. I plan to perform aging intervention research and be at the right place at the right time. And I wanted to have a little fun.

No matter how much you already know about a subject, you will learn a lot more by committing to writing a manual on it. By practicing this in all my available time and by communicating to others I found a greater commitment. I knew that if I were going to be urging others to follow some guidelines that I had better "walk the talk" myself. I have often been seduced by pastry, and confess once having a weakness for ice cream, cookies, cake -- all manner of refined sugar and lard. But I hardly touch that stuff anymore because utilizing nutrition, exercise and other methods described later has stabilized my insulin levels, and the behavior modification & motivation methods have greatly reduced to the fondness for such things. And I've experienced how much better life can be without it. Since starting this project I have just passed by many sugar & saturated fat shops that at one time my car would have turned into automatically. Similarly, I find I'm spreading more love and compassion.
What would you do if you had more prime time?

Most of us aren't consciously afraid of dying. Sooner or later we all take the big sleep. We'd probably rather our passing be later than sooner. But most of us find extended decrepitude unappealing. To my own way of spiritual thinking, our physical bodies are an extension of the earth and death is merging back with the earth, water, air and universe, which are beautiful and grand.

Life can be so damn interesting -- and it's become even more interesting for me since I started this system. There are so many new places to see, things to do, intriguing experiences to enjoy, people to help, and worldly as well as spiritual journeys to make. I think I could keep it interesting and worthwhile for quite a few lifetimes. And besides, things are changing fast and I'd kind of like to stick around to see where this world is going.

So what would your own list be like if you had more prime time? Ahhhh . . . to have more time to learn, love, laugh, play, make new friends, help others, redesign your life or build a new one, get happy, create, relax-really deeply relax, make the world a better place, appreciate the beauty, try something again that you failed at, adopt a child or a pet, locate and get in touch with old friends or relatives who you haven't talked to in years or decades or even centuries, nurture your love or find love again, make peace with someone you've had a falling out with, commit random acts of kindness, forgive, grow wise, invent, daydream, forge a plan, have an adventure, do it again, blaze a trail, conduct a scientific experiment, climb a rock, go surfin', get down and boogie, race a car, fly a kite, uncork some champagne and celebrate, have some fun, live it up, take it up to the limit, stage a comeback, make funny faces, howl at the moon, go ga-ga, star in your own movie, sail around the world, plant a tree, love a duck, learn about history and apply it to build a better future, go on an archaeological dig (wouldn't it be totally cool to walk where people walked and see first hand how they lived 10, 20 or 30 thousand years ago? Or imagine what it would be like to live like they did?), get a massage, give a massage, have some great sex, bask in the sun (don't forget your SPF45 sunscreen), sample all kinds of exotic and healthful foods, do a little dance make a little love get down tonight, crack some jokes, explore the world, travel in space, conquer the world (but not literally, OK?), amass a fortune, get that dream car, build your dream house, collect toys, go back to school, get yourself elected, make your presence known, be a force, strut your stuff, found a charitable organization, hobnob with royalty, hang out with vagabonds, help others, pen a play or a poem or a novel, learn to sing or play a musical instrument, play in a band, sing to a dog, compose a song or a symphony, create some intrigue, take out your microscope and look at all the microbes in ditchwater, make a little mischief, charm & seduce, cause a commotion, pulsate in the dance of love, stargaze, expand your limits, evolve, conceive & design & execute & successfully complete a grand plan, find spiritual truth, connect with spirit, find inner peace, help others, commune with nature, be with God.

These are just a few ideas. The list for someone who loves life and knows how to live it is practically endless. Because it's there. Because we can. LIVE!

This may be a little hard to fathom for those who, when talking about living into the 100's, get a picture of someone who is doddering, decrepit and infirm. Perhaps forgotten in an old age home and being taken care of. Still living, but less and less.

But I'm talking about a centenarian with the body and the energy of a 20 year-old. High-spirited and maintaining (and improving) their keen wit and wisdom.
As for the future: although the medical technologies to turn this rather ambitious multi-centenarian goal into a reality do not exist -- yet! -- each week there are great advances in science, medicine, cellular biology and genetics. We just cracked the genome. Although this has been compared to the first moonwalk, I think of it more like the Wright Brothers' first flight at Kittyhawk.

Even seemingly small breakthroughs can make a big difference when brought together with other developments or disciplines. Soon, hopefully within the next 30, 20 or even 10 years, we will be at a point where we can get in and manipulate and reengineer our DNA to reset our biological clocks. Or maybe even redesign our own selves. I imagine Adams with wings!

Although my enthusiasm for all this sometimes overflows, be assured that any suggested course of action is based upon the best of available scientific information from the most credible sources. Can we make it? Well . . . I'm betting my piggybank on it.

Resetting the aging clock and returning to a youthful physical and mental condition has been dreamed of since we first became aware of our own mortality. Soon it will be a possibility. The plan for now is to get the most out of life and remain healthy, happy, productive, learning, growing, having new experiences, leading an exciting life while helping make the world a better place while some exciting breakthroughs unfold.

Now, there are people out there who are obsessed with "immortality" -- but at the expense of present happiness. Personally, I don't think that if you can't be happy in the present you never will be. And things can happen to change your life very quickly.

You could call this a "Bridge Plan". For example, rebuilding the interstitial, or supporting tissues between cells that are lost over time, or rebuilding the long dendrites (the long parts of brain and nerve cells) that stretch long distances in the brain from the hippocampus to the substantia nigra in the deep portion of the brain are lost in Parkinson's disease, are sure to be an even more daunting task than keeping the tissues we have from declining.

This system covers a range of methods to help you soften what Shakespeare called the "thousand natural shocks that flesh is heir to". So for now, we deal with all this the old fashioned way -- with the scientifically designed and precision nutrition and exercise, stress reduction, appropriate amounts of well-designed nutritional supplements, and other conventional methods you will find in this manual.

And besides, wouldn't you love the challenge? Conceiving, designing, and the execution and successful completion of a grand plan are among my favorite things. What could be more grand? Care to join me? I'm planning a big bash in 2100 and you're invited.

Whether your personal goals are as ambitious as mine, or whether you just want to stay healthy, joyful and alert until your 70’s, 80’s or 100’s, this system will be of great value to you. The cornerstones are intelligently and scientifically designed conventional methods, applied with common sense. Hormone replacement and other therapies may be added after you take care of the basics with the scientifically designed and precision nutrition and exercise, stress reduction, appropriate amounts of well-designed nutritional supplements, and other methods you will find in this manual.
Hold on a Minute -- There Must be More to "Why"?

Ok, a lot of the ideas in the "Why" section above seem like an awfully self indulgent and even silly ways to spend your youthful and joyous living for years, decades, maybe even centuries. And that's not necessarily bad, but how about helping others and reducing some of the misery in the world?

As my best pal, Al, a gregarious public servant who's loved by the ladies says: "Old too soon, smart too late". As we spend more time here on earth, we learn how to better treat our fellows, our fellow creatures, even the earth itself. We evolve. But brings to mind the phrases "Older and wiser" and "By the time you get it figured out they're shoveling dirt on you."

This material is intended for seekers of wisdom and truth -- and those who wish to bring more love and compassion to the world -- and take action to reduce suffering. This does mean being unconcerned with trivial abuses and insults that those who have not been fortunate to have traveled as far down the path as we -- although it does not mean allowing ourselves to be taken advantage of or physically harmed. If given enough time, and the clarity of thought, we'll find the light and unlock even more mysteries of this world. Lots of geniuses, as well as us mere mortals, just begin to make our stride by 50, 60 or 70+.

With time comes wisdom and compassion. And with this a greater ability, and greater willingness and means, to make meaningful contributions and help others -- as well as learn how to treat others who we meet along the way. With the wisdom that comes with time, we learn to set aside our own anger, prejudices, personal indulgences, trifling concerns -- and we learn to replace these with kindness, compassion, love, and more peace in the world. This can come the form of volunteerism, or everyday occurrences.

This system focuses on optimizing your mental and physical self and is not a spiritual program, per se. But with your body, brain and mental "machinery" in optimal working order, it follows that you will be more spiritually aware and feel more spiritually connected. You will have higher consciousness and a greater understanding of, and capacity for, spirituality and for making contributions to others and to the world.

In the future we will face new challenges, like pollution and global warming, worldwide poverty, human rights, child abuse, inequality, hate, animal welfare, encroachment on the forests, the dramatic increase in the loss of animal species, and world peace with freedom from tyrants and bullies. This just names a few of our challenges.

We will need our most experienced minds, as well as those with new and innovative ideas to solve them.

Seniors make good use of their time -- volunteerism is alive and well in the senior sector. According to a recent survey described on the web with of "Independent Sector", a coalition of nonprofit organizations, foundations and corporations at http://www.independentssector.org/programs/research/senior_volunteers_in_america.html, almost 44 percent of all people 55 and over volunteer at least once a year; over 36 percent reported that they had volunteered within the past month. These older volunteers give on average 4.4 hours per week to the causes they support. The 26.4 million senior volunteers gave approximately 5.6 billion hours of their time— a value of $77.2 billion to nonprofit organizations and other causes in this country.

One special example is 100-year-old Mary McAnena, who founded "Mary's Kitchen" in Orange, CA. On a typical morning, Mary is up at 4 a.m., off to church at 8 a.m., and is feeding and helping the homeless by 1 p.m.
Over time even hardened criminals become more sensitive. The FBI recently reported that serious crimes reported to police went down for an eighth straight year in 1999. The 7 percent drop extended the longest-running crime decline on record and pushed the murder rate to a 33-year low. I happen believe that a lot of this has to do with the maturing of America, bringing economic prosperity as we learn to better provide for oneself as well as having the means and greater desire to treat others well. This comes with time and experience.

Ethical considerations are interwoven are an intrinsic part of aging intervention medicine. There are some very hard issues, including stem cell therapies, alternatives to animal research, social and environmental consequences of greatly increased lifespan, access to medical care, human research, genetically engineered foods, benefits of an older and wiser population, and many more.

Here in the U.S., many of us lead pretty charmed lives, many of us with unique problems like whether to have a Caramel Waccachino or a Tutti Fruiti Caffè Grande Ole at $3.50 a cup, how we will afford the lease payments on that BMW and whether to do Europe or just Hawaii on our vacation. Seen the Louvre, seen the waves. And in this age of instant gratification, if we want something we want it right now.

Lots of folks in this big world don't have those options. Daily concerns for millions of people on this earth are famine, disease and war. For all of us, with more time may come a better realization of the misery on this planet and that it might be a good idea to help other folks (and don't forget the animals) who might need it. Maybe we should think more of our earth itself as something to help heal. Our physical bodies are basically water, dirt and wind from this earth walking around -- powered by fire. So we are the earth, in a real physical sense.

Some people have concern that anti-aging medicine is God's territory, and that the same is true for genetic engineering, biotechnology, and other advanced medical interventions. There are those who once felt that way about immunization. Consider all this if you object to really long and robust life for religious reasons.

I have considered the question of whether we are intruding on God's domain a lot. And I certainly don't want to influence anyone else to do anything that's against God's will. So are we supposed to just grow old and pop off at some particular age?

Dr. Francis Collins is head of the government's Human Genome Project and a devout Christian. He has said that some people believe that an understanding of the genome is intruding on God's space. But the notion that we are here to heal, and to try to alleviate suffering, is a very strong mandate for the Christian believer. Christ spent a lot of time on earth healing and Dr. Collins believes he wanted us to notice that. Understanding the genome provides a lot of power to do that.

He reminds us that Christ said (for the believer) "greater works than I do, you shall do". Many believers except this as prophecy and instruction. If medical technology provides the power to heal and grow wise to a greater extent, then we should use it.

Many of the major religions of the world describe God's wish for us to have a century or more on earth. For example, Genesis 6:3 says that our time will be 120 years, and early Hindu texts to the normal lifespan as a century with many writings devoted to life extension. Religious leaders and texts view seeking good health and healing as an obligation, and speaks of the wisdom and understanding of the aged (Job 12:12).
We can optimize and fine-tune the body, brain, mind and spirit so that we have clarity of thought and sense of purpose -- and hopefully the right spiritual channels will open, and the appropriate course for the individual will unfold.

Growing old naturally? What the heck is that? Any time we take an antibiotic, have a little surgery, or put on our eyeglasses we are intervening in the aging process. So who is to set the stepping off point?

Some well respected scientists and ethicists believe we should only stay around for an allotted 115 or so years. And sure, even I have considered how it may be a good idea not to violate some unknown natural or spiritual law. But it keeps coming back to the idea of having more time to find out what they might be.

Consider these simple spiritual concepts:

- To be connected in spirit with others and with the universe
- To extend love, understanding, kindness and forgiveness to those we come in contact with.
- To learn and improve from experiences (some experiences can be quite difficult).
- Find your purpose and live for it.
- Love -- maybe the Beatles had it right and that's all you really need.

About the Changes Ahead . . .

Get ready for huge technological and social changes that lie ahead. Life today would seem very different to someone living 100 years ago (or the even 10 years ago). We should start planning now for people here on good planet Earth leading longer lives. Barring Armageddon or some other form of total social and economic meltdown, these are going to happen whether we like it or not. It's our own personal choice whether we would like to take advantage in the tremendous life-extending and life-enhancing advances that are soon coming, just like it is our choice whether we will go to the doctor when we are sick today.

The important thing is what we do with all those extra years, decades, and even centuries.

Some May Object

There are those who would say: "Hey!! After so many years you had your shot -- get outta here! You're taking up too much space!" So at what age should we depart? By one standard just about everyone past the age of puberty today is overstaying their welcome.

One well known writer on these matters says that people have lived long enough by age 65, (and that the NIH budget for cancer research should be reduced). So is he going to pop off when he reaches 65?? But there are a lot of people who have no intention of going away any time soon no matter what we do.

Population in developed countries is fairly level at this time. Population growth is a skyrocketing in many developing companies. Pakistan, Nigeria, Bangladesh, Indonesia, and India in particular. Actually, today there's enough room for all of us, and then some. National Geographic says that if everyone in the world were to go to Texas there would be 1200/sq ft for each of us. Population in developed countries has stabilized.
The Above Discussion About the Goodness We Can Spread is Just Wonderful, But . . .

We're Living Longer

In ancient Roman times life expectancy was about 25 years. During the Middle Ages in Europe, the average life span was around 40 years. Around 1900 it was 47 and the life span of Americans has continued to increase to about 76.

Actually, not much of this is due to medical interventions. Life expectancy is the projected average age of death of a population. It began as an actuarial calculation in the mid-nineteenth century when people started to buy life insurance in large numbers, and a way to calculate premiums was needed. Although life expectancy has risen greatly, this calculated number is largely the result of a great reduction in infant and child mortality as a result of immunization, public sanitation, and the like. Also, the number of women who die in childbirth has reduced.

In 1900 the most common causes of death were influenza, diarrhea, pneumonia and tuberculosis. Because of better public health, modern sanitation and medical advancements the life span of Americans has continued to increase to about 76.

Since the 1950s, medical science has been able to reduce deaths due to heart disease 45% and stroke by 60%. In the 1990's the most frequent causes of death were heart disease, cancer and stroke. We are now living long enough to get cancer, and hypertension is a disease of civilization.

The number of centenarians has increased from the 3700 in 1942 about 61,000 today. They are the fastest-growing segment of the U.S. population. The Census Bureau projects that one and time baby boomers (9 million of the 80 million people for between 1946 and 1964) will survive to see their early '90s, and that three million will the reach 100.

Today the average lifespan for an American female 79.4 years and for a male it's 73.8 years. The life expectancy of a 65-year-old is about 19 years for females and 15 years for males. U.S. Census Bureau demographic data and projections say that one in eight persons (about 12 percent of the U.S. population) is now 65 years of age or older. Currently, the number of people over 65 is 34 million, which exceeds the number of people under 25. This trend will continue to grow. In 2010, almost 40 million Americans will be older than 65 -- and by 2030, the number will rise to 70 million (one in five Americans).

Source: U.S. Census Bureau

Unless we stay younger for longer and stay healthy, who's going to pay for the skyrocketing medical and nursing costs of the increasing number of old people? (This was written circa 2002). We are frequently reminded in our reading and through the media, and in our bones, that there is great body of people who are growing older and are destined to become disabled and dependent -- and expensive. This is true not only in the U.S., but worldwide. The economic pressure that our health-care systems are facing today, in an environment of increased competition and reduced health-care dollars from government and insurance companies, will only increase. When they become sick, a lot of aging peoples' savings will become exhausted by the costs. There will be an
increasing divide between taxpayers and benefit-consumers, with younger workers growing resentful of carrying the burden of social security, medical payments and other costs of too many old pensioners. It is unreasonable to expect that volunteerism, church groups, and the like will pick up the slack. Helping people stay healthier for longer can help solve these problems.

Currently, the U.S. health care bill exceeds $1 trillion. Each year, more than $600 billion is spent in the United States on age-related disease, much of which is for pharmaceuticals and drug-intensive therapies for their treatment.

The Federal Interagency Forum on Aging-Related Statistics report “Older Americans 2000: Key Indicators of Well-Being,” states that in the U.S., the population age 65 and older is expected to double by 2030.

In a 1995 study, James Lubitz of the health care financing administration calculated that medical expenditures for last two years of life average $22,600 for those who died at 70, and just $8,300 for those of make it past 100.


a. In 1996, the average annual expenditure on health care was $5,864 among persons ages 65 to 69, compared with $9,414 among persons ages 75 to 79, and $16,465 among persons age 85 or older.

b. In 1996, older Americans living in institutions incurred $38,906 in annual health care expenditures on average, compared with $6,360 among older persons living in the community. Nursing home care accounted for 64 percent of the total expenditures of the institutional population.

c. Between 1992 and 1996 there was a slight increase in average annual health care expenditures among older Americans in every age category.

d. In a given year, health care expenditures tend to be concentrated among a relatively small group of individuals. In 1996, 1 percent of Medicare beneficiaries age 65 or older incurred 13 percent of the health care expenditures in that age group. The top 5 percent of enrollees with the highest expenditures incurred 37 percent of all health care expenditures.

According to the U.S. Census Bureau (statistical brief entitled "Sixty-Five Plus in the United States"), the elderly support burden in the year 2025 will be 50% larger than that in 1998. Some of this will be covered by private insurance, savings (until it runs out), and family. Still, a great burden will be placed on everyone else. The bottom-line: we'll save a lot of money by keeping and older population healthy. See the references and links in Appendix Item 1 for lots of information and statistics on this.

So let's stay healthy and happy, and save a lot of money.

Level One of This System

The system described in this manual is Level One. Some good news is that what you will learn in future chapters does not involve a lot of expense. In fact, in addition to
increased health and happiness and better health, you are likely to find that by practicing better, scientifically designed nutrition that you are saving money compared with your current eating habits.

**Level Two -- A Medical Program Customized to Your Own Body**

The Level One system described above is a great improvement over the typical American lifestyle. It makes use of the best available information and would result in great improvement in health. But it is a generic system. Medical evaluation and disease prevention, caloric and essential nutrient requirements, exercise, nutritional supplement and other specifics can differ among people. So the level would be to get professional guidance from an experienced physician(s) skilled in aging intervention medicine, as well as conventional medicine. At the very least the practitioner(s) would be experienced in neuro-endocrinology, with additional training in cardiology, as well as nutrition, exercise physiology, and psychological & spiritual concerns.

Initial consultations would consist of a physical examination with comprehensive blood analysis, along with discussion about exactly what you want to achieve, then you would receive recommendations as how to best reach them, and other items. A treatment plan would be developed and you would be educated as to your new program. Your optimal program may change over time.

Many people are disillusioned with doctors. Although doctors work extremely hard for many years, their method is usually to fix things after they are broken and not prevention. They come from an "ill health" model and are used to looking at people when they are sick. So that's their only frame of reference. A lot of doctors do not work well along with patients to develop disease prevention programs.

Recently M.D.s are going to weekend seminars on growth hormone and other forms of hormone replacement etc. But after the brief training they do not really understand the complexity of the neuro-endocrine system and cannot apply it effectively until they have had years of experience.

**Level Three**

Level Three consists of highly effective treatments for diseases and methods of diagnosing disease that you might develop in the near or distant future. Medical technology is moving at an astounding rate. For example, there's a lot of new research and information about how genes predispose us to, and control the development of diseases. This is beginning to be put into use right now.

There have been huge advances in medical technology with last few years, and the pace is accelerating. Biotechnology, cloning, and human genome project come to mind. In the various Email lists to which I subscribe, I see advances on a smaller scale made almost daily. Here are a few of the more recent initial developments, most of which should lead to very significant advances. These may be old hat by the time you read this.

**Here's what the future holds:**

- **A greater understanding of diseases and how to combat them on the genetic level.**
  Note: There will be a brief discussion of genes and genetics in the Part I.  For example, a single gene, p21, is thought to launch cells on the road to cancer, hardening of the arteries, arthritis and Alzheimer's disease. When the gene is turned off, cells stop dividing and age. When the gene is switched on, it starts a protein chain reaction that triggers other genes into creating proteins that may cause old-age
diseases. There are other genes involved in these diseases, but p21 seems to initiate the processes. In a just-completed study, two collaborating groups of scientists at the Wistar Institute have identified the structure of a molecule known to regulate gene expression. The molecule, called Esa1, is essential for cell growth in yeast and is related to a human molecule that has been implicated in certain kinds of leukemia. They compared the structure with that of several molecules with related function (known as histone acetyltransferases, or HATs) but with different kinds of composition -- revealing unanticipated structural similarities, suggesting the molecules probably share a common mode of action. The ability to turn genes on and off appropriately is key to normal function in all cells, and mutations in the regulatory molecules studied have been linked to an array of diseases, including cancers. "These molecules help balance the activation and inactivation of genes in the cell in a way that appears to be crucial to health," says Ronen Marmorstein, Ph.D., senior author on the study and an associate professor at the Wistar Institute. "When they are disrupted, disease states such as cancer can result. So, the development of drugs to modify their activity, perhaps based on structural insights, could have significant medical implications."

- **Curing disease caused by a specific gene** Researchers at Duke University Medical Center have shown for the first time that alteration of a specific gene appears to contribute to both the common late-onset form of Parkinson's disease, and the rarer, early-onset form of the disease. This finding demonstrates for the first time a common genetic basis for the different forms of Parkinson's disease, and they suggest that genetic analysis might eventually be a useful diagnostic tool for the disease.

- **Creating custom organisms** by assembling entire DNA genome, letter by letter.

- **Greater understanding of fundamental disease processes and how to combat them** Several laboratories have how determined how "gram-negative" bacteria, such as Salmonella and E. coli, infiltrate host cells and establish infection. These bacteria utilize needle-like projections that appear to serve as syringes in order to inject disrupting toxins into the cell and then gain entry. This knowledge will lead to better treatments, particularly for bacteria that have grown resistant to antibiotics.

- **Greater understanding the genetics of bacteria and viruses** For example, a team of scientists at the University of Wisconsin researchers and elsewhere have decoded the DNA of the lethal strain of E. coli O157:H7 bacteria. Armed with this information we will eventually create a vaccine. E. coli frequently picks up swatches of genetic material from other bacteria and viruses. A harmless version of E. coli lives in the gut of humans. The virulent strain shares about 3,500 genes with its harmless cousin. But the E. coli O157:H7 strain has about 1,300 additional genes, while the harmless strain has 530 genes not found in O157:H7.

- **Gene chips** displaying a visual representation consisting of different colors representing whether particular genes are activated or are silent.

- **Genetic screening.** It used to be that the same treatment or medicine would first to be given to everyone stricken with a particular disease. Then it would be a matter of waiting to see whether it worked. If it did work, great! If it didn't, then the next treatment or medicine would be tried. Different people respond to different treatments in different ways. Genetic screening will determine which treatments would be most effective for an individual genetic makeup.

- **Repairing damaged and aging brains** -- from Alzheimers to Parkinsons to Attention Deficit Disorder, and more.
• **Faster and more effective methods of diagnosing disease** are being developed. For example, the agonizing wait to discover whether a baby has cystic fibrosis is being reduced by a small portable detector developed by researchers in Ireland which can give a result in minutes, rather than the full day needed for a lab test.

• **Gene therapy** to splice a new gene to the DNA to replace a faulty one.

• **Medications that are personalized your body.**

• **Stem cell therapy** This may someday be used to cure currently incurable diseases such as diabetes, heart disease, Parkinson's and others. A stem cell is a basic kind cell that is "undifferentiated". They're kind of like blank cells or templates. Scientists are learning to manipulate stem cells to get them to divide and differentiate into any specialized kind of cell in the body (neurons, blood, muscle, bone, etc.) in order to replace diseased or lost tissue.

There is a great deal of ethical debate surrounding stem cells, as currently they are derived from embryos. Typically these would come from embryos developed through in vitro fertilization, but where the parents had already had their child or decided not to have a child and were destined to be destroyed. The core of the debate is the question as to whether the embryo (a one-week-old microscopic ball of undifferentiated cells originally destined for in-vitro fertilization but are later determined not to be used) is a human being, and potential medical benefits for desperately ill children adults outweigh any ethical reservations. According to a poll commissioned by the Juvenile Diabetes Research Foundation International (JDRF) nearly two thirds of Americans support federal funding for stem cell research from excess human embryos developed through in vitro fertilization and fetal tissue that has been donated to research.

• **Adult Stem cell therapy** A new technique which can examine all the chromosomes in test-tube embryos could identify those with chromosomes that are 'non-viable' -- meaning incomplete, broken or hybrid sets of chromosomes. A large percentage of embryos have these defects and would have no chance of growing if implanted into the womb. But there have been cases where early tests have shown a chromosomal abnormality in an embryo, but when the baby is born it doesn't have the abnormality. So it may be possible for the embryos to fix themselves in some cases.

• Also, recent evidence that certain cells from adults may hold much of the curative potential previously believed unique to embryo cells. For example, Advanced Cell Technology has had early success in the use of skin cells in animals. And French researchers recently harvested muscle cells from a 72-year-old patient's thigh, grew them in a laboratory for two weeks and then injected them into a portion of the heart muscle that was so badly damaged from a heart attack that it was failing to contract at all. And researchers at UCLA and the University of Pittsburgh have grown bone, muscle and cartilage using stem cells harvested from **fat**.

• **Bone marrow** might provide an easy source of new brain cells, offering treatments for a range of diseases from stroke to Alzheimer's. Recently two separate teams of scientists from the National Institute of Neurological Disorders and Stroke (NINDS) and Stanford University in California, using different methods and different strains of mice, demonstrated that transplanted bone marrow cells can transform themselves naturally into brain cells and install themselves seamlessly into the brain.

• **Proteomic gene chips** are counterparts to the much publicized genomic "gene chips", reveal the activity of thousands of genes in the human genome project. Proteomic
chips have been developed that measure the functions of thousands of proteins simultaneously. In an article published in the September 8, 2000, issue of the journal Science, Howard Hughes Medical Institute investigator Stuart L. Schreiber and Gavin MacBeath, both at Harvard University, reported that they had successfully developed and tested protein microarrays. In experiments these chips indicate when proteins attach to one another, the interactions between enzymes and their substrates (molecules upon which the enzymes act), and small molecule-protein interactions. Advanced versions of these are under development that will be invaluable in distinguishing the proteins of normal cells from early-stage cancer cells, and from malignant, metastatic cancer cells.

- **Pre-implantation genetic diagnosis** allows doctors review genes and select a healthy embryo to be fertilized and then implanted in the womb of a mother. Inherited diseases such as hemophilia and cystic fibrosis can be screened out before the embryos are placed in the womb. Although are tests for diseases like CF, which can be done during pregnancy, they will only tell a couple whether the already growing fetus has the disease. If positive, they are then faced with the knowledge that their child will have the disease and with the decision of a possible abortion.

- **Nerve growth factor (NGF)** -- In the study funded by the National Institute of Mental Health, neuroscientists at the University of Rochester Medical Center genetically engineered mice with enhanced ability to learn. The results were published in Human Gene Therapy. The team was able to make the line of mice smarter by boosting the amount of the molecule nerve growth factor (NGF) in their brains. These mice learned to run unfamiliar mazes more quickly than their unmodified counterparts. Maybe someday we'll know enough to help prevent people from losing their cognitive abilities prematurely, as we see in some neurodegenerative diseases -- or even enhance cognitive abilities in ourselves.

- **Thought control of medical devices** People who are paralyzed as a result of spinal-cord injuries or illnesses such as Lou Gehrig's disease the ability to use their thoughts to command robotic limbs, wheelchairs, even their own rewired bodies.

- **Animal lovers, check this:** Have you ever noticed how dogs have such a tough time eating and carrying things around? I'm envisioning a kind of robotic hand attachment so they can chew down on their doggie biscuits with delicacy and dignity. Maybe even a speech chip so he can just tell you when he wants out.

- **Nanotechnology and nanomedicine** Tiny devices, smaller than a cell, that will move around the body and repair DNA thereby preempting disease, remove cellular and debris and otherwise repair our bodies on a micro level. "Smart pharmacies" will detect chemical signals from body cells, calculate the dose and precisely dispense drugs, or travel up and down your DNA looking for errors, and make repairs. Although most of this falls into what I've labeled "Level III" and "IV", in Nov., 2000 scientists at Cornell University announced that they have built and pilot-tested the first biomolecular motors with tiny metal propellers the size of virus particles. These prototypes are fueled by ATP, the body's own energy molecule.

- **Retinal and cochlear implant technology.** Cochlear implants detect sounds in the ear and transmit them to the brain's auditory nerve. Today cochlear implants allow tens of thousands of deaf people around the world to hear sounds. Retinal implants, which detect light signals and transmit them to the optic nerve, are currently under clinical trials. They are best suited for people who suffer from diseases like retinitis pigmentosa and macular degeneration.
• **Fiber-optic probes** to immediately detect bacteria like Salmonella and E. Coli in foods. These are now under development by University of Rhode Island researchers. A fiber-optic probe can be inserted into the food at the processing plant to test levels of bacteria. Results are returned in about an hour. Currently, food samples must be sent to a lab for testing and it takes several days to get the results.

• **Gene Biochips** (a sliver of glass or silicon covered with bits of DNA) -- When a specimen of diseased tissue is dropped on a biochip, the device pinpoints the active genes. This is a first critical step toward diagnosis and treatment. It makes the distinction between genes that should be active to keep cells healthy and detects inappropriate gene activity that makes cells sick.

• **Microchip technology** to create biomedical nanotechnology treatments. This technology will use microscopically small microchips combined with cell manipulation, which can then deliver a specific amount of drugs to a particular kind of cell. Much of it is still a long way off from commercialization or human experiments, but as a basic example, when former astronaut and U.S. Senator John Glenn was catapulted back into space his vital signs were monitored through a pill he swallowed containing a miniaturized radio communications device.

• **Genetic engineering** Today flocks of genetically engineered sheep produce human proteins for use in the drug industry and genetically engineered bacteria and yeast routinely provide human proteins such as insulin. Using techniques similar to those used to produce Dolly the sheep, scientists at Nexia Biotechnologies in Quebec have bred goats with spider genes. They claim to be on the verge of producing unlimited quantities of spider silk - in goat's milk. Spider silk is compatible with the human body, and could be used for strong, tough artificial tendons, ligaments and limbs. The new material could also be used to help tissue repair, wound healing and to create super-thin, biodegradable sutures for eye or neurosurgery.

• By the year 2005, scientists may be able to genetically engineer and replace damaged cells in the ears of deaf individuals to help them hear restore hearing to patients with long-term deafness. The genetically modified cells from the embryonic ear will work along with cochlear ear implants.

• **Cloning of endangered and extinct species** Advanced Cell Technology, Inc. (ACT) reached an agreement with the Spanish Government to clone the extinct bucardo mountain goat. ACT has successfully implanted the cloned cell of an endangered Asian guar (a kind of ox) into a cow named Bessie. The goal of the research is to use the cross-species cell transfer technology to reprogram human cells for medical purposes, said Dr. Michael West, CEO of ACT. ACT scientists removed the DNA from one of Bessie's eggs and fused the egg with a skin cell taken from a living gaur, producing a genetically gaur egg that would be accepted by Bessie's immune system. Before being implanted in Bessie's uterus, the egg was artificially induced to begin dividing without being fertilized. The technique could not be used on long-extinct species because the DNA donor cells must come from a live animal, one that has been dead for less than five days, or one that has been frozen since its death. Bessie recently gave birth to Noah, the guar calf. Sadly, even though some of the finest veterinarians attended Noah, after one month he died of dysentery which could have been prevented by a vaccine.

The list goes on and on, with significant announcements almost daily. But with this we're not yet repairing or reengineering your DNA to restore you to youthful condition. The best part comes next . . .
**Level Four -- The Next Generation**

Medical knowledge has been doubling about every 3.5 years. That rate is increasing due to technologies like the internet and the recent mapping of the human genome. We have an unprecedented increase in the ability to gather, synthesize, and communicate information and this is increasing exponentially.

Level Four is under continued construction and where we really get into pushing out our maximum life span, as well as our capabilities.

Since different parts of the body age for different reasons, these advances will be made on multiple fronts with multiple methods. Methods to treat and prevent disease will team with medical technology to intervene in the aging process, and allow us to re-engineer our DNA and other body components to reset the aging clock and redesign our bodies and nervous systems for much greater durability and intelligence.

Drugs and genetic engineering will knock out genes that cause disease, enable ones that prevent it, and splice in other genes for added functionality. More effective and precise antioxidants will be designed. Stem cell therapies and cloning body parts (not an entire person) will fix worn out organs.

Nanotechnology and nanomedicine -- tiny biomechanical systems would travel up and down our DNA and throughout our bodies and fix them.

Sure sounds easy, but actually an immense and daunting task, and an ultimate challenge. But who said it would be easy? Let's stick around long enough to find out.

Other radical transhuman (transitional human) ambitions include things like much higher intelligence, person-machine interfaces or even merging with machines, traveling and living in space, and just about anything else you could imagine.

Some futurists are predicting the ability to eventually "upload our consciousness" into a kind of supercomputer, and live in a virtual reality world with any conceivable kind of experience and sensory input delight you would imagine or desire. Faxing and copying ourselves has been the topic of science fiction movies lately. But if we can somehow "move your consciousness" into another brain or into a machine so that the being has the same personality and memory, will it still be you? I may be an old fuddy-duddy, but like I said before, I like my present form thank you very much. Although some kind electronic shell or "force field" or the like for protection from airplane crashes, or to deflect things like thugs and refrigerators falling out of the sky would be nice.

How about throwing a love and compassion chip implant into the mix?

**Meet Lord Lee-Benner, M.D., F.A.C.E.**

I once asked Dr. Lee-Benner why he chose aging intervention medicine. "What else is there?" he replied in his characteristic concise and authoritative style. At age 70, he is a walking example of the Lee-Benner Method. He has great vigor and is still building muscle, while putting to shame men half his age who are habitually fatigued and just building paunch.

With more than 35 years experience in aging medicine Lord Lee-Benner, M.D. F.A.C.E. is the foremost authority on clinical applications to treat and prevent the many negative changes that come with aging.
Although he understands the many theories of aging, he is primarily a clinician -- he treats patients on a one-to-one basis, helping them have longer and better lives. And while other practitioners know about one or two of the “hows” and “whys” of aging, Dr. Lee-Benner applies what is often a complex combination of the medical specialties that are important in aging -- endocrinology, neurology, cardiology, nutrition, exercise science, psychiatry, sexuality, life changing behavior techniques, spirituality -- and others depending on each individual patient's needs and interests.

He was acclaimed "the World’s leading authority in Anti-Aging Medicine" by Longevity Magazine, 1989, and again by his peers at the First International Meeting of Anti-Aging Specialists, Cancun, Mexico, 1994.

His youth, in his own words, “was a time of perseverance through adversity, and learning to be self-reliant.” During his early years, he lived in orphanages and in foster homes, working at odd-jobs to support himself through school, excelling in scouting, and studying with the Jesuits. At the age of 17 he volunteered to join the U.S. Navy to fly torpedo bombers during the Korean War. He served in the Navy for over 10 years where he completed his high school and college degrees, as well as serving 4 years as an officer-of-the-line at sea, and as a U.S. Naval Minewarfare Officer, and again, volunteered to be a Military Advisor in Indochina. While there, he took advantage of the opportunity to become familiar with the philosophy and teachings of Buddhism and meditation.

Initially in his professional practice, Dr. Lee-Benner worked with seniors who were bed-ridden. This gave him an understanding of the helplessness and frustration that comes with old age and frailty. It's that feeling of helplessness that inspired him to explore preventive medicine and dedicate his life to finding preventive causes of diseases that accelerate aging.

Dr. Lee-Benner is uniquely qualified and recognizes how aging is a complex issue involving biochemistry, neuroscience, cellular and molecular biology, neuro-hormonal and neuro-immune interactions, precision nutrition, and high performance exercise physiology. Relevant medical specialties include endocrinology, neurology, cardiology, immunology, exercise science, psychiatry, nutrition, as well as general medicine and even spiritual guidance. It involves influences from psychology and life-long personality adaptations, behavioral modification, issues of sexuality, stress management, lessons gained in self-mastery, and spiritual concerns.

Dr. Lee-Benner has been inducted into the prestigious Endocrine Society, and has been elected a Fellow in the American College of Endocrinology (this is what the "F.A.C.E." following an "M.D." designates). He's also a member of the American Association of Clinical Endocrinologists, the Growth Hormone Research Society, the American Society of Andrology, International Human Growth Hormone Research Society, the International Association of Biomedical Gerontology and the American College of Clinical Gerontology (founding member). He is and a diplomate of the American Board of Psychiatry & Neurology (1976) and the National Board of Medical Examiners (1976).

Dr. Lee-Benner has written four medical school text books: Free Radials, Immunity and Aging, Physician’s Guide to Free Radicals,
Immunity and Aging, and Physician’s Guide to Physical Fitness, as well as a book for the general lay public, Turning Back the Aging Clock. In 1972, he instituted the first practice of Nutritional Medicine for reversal of heart disease and diabetes. This was soon followed by his endocrinological studies leading to his use of hGH to treat the changes related to aging and the first textbook on anti-aging in 1974.

Dr. Lee-Benner has gathered his knowledge base from a wide range of medical research and literature, and most important, from experience with his patients and his own program. He conducts research, has numerous publications to his credit, has made presentations to prestigious groups of physicians, and frequently conducts clinical teaching.

He participates in international educational conferences and workshops that bring together the most advanced research and technology in the world. These advanced forums enable him to remain at the forefront of medical science for the improvement of human mental and physical performance. These include the Los Angeles Gerontology Research Group, the Fifth International Congress of International Association for Cytobiological Therapies, the International Symposium on Sex-Steroid Interactions with Growth Hormones, American Association of Clinical Endocrinologists Annual Meeting and Clinical Congress.

His affiliation with Growth Hormone Research Society is especially noteworthy. At the 2nd International Conference in London, England-1996-Plenary Session, Dr. Lee-Benner was a guest speaker, and presented his scientific research on 10 years of clinical studies on the effects of long-term use of Growth Hormone in adult humans. The presentation made a significant contribution to the eventual establishment of standard guidelines for adult Growth Hormone deficiency diagnosis and treatment. These guidelines were published in the February 1998 issue of the Journal of Clinical Endocrinology and Metabolism.

His clientele includes high level executives throughout North America, Europe, Australia and South America, as well as celebrity clientele from Stage, Screen, Television, and Professional Athletes. Other physicians such as plastic surgeons, orthopedists, radiologists, and dental surgeons also seek for his treatments and supervision.

His web site at www.theantiagingdoctor.com is provided for educational purposes and condenses some of his in-depth knowledge. It would be worth your time to spend about a day or more studying the site. His curriculum vitae is here: www.theantiagingdoctor.com/cv.htm.

Here's What You'll Need To Do

The plan for now, if you do care to join me, is to get the most out of life right now and remain healthy, happy, productive, learning, growing, having new experiences, leading an exciting life while building a better world, while these new and exciting aging intervention breakthroughs unfold.

"Time marches on . . ."
Albert Einstein? Fred Smith? All I know is that it does march (and it often flies).

Now on to some background information in the next chapter . . .
You will find the following information very useful and motivating. When you are armed with accurate information (and there's a whole lot of misinformation out there) you will be more motivated to take action to improve your health.

However, I don't want you to be bogged down with too much reading, and do want you to quickly get into the system starting in Part Two. So if you find that this is just too much medical detail (or heaven forbid - boring) read the part about free radicals starting on page 41 and skim the rest so that you get the general idea and move on to the chapter on nutrition, and come back to the rest later.

You will get a multiple positive effect by taking action to reduce free radical damage in your body -- so definitely read the part on free radicals.

Life is Largely a Matter of Chemistry

Our bodies, feelings and continued living depend on an immense amount of chemical activity. Just in case you've never had a chemistry class, here's a very brief introduction, starting with some basics.

For now we won't need to be concerned with the subatomic level of neutrinos, quarks, or quantum mechanics etc. Some writers are describing how our mental and spiritual existence is a result of matter on this level.

On the atomic level, matter is basically composed of particles called protons, neutrons and electrons. Electrons are tiny compared to protons and neutrons. When combined in various ways, protons, neutrons and electrons make up an atom. In an atom, one or more electrons orbit around a nucleus composed of various combinations of protons and neutrons (with the exception of hydrogen, which has just one proton in its nucleus.

Hydrogen is the simplest of elements. A hydrogen atom has just one electron spinning around its one-proton nucleus. Oxygen has eight electrons whizzing around a nucleus comprised of 8 protons and eight neutrons.

Different kinds of atoms can combine with one of another to form molecules. A molecule is the smallest unit into which a substance can be divided and still retain the composition and chemical properties of that substance. For example, when two hydrogen atoms combine with one oxygen atom, the result is one water molecule. This is, of course, abbreviated H$_2$O.

See the appendix, Item 2 for web sites with information on chemistry.

When different kinds of molecules come in contact with one another, they can combine, split apart, or otherwise transform to become other kinds of molecules. This is called a chemical reaction. A whole lot of chemical reactions are going on inside your body right now -- it’s a part of your digestion, your muscle contraction while breathing, even the chemical actions in your brain that give rise to thought, and a whole lot more.
An enzyme is a molecule manufactured by living tissue that causes a specific chemical reaction. One example is a pancreatic enzyme which causes complex proteins in food to break down into simpler structures that can then be absorbed by the intestines. A coenzyme is essential to the action of enzymes, or binds with an apoenzyme to form the active enzyme (holoenzyme) to effect a chemical reaction. Vitamins such as B1, B2 and B6 are coenzymes.

Some molecules bind with "receptors" on cells to cause a particular activity in the cell. There are receptors for insulin, receptors for low-density lipoproteins (LDL), receptors on immune cells that are activated by antigens etc.

An antigen is any substance that stimulates the formation of an antibody. Antibodies are molecules produced in the blood that produce a specific immunity, or defense attack, to a specific germ or virus. Antigens can be toxins or proteins or other material that has been generated by an invading bacteria, or the bacteria itself.

The action of an activating substance on a receptor is specific -- kind of like a lock and key. Some molecules, such as some drugs, micronutrients or phytochemicals, can compete with a toxin and bind with a receptor, thereby preempting the first toxic molecule. This is called competitive inhibition.

Others may bind with the activating molecule to neutralize, or render it inactive. More of how micronutrients and phytochemicals protect us from diseases like cancer, and why precision, scientifically designed nutrition and other elements of this system are important, will be discussed soon.

**Food Composition**

Have you noticed how some old men have spindly arms? This muscle loss is a reflection of their decreases in organ size and bone loss -- the loss of protein. Loss of muscle mass and strength (medical term sarcopenia) leads to impairment of physical function, as indicated by the impaired ability to arise from a chair, climb stairs, generate gait speed, and maintain balance. The impairment of physical function contributes to loss of independence, depression, dependency, and increased risk of falls and fracture in the elderly -- but don't think that if you are not already elderly that it doesn't apply to you. Along with the general decline in other functions of the body and brain, it starts relatively early in life.

The prevalence of sarcopenia, depending on the definition used, varies from 10% to 30% in men over the age of 60, and women over the age of 30. The principle component of the decrease in fat-free mass is in the loss of muscle mass -- there is little change in non-muscle lean mass. Between 20 and 80 years of age, the cumulative decline in skeletal muscle mass amounts to 35%-40%. The depletion of muscle mass does not result in weight loss because of the corresponding accumulation of body fat.

The nutrition, exercise, and other components of this system will help you keep from losing your protein and maintain your muscle, organ size and function, bone density, even brain function.
Protein in the diet is good and we really like it. Your body utilizes around 250,000 different kinds of protein, and each serves a specific biological function. (This is distinguished from the amino acids that compose the protein in our diets). Proteins are involved in virtually every vital process in your body.

It takes energy (calories) for our bodies to metabolize the foods we eat, and it takes a lot more energy to metabolize protein than fats, sugar and carbohydrates.

In a recent study published in the American Journal of Physiology, people who exercised and ate a high-protein diet (a little more than one gram per pound of bodyweight per day) burned more fat than people who ate a protein diet near equal to the RDA. The researchers said this was partly due to the increased "thermic" effect, or the increase in metabolism after eating. In the high-protein group, the thermic effect was elevated 42% after eating, compared to only 16% in the lower protein group. Since this so-called thermic or calorigenic effect of food reaches its maximum one hour after a meal, eating six meals a day takes advantage of the increased metabolic rate that accompanies eating.

So, we can raise our metabolic rate and become "fat-burning machines." It's possible through exercise, supplements, muscle mass, and frequent small meals. Adequate amounts of protein are required for an immense number of your body's functions, as well as structure -- and protein turnover allows for the removal of oxidated proteins.

Your brain and nervous system, muscles, heart, blood, skin, lungs, liver, and kidney are made largely of protein. Blood contains a lot of it. Bones are a protein matrix.

Some categories of proteins included enzymes, hormones, antibodies, transporters, structural, supporting, and contractile proteins.

You have probably heard about human growth hormone (hGH). Under expert guidance, it can be a useful part of your system. But it is not the "Youth in a Bottle" as described by many promoters -- and it's definitely not for everyone. More about this in later chapters.

hGH is a protein. Scientists represent molecules in different ways depending on the information they need to review. These pictures represent different ways of viewing the Human Growth Hormone molecule, a complex structure consisting of a chain of 191 amino acids.

Protein functions are diverse, including enzymatic catalysis, receptor signaling, and maintenance of the structural integrity of cells. These functions depend critically on each protein folding into its proper 3-dimensional shape, or "conformation".
Some examples of proteins

- **Brain and nervous system, muscles, heart, blood, skin, lungs, liver, and kidney** are made largely of protein. **Blood** contains a lot of it. **Bones** are a protein matrix.
- **Antibodies**: recognize molecules of invading organisms.
- **Receptors**: part of the cell membrane, they recognise other proteins, or chemicals, and inform the cell of their presence.
- **Enzymes**: assemble or digest.
- **Neurotransmitters** and some **hormones**: Trigger the receptors.
- **Channels, and pores**: holes in the cell membrane (with or without a gate). They filter the flow.

Your immune system’s antibodies that fight off disease are constructed of protein, as well as the enzymes and many of the hormones that regulate your body’s biochemical activities. Mention the word hormone, and sex hormones like testosterone or estrogen, often come to mind. A hormone is a kind of chemical produced by a gland, that is secreted into the bloodstream and controls the function of distant cells or organs. It's a form of long-distance communication within the body.

Insulin is a protein hormone that, among other things, regulates the level of glucose in your blood. Glucose is the chief source of energy for living organisms. Excess glucose is converted to glycogen and stored in the liver and muscles for use as needed. Beyond that, glucose is converted to fat.

Enzymes are protein molecules that facilitate and direct the thousands of chemical reactions that are constantly taking place in your body. They are essential for breaking down protein, fats, and carbohydrates during digestion, as well as for rebuilding new proteins from the raw materials obtained from the diet. Each enzyme is highly specific for a particular task, and without the appropriate enzyme the reaction cannot take place. Other proteins are designed for the specific assignment of transporting nutrients and other molecules. Wound healing and water balance depend upon protein. So protein's pretty darn important.

Proteins are large and highly complex molecules consisting of one or more chains of amino acids. The 20 amino acids share a common "backbone", or main structure of molecules, but each has a specific "side group" consisting of other kinds of molecules. The backbone structure of an amino acid consists of an amino group (specifically, -NH₂, which means one atom of nitrogen combined with do with hydrogen atoms), a carboxylic acid (-COOH, which is one carbon, two oxygen and one hydrogen atom) and a central carbon atom (designated C-alpha) to which one of 20 different side chains, called the R-group, is attached. The R-groups give the amino acids their physical-chemical characteristics such as polarity and charge (acidic or positive vs. basic (or alkaline) or negative).

The joining of the amino acids results in the formation of a polypeptide chain which then twists and folds into a compact, three-dimensional structure that is a functional protein. The three dimensional structure is held together by the interactions of the amino acids at different parts of the chain. And this determines the "activity" of the protein, or what it does. The polypeptide chain can then perform complex chemical interactions which are the "work" or beneficial functions within your body.

The requirement for protein is not for "protein" per se, but, rather, the requirement for the 20 amino acids that are the building blocks of human protein. These are, in turn, the building blocks of life.
Of the 20 different kinds of amino acids in the human body, eleven of these can be synthesized by the body. However, the other amino acids cannot be manufactured in the body. It is essential that the diet supply them. This is why they are called "essential amino acids". Even if one essential amino acid is missing you are in big trouble.

The body continually breaks down and reconstructs proteins from your muscles, organs, enzymes, etc. in the process of protein turnover. It has been estimated that the average 150-pound man breaks down and synthesizes about 400 grams of protein each day. That's about 13 chicken breasts.

In the event the body runs out of carbohydrate (glucose) and glycogen, protein can be burned for energy. This is a very inefficient process. And after circulating protein has all been burned, the body will disassemble and burn your muscle, bone, and organs, which also impairs your immune system and prone to cause illnesses related to immune deficieny, such as colds, flu, and even cancer. A very bad thing! This is why endurance events like running marathons are to be avoided. Burning carbohydrates instead of protein is more efficient and is a basis of this system. This is protein sparing.

The molecules of your body such as proteins can spontaneously mutate into altered forms that are twisted or mirror images of themselves. These mutants are called isomers, and the body cannot use them and they can even cause damage. The amino acids that make up proteins can also become misshapen or bond together in clumps. These damaged proteins accumulate within the cells and interfere with cellular metabolic functions. Lack of growth hormone causes the cells to slow down and stop processing these worn or damaged proteins.

Foods that contain all of the essential amino acids in about the same proportions needed to make body proteins are sometimes referred to as complete or high-quality proteins. All animal proteins, with the exception of gelatin, fall into this category. Vegetable protein, even fish protein, are often called incomplete or lower quality proteins because they are deficient in one or more of the essentials. However, it is possible to attend the proper balance the by combining certain vegetables, such as beans & rice.

Less protein than recommended in this system is sometimes recommend in other programs. The ultimate fact of life is that you are either gaining or losing protein in your body. And with this system, protein intake is scientifically coordinated with weight training and other exercise and obtain the optimum effect to ward off the frailty of aging. This is one reason why we have frequent small meals.

When we eat proteins, there are chemical reactions with digestive juices in our stomach and intestines result in their breakdown to peptides (a short stretch of amino acids - to be further discussed later) or polypeptides (peptides strung together in a chain which usually folds into a compact, stable structure [domain]), and ultimately to amino acids. These small molecules can now pass through the gut, into the bloodstream and onto the cells where they are reassembled into human proteins under the direction of DNA.

Here is scientific information on human growth hormone from the Protein Data Bank:

http://www.rcsb.org/pdb/explore.cgi?pid=265631022778126&amp;pdbId=1HGU

Here is structural (how it's atoms are configured) information. Scroll down to the ATOM records (left hand column is "ATOM"). Columns 6-8 are the 3 dimensional coordinates of each atom in the hGH molecule:

http://www.rcsb.org/pdb/explore.cgi?job=download;pdbId=1HGU;page=;pid=265631022778126&amp;opt =show&amp;format=PDB&amp;pre=1
Here is the main page of the Protein Data Bank. You can enter the name of a protein in the "Search the Archive" section for more of this kind of information on over 17,000 proteins:
http://www.pdb.org

See the appendix for more information on protein.

**Micronutrients and Phytochemicals**

Micronutrients and phytochemicals are similar in some ways. The important thing is that they are found mostly in vegetables and fruits and they will help keep you healthy. They perform a multitude of cellular functions, many of which involve the body's process and disposal of toxins.

A micronutrient is defined as a vitamin or mineral that is essential in small amounts and that the body cannot manufacture. Each definition I've found contains that "small amounts" part. They are either components of enzymes or act as coenzymes (combine with other molecules) in managing chemical reactions. "So what's a macronutrient?" you might ask. The answer is obvious: Any of the nutritional components of the diet that are required in relatively large amounts: protein, carbohydrate, fat, and the macrominerals. Phytochemicals are components of plants that have antioxidant, immune boosting and other health promoting properties, and there are thousands of them.

As far as we know, approximately 40 micronutrients are required in the human diet. Some are vitamins, like C, E, B6, and B12, as well as folate (folic acid), niacin, betacarotene, lutein and lycopene, iron and zinc. There are probably others that we don't know about. There are thousands of phytochemicals. Since so many of these are unidentified, nutritional supplements can only provide a small fraction of the spectrum needed for optimum health.

A number of studies have shown how micronutrients and phytochemicals protect against diseases like cancer, and their antioxidant effects are well known. Another factor in this protection may be the enhancement of cellular repair activity for DNA and other large molecules. Micronutrients and phytochemicals appear to have the capacity to prevent damage to DNA, and they can repair damage to DNA, such as single- and double-strand breaks and oxidative lesions. Mutations also accumulate with age so there's a cascading affect to all this damage.

Deficiencies in micronutrients result in deformation of key enzymes, and mimic DNA damaging radiation. For example, uracil is a component of RNA. RNA transfers information from DNA to the protein-forming system of the cell. Folate (folic acid) helps prevent the unwelcome bonding of uracil onto DNA. And folate deficiency results in extensive incorporation of uracil (4 million/cell). Uracil bonding leads to breaks in the DNA. This is the likely cause of the increased cancer risk, and perhaps in the cognitive defects associated with low folate intake. Both high DNA uracil levels and chromosome breaks in humans are reversed by folate administration. Evidence suggests that vitamin B12 and B6 deficiencies also cause high uracil and chromosome breaks.

The phytochemical ellagic acid binds with carcinogens, thereby preventing them from damaging DNA and rendering them inactive. Apigenin and other flavonoids found in vegetables block the activity for the molecule called tyrosine kinase. (Tyrosine kinase is the enzyme that cancer cells require in order to replicate). Luteolin blocks the binding of estrogens to breast cell receptors, potentially reducing the possibility of cancer.

Increasing fruit and vegetable consumption would do a lot to improve public health, and this would be accomplished inexpensively. However, this means steamed vegetables.
No juice -- juicing causes free radical formation from oxygen perturbation of polyunsaturates in cell walls of vegetables and all you're really getting is high sugar content.

Take your supplements, but be sure to eat your veggies. We'll see how the best provide these in your diet in the chapter on nutrition.

See the appendix for more information on micronutrients and phytochemicals.

Carbohydrates

Today there is a lot of talk about “low carb diets”. Actually, we want “complex carbohydrates” (vegetables, grains), but not simple carb diets (sugars, starches).

Complex carbohydrate foods like vegetables and fruits contain an array of the micronutrients discussed earlier. They have cholesterol-lowering benefits and the kind of fiber found in carbohydrate foods like vegetables provides benefits to the intestine resulting in better nutrient absorption.

When complex carbohydrate foods are eaten with protein foods, they facilitate the uptake, or assimilation, of protein into the cells.

Although the membrane (outer area) of a cell is composed of primarily lipid (fat) molecules, every cell's surface contains complex carbohydrate and protein structures, like the branches of a tree. These are essential to the proper function of the receptors on the cell's surface that serve as a communication network. Receptors on the cell surface receive messages then send information back to the nucleus. This information influences what the cell does.

Michael Pierce of the University of Georgia and his team have determined how this may lead to a greater understanding and new treatments to prevent the spread of cancer. When a cell becomes cancerous, its carbohydrate branches change -- and so do the messages sent are back to the nucleus. Starting with the altered branches, Pierce and his team have worked backward to find what causes these changes, and eventually identified the enzyme GnT-V. This exciting new research draws us to the conclusion that complex carbs are really really important for the prevention of cancer and in health.

Carbohydrates include a large array of foods. Carbohydrate foods are converted to glucose, and are superbly designed to provide energy. Glucose is the chief source of energy for living organisms, its utilization being controlled by insulin. Burning carbohydrate spares protein for its prime role as a building block in cell growth and repair. Carbohydrate can be stored as glycogen for later use.

Carbs have the general molecular formula CH2O, meaning they are all comprised of various arrangements of the carbon, hydrogen and oxygen atoms. Carbohydrates They all come from plants, and include such diverse foods as table sugar, apples, broccoli, rice, pasta and honey.

Monosaccharides are the simplest sugars. The three monosaccharides are glucose (or "blood sugar" the immediate source of energy for us), galactose (a sugar in milk and yogurt), and fructose (a sugar found in fruits and honey).

Disaccharides are the two monosaccharides bound together. Three common disaccharides are sucrose (common table sugar) which is glucose + fructose, lactose (the
major sugar in milk) is glucose + galactose, and maltose (product of starch digestion) is glucose + glucose. Although the process of linking the two monomers (simple molecules) is rather complex, the end result in each case is the loss of a hydrogen atom (H) from one of the monosaccharides and a hydroxyl group (OH) from the other.

Their bonds are easily broken down by digestion (thereby getting into your system fast) and they taste sweet. Unlike people in the rest of the world, most Americans get quite a lot of their carbohydrates in this category.

Complex carbs are molecular chains of many simple sugars that can be strung together by the hundreds or thousands. The varying structures result in the range of textures, flavors, colors and structures.

Starches and cellulose – These include rice, grains and beans. Both are large molecules, and are polymers ("polysaccharides", and built from repeating units, and monomers, much as a chain is built from its links. The monomers of both starch and cellulose are the same: units of the sugar glucose. Most need to be cooked to be digested.

See the appendix for more information on carbs.

**Fats**

The term "lipid" is a general name for a fat, oil, wax, or similar substance that, for the most part, can't be dissolved in water but can be dissolved in an organic solvent (like cleaning fluid). They are built from the same three elements as carbohydrates -- hydrogen, carbon, and oxygen (in different proportions) plus glycerol. Glycerol is a small molecule with three alcohol groups. An alcohol group, in this case, is comprised of a specific composition of carbon, oxygen and hydrogen.

The term "fatty acid" is a biochemical description. The terms "fat" and "fatty" are just names for molecules of this type. Each fatty acid molecule has a chain of carbon atoms, to which hydrogen atoms are bound. In fats, the ratio of carbon to hydrogen is somewhere around 1 to 1. At the very end of the chain there are two oxygen atoms.

In chemistry there are several definitions of what comprises an acid, but basically it is an acid because of its hydrogen. But it is much weaker than battery acid or stomach acid.

Fats the found in the body are made up of one to three fatty acids, plus glycerol. Different kinds of fats are comprised of different amounts and configurations of these basic components. For example, a triglyceride contains three fatty acids to one glycerol. Cholesterol (technically a sterol [a kind of steroid] and not a fat) has the same chemical components as a fat arranged in a series of rings.

**Low-density lipoprotein** (LDL, or "bad" cholesterol) picks up cholesterol from the liver and deposits it on your arteries. **High-density lipoprotein** (HDL, or "good" cholesterol) picks it off the arteries and puts it back in the liver. This is why it's good to have high HDL and low LDL. Nutrition, exercise, age, sex and heredity affect these. Nutrition and exercise are the ones you can do something about.

A fatty acid is called "saturated" if all the hydrogen atoms that can possibly bind are present – all the chains of the carbon atoms are taken up. Saturated fats tend to be sold at room temperature. When hydrogen atoms are missing from two adjacent carbon atoms, the stable second bond, called a double bond, is formed between these carbon atoms rather than between the carbon and hydrogen. The fatty acids containing one double bond are called monounsaturated, and those with two or more double bonds are called polyunsaturated.
Here are some sample chemical structures of several kinds of fats. The "C" stands for a carbon atom, the "H" stands for a hydrogen atom, and an "O" stands for an oxygen atom. Carbon requires two bonds:

Adding hydrogen atoms to a polyunsaturated fat is called hydrogenation. This creates a kind of fat that is particularly harmful called trans fat. Polyunsaturated fats tend to become rancid quickly because of the available spaces on the carbon atom chain are soon taken up by oxygen, which causes the oils to become organic acids which further break down to form hydrogen peroxide and even more dangerous hydroxyl ions -- as well as singlet oxygen and superoxide radicals. All of this acts as bombarding radiation type particles that damage molecular structures within the cell, including DNA. So saturated and hydrogenated fats will have less of the tendency to go rancid than polyunsaturated and monounsaturated fats.

Most highly saturated fats interfere with removal of cholesterol from the blood resulting in high cholesterol levels. Polyunsaturated and monounsaturated fats lower blood cholesterol. But we have already discussed the free radical generating aspect of polyunsaturated fats.

Excess calories from protein or carbohydrates are converted to fat for storage in the body. A calorie is a unit of energy. Specifically, 4.184 absolute joules, or the amount of energy it takes to raise the temperature of one gram of water from 15 to 16 degrees Celsius. But food calories are actually equal to 1,000 calories (1 food calorie = 1 kilocalorie).

See the appendix for more information on fats.

**Life Expectation and Maximum Life Span**

This plan is designed to increase your youthfulness and joy, as well as what is known as "life expectation", until ways of increasing your "maximum life span" are developed.
Currently much can be done to slow the rate of aging, and slow or reverse some of the effects of aging. But right now nothing can be done about the underlying process of aging.

The distinction between "life expectation" and "maximum life span" is important. Dr. Leonard Hayflick is a top researcher and pioneer in the field of gerontology, and along with Paul Moorhead, demonstrated that human cells can only divide a limited amount of times in culture. This is known as "The Hayflick Limit." He defines life expectation as "the number of years, on average, that someone at a particular age can expect to live." For a child born today in the U.S., that's about 75 years.

Maximum lifespan is the theoretical limit of the span of a person’s life. The approximate maximum lifespan for humans is 125 years. Dr. Hayflick says "There is no evidence that the maximum human life span has changed from what it was about a hundred thousand years ago. It is still about 115 years." He later continues: "The likelihood that you and I will live to be 90 or 100 has certainly increased, but the maximum human life span has not changed. Life expectation has increased, but life span has not; the distinction is critical."

**Increasing life expectation -- "squaring the curve":**

Average life span has steadily increased from 25 during Roman times, to around 40 during the Middle Ages in Europe, to about 47 in the U.S. at the turn of the century (but as described earlier, this is mostly a result of a reduction in infant and child mortality as a result of immunization, public sanitation, and the like). Today, average life span is about 76 years. Future medical breakthroughs will increase life expectancy still further.

This is "squaring the (Gompertz) aging curve". The Gompertz Curve is a mathematical function derived to describe expected mortality atistics for a population of organisms whose probability of death increases as a function of time.

**Increasing maximum life span -- "shifting the curve":**

We want to do what it takes to maintain our present level of youthfulness, and even turn back the clock as much as possible, while looking for therapies that will increase the maximum.

Increasing maximum life span in the near future would be called an optimistic expectation by some very knowledgeable people (including good Dr. Hayflick). But recently we've seen tremendous medical advances and anticipate the best -- and soon enough for us to enjoy it. And of course, the quality of your life is also very, very important.

How many years can you add to your life right now with this system? Unfortunately, my guess spans a very wide range. It would vary widely among individuals, and would depend on your genetics and what kinds of damage you may have done to your genes and to other parts of your body so far. My guess is mostly based on personal experience and anecdote, and would be hard to verify with a serious scientific study. I think you might gain an increase in life expectation of something between several years, to maybe as much as 10-15 years. Or even twenty or more if you prevent a potentially fatal disease or nip it in the bud with early detection.
And you would surely improve your quality of life by just about any definition you choose. We're not particularly interested in an empty or hollow increase in life span -- we want to prolong active adult life, filled with vigor and energy. "Compression of Morbidity" is the concept of reducing the time and degree of disease and illness near the end of one's life. We would want this along with a longer healthy life. Said another way, successful aging means extending healthy life (healthspan) so that the period of ill health at the end of life (frailty-span) is very short.

At this time there is no single overall reliable biomarker of aging due to the complexity of aging and because there is no one determinant. Ongoing medical evaluation and guidance are necessary. Results of lab tests and how you feel are also key guiding factors.

But for now, it would not exceed your maximum. And of course, we would keep our fingers crossed for you that methods, perhaps involving telomerase, resetting genes, clearing out the cellular garbage, restoring hormone receptors to youthful numbers and functioning, etc. would soon be developed to push out the maximum. More on these exciting developments later in this chapter.

So What Is Aging?

We'll talk about the biology of aging which will be in a fair amount of detail. It's good to understand what's going on in your body as it ages as well as its effect on your brain and mind, and even some things that can affect your spiritual awareness. These are subject to physical laws of cause and effect, which you can control to a great extent. However, if you've read a lot of "anti-aging" books, with the exception of the section of free radicals, you'll probably find some of it a rehashing.

Definitely read the part on free radicals. However, I don't want you to be bogged down with too much reading, and do want you to quickly get into the system starting in the next chapter. So if you find that this is just too much medical detail, or that it is confusing or esoteric (or heaven forbid - boring), just skim it so that you get the general idea and go to chapter 3 on Nutrition and Motivation, and come back to this later.

You will find that the following section on free radicals is covered in some detail, and a brief overview of other ways we age after that. Free radicals are the culprits that are most key because they contribute to most of the others -- and fortunately for you, it this one of the things you can do the most about. You will get a multiple positive effect by taking action to reduce free radical damage in your body.

Aging is caused by a lot of reasons: genetics, the environment, nutrition, stress and other lifestyle factors. We often hear how "having good genes" is the most important thing in aging. Aging can be accelerated or slowed depending on these. For example, Dr. Michael Roizen of the University of Chicago cites studies on identical twins that show how genetic inheritance influences only about 30 percent of the rate and ways in which you age. The rest is under your control.

Different parts of the body age at different rates and for different reasons. Aging is highly variable between people. Have you never been to a family or high school reunion and noticed how some of your relatives or friends seemed old before their time, while others stayed "Dick Clark young", while remaining vital and excited about life? Think of someone who was young when you first met and you hadn't seen in a while, then when you met up with them they looked old. It happens fast, doesn't it?
As you age, there are thousands of changes occurring on a gross body level, in all of your tissues and organs, as well as in your individual cells. It would be great if we could find just one of the cause for aging and fix it, but there are many.

The body is constantly renewing itself. With a turnover of about six billion cells each day, each year around the 90 percent of the atoms in your body are replaced. We grow a new skin each month, a new stomach lining every five days, a new skeleton every three months, and replenish out red blood cells about every 120 days.

As your body ages, your organs gradually lose their total number of cells and some of the function of the remaining number of cells. We lose about one percent of the total number of cells each year. Without this system we have lost about 14% of the cells in our bodies by age 45, by age 65 its 28%, and downhill after that.

Most people lose about .01-.02 inches of their height each year, and are shorter in old age than when they were young due to bone loss and compression of their vertebrae. You'll lose brain form and function as you age, and about 73,000,000 brain cells next year. Even your earlobes will be affected, with the force of gravity slowly stretching them downward almost 1/100 of an inch this coming year.

Cells in all the tissues and organs of the body also change over time, which affects their function. Cells slowly lose the ability to divide and reproduce as easily. You lose supporting cells that hold you together and nourish other cells. Fat and debris get deposited into cells, tissues, and organs which contributes to a loss of function. Tissues such as bone, muscle and skin become much less elastic. Initially, organs such as the kidneys, liver, heart, and brain have more cells than necessary to function well. But when enough cells are lost, function declines and becomes noticeable. And as time marches on, the body is less able to clear medicines and toxins, largely due to decline in liver and kidney function. So drugs stay in the body longer and cause more side effects. And we are less able to store and utilize food.

Without intervention we become weaker over time. Body weight increases. But unfortunately, muscle and organs are decreasing at the rate of about six pounds each decade, while the fat is increasing. Cartilage is added to the nose and ears, body fluid decreases, and we develop dryness and wrinkles. Thirst decreases, and sweat glands decrease or lose their function, so we are less able to control our temperature. All of the senses diminish and it's harder to get a good nights sleep.

And of course, deterioration in the brain has enormous consequences. Like the other organs, the brain shrinks with age. And unfortunately, the parts that are taking the worst of it are the ones we rely upon most for our abilities to reason, remember, and control our bodies. Neurotransmitters are chemicals that are released from a nerve cell which thereby transmits an impulse to another nerve, a muscle, organ, or other tissue. Major neurotransmitters are acetylcholene, dopamine and serotonin. Neurotransmitter production declines with age. The potential for Alzheimer's, Parkinson's, dementia and other brain and mind diseases increases dramatically.

**Free Radicals**

Free radical damage is probably the most significant reason we age. Free radicals result largely from our diets. They in turn cause the release lots more free radicals, setting off a cascade of events in your body as well as causing other kinds of aging.

This subject comes first and is covered in more detail that the others because you can do much to prevent, or even reverse
free radical damage and aging.

See the appendix for more information on free radicals.

**So what are free radicals?** Normal molecules have an even number of electrons. Their electrical energies cancel each other out and they are therefore in equilibrium. A "free radical" is any molecule that possesses an unpaired electron. This unbalanced electrical energy makes it attach to normal molecules and react with them in highly volatile and destructive ways -- it will attempt to "steal" an electron from the other molecule in an attempt to gain equilibrium. So now the molecule that has lost an electron is now a free radical. All this wreaks havoc in your body as molecules that are vital to your body are both damaged and now free radicals themselves.

**Free radical damage may be involved in most diseases** -- from cardiovascular disease, to hypertension, diabetes, cancer, cataracts, emphysema and other pulmonary diseases, arthritis, immune system compromise, Alzheimer's, and the list goes on. Free-radical damage occurs throughout our lives and is cumulative -- but budgeted can be reversed. This damage is a kind of oxidation, which is the process of adding oxygen to a substance -- also known as rust. It can be slowed and reversed.

The irony is that free-radical activity in the body is not all bad. In fact, it is necessary in some forms. Free radical activity, sometimes referred to as "biochemical electricity", helps produce energy, maintain immunity, transmit nerve impulses, synthesize hormones and contract muscles. Your immune system even turns free radicals against invading bacteria, viruses and cancer cells. For these reasons, too many antioxidants can be counterproductive to your good health.

According to Bruce Ames, Ph.D., of the University of California, Berkeley, these free radicals prevent immediate death from infection. In addition, with the help of other free radicals, the liver's cytochrome P-450 enzymes detoxify harmful chemicals, again, protecting us from a quick death.

The scale of this activity is great. Dr. Ames has estimated that each cell in the body suffers 10,000 free radical "hits" each day. The body's own antioxidants, such as superoxide dismutase and glutathione, form the foundation of an exquisite defense against free radicals. But the defense isn't perfect, which is why free radical damage-oxidation-accumulates.

Because forms of oxygen itself are free radicals, our very breathing and our otherwise healthy aerobic exercise generate free radicals that help along the aging process. They are constantly created in the body and are a necessary part of normal metabolism. The release of high-energy "phosphate bonds" from the universal energy storage molecule, ATP, requires free radical reactions. But during this process, small amounts of free radical intermediates leak out or are converted to other more reactive forms like hydrogen peroxide, superoxide, singlet oxygen and hydroxyl radicals. Collectively, these are known as "oxygen radicals". Fortunately, the benefits of exercise, and breathing, outweigh the losses. It's kind of like driving in a car to see your physician. The solution -- drive safely.

But in their uncontrolled and dangerous form, free radicals attack your body. Free radical damage attacks DNA and RNA synthesis, interferes with the synthesis of protein and attacks your protein, and lowers your energy levels. They prevent the body from building muscle mass and destroy cellular enzymes, which are needed for vital chemical processes. They create harmful metabolic waste products. These waste products include substances known as lipofuscins. On the skin, lipofuscins and related ceroid can be seen as a darkened areas ("aging spots" or "liver spots"). More about this gunk later.
Your genes, cellular membranes, immune system T cells and mitochondria are particularly vulnerable to free radical damage. Free radical damaged chemicals are themselves highly reactive, so free radicals produce a cascade of damage.

You can turn this into good news --
Reducing free radicals produces a multiple positive effect.

Free radicals cause a cascade of events when they attach to the polyunsaturated fats of the cellular lipid membrane. These damaged fats easily become peroxidized (rancid) and break down to form more free radicals. Age associated changes in enzymes, proteins, nucleotides, DNA, and cell membranes may all be attributed to reaction initiated by these lipid peroxides.

So the peroxidized fats become mutagens, carcinogens, atherogens (causing fatty deposits, or plaques, in the walls of arteries causing them to harden [arteriosclerosis]), thrombogens (forming blood clots), and immune suppressants.

The kinds of foods that contain lipid peroxides and other foods that contain a lot of free radicals will be discussed in future chapters.

More Examples of How Free Radicals Cause Disease

Free-radical activity may be involved in the nature of most diseases. For example, there are two stages in the carcinogenic process, initiation and promotion. There is strong supporting evidence that free radical reactions serve as a continuous source of cancer initiation and promotion.

Enzymes are substances manufactured by tissue that stimulates specific chemical changes, such as pancreatic enzymes which cause complex food proteins to break down into simpler structures that can be then absorbed by the intestines. There are enzymes that repair DNA. These, too, become damaged by free radicals.

The chemically reactive free radicals damage joint membranes, protein in cartilage, and cells that lubricate joints. This results in the pain, swelling, and limitation of the ability to move, or arthritis.

Red blood cells and serum (the part of whole blood which remains after blood has clotted and is yellowish in color) are damaged as a result of the rupture of the cellular membranes, and narrowing or closing of small arteries and capillaries due to toxic peroxidation of serum and the formation of vessel wall irritants and suppression of the synthesis of natural anti-clot hormone.

Like I mentioned earlier -- if you find that this is just too much, just skim it so that you get the general idea and go to Part Two, and come back to this later.

Free Radicals and Your Immune System

Surface receptors on your immune cells are responsible for sensing the debris released by cells that are invading the body, following the trail to the invader, then engulfing the invading cell and killing it. This debris is called an antigen (any substance that stimulates the formation of an antibody). An antibody produces a specific immunity to a specific germ or virus. Free radicals created by lipid peroxides damage the surface receptors and reduce their number of receptors. Free radicals also reduce the affinity for this debris, and the mobility of the cell. Free radicals also damage other components of immune cells. This
is a partial explanation why free radicals reduce immune function.

The thymus gland is responsible for programming the immunoregulatory response of T cells (a kind of immune cell that normally attacks bacteria, viruses and cancer cells). Free radicals most likely attack the thymus gland. No longer under the thymus gland's regulation, the free radicals that the T cells normally use to destroy invading cells now attack the body -- autoimmune disease. So this is one of the examples of how the body normally uses free radicals to its benefit. But free radical damage to another controlling organ results not only in the inability to use free radicals properly, but in even more free radical damage.

And much of this damage was most likely brought on by the person's eating habits.

**Free Radicals and Your Brain**

OK, two psychiatrists passed each other in the hall. One says "Good morning." The other one gets to the end of the hall and says to himself "I wonder what he meant by that?" Ha! He probably had lipofuscin and ceroid ("age" or "liver" spots), formed through cross-linking oxidized unsaturated fats and proteins and seriously disrupting cell function in the brain and elsewhere in the body.

The cell membrane is the outside layer of the cell. A cross-link is an undesirable bond that is formed between biological molecules in your body. An ion is an atom that has a positive or negative electrical charge. And a neuron is a brain or nerve cell.

Cell membranes, particularly brain cell membranes, are largely made up of polyunsaturated fatty acids. This damage, in turn, results in the release of large quantities of a particular kind of free radical, hydroxyl ions. These ions appear to disrupt neuronal activity in the brain, resulting in the deposit of a protein substance called amyloid. Brain cells that are particularly damaged by this cascade include deep white-matter (associated with dementia, a loss of mental function and coordination) and changes in the cortex (associated with Alzheimer's).

Glial cells surround neurons, and both protect and nourish them. A neural synapse is the juncture of two neurons, and neurotransmitters are released from one neuron to another. Both glial cells and the areas around neuronal synapses (the area where one nerve ends and another begins) are also composed largely of polyunsaturated fats, therefore subject to the cascade of free radical damage described above. Here in the brain, as in elsewhere, fibrosis (replacement of the normal components of a structure by fibrous tissue) in the capillaries develops as a result.

Disruption to lipid cellular membranes results in the development of sensory and cognitive deficits in old age.

Autooxidation of L-Dopa damages dopaminergic brain cells (brain cells that utilize the neurotransmitter dopamine), and likely plays a major role in Parkinson's.

The end results of free radical activity in the brain are a decrease in the ability to sense the world around you, a permanent decrease in the ability to think, and other kinds of mental decline.

**Free Radicals and Your Skin**

Free radicals attack the collagen and elastin, which keep our skin flexible, smooth, moist and elastic. Lipofuscin and ceroid appear as "age" or "liver" spots on the skin. So you end up looking old, along with being old.
Free Radical Repair and Antioxidants

All air-breathing organisms on this planet have elaborate defense and control systems for free radicals. Some of the body's own free radical scavenging enzymes are called glutathione peroxidase, superoxide dismutase and catalase.

Antioxidants, often called free radical scavengers, bind with these free radical electrons before they can attach themselves to other molecules and/or cause cross-linking. After binding with the free radicals, they are excreted, or passed along to other antioxidant molecules and then excreted. The body produces natural antioxidants, like superoxide dismutase (SOD), glutathione peroxidase, catalase and others. We get vitamin C, vitamin E and beta-carotene and some others from some foods. We can also take antioxidant supplements. More of this will be covered in the section on nutritional supplements. Specialists in anti-aging medicine sometimes recommend a host of other natural and manufactured antioxidants to help combat the effects of aging.

Researchers have not determined whether aging causes an increase in free radical production or causes a decline in free radical scavengers. Studies on aging livers show both occurring. One thing is certain: Free radicals damage DNA, and damaged DNA makes defective proteins, which results in cells that don't function properly.

A detailed scientific explanation of the biomedical processes of free radicals in medical terms can be found in Dr. Lee-Benner's book "Physician's Guide to Free Radicals, Immunity and Aging".

These are just a few examples of how free radicals attack every part of your body and make you sick and old.

Reducing your caloric and fat intake reduces free radical activity.
A sensible program of antioxidant supplements reduces free radical activity.

One more time:
Fortunately for you reducing free radicals produces a multiple positive effect.

DNA Damage & Mutation, Errors and Repair

DNA is a tightly wound and incredibly long chain of molecules. It is the blueprint for life that codes for an immense number of processes that result in an organism, and you. By coding, I mean that it instructs the proteins on what to do and how to build the components of your body. every cell of your body has a copy of DNA.

DNA is comprised of only four repeating molecules, called bases or base pairs. They are named adenine, guanine, thymine and cytosine (usually abbreviated A, G, T and C). There are 3 billion "letters", or base pairs. The gene is compared to a sentence and is the unit of instruction in DNA. A chromosome, which are composed of genes of which we have 23, are sections of the genome and are often compared to a book.

Your complete complement of DNA, called the genome, is often compared to library. If all of this were actually in books, they would as stack as high as a six story building. SNPs (single nucleotide polymorphisms, pronounced "snips") are the small changes in DNA that make us unique.

Different kinds of cells have different parts of their DNA partially unwound depending on the type of cell and the particular stage of development. This is to allow certain genes
to carry out its particular function, which is to code for proteins that carry out particular functions.

(This section was written circa 2000). Just a few minutes ago I read in an Email of a biotech list that I subscribe to that Celera Genomics and the National Institutes of Health have just announced that the genome has been decoded. This is a monumental event, similar in scope to the first moonwalk.

Some genetic diseases are caused by changes, or mutations, to just one gene. Sickle cell disease results from just one wrong base pair. Other diseases, like diabetes, cancer and heart disease, involve complex interactions between a number of genes. Diseases can and do result from DNA damage that occurs as a result of a one's lifestyle and environment. Free radicals damage DNA, environmental toxins damage DNA, and unfortunately, even a person's natural body functions damage DNA.

Genomics is the definition and analysis of the function of genes, which are units of DNA that carry out a particular function. Diseases tend to have a genetic component, meaning that the genes interact with things in the environment.

Pharmacogenomics is the study of how genes interact with drugs. Some people suffer side effects in response to common medications, and others don’t. Likewise, some people suffer side effects. Many diseases, cancer, diabetes and asthma for example, are actually groups of slightly different diseases. Genetic screening can identify help doctors better identify and classify the various kinds of diseases and those people most likely to respond favorably or suffer side effects, so the best drug can be prescribed for them.

A thorough discussion of gene therapy would take volumes, but simply said, it is repairing bad genes.

But although genes are cool, protein is where it's really at. Proteins carry out the genes' instructions. So the genome is like a blueprint in car manufacturing, but the proteome is like the set of fabrication drawings that tell the workers how to build the car.

Proteomics is a key enabling tool for genomics and the study of how proteins accomplish this. It considers the composition, structure, function and vast amount of interactions of proteins, particularly in carrying out the genes’ instructions. Uncovering the function of proteins is much more complicated than decoding the genome. Sometimes one protein will act on another, which acts on another, and so on to produce a result. Even with genomics technologies, it takes 10 or 15 years to get a new drug out of the lab. Proteomics may shorten that to perhaps a few years by identifying candidates that would be effective, and eliminating those that would be ineffective or toxic.

Proteomic analysis would identify protein markers of diseases (proteins thrown off by a particular disease), and help doctors better recognize what stage a disease is in. And understanding the form and function of proteins reveals new drug targets.

A particular kind of protein molecule called RNA is created by a chromosome mostly from protein. This RNA copy is like a working blueprint or fabrication drawing to code for the building of your body's proteins of which there are three types: structural proteins, signaling proteins, and enzymes. Your cells are composed of structural proteins. The signaling proteins instructing cells on what to do. Enzymes change some molecules into other kinds of molecules, they join molecules together, building molecules and disassemble others. All this is carefully regulated and there are elegant error checking and repair mechanisms.

When a cell divides the DNA makes a copy of itself so that each of the resulting cells will have a copy. There are errors to the copying which are cumulative. We have
elaborate repair mechanisms, but as we age they are unable to keep up with the damage so some of the errors go unrepaired.

Imagine that coffee is spilled on a part of the blueprint for your new house. It may have spilled on a part of the house you don't use too much, like a broom closet. Or it may have spilled on a part that you use a lot and find really important. Now the builders don't know what to do, and that part of your house gets build badly or not at all. Your body reacts in kind of the same way you would if your house had, say, opened windows, no kitchen or a broken bathroom.

DNA damage manifests itself in somewhat the same way. DNA replicates itself each time a cell divides. Free radical damage may occur to an important part of the DNA that codes for a function involved in immunity, energy metabolism, or other body function. Or it may damage some of the sequences of the DNA that apparently don't do anything ("junk" DNA). When DNA is damaged by free radicals this damage gets passed along to its copies, which in turn get passed along to those cells' copies, and on and on. After enough of this accumulating damage it's kind of like a 10th or 20th generation xerox copy -- starting to get awfully blurred, hard to read and very dysfunctional.

High-energy photons like x-rays, microwave radiation, and sunlight, as well as toxins we pick up from our environment damage DNA. Toxins occur naturally in food, and man-made toxins include pesticides and herbicides, as well has a vast range of pollutants. Medications and taking too many nutritional supplements can be toxic. Your body creates toxins in the form of free radicals, enzymes, and acids as part of its metabolic processes and defense against infection. Unfortunately, these too can damage DNA. There's a lot of disagreement over the effects of electromagnetic fields from electrical power lines and the like. Advocates say it causes cancer and other diseases, and the power companies and other researchers say that it doesn't. Personally, I wouldn't live or raise children near one.

Toxins can change base pairs, and they can add or subtract base pairs to your DNA. So toxins rewrite your DNA. And as a result the gene that has been rewritten cannot code or express itself properly.

A phenotype is any observable feature of an organism that is the result of one or more genes. The messages your genes send out can be triggered or the attenuated by lifestyle factors, affecting the way your genes are expressed. This could be compared to a factory. Even if the proper instructions are present, if the necessary raw materials are not present (i.e. food, nutrients, etc.), the result will be a defective product. So by implementing the nutrition, exercise, stress reduction, hydration (adequate amounts of water), nutritional supplementation and other aspects of this system you are improving your phenotype.

**Cross Linkage**

A cross-link is a bond that is formed in error between biological molecules in your body. They reduce the flexibility and function of your cells and are caused mostly by free radicals.

Cross-linking causes damage to vital conductive tissue proteins. The cross-linking of the flexible connected tissue lining blood vessels causes inflexibility leading to hardened arteries, cataracts, loss of lung compliance, brittle bones and fibrous accumulation in muscle, and diseases such as sclerosis, and a declining immune system.

And worse yet, causes damage to your DNA.
Like I said earlier, I don't want you to be bogged down with a lot of reading, but would rather have you quickly get into the system. So if you find that this is just too much medical detail, or that it is confusing, just skim it so that you get the general idea and go directly to chapter 2 on nutrition.

**Mitochondrial Damage**

An organelle is a specialized structure within a cell, kind of like an organ. Mitochondria are the energy-producing organelles in the cells. The mitochondria are receiving a lot of attention lately. They break down glucose to produce a molecule called ATP (adenosine triphosphate), our primary source of energy. They contain their own DNA and ribosomes (intracellular organelles concerned with protein synthesis), they replicate independently, and synthesize some of their own proteins. Mitochondria are of very great interest today in antiaging. Every living cell has at least some mitochondria, and cells that require a lot of energy, like heart muscle, contain enormous numbers of them. Mitochondria are unlike the nucleus in that they lack the ability to repair their DNA.

The origination of mitochondria is very interesting. Many scientists believe they are independent living creatures that are descended from living bacteria. Originally these bacteria were engulfed by a primordial cell. A symbiotic relationship was formed -- the mitochondria provided energy and the cell provided protection from the environment. As organisms evolved and became more complex, this relationship remained.

The bad news is that the energy production process leads to the formation free radicals. Mitochondria are themselves one of the easiest targets of free-radical injury because they lack most of the defenses and repair mechanisms found in other parts of the cell.

The ongoing decline in mitochondrial function and the corresponding decrease in ATP production as we age is a major contribution to our vulnerability to age-related diseases and frailty. Evidence now indicates that mitochondrial dysfunction is least partly responsible for Parkinson's disease, Alzheimer's disease, heart disease, fatigue syndromes at a variety of genetic syndromes.

**Extrachromosomal rDNA circles (ERCs)**

It has been observed in some lower life forms that various places on the DNA contain attached coiled arrays of rDNA (ribosomal DNA) units called extrachromosomal rDNA circles (ERCs). This is probably true for most humans. The older the cell, the more ERCs until an accumulation eventually kills the cell.

Like cross-linking, ERCs inhibit the function of DNA. ERCs are likely caused by free radicals, and inhibited or repaired by genetic mechanisms (a gene known as Sir2 in particular).

**Wear and Tear**

Wear and tear is the idea that the body and its cells are damaged by overuse and abuse and just wear out. This is especially true for the knees -- which is why run on soft surfaces and not on concrete (along with avoiding repetitive tasks, bad posture, injury and bone crushing athletics as inflammation and arthritis are often the result).

Another example that comes easily to mind is the wearing out of a hip. Cellular wear of the bone and cartilage in the hip ball and socket are easy to visualize. This wear and tear also takes place on the gene levels, and is is related to the telomere concept that is coming up.
Methods covered in this manual can help reverse the aging process by stimulating the body's own ability to repair and maintain the wear of organs and cells.

**Telomeres and Telomerase**

Telomeres are the ends of chromosomes consisting of sequences of repeating base pairs. They are often compared to the plastic ends on shoelaces. When the plastic tips of shoelaces wear out, the shoelace begins to unravel. This is similar to what is believed to happen in your DNA. So the telomere would be a kind of "clocking" mechanism that controls the life span of dividing cells.

In the wear & tear example above regarding wearing out of a hip, it follows that when the cells of the hip that replenish the cartilage, fluids, etc. can no longer replicate (or at least most of them can no longer replicate, and those that are left a poor job and cannot keep up in with the additional wearing), that it will no longer function and is worn out. So the hip would be older than the rest of the you.

Scientists have found that the key element in rebuilding shortening telomeres is the "immortalizing" enzyme telomerase, an enzyme found only in germ cells (cells specifically involved in reproduction) and cancer cells. Future development of telomerase inhibitor may be able to stop cancer cells from dividing and presumably may convert them back into normal cells.

**Hayflick Limit**

This concept, developed by Dr. Leonard Hayflick and Dr. Paul Moorhead, relates to the limited number of cell divisions described in the previous section on telomeres and telomerase. It demonstrates a biological clock within each cell. It was demonstrated that human fibroblast cells (a kind of connective tissue cell found in the lung, skin, muscle, and heart) have a limited life span. They divide approximately 50 times over a period of years and then suddenly stop.

Nutrition has an effect on the rate of cell division. Overfed cells made up to 50 divisions in a year, while underfed cells took up to three times as long as normal cells to make divisions. This points to free radical damage.

Alterations and degeneration occur within some cells before they reach their limit. The most apparent changes took place in the cell organelles, membranes and genetic material. This improper functioning of cells and loss of cells in organs and tissues has much to do with aging resulting from free radical damage caused by too much food, and of the wrong types of food -- sugar and fats.

**Genetic Control -- Group Selection**

This planned-obsolescence theory focuses on the genetic programming encoded within our DNA. The idea is that it is a selection, or survival mechanism, for the species rather than the individual. Get the old people who are using up resources out of the way so that the younger members can better care for their young and reproduce. When that clock goes off it signals our bodies first to age and then to die.

**Neuroendocrine Depletion**

The neuroendocrine system is the complicated network found in the brain, nervous system and other parts of the body that governs the release of hormones and other vital bodily elements. A hormone is chemical produced by a gland that is secreted into the bloodstream and controls the function of distant cells or organs. When young, our
hormones work together to regulate many bodily functions, including our responses to heat and cold, our life experiences and even our sexual activity (heh heh). Different organs release various hormones, all under the control of a structure within the brain called the hypothalamus.

When we're young hormone levels tend to be high. This accounts for menstruation in women and high libido in both sexes, among other things. As we age the body produces less hormones, which can have disastrous effects on our functioning. Human growth hormone (HGH), testosterone, estrogen and thyroid, for example, drop dramatically as we age so that even if an elderly person has not gained weight, he or she has undoubtedly increased the ratio of fat-to-muscle. Along with this, the number of receptors that receive the hormonal signal and cause the next action to take place may have decreased or become less effective. So hormone replacement is a delicate matter and requires management by an experienced endocrinologist. Pumping in more hormones isn't always the solution.

Thus hormone replacement therapy, a frequent component of an anti-aging treatment, may help to reset the body's hormonal clock and so can reverse or delay the effects of aging. If our hormones are being produced at youthful levels in a very real sense the cells of our bodies are stimulated to be metabolically active and thus we stay young.

Death Hormone (DECO)

This one is a lot like wear and tear, telomere, Hayflick limit & genetic control and is considered old school these days by some. Dr. Donner Denckler, an endocrinologist formerly at Harvard University, believed that the DECO (decreasing oxygen consumption hormone), or "death hormone" released by the pituitary gland contributed to a loss of about 10% of neurons. When he removed the pituitary glands of rats the rate of cross-linking in cells reduced, their immune systems revitalized and cardiovascular function was restored. Dr. Denckia speculated that as we age the pituitary begins to release DECO which inhibits the ability of cells to use thyroxine, a hormone produced by the thyroid-governing basal metabolism, the rate at which cells convert food to energy. The resulting changes in metabolic rate bring on and accelerate the process of aging.

Autoimmune Disorder

As we age, the immune system's ability to produce antibodies to fight disease declines, as does its ability to distinguish between antibodies and proteins. It becomes self-destructive and reacts against itself. Examples of autoimmune diseases are arthritis, scleroderma, lupus and adult-onset diabetes. As we have seen, this can be largely brought about by free radical damage.

Rate of Living

The German physiologist, Max Rubner, discovered the relationship among metabolic rate, body size and longevity. In 1908 by introduced the Rate of Living theory. It says that we are each born with a limited amount of energy. If we use this energy slowly then our rate of aging is slowed. If the energy is consumed quickly aging speeds up. Other rate-of-living notions focus on limiting factors such as number of heartbeats and the amount of oxygen inhaled. But as we know today, exercise (which results in an increase in all the above) contributes to greater longevity, not less.

Entropy

This is an overall statement which the others describe. In Physics, entropy is the
amount of disorder in a physical system, or the extent to which the energy in a system is available. It is a matter of order going to disorder. This general concept applies to biological systems as well. It can be seen at just about every level, from the higher structures, to the cells, down to DNA.

**Waste Accumulation -- Lipofuscin, Ceroid**

Over the course of time cells produce more waste than they can eliminate. This waste can include various toxins. Lipofuscin is an excellent example of this waste. Lipofuscin is clutter that takes up space and probably interferes with function.

On the surface of the skin, lipofuscin can be seen as "age spots", or "liver spots". It is the collection of waste in small granules. This is the visible portion of what is going on throughout the body, particularly in the brain and heart.

It is believed that lipofuscin is an end product of lipid peroxidation (breaking down of cell material, particularly membranes, to form more free radicals) or rancidness. Age associated changes in enzymes, proteins, nucleotides, DNA, and cell membranes may all be attributed to reaction initiated by lipid peroxides.

There is an overwhelming body of evidence suggesting that lipofuscin arises by a process of auto-phagocytosis. Phagocytes are a kind of immune cell that destroy circulating bacteria, viruses and other foreign bodies. Auto-phagocytosis is when the phagocyte makes a mistake and goes after the body's own cells.

The points are that where there is lipofuscin, damage has taken place and that free radicals are the major culprit.

**Thymic Stimulating**

The thymus is the master gland of the immune system. The size of this gland reduces from 200 to 250 grams at birth and then shrinks to around three grams by age 60. Scientists are investigating whether the disappearance of the thymus contributes to the aging process by weakening the body's immune system.

There are studies that have shown that thymic factors are helpful in restoring the immune systems of children born without a thymus as well as rejuvenating the poorly functioning immune systems of the elderly. Thymic hormones may also play a role in stimulating and controlling the production of neurotransmitters and brain and endocrine system hormones. This means they may be the pacemakers of aging itself, as well as key regulators responsible for immunity.

See the appendix for more information on free radicals and DNA damage.

John Furber of Legendary Pharmaceuticals offers some outstanding information on biology of aging and senescence:
http://legendarypharma.com/senescence.html
http://legendarypharma.com/chartbg.html

*We are all amateurs; we don't live long enough to become anything else*

Charlie Chaplin

*So, Olympians . . .*
Are you ready to stop getting beat up in a gladiatorial lifestyle and join the olympians in the triathlon of health, fitness & aging intervention for a very long time?

Let the games begin! Now on to the system in the next chapter . . .
If You Have A Medical Condition  If you have a medical condition (disease or injury, including psychiatric disease), don't delay -- get the best treatment right away. A qualified physician may diagnose and be able to treat something serious in the early stages.

If you feel bad, that may be an indication that something's wrong. But if you feel good it does not necessarily mean there is not an underlying problem with your health.

One of the most important parts of a health, fitness & aging intervention program is to first uncover and treat any disease conditions or other problems you might have. Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual.

Legal Disclaimer -- Please Read. This information is designed for healthy adults who are free from medical conditions that would require a special diet, or limit their exercise activity or require other special consideration, and are free from experiencing side effects as a result of nutritional supplements as well as being free of other limitations that a normal healthy adult would have.  The intention for writing this manual is to help people, to increase love, compassion and joy, and to build a better world.  The author, publisher, licensors and affiliates have endeavored to make this the very best information available anywhere. Extensive effort has been made to ensure the information in this manual is as complete and accurate as possible, that readers will benefit from it, and especially that no one will be hurt as a result. But the statements made have not been evaluated by the Food and Drug Administration. The health, age-mitigation and self-preservation information, methods and products described are representative of one individual's personal program. It is intended as a health resource.  It is not intended to diagnose, treat, cure, or prevent any disease, and is not intended to provide medical advice or be a substitute for a physician. For medical advice, consult a properly trained physician. Neither the author, publisher, the licensors or affiliates are engaged in rendering professional medical advice or services to the individual reader, and this manual is not intended as medical advice.

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People with medical conditions should have a program designed for them by a physician or other expert who is experienced in exercise training, nutrition, nutritional supplementation and a wide range of other health, fitness and aging intervention concerns. Neither the author, publisher, the licensors or affiliates are responsible for your specific health or allergy requirements, injuries or other negative consequences that may require
medical treatment or supervision, or for any adverse reactions to the methods or kinds of foods contained in this manual.

**Phew! You're probably wondering what all that extreme legal talk was all about.** What a whopper! Well, it's something you need to know. And, there is a very very small number of dishonorable and naughty people who sue others for frivolous (actually, a better word might be "predatory") reasons, causing much wasted time and chaos in their lives, and making lawyers rich. Despite the noble intentions and extraordinary efforts to make this manual something that will really help people, I'm afraid this might happen. My hope is that they, and others who behave badly, will recognize that this is not the way to treat others and make changes. I'm here to help. Please don't sue me. We want to be able to continue to help others. Any litigation will be subject to the laws of Delaware and will take place at Roach, Nevada.

Have a nice day. 😊
Chapter 3 -- Healthy Happy Eating

"Tell me what you eat and I shall tell you what you are."

Jean Anthelme Brillat-Savarin

which has morphed into "You are what you eat."

My Secret Confession

I have a confession for you. In my past relationships with sweet & fatty foods, I've been no saint. I have chased after cupcakes and been seduced by French pastry. I was infatuated with chocolate and had a roving eye for pie. Loved that custard, turned inside out by fudge. Fallen for the ineffable charm of crème brûlée. Got some donuts when candy was dandy. Cheesecake has turned my head, and definitely had a Jones for shortbread. Had a quickie with a pop tart once -- unsatisfying, felt guilty afterward. Felt a sense of loss when separated from my cookies. Delighted in a lurid menage-a-quatre with ice cream, cake and fudge. Had some cheap Trix. Awakened halfway to dawn in the stillness of a sultry summer night to the carnal, visceral desire for the pecan pie that lay beside me. Sometimes I even had it with Reddi Whip. Ahhh, the escapades. Yep, wallowed with all manner of refined sugar and lard. And don't get me started on my 26-year affair with fast food!*

But you know what? I hardly ever touch that stuff anymore because using precision nutrition, along with the behavior modification and motivation methods described in a later chapter, and just losing the old habits has stabilized my insulin levels and greatly insulated me from these temptations. And since I've experienced feeling better and how much better life can be when I stay away from refined sugar and lard, the change in old habits is further reinforcing. I am reformed, and you can be too -- more easily than you may think, and it will definitely be rewarding.

Imagine your own interest in unhealthy foods just fading away -- of no interest or consequence. You pass by the candy aisle or a fast food restaurant, or whatever your own personal temptation, and hardly notice. Stopping at a fast food joint or an ice cream parlor just isn't worth the trouble. It's just not food that's sitting on those shelves -- more like some prefab plastic that doesn't make any sense. This can result from the behavior modification and motivation methods to be described, and from a change and habit.

Staying on track with the system that follows will require some motivation, organization and discipline on your part. It will take some investment of time and will surely require some lifestyle changes depending on what you're doing now. But if you are motivated and really want to improve the quality of your life and life span, it will become fairly easy.

* OK OK, Although most of this is true, and hot steamy words like "carnal" and "visceral" could be used to describe food lust. I'll admit, though, that I did take some artistic license regarding the pecan pie. Actually it was Dyana, the creator of the divine pecan pie who lay beside me. Dyana was a lovely young lass (age 51), a girl who would take me on incredible journeys to distant planets and to meet the many Dynas within. Now back to the pie: To get to the pie I had to get up and go down the stairs and open the fridge.
The preceding chapter on why we age described factors many that result from diet. You can control many of your aging processes with what you eat.

And what you eat affects your brain as well as your body. This, in turn, affects how you feel, your performance, your health, your joy. You'll do better with the right foods and by avoiding the wrong ones.

Our bodies are being constantly rebuilt, and the food we eat is our raw material. Imagine if we build, say, a car out of shoddy materials. It won't run right or last long. Well, the same goes for you.

Either by design, or through millions of years of evolution, or a combination of both we are endowed with a system to live in that will chug along and survive on a wide range of fuels and conditions. Often these are very bad. The key word here is "survive". May I assume that because you are still reading this, you are interested in living a life that is beyond survival, beyond the kind of life many people are willing to settle for?

I wish you could experience the increase in energy, the joy of life and other benefits you're looking for before making the modest investment in time that it will require. I say "investment in time" because you will probably save money.

Once you experience the rewards, you will recognize how much you're getting from it and be even more motivated, and it will become even easier. You can then expect it to become so easy it'll be second nature.

This system isn't about self-denial or ignoring cravings. Most of the interest in unhealthy indulgences will just drift away -- as though never existed -- replaced by a life that's much better.

Won't you make the decision to follow this system, leaving room for minor adjustments as you find out what works best for you, for 6 weeks?

You’ve already taken action – this is excellent! Carry on! It will be more than worth it. The rewards are immense.

Nutritional guidelines for nutrition from various government agencies and other organizations are cautious and generalized. By now your diet has probably already done a lot of damage. Fortunately, much of this damage can be undone and further damage can be prevented.

This nutrition system is designed to "spare" protein for its prime role as a building block in cell growth and repair, for increasing muscle mass and maintenance of organ size, bone and other lean body mass. All of these tend to decrease as we age. Note: muscle mass is not necessarily mean muscular, although you can have that to if you want. This system will also reduce free radical activity, stabilize insulin and levels, and allow for the balanced amounts of monounsaturated fats to suppress insulin secretion and for sustained calorie reduction and improved energy. Proper nutrition and more stable insulin levels reduce the craving for sweet, fatty junk "foods".

With this system, the body gets what it needs -- and avoids having to deal with processing all the muck most people throw into it.

Medical Details -- and Follow Your Doctor's Guidance
Review the "friendly" disclaimer at the start of the manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctor's approval before implementing any of the ideas in this manual. This is not intended to diagnose, treat, cure, or prevent any disease, and is not intended to provide medical advice or be a substitute for a physician. For medical advice, consult a properly trained physician.

**Important Note:** If you have a medical condition (this includes obesity) . . . Your nutrition program may be different from below. Consult a physician who is highly experienced in nutrition and modify accordingly.

Prescription medications, and even over-the-counter medications, cause nutrient depletions resulting in nutritional deficiencies. This is particularly true for the elderly and women (particularly those taking estrogen). People who take a lot of antibiotics, such as children, are also particularly at risk.

This system is usually a vast improvement for most people. But even better would be to take have a program that is customized to the individual designed by a physician who is experience in antiaging nutrition.

**Obesity in America**

A government report released by the Centers for Disease Control and Prevention (CDC) said that 61 percent of adult Americans are now considered overweight. That means FAT! One in four Americans is now considered obese, up 2 percent from the last survey in 1994. Obese means a Body Mass Index (BMI) greater than 30 percent of ideal body weight. Pick up a twenty pound, or thirty or fifty pound or heavier sack of potatoes and carry it around some time. That's a lot like how it would feel. It's really tiring and after a while really wears on the joints causing arthritis, hypertension, diabetes, coronary artery disease, liver and kidney disease.

**So here's the precision, scientifically designed nutrition system**

**Overview**

Fasting: Recently this system has been upgraded to include fasting (and drinking only water) for 24 hours at least one day a week. There are numerous documented health benefits.

Have frequent feedings throughout the day -- 6 small, highly nutritious meals. Large meals are slow to digest. They contain more calories than you body can metabolize at one time and therefore have to be stored as fat. Larger meals tend to increase blood glucose, and release free radicals and other toxins. The body better absorbs nutrients, and handles free radicals, in smaller amounts. Also, the body does not store protein and we need protein on an ongoing basis.

Eating six small meals rather than a lesser number of larger ones matches up best with the typical blood-glucose cycle of rise, level out and fall. If you eat more frequently, your body has a more controlled response to foods. Going too long between meals, or eating snacks causes your body to pump out
more insulin when you do eat, causing too much flux in blood glucose.

Today there is a lot of talk about “low carb diets”. Actually, we want “complex” carbohydrates” (vegetables, grains), but not simple carb diets (sugars, starches).

The meals should consist of the right balance of protein (30-40% in grams), complex carbohydrates (40-50% in grams) with low amounts and the right kinds of fat (10-20% in grams) -- and low sugar, and provide variety in the types of foods. The micronutrient-dense complex carbohydrates have great nutritional value of their own, and they help you assimilate the protein. If have an exceptionally busy schedule or for some other reason you can only make it 5 feedings, well, that would be OK. But 6 is better.

We lose muscle mass when we go without eating for long periods to time. If you wake up in the middle of the night, one of the meals (protein drink and small amount of fruit works best for me) would be a very good idea. Since nutritional supplements are best taken throughout the day, that would be a good time for some. And, it can really help you get a great night's sleep. But saliva doesn't flow much when we're sleeping. So when you wake up in the middle of the night for some protein & carbs, you'll need to give the teeth another quick brushing, or at least rinse your mouth with water.

Another alternative is to have half a protein-drink & carb feeding in the middle of the night, then the other half before exercising first thing in the morning, then the regular meal just after exercising.

**a. 3 of the 6 Meals -- Regular “Real” Food -- Protein, Complex Carbohydrates, and a Small Amount of Monounsaturated Fats:**

**Protein Foods:** The importance of protein for your body's structure and function was discussed in the "Background" section. Proteins are involved in virtually every vital process in your body.

For protein foods, either skinless lean chicken (white meat is generally lower in fat than dark), turkey, egg whites or cold-water white meat fish (salmon is preferred because it is most rich in EPA (but only salmon grown in the wild, and not farmed salmon, due to unacceptable levels of PCB’s and Dioxin contaminants) as well as herring, flounder or sole, catfish, sardines, cod and perch), and shellfish. (Tuna and mackerel are also on the list, but there have been recent reports of excess mercury in these kinds of fish). Casein, whey. Beef or ham on occasion, prepared without oils. Buffalo and venison. Low-fat cottage cheese. Vegetables with complementary amino acids -- legumes (beans, etc.) mixed with whole grains (like whole grain rice).

Bean alert: Green (string) beans have a lot less protein than other varieties, so others like lima, black or kidney beans would be a better choice for protein.

Choose lean meats and trim fats before cooking. Roast, bake, broil, or simmer meat, poultry, and fish. Remove the skin from poultry before cooking. Light meat has less fat than dark. Cook meat or poultry on a rack so the fat will drain off. Avoid prebasted turkey or chicken that has been partially prepared because they have usually been injected with coconut oil. Nonstick cookware and non-stick vegetable cooking sprays reduce the need for oil and shortening. After preparing, chill meat or poultry broth, stews, and soups until the fat solidifies, rises to the top, and can be spooned off.

**Carbohydrate Foods:** Enjoy different kinds of complex (high-fiber) carbohydrate vegetables -- like broccoli, cauliflower, tomatoes, buttercup and butternut squash, potatoes, sweet potatoes, carrots, barley, spinach, brown rice, peas, celery, asparagus, and the like along with the protein food. Steaming your vegetables breaks down their cellulose, which
is indigestible, insoluble and where the nutrients are found. But since I like raw vegetables I'll have them raw once in a while.

Various fruits -- apples, pears, bananas, peaches etc. Low-fat yogurt.

Also oatmeal, and whole grains (like multi-grain bread, or cereal that's a mixture of grains like rye, barley, oats and wheat), plus a moderate amount of various fruit. Occasionally, pasta (semolina, jaro).

Multi-grain bread -- You're better off if the ingredient list displays mostly grains, than if it includes various sweeteners and sugars, partially hydrogenated oil, extraneous ingredients, and starts out with "Unbleached enriched . . ." This kind of bread will tend to spoil more rapidly than others, so keep it sealed and in the refrigerator.

Here are lists of ingredients for two representative breads:

Ingredients: Sprouted Wheat, Sprouted Barley, Sprouted Millet, Barley, Barley, Sprouted Lentils, Sprouted Soybeans, Sprouted Spelt, Filtered Water, Fresh Yeast.

- and -

Ingredients: Wheat, Rye, Corn, Barley, Millet, Oats and Rice, with Honey, Water, Salt, Yeast and Lecithin.

Fruit juices are loaded with calories, and do not contain much nutrition compared to the great amounts of calories you are taking in, so no juice. Do not use juicers to make vegetables into juices. This results in perturbing the juice with oxygen radicals -- causing free radical damage when you drink it.

I would have expected that steaming milk the way it's done in coffee houses would have the same effect -- but actually it denatures the protein and makes it more readily digestable.

When complex carbohydrate foods are eaten with protein foods, they facilitate the uptake, or assimilation, of protein into the cells. This is especially important after weight training. One study, conducted at University of Texas Medical Branch, measured the amount of uptake of L-phenylalanine (an amino acid) into leg muscle tissue after weight training in three protein shakes. One type of protein shake had protein only, another had carbs only, and a third had a combination of protein and carbs. The L-phenylalanine uptake in the protein and carb shake was three times higher than the carb shake and roughly twice as great as the protein shake.

So What's the Deal with “Low-Carb” Diets?

You want less, or better yet no simple carbs -- like sugar, white bread and the like. Your carbohydrate foods should be complex carbs like those described above.

Fats: The small amount of fat (generally 10-20% of total food intake in grams) should be primarily monounsaturated fat (like olive, or canola oil). Olive oil (extra virgin) is preferred because of its higher proportion of mono-unsaturated oil (85%) to saturated and poly-unsaturated, then canola (62%), peanut (dropping down to 44%) and sesame (just 42%).

Also, moderate amounts of essential oils phosphatidylserine, phosphatidylcholine, phosphatidylethanolamine and phosphatidylinositol, in a base containing medium chain triglycerides (MCTs). The recommended amount of these is 1 tablespoon each day.
Personally, I tend to keep my eating habits simple and don't do a lot of fancy cooking. Modify your own recipes these guidelines. Excellent recipes are available in the Dr. Lee-Benner's book, *Turning Back the Aging Clock*.

Food absorbs a lot of the oils in which they are cooked. Vegetables absorb fat and should never be browned with meat. The effect of cooking varies among foods. Steaming breaks down the fiber allowing you to better absorb the nutrients. Also, natural toxins in plants are killed by cooking. If you can cook for every meal -- great! Fresh is better. But you can also use a fairly large steaming pot to prepare almost a week’s amount at a time, then keep them the fridge. Fruits should be raw.

Cooking at lower temperatures is better than higher because less of the nutrients are destroyed, and higher temperatures cause the formation of more carcinogens. Nutrients are also destroyed when foods are kept warm for long periods of time, like in a cafeteria. Many nutrients are destroyed when food is frozen and thawed. Most palates are likely to find plain meats & steamed vegetables kind of bland. That goes quadruple (like in bypass) for those who live to eat. So it's good to jazz them up a little with spices, salsa, or small amounts of pasta sauce or barbeque sauce -- but be aware that in 2 tbsp of sauces, calories can range from as little as 10 to 50 or more, and carbs can range from 2-15+ (mostly sugar). This can really add up.

But your recipes should contain very, very little or no saturated or unsaturated fats, sugar or salt.

*And the other 3 of the 6 daily meals -- Protein powder, Complex Carbohydrates and a Small Amount of Monounsaturated Fats:* For protein powder I use an ultrafiltered whey protein along with the kinds of carbohydrate foods described above. But others like "Milk and Egg" protein powders usually available at a lower cost and are acceptable.

If you're on the run, low carbohydrate protein bars or drinks are a quick and easy alternative. But be aware that many of them contain inadequate amounts of protein, and poor quality carbohydrate and protein. Many of them are not much more than candy bars. Read the label to make sure you're getting adequate amounts of protein. A protein bar or drink should have a minimum of 20-28 grams of protein.

**Misc:**

Be sure to have at least 1-1/2 to 2 oz. of coldwater fish (wild [only wild] salmon, and tuna and sardines are good) each day for the EPA Omega-3 fatty acids), and at least 1 piece of fruit. And keep oils refrigerated.

You'll need a small food scale to weigh the portions. Before long you'll get the idea of how much various portions of food weigh, and can probably use the scale less often. Small scales can usually be found at a local supermarket or a store that sells cooking utensils.

Buy a small notebook and write down everything you eat for the first two weeks. It really helps motivation when it is “written in the book”.

**How amounts of food your nutritional system is computed:**

The amounts of food in this system go along with your exercise and other components that will be covered later.

The following percentages are in grams. For most active people (although this should be fine-tuned according to the results of some advanced tests like those based upon your
apo E allele makeup[genetic testing] from Berkeley Heart Labs described later), consuming:

40-50% of the diet with high fiber complex carbohydrates like vegetables, oatmeal, fruits and whole grains, plus

30-40% of the diet with high quality proteins like casein, whey, chicken, beef, fish, dairy and eggs, and

20% fat from olive, nut, fish and flax oils, are ideal ranges.

Since we require around 1 gm. of protein per day for each pound of bodyweight, and we lean towards lower calories, 40%/40%/20% breakdown is recommended.

**Amounts of Protein:**

We require around 1 gm. of protein per day for each pound of bodyweight. I'll use a 150 lb. person as an example. A 150 lb. person will need 150 gm. protein each day. There are about 6 gm protein per oz. of meat, so to get 1/2 your protein from meat (75 gm) you will need about 13 oz. total, or about 4 oz. each meal (an amount the size of a 1/2 chicken breast).

Regarding protein powder, a scoop is usually included in a container of protein powder. There are about 3 heaping tablespoons in each scoop. Most scoops contain about 18 gm. protein. So to get your 75 gm. from the powder you will need 4-1/4 scoops per day, or a little less than 1-1/2 scoop with each protein powder feeding.

With half the protein coming from powders, the risk of excessive fat and cholesterol is reduced. Some potential hazards of high protein diet and what should be monitored include ketone level, kidney and liver function, serum uric acid, creatinine urine sediments (urate crystals).

**Amounts of Carbohydrate:**

If you are the hypothetical 150 lb. person who is having 40% of the daily intake in protein as described above, and 40% in complex carbs, it again works out to 150 gm. per day.

Steamed vegetables are our first choice in carbohydrate food. There is a variation in the amount of carbohydrate in different foods -- vegetables have around 1-1/2 to 3 grams of carbohydrate per ounce, and whole grains have around 13 to 20 grams. This depends greatly upon their water content.

Some produce such as apples are grown year round and stored for as long as six months before being sold in the market. Ask your grocer for "new crop" or "fresh crop", which has been grown and picked recently. Toxins are created as vegetables and fruits spoil and they are free radical generators, so they should be as fresh as possible. Ask your grocer for new crop produce.

Again, we are avoiding (or minimizing) simple carbohydrates like table sugar, juice, honey, fructose, etc.

**Amounts of Fats:**

Fat intake should generally be 10-20% of total food intake, and it should be primarily monounsaturated fat (like olive, or canola oil), or the essential oils phosphatidylserine, phosphatidylcholine, phosphatidylethanolamine and phosphatidylinositol. Keep saturated
and polyunsaturated fat to a minimum. The reasons for monounsaturated fats and some other background information, were discussing in chapter 1 under "Fats".

Saturated and polyunsaturated fats are considered a part of your total fat intake.

Monounsaturated fat such as olive oil contains 14 grams of fat (10 grams monounsaturated, 2 saturated and 2 polyunsaturated) and there are about 120 calories per tablespoon.

The exact recommended amount of fat intake within that 10-20% range varies per person, and cannot be determined without an advanced test, such as the one available from Berkeley Heart Labs, and expert interpretation. Dr Lee-Benner advises us that there are 5 subclasses of HDL, 7 subclasses of LDL, besides triglycerides and another deadly molecule called lipoprotein(a). They each act a little differently in the body. The subclass is genetically determined. An apoprotein is a complicated molecule consisting of a carrier protein combined with another molecule(s) as a means of transport. Some apoproteins are associated with lipid (fat) molecules such as LDL. Apoprotein e Isoform is a test of a gene that determines the subclass and activity of LDL that you have. Specifically, it tests the activity of the LDL receptor that attaches to the apoproteins found on various lipid particles. The bottom line is that some people (categorized "E2/2") need fat and do worse (i.e. have a higher cardiovascular risk and other suboptimal health qualities) when they are on a low, or very low, fat diet. Measurements such as this are not included in typical lab tests and require an advanced test such as the one from Berkeley HeartLab. And of course it requires the interpretation of a qualified doctor in this field, and is beyond the scope of this manual.

The traditional standard tests of cholesterol, HDL and LDL have now become obsolete, because they do not provide the information necessary to manage your real risks for developing coronary artery disease, heart disease, stroke, atherosclerosis or other forms of vascular disease such as aortic aneurisms, and even erectile dysfunction.

To find out how much of a component is in a particular food, you can use the data published by the USDA's Food and Nutrition Center. This includes data on protein, carbohydrate, fat and other composition of foods. Their document *Nutritive Value of Foods* lists a thorough breakdown of these, as well as a breakdown of monounsaturated, saturated and polyunsaturated fats. It is available online at no cost at:


The entire document, or individual pages, can be printed and used to look up values. The food breakdown begins on page 20.

*Nutritive Value of Foods* is available in a hardcopy booklet and can be purchased online from the Government Printing Office at:


Stock Number: 001-000-4703-5; Price is $14.00 (U.S.) and $19.60 (non U.S.). If you need help on how to use the online bookstore, you can contact the Government Printing Office Access User Support Team -- 7:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays) at:

Toll-Free: 1-888-293-6498
DC Area: 202-512-1530
E-Mail: gpoaccess@gpo.gov
Fax: 202-512-1262
You can use the next web lookup page to find the composition of foods. It includes a detailed breakdown of vitamins, minerals, kinds of lipids and essential amino acids. The portions are in grams, so you would have to convert:

http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl

It's much easier to look foods up in the printed or hardcopy references, which are in the units of measure most often used in the U.S. (ounces, cups, [broccoli] flower cluster, etc. Weight in grams is also listed.

1 gram = 0.035 ounce (oz., Avoirdupois)
1 (Avoirdupois) ounce = 28.35 grams
(1 troy ounce = 31.103 g)

Their main page is at http://www.nal.usda.gov/fnic/

Different resources, including software you can download the standard reference database are at:

http://www.nal.usda.gov/fnic/foodcomp/

To go directly to the search page:

http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl

→ http://ndb.nal.usda.gov/ndb/search/list

For example, here is the link to the complete listing for chicken (specifically Chicken, broilers or fryers, breast, meat only, cooked, roasted) at the USDA database. "100 grams of edible portion = 100 grams" comes up as the default selection, but other portions, such as "1 cup, chopped or diced = 140 grams", "1 unit (yield from 1 lb ready-to-cook chicken) = 52 grams", and ".5 breast, bone and skin removed = 86 grams" are available:

http://www.nal.usda.gov/fnic/cgi-bin/measure.pl?05064xyz0500xyzChicken%2c%20broilers%20or%20fryers%2c%20breast%2c%20meat%2c%20cooked%2c%20roasted

Similarly, here is the complete listings from for broccoli (Broccoli, cooked, boiled, drained, without salt):

http://www.nal.usda.gov/fnic/cgi-bin/measure.pl?11091xyz1100xyzBroccoli%2c%20cooked%2c%20boiled%2c%20drained%2c%20without%20salt

A reference book that lists the amounts of protein, carbohydrates and fats in different foods. I use The Complete Book of Food Counts by Carinne T. Netzer (Dell Publishing). Although it doesn't give a breakdown of monounsaturated, saturated and polyunsaturated fats like the USDA resource, it's handy and easy to use, and lists packaged and fast foods.

Annual fluctuations, the season and region a food was grown in, and other random variations may result in the actual amounts of protein, carbohydrate, fat etc., in a food being different from what's listed. Different resources may list slightly different amounts. We use the references as a guideline knowing that small differences are acceptable.

If you're not mathematically oriented, stay with the material on calculating the amounts of foods that follows. Once you get used to it, it will become easy -- and it will definitely be worth the effort.

Sample Meals and Feedings
On the next page some sample meals and feedings are described in extensive detail. They fit within the 30-40% protein, 40-50% carb and 10-20% fat guidelines as much as is practical. These (with the exception of extra virgin olive oil, protein powder and essential oils) are from the "Search the USDA National Nutrient Database for Standard Reference" web site at http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl

You can use this as a resource, or use another hardcopy reference.

For these we are taking the hypothetical 150 lb. person and using the 1 gram of protein per pound of body weight per day as a starting point, as 40% of the intake in grams. You could use these as a basis and adjust according to your own weight. For example, if you weigh 125 lbs., use 5/6 (or 125/150) of these amounts.

Values apply to edible portions. You can make them zestier with herbs, spices and seasonings.

These are guidelines -- your measurements don't have to be exactly to the gram, and about plus or minus 5% is OK. However, many people find the breakdowns and amount of detail confusing. So, to keep it simple the four sample meals are described here (They were designed as one of the six meals each day for a 150 lb. person):

<table>
<thead>
<tr>
<th>Healthy Chicken</th>
<th>grams</th>
<th>ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked Chicken</td>
<td>65.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Steamed Broccoli</td>
<td>157.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Bread 1-1/2 slice</td>
<td>48.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Olive Oil 3/4 tablespoon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Salmon Joy</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmon (wild)</td>
<td>92.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Tomato</td>
<td>123.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Cereal-3/4 cup(oatmeal)</td>
<td>176.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Squash</td>
<td>87.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protein Power</th>
<th>grams</th>
<th>ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein Powder mixed with water 1-1/2 scoop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>138.0</td>
<td>4.8</td>
</tr>
<tr>
<td>essential oil blend -- 1/2 tbsp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive oil -- 1/2 tbsp.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vegetarian Delight (lacto-ovo)</th>
<th>grams</th>
<th>ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg whites</td>
<td>132.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Lima beans</td>
<td>100.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Rice</td>
<td>100.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Olive oil -- 1 tbsp.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pct. = Percent, gm = gram, oz. = ounce, Tbsp = tablespoon, Cal = calorie, Prot = protein, Carb = carbohydrate, Fats: Mono = monounsaturated, Poly = polyunsaturated, Sat = saturated, Chol = cholesterol, Fib = fiber

Complete names are listed above the meal, and are from the "Search the USDA National Nutrient Database for Standard Reference"

Values are rounded to the nearest 1/10

Measurements we are most interested in -- calories, and numbers of grams for protein, carbs and fats -- are highlighted in yellow.
These were designed as one of the six meals each day for a 150 lb. person:

**Healthy Chicken**
Chicken, broilers or fryers, breast, meat only, cooked, roasted NDB No: 05064
Broccoli, cooked, boiled, drained, without salt NDB No: 11091
Bread, mixed-grain (includes whole-grain, 7-grain) NDB No: 18035 -- 1-1/2 slice = 48 g

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</tr>
</thead>
<tbody>
<tr>
<td>Baked Chicken</td>
<td>65.0</td>
<td>2.3</td>
<td>107.3</td>
<td>20.2</td>
<td>0.0</td>
<td>2.3</td>
<td>0.8</td>
<td>0.5</td>
<td>0.7</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Steamed Broccoli</td>
<td>157.0</td>
<td>5.5</td>
<td>44.0</td>
<td>4.7</td>
<td>7.9</td>
<td>0.5</td>
<td>0.0</td>
<td>0.3</td>
<td>0.1</td>
<td>0.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Bread -- 1-1/2 slice</td>
<td>48.0</td>
<td>1.7</td>
<td>120.0</td>
<td>4.8</td>
<td>22.3</td>
<td>1.8</td>
<td>0.7</td>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
<td>3.1</td>
</tr>
<tr>
<td>Olive Oil -- 3/4 tbsp.</td>
<td>10.1</td>
<td>0.4</td>
<td>89.5</td>
<td>0.0</td>
<td>0.0</td>
<td>10.5</td>
<td>7.5</td>
<td>1.5</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Totals</td>
<td>360.8</td>
<td>29.6</td>
<td>30.2</td>
<td>15.2</td>
<td>9.1</td>
<td>2.7</td>
<td>2.6</td>
<td>0.1</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pct. of total grams</td>
<td>39.5%</td>
<td>40.3%</td>
<td>20.2%</td>
<td>12.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal</td>
<td>350.0</td>
<td>25.0</td>
<td>25.0</td>
<td>12.5</td>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Percents</td>
<td>40.0%</td>
<td>40.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pct. difference, goal vs.actual(gm)</td>
<td>3.1%</td>
<td>18.6%</td>
<td>20.9%</td>
<td>21.6%</td>
<td></td>
<td></td>
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</tbody>
</table>

Optionally, jazz it up with herbs, spices and seasonings -- or about 1-2 tbsp salsa or bar-b-que sauce -- but be aware that for 2 tbsp, calories can range from as little as 10 to 50+, and carbs can range from 2-15+ grams -- mostly sugar. This can really add up.

**Salmon Joy**
Finfish, salmon, Atlantic, wild, cooked, dry heat  NDB No: 15237
Tomatoes, red, ripe, raw, year round average  NDB No: 11529
Cereals, oats, regular and quick and instant, unenriched, cooked with water, without salt NDB No: 08121 (oatmeal)
Squash, summer, all varieties, cooked, boiled, drained, without salt NDB No: 11642

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</tr>
</thead>
<tbody>
<tr>
<td>Salmon</td>
<td>92.0</td>
<td>3.2</td>
<td>189.5</td>
<td>20.3</td>
<td>0.0</td>
<td>11.4</td>
<td>4.1</td>
<td>4.1</td>
<td>2.3</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Tomato</td>
<td>123.0</td>
<td>4.3</td>
<td>25.8</td>
<td>1.0</td>
<td>5.7</td>
<td>0.4</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
<td>1.4</td>
</tr>
<tr>
<td>Cereal-3/4 cup(oatmeal)</td>
<td>176.0</td>
<td>6.2</td>
<td>109.1</td>
<td>4.6</td>
<td>19.0</td>
<td>1.8</td>
<td>0.6</td>
<td>0.7</td>
<td>0.3</td>
<td>0.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Squash</td>
<td>87.0</td>
<td>3.0</td>
<td>17.4</td>
<td>0.8</td>
<td>3.7</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Totals</td>
<td>341.9</td>
<td>26.7</td>
<td>28.5</td>
<td>13.6</td>
<td>4.7</td>
<td>4.9</td>
<td>2.7</td>
<td>0.1</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pct. of total grams</td>
<td>38.9%</td>
<td>41.4%</td>
<td>19.7%</td>
<td>6.9%</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Goal</td>
<td>350.0</td>
<td>25.0</td>
<td>25.0</td>
<td>12.5</td>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Percents</td>
<td>40.0%</td>
<td>40.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pct. Difference, goal vs.actual(gm)</td>
<td>-2.3%</td>
<td>7.0%</td>
<td>13.9%</td>
<td>8.7%</td>
<td></td>
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</table>

Salmon is rich in Omega-3 Fatty Acids (see Omega-3 Fatty Acids and EPAs section), so high fat content is good. Wild-Type Salmon only -- not farmed.
Protein Power
Protein powder 1-1/2 scoop
Apples, raw, with skin  NDB No: 09003  -- 1 medium (2-3/4" dia) (approx 3 per lb). 138 g
Note: Although this sample meal includes an apple, it does NOT mean that every protein powder meal will include fruit. You could use the carb foods from the previous two meals. One piece of fruit per day is suggested in this system.

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</thead>
<tbody>
<tr>
<td></td>
<td>Protein 1-1/2 scoop</td>
<td>138.0</td>
<td>4.8</td>
<td>81.4</td>
<td>0.3</td>
<td>21.0</td>
<td>0.5</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Apple</td>
<td>63.0</td>
<td>2.2</td>
<td>59.7</td>
<td>0.0</td>
<td>0.0</td>
<td>7.0</td>
<td>5.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>204.1</td>
<td>26.7</td>
<td>34.2</td>
<td>14.5</td>
<td>5.0</td>
<td>1.1</td>
<td>8.0</td>
<td>0.0</td>
<td>3.7</td>
<td></td>
</tr>
</tbody>
</table>

* Information provided by suppliers, and varies among formulations

Vegetarian Delight (lacto-ovo)
Egg white, raw, fresh  NDB No: 01124  -- qty 4 -- (initial values that are provided from USDA are for raw egg whites, you'll want to cook them with a minimum of oils)
Lima beans, large, mature seeds, cooked, boiled, without salt  NDB No: 16072
Rice, brown, medium-grain, cooked  NDB No: 20041

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</tr>
</thead>
<tbody>
<tr>
<td>Egg whites</td>
<td>132.0</td>
<td>4.6</td>
<td>66.0</td>
<td>13.9</td>
<td>1.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Lima beans</td>
<td>100.0</td>
<td>3.5</td>
<td>115.0</td>
<td>7.8</td>
<td>20.9</td>
<td>0.4</td>
<td>0.0</td>
<td>0.2</td>
<td>0.1</td>
<td>0.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Rice</td>
<td>100.0</td>
<td>3.5</td>
<td>112.0</td>
<td>2.3</td>
<td>23.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Olive oil -- 1 tbsp.</td>
<td>13.5</td>
<td>0.5</td>
<td>119.3</td>
<td>0.0</td>
<td>0.0</td>
<td>14.0</td>
<td>10.0</td>
<td>2.0</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Totals</td>
<td>412.3</td>
<td>24.0</td>
<td>45.8</td>
<td>14.4</td>
<td>10.0</td>
<td>2.2</td>
<td>2.1</td>
<td>0.0</td>
<td>7.0</td>
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</tr>
</tbody>
</table>

The lacto-ovo-vegetarian diet is the most common of the vegetarian diets, one that does not include animal flesh but does use the by-products of the chicken and/or cow (eggs and milk products) Vegans, or strict vegetarians, do not eat these foods. In this example we have a balance of 30%-40% protein, 40%-50% complex carbs and 20% fat.

Note: In the first meal, broccoli is chosen as the vegetable because of it's complex (high-fiber) carbohydrate content. Broccoli has 5.06 grams of carbohydrate per 3.5 oz. serving.
Of Course Not Everyone Weighs 150 Pounds

Here's how the "Healthy Chicken" meal works out for someone who weighs 120 pounds. The first example -- using the 1 gram of protein per pound per day -- then dividing that amount of protein into six feedings, then using a 40% protein / 40% carb / 20% fat percentages (and remember, this is in grams, not volume) -- was designed for a 150 lb. person. The example below is the same meal, but for a 120 lb. person. So everything is just 120/150ths -- the same as 8/10ths, which is the same as 4/5ths -- of the one for the 150 lb. person:

**Healthy Chicken**

Chicken, broilers or fryers, breast, meat only, cooked, roasted NDB No: 05064
Broccoli, cooked, boiled, drained, without salt NDB No: 11091
Bread, mixed-grain (includes whole-grain, 7-grain) NDB No: 18035 -- 1-1/2 slice = 48 g
Olive Oil -- 3/4 tbsp.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken</td>
<td>52.0</td>
<td>1.8</td>
<td>85.8</td>
<td>16.1</td>
<td>0.0</td>
<td>1.9</td>
<td>0.6</td>
<td>0.4</td>
<td>0.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Broccoli</td>
<td>125.6</td>
<td>4.4</td>
<td>35.2</td>
<td>3.7</td>
<td>6.4</td>
<td>0.4</td>
<td>0.0</td>
<td>0.2</td>
<td>0.1</td>
<td>0.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Bread -- 1-1/2 slice</td>
<td>38.4</td>
<td>1.3</td>
<td>96.0</td>
<td>3.8</td>
<td>17.8</td>
<td>1.5</td>
<td>0.6</td>
<td>0.4</td>
<td>0.3</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Olive Oil -- 3/4 tbsp.</td>
<td>8.1</td>
<td>0.3</td>
<td>71.6</td>
<td>0.0</td>
<td>0.0</td>
<td>10.5</td>
<td>7.5</td>
<td>1.5</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td></td>
<td>288.6</td>
<td>23.7</td>
<td>24.2</td>
<td>14.3</td>
<td>8.8</td>
<td>2.5</td>
<td>2.4</td>
<td>0.0</td>
<td>6.1</td>
</tr>
<tr>
<td><strong>Pct. of total grams</strong></td>
<td></td>
<td></td>
<td>38.2%</td>
<td>38.9%</td>
<td>22.9%</td>
<td>14.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>350.0</td>
<td>25.0</td>
<td>25.0</td>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goal Percents</strong></td>
<td></td>
<td></td>
<td>40.0%</td>
<td>40.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pct. difference, goal vs. actual(gm)</strong></td>
<td>-17.5%</td>
<td>-5.1%</td>
<td>-3.3%</td>
<td>14.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optionally, jazz it up with herbs, spices and seasonings -- or about 1-2 tbsp salsa or bar-b-que sauce -- but be aware that for 2 tbsp, calories can range from as little as 10 to 50+, and carbs can range from 2-15+ grams -- mostly sugar. This can really add up.

These meals/feedings are only representative samples. The purpose is for you to be able to use the information on the "Search the USDA National Nutrient Database for Standard Reference" web site at [http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl](http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl), or a similar resource, to be able to design your own, using the 40% protein / 40% carb / 20% fat percentages.

**Carbs and Protein in Vegetables**

The carbohydrate and protein content of vegetables other than broccoli are similar. You may be interested to find that there is protein in vegetables, and that we consider it to be a part of our protein intake. An analysis of the amounts of protein and comparison of the percentages of amino acids in beans, rice and broccoli appears in the "The Protein in Beans" and "The Protein in Broccoli!" sections below.

Here are a very few representative comparisons taken from the USDA web site.

Broccoli, cooked, boiled, drained, without salt NDB No: 11091
Cauliflower, cooked, boiled, drained, without salt NDB No: 11136
Brussels sprouts, cooked, boiled, drained, without salt NDB No: 11099
Tomatoes, red, ripe, raw, year round average NDB No: 11529
Carrots, cooked, boiled, drained, without salt NDB No: 11125
Peas, edible-podded, cooked, boiled, drained, without salt NDB No: 11301
These are per 100 grams (3.5 oz.)

<table>
<thead>
<tr>
<th></th>
<th>Carbs</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broccoli</td>
<td>5.06</td>
<td>2.98</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>4.11</td>
<td>1.84</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>8.67</td>
<td>2.55</td>
</tr>
<tr>
<td>Tomato</td>
<td>4.64</td>
<td>0.85</td>
</tr>
<tr>
<td>Carrots</td>
<td>10.48</td>
<td>1.09</td>
</tr>
<tr>
<td>Peas</td>
<td>7.05</td>
<td>3.27</td>
</tr>
</tbody>
</table>

To keep it simple, for carbohydrate amounts I usually just have about 5 to 5-1/2 oz. of any of the complex carbohydrate vegetables.

*I know, I know, all this food calculation may seem complicated . . .*

It may seem complicated and like it requires too much discipline. But you don't have to be exactly to the gram, and about plus or minus a small amount is OK.

After a short while it will become really easy, and when you experience the results and it becomes a habit, you'll be more motivated and it will become even easier.

*You Don't Have to be a Saint*

Constant routine tends to attenuate the benefits. The good news is that while we keep to the kinds of meals and feedings outlined above most of the time, once in a while, perhaps one day a week, it actually can be beneficial to enjoy food that's a little "off the system". It's good to have a little fun once in a while and have a treat, and can help you utilize the fats in your diet.

And throughout the week while staying on your normal eating habits as described above, it's OK to have a small treat. Dark chocolate is preferred. Try drinking a glass or two of water before any treat. It can make it more satisfying and help you feel like you've had more.

*The Above Relates to Change*

Over time, the body becomes used to a constant routine and becomes more efficient with it, and you don't get the same benefit. Energy rates and caloric expenditure decline. When you change routine each few days, the body has to adjust to that change. By changing routine, you force the body to be more efficient and snap out of complacency. The same is true for muscle training -- when keeping with the same weight training routine the muscles become complacent and we lose flexibility, as well as lose the different kinds of development the body can attain.

*If You Just Gotta Have Something Sweet & Fatty*

When you're eating the right foods, your interest in unhealthy foods decreases greatly or even goes away. At the first sign of an interest or craving for unhealthy "foods", just try to put it outside of your thoughts and go on. Or just have a spoonful of your favorite treat, or better yet, peanut butter, or 1/2 cup of Kellogg's All-Bran Extra Fiber cereal.

If you lean toward fondness for sweet, fatty foods, like cookies, ice cream cake, candy, etc., and this continues after several weeks on this system, only have your fruit with the first meal of the day. In addition to satisfying a sweet tooth, steamed vegetables, yams, whole grains or Kellogg's All Bran Extra Fiber can offer you extra fullness.
Chocolate may have at least some health benefits, so if you really gotta have a small sweet treat it may be your least destructive choice. It's rich in antioxidants called polyphenols and flavonoids, which are found in berries, red wine, green tea, fruits and vegetables. Following the consumption of cocoa beverages there is a reduction in the tendency for platelets to clot, similar to the effects of taking a baby aspirin. Platelets are a kind of red blood cell that aid in the normal clotting of blood. If platelets become sticky, however, unwanted clots can form and lead to a major heart attack.

A team at University of California, Davis conducted an experiment where subjects consumed two samples of chocolate a week apart. The chocolates had either high or low levels of flavonoids. Blood tests were done on the participants before they ate the chocolate and again two and six hours later. After two hours, those who had the chocolate with high levels of flavonoids had 20 percent more of the antioxidant in their blood. The participants also showed a reduction in serum leukotriene, a substance that promotes the formation of platelets in the blood. After six hours, all of the participants' leukotriene/flavonoid ratios had returned to normal levels. Findings appear in the January issue of the *American Journal of Clinical Nutrition*.

The Mars candy company says that one kind of polyphenols helps neutralize LDL ("bad") cholesterol. But they didn't say is that chocolate is high in calories and fats. Dark chocolate has about twice is much polyphenol as light chocolate. White chocolate has none -- it's mostly fat. Chocolate is high in fat, but not higher than any other snack food.

**If You Should Err Big Time**

If you fall off the nutrition system, well, that's okay. Just start right up again and do the exercises again in the "Behavior Modification & Motivation" section with renewed vigor. It can be helpful to pair the "sweet and fatty" with the "unwholesome and yucky". Think of your favorite treat with something really gross as a topping, either sitting there (and smelling) all by itself, or using the "Big Bang" method.

And remember, bad habits can take as long as a year to change. Just keep trying. Much of it has to do with insulin regulation. Soon healthy eating habits will come naturally.

Just as insulin receptors become resistant to the stimulation of insulin over time, resulting in an increased requirement to make them function, your sweet receptors do the same. This is another example of health body modifies and three designs itself in response to what's going on. So a reduction in your intake of sweets will result in a greater enjoyment of very small amounts. After reducing their intake, you may notice a kind of bitter, tangy or unpleasant taste that accompanies processed or sugary & fatty foods, in addition to it not being particularly satisfying anymore. This may be your taste buds way if saying it just isn't good for you.

Trying to just forget about it for a while can really help. You may notice the desire or craving for sugary, fatty foods and particular time. Recognize that pattern, and just try to hold off for while -- it will go away and you'll feel better, and you'll have a feeling of accomplishment. If you tend to feel these cravings between meals, or right after meals, increase the fat in your regular meals -- about ½ to 1 teaspoon of olive oil or peanut butter.

Steamed vegetables, yams, whole grains or Kellogg's All Bran Extra Fiber can satisfy a sweet tooth or offer extra fullness.

If you find that you absolutely positively must have some decadent treat, just eat half, or one-third, or just one bite of it. But if you start munching it you will be tempted to finish,
so divide it first, and immediately throw out the part that you won't be eating. Or substitute a small piece of candy. Better yet, substitute a small part of a protein bar.

Each time you just say no to junk food it's a score. It all adds up, at the end the results are lifelong, positive changes. The payoff will be that you will get what you want out of life.

**Glycemic Index and Insulin Index**

In general you will want foods that are low on the glycemic index. Glycemic index is a measure of how fast carbohydrates in a certain food convert to glucose, which then enters the bloodstream and muscles (as glycogen). The glycemic index basically tracks how fast your blood sugar rises after eating carbohydrate-dense foods, such as fruits, vegetables, grains and processed foods (pasta, bread, cereals, crackers and cookies are measured most often).

New research indicates that an insulin index is more appropriate than glycemic index. With the exception of milk and baked white bread products such as bagels, neither of which are recommended here, most foods that are low on the glycemic index are also low on the insulin index.

Consumption of large volumes of food with a high insulin index may play a role in the development of insulin resistance, although the link has yet to be conclusively established.

See the appendix for more information on the glycemic and insulin indices.
### Glycemic Index by Food Category

#### Grain, Cereal Products

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread (white)</td>
<td>69</td>
</tr>
<tr>
<td>Bread (wholemeal)</td>
<td>72</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>51</td>
</tr>
<tr>
<td>Millet</td>
<td>71</td>
</tr>
<tr>
<td>Pastry</td>
<td>59</td>
</tr>
<tr>
<td>Rice (brown)</td>
<td>66</td>
</tr>
<tr>
<td>Rice (white)</td>
<td>72</td>
</tr>
<tr>
<td>Spaghetti (wholemeal)</td>
<td>42</td>
</tr>
<tr>
<td>Spaghetti (white)</td>
<td>50</td>
</tr>
<tr>
<td>Sponge cake</td>
<td>46</td>
</tr>
<tr>
<td>Sweetcorn</td>
<td>59</td>
</tr>
<tr>
<td>All-bran</td>
<td>51</td>
</tr>
<tr>
<td>Cornflakes</td>
<td>80</td>
</tr>
<tr>
<td>Muesli</td>
<td>66</td>
</tr>
<tr>
<td>Porridge Oats</td>
<td>49</td>
</tr>
<tr>
<td>Shredded Wheat</td>
<td>67</td>
</tr>
<tr>
<td>Weetabix</td>
<td>75</td>
</tr>
<tr>
<td>Biscuits</td>
<td>59</td>
</tr>
<tr>
<td>Oatmeal</td>
<td>54</td>
</tr>
<tr>
<td>Rich Tea</td>
<td>55</td>
</tr>
<tr>
<td>Ryvita</td>
<td>69</td>
</tr>
<tr>
<td>Water</td>
<td>63</td>
</tr>
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</table>

#### Sugars

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose</td>
<td>20</td>
</tr>
<tr>
<td>Glucose</td>
<td>100</td>
</tr>
<tr>
<td>Maltose</td>
<td>105</td>
</tr>
<tr>
<td>Sucrose</td>
<td>59</td>
</tr>
<tr>
<td>Fructose</td>
<td>20</td>
</tr>
</tbody>
</table>

#### Miscellaneous

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish Fingers</td>
<td>38</td>
</tr>
<tr>
<td>Honey</td>
<td>87</td>
</tr>
<tr>
<td>Lucozade</td>
<td>95</td>
</tr>
<tr>
<td>Mars bar</td>
<td>68</td>
</tr>
<tr>
<td>Peanuts</td>
<td>13</td>
</tr>
<tr>
<td>Potato crisps</td>
<td>51</td>
</tr>
<tr>
<td>Sausages</td>
<td>2</td>
</tr>
<tr>
<td>Tomato soup</td>
<td>38</td>
</tr>
</tbody>
</table>

#### Fresh Legumes

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad beans</td>
<td>79</td>
</tr>
<tr>
<td>Frozen peas</td>
<td>51</td>
</tr>
</tbody>
</table>

#### Root Vegetables

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beetroot</td>
<td>64</td>
</tr>
<tr>
<td>Carrots</td>
<td>92</td>
</tr>
<tr>
<td>Parsnips</td>
<td>97</td>
</tr>
<tr>
<td>Potato (instant)</td>
<td>80</td>
</tr>
<tr>
<td>Potato (new)</td>
<td>70</td>
</tr>
<tr>
<td>Swede</td>
<td>72</td>
</tr>
<tr>
<td>Yam</td>
<td>51</td>
</tr>
</tbody>
</table>

#### Dried and Tinned Legumes

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans (tinned, baked)</td>
<td>40</td>
</tr>
<tr>
<td>Beans (butter)</td>
<td>36</td>
</tr>
<tr>
<td>Beans (haricot)</td>
<td>31</td>
</tr>
<tr>
<td>Beans (kidney)</td>
<td>29</td>
</tr>
<tr>
<td>Beans (soya)</td>
<td>15</td>
</tr>
<tr>
<td>Beans (tinned soya)</td>
<td>14</td>
</tr>
<tr>
<td>Peas (blackeye)</td>
<td>33</td>
</tr>
<tr>
<td>Peas (chick)</td>
<td>36</td>
</tr>
<tr>
<td>Peas (marrowfat)</td>
<td>47</td>
</tr>
<tr>
<td>Lentils</td>
<td>29</td>
</tr>
</tbody>
</table>

#### Fruit

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples (Golden Del.)</td>
<td>39</td>
</tr>
<tr>
<td>Bananas</td>
<td>62</td>
</tr>
<tr>
<td>Oranges</td>
<td>40</td>
</tr>
<tr>
<td>Orange juice</td>
<td>46</td>
</tr>
<tr>
<td>Raisins</td>
<td>64</td>
</tr>
</tbody>
</table>

#### Dairy Products

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Glycemic Index %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice cream</td>
<td>36</td>
</tr>
<tr>
<td>Milk (skimmed)</td>
<td>32</td>
</tr>
<tr>
<td>Milk (whole)</td>
<td>34</td>
</tr>
<tr>
<td>Yogurt</td>
<td>36</td>
</tr>
</tbody>
</table>
Glycemic Index by Percentage Groups

110%
105 Maltose
100 Glucose
100%
97 Parsnips
92 Carrots
90%
87 Honey
80 Potatoes (inst. mashed)
80 Cornflakes
80%
79 Broad beans (fresh)
75 Wheatabix
72 Swede
72 Rice (white)
72 Bread (wholemeal)
71 Millet
70 Potato (new, white)
70%
69 Ryvita
69 Bread (white)
68 Mars bar
67 Shredded wheat
66 Rice (brown)

66 Muesli
64 Raisins
64 Beetroot
63 Water biscuits
Bananas
60%
Sweet corn
Sucrose
Digestive biscuits
Rich Tea biscuits
Oatmeal biscuits
Yams
Potato chips
Peas (frozen)
Buckwheat
All-bran
Spaghetti (white)
50%
Porridge oats
Potato (sweet)
Potato (baked russet)
Orange juice
Grapes

Beans (canned navy)
40%
Apples (golden del.)
Tomato soup
Yogurt
Lima beans
Ice cream
36 Chick peas
36 Butter beans
34 Pears
34 Milk (whole)
33 Peas (dried blackeye)
32 Milk (skim)
31 Haricot beans
30%
29 Peaches (fresh)
29 Lentils
29 Kidney beans
26 Grapefruit
23 Cherries
20 Fructose
20%
14 Soya beans (canned)
13 Peanuts

Foods like ice cream have a low glycemic index, but they also have a high fat content. Therefore their caloric value has to be considered in addition to their possible effect on insulin response.

**The Protein in Beans**

There's variation in the amounts of protein and carbs between different kinds of beans (mature or immature, cooked or canned) -- but in general, the greater the protein, the greater the carbs. This seems to have to do with water content (more water, less protein and carbs, which makes sense). "Lima beans, large, mature seeds, cooked, boiled, without salt" were chosen above as representative of the lot.
A representative sample of protein and carbohydrate in different kinds of beans:

<table>
<thead>
<tr>
<th>Type of Beans</th>
<th>Prot</th>
<th>Carb</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lima beans, large, mature seeds, cooked, boiled,</td>
<td>7.8</td>
<td>20.89</td>
<td>69.79</td>
</tr>
<tr>
<td>without salt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lima beans, immature seeds, cooked, boiled,</td>
<td>6.81</td>
<td>23.64</td>
<td>67.17</td>
</tr>
<tr>
<td>drained, without salt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans, kidney, red, mature seeds, canned</td>
<td>5.25</td>
<td>15.6</td>
<td>77.36</td>
</tr>
<tr>
<td>Beans, black, mature seeds, cooked, boiled,</td>
<td>8.86</td>
<td>23.71</td>
<td>65.74</td>
</tr>
<tr>
<td>without salt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans, pinto, mature seeds, sprouted, cooked,</td>
<td>1.86</td>
<td>4.1</td>
<td>93.39</td>
</tr>
<tr>
<td>boiled, drained, without salt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans, kidney, mature seeds, sprouted, cooked,</td>
<td>4.83</td>
<td>4.72</td>
<td>89.3</td>
</tr>
<tr>
<td>boiled, drained, without salt</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rice was a little more consistent (short/medium/long grain, brown or white). If you're really interested you can look them all up.

It is said that beans and rice together have complementary proteins (essential amino acids) which together make complete protein. I wanted to see exactly what they are, so I ran some numbers:
**Comparison of amino acid content -- chicken, rice and beans:**

Chicken, broilers or fryers, breast, meat only, cooked, roasted NDB No: 05064

Lima beans, large, mature seeds, cooked, boiled, without salt NDB No: 16072

Rice, brown, medium-grain, cooked NDB No: 20041

% difference of total amino acids is computed by:

\[
\frac{\text{% chicken-beans}}{\text{% chicken}} \quad \text{and} \quad \frac{\text{% chicken-rice}}{\text{% chicken}}
\]

Note: You will find some differences attributed to rounding error when calculating % difference of total amino acids.

This is deemed acceptable, as the % differences use the "true" numbers -- for example, for chicken and beans,

\[
\frac{0.362/29.174-(1.24/7.841)}{0.362/29.174} = 5.53\%
\]

or (0.0124198030672110337255978316807905 minus 0.0117331972962632317306466011988267) divided by 0.0124198030672110337255978316807905

Essential amino acids are in red.

<table>
<thead>
<tr>
<th>Amino acids</th>
<th>100 grams</th>
<th>grams</th>
<th>% of total amino acids</th>
<th>% difference of total amino acids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tryptophan</td>
<td>0.362</td>
<td>0.092</td>
<td>0.03</td>
<td>1.24%</td>
</tr>
<tr>
<td>Threonine</td>
<td>1.31</td>
<td>0.337</td>
<td>0.085</td>
<td>4.49%</td>
</tr>
<tr>
<td>Isoleucine</td>
<td>1.638</td>
<td>0.411</td>
<td>0.098</td>
<td>5.62%</td>
</tr>
<tr>
<td>Leucine</td>
<td>2.328</td>
<td>0.673</td>
<td>0.191</td>
<td>7.99%</td>
</tr>
<tr>
<td>Lysine</td>
<td>2.635</td>
<td>0.523</td>
<td>0.088</td>
<td>9.04%</td>
</tr>
<tr>
<td>Methionine</td>
<td>0.859</td>
<td>0.099</td>
<td>0.052</td>
<td>2.95%</td>
</tr>
<tr>
<td>Cystine</td>
<td>0.397</td>
<td>0.086</td>
<td>0.028</td>
<td>1.36%</td>
</tr>
<tr>
<td>Phenylalanine</td>
<td>1.231</td>
<td>0.449</td>
<td>0.119</td>
<td>4.22%</td>
</tr>
<tr>
<td>Tyrosine</td>
<td>1.047</td>
<td>0.276</td>
<td>0.087</td>
<td>3.59%</td>
</tr>
<tr>
<td>Valine</td>
<td>1.539</td>
<td>0.469</td>
<td>0.136</td>
<td>5.28%</td>
</tr>
<tr>
<td>Arginine</td>
<td>1.871</td>
<td>0.478</td>
<td>0.175</td>
<td>6.42%</td>
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<tr>
<td>Histidine</td>
<td>0.963</td>
<td>0.238</td>
<td>0.059</td>
<td>3.30%</td>
</tr>
<tr>
<td>Alanine</td>
<td>1.692</td>
<td>0.398</td>
<td>0.135</td>
<td>5.81%</td>
</tr>
<tr>
<td>Aspartic acid</td>
<td>2.764</td>
<td>1.006</td>
<td>0.217</td>
<td>9.48%</td>
</tr>
<tr>
<td>Glutamic acid</td>
<td>4.645</td>
<td>1.104</td>
<td>0.472</td>
<td>15.94%</td>
</tr>
<tr>
<td>Glycine</td>
<td>1.524</td>
<td>0.329</td>
<td>0.114</td>
<td>5.23%</td>
</tr>
<tr>
<td>Proline</td>
<td>1.275</td>
<td>0.354</td>
<td>0.109</td>
<td>4.37%</td>
</tr>
<tr>
<td>Serine</td>
<td>1.067</td>
<td>0.519</td>
<td>0.12</td>
<td>3.66%</td>
</tr>
<tr>
<td></td>
<td>29.147</td>
<td>7.841</td>
<td>2.315</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

For most amino acids, the percent content of each amino acid in both beans and rice appear close to the percent content in chicken. This is not to say the amounts are the same. Since refined carbohydrates, such as white rice and white bread are quickly broken down in the body (causing rapid elevation of blood glucose levels) resulting a large release of insulin. See the Glycemic Index above. So proportionately more beans than rice would be a good idea.
Here's a similar comparison of chicken and broccoli:
Chicken, broilers or fryers, breast, meat only, cooked, roasted NDB No: 05064
Broccoli, cooked, boiled, drained, without salt NDB No: 11091

% difference of total amino acids is computed by:
(% chicken-broccoli)/% chicken

Note: You will find some differences attributed to rounding error when calculating % difference of total amino acids.

This is deemed acceptable, as the % differences use the "true" numbers -- for example, ((.362/29.174)-(0.031/2.173))/(.362/29.174) = 5.53%
calculated another way: (0.0124198030672110337255978316807905 - 0.0142659917165209387942936033133916) / 0.0124198030672110337255978316807905
or (0.0124198030672110337255978316807905 minus 0.0142659917165209387942936033133916) divided by 0.0124198030672110337255978316807905
Essential amino acids are in red.

<table>
<thead>
<tr>
<th>100 grams each</th>
<th>Amino acids</th>
<th>Chicken</th>
<th>Broccoli</th>
<th>% difference of total amino acids</th>
<th>% difference of total amino acids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tryptophan</td>
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<td>0.031</td>
<td>1.24%</td>
<td>1.43%</td>
<td>-14.86%</td>
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<tr>
<td>Threonine</td>
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<td>0.097</td>
<td>4.49%</td>
<td>4.46%</td>
<td>0.68%</td>
</tr>
<tr>
<td>Isoleucine</td>
<td>1.638</td>
<td>0.116</td>
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<td>5.34%</td>
<td>5.01%</td>
</tr>
<tr>
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<td>0.139</td>
<td>7.99%</td>
<td>6.40%</td>
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<tr>
<td>Lysine</td>
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<td>6.90%</td>
<td>23.64%</td>
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<tr>
<td>Methionine</td>
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<td>2.95%</td>
<td>1.66%</td>
<td>43.79%</td>
</tr>
<tr>
<td>Cystine</td>
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<td>0.021</td>
<td>1.36%</td>
<td>0.97%</td>
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</tr>
<tr>
<td>Phenylalanine</td>
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<td>0.09</td>
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<td>4.14%</td>
<td>1.93%</td>
</tr>
<tr>
<td>Tyrosine</td>
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<tr>
<td>Valine</td>
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<td>6.26%</td>
<td>-18.53%</td>
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<td>Arginine</td>
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<td>Histidine</td>
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<td>26.18%</td>
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<tr>
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<td>5.75%</td>
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</tr>
<tr>
<td>Aspartic acid</td>
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<td>0.227</td>
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<td>10.45%</td>
<td>-10.16%</td>
</tr>
<tr>
<td>Glutamic acid</td>
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<td>0.401</td>
<td>15.94%</td>
<td>18.45%</td>
<td>-15.80%</td>
</tr>
<tr>
<td>Glycine</td>
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<td>0.101</td>
<td>5.23%</td>
<td>4.65%</td>
<td>11.11%</td>
</tr>
<tr>
<td>Proline</td>
<td>1.275</td>
<td>0.122</td>
<td>4.37%</td>
<td>5.61%</td>
<td>-28.35%</td>
</tr>
<tr>
<td>Serine</td>
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<td>0.106</td>
<td>3.66%</td>
<td>4.88%</td>
<td>-33.25%</td>
</tr>
</tbody>
</table>

29.147  2.173  100.00%  100.00%

These are close to the percentages of protein in beans and rice -- but not the amounts.
**Johnny's Healthy Protein Shake**

Mix 1-1/2 to 2 scoops Unisyn MRP2 protein powder by Universal Nutrition with 1 cup nonfat milk. I know, I know, milk is high on the insulin index (and many people find it hard to digest), so I usually only have one of these a day and the rest of the time just mix the protein powder with water. If the milk causes you tummy trouble, then try lactose-free milk or substitute water.

Add about a teaspoon of low calorie hot chocolate mix or a tablespoon of peanut butter for flavor. Add 2 or more tablespoons nonfat yogurt just for the froth of it. Mix it up in a shaker cup or blender until nice and frothy.

Goat yogurt imparts a distinctive flavor to this shake that can only be described as, well, goaty. I have yet to try this with yak yogurt. Surely, like myself, you have wondered how one would describe the distinctive flavor of yak yogurt. Well, you can find out this and more than you would ever want to know about those lovable beasts at [http://www.animalinfo.org/species/artiperi/bos_mutu.htm](http://www.animalinfo.org/species/artiperi/bos_mutu.htm).

**The OK to Eat List -- probably won't hurt you**

Lettuce doesn't really have much nutrition. It’s mostly water and crunch, and falls under the category of innocuous "fun" food. But many salad dressings contain lots and lots of fat. So if you want your lettuce or if you are a rabbit, have some lettuce without the dressing.

**The Normally NOT OK to Eat List**

Anything that was once food, but has been pulverized, compressed, boiled in fat, and loaded up with sugar and salt. As expected, these include processed "foods" containing added fat, sugars or salt.

All the usual suspects: pastry, doughnuts, ice cream, cookies, candy, potato & corn chips, soda, chicken nuggets, hot dogs, french fries, fruit juices and juice-flavored drinks, rolled-up dried "fruit", toaster pastries, and most prepackaged lunches.

Sadly, many of the above are packaged and marketed to children.

A food that says "Healthy" on the label isn't necessarily your most healthful choice.

On a television program I once heard a junk food industry representative describe his product as having "snack value", whatever the heck that is. Almost invariably packages labeled "low fat" will mean high-calorie, and "lite" will be "not a lot of pounds" -- and not low fat, low sugar, healthful and nutritious.

Fruit juices, from fruit or blended, contain far too little nutrition for the immense amounts of sugar and calories. Vitamin C in juice is lost soon after exposure to light, heat, air or metal. Popular tomato/vegetable juice blends have been pasteurized, resulting in the destruction of nutritional content. With an average of 160 calories each, sodas are probably the greatest source of sugar in the American diet. Holiday eggnog has a whopping 340 calories a glass, while white wine has only about 70 per 3.5 oz. glass.

New animal research suggests that fat-laden meal plans can take a toll on the brain by starving it of its energy supply.
Foods with polyunsaturated fats, as well as saturated fats should also be shunned. Most people eat too much fat because they don't know what they're eating. Cooked chicken from a supermarket deli are usually fatty birds and should only be resorted to the most hungry of situations. Ditto with many fast food restaurant chicken sandwiches. One exception is the "Koo Koo Roo" chain, which does a real good job of providing low-fat and healthful chicken and side orders.

As previously mentioned, most salad dressing contains lots and lots of fat. Nuts and seeds are typically loaded with fat and they're usually rancid by the time they get to your home – therefore, filled with free radicals. Also, nuts sometimes contain aflatoxins, which are cancer causing molds.

The recent "Got Milk?" ad campaigns are absolutely brilliant examples of fabricating some drama to motivate us to buy something that, in my opinion, isn't nearly as nutritious as some other foods you could be using to build your body as, say, broccoli. Milk lacks complex (high-fiber) carbohydrate and it's high on the insulin index. Milk is great for baby cows, but in humans it can lead to a number of maladies. Heart disease begins to show up around the age of 3. After age 3 you don't need milk, and breast milk is better for the immune system.

The milk from one species just isn't designed for other species. Around 50%-85% of all people lack adequate amounts of the enzyme lactase which breaks down lactase (milk sugar) This is lactose intolerance which means they can't digest it and get sick because it spoils in their digestive tracts. And we are the only species on earth that I know of (maybe with the except of domestic farm animals like lambs who will surreptitiously nurse from a cow, cats who will wait along the sidelines while the cows are being milked hoping for a free squirt or two, or maybe ants who "milk" the nectar from aphids) that has figured out how to get the milk out of other species. But that's why we rule the world and are the only species who has figured out how to make potato chips.

Barbecue, smoked and pan-fried meats contain a lot of heterocyclic amines (HCAs). HCAs are created when heat breaks up amino acids and creatinine and provoke free radical activity. HCAs cause DNA mutations and colorectal, esophageal, long, liver, intestine, prostate, liver and breast cancers.

There is a lot of sensationalism regarding the artificial sweetener Aspartame, or NutraSweet. But there have been very rare occurrences of neurotoxicity for some people, especially infants. It contains Methyl Alcohol, which is said to be highly toxic and can cause recurrent headaches, behavioral disorders, seizures, suicidal tendencies, birth defects, skin lesions and urinary bladder disturbances, and some new research suggests that people who consume a lot of aspartame are more likely to suspect they have memory problems, typically of the type where you forget whether you did something. Did I say that already? But representatives of NutraSweet's maker maintain there's no evidence that the sweetener does anything to affect memory and researchers have not demonstrated conclusive evidence for memory problems.

According to the NutraSweet company, aspartame is manufactured mainly from amino acids, which make up protein. While it has about the same caloric makeup as sugar, it is much sweeter, meaning that much less is required to sweeten a food or drink. And as I mentioned, there's a lot of sensationalism, and side effects are very rare, and I still have drinks with aspartame myself.

Toxins are created as vegetables and fruits spoil and they are free radical generators, so they should be as fresh as possible.
OK, OK, it’s hard not to be tempted when you’re out with friends or over the holidays. A guy or a gal has to have a little fun once in a while. In addition to this nutrition regimen, some days I’ll have just one treat that’s around 50-100 calories (about 1/3 a chocolate bar) and still stay really sharp. If you must, then chocolate is the least undesirable.

It would be all right to, maybe once a week, indulge in a slice or two of pizza, a candy bar or a scoop of ice cream. OK, I’ll throw in a cookie. But – don’t be surprised if the next morning you’re just not quite as alive and energized as usual, and it takes you the rest of the day to get back to your usual self.

Just don't keep junk foods around the house. It is great when you get to the point where you follow this automatically and have just lost the desire for unhealthy foods. Choose "high water content" foods, like fresh produce, how cereal and the like, over low water foods like dried fruit, nuts, and snacks. 1/4 cup of raisins contain 100 calories -- the same as two cups of grapes.

Actually, the oil in peanut butter is around half monounsaturated, or the "good fat" that's also found in olive and canola oils, and to a lesser amount in peanut and sesame oils.

If you get a tummy upset or gas, have some unflavored yogurt providing friendly flora/acidophilus & bifidus, and some pineapple or mango 3-4 times a day for a few days, and stay in touch with your doctor. The "fruit" on the bottom of yogurt is really mostly sugar.

When I first started this meal system I had been vigorously working out with weights. But I just wasn’t getting enough protein to support that strenuous routine. In fact, I was protein deficient. At first the protein drinks tasted really good! After a few months they started tasting a little less desirable, for me anyway. But what really spices up the old protein drink is a spot of yogurt, and if you need a little added sweetness, a small amount of the “fruit” (actually some kind of jam or sugary compote) that comes on the bottom of a lot of yogurts.

**Why Too Many Calories, and Sugars, are Really Bad**

OK, would you pump maple syrup (a fine source of energy) in the gas tank of a superbly designed, snazzy sports car then try to hurl down at the Bonneville Salt Flats at about 3000 mph? You probably wouldn’t even put diesel fuel or regular gas in a car that was designed for premium. Suppose the tank was overfilled and gas ran over and corroding a brand new paint job. That’s what eating the wrong foods and overeating is like.

And imagine a car that was constantly being repaired and rebuilt, depending on the kinds of gas and oil you used. Would you rebuild your fenders out of cardboard and the engine out of cheap tin?

Excusez-moi for the car analogy (and pardon my French). Sure, this is a little obtuse. But I'm trying to anchor this idea in your mind. Our bodies do operate on physical principles. Like a house or car -- if we build it out of quality materials it will last a long time, and if we build it out of flimsy materials it will crumble. And if we subjected to a lot of stress, it will break down, and so forth.

If you're going to hurl down the Bonneville Salt Flats, you'll want the strongest frame and an engine that has been built from the highest quality components.

This is just what most people do to something that is a lot more valuable to them than a snazzy sports car: their bodies. Lucky for us the body isn’t nearly as finicky as a car and
won’t stop running when being fed a lot of muck. Either by design, or through millions of years of evolution, or a combination of both we are endowed with a system to live in that will survive on a wide range of fuels and conditions – often very bad. The key word here is “survive”. May I assume that because you are still reading this, you are interested in living a life that is somewhat beyond what most people are willing to settle for?

Eating too many calories sets about a chain of processes in your body that "eat" you alive . . . from the inside! The destructive effects of glucose in the blood have been previously described. But the biggest offender in this chain of events is free radical damage, which we also discussed earlier. Studies have linked sugar with degenerative diseases which accelerate aging -- and reduce lifespan 16-25 percent.

But we like it. Why? We have a genetic predisposition to store up on calories for a famine, as well as a preference for sweet foods which are less likely to be poisonous than, say, bitter foods.

Sugar also increases blood pressure, heart rate, triglycerides, LDL cholesterol and total cholesterol. Reducing fat in the diet does not improve these levels unless dietary sugar is removed from the diet. Sugar loading causes high uric acid, inorganic phosphorous, SPOT, and triglycerides. There is a strong correlation between sugar intake and breast cancer in older women. During exercise, high sugar can impair muscle performance. Sugar loading can be responsible for the pain, joint stiffness, and degeneration of arthritis of the spine. Many people are particularly sensitive to sugar. And in the previous section we saw how sugar causes an insulin spike.

And when we are stressed, the brain releases a chemical called corticotropin-releasing hormone, or CRH, that suppresses appetite. The adrenal glands then secrete their powerful fight-or-flight stress hormones, adrenaline and cortisol, which propel sugar into the bloodstream for a short-term energy rush. After that rush, cortisol sparks the hunger for carbohydrates and fat.

And all this means accelerated aging for you.

Reducing sugar consumption will improve your health.

Did I mention that sugar can cause tooth decay?

And it doesn’t matter where you get your sugar – sucrose, fructose, glucose, honey, lactose, maltose, or other “natural” sweeteners are just about the same. This includes "raw" sugar. And, sugar is habit forming. The good news to this is that a sugar habit can be broken. So if you crave sugar, you can get over it. If you really must have sugar, limit it to 28 grams (1 oz.) per day. That’s a few teaspoons.

**Why Polyunsaturated Fats, and Most Other Fats are Really Bad For You**

Unsaturated (polyunsaturated) fat produces just as much fat blockage in the capillaries as saturated fat, and it often hangs around longer in the bloodstream. Unsaturated fat is no better at protecting against the risk of heart attack or death than saturated fats. And they cause coronary heart disease and atherosclerosis. This was determined in scientific studies as early as the ’60s.

Polyunsaturated fats were once advertised as practically a kind of health food. They are often used by food processors and in restaurants because of their low cost. Although saturated fats and cholesterol have been shown to be a major factor in atherosclerosis and heart disease, polyunsaturated fats are a major source of free radicals. Although polyunsaturated fats do reduce blood cholesterol, at the same time they increase the amount
of cholesterol in the arterial plaques, artery wall, liver, and other tissues. Through free radical production this causes heart disease, cancer in various places in the body, especially in the breast, prostate and colon. Promotion of initial tumor growth is now thought to require a minimal amount of unsaturated fat, and they have been shown to suppress the immune system in laboratory animals.

Polyunsaturated fatty acids become rancid (a further source of free radicals) within 9 days of opening the container and being exposed to air, long before you can detect a rancid flavor or odor. This occurs even if they contain preservatives. To preserve cooking oils, add the contents of a 250 mg capsule of BHT (Butylated hydroxytoluene) to each 16 oz. of oil. Still, it will go rancid in a couple of weeks. BHT is available in health food stores. And do not save or reuse cooking oil.

Olive oil is a monounsaturated fat. Coconut and palm oils, for example, are particularly highly saturated.

**Why Protein and Complex Carbohydrates are Critical in This System**

The reasons that protein and complex caribs are vital to you was covered in pages 1-6 of the Background chapter. If you missed this, please read it now.

**Variety**

Eating a variety of foods is essential because it will better assure a range of nutrients that are vital to your health. Variety also avoids possible toxicities that can accumulate from the soil additives, sprays and even undesirable natural substances found in foods themselves. Eating a varied diet can help minimize exposure to any particular additive. Some people develop hypersensitivities when eating the same foods again and again. Besides, variety keeps it interesting.

**Weight Loss**

Although this isn’t a weight loss system per se, most people who are somewhat overweight but not obese will come to something near their ideal weight with this system. But on this system you are likely to exchange fat for muscle -- a very good thing. I'm not saying you'll necessarily want to become "muscular" (you can if you want to), but you'll definitely become more defined. More of this in the section on exercise. And exercise lowers your appetite set point -- so you'll be less hungry.

**Crash Diets**

Crash diets -- losing lots of pounds in a short period -- are dangerous. Permanent weight loss must be a slow process. Most people resume their former eating habits after a crash diet. This can result in an upward spiral of ever increasing weight. In response to the deprivation, our bodies lower the metabolic rate in order to conserve energy and increase fat storage. But the metabolism does not return to its former level after a crash diet when normal habits are resumed. So the more we starve ourselves, the faster we regain the lost weight after we begin to eat again. The dieter gains weight even more quickly than before, and on less calories than it would have previously taken to gain weight. Repeat offenders gain weight on less than 1000 calories per day!

Dieting along to lose weight causes the body to lose muscle more than it does fat. Therefore, during re-feeding the body puts on more fat but no more muscle.
The body's main fuel is glucose, which is most easily obtained from carbohydrates. If glucose is unavailable (as in a crash diet) the body's most efficient way of obtaining glucose will be to get it from protein in the diet. So it will disassemble your muscle (this can cause atrophy of the heart), and your organs and the infrastructure of your body to burn as fuel. Many people who have been on a lot of crash diets have faces that look thin and drawn because they have lost a lot of facial muscle.

Fat loss comes from burning calories through exercise, and weight training, which builds muscle. Muscle burns more calories, therefore increasing fat loss.

Glucose is obtained from fat very poorly. If carbohydrate remains unavailable for several days the body will try to conserve it's protein by producing an alternative fuel source by partially burning fatty acids, called ketones. Ketones serve as a substitute for glucose and help keep the central nervous system running -- although it does not fuel all of the central nervous system cells. As fat breakdown continues, these ketones will build-up of the blood causing an abnormal condition called ketosis. The blood becomes more acidic, so there is a chemical imbalance with potentially serious side effects. Yes, there is a dramatic weight loss during the first week or so. Unfortunately it's mostly water, not fat, and is quickly regained later.

The diet industry is a very big business. But many diets just don't work or are downright harmful. Some appetite suppressants are habit forming.

Weight loss must be a slow process. So we want to coax the body to alter its hunger set point by feeding it the kinds of foods and on the schedule recommended in this system. This may take some time, maybe a few months.

As caloric intake drops, the margin of safety for essential nutrients becomes narrower. Everyone is different and caloric and nutrient requirements differ among people. So responses to changes in food intake are highly variable. A person who is greatly overweight should be undertake a personalized health, fitness and aging intervention program initially focusing on permanent weight loss, designed by a physician who really understands it.

**Processed Foods**

Many of us have an innate hereditary desire to eat sugary and fatty foods in order to store up the sugar and fat that were once scarce and therefore valuable. Although nutritious fruit tastes sweet, today unhealthy sweet and fatty foods today are available on every street corner and at a relatively low cost.

Today we take perfectly natural and good food and pulverize it, compress it, boil it in fat, then load it up with sugar and salt. And there are automated factories that produce gooey emulsions that go through nozzles and *splat* onto cardboard-like wafers or into plastic containers. Now that the wholesome ingredients are rendered almost totally devoid of the nutrients our body needs, and a lot of other stuff that will hurt us is added, we eat it and actually enjoy it. And here's the kicker -- processed foods cost more money than natural fruits and vegetables!! When it comes to food, our affluence may also be our downfall.

Companies that sell processed food are very good at knowing how to manufacture food with tastes that will sell, and how to keep their production costs low. They know the way to make foods "taste better" and sell more is to add more sugar and more salt. But natural foods are less expensive, likely because there is no cost to process them and because they don't have to be marketed. Don't be fooled.
Sure, like tobacco, it doesn't kill you immediately. But not only will processed foods kill you in the long run (partially because of the content, and partially because you're not taking in what the body needs), but processed foods reduce the quality of your life because your body and brain are not getting the nutrients to run effectively.

"Natural" Foods

Imagine the products that could be called "natural". Poison ivy typically (and naturally) grows at the edge of the field, forest, parking lot, or road, and only 1 nanogram (billionth of a gram) needed to cause rash. You wouldn't trust your face to a poison ivy skin crème, would you?

The phrases "natural", "all natural ingredients" and the like are questionable. If you read the list of ingredients you will often find lots of sugar and salt which are themselves quite natural. And because something is natural, such as natural herbs, does not mean it is necessarily safe.

There are no standards for what natural means -- you really don't know what you're getting. And "natural" doesn't mean pure or clean either. According to the cosmetic trade journal Drug and Cosmetic Industry, "all plants [including those used in cosmetics] can be heavily contaminated with bacteria, and pesticides and chemical fertilizers are widely used to improve crop yields."

Chew Your Food Well

Digestion begins with chewing. Inadequate chewing and eating on the run are major causes of poor nutrient absorption. Chewing is the first step in carbohydrate digestion and mixes enzymes with food. An enzyme causes food to break down into simpler structures that can then be absorbed by the intestines.

If your food isn't chewed well, the pancreas must take over later. And mouth enzymes are needed to activate intestinal enzymes. Undigested food particles leak out through the gut and the immune system treats it as an invading virus or bacteria, with a resulting food allergy.

This is exacerbated as time goes on, as aging results in a decreased production of hydrochloric acid and digestive enzyme secretion. Also try to not eat on the run, as a more relaxed body better secretes digestive juices and absorbs nutrients.

Omega-3 Fatty Acids and EPA

Sometimes while in my local market I imagine I'm the eskimo hunter named "Nanookie". Permafrost crunches beneath my boots as I walk, the cold north wind whips against my face, icicles dangle from my nose. With great stealth I approach the fish cooler. My heartbeat quickens. I crouch low, then faster than you can say "Let's rub noses like the eskimoses" I hurl my finely honed spear into the cooler and land a 12 pound Alaskan salmon fillet! Bystanders cheer! Clerks applaud my ever improving prowess! The meat dept. manager dials 911! I'm filled with arctic joy, secure in the knowledge that my arteries are clear because fish from cold water characteristically and uniquely contain significant quantities of long chain omega-3 fatty acids!

Natives of the Pacific Northwest, Greenland Eskimos and Japanese fishermen consume large amounts of cold water fish. As a result, they rarely develop coronary artery disease. It's the omega-3 fatty acids from fresh fish that contribute to this reduction in disease.
By the way, the skill and resourcefulness of the peoples of the Pacific Northwest are pretty awesome. The Chinook, for example, were master fishermen and exceptional canoeists. A single canoe and crew, using large nets of their own construction, could catch two tons of salmon on a single outgoing tide. They were so wealthy they could afford to devote two months each winter to spiritual and artistic pursuits.

Anyway, back to omega-3 fatty acids.

The term "Omega-3 Fatty Acid" is a biochemical description of the molecular structure. Fats were described in the background chapter. Each fatty acid molecule has a chain of carbon atoms, to which hydrogen atoms are bound. In fats, the ratio of carbon to hydrogen is somewhere around 1 to 1.

Regarding the acid part -- In chemistry there are several definitions of what comprises an acid, but basically it is an acid because of its hydrogen. But fatty acids are much weaker than, say, battery acid or stomach acid.

The "omega-3" designation identifies the precise chemical location of some of the unique structural features of the molecule.

All fatty acids are chains of carbon atoms with oxygen atoms hooked on at one end (the alpha end), and three hydrogen atoms hooked on at the other end (the omega end). Bonds are molecular connections. Fatty acids differ based on how many carbon atoms are strung together, and where there are double bonds (two molecular connections) between the carbon atoms instead of single bonds.

A double bond (two molecular connections), is located at the third carbon atom from the omega end.

Omega-3 fatty acids have the first double bond three carbon atoms away from the omega end.

Similarly, omega-6 molecules have the first double bond located on the 6th carbon from the end, and are termed omega-6 fatty acids or omega-6 polyunsaturates.

There are two kinds of omega-3s, those with a short chain length (18 carbon atoms or less) and those with a long chain length (20 carbon atoms or more). The difference is critical, since the body requires the long chain omega-3s, and doesn’t seem to have any particular direct use for the short chain versions. It is questionable whether the body converts the short chain version to the long chain version.

These are "essential" fatty acids. Essential fatty acids, like essential amino acids are essential in that they cannot be manufactured by the body, so they must be obtained through diet.

Eicosapentaenoic acid (EPA) is one kind of omega-3 fatty acid. Omega-3s are considered safe from lipid peroxidation (rancidness -- breaking down to form more free radicals).

EPA's action is to inhibit the negative effects of free radicals. EPAs particularly in the food and useful in preventing lipid peroxidation that is highly destructive to the brain and heart.

Arachidonic acid (AA) gets incorporated into your body's cell phospholipids. This is bad. EPA acts as a competitive inhibitor of AA. This means that the EPA binds to the cell before the AA gets into the cell.

Omega-3's lower the rate at which triglycerides are manufactured by the liver. They have antiinflammatory effects, and inhibit platelets from sticking together and from
adhering to the endothelium (inner lining of blood vessels, lymph channels and elsewhere). Their they lower blood pressure, and help repair the damage caused by lack of oxygen to body tissue.

Omega-3 supplements are to be avoided. Some are extracted from the livers of fish and contain large amounts of vitamins A and D, which can be toxic in large amounts. They are highly unstable and undergo rapid peroxidation when exposed to air during their preparation and while in the capsule.

Some fish oils are high in cholesterol, so people who are treating in the territory of high cholesterol should be monitored.

As previously mentioned, eat at least 1.5 oz. of fresh fish each day. Salmon is preferred because it is most rich in EPA.

**Farmed salmon does not have omega-3s.** And it has been recently discovered that unacceptable levels of PCB's and Dioxin contaminants get into farmed salmon. Someday this problem will be eliminated, but for the present, I recommend Wild-Type Salmon only.

Mackerel, herring, flounder or sole, catfish, tuna, sardines, cod and perch are also good.

The Food and Drug Administration has warned pregnant women to avoid certain types of dark meat fish, particularly shark, swordfish, king mackerel and tilefish because they contain unusually high concentrations of mercury. These are typically older fish so they’ve had more time to absorb the mercury. High levels of mercury may harm an unborn baby's developing nervous system. FDA is also advising nursing mothers and young children to avoid these fish as well. The FDA also says "there are many varieties that pose few health risks and many benefits, particularly for pregnant women." Surely these levels of mercury would be bad for anyone, not just unborn and nursing babies, so I avoid these kinds of fish.

Recently there are reports of excess mercury in swordfish, shark, tilefish, halibut, mackerel, sea bass, and tuna.

I talked with the clerk in the fish department at my local market this morning regarding the possibility of mercury in salmon and other kinds of fish. He said that he was aware of this problem in shark and swordfish, but not salmon. His salmon are farmed (farmed is no longer recommended due to contaminants -- only salmon grown in the wild are recommended) and come from Alaska, Washington, Chile, and all over the world. And "Atlantic" salmon is just a name and doesn't necessarily come from the Atlantic Ocean.

The reasons for shark, swordfish etc. is that they tend to be older fish have had more time to pick up the mercury. There are some 100+ year old rockfish being caught. You could probably take your temperature with one of them!

**Food Safety**

Stay out of the way of food traveling at a high rate of speed, and other forms of fast food. Ha! :o)

OK, enough yaks for a while. Here are the real tips on food safety: Wash your hands thoroughly with warm water before and after handling all foods, especially raw meats. Always wash fruits and vegetables before eating. Fresh meat, poultry and fish are best, but if frozen, thaw them in the refrigerator or microwave oven or under cold water -- never on a countertop. Wash your countertops after meat has come in contact with them, especially chicken. This would prevent the transfer salmonella infection and other kinds of food poisoning.
RDA, DRI and other Nutritional Recommendations

Currently, the Food and Nutrition Board of the National Academy of Sciences is evaluating and revising the Recommended (not required) Daily Allowances (RDAs). New recommendations, called Dietary Reference Intakes (DRIs), have been established for those nutrients that have undergone this review process.

The Dietary Reference Intakes (DRIs) are values that are quantitative estimates of nutrient intakes to be used for planning and assessing diets for healthy people. The DRI is include both recommended intakes intolerable upper intake levels. The DRI's are determined by the Institute of medicine, a private, nonprofit organization that provides health policy advice under government funding to the National Academy of Sciences.

Over the next few years, the DRI's will replace the RDAs. The DRI's represent a shift in emphasis from preventing deficiency to decreasing their risk of chronic disease through nutrition.

The DRIs are actually a set of four reference values: Estimated Average Requirements (EAR), Recommended Dietary Allowances (RDA), Adequate Intakes (AI), and Tolerable Upper Intake Levels, (UL) that have replaced the 1989 Recommended Dietary Allowances (RDAs).

The following USDA Food and Nutrition Information Center web site lists information on vitamins, minerals, macronutrients and other reports and information:

This one lists vitamins:

And here is a list of frequently asked questions and answers:
http://virtual.clemson.edu/groups/NIRC/Gen_info/pdf/rdadri.pdf

Fresh Foods Taste Better, Organic Food and Food Additives

The bottom line: fresh organic foods are not more nutritious, or safer, or better than other kinds of food. But they are better tasting, and growing them is a lot easier on the environment. For these reasons I have begun to do most of my shopping in stores offering certified organic.

The U.S. Department of Agriculture has put in place a set of national standards that food labeled "organic" must meet, whether it is grown in the United States or imported from other countries. Any farm, wild crop harvesting, or handling operation that wants to sell an agricultural product as organically produced must adhere to the national organic standards.

But -- it's a big question as to how the USDA verifies producers' claims.

The USDA definition of organic food: Organic food is produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. Organic meat, poultry, eggs, and dairy products come from animals that are given no antibiotics or growth hormones. Organic food is produced without using most conventional pesticides; fertilizers made with synthetic ingredients or sewage sludge; bioengineering; or ionizing radiation. Before a product can be labeled "organic," a Government-approved certifier inspects the farm where the food is grown to make sure the farmer is following all the rules necessary to meet...
USDA organic standards. Companies that handle or process organic food before it gets to your local supermarket or restaurant must be certified, too.

Under the rule, meat and dairy labeled organic must come from animals that are raised on organic grains or grasses, given access to the outdoors and have not been treated with antibiotics and growth hormones.


There are four labeling categories. For example, cereal with 100 percent organic ingredients can be labeled "100% organic" and carry the seal; cereal with 95-100 percent organic ingredients can be labeled "organic" and carry the seal; cereal made with at least 70 percent organic ingredients can say "made with organic (and list organic ingredients); and cereal with less than 70 percent organic ingredients. Products with less than 70 percent organic ingredients may list specific organically produced ingredients on the side panel of the package, but may not make any organic claims on the front of the package. Look for the name and address of the Government-approved certifier on all packaged products that contain at least 70 percent organic ingredients. See the following web page for the seal and examples.


Or call the National Organic Program at 202-720-3252, or write USDA-AMS-TM-NOP, Room 4008 S. Bldg., Ag Stop 0268, 1400 Independence, SW, Washington, DC 20250.

This page will tell you about the definition, standards and practices.


Regarding animals, the livestock standards apply to animals used for meat, milk, eggs, and other animal products represented as organically produced. It says:

Animals for slaughter must be raised under organic management from the last third of gestation, or no later than the second day of life for poultry. Producers are required to feed livestock agricultural feed products that are 100 percent organic, but may also provide allowed vitamin and mineral supplements. Producers may convert an entire, distinct dairy herd to organic production by providing 80 percent organically produced feed for 9 months, followed by 3 months of 100 percent organically produced feed. Organically raised animals may not be given hormones to promote growth, or antibiotics for any reason. Preventive management practices, including the use of vaccines, will be used to keep animals healthy. Producers are prohibited from withholding treatment from a sick or injured animal; however, animals treated with a prohibited medication may not be sold as organic. All organically raised animals must have access to the outdoors, including access to pasture for ruminants. They may be temporarily confined only for reasons of health, safety, the animal's stage of production, or to protect soil or water quality.

And here are some links to other sources of organic information provided by the USDA:


"Natural" does not mean the same thing as "organic". And because something is natural, such as natural herbs, does not mean it is necessarily safe.

Tomatoes grown on commercial farms are grown more for durability than taste. They resist disease and ship well.
A 1989 report to Congress from 14 scientific societies with total membership of more than 100,000 food scientists, microbiologists, toxicologists and veterinarians concluded that the major hazards in our food are not from additives and pesticide residues, but from disease causing microorganisms.

Food becomes spoiled because of the presence of disease causing microorganisms living in the food and breaking down its structure. Disease causing microorganisms can multiply in the time it takes to get the food from farm to market. These microorganisms produce toxins like fungi, bacteria, and other organisms that cause food poisoning. Salmonella poisoning and botulism are examples. Other microorganisms include bacteria, molds and viruses. So it stands to reason that we would have an inborn inclination toward fresh food.

A trusted friend once told me how he asked co-worker in health food store "What's the difference battalion organic and regular produce?" The produce man replied "Organic has less, not no, pesticides. If you use no pesticides the tree dies." Another one said that non-organic produce has pesticides, organic has worms.

We have learned that preservatives are not really as bad as once thought -- in fact, they can be good for you, as they preserve you!

Organic foods can maintain more disease causing organisms than foods that are not labeled organic. I have at times been disappointed by the quality of health food store produce, and have often found it starting to spoil. I've noticed the containers of cut pineapple at one health food chain are a lot more expensive in contain a lot more of the dense fibrous part of the pineapple than that found at a local supermarket.

Disagreement between conventional food industry "establishment" representatives and organic & health food industry representatives can be political and quite acrimonious. I listened to them go at it on a recent radio talk show. After all, there are huge amounts of money at stake. Critics of the health food industry fire volleys by pointing out the dangers of bacterial infection, such as E coli 0157:H7, present in animal manure used to fertilize organic produce. The health food people return fire by talking about the use of raw sewage as fertilizer. Cows that have dropped dead, often for unknown reasons have been ground up and fed to living cows! This practice of bovine cannibalism has since been banned.

Similarly, there is an ongoing debate regarding pesticides. Surely they would be toxic in high doses, but there is no evidence that pesticides cause bad health in the doses they are found in foods. Environmental groups, health advocates and the health food industry argue that most pesticides are dangerous and should be banned. On the other hand, in the United States pesticides are closely regulated, and when a hazard is demonstrated by scientific evidence the substance is banned. But this is often after it is proven to be dangerous.

There is a broad range of herbicides, fungicides, rodenticides, avicides, molluscicides. Bob Scowcroft of the Organic Farming Research Foundation, a nonprofit organization, says "We are using three times the chemicals as we were 40 years ago to kill the same pests." For protecting strawberries, methyl bromide is injected into the soil, then a tarp is placed over it. Monica Moore of the Pesticide Action Network of North America says "It kills everything from mammals to microbes. It's a complete biocide"

An eye-opening article in Newsweek Magazine written by Anne Underwood and Karen Springen reminds us that these practices may not be poisoning our food, but there is no question it is killing off wildlife, endangering farmworkers and degrading the soil and water that life depends on. Pesticides now kinn 67 million American birds each year. The Mississippi River dumps enough synthetic fertilizer in the Gulf of Mexico to maintain an 60-mile-wide "dead zone" too choked with algae to support fish. The soil erosion threatens
to turn much of the world's arable land into desert. The article quotes Fred Kirschenmann of the Leopold Center for Sustainable Agriculture: "At some point, the systems will start to break down."

By far, the most common food additives are salt, sugar, corn syrup and other sweeteners. Other potential contaminants include environmental pollutants like heavy metals, asbestos, PCBs, vinyl chloride and other industrial waste. Also, antibiotic residues, hormones and other substances may find their way into foods.

Recently there has been a great amount of concern over Mad Cow disease in Europe, accompanied by numerous beef recalls. These diseases are brain deteriorating, fatal, and result in horrendous physical and emotional consequences. They may take many years to manifest. It has been said that the United States, with less than ideal beef inspection procedures, is poised for a similar outbreak. Egad! What next? Mad chicken disease?

On a happy note, home grown vegetables are nutritious and delicious. And you could avoid the pesticides. It's easier than you might think, and it's fun.

**Vegetarianism**

There is no longevity advantage to being a vegetarian. It would be possible to have an antiaging diet with no meat, but would take much more careful planning to get the proper amounts and balances of amino acids. And there is a more narrow margin of error for some other nutritional deficiencies. Strict vegetarians may not be getting enough vitamin A in their diets if they're not careful about which vegetables they eat, suggests a National Institute of Medicine report. Vitamin A deficiency affects about 100 million children worldwide and causes night blindness, skin dryness and more severe complications. Deficiencies of iron and zinc, which are also plentiful in meat, are also to be considered. Vegetarians should also be careful to avoid deficiencies in iron, folic acid and vitamin B12.

Vegetarians exclude all or some animal products. There are many variations. A vegan diet consists of only foods of plant origin. Lacto-vegetarian consists of plant foods plus some or all dairy products. Lacto-ovovegetarian consists of plant foods, milk, dairy products and eggs. A semi or partial vegetarian doesn't eat red meat, but may eat chicken or fish with plant foods, dairy products, and eggs.

An extreme variation is the fruitarian, where any plant products except those parts of the plant that are cast off or dropped from the plant and that do not involve the destruction of the plant itself are avoided.

**Factory Farming and Animal Rights**

"The greatness of a nation and its moral progress can be judged by the way its animals are treated"

- Mahatma Gandhi

We may be torn between the need for protein and the awareness that farm animals are often jammed in confined cages, subjected to procedures such as debeaking, and often suffering painful deaths. This is generally a part of what's known as "factory farming". Eating animals who have had excessive antibiotics, as well have endured
stress and squalid conditions, is a not good for your health.

Here's what happens to a lot of animals:

http://www.factoryfarming.com/gallery.htm

Have you ever passed on eggs at 99 cents a dozen, in favor of "free range" at, say, $2.99 per dozen? What "free range" really means is this: The USDA requests that the animals be allowed outdoor access for at least five minutes a day. And the growers don't have to ensure the animal actually goes outside. There are third party certifications that help ensure the animal was raised with adequate space and without the use of hormones or unnecessary antibiotics (but I've never seen any labeling of this type). Certified organic would be most comprehensive choice.

Although we can sustain on a purely vegetable diet, for optimal existence we were created or developed to utilize protein from animal sources.

As previously discussed in the section on organic foods, this page will tell you about the definition, standards and practices of USDA National Organic Program regulations:

http://www.ams.usda.gov/nop/FactSheets/ProdHandE.html

Regarding animals, the livestock standards apply to animals used for meat, milk, eggs, and other animal products represented as organically produced. It says:

Animals for slaughter must be raised under organic management from the last third of gestation, or no later than the second day of life for poultry. Producers are required to feed livestock agricultural feed products that are 100 percent organic, but may also provide allowed vitamin and mineral supplements. Producers may convert an entire, distinct dairy herd to organic production by providing 80 percent organically produced feed for 9 months, followed by 3 months of 100 percent organically produced feed. Organically raised animals may not be given hormones to promote growth, or antibiotics for any reason. Preventive management practices, including the use of vaccines, will be used to keep animals healthy. Producers are prohibited from withholding treatment from a sick or injured animal; however, animals treated with a prohibited medication may not be sold as organic. All organically raised animals must have access to the outdoors, including access to pasture for ruminants. They may be temporarily confined only for reasons of health, safety, the animal's stage of production, or to protect soil or water quality.

One of the points is to maintain animal health without the use of drugs.

"Access to outdoors" may not include "access to pastures." Under this scenario, dairy cows on dirt feedlots would considered organic.

Robert Hadad, Director of Farming Systems Farm Animals & Sustainable Agriculture - The Humane Society of the United States offers the definition of access to the outdoors for organically raised poultry. He says it is well understood by organic farmers that this means a free-choice type of arrangement for the birds. If the birds are housed in a permanent structure, they have sufficient openings to venture outdoors as they wish. Chickens aren't that stupid. If the weather is bad, they might not want to go out. If the weather is decent for their comfort level, then they will go outdoors as often as they wish.

For a pastured system as used by Joel Salatin, who has been a huge family farm advocate, the pens he uses (and others have copied) is movable. The chickens have shelter but are also totally fenced in. the floor is open. The pens are moved daily to fresh pasture for the birds to scratch and peck as they wish. Food and water is also provided daily.
The issue of outdoor access is getting muddled because 1) the USDA definition of free-ranged is an actual label claim. The FSIS office of USDA does not get very specific with how long a time period constitutes being outdoors in a free range system. Obviously, the vagueness of the regulations favors large corporations who want label claims without actually doing what family farms do.

There is a fight going on with the National Organic Program concerning outdoor access for organic poultry. Industry is trying to use scare tactics to convince the NOP and USDA that having birds outdoors is a bad thing despite the official rule that requires outdoor access. Companies really want to cheat on this because they cannot afford to set up a system where they have 10,000 - 100,000 birds outdoors and managed properly. They also do not want 100% organic feed regulations either. All this will cost them money. They want the organic premium but with out the expense of the practice.

A brave coalition of agricultural and consumer advocacy groups are working to maintain the organic integrity of the regulations and actually make the rules stricter so that large companies can't cheat so easily.

What the deal is now is that the NOP is saying they interpret the regulations as saying that due to weather or supposed disease prevention that producers could keep their poultry indoors for some time period. This time period is not clarified. Also, the issues of disease is unfounded. There is no scientific studies that have shown poultry with outdoor access is any more likely to contract diseases than indoor birds. In fact the vast majority of disease outbreaks (Salmonella, Avian Influenza, and Campylobacter) have all been in the huge confinement poultry operations.

According to critics, producers sometimes look for loopholes in order to get a premium price for foods labeled organic. "Access to outdoors" may not include "access to pastures." Under this scenario, dairy cows on dirt feedlots would considered organic.

They also say there is no clear definition of what constitutes "pasture" is offered, nor does the USDA delineate exact space or spacing requirements for humane housing and outdoor access for poultry, pigs, cattle, and other animals. This proposed set of regulations, as currently written, actually allows for animal factories.

Other critics (mostly egg producers) comment that allowing chickens to roam free will result in outbreaks of salmonella enteritis and avian influenza, diseases that affect humans, as well as birds. They say letting chickens roam outdoors exposes them to rodents and predators, substantially increasing their chances of becoming sick and laying bad eggs. They also say that open access intended to create a natural environment, would instead create stress (which decreases egg production).

Dr. Michael Appleby is vice president of farm animals and sustainable agriculture for The Humane Society of the United States. During a National Organic Standards Board volunteer board meeting in 2002 he said, "We have helped to ensure that producers who want to call their poultry organic must allow them outdoors." He submitted written comments to the board, which were supplemented by direct testimony from Robert Hadad, director of farm systems for Humane Society. They outlined some humane, as well as practical reasons for outdoor access:

- To satisfy the birds' natural behavior patterns
- To provide adequate exercise area
- To strengthen bird health through reduction of stress and increased immunity
- To meet consumer expectations of organic livestock management

But opponents say just the opposite -- they argue that only CONFINEMENT of animals could be considered "organic" and "humane." They also criticize the standards' inconvenience and lack of guarantees for healthy poultry. North Carolina's state veterinarian, Dr. David Marshall said "While noble in its intent, this concept [outdoor access] is ill conceived and not conducive to the mass rearing of poultry for human consumption"

You can read all about it here:

http://www.hsus.org/ace/14057

Some controversy is generated as the USDA implements the National Organic Program. In Massachusetts, a Massachusetts Independent Certification (MIC) ruling was overturned. Late in 2002, Don Franczyk, certification coordinator for Massachusetts Independent Certification for the Northeast Organic Farming Association (NOFA) said "The NOP made an arbitrary interpretation on an important issue, without any public comment, and now that interpretation has the force of law. That's not how it is supposed to happen." An article in the December-January 2002-03 issue of the NOFA/Mass News states "But as it now stands, eggs and meat can be sold as organic even if the animals spend their lives essentially indoors. The certifier must accept the farmer's judgment; virtually any documentation will do to support when and how much access is granted." And "Prices for conventional eggs (influenced by huge operations with caged birds) are notoriously low, so the incentive is strong to label eggs as "organic" in order to get a price premium." Read all about it:

http://www.nofamass.org/programs/social/hen1202-103.html

I wasn't sure what to call animals who haven't been mistreated. Diane Hatz of the Grace Factory Farm Project has been very kind and suggests we not use the term "organic" because that entails a lot of other things. She suggests "sustainably-raised" or "sustainably-produced" food. (For meat, that's sustainably-raised". That means open range, no antibiotics, no hormones, humane conditions. To my thinking, "sustainably-raised" implies that it's better for the animals, good for you and me, as well as the environment.

The following are a few web sites with information. Please note that some of these pages may contain links to other pages with social or political content that I may or may not support:

http://www.factoryfarm.org/
http://www.hfa.org/
Excellent sub pages
http://www.factoryfarm.org/sustainable-solutions-poultry.html
http://www.factoryfarm.org/facts-ffintro.html
http://www.hfa.org/factory.html

Most important -- how to locate stores:
In the third selection box, select "Food Products -- Co-op/Stores -- " with your area: But be aware that a company claiming to be kind to animals may not necessarily be doing what they say, or they may change their policy. Personal visits to the farm would a good way to verify.
Some ethically-challenged farms let their chickens run cage-free for just five minutes a day!
http://www.greenpages.org/

Diane Hatz offers the following lists of places to buy -- see the heading "SUPERMARKETS" part way down.
http://www.iatp.org/foodsec/library/admin/uploadedfiles/Eat_Well_Eat_Antibiotic-Free_2.htm

Here's some information provided by Erica Liss of the Humane Farming Association (Erica was very thoughtful in providing information, which is much appreciated):

To try to find items that are produced with both consumer health and animal welfare in mind, we recommend that you go to your local health or natural food stores. You will find an extremely wide variety of meat substitutes and typically more information about all the products they carry. We also encourage our supporters to visit their larger, mainstream grocery chains and request that factory-farmed products be replaced with conscientious alternatives.

We would caution you to be careful in researching any products listed as "free range" and "humanely raised". We've had experiences in the past where members of ours have depended on lists claiming to be resources of such products only to find that so-called "humane" farms have changed their policies and practices by the time the list was published, leaving those holding it with inaccurate information.

In addition, even when animals are raised with promises of humane or drug-free treatment, there are no controls or oversight that would ensure that they were not dismembered while fully conscious once they arrived at the slaughterhouse.

Please also join HFA (www.hfa.org/member.html). It is through your support that we are able to keep on the pressure and protect farm animals. Any support, in any amount, makes a difference.

More info pages:
http://www.awionline.org/farm/
http://www.factoryfarming.com/index.htm
http://www.iatp.org/
http://www.animalfreedom.nl/english/
or http://www.animalfreedom.nl/ , then select your language (near the top left)

And it is said that factory farming harms the environment.
http://www.factoryfarm.org/reports-sustainability.html

Are we out to earn our wings? Maybe. Partial solutions:

1) Make the protein component of one or two of the "Real Food" meals each day a "complete vegetable protein", like rice & beans.
2) Buy only eggs laid by uncaged, undrugged hens. As a rule of thumb, look in natural food stores for fertile brown eggs that state "no antibiotics" on the carton. (but see Erica's comments above) Hens allowed a healthful diet, fresh air, and exercise don't need antibiotics to survive.

3) Tell your local restaurant owner that you won't eat veal there, inform him or her of the cruelty involved and that more customers are becoming appalled by it, and would appreciate it if he or she would remove it from the menu.

Here are a bunch of rice & beans recipes and books:

http://www.redbeansandrice.com/
http://www.angelfire.com/ny/veganfood/

The following blues band "Red Beans & Rice" surely "cooks", but is not a way to cook red beans and rice:
http://www.redbeans.com/

Egad -- I hope conscience doesn't set in regarding vegetable rights. Someday we'll have protein-rich vegetable and synthetic designer foods tailored to your exact needs at that particular time. Then a "farm" will be more like a petting zoo. Until then, it's either eat once living things or eat dirt.

Let's be kind to animals. I'm going for some beans along with a little rice now.

**Seaweed?**

Even the best of soils are somewhat depleted of nutrients. Seaweed may have a some trace minerals that are unavailable in foods that are grown on land -- but unfortunately today this is a very good source of heavy metal contamination.

**Soy**

For a while I was drinking 2 cups of soy milk, plus a variety of other soy foods like soy beans and tofu. Soy is one of the richest sources of plant estrogens. My estradiol (a form of estrogen, a female hormone) rose to 135 pg/mL -- the reference range for men is less than 55! This is not a good thing, due to the feminizing effects over time, among other reasons. So I discontinued all soy and on the next test it was back to 49.

Also, soy counters the effects of testosterone in men, thus increasing body fat, reducing libido, erectile function and sex drive, and causes emotional swings. The September 2001 issue of the Journal of Agricultural and Food Chemistry reports that too much soy could lead to kidney stones -- and they are painful.

Still, the American Heart Association (AHA) has given soy a blessing of for its cholesterol-lowering properties. Research on cholesterol reduction has shown improvements with 30 or more than grams of soy protein per day. Although it may have good effects for the cardiovascular system, this is not an example of a holistic approach.

Soy is a polyunsaturated fat, so it is easily oxidized (becomes rancid) and generates free radical damage. Large amounts of soy intake have been associated with cancer.
Plant estrogens can lengthen a woman's menstrual cycle by two or three days. Over the course of a lifetime soy can increase uterine and breast cancer risk. During menopause, with a woman's estrogen production is declining, soy may reduce hot flashes.

Soy contains isoflavones, which are molecules that mimic estrogen, a hormone that can increase a woman's risk of breast cancer. Genistein and daidzein are two of the isoflavones.

The thinking goes that by getting false estrogen women can avoid the potential harm caused by the real thing.

**Isoflavones act like drugs, so we should view them that way. Because of the estrogen-like content in soy, estrogen levels should be monitored in both women and men.**

And there may be some other negatives to excess soy that we don't yet know about.

Soy comes in many forms, and it is eaten by itself or used as a substitute for foods that are high in fat. Soy beans are boiled, and the soy is a component of tofu and soy milk. Soy comes in protein bars, but often contain excessive isoflavones (more than about 20-30 mg) and calories.

Populations of people who consume a soy-rich diet have documented reduced risks of some diseases. For example, Japanese and Chinese people have lower rates of heart disease and breast and prostate cancer that Americans. But soy, like nutritional supplements, can be overdone. Beware of soy pills and powders. Many of these powders contain as much as 600-1000 mg. Large amounts of soy intake have been associated with cancer. This is likely the result of free radical effects.

My hunch is that people taking a lot of lots of isoflavone supplements are also taking large amounts of other nutritional supplements (like I was) to their detriment.

Some experts recommend packing in as much soy as you can eat. And some researchers are also increasingly finding a role for estrogen in the brain, where on one hand it seems integral to nerve health. But others are more cautious. A preliminary study published by Dr. Lon White et al, a brain expert at the Pacific Health Research Institute in Honolulu in the April 2000 in the *Journal of the American College of Nutrition* found that people who eat tofu twice a week or more may double the risk of suffering cognitive deficits in old age, also likely the result of free radical effects. While preliminary, the report shows soy isn't the answer to every disease. The se researchers say chemicals in soy may interfere with the brain's ability to make and keep nerve connections, which in turn could lead to both functional and physical brain changes over time. But this finding is very preliminary and hasn't been replicated.

**Insulin**

Insulin is a protein hormone that is secreted into the blood in response to a rise in blood glucose or amino acids. Insulin does a number of things, but primarily, insulin binds to receptors on the cell's surface -- the cell then activates other receptors designed to absorb glucose. Cells cannot utilize glucose without insulin. So you need glucose to live -- but here comes the bad news: glucose causes oxidation damage within the body. So excess glucose is real bad thing.

Poor blood sugar and insulin control results in the chemical combination of glucose and proteins in blood and tissues to produce damage proteins AGEs (advanced glycosylated endproducts). As AGEs accumulate in your body they interfere with mitochondrial function, thereby producing more oxidative stress.
Insulin stability, i.e. the slow and steady release of smaller amounts of insulin is better than large surges. Too much insulin (that can be brought about by sugary calorie-rich foods) is a very bad thing. Insulin receptors become resistant to the stimulation of insulin over time, requiring much more insulin to make them work. So glucose is hanging around in the blood longer doing damage. By reducing the concentration of glucose in the blood, insulin reduces the long-term complications of diabetes, including damage to the blood vessels, eyes, kidneys, and nerves, and insulin insensitivity can be partially reduced.

Aging causes are relative and sensitivity to insulin, requiring greater levels of insulin production. Excess insulin production/released is a significant initiate of inflammation of blood vessel lining. It is an independent cardiovascular and stroke risk factor. It may be the underlying cause for atherosclerotic plaque formation. The precision, scientifically designed nutrition, exercise, nutritional supplement and other components of this system help reduce and prevent this.

**Fiber**

Let's talk about something good for a while: FIBER! Most people think of oat bran when they hear of fiber. Dietary fiber, the kind found in plant foods, is of greater physiological importance than crude fiber. This kind of fiber is found in whole grains, legumes fruits and vegetables. Vegetable fiber from vegetables like broccoli, brussels sprouts, cabbage and cauliflower is highly beneficial. A good definition of fiber is anything that passes through our intestines undigested. These are typically undigested complex carbohydrates.

There are five different types of fiber, from soluble to insoluble. Each has its own characteristics and effect on the body.

Fiber does more than just scrape our intestines. Foods containing water-insoluble fiber bind with bile salts, thereby interfering with bile reabsorption and lowering cholesterol. Fiber modifies intestinal bacteria, and promotes weight loss. Byproducts of fiber strengthen the lining of the intestine. Some of them are short-chain fatty acids (acids originating from hydrocarbons) and are better sources of energy than glucose. People with a diet rich in fiber feel full, so they tend to eat less voluntarily and weight loss occurs.

Pectin and guar gels from oats, beans and fruits appear to alter the structure of the intestinal villi, thereby increasing pancreatic enzyme activity to help in the digestion of fats and vitamin B12 metabolism. And they lower cholesterol (par at particularly LDL) and serum glucose, thereby reducing your insulin requirements.

Start off with lower amounts of fiberous foods, and increase over the course of a few weeks. OK, so high fiber diets can have a few side effects including sensations of abdominal fullness, increased flatulence, mild diarrhea, or even temporary constipation. These are temporary and would take anywhere from a day or two to a few weeks to subside. However, it may take as long as six months to adjust to high-fiber diet.

High fiber diets of whole grains, form irreversible bonds with minerals, interfering with mineral absorption throughout the intestinal tract. Essential minerals like calcium, copper, iron, magnesium, phosphorus, and zinc have increased losses with high-fiber diets. This is true to a lesser extent with other kinds of fiber. Minerals such as above should be taken one hour before or three hours after ingesting in soluble fibers to reduce the risk of losing these minerals through fiber-mineral complexes.

**Sodium (Sodium Chloride, or Salt)**
A marketing consultant once told me there's a saying in the snack food industry: "To make snack food taste better, just add more sugar or salt."

Sodium plays an essential role in the regulation of fluids and blood pressure. It is chiefly obtained in sodium chloride, or common salt. Also, baked goods contain sodium as the bi-carbonate.

Although sodium is necessary in the diet. The National High Blood Pressure Education Programs (from the National Institute of Health's National Heart, Lung and Blood Institute) recommends a daily intake for everyone of no more than 2,400 mg of sodium (the amount in 1-1/8 teaspoons of salt), and the American Heart Association's recommendation for the general public is no more than 3,000 mg. The average amount consumed by Americans is 4,000 mgs. If no salt were added to food during processing or cooking, there would still be an adequate amount of sodium in the diet.

Other minerals, such as calcium, magnesium and potassium, also play a role in blood pressure regulation.

Many studies in different populations have shown that a high sodium intake is associated with higher blood pressure. Most research suggests that many people at risk for high blood pressure can reduce their chances of developing the condition by using less salt or sodium. However, some other factors may interact with sodium to affect blood pressure.

Sodium and salt are mainly found in processed and prepared foods. Some people add salt and salty sauces (like soy sauce) to their food, but most dietary salt comes from foods to which salt has already been added during processing or preparation.

Take note of the sodium content of your condiments, particularly soy sauce, meat tenderizer, steak sauce, salsa and catsup. Try using alternate seasonings, and a salt shaker with smaller holes.

People aren't born with a taste for salt, it's acquired. And it's a lot like sugar -- getting used to using less salt results in a greater sensitivity in the taste buds. So a reduction in your intake of salt will result in a greater enjoyment of very small amounts.

**Caffeine -- Coffee, Tea, Cocoa, Nodozo etc.**

Some research shows that a cup or two of coffee a day can be good for you.

Caffeine, found in coffee, tea, colas, chocolate and cocoa is a drug. Caffeine is the naturally occurring toxicant methylxanthine (xanthine, for short). Related substances found in tea and cocoa are called theophylline and theobromine. Individual responses to caffeine vary, but people seem to fall into two groups. For many people, small amounts increase alertness and larger amounts result in nervousness.

Caffeine inhibits the breakdown of cyclic AMP and GMP (nucleotides that carry signals from the cell surface to proteins within the cell). Normally, AMP and GMP are rapidly broken down. They control metabolic processes in the brain, nerves, heart, arteries, kidneys, stomach and intestines.

More than two cups of coffee significantly affects the levels of total cholesterol, triglycerides, and blood levels of epinephrine rise 147%.

Coffee drinking has been associated with increased serum cholesterol levels in some, but not all, studies.
Coffee affects your hormones which in turn can affect your mood. It alters insulin response, and makes the blood glucose levels more unstable for a few hours. Some people report increased desire for carbohydrates later because blood sugar decreases.

There is some evidence it may reduce the risk of getting Alzheimer's disease.

Caffeine stimulates the heart muscle and dilates coronary arteries. In contrast to their dilating effect on other blood vessels, xanthines constrict the blood vessels of the brain, reducing cerebral blood flow — that’s why they relieve some types of headaches. Caffeine also stimulates gastric acid and other gastric secretions. It tans your intestines. What could be worse? It alters moods, sleep patterns, behavior, cognition, psychomotor coordination and the quality of sleep.

All xanthines act on the kidney to increase urination, which limits their usefulness in fulfilling the body’s fluid needs. So all that coffee doesn’t count as water.

Here’s the good news: caffeine can improve athletic endurance!

More bad news: People suffer from caffeine withdrawal headaches after about 12 to 18 hours, and these caffeine withdrawal headaches may persist for several weeks.

More good news for tea drinkers: Green tea contains polyphenols, alleged to do a host of wonderful things, like prevent cancer, protect the heart from atherosclerosis, improve HDL/LDL ratios, exhibit antioxidant properties, decrease hypertension, is an antibacterial for cholera and typhus, and is antiviral for influenza. But wait, there’s more: It is alleged to decrease tooth decay. Green tea does contain caffeine, but it is reported to not cause people to become as jittery as coffee.

Researchers found that drinking 350mg of caffeine can cause lapses in concentration and increased stress, according to a survey sponsored by Volvic mineral water. This may be partly to blame for office workers' poor performance. The average cup of coffee contains about 100mg of caffeine. Of 1,000 office workers surveyed, 76% said they drank tea, coffee or caffeinated cola more than three times during the working day, with one in 20 consuming more than 10 drinks. Stress specialist Dr David Lewis, who analyzed the research for Volvic, is calling for traditional morning and afternoon breaks to be scrapped. He said: "Our clinical research found that a high caffeine intake (more than 350mg during the working day) acts as a powerful diuretic and causes people to visit the toilet more frequently, which can lead to performance-zapping dehydration. "This, coupled with the powerful stimulating effects of caffeine, increases stress and causes failures in concentration." Sarah Schenker, a dietician for the British Nutrition Foundation, said there was nothing wrong with people drinking three or four cups of coffee a day - provided that they also drank water or other decaffeinated drinks to compensate. She said: "If you only drink caffeinated drinks then you will become mildly dehydrated. It has been shown that just 2% dehydration does affect concentration, and also makes you irritable."

Having devoted all this ink to the subject, you might think I’m down on the bean. Well, here's a reversal -- A new study of 8,004 Japanese-American men in Hawaii suggests that coffee may prevent Parkinson's disease. Researchers said the benefits were probably linked to caffeine, and they say apparently the more, the better. They suggested some theories about how it might work.

But some people tend to just become more alert, and others become more anxious when under the Starbucks spell [??? Can I say that?]. The anxiety prone people display increased irritability and agitation, and insomnia, and in more extreme cases, tremor, palpitation and nausea.
Personally, I have found that a little coffee (about 6 oz.) makes me perky, and a lot makes me jumpy. Most hardcore coffeeholics would do a lot better, and feel better, on less. It’s one of my few vices these days, although I have cut down from about 3 to 6 cups per day to maybe 1-1/2, and often substitute green tea. So all things in moderation – including caffeine.

**Alcoholic Beverages**

The alcohol equivalent of one to two glasses of wine each day have may be beneficial to one’s heart. Red is preferred to white. Of course, more alcohol does not mean even longer life. Studies show drinking more than one or two drinks per day can raise blood pressure, and can cause fetal alcohol syndrome, stroke, irregular heartbeat and sudden death.

All this doesn’t necessarily mean that if a tea totaler starts drinking, that they will live longer. It just may mean that there is something else that results in an inclination to live long as well as have a drink. Correlation does not necessarily mean a causal relationship. On the other hand, the relaxation and stress reduction can be beneficial.

The publication Wine Spectator is pleased to report that Danish researchers have found wine drinkers to have a lower risk of death from heart disease and cancer than people who consume only beer and spirits. Wine consumption appeared to be related to a reduction in death from both coronary heart disease and cancer, wrote the researchers, who theorized that "wine may contain one or several substances that add to the beneficial effect of intake of a small amount of ethanol."

**Needless to say, but I'll to say it anyway:**

Don’t drink and drive – or operate heavy machinery, or drink and do anything else that requires your full concentration and mental faculties. What’s more, if you start making speeches when you're drunk you'll make the best speech you'll ever regret!

**Caloric Restriction**

Caloric restriction (CR) is a reduction of calories in a diet, while maintaining a very high nutritional value in the food that is consumed. It is often called undernutrition without malnutrition. At this time, it is the only proven life extension method -- in laboratory animals anyway. It has been shown to extend the lives of a wide range of animals, from worms to fruit flies to mice, and probably monkeys. These effects are dramatic if initiated early (30 to 40 percent if initiated in early adulthood) and have significant effects even if implemented by middle-age.

First we'll talk about the experimental results in laboratory animals. If you're not a laboratory animal, you may be interested in the section on humans.

Most of the CR research has been done on animals, such as nemotodes, fruit flies and rats, and research is currently being conducted on monkeys. CR animals have a significant reduction in the ailments of aging, such as cardiovascular disease, diabetes and cancer. Rats continued to master mazes long after rats on a typical diet stopped learning. But this effect has often not been the case in monkeys. Also, studies suggest that CR results in a reduced ability to withstand stress, such as injury, infection or exposure to extreme temperatures, as well as increased incidence of osteoporosis.

One likely explanation for caloric restriction's role in the prevention of aging is that lowered caloric intake results in lowered metabolic rate, and therefore a lowered rate of oxygen consumption and damage due to oxidative stress. Metabolism is the process by
which foods are transformed into basic elements which can be utilized by the body for energy or growth. Species with low metabolisms tend to live longer, and vice versa. The process of metabolism generates free radicals, and metabolism determines intracellular enzymatic activity. So less free radicals are generated, and they are better disposed of. Glucose causes oxidation within the body, and caloric restriction forces the body to use glucose more efficiently.

It has been theorized that the reason caloric restriction works in rodents is because it lowers their body's temperature set point, resulting in less free radical production. But we humans maintain our temperature.

Recent evidence shows that CR increases the available amounts of the substance called nicotinamide adenine dinucleotide (NAD), which plays an important role in cellular energy production through the breakdown of glucose. Abundant NAD increases the effectiveness of the protein Sir2p, which prevents, or "silences" the expression of certain genes that are believed to be responsible for DNA damage. In an article in Science magazine Dr. Leonard Guarente and associates have identified a cellular metabolic pathway underlying this. This pathway is a suitable target for a new drug to mimic the effects of caloric restriction.

Some of the most exciting research to date has been performed by Dr. Richard Weindruch and Dr. Tomas Prolla of the University of Wisconsin. Genetic analysis of caloric restricted mice has shown that their DNA remains in a more youthful condition. And although muscle and organ mass is decreased, the mice remain active, and maintain brain mass until later years. The incidences of degenerative diseases decrease. The effects on humans appear to be remarkably similar in many respects. And have demonstrated results like lowered leukocytes, uric acid and LDL cholesterol, and higher HDL cholesterol with caloric restriction. And it is effective even is begun in mid-life. Caloric restriction has also been shown to improve physiological measures of health, like basal glucose and insulin sensitivity in monkeys.

**Great! But What About Us Humans**

But aggressive CR has not been proven to extend the lifespan of humans. Not that many people have been practicing aggressive caloric restriction to have the data necessary to prove its effectiveness and safety in humans.

Most of the research on food restriction on humans is related to obesity and weight loss. In this group caloric restriction has been shown to lower blood pressure, produce the level of blood lipids, increased the ratio of beneficial HDL cholesterol, improve insulin responds in the control of blood glucose level and diabetics, decrease frequency of angina (pain in the chest, sometimes radiating to the left arm, caused by a spasm of the coronary artery of the heart), and claudication (cramp-like pains in the legs due to insufficient arterial blood supply to the muscles seen in association with hardening of the arteries of the legs). It reduced abnormalities of cardiac rhythm revealed by electroencephalogram. It also improved memory, alertness, and other complex mental functions, as well as retarding the onset of mental decline.

The research in animals and obese humans offers strong arguments that an ongoing low-calorie diet will improve health and extend the life span. We have certainly seen the detrimental effects of overeating.

There are problems when applying the results of animal research to humans. One major consideration is that we just don't know the long-term effects of caloric restriction on humans -- particularly upon the brain and mental function.
Aggressive caloric restriction for a human is something in the neighborhood of 1300-1800 calories per day. The irony is that many people, practicing poor dietary habits, are getting less nutrition of a CR program, but with a whole lot more sugar and fat!

A typical caloric restricted intake for a 150 pound person would be about 1400 calories per day. This is very difficult for most people. However, with the right motivation and by practicing methods like those in the Behavior Modification and Motivation section, and self-hypnosis and neurolinguistic programming, it could be much easier. When testing a diet that was around 1900 calories, I actually experienced a good feeling of reassurance from the empty, kind of hungry feeling.

The mice on caloric restricted diets not only become very mean, but they often kill and eat each other. Videos of the mice show them to be as active as young mice, long into the evening. But I don't know, maybe they're just searching their cages for a morsel of food. And maybe it's my imagination, but I thought I heard one of them say "Hey! Ya got any food? I'm hungry here! Just a scrap of rat chow or some lettuce? Anything will do."

There is a narrow margin of error in being assured of proper nutrition when drastically reducing food intake. Obviously, people who eat so little become very thin. Different people have different caloric needs, and nutritional supplementation is a given. A human must restrict calories slowly, and will absolutely need qualified medical supervision.

There's uncertainty about the effects CR might have on osteoporosis in later years. This is particularly important for women, as well as the fact that it is entirely inappropriate during pregnancy.

Caloric restricted mice maintained brain mass until later years. But people are not mice. Our brains and nervous systems are a great deal more complex than those of mice, giving rise to things like language, higher judgment, creativity and much much more. Convincing evidence that humans will not lose brain tissue and neurological and other function with a serious caloric restricted diet does not yet exist.

And everyone's different. We each have a different genetic makeup, and a CR diet that works for one person may be disastrous for another.

I personally speak from the experience of once having blindly followed a very aggressive program based upon incomplete evidence and doing myself a lot of harm. The system outlined in this manual is a reduced caloric restriction program, but with important exercise, nutrient and other components that are in balance with its nutritional component. Your exercise would need to be reduced along with the reduced calories. But it is possibly your mental abilities would also be reduced for you.

Still, some people practicing aggressive caloric restriction say that it's not all that bad once you get used to it. It has even been described as fulfilling, and some medical measurements have been described as "phenomenal".

Looking up the keywords "caloric restriction" in a web search engine (I use www.google.com and the multi-engine system at www.dogpile.com) will reveal a lot of papers, resources and "how to" discussions.

At around 2250 calories per day, the nutrition system outlined in this manual is a modified caloric restriction program, and is balanced with the exercise, nutritional supplementation and quality of life issues.

Although I don’t recommend CR just yet, I leave it to you whether to really take the plunge and severely restrict calories. I would hope to compare notes in with you to about a hundred years.
By the way, it is difficult to tell whether the CR monkeys are happy.

**Healthy Eating at Restaurants**

This is a tough one, as it can be difficult ordering healthful foods at restaurants. Most restaurant food has a lot of hidden fats. Polyunsaturated fats are cheap, and people seem to like the taste, so they find their way into restaurant foods. No, fat doesn't really "find its way" anywhere, they are placed there. Chicken is one of our favorite protein foods, but restaurant chickens, particularly those from fast-food restaurants, are often fatty birds.

Pressed meat contains various fillers, byproducts, fat, and I suspect, the beaks and talons. I can't tell you how many times I asked the counter person at a sandwich shop whether the turkey breast was real or pressed meat, and was told it was definitely real turkey breast -- only to find that it was pressed meat with the sandwich came.

Here lowdown on some typical restaurant items:

- Caesar Salad -- 38 grams of fat, 505 calories *Ach!*
- Pasta Salad -- 28 grams fat, 450 calories *Ohmygosh!*
  (not enough protein in the above salads for a meal, maybe 0-10 grams depending on how much meat, if any, is included)
- Cappuccino -- 9 grams fat, 160 calories *Egad!*
- Mayonnaise 11 grams of fat and 100 calories per tablespoon, and thousand island salad dressing 5-6 grams fat and around 50 calories per tablespoon. *Oink!*
  So specifying no mayo or salad dressing will go long way to reduce the unhealthiness of your food.
- The "Big Mac" -- 32 grams fat, 570 calories. But at least you're getting 26 grams of protein. *McZowee!*
- Chicken or other meat pot pies, fast food taco salad and tuna sandwiches are more of the kinds of fat-laden foods to be greeted with an "*Ugh!*" and crossed off your list.

Precision nutrition must be ongoing. After being on this system a couple of months and experiencing the benefits, particularly more energy and clarity of mind, I got disorganized and lazy. A real backslider. I started thinking it would be just OK have a few yucky ice cream sundaes each week as well as a few junk food treats every day, fall back into a work life of great stress, and skip working out and still feel fully energized and alive. And I stopped drinking enough water. WRONG! It doesn’t work that way.

I also wasn’t feeling as fulfilled or as happy as at first when closely adhering to the system. So I went back and took a look at the details that had brought these negative changes. After 3 times through this routine I FINALLY GOT IT! And like me, you will figure out that remaining disorganized in your eating habits, not taking the time to prepare or take the right kinds of foods to work with you, just eating whatever, and whenever, JUST ISN'T WORTH IT! You'll get the results you want if you keep it up!

**Now Take Some Action!**

Expect to just lose your interest in harmful "foods". And when that happens, you'll know you've arrived.

Now on to the next part for some behavior modification and motivation . . .
Chapter 4 -- Behavior Modification and Motivation

"Motivation is what gets you started. Habit is what keeps you going."

Unknown

The one overriding requirement for using these is that you have to want to. Still, there are some methods you can use to implement this system and turn the application of it into habit. As evidenced by your reading up to this point, you're already rolling. With motivation, one could fly through the rest of the pages, implementing the system and on to youthful, joyous living for years, decades, maybe even centuries.

I placed this section here because you may need some methods to make the nutritional guidelines, as well as the other ideas that follow, a little easier.

And even the most motivated of us could use a boost sometime -- myself included. The good news is that you can do a lot to more easily make this system a habit. Why? So that you will take action, and follow this system for 6 weeks. After that, when you experience the youthful and joyous living, you are sure to continue.

It's been said that it takes 21 days to change a habit. But it may take as long as several months or longer for you to change your lifelong eating habits. Every day you exercise is a big win. Each time you just say no to junk food is a score. It all adds up, at the end the results are lifelong, positive changes. The payoff will be that you will get what your want out of life.

You must be committed and follow this system even when it is inconvenient. You are in control -- you can influence the events in your life. Maintain an attitude of curiosity and responsibility. Provoke questions, explore, take responsibility, maintain control and learn new attitudes, and look at things as an interesting challenge. And seek to transform your life.

Medical Details -- and Follow Your Doctor's Guidance

Review the "friendly" disclaimer at the start of the manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual.

If You Have a Medical Condition

As with nutrition, if you have a medical condition, that changes things. The information below would need to be modified to meet your special needs.

Some Behavior Modification and Motivation Methods

With the methods that follow will help you operate your brain. Although we have what I’ll call our “higher self”, some parts of the brain act pretty much automatically. Some are in the form of reflexes, and others are learned ways of behaving. There are ways you can operate these automatic systems, much like flipping a light switch or driving a car.

What do you want? A good first step is to decide exactly what it is that you want. Write down your goals and include timeframes.

Once an hour, every hour Whatever it is you want in life, write it down on a piece of paper once each hour. Then look at it, and read what you've read. It doesn't have to be
legible, a scrawl will do. You'll impress your brain within instruction in three ways -- visually (by reading), through sound (by saying, even if it is to yourself) and through motion (by writing). If there’s just no pen and paper around, write it in the air with your finger. If someone asks what the heck you're doing, just tell them you're conducting the Philharmonic next Saturday and need to rehearse.

Make your statements in the positive, and complete with an action statement. For example: “The desire for unhealthy foods is gone gone gone. It is replaced with only the desire for healthful and nourishing low-calorie and low-fat foods according to this system.”

Do not confuse your mind with negatives or double negatives, like “I don’t like unhealthy foods”.

For whatever reason you undertake this system, whether to make the fat go away, or to have an improved and younger appearance, or to make your energy rebound, the result will be yours.

And remember, you can format this to work with anything you want. Scott Adams, the artist who draws the "Dilbert" cartoons used this method by writing down "Dilbert will become the most widely read cartoon in America." Sure enough, slowly at first then ever increasing, his readership widened and he accomplished exactly that.

Obviously, if you are driving a car, in a meeting, or flying an airplane, it'll wait -- but hopefully not for too long. If not, then please do this right now.

There is a mysterious connection between impressing in your brain in this way, and what comes into (or exits from) you life. Perhaps that connection is mystical or spiritual. Or maybe your mind is working in the background and you just put plans into action or become more tuned in to acting on the opportunities that are continually coming our way, often without our noticing.

You may be amazed at how this works! The brain is smart. It'll find a way to make it happen.

After the change in habit has been put into place, you may want to only do this a few times a day or once in the morning instead of every hour. But it's one of those things it's easy to forget -- so don't forget.

**Meditate On How Great Your Life Can Be**

You'll learn more about meditation in a later chapter. But for the purpose of motivation, as you meditate envision your behaviors and body changing. Old habits float or drain away, while the golden light of your new habits fill and warm you. You see your body changing -- becoming leaner and stronger, while your mind becomes ever clearer and filled with joy.

**Ask Yourself Enabling and Empowering Questions**

Asking yourself enabling and empowering questions will redirect your mental focus and state of mind, thereby changing how you feel and the inner workings of your brain and mind.

What you ask depends on your unique goals and needs. The questions are usually in the format "What would life be like if . . ." or "How would I feel if . . .", or "What will I do when . . . ?" and so forth.

For example, if you want to make life-changing improvements but are having difficulty getting started (when you experience the great positive effects and it becomes a habit it will
be really easy), ask yourself "How will I feel when I am eating right, exercising properly, and thinking clearly?"

If you have been living in stress, you might ask yourself "What would life be like if I were totally stress-free?" Or if you have a fear of heights, you might ask "What things will I do when I am free of this feat of heights and be comfortable and joyful in high places?"

Your mind will find ways to turn your questions into reality.

**Big Bang**

Envision what you would like to change on your mental screen. This could be your self as overweight, or slothing on the couch like a couch potato, or not being able to face a particular situation, anything you just don't want. Make it as vivid as possible -- see the colors, hear the sounds, smell the smells, imagine how it feels. Now imagine how you would like things to be in miniature at a corner of your mental screen. Imagine the miniature growing, swirling, making a sound like a jet engine and swooping up and around and smashing into the larger vision that you no longer desire. Imagine a big swooshing sound as it moves to demolish the thing you want changed with a big bang. Make new image as vivid as the first one was.

The brain/mind knows what to do to make this happen. It's working in the background to change habits and become receptive to opportunities, and will do what it takes to bring the change you want into reality.

After you find the change coming about you can do the Big Bang less frequently.

**Double Ben Franklin**

What's better than a hundred dollar bill? Two hundred dollar bills. Although this ain't that, it could help you make a whole lot of hundred dollar bills. Ben Franklin is attributed with coming up with the method of making a list of "reasons for" and "reasons against" a certain course of action in order to bring the light important information and help make a decision. (Or when comparing two possible courses of action you can assign a value to each reason and add up the totals and compare in order to find which one would be better).

This carries it a step further in order to motivate and change behavior. Take a piece of paper. On the top left, write a brief heading describing the way things are not or what you are doing now. It could be something like "Eating Unhealthy Foods" or "No Exercise" or the like. Near the middle of the page on the left write another heading, something like "Healthful Eating" or "Exercise". Under each of these headings make two columns with the sub headings "What I'm Gaining" and "What I'm Losing". Now fill each of your four columns. You should be a write down at least 3 things in each column. Perhaps a few more ice cream sundaes and nights “relaxing” in front of the TV (I don’t know about you, but I don’t feel all that refreshed after an evening of vegging out in front of the tube). Take your time, and find a whole lot of reasons. You will accomplish two things with this: 1) You will find lots of reasons for making a positive change, and 2) you will impress these reasons upon your mind. Review this several times a day. The brain is smart. It'll make it happen.

Go back and read the very start of this manual if you need a few ideas. Come on, work with me on this. ]
Puhleez, just do the "Once an Hour", "Big Bang" [???and"Double Ben Franklin"] now. Write these things down on a piece of paper right and do the exercise now.

Go ahead, I'll wait . . .

OK. Although sometimes it takes a while for it to sink in, you will soon begin experiencing a thing called more MOTIVATION!

By your own choice and design, you are making it much easier to follow this system for the 6 weeks I talked about on the first page. You're really starting to pull your own strings now.

**Snap Goes the Rubber Band (OW!)**

Put the rubber band of around your wrist, and give yourself a stingy little snap. Hertz, donut? (hurts, don't it?) :0) Now do this when you start to think about unhealthy food, when you begin to flop on the couch while foregoing your exercise, or when starting to do something by habit that needs to be changed. This will rewire your brain to connect the unhealthy effects of "the bad thing" with something irritating and help you break the habit.

Just one more thing – right now sit or stand up straight and take a deep breath. Now move your body with a sense of energy, and the way you would when you are feeling a sense of strength and control. This will energize you to take action.

**Meditate, Affirm and "Program" Yourself** Go to a place where you will not be disturbed, deeply relax and breathe deep from the diaphragm. Just repeat the positive action statements like in the "Once an Hour" section above.

**Expect the Best** When you expect a positive outcome, motivation increases. Expect to get tremendous rewards from this system. It's true.

**Trying TOO Hard?** Some goals are driven by the "ego". You'll learn more about your ego and how it can undermine your true happiness in chapter 6. Regarding changes, sometimes the harder you fight it, the more power you give the ego and the more difficult it becomes. So sometimes the best course of action can be to just relax and not take it too seriously.

**Find Some of Your Own** Go to a book store or library and find a few more that work just right for you.

**Want it to happen -- expect it to happen --**

**and watch it happen.**
Chapter 5 -- Exercise

There is no wealth but life

John Ruskin, 'Unto This Last'

Vigorous exercise can help keep you younger longer -- and help prevent disease.

Here's the short list of what the exercise system that follows can do for you: Increase lean body mass, promote cardiovascular fitness. It stimulates the repair and growth of your body, builds muscle tissue, increases bone density, increases the hormone production and balances hormones (increases HGH, testosterone, estrogen, and reduces cortisol). As previously discussed, a hormone is a kind of chemical produced by a gland that is secreted into the bloodstream and controls the function of distant cells or organs. Proper hormone levels help reduce fat and build muscle and other lean body mass, gives you energy, builds your immune system, stimulates the repair of your body, reduces cholesterol and even makes you sexier.

The more lean body mass (muscle) we have, the greater the number of calories we will burn throughout the day. We can improve our body composition through exercise (both resistance training and aerobic exercise), which can dramatically increase our daily energy expenditure and burn off excess energy stores (fat). This happens while we are exercising and, if the exercise is intense, as the day goes on we continue to burn extra calories.

Exercise will replenish and restore vascular endothelium and raises endorphin levels (endorphins are those brain chemicals that make you happy). It increases your cells' insulin sensitivity, raises basal metabolic rate, increases stress adaptogens, improves respiratory function, enhances immune responses. It increases neuromuscular coordination and promotes enhanced mental function, reduces cholesterol & triglycerides, increases HDL 2b (reverse cholesterol transfer). It'll even make you sexier (did I say that yet?).

When combined with practicing good posture, well-conditioned muscles will bring your body into proper alignment thereby preventing joint grinding and wear. Strong muscles and flexibility also result in less load on the joints. The increased blood pressure and circulation resulting from exercise will stimulate the growth of micro-capillaries throughout your body, resulting in the better nutrient to flow to your cells and better waste elimination. Exercise improves glucose metabolism and insulin sensitivity to assure that your cells have the proper amounts of fuel at the right times, and reduces cholesterol thereby reducing the risk of heart disease and stroke. It can even improve your mood and stimulate the growth of brain cells in certain parts of your brain! And exercise lowers your appetite set point -- so you'll be less hungry. Did I mention that exercise will even make you sexier?

Of course exercise is good for people of all ages. But according to an Ohio University study men over 60 can become 80 percent stronger if they start doing high-intensity weight training. And seniors can gain strength at the same rate as men in their 20s. The subjects were all healthy but had never weight trained before also showed marked improvements in their aerobic capacity.

Robert Staron, an associate professor of anatomy at the university's College of Osteopathic Medicine explains: "Elderly individuals are very capable of responding to exercise and maintaining strength," says Staron, who co-authored the study that appeared in the Journal of Gerontology.
Mitochondria were discussed in the "Why We Age" section. They are the energy power plants of your body. There is recent evidence that the demand exercise places upon the mitochondria causes them to multiply. The result is more energy production, hence, feeling better and more energetic, and even a clearer mind.

Studies with isolated mitochondria have indicated that during normal cellular respiration (which differs from "breathing" respiration) there is leakage of reactive oxygen species from the electron transport chain, resulting in the production of superoxide, hydrogen peroxide, and the formation of tyrosyl radicals.

There are downsides to just about everything, even breathing which causes the release of free radicals. Vigorous exercise dramatically increases cardiac output to supply skeletal and cardiac muscle mitochondria with increased oxygen. It has been determined that the increase in oxygen flow in cardiac muscle is 10-fold, and the increase in skeletal mitochondria is approximately 100-fold. This possibly overwhelms antioxidant defenses. Therefore, the increase in mitochondrial oxidative metabolism induced by exercise may result in an increase in oxidative stress and increase protein oxidation. So taking some antioxidants within a couple of hours before exercise, and some Acetyl L-Carnitine just before exercise is important because it is believed that extracellular saturation of vitamin dependent antioxidant enzyme systems is vital to protect cellular walls from oxidative stress injury and prevent a cascade of free radical production from oxidation of polyunsaturated fats in the lipid bilayer cytoskeleton, a layer of cellular membranes.

Several investigators have postulated that contracting skeletal muscle is under exercise-induced oxidative stress. In addition, they found that aged animals are susceptible to exercise-induced oxidative damage. Moreover, investigators have found disruption of mitochondrial form in electron microscopic studies of heart tissue from acutely exercised rats. This altered mitochondrial form in the exercised animals was temporary and was not visible 24 hours after acute exercise.

Good news for whoopee makin' -- according to a study published in the Journal Urology, men who walked briskly for two miles a day were less likely to suffer from erectile dysfunction than their more sedentary counterparts. What's more, men who hadn't been active when they were younger but started a regular exercise regimen in middle age were able to cut their risk for the disorder. If the risk of erectile dysfunction doesn't send you running to the gym, consider ulcers. Now researchers who have studied 8,500 men over two decades report that those who ran or walked at least 10 miles a week were 62 percent less likely to develop duodenal ulcers than those who did not exercise regularly.

The list of benefits goes on and on and on and on. But too much exercise, or the wrong kinds of exercise do you damage. This could include joint and cartilage degeneration, and excessive free radical production resulting in DNA damage. And proper nutrient supplementation, like antioxidants and protein, should be used along with exercise.

**Medical Details -- and Follow Your Doctor's Guidance**

Review the "friendly" disclaimer at the start of the manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual.
If You Have a Medical Condition

As with nutrition, if you have a medical condition, that may change things. The system below may need to be modified to meet your special needs.

The exercises below were designed for healthy adults who are free from medical conditions that would limit their activity or require special consideration. People with medical conditions require a program designed for them by a Consult a physician or other expert who is experienced in exercise training. These special programs are usually of moderate intensity, at most. And each group has its own contraindications.

These medical conditions include, but are not limited to: advanced age, arthritis, asthma, cancer, cardiac rehab, cystic fibrosis, diabetes, hypertension, osteoporosis, end stage renal disease, hyperlipidemia (elevated blood fats), obesity, pregnancy, nursing mothers, young people, to name a few.

For example, arthritics may be placed on a program where they exercise two or more times a day, and in water for resistance because it is easier on the joints. Most hypertensives would not engage in resistance training until their blood pressure is under control. Diabetics usually benefit from moderate to low impact aerobics (like walking) that progress in time and intensity, as well as moderate to low weight training. Many diabetics have serious cardiovascular problems that could make sudden, intensive exercise a very bad idea. Diabetics’ blood glucose should be monitored and no exercise if glucose is out of range until food or glucose is administered, or there are blisters on the hands or feet, cardiac problems or high lipid levels.

For more detail on how to design a program for people with medical conditions, see to “Physicians Guide to Physical Fitness” by Lord Lee-Benner, M.D.

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Important Note: Start off Sloooooow

If you haven’t been exercising for a while, start off with easy exercise and increase the intensity and duration at a pace you are comfortable with. Ramp up slowly. It will take you at least three months to get in shape. Your tendons will be strengthened, blood composition will improve, and the infrastructure in your body will develop and progress to support high-intensity workouts and better health.

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Another Important Note: Do not become injured.

If you feel a muscle pull or an unusual pain, or feel faint or dizzy, just stop! If you are lifting weights and feel a muscle pull, do not even try to finish the set! An injury will really set you back. And besides, it hurts!

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Nope, Not the last -- Just One More Important Note:

Overtraining can be damaging. People training beyond their metabolic capability can sustain tissue damage, protein deficiency, hormone imbalances, an impaired immune system and depression.

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Stay away from all herbal stimulants before your workout -- and anytime -- as they could be very dangerous. These include St. Johns Wort, yohimbe, ma huang,
ephedrine, ephedra among others. They can cause dangerously high blood pressure and irregular heart rhythms, and result in death. The contents of herbals from different companies can be extremely variable, ranging from literally "zero" mg of the active ingredient to the full value of what the label says.

In you feel ill, just take the day off.

So here’s the precision, scientifically designed exercise system

Exercise at least 20 to 30 min. each day. If you haven’t been exercising, start slowly for a few weeks. Do it first thing in the morning -- later it's too easy to make excuses. I take at least one day off each 2 or 3 weeks or when I feel the body needs rest.

Warm up for 5 to 10 minutes whether you're going to do a weight training or aerobic workout. Whether weight training or doing aerobics, start by stretching. This will start the blood circulating, as well as break down the fibrous material that builds in the tissues as we grow older. And stretch easily -- don't overextend your muscles. Jog lightly until you break a light sweat. At the start of each workout, warm up with some cardio exercises (walking, cycling) until you break a sweat. Stretch the muscles you will be working really well, easily at first.

Start off easy during the first few weeks and ramp up. But within a few months begin to really work it hard. Drink extra water during the workout. And you may modify this according to your own mental predisposition. Do not eat a large meal prior to working out, as blood will be diverted from the intestine and your digestion will not be as good.

The Weight Training Component of Your System:

Obviously, working out with weights builds muscle. And even at rest, muscle burns calories – a very good thing! Muscle burns more calories than fat. By building muscle your body is increasing its metabolic rate. If you are over 25 and do not exercise, you are not building muscle, you are losing muscle.

But weight lifting must be done properly, not only because injury can result, but heavy training not properly done can result in little or no results, or even muscle loss.

Work out with weights on 3 of the 7 days each week. Spread your weight workouts out with a day or two of cardiovascular exercise between them.

If you haven’t lifted weights before or are out of shape, start slowly for a few weeks. Never lift more weight than you feel you can safely handle.

Start lifting weights with a light set.

Use good form (described below). Injuries often occur when you try to lift too much weight. Focus on using proper form. Increase the weight when you can do 12 to 15 reps easily and smoothly.

Never hold your breath while lifting weights. Lift the weights slowly and smoothly, and exhale during the difficult part of exercise – usually when extending.
Work opposing muscles on the same day -- chest, back and abdominals, for example. On one of the days, work the chest and back muscles, abdominals and forearms. On another, work the shoulders, biceps, triceps and forearms. And of the other workout day, work the legs. It takes about a week for the muscle to heal, rebuild and grow. Working a particular muscle more often than once a week causes damage, so work any muscle group only once in a week. Refer to books on weight training for specific lifts. Have at least a few of sessions with a qualified and certified personal trainer. Many gyms will give you training sessions as part of membership.

After several weeks or months of getting into shape, when normally lifting, lift heavy weights – as much as you can. Do every set to “failure”, where you just can’t press any more, then slowly retract. And form is important for getting the maximum benefit for your efforts, and for preventing injuries.

Feel the muscle you’re working, and work just one muscle group or one muscle at a time. Try to get a “burn” – a kind of hot sensation that most people know when they feel it. And muscles respond best to a variety of kinds of lifts, with different amounts of weight, different tempos, different types of exercises (different angles and motions), and with varying numbers of repetitions (typically around 6-8 reps for maximum muscle mass, and around 12 for best definition). When I started I found that my muscles tended to be sore two days after working out, when I expected this to be on the following day. It's a sign you are building muscle. If you are sore the day after your weight workout, you have overdone it.

Here are some key concepts regarding form. I’ll use the dumbbell bench press as an example. The weights should be extended (the eccentric or positive movement) to the count of 2, and retracted (concentric or negative movement) to the count of 6, and with no resting time between counts. Most trainers recommend a count of 3, but it’s the negative motion that builds the muscle so that's why we go with six counts. Exhale when extending, inhale when bringing the weights back. Don’t extend or bring the weights back so that you’re resting at any time.

When starting at the lower position, have your upper arms extend straight out with elbows level with your shoulders – lower than this risks rotator cuff (shoulder) damage. When extending, move the dumbbells to a position above your head, in a triangular motion. Movement should be for a count of two. Move the dumbbells out to a position above your shoulders, then lowering for a count of six.

The muscles should remain tensed throughout each part of the lift -- do not extend the arms fully so as to lock the elbows and rest of the top or at the bottom of the lift. Vary the kinds of lifts, the angles and the speed at different workouts. This will challenge your body and help you avoid a plateau, as muscles respond to a change. Eight repetitions will develop muscle size, and twelve will develop definition. A good combination for most people is two consecutive weeks workouts of 8 reps, then one of 12 reps.

By changing routine, you force the body to be more efficient and snap out of complacency. When keeping with the same weight training routine the muscles become complacent and we lose flexibility, as well as lose the different kinds of development the body can attain.

And maintain good posture while lifting, as you are training your postural muscles as well. This also will help you breathe correctly.

Get your heart rate into your target heart range (70-80% of max heart rate) at failure for optimum results. Then rest to bring it down to somewhere in the ’80s (preferably low ’80s) before starting the next set. Lactic acid is the result of anaerobic exercise (not enough O₂ to
the muscle - e.g. fatigue or full contraction of all the fibers in that muscle group) when you left weights. Bring the heart rate down will clear the lactic acid from your muscles. You will need a pulse rate monitor for this and for your aerobic exercise.

New research indicates that doing just one set resulted in between 70% and 88% of the increase in strength as compared to doing three sets. In one exercise, the leg extension, doing one set at maximum efficiency and minimum amount of time expended resulted in an six percent increase in strength.

For a muscle group I'll do just 1 sets each of three different exercises. For example, when working the chest it's something like 1 set of bench press, 1 set of reverse incline dumbbell press, then one set of cable flys. But since the body responds to different kinds of exercises, I will vary the exercises with each workout. A majority of the time will be spent on bringing down the heart rate.

Drink lots of water while working out. Also, have your protein meal within one hour of ending your workout. Protein drinks mixed at smack bars in gyms typically contain an awful lot of sugar and do more harm than good. And unless you are certain your protein drinks sold at the snack bar contain high-quality whey & egg white protein that includes essential amino acids, use your own. Usually I will have one scoop of Universal Milk & Egg protein along with 1/2 chicken breast and about 2 1/2 ounces of baked potato and about the 2-1/2 ounces of steamed vegetables, along with about a tablespoon of olive oil.

Your body requires adequate rest, as well as sufficient protein intake, for the repair of muscle (and you need sufficient carbohydrate for this to happen). It also requires adequate glycogen buildup in the cells for ATP generation. If you have had adequate recovery your heart rate will go up to its maximum range -- at least 100 beats per minute. If you are not getting adequate recovery, take a week off. The body must recover on an ongoing basis.

Pay attention when in the weight room, and have someone else watch over you (spot you) on difficult lifts. Dropping a dumbbell on your head or any body part would hurt. And don't do something like walk into someone while they're straining to lift a barbell hovering over their head!

The Aerobic Exercise Component of Your System: Do aerobic exercise at for least 20 minutes for three days a week, and preferably four. It can consist of aerobics classes, or exercises like running (on a soft surface such as grass), or fast walking. Gradually warm up and increase your pulse rate over about 5 minutes until you reach your recommended heart rate. You can also do your cardio on the same day as your weights. It's OK to do cardio before weights to increase heart rate and get an adequate warm up.

You can do cardio (aerobic exercise) for more than 20 min (but not to exceed 40), depending on what you are trying to accomplish. If you are trying to burn fat, more than 20 minutes is OK, but for cardiovascular fitness it's generally not beneficial. But for me it just seems like aerobic exercise for 25-30 minutes results in a lot better mood and joy of life.

Your age predicted maximum heart rate (in beats per minute [bpm]) is computed as 220 minus your age. So for a fifty-year-old, the max would be 220 – 50 = 170 bpm

If your goal is cardiovascular health: Heart rate of between 60% and 75% should be maintained for a maximum for 20 min. So, for the 50 year old example above:

170 x 60% = 102 bpm
170 x 75% = 127.5 bpm

If your goal is weight loss, it’s between 75% and 80% for 30 min.

170 x 75% = 127.5 bpm
170 x 85% = 144.5 bpm

Dr. Lee-Benner cautions us: Going over 80% of maximum heart rate is considered red lining it -- not good. That's when you start losing more muscle (lean body mass) than body fat -- a catabolic (breakdown) as opposed to an anabolic (buildup) effect. Also it injures the immune system because it causes too much stress -- and increases the risk of cancer from the increase in free radical damage to DNA, and impaired killer cell function in the immune system (killer cells are the ones that seek out and destroy new cells with DNA mutations before they can become cancerous).

I keep mine between 70% and 80%. Again, you will need a pulse rate monitor to measure your pulse.

Running (on a soft surface) as aerobic exercise is just fine. It's OK to run part of the time and walk part of the time, the important thing is keeping the heart rate in range. It's not necessarily required to move the arms and upper torso a lot to get the benefits of aerobic exercise, such has increased vascularization (the building of vessels and capillaries (tiny blood vessels) throughout your body. The increased blood flow will provide nutrients and eliminate waste.

I greatly prefer running in a natural setting to running in place on a treadmill and like to do a kind of jogging aerobics in a park or on the beach, jogging part of the time and moving the arms and legs all around in regular aerobics class kind of motion part of the time. It gets a lot of funny looks from the seagulls.

If you are under stress, do aerobic exercise twice a day for 20 min (but no more). Excessive aerobic exercise burns up your protein.

This system may be modified to meet an individual’s interest and temperament. Many people (especially seniors) gain a feeling of autonomy and empowerment when working on bicycle or rowing machines. And busy Type A executives may go for the challenge of working against weight machines.

Some people think that it's OK to load up with drinking sugary sports drinks, sodas or fruit juices when exercising. But it is especially important to avoid these within 1 hour of exercise because they can impair muscle performance and can also be responsible for pain, joint stiffness and the degeneration of arthritis of the spine.

Do not overtrain. If you feel extraordinarily tired or weak after your workout or for a day or two following your workout, take a week off then ease up on your regimen and consult your doctor.

Also, stay away from all herbal stimulants before a workout, and at all times. These include St. John's Wort, yohimbe, ma huang, ephedrine, ephedra among others. They can cause dangerously high blood pressure and irregular heart rhythms, and result in death.

Training methods can be quite sophisticated for high performance athletic training. For example, interval training is basically where you do short bursts of peak effort (like wind sprints). These are best done under expert guidance.
Yoga

Although yoga can bring you great benefits to your life, for exercise purposes yoga will best be considered a flexibility building method, and should not be substituted for weight training and aerobic exercise. Excessive yoga practice without necessary weight and aerobic training results in too much flexibility and inadequate muscle tone and strength.

The yoga techniques of stretching, deep relaxation, breathing, and visualization are powerful tools for stress management. But even more important is yoga's value for helping you transform. It can help you learn to open our hearts to your feelings, and to reach lasting inner peace and happiness.

Yoga originated as not so much a physical exercise, but rather as a spiritual exercise. Yoga literally means "union with God". Tantric yoga can take you to the highest level of spiritual awareness. Along these lines, the book "Luminous Emptiness" by Francesca Fremantle, is highly recommended.

See the appendix for more information on exercise.

Now Take Some Action

The exercise habit comes pretty easy. You are likely to be drawn to daily exercise because it feels good, long after the workout. OK, that may happen after some initial soreness, but even that hurts good. If you need help in forming a habit of daily exercise, visit the section on "Behavior Modification and Motivation".

An Exercise Sensation

Suzanne Somers, who played that adorable but dingy "Chrissy" in the TV show Three's Company invented an exercise device called the "Thigh Master". It's simplicity will amaze you -- you just put the thing between your legs and squeeze your legs in and out! Actually, that exercise only works a few muscles on the interior part of the thigh (the gracilis major, adductor magnus major, adductor brevis major and adductor longus major if you really must know), but it really works them. If you develop big muscles on the inside of your thighs people are sure to notice. Both because of their impressive size, and because your thighs will slap together when you walk around the gym! Just kidding. Actually you can get the same effect by straddling a medicine ball and squeezing your thighs together for 3 sets of 25 contractions each.

Hey, I bet if you're a woman your lover will notice (nudge, nudge, wink, wink). I don't know, do you think the Thigh Master should go in the "Sex" section?

This just in! Suzanne has now invented an electronic contraption called the "Face Master" (I personally avoid electrical stimulation) What's next? Is the world ready for a "Butt Master"?

OK OK, enough Thigh Master bashing. No, I don't necessarily recommend the thing -- just got back from the gym, feeling frisky and trying to have a little fun.

Anyway, have you noticed how Suzanne looks forever adorable & young? And in case you haven't noticed, she's really smart too. P.S. You can actually use the Thigh Master to work other muscles than the gracilis major, etc. etc.

Addendum: This just in! -- I was out for a walk and passed a garage sale last week, and guess what I saw??? A genuine Suzanne Somers Butt Master!!! But from the size of the proprietress's tush it mustn't have been used much.
Chapter 6 -- Happiness, Mental Clarity and Performance

What Do You Really Want?
Isn't it really happiness -- for yourself and for others?

A Healthy Brain is a Happy Brain

It doesn’t matter if you have a healthy 120 year-old body if you don’t know who or where you are. The system in this book is designed to keep your brain and mind at their peak, as well as the rest of you.

In past chapters we looked at how your brain and mental health and abilities are affected by diet, nutritional supplements and exercise, and some other factors that are within your control right now. And by the way, although the supporting cells of the brain are replaced it has been found that certain parts of the brain really do grow new neurons (under specific conditions).

The scientifically designed, precision nutrition and exercise, stress reduction, appropriate amounts of well-designed nutritional supplements, and other methods found in this manual can do a lot to improve your mental well-being.

On this system, protein, neurotransmitter and nutrient deficiencies or other problems can be resolved, thereby bringing more joy and happiness, more energy, a clearer mind with better concentration and improved problem solving abilities, a more carefree approach, and a renewed enjoyment and spark of enthusiasm for life.

Lowering levels of the destructive stress hormones cortisol and adrenaline (a powerful muscle stimulant) that are pumped out during periods of stress by calming revved-up physiological functions will do much to preserve and protect your brain function, clear your head and raise your consciousness and mental abilities. The end result is greater health and happiness.

When your body, brain, and mind are tuned up working as well as they can, don't be surprised if things that have upset you or problems that have dogged you no longer matter and just float away -- irrelevant and meaningless, barely remembered. You come to realizations that weren't easily apparent. Things are in perspective, in proper order. Mood swings resulting from neurotransmitter depletions and insulin highs or lows may subside.

Neurotransmitters are chemicals that are released from a nerve cell and transmit an impulse from one cell to another, be it nerve, muscle, or other organ or tissue. The main ones in the nervous system are called GABA, dopamine, acetylcholine, and serotonin, and they are vital to the functioning of your brain and body. Their production declines with age. On this system you'll now be getting the raw materials your body needs to manufacture these neurotransmitters and other components key to brain, mind and spiritual health.
Also, it's important to keep your brain stimulated. "Use it or lose it" applies to your brain and mind, as well as the body. Take up new pastimes, try new mental tasks, continually remain stimulated. Your brain will continue grow more connections and stimulate neurotransmitter production.

**What's Going On Physiologically When You're STRESSED?**

When we sense a threat, in a matter of seconds your body biochemically prepares for exertion. Your adrenal glands produced about 40 hormones, but primarily the stress hormones cortisol and adrenaline (epinephrine). When under stress, the adrenal glands secrete lots of these, which rev up your metabolism to prepare us to either fight or run -- "fight or flight". These states may be acute (immediate, short-term) or chronic (long-term). This is DESTRUCTIVE!

Blood pressure and heart rate increase, and digestion is halted allowing the body to dedicate its energy to the muscles. Blood flow is shunted from less critical areas such as skin and stomach, to more vital areas such as brain, heart, and muscles in preparation to create a state of aggression or fear. In extreme situations the bowel and bladder empty.

Extra blood cells flow out of the spleen, allowing the blood to carry more oxygen to muscles. The liver converts sugar stored as glycogen to glucose and calls up fat reserves (cholesterol, triglycerides, and LDL, etc.) for quick energy. The excess cholesterol, triglycerides, and LDL don't get metabolized right away, so they hang around the bloodstream increasing the risk of being deposited in the vessel walls which leads to heart disease, and atherosclerosis, as well as peripheral vascular disease, etc.

Insulin is released in response to the elevated glucose. As we found in the nutrition section, glucose causes oxidation damage within the body. So excess glucose really a bad thing. Pain sensitivity decreases. The probability of surviving this crisis has increased, but a dreadful long-term deterioration has begun.

Cells lose potassium and retain calcium and sodium, and free radicals are generated causing damage. Blood is shunted away from capillaries and the concentration of blood clotting mechanisms increases, to reduce bleeding in case of injury. Intracellular components such as mitochondria, liposomes, endoplasmic reticulum and outer cell wall membranes take a beating, and nerve and muscle action slows.

A few minutes after the flight or flight response begins, your body makes other changes in an attempt to stabilize and replenish itself. Your liver converts fat into usable fuel. Immune function is diminished, probably in order to increase available energy. In the brain, the hippocampus (the center for memory and learning) becomes activated.

The net effect of all the cortisol and adrenaline is to decrease immunity, in order to conserve resources for what your body automatically senses to be a more immediate and urgent requirement at hand. Senses become acute and the body begins to excrete an odor. In situations of greater stress, the hands and feet become cold and clammy as blood is directed away from the extremities and redirected to the brain and major organs, and the large muscles that are used for fighting and running.

But wait, there's more . . .
The body converts sex hormones into stress hormones (cortisol, and adrenaline), so there goes your love life even if you wanted one in situations of high stress. Over time your adrenals increase in size to keep up with the request for increased production. Did you see that movie about the worm-like creature from outer space that bores through the ear and eats your brain? Well, stress is kind of like that but you're mostly doing it to yourself because over time cortisol can be toxic. This cascades into depression. High cortisol levels have been associated with depressive disorders, stress, anxiety states, and memory loss.

Stress lowers your frustration tolerance, thereby predisposing you to become more upset about minor irritations.

Decreases in blood flow to the stomach and intestines leave the mucous lining vulnerable to ulcers. Actually there is an increase in the flow of gastric acids to speed digestion, and a decline in mucous production which is a "protective factor" against ulcers and erosive gastritis.

Communication happens in both directions between the nervous, endocrine and immune systems. Stressors affect the immune system by disrupting these networks. Functions of the immune system, like antibody production and cellular immunity from T-cell activity may also be impaired as a result of the oxidative stress. Lymphocytes, which are loaded with fatty acids to help them fight your body’s invaders, but under stress lymphocytes turn against your body’s own immune to system. Stress throws a number of other components of your immune system out of whack, resulting in decreased prevention of disease.

Your immune system can go away -- losing self-tolerance and attacking your own body creating autoimmune disorders such as asthma, arthritis, scleroderma, lupus, psoriasis, and allow cell mutations to survive and become cancerous.

The adrenals grow in response to chronic stress, so you get upset and angry bored easily and stay upset and angry for longer. Over time, or if the stress response is activated too often, the cortisol becomes toxic to brain cells -- cognitive ability is damaged, and fatigue, anger and depression ensue.

And stress can indirectly harm us. Have you noticed that your good eating and exercise habits go out the window when you’re stressed? This is often because of a hormone imbalance in the brain. When we are stressed, the brain releases a chemical called corticotropin-releasing hormone, or CRH, that suppresses appetite. The adrenal glands then secrete their powerful fight-or-flight stress hormones, adrenaline and cortisol, which propel sugar into the bloodstream for a short-term energy rush. After that rush, cortisol sparks the hunger for carbohydrates and fat.

And how many times did you make really dumb mistakes, or miss really great opportunities, when you were stressed? Have you ever been in an accident when you were distracted because of stress?

**Cells in the hippocampus are critical for memory. The release of steroids caused by stress kills them, so your memory worsens with the long-term effect of dementia.**

But perhaps the worst part of it is that you lose the ability to turn off the steroids that are causing the damage. Additional stress, not only psychological but things like low blood sugar or low oxygen, kills more brain cells. The result is a vicious cycle of more stress – and more damage!
In the short term, sure, these changes will give you more strength to fight oh, say, a sabre tooth tiger. We all have a lot of those to deal with in our daily lives? But in today's world these elaborate preparations are wasted.

**Science shows that people get sick when under stress**

There are a very great number of scientific studies showing the relationship between stress and illness. For example, UCLA experiment tracked a group of patients with melanoma, a potentially lethal skin cancer. Half the group received mind/body therapy, including support-group interaction and relaxation techniques to reduce their stress. After six years, patients who received the additional therapy were three times less likely to suffer a recurrence of cancer and three times less likely to have died than those who did not.

It stands to reason that the military would be interested in knowing about the effects of stress. A study conducted for the U.S. Navy showed that men who had gone through stress causing profound life changes (like job loss or divorce) had a greater chance of becoming sick within the months following their problems than those who suffered no such changes.

Stress also has an effect on those who care for those who are ill. So this is yet another part of the vicious cycle of stress -- stress causes illness, which in turn causes stress in those who care for them. In a study conducted by researchers at Ohio State University it was shown that chronically stressed women caring for dementia patients took an average of nine days longer to heal a small biopsy wound than those in a control group. The caregivers blood cells produced less of a chemical involved in immune defense that is important for wound healing. They also found that caregivers of patients with Alzheimer's disease didn't produce as much of an antibody in response to a flu vaccine as controls. The caregivers also did not produce as much of a T-cell reaction.

These are just a few of the many studies that have been done demonstrating the connection between stress and a variety of illnesses.

Or how would you like a nice cold or a case of the flu? When you're stressed and your immune defenses are down, you're a lot more likely to get a minor malady, and suffer the discomfort and lack of productivity that accompanies it.

See the appendix for more information on stress.

**The Power of Imagination**

Your nervous system cannot tell the difference between an imagined experience and a real experience. In either case, it reacts automatically to information which you give it from your forebrain. Your nervous system reacts appropriately to what you think or imagine to be true. Getting ready to go on a vacation can be stressful, as well as the initial effect of being away from your regular routine. Of course, after that period of adjustment you will relax, but, then getting back into your work-routine creates more stress again. Change of routine, change of employment, jet lag, all are stressful. Every hour of time zone change requires a full day of adjustment. So avoid making important decisions until that period of adjustment has passed.

**It's As Though We Create Our World By Our Thoughts And Actions**

It's as though we design our world by our thoughts and actions. We can influence how we perceive the world by our thoughts -- and some spiritual and religious schools believe that our thoughts directly affect the physical world itself. I plan to investigate whether some physicists are confirming this with quantum physics, etc.
My friend Jean is a computer consultant and former pop and jazz musician who is sometimes, well, takes things a little too seriously. He relays to me "I recently had a situation where I was sloshing around, forgetting to do my Behavior Modification and Motivation methods described in Chapter 2. It was a cloudy, kind of gloomy day. As described in "Once an hour every hour" I wrote down how I feel really good, very happy and at peace, filled with energy etc., and just then some clouds must have opened up because for a brief while it was sunny! And when I got home I opened an Email saying that the $2700 check I was expecting (having some doubt whether it would ever come) would be arriving soon!" And it did!

**Medical Details -- and Follow Your Doctor's Guidance**

Review the "friendly" disclaimer at the start of this manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual.

**If You Have a Medical Condition**

If you you have a medical condition, that may change things. The system below should be modified to meet your special needs.

**So Cut the Stress**

*Some stress reducing solutions to heal your body, mind and spirit:*

Although it's sometimes simple to say but difficult to do -- look for and reduce the underlying causes of stress.

Pay attention to what’s going on inside you the next time you’re rushing around under siege. Take a moment and ask: Is my breathing shallow or am I holding my breath? Are my muscles tight? Is my mind racing from one thought to another, never really thinking anything through to completion? Is a fast song running through my head? Am I all hunched over and developing a “turtle back” common in a lot of people who work with computers? Are my shoulders pulled up? Am I wearing a scowl, resulting in semi-permanent wrinkles etched in my face? Or having imaginary arguments and fights with people I feel have done me wrong? Or worse yet, am I having road rage that sooner or later will lead to an life-shattering accident?

All this is just an outward reflection of the damage you're doing to yourself on the inside. And the worst part is that it is often self-inflicted and can be avoided.

Our bodies operate about the same today as they were when we were cave-dwelling hunters and gatherers 50,000 years ago. In those days, we lived by our wits, killing animals for food and protected ourselves and our their families against attack either by fighting or by running away. Although this can get us out of physically life-threatening situations, today we invoke much the same response to non-life-threatening situations like giving a speech, worrying about money, having a healthy confrontation with someone or flying in an airplane. These can have much the same effect as being chased by wild animals nonstop from sunrise to bedtime.

Many of us are stressed that we don't even know it. We get conditioned to feel that stress is normal, or even miss the excitement when things are calm. Some people become hooked on the stress, and even become listless or bored, or feel that something is missing when not on the edge. Over the long term even moderate amounts of these biological and mental changes add up to immense damage.
The damaging physical and mental changes that occur during stress can be stopped and reversed. Applying this system, particularly the exercise, meditation, nutrition, and nutritional supplement parts, will do a lot to reduce your chronic stress level. Meditation, deep relaxation, hypnosis and prayer are all related in the way they affect your biology and reduce stress.

Recognize when you are under stress -- many of us are stressed that we don't even know it. Take corrective action early. Begin by breathing deeply and relaxing the body then and there. Break that stress habit.

My friend Jean, the computer consultant, told me about a damage control situation that happened to him recently: "When a supplier dragged his feet and didn't secure a component that was both vital to my business (and near and dear to my heart) I started to get really, really, and I mean really upset. Fortunately, I recognized what was happening right away, and how the downward spiral that was starting was completely unnecessary. So I took control of the situation and immediately shifted into correction mode. First, I wrote down on a piece of paper 'The bad feeling about this has left. It is replaced by calm and assurance that things will be fine and this is for the best' according to the 'once an hour every hour' technique under the Motivation and Behavior Modification section of Johnny's manual. Then I meditated to physiologically and mentally calm down. Then, I used the 'eraser' technique that I learned from some Anthony Robbins materials to just undo it from my mind about it.

When under abnormal stress, try the following and find what you like and what works best for you. Recognize that you can endure anything.

The next section on meditation covers a lot of relaxation methods. Meditate for at least 40 min.daily. And when stressed, twice daily would be even better. A section on meditation follows.

Exercise is the best stress buster. If you are under a lot of stress, do a second aerobic exercise session for about 20 minutes (don't exercise much longer because it will start to burn the protein in your body for fuel). Don't be tempted (like I have been) to just sit in front of the TV "relaxing" -- get your butt up and exercise. You will feel better. You just can't afford to not undo the physical and mental damage, can you? While your spouse or friends may forgive you for some bad judgment, can you afford to make a wrong decision while driving your car, or to make a very bad decision at work because you are all wound up. Get up and go! You'll feel a release almost immediately. Go go go! Exercise!

Relaxation is liberation. By implementing stress relieving and relaxing methods your health will improve almost immediately and you will feel much, much better. Another good stress-reduction method (also a meditation method) is to progressively relax parts of your body, starting with the feet, ankles, up to the calves and moving upward. Spend more time on any part of the body that's particularly tight. This will settle your body's chemistry and spirit. Listening to a relaxation audio tape can be much more helpful than doing it alone. Envision all the stress, the problems, the worries and heartaches as draining down and out of your body, being replaced by a golden light that brings healing, joy and relaxation.

Make the decision to do something about unnecessary stress.

Think back on a time when you were joyful and filled with power. Play some music that reminds you of that time.

Get a massage. Make love with your loving and willing (and hopefully enthusiastic) partner. Adapt a more spiritual outlook. Make an affirmation to reduce stress a part of
your “Once an hour, every hour” routine. Or just go for a long walk and focus on the outward beauty of the world and untangle the close focus of attention that you've been giving to your work or your PC, or on your thoughts or internal turmoil.

Do yoga, listen to soothing music. Write about the stressful periods of your life. Do some things to feel more in control of your life -- make a list of things to do or set some goals (hopefully overachievement is not what got you in this stress in the first place).

Having fun and laughing releases endorphins in your brain to soothe you, and interleuken, a powerful cancer fighting and interferon drug is also released. The tranquil experience produces a relaxing surge of diazepam -- the real valium.

When you're rushing off to work to do errands, stop to smell the roses -- and the grass, and the air. While you're at it, take a look at the sky and the trees, listen to the birds and the feel of the breeze.

Perhaps under situations of extreme unexpected stress, a little valium or similar relaxant, under the guidance of your physician, could be the right thing for you.

Reduce stimulation, relax and lounge around for an entire day. Impractical? Well, maybe not as much as you believe. Think of how much more you'll get done, and how much clearer your decision making will be, after an entire day of nothing.

Choose to be happy

Mark Twain once wrote that people are as happy as they decide to be. So deciding to be happy would be a good first step down the happy trail.

Act Happy

There is a direct connection between your body movements and neurochemistry. It’s called “neuro-kinesology”. Act happy. Talk happy. Think happy. Put a big silly grin on your face. Move all around happy -- arms, legs, big smile. Walk a happy walk. Put a skip in your step. Do a happy dance. Do the things that happy people do. Fake happy 'till you make happy. Fill your heart with love. And put the characteristics of happy people described above into action. This will send a signal to your neuro-endocrine system resulting in the release of endorphins and improved receptivity to them. And it will trigger your positive emotions, and the soon it will become a habit.

I had an unpleasant situation lately and was lied to, cheated and stressed. I put a big happy silly grin on my face, walked a fun, happy silly walk, put the problems out of my mind – and felt a WHOLE LOT BETTER!

This can work for you.

Meditation and Deep Relaxation

Meditation has been defined as the "self-regulation of attention." It can clear your head and raise your consciousness. It increases creativity and intelligence, improves memory and learning ability. It improves energy and promotes inner calm and peace. Our muscles and nervous and endocrine systems have a kind of "memory" in that they store the hurts, fears, upsets and sadness that you may experience throughout the day. Meditation helps dissipate this. The end result is that we are healthier and happier.
Meditation can be divided into two (or more) major types of techniques: "concentration" meditation, which encompasses transcendental meditation TM and the relaxation response, and "mindfulness" (or "insight") meditation, which uses one-point attention to cultivate calmness and stability.

There are many kinds of meditation, and different methods are suited to different people. Some of the major methods are Zen, Yoga, Sufi, Gurdjieff and Transcendental. "Paths" of meditation include through the intellect, the emotions, the body, and through action. How to Meditate by Lawrence LeShan (Back Bay Books) is an excellent book that goes into the background and practical application.

Some of the main purposes of meditation are to achieve deep relaxation, and quiet the mind and give it a break and allow it to replenish neurotransmitters. This is accomplished, in part, by stopping all the mental chatter. Meditation reverses the negative effects of stress. Meditation lowers the cortisol and adrenaline that build up when you are under daily stress, reducing the physiological cascade that these damaging hormones trigger. So worries diminish, problems don’t loom as large, worry, anger, frustration decline, and fear and aches & pains will even diminish, blood flow to the brain increases, good hormones like growth hormone, testosterone, and estrogen increase and come into balance. Happiness, confidence and memory improve. The benefits of meditation will become apparent very soon after starting. The result can be dramatic.

Alpha brain waves (slow electrical firing of the brain associated with relaxation) increase during meditation. The hormone melatonin is associated with better sleep and meditation can increase levels of melatonin in the fluid portion of blood. It remains to be determined whether this is achieved through decreased hepatic (liver) metabolism of the hormone or via a direct effect on the pineal gland, where melatonin is produced.

Transcendental meditation (TM TM) is based on traditional Indian vedic philosophy and is the method often used in scientific research studies because of the specifics of its application. The goals of TM involve inducing less active thinking processes and creating a state of "restful alertness." It was founded by Maharishi Mahesh Yogi (the guru to the Beatles) and is perhaps the most widely known. There are seven steps to learning TM. The Maharishi Health Education Centres describe it as a simple, natural, effortless technique.

Many effects on physiology have been reported in the TM medical literature. These include decreased respiratory rate, decreased skin conductance, decreased total peripheral resistance, increased alpha-wave activity as measured by an electro encephalogram (EEG), increased frontal and occipital lobe (parts of the brain associated with thought, motor and visual function) blood flow, alterations of hormone levels, decreased serum lipid peroxide, decreased beta-receptor sensitivity, decreased erythrocyte glycolysis and decreased serum. I'll not go into what these are now, but suffice it to say that these are good things. The bottom line -- TM is believed to have a beneficial effect upon risk factors for cardiovascular disease, including high cholesterol, high blood pressure, and even tobacco use.

Every moment you are relaxed results in an improvement.

**Transcendental Meditation and the Prevention of Heart Disease and Other Positive Effects on Health**

This part relates to what is often called "mind-body medicine", addressing the intimate relationship and influences of the mind and body upon one another and it is related to the "placebo effect" (discussed later). Meditation is one form of mind-body medicine.
One randomized, controlled study examined the effects of regular TM on carotid (heart) atherosclerosis. One group was asked to meditate twice a day for 20 minutes, the other (called the "health education group") was asked to devote the same timeframes to any leisure activity, like reading or exercising. The study lasted seven months. In comparison to the health education group, the TM group showed a significant decrease in carotid atherosclerosis -- and the health education group had an increase.

Positive results have also been reported in studies using TM for patients with angina (pain or discomfort from a blockage in the coronary artery, resulting in not enough blood getting to the heart), high blood pressure and high cholesterol.

Some studies have demonstrated positive results of TM such as a reduction in health care visits, mood disturbances, cancer survival rates and psychosomatic symptoms.

**Important: TM or other forms of meditation should not be used as a healing method that substitute for traditional medical treatment.**

**How to Meditate**

Twenty minutes meditation each day, in the form that works best for you, is essential in your system. Try it first thing in the morning and see how it sets the tone for the day. Or perhaps the middle of the day or the evening is best for you. Twice a day meditations would be even better, and it should be done anytime stress begins to build.

Some forms of meditation are structured and others are unstructured. Meditations are done sitting, lying or standing. There are meditations to connect you with the spirit, but the one I use is one that empties the mind. Here's a brief introduction to some ways to meditate in this way. You can meditate with a friend, and meditating with a dog or a cat can be soothing for all concerned.

One way is to stop all thoughts as much as possible. Deeply relax the muscles -- "past" the point of just being relaxed to where every tension is totally released. Breathe deeply from the diaphragm -- this is vital. "From the diaphragm" means you feel the lower part of the lungs filling up with air first as your tummy goes out, then up through your chest as the lungs fill. Exhale in reverse by letting out the air from the top down. Your heartbeat will automatically slow with each exhalation.

The idea is to deeply relax and set aside the conscious mind, or ego. Stop the mental meandering and mental chatter.

Posture is important. Sit up straight, with back straight and lower back supported, and head centered above the shoulders. Legs may be crossed if you like. If you meditate while lying down your mind is more likely to wander or go to sleep.

It may take a while to ease into the soothing meditative state of mind. But as the minutes pass, more and more you'll find yourself calming and unruffling.

Don't be tempted to fall asleep while meditating. Sleep is good and if you can squeeze in a nap sometime during the day, that's just great. But sleep is not meditation and you do not get the same beneficial effects. And of course, thinking about problems is not meditation. However, ideas, answers to questions or solutions to problems just may pop into your head while without trying. Perhaps you are using the untapped power of your mind, or maybe the angels or God are whispering in your ear. You may have to make a decision whether to write it down on a piece of paper or wait until later. (But if you don't write it down right away you'll probably forget).
There are many ways to meditate. We're all different, and different kinds of meditation will appeal to different people. Counting breaths teaches the ability to do one thing at a time. Some of us tend to process the world visually, so it stands to reason that they may prefer a visual form of meditation by envisioning something soothing or something to change. Others process the world by sound more than by the other senses, so they may like to hear soothing sounds to help them meditate. And others tend to process the world in terms of the way they feel, so they may prefer to concentrate on their breathing or the feel of something soothing. Perhaps while taking a nice warm bath. There is even a soothing moving meditation where you walk across the room absolutely as slowly as possible. And you can combine several sensory methods. Try different ways and find what works for you.

You can concentrate on a particular sound, or a color, or an object in the room. Or imagine a calm, soothing scene -- clouds, a park, the wilderness, a sunset. Use your imagination to visualize the scene and hear the sounds of birds or waterfalls, "smell" freshly cut grass, "feel" the warmth of the sun. Or listen to a tape or CD recording of the great outdoors with birdies going *tweet tweet* and maybe the *bgloishhhhh* of a babbling brook. Or go out in the woods to experience these for real. Silently watch the branches of a tree from a window as they gently bend in the breeze. Or listen to soothing music or the slow and deeply resonant tones of a wind chime.

Perhaps envision all the stress, the problems, the worries and heartaches as draining down and out of you. And imagine the words or symbols for youth, joy, life -- as well as contentment, confidence, carefree, fun, or whatever as they flow into you. Or healing, golden light accompanied by feelings of joy and loving, and the sound of beautiful music. Out with the bad, in with the good.

A mandala is a circular geometric pattern used as for meditation. Meditators have gazed upon mandalas to induce a quite, inner peace. Mandalas have been used in every corner of the world, from Tibetan mandalas, Native American sand paintings, to Hindu Yantras, to the Christian Rose Window, to the Jewish Star of David, to Islamic geometric patterns.

Do NOT stare at the sun or a bright object.

Some people can go into a meditative state by tilting the eyes upward about 45 degrees.

A relaxation audio tape can put you into deep meditation and keep the mind from wandering. Just sit and listen. Try to sit up straight while meditating, as lying down usually doesn't work well.

Try a relaxing "rolling meditation". No, not by rolling on the ground. Feel the relaxation roll up and down your body from head to toe with each cycle taking about 2 or 3 seconds and a brief pause between each one. Spend more time on any part of the body that's particularly tight. Scan your body, seek out and unwind those tense body parts on a "search and relax" mission.

And if you need a creative solution try this: tell yourself what you want, sit and meditate, clear your mind of all thoughts (do not think or try to reason through the problem). Wait for answer to pop out.

Or count slowly from zero and go as high as you can without having thoughts pop into your mind (number cruncher types may like this, but then again, they may want to get away from numbers for a while). The moment you feel a thought, start from one again. Don’t be concerned if you didn’t get very far. It’s not a contest. If your mind should wander, just
keep coming back. With each count, and in each moment, you are healing your mind and body and becoming more refreshed.

Or if you are an engineering type, envision gauges or bar charts with the labels of physical parameters like "cortisol", "adrenaline", "blood pressure" and the like, and others with labels pertaining to yourself like "worry", "anger" and "tummy upset" or the like -- these are going down as you meditate. And the ones labeled "white blood cells" or "oxygen flow", "calm", "contentment", "joy", etc. are rising.

See how low you can get your heart rate (your heart rate monitor will come in handy for this).

Chanting can be good -- like "Aaaaaahhhhhhh" (the sound of creation) or "Oooohhhmmmm" (the sound of thankfulness), or "whatevrrrrr". It would be fine to make a chanting sound throughout your meditation, or if you feel your mind start to wander, start chanting until it's again centered. Sunrise and sunset are particularly synchronous powerful meditation times.

Write down a question or a problem on a piece of paper, then meditate. Wait for an answer.

I have known a couple of people who seem to process their worlds by food! One was a really good cook and the other was bulimic. Analogies of food are often woven into their conversations, and they will tend to laugh more at jokes when produce is involved. I once heard how, if asking for directions, some people will say "Go down the street until you reach the McDonald's Burger Joint and turn right, then go down to the Piggly Wiggly supermarket and turn left . . ." etc. I don't know, maybe to meditate they could think of jell-o gently jiggling in the breeze. Better make that steamed vegetables. Or the ancient zen quotation "Life is just a bowl of cherries."

Just be still. Quiet the chatter. Listen. You will feel the hurts, fears, upsets and sadness, all the upsetting memories of events of the day that have caused you stress will dissipate. Feel your body becoming filled with health and healing.

Don't be dismayed if you do experience an unusual sensation resembling a flash of light, a scene or a sound. This could be anything from auto-suggestion (self-hypnosis) leading to a self-induced hallucinatory experience (similar to an LSD effect), to a release in neurochemicals such as endorphins or neurochemicals that have a stimulatory effect on the senses arising from the occipital lobe (associated with vision) or the mid brain and limbic system (emotions).

Perhaps ask the spirit for an answer to a question, then sit quietly and listen for the answer. And don't forget to give thanks in your meditations for your many gifts.

Also, thinking about events, problems etc. is not meditation. But don't be surprised if ideas or solutions to problems pop into your head without trying. If this happens to may be faced with a decision whether to interrupt your meditation and write down on a piece of paper what has come to you. (You probably will forget if you don't write down then and there).

Just stop thinking for a while.

Similar to nutritional habits and adequate amounts of daily water intake, this one is easy to let slip. The ultimate goal of every meditation is to empty the mind of all thoughts, even if it is only a brief moment in time. A successful meditation passes quickly, because for that moment, you have you have left your body and are floating in timespace.
Any meditation should make you more alert, but if you do also feel kind of groggy after meditating, don't operate a motor vehicle, heavy equipment, fly an airplane or do anything dangerous that would require your full concentration.

**Johnny's favorite meditation**

Try this as you read about it. It's a little difficult to describe, but it really does it for me so here goes: Sit up straight, with back straight and head centered above the shoulders. Eyes are usually closed, but can be open while looking at an object. Relax all over, but particularly around the head, face and eyes. After a short while I try to feel what the difficult to describe feeling of a kind of "loosening" and "sinking" and "opening up" sensation, particularly in the head, eyes, between and behind the eyes, and the entire body. Something like a soft mental "cap" drops down and covers my head. Breathe deeply through the nose, down into the diaphragm, and exhale slowly through the mouth, in reverse by letting out the air from the top down. During, and especially at the end of each breath, become a more deeply relaxed. Relax even further "past" the point of just relaxing the muscles, to where every muscle fiber is released -- head, eyes, and between & behind the eyes, and in the entire body. Soon, almost from something you could perhaps describe as the “third eye”, a kind of field of vision seems to “open up”. It's nothing as clear as actually looking at a real scene, but more of a sensation. You may possibly kind of envision a plain, or the ocean, or a field with mountains in the distance, but it's more of a sensation of "distance vision" that's really hard to describe. Shortly after each exhalation feel the experience of sinking and detachment, going deeper relaxed. If your mind should wander, just keep coming back. Continue to relax the head, eyes, and between & behind the eyes, and in the entire body, and progressively relax different parts of body (starting from the toes, to the feet, up to the ankles etc. for example). Breathe deep, sink, detach, and go deeper relaxed. Breathe deep, sink, detach, and deeper relax. It will probably take about 20 minutes, but when you're there you'll know it. Breathe deep, sink, detach, relax, and try to get that field of distance vision to "open up". Feel the area around and behind your eyes become particularly relaxed and open up. That's it! I this works for you, it really does it for me. You will feel serene, refeshed, and experiencing the world anew. Maybe a little groggy, but in a nice sort of way. And again, don't operate a motor vehicle, heavy equipment, or do anything dangerous requiring your full concentration if you're feeling groggy.

After finishing a meditation, hold onto that state of mind. Should a disturbing thought pop into your mind, let it go. Hold on to the relaxed state.

You may want to meditate before doing creative work. Creative ideas and solutions to problems may flow. I have had creative breakthroughs and complex technical solutions will just come to me while doing this. Many of the best parts of this manual came during or after meditation, or while drifting off to sleep. This gets you in touch with spirituality and some interpret this as God speaking.

I find I have to immediately write the idea down on paper or I'll forget it. Obviously, this can be a real distraction. So unless you have an extraordinary memory, you may be faced with this choice. But after all, it's a great choice to have to make.

Each time that you have a calmed mind that is free from chatter and free from the racing, mental meandering of monkey mind, however short, you are living life your own way.
Surely the meditation described here, along with the nutrition, exercise, nutritional supplements, etc. all work together to this end. So the next time your mind is abuzz, quiet that monkey mind and make it your friend.

Some people have reported a feeling of being detached from the body while in a meditative or spiritual state.

Yoga

Please see the exercise section on page 8 for a discussion of the benefits of yoga.

According to Swami Vivekananda: Combining all of the yoga methods-techniques in their original context yields a power greater than the sum of the individual methods.

That's because while yoga is a very powerful system of Stress Management, these tools were designed for something much greater-as tools of transformation. The yoga techniques: stretching, deep relaxation, breathing, and visualization techniques-are powerful tools not only for "stress management" but also for helping us to learn to open our hearts to our feelings and inner peace.

Thoughts connect our heads; feeling connect our hearts.

Altruism, compassion and forgiveness-opening our heart-can be powerful means of healing the isolation that leads to stress, suffering, and illness.

Now, I avoid getting into a power struggle with people. I just provide them with information so that they know what their options are and then can make informed choices. And, I support whatever they choose.

There is nothing you can do or get that will bring you lasting peace and happiness! Lasting peace and happiness are not something we get; we have them already until we disturb them. In that sense then, acting "selflessly" is the most "selfish" way to behave, since it maintains our sense of inner peace and joy.

The purity of the feeling-even a negative feeling has the potential for being transformative if properly guided. The intensity of negative energy can be directed into something more positive.

That which you meditate on you begin to manifest in your life. To the extent that you (I) can have compassion for your (my) own ignorance and your (my) own darkness and inner demons, than you (I) can begin to have the same compassion and love for other people whenever they display their darkness to you (me).

Fear creates inner walls that keep our heart in darkness. The ongoing process of learning compassion-for my own darkness and that of others-is what helps to free me from my sense of isolation. That's what frees us, that's what heals us, and eventually, it may open our arteries as well as our hearts.

Pain and suffering, whether in the form of physical illnesses like heart disease, or emotional diseases like severe depression, or spiritual pain, like hatred, can be profoundly healing. The goal is not simply to reverse the anatomical blockages, the real issue is how we can feel more free and more joyful. How to open our hearts on psychological levels to build intimacy-and spiritual levels-to develop compassion. More precisely, we are free already; by remaining compassionate, we can stop binding ourselves and limiting our freedom. We may live longer because of this, but that's not the primary goal. We can live better.
We can use our pain-emotional or physical-as a catalyst to begin healing, not just curing. To me, "curing" means only getting back to the way we were before we became diseased. "Healing" is when we use our pain or illness as a catalyst to begin transforming our lives-healing our inner pain and our relationships, our hearts and our souls.

-- Swami Vivekananda (1896) Juana Yoga

**Another Application of "Once An Hour"**

Get an inexpensive watch with a pleasant chime that beeps once an hour. Each time it beeps, clear your mind, relax, meditate for a brief period. Remind yourself of how important it is to relax, how damaging the stress is, and how important it is that you're happy and feel great.

**Feel it Flow**

Feel the joy flow up from your heart. Make everything you do and everything you look at bring you joy. Hold that feeling -- if you "force" it for a while, even 20 minutes or so, soon it will become habit and a part of you.

**Decide to Wake Up Happy**

When you go to bed set the idea in your mind that you will wake up happy – and that you will not allow any negative thoughts to enter your mind. Also, sometimes just laying around in bed after waking up can lead to grogginess and depression (at least for me anyway).

**Anytime, Anywhere**

This one is a combination of a relaxation and meditation method. It may be a little difficult to maintain, but it can be very effective whenever and wherever. You can experience very positive effects any time of the day or night by just breathing deep from the diaphragm, relaxing all the muscles and the body and the putting your thoughts on hold. Do any body movements slowly as slow as possible. Just continue to relax all the muscles in the body.

Breathing "from the diaphragm" means you feel the lower part of the lungs filling up with air first as your tummy goes out, then up through your chest as the lungs fill. Exhale in reverse by letting out the air from the top down. The heartbeat automatically slows with each exhalation. Perhaps repeat the phrase "relax the body all day long, relax the body all day long" over and over. Within a few minutes you will experience of greater comfort, calmness and clarity of mind, more refreshed and unwound. Continue to relax, whatever you're doing. It gets easier as each minute passes. If you can keep this up for about 20 minutes, your mind should be clear and you should be feeling great. When you get to a point where you can do this all day long, no matter what your activity, you'll know you've got it made.

A great variation of this that works to start off the morning is to slowly repeat to yourself "Relax the body, breathe deep, relax the body, move slow" again and again. One statement should take about eight seconds. Or substitute the things you need to do, like "Relax the body, breath deep and right, relax the body, have good posture". Make up your own. Remind yourself when you go to sleep (and write yourself a note) to do this first thing in the morning.
Take a Walk

Take a nice long walk while focusing your attention on things in the distance, like houses, trees or scenery. Feel the solidness of the trees, buildings etc. This will relieve the stress of living in an internal world.

Take a Vacation

And here's a tip that will work fantastic for you: take an vacation! About four days is the time that it takes to replenish depleted brain neurotransmitters.

Or occasionally take at least an entire day to just stroll around places you enjoy or lie on a beach doing absolutely nothing in particular. Or just stay in bed. OK, I know that in real life you may have many important responsibilities, and children or others who may need your attention. But couldn't you find just one day each week just for you? Don't be tempted to turn on the computer, or make just a quick hop to the store, or whatever -- you'll just keep going and do more. And you'll find that the next few days you'll get a lot more done that you would have had you worked straight through -- and you'll feel better.

Johnny's Big Day Off -- You Can Have One Too

After working about 11 days straight I noticed I wasn't taking my own advice and was starting to get way stressed and worn. So I went over nearby Huntington Beach, CA and sat drinking a cup of green tea, then just strolled up and down the sidewalks, beach and pier.

I came upon the Huntington Beach Surf Museum, a fun place that brought back memories. And there was a concert by the "Chantays", a five piece surf band rocking the crowd with a 40" mural with surf and surfers, miles of crystal white sand and California beach babes as a background (OK, I just imagined the beach babes). I forgot to ask, but what the heck is a chantay? It's interesting how fun things appear for you, and how much better ordinary things seem, when you're in the right relaxed frame of mind.

Then, my mind and work took on new clarity and energy and passion that I hadn't felt since, oh, about 11 days before.

Enough of Johnny's big day off. Go design your own.

Important Note: Don’t get carried away by your new superpowers.

Just what do I mean by that?? And what’s it got to do with stress?

When I first started feeling all supercharged with this system, I got extraordinarily ambitious and started working day and night on some projects. But I wasn’t paying attention to how hard I was working and my state of mind and had gotten into a spiral of stress that undermined the very goals of the system. When I stopped the stress it got better. So pay attention to how you’re doing, and stay loose.

And this probably won't pertain to you, but as an aside, I noticed that after a while on this system I would become just a little more impatient, irritated or upset with the kinds of people or situations that are easy to become impatient, irritated or upset with. More buttheads seem to magically appear. This may be a personal plight with just me, and the result of misdirected energy. A powerful racecar takes some time to learn to control. As this can be a negative spiral, so stay in control and don't let this happen to you.
Who Wants to be a Gazillionaire?

Is an ultra-fast paced go-getter materialistic millionaire lifestyle worth it? Is the chaching of the cash register of greater value to you than happiness? Are dollars (or your favorite currency) the measure of your life? In The Overworked American, Harvard economist Joliet Schor reports that since the late 1960s, the average U.S. worker is putting in the equivalent of one month more each year. But today lots of highly paid, overworked workers are trading in their high-powered occupations for less punishing jobs, but at lower salaries. Lawyers are purchasing and tending vineyards, investment bankers are opening bed-and-breakfasts, consultants are going into teaching.

Are you working really really hard, but making more money just to spend it? Sure, on this system you will find that you have the ability to work longer, harder and smarter in your work, thereby increasing your ability to make money. But consider how much better the quality of your life might be by working less hours but in a more focused and smarter fashion. And consider how much more you could make for each hour of your time.

Think of how much more money will come to you in those extra years, decades, or even centuries if you stick can just around to earn it? You purchase money with your time and expertise. You decide whether or not the price you are paying for the money, in terms of body, brain, peace of mind (in short, your own flesh) is a good deal.

There are those who, rather than having an interest in finding happiness and conscious raising, prefer a matter of fact approach using financial tools like cost benefit analysis, ROI and the like. So how much more money will you make next year by being more creative, thinking outside the box, and being receptive to opportunities? How much will you save on insurance premiums with the reduced risk of getting sick? If you get a disease that could have been avoided or delayed, how much put cost you to treat the disease, and how much would you lose by being away from work? Or if you feel that sooner or later you'll get sick anyway, what's the time value of that money by delaying the cost? How much more we be up collect on that retirement or pension by sticking around a little longer? If "stuff" is your thing, think of how much more stuff you'll be able to accumulate. Decide what measure is important to you, then run your own numbers for yourself.

A red traffic light, the hourglass on your computer, a long wait in a line or the sands of time do not mean "stop" -- they mean "rest".

See the appendix for more information on reducing your overhead and living simply.

Got Happy?

"People are as happy as they decide to be." -- Mark Twain

OK, another stupid "got whatever\textsuperscript{TM}" tag line. But isn't happiness what it's really all about? So what is happiness? Joy, an inner feeling of balance and contentment, pleasure out of daily living? But for most people it needs no definition.

No matter what your station in life or how much stuff you have, if you're happy then you're better off than someone with higher position and more stuff.

Happiness means different things to different people. For one person it could be complicated balance of having pleasure and avoiding pain. And maybe adventure, challenge, and service to others are more important than joyous happiness to another.

Factors like wealth, fame, and good fortune have been associated with happiness. And sure, poverty is associated with misery. But beyond a certain level of resources, increased
affluence adds little to happiness. Winning the lottery would definitely make us happy for a while, but eventually we would calm down to our habitual level.

It's so important I'll say it again -- The precision, scientifically designed nutrition and high-performance exercise methods, appropriate amounts of well-designed nutritional supplements, stress reduction, and other methods found in this manual will do a lot to improve your mental well-being. Sometimes they will bring immense results. When your body, brain, and mind are tuned up working as well as they can, don't be surprised if things that have upset you or problems that have dogged you no longer matter and just float away. Mood swings resulting from insulin highs or blood sugar lows, protein, neurotransmitter and nutrient deficiencies can be resolved, as well as fatigue, stress, hormonal shifts.

This will bring you more joy and happiness, more energy, a clearer mind with better concentration and improved problem solving abilities, a more carefree approach, fewer low points that don't last as long as they once did, and a renewed enjoyment and spark of enthusiasm for life.

So go forth and make happy.

If You Need Help

This is not a mental health program, per se. What follows are some little methods to give you a lift and bring cheer, and even provide some amusement. But if you are regularly depressed, sad, angry, confused, frustrated, resentful or scared, you won't just want something to reduce the intensity of your problems so that you can function the little better in the world. You want to eliminate the source so you can function fully in the world.

Psychological counseling may offer you this. Volumes could be devoted to do locating a counselor who could best help you. As with any form of professional help you will want one with a lot of experience. You will want to screen about a dozen. There are numerous kinds of therapies and one kind of therapy may be better for you than another. The counselor you feel most "comfortable" with may not necessarily offer you the best or right kind of therapy for you, or even be all that good. Antidepressants or relaxants, under expert medical guidance may or may not be right for you, but they are worth considering. For some people short-term antidepressant therapy would be the best thing to temporarily help bring them out of the slump, and for others even lifelong antidepressant therapy would be appropriate after other avenues are shown not to work. Also, a Course in Miracles can be an instrumental in resolving deep-seated issues. There were be the section devoted to this later.

Some Characteristics of Happy People

Happy people have some things in common, according to expert on happiness David G. Myers, PhD, who surely must be a darn happy guy himself. In his book "The Pursuit of Happiness: Who Is Happy-- and Why" he discusses how satisfaction with income, family life and friendships are important, but satisfaction with self ranks higher. Happy people like and accept themselves, they have high self esteem. Also, happy people tend to be optimistic and expect the best, as well as being social and outgoing people. And maintain close relationships.

Dr. Joyce Brothers advises to share your feelings, successes and failures with friends and loved ones. Initiate new relationships and nurture old ones. Cultivate a sense of gratitude for the many, many good things you have in your life, and frequently give thought to them.
Angus Campbell remarks that the nationwide surveys conducted by the University of Michigan show that happy people have a sense of control over their lives. And they fill up their time with meaningful activities. They do things to take control their situations.

**You can reverse engineer your happiness by doing these things until they become a habit.**

**So here are some ideas to give you a lift and bring cheer, and maybe even provide some amusement.**

**Think Positively**

Think positive thoughts, push negative thoughts out.

**Cultivate Optimism**

Actor Lorne Greene who played the patriarch Ben Cartwright in the TV show *Bonanza* used to do a news broadcast parody where he would announce all the floods, fires, and earthquakes etc. that did *not* happen that day.

Optimism is the expectation of a positive outcome, a cheerful hopefulness. Cultivate optimism and try to expect the best.

**Gratitude**

Comparison is of great value in happiness. Take a few minutes at the end of any day and try to think of all the good things that have come your way and all the blessings you have had. You are sure to come up with a long list -- much longer than you expected. Take a few moments to consider the poverty, famine and natural disasters that you didn't endure today.

**Laughter is a Great Medicine**

Get a joke book and read some jokes (there are some great joke web sites and Email joke lists. Get together with your friends or your dog and tell some jokes. Really yuk it up. Watch a funny program or rent a funny video. Make up some jokes -- they don't have to be very funny, just look at some of mine. Laughter actually stimulates the emotion center of the brain called the limbic system. It is here that endorphens are released that produce the sensation of pleasure and well-being.

See the appendix for more information on jokes on the web.

**Sweet Dreams**

Your body repairs organs and tissues, produces immune cells, grows new bone, and produces growth hormone while sleeping. So if you're not sleeping, well, you're not repairing organs and tissues, producing as many or as much immune cells, bone and growth hormone.

Sleep deprivation can throw your immune system of whack and accelerate your aging. Cortisol (that really bad hormone) increases, and insulin response (the ability of your cells to allow the entrance of glucose in response to insulin) decreases with sleep deprivation. Drowsiness can result in accidents. And feeling sleepy all day is no fun.
Researchers at the University of Chicago found what appears to be a link between middle-age spread and sleep patterns as they get older. Men produce growth hormone primarily during deep sleep. The researchers found that the quality of men’s sleep decreases with age along with the body's production of growth hormone. The drop in growth hormone, in turn, is thought to lead to flab. Six months of growth hormone injections have reduced body fat 13-20% in growth hormone deficient adults. However, growth hormone is very costly.

So the researchers are working to see if new types of sleeping pills or hormone injections can improve sleep, thereby slowing the signs of aging. If deep sleep can be increased, growth hormone production will also increase.

Some common causes of insomnia are stress, depression, stimulants (caffeine or nicotine), herbal supplements or over-the-counter medications, alcohol, medical problems, and a change in environment, time zone or work schedule.

Implementing this system, particularly the exercise, will help you sleep better, naturally. At one time in my life I would wake up in the middle of night about 4 or 5 times a week and not be able to get back to sleep for an hour or more. Now that is very rare, maybe once every 3 months or so.

Ideas for better sleep include maintaining a regular routine and going to bed at a regular time, keeping the bedroom dark, not smoking before bedtime (better yet -- not smoking ever), and avoiding naps or strenuous exercise just before bedtime. Soft sheets of at least 275 thread count are very comfortable. Maintain adequate ventilation, and a comfortable temperature and level of humidity. A comfortable bed with clean sheets can be soothing.

Too much caffeine too late in the day may keep you awake at night. Caffeine after 10 AM increases your stress level by speeding up your biologic clock. Thus giving you, in effect, a much longer day.

Use your bedroom only for sleeping, meditation, nighttime reading, and of course, great sex. This will help you associate your bedroom with relaxing and sleepiness, and maybe with fun. Go to bed and get up at roughly the same times each day, even on weekends. A long, hot bath or shower before bed can be soothing. Read a magazine or book just before nodding off. Avoid suspenseful or overly dramatic materials. Instead, read something amusing or uplifting -- the kinds of things that quiet the mind. I’ve been noticing a lot of violent television programming, particularly on cable, during the hour or so just before bedtime. Even the late TV news dwells on the worst of human nature -- police blotter kinds of stuff. This can be engrossing, but can also put your mind in a stir and reduce the quality of your sleep. Who needs dreams where you’re being chased by criminals or in the middle of a disaster.

Sounds that you may not even notice or have become used to, like a television in another room or traffic, can prevent you from entering the deep part of your sleep cycle. If you can't avoid it, then moldable ear plugs can help. Be sure to follow the manufacturer's instructions, and don't get them stuck in your ear.

Plant a thought in your mind that will be present when you awake. For example, the idea that you will remain calm and free from stress all day long.

One form of sleep inducing meditation is to breathe deep and repeat to yourself “Relax the eyes, relax the face (while relaxing the eyes and face), relax the head, relax the another body part that needs relaxing” (move from toes to foot to ankle, etc with each repetition). Relax them "past" the point of just being relaxed to where every tension is totally released. Breathe deep from the diaphragm with each breath and exhale slowly. Feel the heart beat.
slower with each exhalation. This is a kind of like meditation, but now it's okay to fall asleep. Repeat over and over as you relax these body parts. Listening to a relaxation tape that guides you through this process can really help unwind the mind.

Tell yourself that you're going to sleep sooner or later -- so it might as well be sooner. This will relieve the self-imposed pressure of feeling you have to drift off, and you will further relax.

Centuries ago the Chinese developed another form of sleep meditation. Close your eyes and imagine a small wheel turning inside your head just above the center of your eyes. I prefer a waterwheel, with the water symbolizing the flow of life. Chant the word "ahhhmmmm."

Melatonin is a powerful neuro-hormone secreted by the pineal gland in the human brain that is associated with our natural sleep-wake cycle. It can be very helpful in getting a good night’s sleep and for insomnia. Melatonin is a precursor to the neurotransmitter serotonin. It must be used moderately and wisely. Serotonin production decreases with age. During the day, our melatonin levels are very low. But at night they rise dramatically, apparently in response to the fading light.

**Melatonin supplementation is not for everyone. Not everyone is low in serotonin.**

**Only if you need it, use small amounts of melatonin – only as much that is needed to help you drift off.**

**Too much melatonin can cause depression.**

You do not want to flood the brain with too much melatonin. I take about 1/6 mg each night at bedtime. I open up a 3 mg capsule, and place 1/6 of the contents and (1/2 mg) under my tongue for rapid absorption.

If you are like me, a short while after taking the melatonin you may notice an aggressive feeling, or even a little anger. If this is the case, take less in the future.

If you wake up in the middle of the night to whiz because of all the water you're now drinking, it would be a good time to have a small meal. As previously described, the body doesn't store protein, and will even take it from stores in your muscle and organs, (i.e. disassemble you), even when you're sleeping. I usually have one of my small meals then. - - also some antioxidants. Saliva doesn't flow much when we're sleeping, so you'll need to give the teeth another quick brushing. You may or may not want to take just a little more melatonin under the tongue -- probably less than 1/6 of the contents of the capsule (less than 1/2 mg), as it may cause you to be groggy upon waking. Personally, I do NOT need or take any melatonin in the middle of the night like I this. Do the “Relax the eyes, relax the face . . . " meditation described above. Upon doing these I go back to sleep fairly quickly, sleep deeply and wake up really refreshed. And, it will really help you sleep. Is waking in the early morning hours issue problem, perhaps even setting an alarm at 1:00 or 2:00 am and doing the above would be worth a try.

Sweet Dreams.

**Behavior Modification and Motivation**

Using phrasing of your choice, use the "Once an Hour" and "Big Bang" methods in the Chapter 9 to get happy.

**How do you cook a monkey?**
First, you coax him into a kettle of moderately warm water with, say, a banana or a nice girl monkey. He's happy, so you turn up the heat ever so little. He doesn't notice a thing. Then up the heat just a tad, then a tad more. He still doesn't quite notice, but he's just not as happy as at first. Keep upping the heat and voilà -- your monkey is cooked.

Animal activists, take note: This is just an example of what can happen to any of us. I am not actually advocating the cooking of our simian friends. I have never, ever in my life turned up the heat on a kettle of live monkey, or any other living thing, not even a lobster. I believe animals have feelings and I advocate the rights of animals on many, many issues. This is just an example of what can happen to a person who gets into a situation that's comfortable and satisfying at first. Then a little of the reward is taken away or a few more demands are made. More taken and more demanded and so on, until you feel like you're cooked.

So learn to recognize when this is happening to you -- Jump out of the kettle and flee. If there's a situation it your life that's repressive dragging you down, try to fix it. And if the situation involve something other than, say, your child or another personal responsibility that you really must to stay with, just get out. If you must stay with it, then do was much of this system as you can for now, and pick up the rest later. These situations will be more easily recognized, and solutions will be more apparent with the fine tuning you'll experience from this system.

**Know what to change and when to change it**

Happiness can be a balance between accepting things the way they are and making some changes. Take a look at what needs to be changed in your life -- your job, relationships, living situation, and the like. Then take action to make what changes are necessary for greater happiness.

**Stonewall It**

Push unwanted thoughts out of your mind. The mind makes no distinction as to what’s real and imagined. A positive mental outlook will come easier with your body, brain, mind and spirit are operating as well as they can be with the use of this system. Optimism will come more naturally.

Eliminate thoughts of frustration, anger, resentment, depression, thoughts of what you should have said, that bozo who cut you off on the freeway, what someone said to you at work, and even fear . . . sound familiar? Throw them out of your mind! You have no place for them.

Throw these thoughts out – and if they try to return, don’t let them get a foothold. Replace them with thoughts of love, joy and peace, thoughts of good things and good people who have graced your life, and thoughts of your favorite things.

Admittedly, this one can be the most difficult under normal conditions. But if you have been under extraordinary pressure (whether “real”, or self induced and unnecessary), you may have reached that point of motivation where you’ve really, really had enough. This will change your life. You will be amazed at the value of this.

Yes, ugly thoughts can be like old friends and hard to part with. But they're not your friends – in fact, they are destructive and they tear your mind and your body down. And you have the choice in designing your own mentality. It’s difficult at first, but as you continue and gain momentum it becomes a positive habit. So drive out all bad thoughts,
thoughts of things that go wrong, thoughts of anger, how you have been hurt or betrayed . . . starting now.

**The Happy Blast**

This one is just a quick fix and really doesn't solve any underlying problems, but it's kind of fun. So for a quick positive charge (especially when something goes wrong) I use a swinging little mantra I call the HAPPY BLAST and it goes like this:

"I feel happy, I feel good, I feel happy, happy gooed, I feel happy happy good good, really happy happy good. . . everythings going to be just great, bad is gone good is in, hippy happy good good  ah-woo woo woo . . . " etc.

After about 20 minutes of this I get real happy. Just make up what suits you.

Try the accompanying happy walk. Or for a really good time, do the happy dance.

**Last thing at night, first thing in the morning**

What are the first things you think about when you first wake up? Probably all the things you have to do, rehearsing for what you will say to someone, or worrying?

For a few minutes, make the last thing at night and the first thing in the morning filled with positive thoughts. Remind yourself that throughout this day, and in every day, there is no place in your heart for anger or worry, or anything else that will disturb your peace.

Is it worth the aggravation to let your ego win some minor battle, but damage your body with all the stress that it takes to get it?

Consider the beauty of nearby trees and grass, how a seed melds with the earth, water and air to become a flower, the beauty and power of love. Maybe even put on some easy listening or soothing classical music to further set your tone for the day.

To help remember in the morning, the very last thing before going to sleep at night is to remind yourself to do this upon first awakening.

**Personal Growth**

There are lots and lots of books and tapes on self-improvement, self-help and spiritual awakening available to you from an array of sources. Everyone is different, so try some -- explore and find what works for you. "A Course in Miracles" is among the best. Wayne Dyer's "Manifest Your Destiny" offers spiritual principles to help attract what you want into your life. For me, it was instrumental in bringing about a greater sense of harmony with the world. It's available in a book and on tape, with an accompanying meditation tape.

Deepak Chopra's "The Seven Spiritual Laws Of Success" combines physics, philosophy, spirituality, Eastern wisdom, and western science for a fulfilling guidebook to discovering one's potential. And Anthony Robbins offers lots of methods for rewiring your brain for success and happiness, as well as reducing the pain in one's life. For example, his method of listing what you have to gain and lose can change unwanted behaviors and patterns. I have used these with excellent success. These methods are available in "Personal Power II" by Anthony Robbins.

These are a few of the great materials out there, this list just scratches the surface. Don't be gullible, but continue to learn and grow, physically, mentally, emotionally and spiritually.
**Personal Relationships**

A study of 22,000 men and women at the University of Michigan showed that people with few close relationships were two-to-four times more likely to die in a given period of time than those with a strong network of friends. This demonstrates how relationships can help us handle stress.

One study of elderly heart attack patients found that those with two or more close associates enjoyed twice the one-year survival rate of those who were completely alone.

Relationships require time, cultivation and sometimes a little understanding

**Your Career**

My excellent pal of over twenty years, "Captain" Rick is a high energy, movin' on down the highway of life kind of guy, and a budding musician and songwriter. He's always eager to master new skills and take on new adventures. Twenty years ago he would describe his dream of becoming a pilot. Sure enough, through hard work and persistence he is now a pilot for a major airline. Piloting a 727 can be immensely challenging and rewarding. There's just one problem though, it's just not his cup of tea and it's a mismatch for his personality type.

A happy work life is vital to health and antiaging. "Have a job you love and you'll never work again" is a phrase we sometimes hear. One minor problem with that is that the world often places little value and won't pay money for us to do what we love. Consider "Find something you like a lot that for sure the world will pay for, and do other things you really love in your spare time, and you can still be really happy". Or maybe "Find a way to make your present career fun and rewarding". The Behavior Modification and Motivation section can help with all this.

If you are considering a new career, take personality tests to find what's really a good fit. Research the opportunities and occupational categories. There may be options of which you're not aware.

Beware of inflated claims of market opportunities by educational institutions and companies selling training programs. Research the market thoroughly, talk to graduates and companies that might employ you.

Here's a occupational retooling success story: Everyone seems to immediately love my dear friend Amy. When she enters a room full of strangers she is soon the center of attention. And she has a profound love for animals -- dogs, cats, raccoons, llamas, you name it. She was successful as a legal secretary for 12 years, but wanted to move to a career with not only more opportunity, but also where she could make more meaningful contributions to the world. At first she considered something along the lines of a psychotherapist (one aptitude and personality test suggested the option of "ward nurse") . One problem is that it takes many years of study, then on to usually unpaid internships, then a long time to build up a practice. And it takes a special kind of person to listen to other peoples' problems all day long. Many people become disillusioned and unhappy after making such a great investment in time and money only to find that it was fun while learning, but the day-to-day job is not for them. Anyway, legal secretaries know a lot about the inner workings of the law and legal processes and the like, and often train attorneys fresh out of school as to what the law is really all about. So I suggested she become a lawyer. At first she was stunned with disbelief and just didn't think she had what's needed to be a "powerful attorney" type. But over time the idea grew on her and she
enrolled in night school. Today she's a happy (and "powerful") attorney and frequently
takes on and resolves animal cruelty cases. And recently she took about a 1/3 cut in pay to
have a lower pressure position with work that she loves and a firm that really appreciates
her.

And all is well for Captain Rick. His present occupation supports him and his family
well, and it affords him enough spare time to research and start new businesses.

**Come Up for Some Air**

Imagine a zeppelin that’s all crunched over and only able to be partially inflated. Do
you think it would ever get off the ground? OK, another dumb analogy. But this is how a
lot of people live their lives – all hunched over and depriving themselves of the oxygen
necessary for your youthful joyous life.

Every part of our bodies needs oxygen on an ongoing basis, as well as to eliminate
carbon dioxide.

Deep breathing also helps reduce stress, as well as reduce the urge to overeat. You may
frequently catch yourself breathing shallow or even holding your breath, especially when
under stress. This causes more damage to the body and brain by depriving them of the
necessary ongoing resources. Resolve to “catch yourself in the act” and always practice
better breathing. Soon it will become a habit.

Get in the habit of sitting or standing up straight, and breathing from deep in the
diaphragm as described in the relaxation and meditation sections.

**Deep breathing exercises? - NO!**

While correct deep breathing throughout the and while meditating is important,
"health" and "therapeutic" breathing methods consisting of repeated deep breaths, often in
the hundreds of unnatural breaths, is dangerous and should be avoided.

**Spirituality, Faith, Prayer and Health**

Having your body, brain and mind in tune and working at their peak with this system
can do much to improve your spiritual receptivity and help you form your own spiritual
connection. The "body as a temple" is the cornerstone of many religious beliefs. Although
this is not a spiritual program, per se, when your machinery is in optimal working order, it
follows that you will be more spiritually aware, and be better able to form a spiritual
connection. You will have higher consciousness and a greater understanding of, and
capacity for, spirituality and for making contributions to others and to the world, as well as
make better judgments between what is real and the ones that are illusion.

Spirituality is a personal concern and is subject to individual interpretation. It is
difficult to find agreement on exactly what it is. In an article named "Leaping Lamb:
Investigating the Spirituality of Children" in the July/August 2000 issue of Science &
Spirit, K. Helmut Reich points out that although no consensual definition exists, some
categories constitute the core of spirituality: achieving personhood, existential awareness,
being-in-relation, a sense of the sacred, and so on. Some view religion as part of
spirituality, others view spirituality as part of religion, and others say that spirituality and
religion are distinct but overlapping. He says that perhaps spirituality could be considered
as not simply **extending** but **transcending** the biological. In addition to religious
spirituality, we can speak of the spirituality of art, music, esthetic appreciation and so on.
Religion does not go hand-in-hand with spirituality. Spirituality is completely separate from religion. Spirituality is being aware, and listening to your essence, which is part of God. Religion can be a way to bring people together to collectively do good and keep on track, and it can contain dogma and ritual. One can be very religious, but completely lacking in any spirituality -- e.g. religious extremists and fanatics, persecution and religious oppression, hatred, intolerance,quisitions, torture and other inhumane acts such as wars brought on by religious fervor.

And in "First Impressions: Evidence of a Hard-Wired Spirituality", David Hay notes how the overarching theme, coined "relational consciousness", referred to an intense awareness of relatedness -- either to God, to other people, to the and garment and indeed to the self. He also describes how language is ill-equipped to give adequate expression to spiritual life.

A study in the May issue of Health Psychology entitled "Religious Involvement and Mortality: A Meta-Analytic Review" reveals that religious involvement is associated with higher odds of survival (or, conversely, lower odds of death). Dr. Michael E. McCullough and his research team summarized the findings of 42 different studies examined the relationship between religious involvement and longevity to arrive at this conclusion.

As Wayne Dyer describes in Manifest Your Destiny, a lot of people think of God is a kind vending machine. They put in coins in the form of prayers and hope to get what they want in return. This has never worked for me. Dr. Dyer also stresses the importance of the relationship of the person to the world in spirituality.

Dr. Harold Koenig, director of Duke University's Center for the Study of religion/Spirituality and Health assures that religion is relevant to health. He and his colleagues have found that people who attend church regularly are hospitalized less than those who never or rarely participate in church services.

People who pray and read the Bible have lower blood pressure and stronger immune systems. Health benefits are higher in those with a greater level of religious involvement. Other research in the field has shown that the devoutly religious are less likely to suffer heart attacks, and religious cancer patients have less anxiety.

The religious people tend to avoid alcohol abuse, risky sexual behavior and other destructive habits. Also, and affiliation with a church may be practical in terms of support systems were even catching a right to the doctor.

The National Institutes of Health has just funded a five-year project to measure how prayer alters the natural neuroendocrine mediated immune protective mechanisms in breast cancer patients. Neuroendocrine markers, and T, NK cell and lymphocyte immune cells will be measured, as well as subjective perceptions of stress, psychosocial functioning, and quality of life.

The above effects, however, are observations and not double-blind crossover studies. Others, including Dr. Lee-Benner have conducted surveys among dying cancer patients and found emotions to be only a very weak contributor, if at all. So the point is -- stay in as good of condition as possible and do what you can to avoid disease or diagnose and treat it early.

"Why does man look for a God? Why does man in every nation, in every state of society, want a perfect ideal somewhere, either in man, in God, or elsewhere?-Because that idea is within you. It was your own heart beating and you did not know; you were mistaking it for something external. It is the God within your self that is impelling you to seek Him, to realize Him. After long searches here and there, in temples and in churches,
on earth, in heaven and in hell, at last you come back to your own soul, completing the
circle from where you started, and find that He whom you have been seeking all over the
world for whom you have been weeping and praying in churches and temples, on whom
you were looking as the mystery of all mysteries, shrouded in the clouds, is the nearest of
the near, is your own Self, the reality of your life, body, and soul...By means of spiritual
discipline the individual soul ultimately recognizes its oneness with the Universal Soul."

-- T.S. Eliot, Four Quarters

**Forgiveness**

For a long while I was in proximity of a big burly bearded personality with a booming
voice and an ever expanding midsection. We'll call him "Barney". It can take some time
and effort to find forgiveness for mere minor offenses such as his -- we want to get to point
where forgiveness comes natural for the greatest of offenses.

With average height, the bulk of his midsection could fill a doorway. He can be affable
and at times rather charming, and knowledgeable on a great many things. A pillar of civic
responsibility and weekly churchgoer. But when you are in proximity for a while, another
Barney steps out. This one's a strange butthead, a bully and a self-centered child. He'd start
to move with a kind of roly poly studly strut and you could detect a mean glint in his eye.
When he's around it's somehow noisier. There's tension in the air, and at times, a lot of
cursing which would upset the children. You feel somehow jumpy. Not when you first
meet him, though. At first there's just polite conversation, but if you were paying attention,
a faint suspicion of an odd and overbearing presence.

Barney seemed to take pleasure in toying with others. One of his jolly games was to
bushwack me from behind while I was absorbed in some activity, booming his trademark
"YOOOO!". Variations on this included bellowing, blitzkreig "friendly conversation" or an
enormous belch. Madcap fun for him, but after a couple of dozen times, absolutely
unnerving for the subject. Made me jump out of my boinkin' skin lots of times until I got
smart and learned some evasive maneuvers. This silliness persisted despite repeated pleas
in various forms to just stop.

More antics: Once Barney came barreling down a hill in his car on a dark night when I
couldn't have known it was him. He swerved to the opposite side of the road where I was
standing and hit the brakes, stopping just short of me. A fright. And once I was helping
him with a piece of portable furniture. He was familiar with the operation of this
equipment, but just must have forgotten how the spring-loaded leg assembly would shoot
outward with a resounding *schoick* sound unexpectedly, and with great force. I was in
luck, though. It missed my eye by a good three inches.

A couple of times when I didn't display appropriate interest in some long and involved
paper he had written, he bumped me off my feet with his excessive belly. But I had a soft
landing, so no harm, no foul.

He once casually informed me of the parking ticket I was about to receive all morning,
but 20 minutes after it had been placed under my windshield wiper. He'll let out huge
belches and pass gas just about anytime and anywhere, and has even subjected his
extremely thoughtful and generous wife to this at the dinner table. He turned up at a couple
of singles get-togethers when wifey was out of town, and once bragged about the crude and
ridiculous way he had recently propositioned a former girl friend.

One appalling event I once witnessed was when, for no apparent reason, he told his
visiting step-granddaughter "I'm really glad you came to visit. So I can spank ya." Yes, I
alerted his wife to this meanness and was prepared to take further action. No, I've never witnessed any such spanking. But the sound of bushwacked children with a huge "Arrrrrrrr!", instantly followed by little shrieks or a feebly admonishing "Ohmygosh!!" still rings. Spawning a new generation of bushwackers.

My anger, resentment and distaste were kept pretty much in check. But a little dread would swell up from inside when I would hear him coming, and I started looking over my shoulder a lot.

But of course, Barney's obnoxious antics are not in nearly the same league as physical abuse, rape, taking the life of a loved one and other transgressions of the kind that others endure and forgive.

Carrying around hateful and loathing baggage undermines your own mental and the physical well-being. Maintaining "attack thoughts" is an attack upon yourself.

Forgiveness will bring you healing. It will lift a burden from you and bring peace. Forgiveness will allow you to see the good and not the ugly, and redesign the world in which you live.

Along with prayer, forgiveness is a fundamental component of mental and spiritual health and can produce beneficial and healing effects. This doesn't mean leaving yourself open for more abuse or even staying around an abusive person.

Robert Enright is professor at the University of Wisconsin-Madison and president of the International Forgiveness Institute. In a study among elderly females, Enright, along with researcher John Hebl found a significant decrease in depression and anxiety among those who participated in a forgiveness program (although the control group did experience some of the same benefits). Furthermore, the researchers found that the elderly women who participated in the study not only used forgiveness skills to reconcile with a single person, but "also to consider more deliberately forgiveness as a social problem solving strategy". (F1)

My friend Adam is a writer with high ambitions of breathing life into dreams. He affirms: "Holding anger, grudges or attack thoughts will eat you alive. They can bring down your health, your state of mind and your effectiveness at work. Let 'em go. Regarding snappy and aggravating people, we should feel bad for them because they're stuck with such sour attitudes and are awfully unhappy. If we just treat them pleasantly it just may lift their spirits, as well as ours."

Here are just a few methods: Say that you forgive the person aloud, using their name. Or write them a letter of forgiveness. You don't have to give the letter to them. Or see the person in your mind and try to perceive some light within them, and a spark of goodness somewhere. In your mind make him or her your friend. Remember that you aspire to a level of living and freedom that is beyond such negativity. "A Course in Miracles" and other texts can help you with this. Also, the "Once an hour every hour" and "Big Bang" methods in the Behavior Modification and Motivation section will help get negative thoughts away from your mind and replace them with more positive mental activity.

Surely you have known a Barney. He seems to be mellowing in recent years, though. Increasing health problems must be taking the wind out of his sails. And I suspect, a great loneliness.

See the appendix for more information on forgiveness.

*When Things Go Wrong*
When things go wrong, ask "what's the lesson here?" Try to learn from it, and don't compound the problem by getting yourself all worked up.

**Love in the Streets**

As you walk down the sidewalk or drive down the road in your car, imagine sending love to every person and everything you pass. You'll be surprised at how uplifting it will be for you, and how much better you'll feel about the world.

**Potpourri**

Envious of others and their possessions/friends/love live/[fill in the blanks]? Well don't compare yourself with others -- consider what you have and how great you are. Besides, they've got their own set of problems. Lack confidence? Minimize your risks, ask ask "what's the worse that could happen." Chances are you could live with it. Mourning a loss for too long? Embrace the mourning for one day. Go ahead, cry, do nothing, whatever. Then absolutely put it behind you and move on. Been living up to others' expectations? Free yourself -- so what if you disappoint someone else? Worry too much? Take action to free yourself from worry. Just start on the very first thing, then the next, then the next. Make a list, take action. Overcommitted? Do some things just for yourself. Stressed? This entire manual will help you lower it -- in particular, exercising twice a day as previously described, and meditation for around an hour on the days you might fall into particularly high stress.

**Meet Your Ego**

According to *A Course in Miracles*, your ego is the wrong-minded attempt to perceive yourself as you wish to be, rather than as you are. You perceive the world and everything in it as meaningful in terms of ego goals, which have nothing to do with your own best interests.

The ego likes to run the show, and can cause us an awful lot of grief. It has a bag of tricks that it uses to try to stay in control. These tricks include conflict, confusion, illusion, dissatisfaction, self-preservation and fear. Sometimes it will cause you emotional distress for no reason just to try to show you it's influence.

Egos often try to exploit situations and turn them into forms of praise for itself in order to overcome its doubts. It "gives to get". Egos often clash, and some egos make themselves feel better by putting others down. Egos can play lots of games for strange gratification. Like making inane remarks or vague insults to shake another up and draw them in, or watch them try to explain to them why they are so very wrong.

The ego varies among people, but is universally unstable. It believes it is completely on its own. An ego will really fight to keep from losing control to the (holy) spirit. It can put you through hell to get what it wants.

*A Course in Miracles* and other psychological & spiritual studies can help one drop the ego and live in spirit.

Be free from the influence of the ego, and experience perfect happiness.

**A Course in Miracles**

*A Course in Miracles* is a system of spiritual study. The curriculum is carefully conceived and explained, step-by-step, at both the theoretical and practical levels. It
emphasizes application rather than theory, and experience rather than theology. It requires "a little willingness" and when going through it you normally study one lesson each day.

*A Course in Miracles* is the result of a joint effort in a common goal by Helen Schucman and William Thetford. They were Professors of Medical Psychology at Columbia University's College of Physicians and Surgeons in New York City.

Chapter One offers 50 explanations, or principles, regarding what a miracle is. It's not quite the same as the dictionary definition of "an event transcending the known laws of nature due to supernatural intervention", like instantly healing the sick or raising the dead. But to my thinking it is just as wonderful an expression.

The idea is to train your mind in a systematic way through a different, and immensely better, perception of the world -- free from the influence of the ego and in perfect happiness. It is Christian in statement, but deals with universal spiritual themes. It stresses that it is but one version of universal truth. There are many other paths that lead to God in the end and this one differs only in form.

Some of the concepts include the elimination of preoccupation with past thoughts such conflict, illusion and fear, seeing peace and being at peace, eliminating "attack thoughts" and their effects on you, and bringing peace through forgiveness.

Some of the concepts can be disagreeable or even disturbing. Your ego may throw up barriers and actively resist.

We consider "A Course in Miracles" a "requirement", although it is up to you when you are ready to take it.

Like all good things, it requires time and commitment. Although I'm still working on it, the course has helped me clear out some erroneous and illusory notions from my thinking and brought me peace.

Although there are a number of supplements to it, the usual format is the combined volume and consists of a blue book of about 1000 pages. There is a text, a workbook for students, and a manual for teachers.

SO THIS IS IMPORTANT: If you do A Course and Miracles, it is important for you to know that the workbook for students starts at the middle of the book -- And that's the most important part for you to study. You probably won't want to start at the beginning, like I initially did and got pretty confused.

**Daily Word**

The Daily Word is a neat little book offering brief, three or four paragraph inspirational and energizing messages each day on a variety of topics. Subjects include life's journey, forgiveness, amazement and inner peace. The Daily Word is available from the Unity Church.
Chapter 7 -- Water

"All diseases will surely be cured, even old age."

Benjamin Franklin

Your body is kind of like the city of Venice, where the roads are canals. Water is the transportation medium by which necessary materials (in your body, that's things like nutrients, oxygen, energy and waste) are moved into, around, and out of your city/body. Now imagine the Venetian canals with about 3 inches of water. Yikes! Groceries going undelivered, stinking garbage piling up. Gondoliers running aground, and they're not singing. Things start to stagnate and smell really bad. I know, yet another obtuse comparison. But I really want you to remember to drink your water, because . . .

Like temperature, ph (acidity), and the concentration of molecules, water has an effect on how your body operates on a molecular level and how the molecular structures necessary for life interact with one another.

We could live without food for two months, but without water you'd die within days. Water aids in digestion and metabolism, maintains body temperature, and lubricates your joints. It is also necessary for maintaining muscle tone, washing out toxins and impurities, and water helps the kidneys filtrate wastes from your blood. Blood is 50% water, so if your water content is low, your blood is thick like sludge. Well hydrated blood moves more easily around obstructions. Water helps to maintain our body temperature, and it is needed for weight loss because it is needed in order to metabolize fat. Also, drinking water will help you feel fuller and the less inclined to snack. And it even keeps the skin full and plump, so you'll be lookin' good.

The thirst feedback system -- I call it the "thirstmostat", ☺ sets lower with age. So older people actually need more water than they perceive because they're not thirsty when they should be.

As previously mentioned, coffee, tea and cocoa drinks act on the kidney to increase urination, which limits their usefulness in fulfilling the body's fluid needs. So they don't count as water. In fact, they are diuretic and dehydration-promoting so you'll have to drink a little more water to make up for them.

75% of Americans are chronically dehydrated, in 37% of Americans, the thirst mechanism is so weak that it is often mistaken for hunger, even MILD dehydration will slow down one's metabolism as much as 3%, one glass of water shuts down midnight hunger pangs for almost 100% of the dieters studied in a University of Washington study, lack of water is the #1 trigger of daytime fatigue, a University of Washington study indicates that 8 to 10 glasses of water a day could significantly ease back and joint pain for up to 80% of sufferers, a mere 2% drop in body water can trigger fuzzy short-term memory, trouble with basic math, and difficulty focusing on the computer screen, drinking 8 to 10 glasses of water daily decreases the risk of colon cancer by 45%, plus it can slash the risk of breast cancer by 79%, and one is 50% less likely to develop bladder cancer.

Medical Details -- and Follow Your Doctor's Guidance

Review the "friendly" disclaimer at the start of this manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual.
Some examples of medical conditions where a person would have to modify or limit the amounts of water they drink include congestive heart failure, renal insufficiency, impaired renal function, among others. Someone who is on diuretics may have similar considerations. Discuss this with your doctor and follow their advice.

**Amount of Water**

- **Spread your water drinking out throughout the day.** If large volumes of water are taken in a short space of time it can provide short lived symptoms similar to being drunk. And it's OK to have water (and nutrients) with meals as it's not going to significantly dilute your digestive juices.

  If you’re into formulas, here’s one for water intake: (Approx.) \( \frac{2}{3} \) ounce per pound of your body weight per day (if you’re active, and I’m assuming you are because you’re following the exercise recommendations above), spread throughout the day. So for a 150 pound person, that’s \( 150 \times \frac{2}{3} = 100 \) oz. So that’s about 12.5 8 oz. glasses per day. It works best to carry water with you, or keep it nearby.

  And if you’re not into formulas and making measurements, **usually about an 8 oz. glass each hour for a 150 pound person** will do just fine -- a little more if you’re heavier, a little less if you’re lighter. Or just make it a minimum of 2 quarts a day, but about a gallon a day is best.

**Water Quality**

- Like health food, there's a lot of controversy regarding our public water supply. Clean water proponents and bottled water companies say that more than a dozen known carcinogens, pre-cancer forming agents such as toxic minerals, are found in small amounts in drinking water of some U.S. cities. Many of these form as a result of the chlorination process that kills harmful microbes. In recent years, detergents, pesticides, fertilizers, industrial byproducts, other chemicals -- like arsenic, mercury, cadmium and lead -- and even nuclear wastes have begun to seek into our water supply. These have either been discarded improperly, or come from industrial dumping, leaking storage tanks, landfills, or storm runoff. Lead is also a serious problem, and excessive exposure can lead to damage to the nervous system, brain, kidneys and red blood cells -- and children are particularly at risk for lead poisoning. (Ref T1) Although there is controversy whether small amounts of these pose a cancer threat, just to play it safe but I'll drink bottled over plain old tap water. Buying a small water dispenser and 5-gallon bottles is probably the most cost effective pure water solution.

  But if there's no bottled water around or if you just can't afford it, drink it from the tap. However, be aware that even in water bottled directly "at the source" from "mountain springs" have been shown to have unacceptable levels of cancer causing chemicals, like chromium 6. There are tests available to determine the level of these chemicals that have been ingested.

**What Goes Up Must Come Down**

- After a few weeks of increased intake your bladder should be able to carry more. Now for a bit of practical reality: The urge to purge the water you drank an hour ago can come up on you with an urgency that is immense. Yup, like a racehorse. And I mean desperate and getting worse by the moment. You will have two options -- and one of them is to explode. At minimum it would be a source of great discomfort. Or even the source of
great embarrassment if you are out driving around or are in a meeting and really need to use a bathroom but can’t find one. So plan accordingly.

**And if you are driving and really, really, really have to go, no matter how desperately, continue to drive safely.**

Also, unless you don’t mind getting up from bed to march down the hall a couple of times each night, don’t drink water a couple of hours before bedtime. More reality: Still, you'll probably need to urinate at least once in the middle of the night. A guy can keep a jug at the side of the bed and just, well, kind of roll on his side -- you get the picture (dabbing the urethral area with tissue afterward can cause irritation). For a gal, this can be the little more difficult to negotiate. And you won't want to have to wake up early in the morning, and not be able to get back to sleep and miss out on your REM sleep. So definitely planned your drinking habits accordingly.

When you are awake in the middle of the night, that would be a good time to have one of your protein powder and carb meals. Since nutritional supplements are best taken throughout the day, that would be a good time. Be sure to need to give the teeth another quick brushing afterwards. You'll find that you will sleep deeply afterwards, and you'll a probably dream. Read the section on sleep for ideas on how to get back to sleep easily.

**The body needs adequate amounts of water for the nutrition and exercise, and other concepts presented here to work. But this is the easiest to forget.** This has happened to me. After about six months I noticed that I didn’t have as much energy and vitality, and wasn't as happy as before. I made a check of everything in the program, and found that the correct amounts of water were missing. Learn from my mistake.

So measure it if you must, but remember your water.
"Health is the first wealth."
Ralph Waldo Emerson

Moderate and appropriate amounts of well-designed vitamins, nutrients and other nutritional supplements can be a valuable part of your aging intervention system.

They should be coordinated with a complete health, fitness, aging intervention, antiaging science and life enhancement system which includes the scientifically designed and precision nutrition and exercise, stress reduction, risk reduction and other methods in this manual.

Remember -- "Youth Doesn't Come In a Bottle"? -- or a syringe or patch or other delivery system.

Still, it would take 20,000 calories of vegetables each day to fulfill your requirements for vitamins, minerals, and micronutrients.

Vitamins are vital nutrients and organic substances that act as components of enzymes and coenzymes. Enzymes are needed for speeding up chemical reactions that take place in our bodies. Coenzymes help enzymes carry out their life-sustaining functions. These chemical reactions are what control our body’s very metabolic processes. So taking vitamin supplements are needed for maintaining good health, especially if there is a deficiency.

You will find the vitamin and nutrient suggestions found in these pages awfully tame compared to the outlandish claims, or recommendations for megadoses that have been made by some popular authors and lecturers. The hazards of megadosing (taking lots and lots of vitamins) and combining megadoses of many different supplements are coming to light and is considered unnecessary and dangerous by many reputable and responsible experts and companies selling nutritional supplements. But many still offer a very wide range of questionable supplements and make outrageous claims. The effects of combining lots of different kinds of supplements are unclear.

The Physicians Desk Reference (PDR) is a comprehensive resource with information on more than 1,000 prescription medications, including side effects and possible food and drug interactions. There is a PDR for Nutritional Supplements to help you separate fact from fiction. It's available here:


or at (800) 232-7379.

Or at this site: http://www.pdrhealth.com/

And specifically at this page: http://www.pdrhealth.com/drug_info/index.html

These are the selections:
- Prescription Drugs A-Z
- OTC Drugs A-Z
- Herbal Medicines A-Z
- Nutritional Supplements A-Z
First we'll discuss some of the negatives (and dangers) of inappropriate supplementation, then we'll go on to some guidelines and what works.

**Some Questionable Marketing Methods**

As I write this I'm looking at an ad with cross sections of three arteries -- the first is nearly clogged due to atherosclerosis, the second is only partially clogged, and the third is healthy and clear. The ad's copy talks about wonderful restorative effects of the product. Maybe I'm a skeptic, but to me it implies that this product will restore atherosclerotic arteries to healthy ones.

Some of the "scientific references" at the end of the ad may include popular magazine articles, studies or letters in journals of questionable standing, data only (data from experiments done on rats -- and although we share many biological similarities, rats are vastly different from humans), references that are only distantly related to the product, or talk about diseases that are different than the one the product is said to improve, and even U.S. Patents. They often reference the advertising or articles in their own publication. Often these articles often don't show the name of the author or their credentials -- respected doctors and researchers with a lot to lose if their reputations were to be tarnished.

There will sometimes be references to "clinical trials" or "clinical studies" or "clinical research". Often there is no mention of the names of the researchers and institutions where they were conducted, and in which peer reviewed journals they were published -- who is putting their reputations and livelihoods on the line? The design of the "experiment" is often not discussed. Most likely it does not conform to the gold standard -- randomized, double blind, placebo controlled, ideally at multiple locations.

Some companies make no claims in their literature but rely on testimonials, encouraging people to try their products and credit them for any improvement that happen. Chances are the people giving testimonials are doing a lot of other things that will affect their health, and the positive (or negative) changes may not be caused by the factor they think. Some people just like to see their names in print, and they may change their opinions over time after having more experience and after the novelty has worn off. Often testimonials are entirely fictitious.

And all this is complicated because many promoters sincerely believe in what they are doing, whether it is true or not. And often information about proper nutrition, exercise, stress reduction and the like are completely ignored. It could be argued that they're not in the business of nutrition, exercise, stress reduction and shouldn't be expected to offer information on anything other than their products, any more than a car dealership should be expected to give you information on other products, like how to buy house. But health issues involve a different, and higher, standard of ethics.

Some ads for nutritional supplements will contain a vague reference to "people" or "scientists" making an endorsement. Like "There are many people who believe scientists have found the way for us to reach age 80, 90 or 100 in excellent health and vigor. It's known as human wakinol . . ." Or claims may be couched in a question, like "Can polyurethane extract make you perform like you're a twenty year old stud muffin again?" (assuming you ever could), and so forth.

It's been said that if you want to boost sales of a product, tell people it will:

- Make them rich.
- Burn fat.
- Get them sex . . .
SEX sells

. . . not just cars, clothes, cigarettes and booze, but health products as well. One recent ad I noticed is for a vitamin potion depicting what could only be described as a goddess come to earth lookin' for whoopee. She appears very to be hot for one of us ordinary looking mortal type guy who just happens to take a particular kind of nutritional supplement offered by the company.

And this morning I just happened to notice an advertisement with a gray-sprouting, manifestly middle-aged man who looked really really happy, and maybe a little disoriented. He was locked in an amorous embrace with a beautiful, and much younger, babe -- er, I mean young woman, who seemed to be really enjoying herself as well. I would have mistaken her for his daughter!

The unspoken pledge is the same as endless other pledges in modern advertising: "Buy this, get that".

It is well known in the public relations business that an editorial in a newspaper or magazine is many times more believed than an advertisement. So some of the nutritional supplement companies will pay someone with credentials to write an article and make claims for them. This person may be selling the supplements in his or her own practice. The "research" is often based on data that is not genuine and certainly does not comply with the gold standard of research: randomized, double blind, placebo controlled research study -- ideally conducted at multiple locations and published a peer reviewed medical journal. And conducted by scientists who are experienced and respected in the scientific community -- and with a lot to lose if their reputations were to be tarnished.

Sometimes authors and other proponents of nutritional supplements either have their own lines of vitamins to sell you or are aligned in some way with the people who will sell you vitamins. Vitamin companies are prohibited from directly making therapeutic or extravagant claims themselves in product literature. Some companies run this risk, hoping that the government won't take action until their customer base is well established. Often promises are couched in subtle pseudo-medical jargon, or in weasel words like "appears to" (even though the statement may come from a legitimate scientific source) that create an illusion of a promise.

Danish scientists have studied the differences in effects between groups that receive the medication being studied, as well as a placebo and no medication at all. They found that the improvements in the patients who received a placebo and no treatment were often the same -- leading them to wonder whether people who improve on placebos would do as well without any medication.

Or the "results" may be based on "in vitro" (in glass -- [in the laboratory]) experiments with cell cultures or the like that are done in a test tube or similar laboratory container. Things are many times more complicated in the human body. Or the research may be based on rat data that is extrapolated to humans. There is a great amount of scientific literature with examples of chemicals that were first shown to be safe an effective in animals and then found to be ineffective and/or toxic in humans.

On the other hand, some substances deemed hazardous are based on studies where huge amounts of it were fed to rats that developed cancer, and small amounts would probably be safe. Rodents deal with oxidative stress in ways that are fundamentally different and less effective than humans, and they have longer telomeres.
There is little research having to do with the effects of a combination of different nutritional supplements. Or recommendations may be out of the context of a comprehensive system that is practiced on a daily or lifelong basis. Often presentations are unbalanced, and contain little or no information regarding vital exercise, nutrition, stress reduction and the like.

And guess what comes after the scientific article in their magazine? An ad for the product. I'm not saying that that is necessarily bad -- some of the articles are informative, deep and insightful, and based upon good scientific research. People need information to make an informed decision about purchasing products. But often the references include no information on the efficacy of the product they're actually selling.

Psychosomatic symptoms (defined as a reaction by the body to tension) are often relieved by anything taken along with a suggestion that it will work. Tiredness and other minor aches and pains may respond to any enthusiasm accompanying a product that does nothing in itself. For these problems, even physicians may prescribe a placebo. A placebo is something that has no pharmacological effect on the condition for which it is used, but is given to satisfy a patient who believes it to be a medicine.

**Response to an Inquiry**

A personal trainer contacted me once to ask what I thought of some nutritional supplements with scientific sounding names that he was selling. He also asked about telomere shortening. I did some research, and spend a good amount of time to give a very thoughtful reply to his request.

I wrote back and said I'd be interested in knowing why someone would need the first three specifically, and why appropriate nutrition wouldn't supply enough of them. In a brief web search for some of them I found some unsubstantiated, bogus sounding statements -- and little or no talk of the importance of nutrition, exercise, stress reduction etc. -- and how to do them -- accompanying the claims. I obviously take a very dim view of a lot of supplements, and of companies that do not tell the complete story regarding the importance of nutrition, exercise, stress reduction, etc. I also offered my opinion of the role of telomeres in aging along with some resources.

After the time I spent and some useful information I provided, I expected some communication in return, or at least a "thank you" -- but never heard from him again. It became clear that he was trolling for distributors.

**Megadosing**

Regarding megadoses, perhaps they would work for some individuals and for some specific conditions. But there is little scientific evidence that megadoses work under most conditions, and many vitamins and nutrients are toxic in even moderate amounts. This risk rises exponentially when combining megadoses of different nutrients. Over-supplementation, and using the wrong supplements, can carry potential side effects and be hazardous to your health. Megadoses of many minerals, trace elements or vitamins can be toxic, and can overload your body or block the actions of other nutrients. Free radical activity and oxidation are necessary in some forms and too many antioxidants can be counterproductive to your good health.

I was once taking a lot of, and I mean a lot, of antioxidants. I took what is called an oxidative stress test available from a company called Genox. It revealed that the amount of oxidative stress (a measure of oxidation, or free radical damage) in my body were not...
particularly low. This is probably because the antioxidants I was taking were of poor quality, as well as the truth that in most people megadoses do not work.

**Just a few examples of the toxicity and ill effects of overuse of some over-the-counter nutrients:**

- Vitamin A can cause liver damage, and cerebral edema which can be fatal!
- Antioxidants could cause fatigue and muscle weakness. Although Vitamin E supplements increase stamina, there's a point of diminishing returns -- and after that Vitamin E can be toxic.
- Too much zinc suppresses immune function.
- Vitamin D can contribute to hardening of the arteries, liver damage and kidney damage.
- Vitamin B6 can cause irreversible nerve damage. It took me about a year for the tingling and numbness in my right hand to go away.
- Iron can raise "bad" (LDL) cholesterol. Middle-aged men and women should avoid multivitamins that contain more than 15 milligrams of iron. Having too much iron in the blood can put people at risk of cancer, diabetes and heart disease. Several studies have shown that people in industrialized nations who regularly donate blood, thus depleting iron stores a bit, have a lower risk of heart attack.
- For those who are prone to calcium oxalate kidney stones (the most common kind) high doses of Vitamin C will break down into oxalates. (Also diet must be modified) Vitamin C oxidizes and becomes a free radical agent.
- Everyone is different -- some people are sensitive to particular supplements.

The ingredient "thymus" in a dietary or herbal supplement might be thyme, or it might be lymph tissue from a cow. Other raw animal meat may also be hidden in the supplement. Dr. Scott A. Norton, a Maryland dermatologist, wrote in a letter to the editor in the New England Journal of Medicine that because these "natural" supplements are essentially unregulated by the federal government, many contain a variety of animal tissues that could spread illness such as Bovine Spongiform Encephalopathy (BSE), otherwise known as the mad cow disease we've been hearing about in Europe. Eating meat from an animal with the disease is believed by scientists to cause a new form of BSE. A similar fatal brain-wasting affliction that has killed more than 50 people in Britain. However, no case of BSE has ever been found in the United States. Yet.

And here's another example of supplementation that can be misapplied: androstenedione supplements are made of a naturally occurring steroid hormone the body uses to make testosterone. The supplement had been used by home-run king Mark McGwire did raise his levels of testosterone. Researchers say that men who are past their prime muscle-building years can't count on androstenedione to help them build muscle. And a recent study found that the supplement raises the risk of health problems. "Andro didn't raise testosterone levels enough to trigger the male hormone's muscle-building capacity in men ages 30 - 56 years," it said. Meanwhile, "levels of the beneficial form of cholesterol known as HDL fell," the study said. Researchers looked at blood samples taken once a week over 28 days from 27 men who took 100-milligram capsules of andro three times a day. Results from the men on andro were compared with those of 28 men who were given inactive substitutes. The men on andro developed increases of 40 - 50 percent in free testosterone levels in their blood. In a similar study, men 35 - 65 years of age showed no
benefit from andro, even when they did high-intensity strength training. Chronic andro use also lowers libido and erectile function.

As previously discussed, prescription medications, and even over-the-counter medications, cause nutrient depletions resulting in nutritional deficiencies. This is particularly true for the elderly and women (particularly those taking estrogen). People who take a lot of antibiotics, such as children, are also particularly at risk.

In some cases nutritional supplements can increase the effectiveness of prescription drugs.

Most multivitamin/mineral formulas sold in stores are over two years old by the time they are bought off the shelf from the time of manufacture. Also these ingredients are usually a mixture of "natural" and processed products. They are made as inexpensive as possible.

Recently scientists have found that synthetic compounds are purer and more completely absorbed by the body than the so-called "natural" products. For example "Natural" Vitamin E Oil capsules are rancid because they cannot be protected from oxidation in the oil form. Vitamin E does not become an antioxidant until it crosses the intestinal membrane and becomes chemically changed from the Ester form through hydrolysis to the free form. The only safe way to take Vitamin E is the synthetic form which is a pure crystalline powder.

When you approach a nutritional and antioxidant system, it is important to keep in mind that we are biochemically individual. This personal regimen is not a blueprint for you, but rather an example of what worked for me. I offer it as an example to guide other people to help them find what will work for them.

"Smart" Pills

"Smart" pills are vitamins, herbs, & drugs are alleged to increase intelligence, improve memory, & prevent brain aging. True, there are some smart pills that will preserve your brain and increase mental abilities like creativity and memory. But most of them should be taken in small amounts at the most. There ones that will damage you -- so not a smart thing to take.

For example, St. Johns Wort is an herbal supplement sold in health food stores. It is an antidepressant with powerful effects upon the brain. St. Johns Wort should not be used -- not even under "expert" guidance. Also, stay away from all herbal stimulants before a workout, and at all times. These include St. Johns Wort, yohimbe, ma huang, ephedrine, ephedra among others. They can cause dangerously high blood pressure and irregular heart rhythms, and result in death.

The supplements recommended in the for improved brain and nervous system Tier 1 basic system in this manual are proven to be effective by scientific research. Small doses are recommended. A vast majority of people taking them feel more alert, happier and experience greater mental clarity. Still, everyone is different. So if you begin to feel not right, for example like being unusually agitated or "revved up", or overthinking an unfavorable situation that may arise, or feel subdued, or notice anything negative that is unusual about the way you feel, discontinue them for a day or so, then try smaller amounts of them one-at-a-time to fine tune your system to find out what works best for you.

As an example, choline is a dietary precursor to acetylcholine in the central nervous system. It has improved memory and learning in normal subjects and is considered an
essential component of a supplement program. If you become depressed, choline is the most likely candidate to reduce.

So discuss it with your physician, and pay attention to how you feel and be aware that you may have to fine-tune your system as long as you are on an antiaging system and as long as you are taking supplements.

**Hormone Supplementation -- Growth Hormone, Testosterone, Estrogens, DHEA**

Some of the conditions and diseases that middle aged people begin to experience, including abdominal weight gain, depression, and prostate and heart disease, are directly related to hormone imbalances that are correctable with available drugs and nutrients.

Hormone supplementation can improve mood, alertness, libido, and skin and muscle tone in both men and women.

For most people, human growth hormone (or hGH, GH, HGH) Testosterone, estrogen DHEA and other hormone levels drop dramatically by age 30. This is only part of the picture. The simple, and often wrong, solution to the decline in production and aging is to take hormones.

**Human Growth hormone (hGH)**

Human growth hormone has been getting a lot of publicity lately. There is a lot of misunderstanding and misinformation regarding hGH. Its effects can be very positive, but many people mistakenly believe that all you have to do to be young again is inject hGH, or spray something that has been marketed as hGH (but is not) under the tongue. Others would have it as the first thing they would do in their system.

The effects of inappropriately administered hGH and other hormones, like other nutritional and hormonal supplements, can be hazardous to your health.

People who are not deficient in hormones do not need to use them. In fact, supra-physiologic (more than the physiological amount) hormone replacement hormone replacement is harmful, even lethal!

"Growth hormones and testosterone are indicated only for actual deficiency", confirms Paul S. Jellinger, MD, president of the American Assn. of Clinical Endocrinologists. "The issue gets complicated in the context of anti-aging medicine. Patients are asking about supplements and hormones, and doctors have to be well-informed."

Often it is an entirely inappropriate form of anti-aging therapy.

Also, some preliminary data from studies on animals shows that although growth hormone can improve the apparent quality of their lives, itshortens them somewhat.

Most doctors are not well informed about this -- despite what they say about themselves. The use of hGH -- which is a brain hormone -- is a field best left to the subspecialty of endocrinology. You should definitely be under the care and supervision of a neuroendocrinologist.

Growth hormone is secreted by the anterior portion of the pituitary gland located in the base of the skull. A hormone is a kind of chemical produced by a gland, that is secreted into the bloodstream and controls the function of distant cells or organs. Mention the word hormone, and sex hormones like testosterone or estrogen, often come to mind. 300,000 nanograms or more of hGH per day are required to do any good.
hGH production, like neurotransmitters and many or most other hormones, declines with age. hGH secretion begins to decline after you reach full growth, at the rate of 14% per decade, and is reduced from a peak of about 20 ng/ml to around 2 ng/ml. After the age of 50. (ng = nanogram, or 1,000,000 gram). Decreased production of growth hormone is responsible for the frailty and fragility of aging, produced by poor body and muscle tone, weight gain and immune function decline.

Growth hormone is quickly metabolized, and only present in the bloodstream for a few minutes, so it is not easily measured directly. It is responsible for intracellular transduction signaling for protein metabolism. Its effect is to signal the liver to make a series of "growth factors" which may be the actual ones that repair the cells. IGF-1 is one of the more stable ones, because and it remains detectable in the blood for a 24 hour period. There is not a direct relationship between growth hormone and IGF-1 in the blood, so you cannot measure the effects of hGH is by measuring the IGF-1. However, it is used as a measure to indicate excessive effects of hGH.

The relationship of growth hormone with other hormones is complex, and growth hormone production is controlled by a complex feedback system. hGH depends upon another hormone and is inhibited by somatostatin (growth hormone-releasing hormone), which is secreted by the hypothalamus. hGH is released in a pulse-like fashion, 6-8 times a day and most prominently during deep, slow wave sleep which occurs about an hour after you fall asleep.

A simple, and often wrong, solution to declining hGH production that accompanies aging that is performed by many inexperienced practitioners is to put a patient on hGH. Unfortunately, there are many other considerations, such as changes in hGH receptors, the patient's unique physiology, interactions with other hormones, and many others.

There is a feedback system, so the body decreases or shuts down natural production.
Natural hormones produced by the body are usually better. And hormone receptors (the sites on the cells that are activated by the hormones that produce the desired responses) typically decline with age, along with the machinery and the cells that communicate and make use of the hormonal messages. All this complicates things, which is part of the reason why the supervision of a neuroendocrinologist is needed.

Growth hormone costs around $800-$1200 per month. If you have a whole lot of money, hGH might be a good idea -- if you need it. But most folks would have to work extra hard for more hours, and subject of themselves a lot of wear and tear (stress) to make that extra money to be able to afford it since most insurance companies don't want to pay for it. And by putting in all those extra hours you might be tempted to slack off on the exercise, food preparation for necessary nutrition, meditation, and other key components in this system. This trade-off just wouldn't be worth it.

Measures of aging include muscle, bone, organ and fat mass. The first three decrease with age, and as most of us know by now, fat tends to increase -- particularly intra-abdominal (visceral) fat (a cardiac risk factor). Growth hormone supplementation can partially reverse this. The size and number of muscle cells, and the rates of protein, DNA and RNA synthesis within muscle cells, are sensitive to GH. hGH also has important effects on the functions of most organs, including the liver, kidneys and lymph system. Adequate growth hormone release is necessary for proper T-cell (a kind of immune cell) production. Thus, the decline in the body's growth hormone release results in immune system decline.

Growth hormone treated patients have had significant improvements in quality of life scores on standard psychological tests of energy, and emotional reactions to stress, and social isolation. This hormone is one of the most studied and well researched. There are 40,000+ peer reviewed scientific articles researching the effects, efficacy, safety, etc. over the past 35 years. This does NOT mean that all use of growth hormone is effective or safe.

The most common side effects of hGH in adults are edema (fluid retention) and arthralgia (joint pain) or myalgia (muscular pain). Also, carpal tunnel syndrome, initial bone loss, increased insulin resistance and possible cardiovascular disease. These are usually dependent upon the dosage.

Here is scientific information on human growth hormone from the Protein Data Bank:

http://www.rcsb.org/pdb/cgi/explore.cgi?pid=265631022778126&pdbId=1HGU

Here is structural (how it's atoms are configured) information. Scroll down to the ATOM records (left hand column is "ATOM"). Columns 6-8 are the 3 dimensional coordinates of each atom in the hGH molecule:

http://www.rcsb.org/pdb/cgi/explore.cgi?job=download;pdbId=1HGU;page=;pid=265631022778126&opt=show&format=PDB&pre=1

Here is the main page of the Protein Data Bank:

http://www.pdb.org

**The Rudman Study**

A landmark hGH study was performed by Dr. Daniel Rudman et al in 1991. It showed how a small group of people with advancing age (who were experiencing a decrease in lean...
body mass and the increase in mass of adipose [fat] tissue occurring with aging) experienced a decrease in fat and an increase in muscle with HGH. As previously discussed in the section on protein, the reduction of lean body mass reflects atrophy in skeletal muscle, liver, kidney, spleen, skin, and bone.

This study examined 21 healthy men from 61 to 81 years old who had plasma IGF-1 concentrations of less than 350 U per liter during a six-month base-line period. A six-month treatment period that followed. In this group, lean muscle mass increased 8.8 percent, there was a 14.4 percent decrease in adipose-tissue mass, and a 1.6 percent increase in average lumbar vertebral bone density. There was no significant change in the bone density of the radius or proximal femur. Skin thickness increased .1 (1/10 of 1) percent.

Here's a link to the Rudman study:

But based on this study, there has been a surge of entrepreneurial physicians, who had no previous training in endocrinology and less insight into neuroendocrine mechanisms, who began using "cookbook formulas" of "anti-aging hormone replacement" cocktails. This includes offshore brands of growth hormone, because U.S. pharmaceutical companies under the scrutiny of the FDA will not provide it to Doctors who are not qualified endocrinologists -- skilled in diagnosis and treatment of growth hormone deficiency (GHD).

**Sublingual "hGH"**

It is important that you not confuse real growth hormone with sublingual (under the tongue) sprays. Sublingual "hGH" is a product that is sprayed into the mouth or under the tongue, and is said to contain real hGH (human growth hormone) that is supposedly absorbed under the tongue or through other parts of the mouth. Often the ads will make inflated claims about the benefits of real hGH and describe the characteristics of another molecule called insulin-like growth factor-1 (IGF1), and it is difficult for the novice to determine that this is not the product they are actually selling.

Real growth hormone is produced by sophisticated genetic engineering methods. It must be kept refrigerated, and is injected. Sublingual sprays, usually synthesized from vegetable sources, are not real growth hormone and they do not work.

This graphic breaks out the different hGH amino acids by color. The mucous membrane can pass molecules up to four amino acids wide (four colored sections in the diagram). It demonstrates how sublingual "hGH" could not be absorbed, even if it were in the proper 3-D (folded) conformation that it needs to be in order to work.

In the graphic of hGH, each amino acid in the chain is represented by a different color. The distance between the arrows is roughly the width of the openings in the mucous membrane -- four amino acids. hGH cannot pass through an opening this small.
color. The distance between the arrows is roughly the width of the openings in the mucous membrane -- four amino acids. HGH cannot pass through an opening this small.

hGH is a large, fragile protein molecule with a molecular weight of 20,000. It contains 191 amino acids in an exact sequence. The molecule is folded and twisted on itself repeatedly. It is held in an exact three-dimensional configuration by fragile cross linkages between branches of this very large molecule. It works on cell receptors like a key in a lock. Its activity in the body depend on it being in an exact, complex configuration.

Creating it in a lab for injection requires the use of very expensive equipment and meticulously preformed recombinant DNA technology. hGH from any other source than a human, even from other animals, will not work in a human. There is no other source of hGH (i.e. "plant source"). hGH must be made using human genetics. The only safe form of hGH is made by splicing human genes into plant cells and then multiplying those cells in a culture media. A protein molecule as large as hGH cannot penetrate membranes to any significant amount. Most of real hGH would be wasted if used in a nasal spray or orally.

During storage and shipping hGH must be very carefully freeze-dried under a vacuum to become a powder. Even the powder must also be kept refrigerated to maintain activity for more than a few months. The hGH molecule loses potency very rapidly when dissolved in solution. Even if the chemical formula remains exactly the same, any change in shape means hGH will not work. Those cross-linkages described above break very easily and become unstable soon after dissolving in solution. Only with refrigeration can biological activity be maintained for up to two weeks. That's how fragile the molecule is. So its activity cannot be maintained in a liquid spray (if indeed there is any HGH present).

Ways to partially absorb some drugs through the skin have been developed. But this works only for small, non-protein molecules. Insulin is a protein molecule only half as large as hGH. If it were possible to absorb that kind of hormone by mouth, by spray, or through membranes, millions of people with diabetes would not need to inject insulin.

Dr. Chris Heward, of Kronos Science Laboratory, recently tested several of the more popular oral (sublingual spray) hGH preparations to determine their hGH content. The labels claimed that the products contained 2000 ng/serving (or 5,000 ng/ml, i.e. 1 serving = 3 sprays; 3 sprays = 0.5 ml). Test Result: None of the products tested contained more than 2.4 ng/ml hGH (less than 1/2000th of the amount claimed on the label). The fact is, hGH is NOT absorbed through the oral mucosa anyway, nor is it absorbed through the GI tract. Even if it were, the amount of hGH in these products (if present at all) is insignificant. The normal average hGH concentration in the serum of patients stimulated with GHRH is in the range of 20-30 ng/ml. Assuming that (a) hGH is found only in the serum (it isn't), and (b) the average volume of serum is about 5 liters (5,000 ml), then the total amount of hGH in a typical normal patient is about 125,000 ng (25 ng/ml X 5,000 ml). Since, hGH secretion is intermittent (not continuous throughout the day) the total amount secreted per day in the healthy adult is between 300,000 and 500,000 ng.

Thus, even if the products tested
(a) actually contained the hGH claimed on their labels and
(b) were 100% absorbed through the oral mucosa or GI tract
a single serving would contribute less than 2.0% of the amount of hGH normally needed for a meaningful physiological response. A more accurate estimate based on average total body fluid volume is probably at least an order of magnitude less. In reality, practically NONE of the hGH in these sprays makes it to the appropriate receptors. Thus, they are of no medicinal value. Claims to the contrary are simply not true.
An anti-aging M.D. once sold me a popular brand of sublingual "hGH" spray at a cost of $120 -- and then an IGF-1 test ($40) which proved the sublingual spray did absolutely nothing to raise my IGF-1 level.

The bottom line: reported benefits of "hGH" sprays are apparently the result of the placebo effect. Reported benefits of these sprays coming from people who are trying to sell you the stuff are apparently placebo, fueled by the profit motive.

My Experience with hGH

For about 18 months I was fortunate to be enrolled in a clinical study conducted by Pharmacia-Upjohn Co using their brand of hGH, Genotropin. The benefits of this system I described in the introduction were written about before this time and without hGH. I was doing absolutely great without hGH. However, on hGH I'm pleased to report noticeable, sometimes significant improvements in mental well-being, performance and energy. It seems like I was even less interested in my worst vice of sweet and gooey treats.

Sometimes when looking at the clouds or a sunset, or when walking and feeling a slight breeze against my face, I felt kind of the same as when I was in my twenties. But this happened a lot without hGH. Although my first musical choice is classical, *The Rolling Stones* sounded real good again. And although I had often thought about digging out my old skin diving equipment and going diving again, I never really did it -- until then.

Sex was definitely, well, sexier. Sometimes it was Va-va-va-voom!

Although I've been driving Volvos for a few years, there was a rekindled attraction to the Jaguar XKE roadster -- you know, the one that looks like it's doing 120 mph while sitting at a curb? Don't worry, if I get another one I'll always wear my seat belt and drive like a gramps. No more smash-ups like the last one.

But I will also say that I sometimes tended to become more upset or angry over the kinds of situations and people that aggravate, mistreat or cheat.

Alas, it's inconclusive as to whether my own improvements on hGH are a result of only the hGH, or to some other positive changes and reduction of aggravation that I've made at about this time. Or were these changes made as a result of a clearer mind and greater as a result of the GH? Or a little of each? Such are the problems of interpreting anecdotal data.

Anyway, my own improvements are not nearly as profound as some books and reports would lead you to believe. At prices of around $12000 per year, I don't know whether I'll continue hGH after this study. Probably depends on how many of these darn books I can sell. But under no circumstances will I take hGH in place of the scientifically designed and precision nutrition, high-performance exercise physiology, stress reduction, appropriate amounts of well-designed nutritional supplements, and the other methods in this manual.

The bottom line on hGH

Here's the bottom: If you are doing all the other things in this system (many of which cost no money, save you money, and help you make more money) and do have a lot of extra money ($800 to $1,200 per month), then consider it -- but only under the guidance of a qualified neuroendocrinologist. But not absolutely according to the pharmaceutical
industry in their official policy. As a matter of fact, they stipulate that the physician must be a pediatric endocrinologist.

On the margin, it would probably be worth it for you. But you are likely to get much less value from growth hormone alone than the effective, conventional, common sense approaches like practicing excellent scientifically designed nutrition and exercise, stress reduction, proven nutritional supplements and other methods described in this manual.

**Counterfeit Anti-Aging Drugs and Pharmaceuticals**

Counterfeit pharmaceuticals are a major worldwide problem. Regarding imported pharmaceuticals, you just don't know what you're getting. There have been reports of counterfeit drugs, with packaging that appears to be genuine, being manufactured in the U.S. then smuggled into foreign countries. Many drugs manufactured in other countries do not meet the same quality control standards as in the U.S. It is against the law to get drugs without a prescription, and it is suicidal to take drugs without expert medical guidance.

**Nutritional Supplement Guidelines**

Nutritional supplements should meet FDA standards and be manufactured according to FDA protocol for laboratories licensed under strict federal guidelines for pharmaceutical grade products. They should be hypoallergenic, and not contain any salt, sugar, or artificial dyes, colors or flavors. They should be as fresh as possible.

Some companies manufacture vitamins as cheaply as possible, and in huge batches in order to reduce the cost, so their products often sit on the shelves for a long period of time (for months or years). Most multivitamin/mineral formulas sold in stores are over two years old by the time they are bought off the shelf from the time of manufacture. Also these ingredients are usually a mixture of "natural" and processed products.

Recently scientists have found that synthetic compounds are purer and more completely absorbed by the body than the so called "natural" products. For example "Natural" Vitamin E Oil capsules are rancid because they cannot be protected from oxidation in the oil form. Vitamin E does not become an antioxidant until it crosses the intestinal membrane and becomes chemically changed from the Ester form through hydrolysis to the free form. The only safe way to take Vitamin E is the synthetic form which is a pure crystalline powder.

The most important concept to appreciate when undergoing therapy for almost any condition is that people are different. It is easy to see the superficial aspects of body shapes, hair, skin color, etc., but there are far more numerous and clinically important factors that lie beneath the skin. Some of these are physiological (i.e., how much of how may antioxidants we have consumed, our vitamin/mineral reserves, our immune system activity, our hormone levels, our toxic burdens, etc.). These latter elements are generally termed "biochemical individuality."

**What Makes a Good Multivitamin, Who Needs One and What They Do**

In a perfect world, patients would get an adequate amount of essential nutrients from a well-balanced diet. However, for a variety of reasons-including nutritional deficiency, pregnancy, advanced years, and lifestyle-many patients simply are unable to meet these recommended standards and may require dietary supplementation.

For example, research has shown that adequate levels of folate can prevent neural tube disorders in the developing fetus. However, demonstrating that multivitamin
supplementation prevents chronic disease has been another matter-made difficult by many contributing cofactors, such as diet, family history, and environmental issues.

Clinical trials and observational studies suggest an association between multivitamin use and disease prevention, but no clear causal relationship has been shown. For example, among the nearly 90,000 participants in the Harvard Nurses’ Health Study, the women who took multivitamins for 15 years reduced their risk of colon cancer by as much as 75%. The data also suggest that multivitamins may reduce the risk of breast cancer in certain women. Conversely, results from the National Health and Nutrition Examination Survey found cancer mortality and overall mortality were similar in regular users and nonusers of dietary supplements.

According to a survey conducted by the American Dietetic Association (ADA), nearly half of Americans consume vitamin and mineral supplements on a daily basis.

A well-balanced diet can provide adequate levels of most vitamins and minerals as well as fiber and phytochemicals. Often, people who eat a nutritious diet don’t need to supplement with a multivitamin. Ironically, many studies have shown that people who have higher intakes of nutrients from food are the very people who are most likely to take a multivitamin.

As reflected in the ADA study, regular vitamin and mineral supplementation increases with age and is associated with more frequent intake of fruit and vegetables. Multivitamin use also seems to be most prevalent among those who believe their health is affected by diet.

Try as many patients might, however, only 28% of Americans have made significant adjustments in their eating behavior. The vast majority have failed to achieve a healthy, nutritious diet or have made no effort at all. In addition, many people have special dietary concerns and may not be able to get adequate levels of nutrients from the food they eat. These people may include the elderly, children, pregnant women, the physically active, and those with absorption problems or chronic illnesses. In these situations, dietary supplementation may be necessary.

**Antioxidants**

Antioxidants are among the most important nutritional supplements. They provide protection against free radical damage. Now might be a good time to refresh your memory with a review of the section on free radicals in Chapter 1 where we saw why free radicals are so damaging to your health.

Antioxidants also may inhibit the formation of fatty streaks and plaque that progressively close off arteries. LDL cholesterol (the "bad" cholesterol) have to be oxidized by free radicals in order to form these plaques. White blood cells' chief function is to scavenge toxins and other matter for excretion. As a result of engorging fat droplets of cholesterol-filled LDLs, the white blood cells become transformed and become embedded in arterial walls within plaque. Free radicals attack LDL particles, deplete them of their antioxidants and degrade the polyunsaturated fatty acids (linoleic acid and arachadonic acid) that are bound to phospholipids in their outer layer.

Some of the body's own free radical scavenging enzymes are called superoxide dismutase, glutathione peroxidase and catalase. For most people, antioxidants are the most important component of their supplement program. Vitamins C, E, B1, B5, B6, zinc, selenium, cysteine, and methionine are among the most important and most effective. Prescription antioxidants, like Hydergine, bromocriptine, and DMAE may also be
considered, but only under close medical supervision by a doctor who is highly experienced in their use.

In appropriate amounts, antioxidants can be particularly useful in the prevention of senile dementia.

**Aspirin**

An 80 mg "baby" aspirin each night can reduce platelet clumping, thereby helping prevent artery blockage and heart attack. A platelet is a disc shaped cell in the blood responsible for coagulation. However, this can result in a slightly increased risk of stroke. Also, aspirin is an acid and can irritate the stomach.

Also, a full sized aspirin tablet and 1-2 cups of coffee on an empty stomach is the most effective and safest way to increase thermogenesis for enhanced fat loss.

**Timing**

Most antioxidant supplements are water soluble and only stay in your system for a few hours. Antioxidant molecules are used up one-for-one with free radicals, so it is essential that they be taken in divided doses throughout the day. So antioxidants should be taken at lease twice a day -- ideally every 3-4 hours. Also, exercise generates free radicals, so take antioxidants within a couple of hours before exercise.

Stay away from all herbal stimulants before your workout -- and **anytime** -- as they could be very dangerous. These include St. Johns Wort, yohimbe, ma huang, ephedrine, ephedra among others. They can cause dangerously high blood pressure and irregular heart rhythms, and result in death.

**Making vitamins easier to swallow**

Chewing just a little banana, then popping the pills in the mouth along with the banana, then swallowing them together can make your vitamins easier to swallow. But be aware that some vitamins should be taken on an empty stomach. Discuss this with your doctor.

**A Basic Vitamin, Nutrient, Mineral System**

Here's the generic nutritional supplementation program developed by Dr. Lee-Benner to meet the basic nutritional supplementation needs of most people who are following the other components of this system.

**Medical Details -- and Follow Your Doctor's Guidance**

Review the "friendly" disclaimer at the start of this manual.

_It is recommended that you consult a physician who is highly experienced in health, fitness & aging intervention for a personal program based on your own personal characteristics._ Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual. This information is not intended to diagnose, treat, cure, or prevent any disease, and is not intended to provide medical advice or be a substitute for a physician. For medical advice, consult a properly trained physician.

The supplements recommended in the for improved brain and nervous system Tier 1 basic system in this manual are proven to be effective by scientific research. Small doses
are recommended. A vast majority of people taking them feel more alert, happier and experience greater mental clarity. Still, everyone is different. So if you begin to feel not right, for example like being unusually agitated or "revved up", or overthinking an unfavorable situation that may arise, or subdued, or notice anything negative that is unusual about the way you feel, discontinue them for a day or so, then try smaller amounts of them one-at-a-time to fine tune your system to find out what works best for you.

As an example, choline is a dietary precursor to acetylcholine in the central nervous system. It has improved memory and learning in normal subjects and is considered an essential component of a supplement program. If you become depressed, choline is the most likely candidate to reduce.

So discuss it with your physician, and pay attention to how you feel and be aware that you may have to fine-tune your system as long as you are on an antiaging system and as long as you are taking supplements.

These formulas are designed to be synergistic with each other. These are combined in precise ratios to each other in order to work properly. They are designed to build your immunity to disease, counteract the effect of a nutrient depleted processed food diet, and revitalize your overall health.

And Once Again, If You Have a Medical Condition

As with nutrition and exercise, if you have a medical condition, that changes things. Your supplement requirements may be different from someone without your condition, dosages may be different and lab tests may be needed.

If you are taking prescription medications, care should be taken to avoid interactions. This requires expert medical advice.

Everyone is different, and the same person may have different requirements depending on their age, physiology, genes, what's going on in their life, how long they have been practicing this system, and numerous other variables. Also, recommended vitamins, nutrients and minerals will be different depending on your life’s conditions at any one time. These could include times of stress, whether you smoke or drink, whether you have high cholesterol, etc. Pay attention to how you feel and discuss it with your doctor, and be aware that you may have to fine-tune your system as long as you are on an antiaging system and as long as you are taking supplements.

Actually, how you "feel" may be very misleading. You don't have to feel "bad" to have something bad going on. Also, risk factors are important things to be identified and ameliorated.

An excellent resource that offers specifics on medical condition precautions, drug interactions and recommendations for special circumstances is “Physicians Guide to Free Radicals, Immunity and Aging” by Lord Lee-Benner, M.D.

Scientific units such as "I.U.", "mg" and "mcg" are different ways of measuring the amounts of vitamins and minerals in each tablet or soft gel. Water-soluble vitamins and supplements, such as B vitamins and vitamin C, are measured in milligrams (mg) and micrograms (mcg); one milligram (1/1000 of a gram) is equal to 1000 micrograms. Minerals that are needed in smaller amounts in the body are also measured in micrograms.

"I.U.", or "International Unit," is the global standard for measuring fat-soluble vitamins and minerals (e.g. vitamins A, D and E). The I U is similar to the United States Pharmacopeia unit (USP) that also is based on measured biological activities. The use of
IU is mostly having to do with the daily requirements for a human or an animal with the purpose of providing adequate an amount. Systematic procedures are used to determine its function, the effects of deprivation, and quantitative requirement. So the results will be expressed in terms of IU.

The following supplement formulations (Basic antioxidant and vitamin formulation, Brain/Mind Formula I, Brain/Mind Formula II, and Growth Hormone Releasing Nutrients) were designed by Dr. Lee-Benner

**Basic antioxidant and vitamin formulation**

**Directions:** Please be sure you have read the section on free radicals in Chapter 2 -- Practical Information.

An antioxidant nutrient is a compound present naturally in the diet, or added to it, which lowers the rate of production of deleterious changes by free radical reactions without significantly impairing the essential reactions involved in body maintenance and function.

The beneficial effects of antioxidant nutrients are now supported by many studies, including those that have increased life span and lowered disease incidence. In fact experts in caloric restricted diets for optimum health and Longevity agree that in addition to a sustained low-caloric intake, we need the equivalent of a 20,000 calorie diet in nutritional supplements each day to protect us from free radical damage!

The formula below contains the appropriate balance of necessary antioxidants: vitamins A,B,C,E, and D, plus minerals, selenium and zinc designed to shield and protect cells from harmful oxidants and help ensure normal cell life. It provides calcium, magnesium and potassium in the right amounts for good health, nutrients which also help to protect bones, nerves, muscles and teeth against some of the effects of aging. This formulation is high in both Vitamin C and E antioxidants, which have been shown to help reduce the risk of developing Alzheimer’s disease.

Take two to three tablets with the following ingredients with a full 8oz glass of water two to three times a day after meals as a dietary supplement or as directed by your doctor.

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>AMOUNT</th>
<th>% US RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A (Fish Liver Oil)</td>
<td>25,000 IU</td>
<td>500</td>
</tr>
<tr>
<td>Beta Carotene</td>
<td>10,000 IU</td>
<td>400</td>
</tr>
<tr>
<td>Vitamin D 3 (Fish Liver Oil)</td>
<td>100 IU</td>
<td>25</td>
</tr>
<tr>
<td>Vitamin E (D-Alpha Rocopherol Succinate)</td>
<td>200 IU</td>
<td>667</td>
</tr>
<tr>
<td>Vitamin C (Ascorbic Acid, Ascorbate)</td>
<td>570 mg</td>
<td>950</td>
</tr>
<tr>
<td>Thiamine HCL (B1)</td>
<td>75 mg</td>
<td>5000</td>
</tr>
<tr>
<td>Riboflavin (B2)</td>
<td>75 mg</td>
<td>4412</td>
</tr>
<tr>
<td>Riboflavin 5-Phosphate</td>
<td>15 mg</td>
<td>--</td>
</tr>
<tr>
<td>Pyridoxin HCl (Vitamin B6)</td>
<td>100 mg</td>
<td>5000</td>
</tr>
<tr>
<td>Pyridoxal 5-Phosphate</td>
<td>15 mcg</td>
<td>--</td>
</tr>
<tr>
<td>Vitamin B12 (as Cyanocobalamin)</td>
<td>150 mcg</td>
<td>2500</td>
</tr>
<tr>
<td>Niacinamide</td>
<td>50 mg</td>
<td>225</td>
</tr>
<tr>
<td>Niacin</td>
<td>25 mg</td>
<td>150</td>
</tr>
</tbody>
</table>
Brain Formulations -- Nutritional supplements often effect different parts of the body. The following act on the brain and nervous system for the most part.

The supplements recommended in the for improved brain and nervous system Tier 1 basic system in this manual are proven to be effective by scientific research. Small doses are recommended. A vast majority of people taking them feel more alert, happier and experience greater mental clarity. Still, everyone is different. So if you begin to feel not right, for example like being unusually agitated or "revved up", or overthinking an unfavorable situation that may arise, or subdued, or notice anything negative that is unusual about the way you feel, discontinue them for a day or so, then try smaller amounts of them one-at-a-time to fine tune your system to find out what works best for you.

As an example, choline is a dietary precursor to acetylcholine in the central nervous system. It has improved memory and learning in normal subjects and is considered an essential component of a supplement program. If you become depressed, choline is the most likely candidate to reduce.

So discuss it with your physician, and pay attention to how you feel and be aware that you may have to fine-tune your system as long as you are on an antiaging system and as long as you are taking supplements.

Brain/Mind Formula I

Directions: Take two to three tablets with a full 8oz glass of water, two to three times a day as a dietary supplement.

Each capsule contains:

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Amount</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pantothenic Acid (D-Calcium Panthothenate)</td>
<td>100mg</td>
<td>1000</td>
</tr>
<tr>
<td>Folic Acid</td>
<td>800mcg</td>
<td>200</td>
</tr>
<tr>
<td>Biotin</td>
<td>75mcg</td>
<td>25</td>
</tr>
<tr>
<td>Inositol</td>
<td>100mg</td>
<td>--</td>
</tr>
<tr>
<td>Choline Bitartrate</td>
<td>100mg</td>
<td>--</td>
</tr>
<tr>
<td>PABA (Para Aminobenzoic Acid)</td>
<td>150mg</td>
<td>--</td>
</tr>
<tr>
<td>Lemon Bioflavenoids</td>
<td>100mg</td>
<td>--</td>
</tr>
<tr>
<td>L-Glutathione (99% reduced)</td>
<td>25mcg</td>
<td>--</td>
</tr>
<tr>
<td>Iodine (Marine Organ Min. Complex)</td>
<td>225mcg</td>
<td>150</td>
</tr>
<tr>
<td>Calcium (Hydroxyapatite, Ascorbate)</td>
<td>250mg</td>
<td>25</td>
</tr>
<tr>
<td>Magnesium (Amino Acid Chelate Citrate, Aspartate)</td>
<td>500mg</td>
<td>125</td>
</tr>
<tr>
<td>Zinc (Picolinate)</td>
<td>30mg</td>
<td>200</td>
</tr>
<tr>
<td>Potassium (Citrate)</td>
<td>99mg</td>
<td>3</td>
</tr>
<tr>
<td>Manganese (Aspartate)</td>
<td>5mg</td>
<td>250</td>
</tr>
<tr>
<td>Chromium (Aspartate)</td>
<td>200mcg</td>
<td>167</td>
</tr>
<tr>
<td>Selenium (Amino Acid Chelate)</td>
<td>200mcg</td>
<td>286</td>
</tr>
<tr>
<td>Copper (Amino Acid Chelate)</td>
<td>2mg</td>
<td>100</td>
</tr>
<tr>
<td>Molybdenum (Amino Acid Chelate)</td>
<td>50mcg</td>
<td>--</td>
</tr>
<tr>
<td>Vanadium (Amino Acid Chelate)</td>
<td>50mg</td>
<td>--</td>
</tr>
<tr>
<td>Montmorillonite</td>
<td>50mg</td>
<td>--</td>
</tr>
</tbody>
</table>
Brain/Mind Formula II

**Directions:** Take four tablets with a full 8oz glass of water, two to three times a day as a dietary supplements.

Four tablets contain:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>AMOUNT</th>
<th>% US RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnenolone</td>
<td>10 mg</td>
<td>*</td>
</tr>
<tr>
<td>Ginkgo Biloba Leaf</td>
<td>180 mg</td>
<td>*</td>
</tr>
<tr>
<td>Inositol</td>
<td>100 mg</td>
<td>*</td>
</tr>
<tr>
<td>Pyroglutamate</td>
<td>250 mg</td>
<td>*</td>
</tr>
</tbody>
</table>

* % US RDA has not yet been established.
Growth Hormone Releasing Nutrients
3 to 6 at bedtime or upon awakening

This formulation is a must for those who want to stimulate human growth hormone (hGH) production, immune and mental function, as well as lower blood pressure, reverse heart disease, have a better body, lose weight or increase fertility, and enhance sexual function.

Some amino acids, like L-Ornithine, L-Tyrosine, L-Arginine, L-Carnitine and Phenylalanyldehyde can stimulate growth hormone secretion. Cofactors, like Vitamins C and B6 are needed to help them work. They should be taken on an empty stomach when going to bed and when first awakening.

Arginine, a by-product of Ornithine, is now recognized to be a pro sexual nutrient (whoopee!!). Arginine increases sperm count and motility. An Italian research team found sperm count to increase over 100% following arginine supplementation for six months. Fertility was increased over two-fold. Arginine works for both men and women by enhancing nitric oxide (NO) levels. NO has been dubbed the "sex trigger" because it has been found to be the neuromediator responsible for initiating erections in men, and vaginal arousal in women. In one dramatic study, 6 of 15 impotent men noted restoration of normal sexual function after only 2 weeks of taking 2.8 grams of arginine per day.

At the 1995 meeting of the American Heart Association, British researchers reported that the amino acid arginine may reverse some components of the aging process. Their findings were that the linings of blood vessels, known as endothelium, are damaged by age-related loss of their power to respond to triggering mechanisms that signal blood vessels expansion or contraction. This leads to heart disease. This study showed that his damage can be prevented, or reversed by arginine.

Free-form amino acids such as tyrosine, ornithine, arginine, glutamine, phenylalanine, L-Dopa, tryptophan and carnitine have been proven in clinical tests by endocrinologists to provide a host of youth restoring properties to our brains. They enhance neuromuscular transmission, thus enabling our bodies to maintain youthful function such as mental alertness, strength, vigor and stamina. They enhance sexual function, not only arousal and erectile function, but also sensation and fertility.

By stimulating growth hormone release, it increases lean body mass, decreases body fat, and blood lipids, improves cardiac and immune function and also increases bone density along with skin thickness, hair and nail growth.

There is reason to believe the combination of Tyrosine, L-Ornithine, L-Arginine, and L-Carnitine, along with vitamin co-factors B6 and C, are synergistic. The Lee-Benner Institute has followed the beneficial changes in hundreds of age-related patients using this formula over the past 15 years. There have been excellent health improvements. These results were over and above the benefits achieved through just diet, exercise and maintaining a healthy lifestyle alone.

This formula can stimulate hGH production, and lower blood pressure, reverse heart disease, have a better body, lose weight or increase fertility, and enhance sexual function.

If you have cold sores, canker sores or herpes, this formulation may worsen the situation so consider decreasing or eliminating.
**Directions:** Take three to six tablets with a full 8oz glass of water, on an empty stomach at bed time (at least 3 hours after eating), and/or half hour before breakfast as a dietary supplement.

One capsule contains:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>AMOUNT</th>
<th>%US RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Ornithine HCl</td>
<td>375mg</td>
<td>*</td>
</tr>
<tr>
<td>L-Tyrosine</td>
<td>62.5mg</td>
<td>*</td>
</tr>
<tr>
<td>L-Ornithine HCl</td>
<td>375mg</td>
<td>*</td>
</tr>
<tr>
<td>L-Arginine</td>
<td>40mg</td>
<td>*</td>
</tr>
<tr>
<td>L-Carnitine</td>
<td>40mg</td>
<td>*</td>
</tr>
<tr>
<td>Vitamin B-6 (pyridoxine HCL)</td>
<td>6.0 mg</td>
<td>300</td>
</tr>
<tr>
<td>Vitamin C (ascorbic acid)</td>
<td>60.0 mg</td>
<td>100</td>
</tr>
</tbody>
</table>

* US RDA has not yet been established

**Acetyl L-Carnitine**

Acetyl L-Carnitine is recommended, particularly before exercise, because it enhances energy metabolism at a cellular level by easing transport of fatty acids, which are used for energy, across the cellular membrane. This also helps protect the mitochondria -- the damage of mitochondria is one cause and type of aging.

**Essential Oils**

The most important ingredient in this supplement formulation are phospholipids and essential oils (fatty acids). "Essential" means that the body cannot manufacture them, so they must come from the diet. These are phosphatidylserine, phosphatidylycholine, phosphatidylethanolamine and phosphatidylinositol in a base containing medium chain triglycerides (MCTs). These supplement helps build cell membranes, as well as keep nerve cell membranes flexible, permeable and resistant to stress and damage.

Phosphatidylserine has been demonstrated in double-blind placebo-controlled scientific studies to play an important and unique role in memory function. MCT stands for medium-chain triglycerides, a description of the length of carbon chain of the fatty acids that make up the oil. MCT improves fat digestion and absorption.

Only one-half tablespoon, twice a day, is recommended.

**Saw Palmetto (for men)**

Saw palmetto can help to keep the prostate gland from age-related enlargement. (There is some positive evidence for its effectiveness against prostate problems, but there's a lack of real scientific information based on well-designed clinical trials.)

**Description of Supplements**

**Vitamin or Nutrient, and Function -- Partial list of known functions for many of these.**

Vitamin C (Ascorbic Acid, Ascorbate)
The body's first line of internal defense. Controls free radicals. Can prevent the formation of peroxides or nitrosamines. Essential in the repair of skin, bones, teeth, and the ground

Vitamin E
Antioxidant - free radical scavenger. Prevents lipid peroxidation of PUFAs in the cell, particularly in the cell membrane. Protects red blood cells from oxidative hemolysis (destruction of red blood cells and escape of the hemoglobin within the bloodstream). Inhibits prostaglandin (a kind of fatty acid).

Vitamin A
Immune system stimulant, affects thymus gland to improve T-cell response. Inhibits arthritis and the promotion phase of carcinogenesis (cancer).

Vitamin B1 (Thiamine HCl)
Immune system stimulant and antioxidant. Required for lipid synthesis from carbohydrates and conversion of glycogen (sugar as it is stored in the liver and held ready for release) into ATP. Plays role in peripheral nerve conduction.

Vitamin B2 (Riboflavin)
Riboflavin is essential for regulating oxidation and reduction reactions and for reducing glutathione to prevent lysis of RBCs, reducing allergic reactions, and inhibiting the formation of cataracts. It may inhibit tumor development. Caution: Must be taken with other antioxidants to prevent photosentization. Large doses are contraindicated during lactation.

Riboflavin 5-Phosphate
This is the same as B2, and it makes the urine bright yellow. So when it becomes straw-colored again, it means all the water soluble vitamins have been eliminated from your system and it is time to replenish them for optimum protection.

Vitamin B3 (Niacin)
Too much niacin can result in an uncomfortable "flush", or kind of reddening accompanied by a warm sensation and possibly disorientation. Niacin is essential in the production of energy from carbohydrates. Large doses reduce serum cholesterol, triglycerides and VLDL levels. Niacin elevates and stabilizes blood sugar levels, stimulates histamine release for improved sexual function, and has been found to cause tranquilization. High-dose niacin improves long-term mortality rates in post-myocardial patients. Caution: Large doses may not be beneficial for maximum output endurance. Large doses may increase utilization of muscle glycogen stores and decrease mobilization of fatty acids. To be used with caution for patients with sensitivity to serotonin (headaches may develop), asthma or peptic ulcer disease. Watch for elevated levels of serum enzymes, uric acid or glucose, liver damage and HBP. May cause temporary drowsiness which is dose related and subsides with tolerance. Large doses of niacin are contraindicated during lactation.

Niacinamide
This is similar to niacin, but it doesn't produce the flush that you get from niacin. It doesn't give you the benefit of reducing your cardiovascular risk factors, either.

Vitamin B5 Pantothenic Acid (D-Calcium Pantothenate)
Pantothenic acid is a strong antioxidant and anti-stress vitamin. Pantothenate greatly increases resistance to stress in experimental animals and humans. In mouse studies, it increased life span by 20% when fed in quantities of 12 mg/kg (equal to one gram/day for an adult human). Vitamin B5 makes up one-half of acetyl-CoA which is needed to convert choline to acetylcholine, is essential for the conversion of glycogen to ATP and the biosynthesis of fatty acids. It prevents autooxidation of L-Dopa in the brain and may help prevent autoimmune reactions.  

**Caution:** Large doses may cause a laxative effect. To prevent this, start with low doses (100mg/day).

Vitamin B6 (Pyridoxin HCl)
High protein diets increase the requirements for pyridoxine in order to reduce free-radical damage. B6 supplements are also advised for patients on INH therapy for TB prevention, penicillamine for treatment of Wilson's Disease, corticosteroid therapy, anti-convulsants and chronic alcohol abuse syndrome. Patients with carpal tunnel syndrome have become asymptomatic after a number of weeks on 1000mg/day. Long term treatment with large doses (500 mg/day or more) have resulted in marked clinical improvement in diabetics. It is necessary for fatty acid metabolism and should improve stamina for high performance endurance athletes. There are many references citing its role in CNS metabolism, immunological phenomena, the prevention of kidney stones, atherosclerosis, dental caries and endocrine metabolism. It plays an important role in the health of the elderly. There are special requirements during pregnancy and during the taking of oral contraceptives.  

**Caution:** Parkinson patients initiating L-dopa therapy should be closely supervised. Large doses, greater than 200mg/day are contraindicated during lactation. Larger doses may cause reversible peripheral neuropathies.

Pyridoxal 5-Phosphate
An important co-factor needed for basic cellular metabolism and the creation of energy within the cell. It is involved in the synthesis and catabolism of all amino acids.

Vitamin B12 (as Cyanocobalamin)  
Cyancobalamin (vitamin 812) is recommended in normal adults from an anti-aging perspective because of research that shows that it increases RNA synthesis in rat brain neurons and is associated with improved learning in rat experiments. It is recommended, along with other agents, to counter the damaging effects of alcohol to memory.  

**Caution:** Even additional B12 may not protect against Bi2 deficiency when one takes megadoses of Vitamin C.

Beta Carotine
B-carotene is converted to vitamin A on demand in the body. High doses are non-toxic but can turn the skin yellow-orange (which is reversible). B-carotene is a highly effective quencher of singlet oxygen. It also protects against ultraviolet radiation, and is being studied as a possible prevention against lung cancer.

Vitamin D3 (Fish Liver Oil)  
Principal regulator for calcium homeostasis, bone metabolism and skeletal development.

Folic Acid  
An important cofactor for many intracellular energy reactions. An essential ingredient for red blood cells, and the nervous system. Lowers the risk of neural tube defects and
possibly other types of birth defects. It may have antiatherogenic, anticarcinogenic, neuroprotective, and antidepressant actions.

Biotin
Biotin is a sulfur-containing antioxidant vitamin and a portion of acetyl-CoA. It is important in fatty acid biosynthesis. Biotin seems to be a growth factor. It improves energy, stamina and may benefit high output endurance Athletes.

Inositol
Inositol is an antioxidant and membrane-stabilizing B vitamin. It promotes calming and REM sleep when used with niacin and GABA. This combination is recommended as a substitute for alcohol or tranquilizers for sufferers of anxiety or chronic stress syndrome. It may have a function in reducing the pain of arthritis. Another dietary component, phytic acid (inositol hexaphosphate) from cereals might be the most important variable governing the frequency of colon cancer.

Caution: When calcium intake or vitamin D activation by the sun is low, high inositol intake could be a contributing factor to osteoporosis.

PABA (Para Aminobenzoic Acid)
Para-aminobenzoic acid (PABA) is an antioxidant, membrane-stabilizing B-complex vitamin. It has been used to retard hair loss and premature graying. PABA is recommended for extra antioxidant protection from ozone, nitrogen oxides, and carbon monoxide gases. It can provide added protection (when used with other antioxidants) against lipid peroxidation. It is also beneficial to people who suffer from obesity, chronic respiratory conditions, arthritis, injuries and bruises.

Caution: PABA is acidic and high doses (especially when combined with vitamin C or niacin) may lead to gastric upset or potentiate peptic ulcer disease.

Warning: PABA completely neutralizes the effect of sulfonamides.

Lemon Bioflavenoids
Hesperidin and rutin are cofactors found in vitamin C and increase the bioavailability of vitamin C and enhance its immune stimulant effect. Rutin is effective in preventing free-radical-induced cataract formation in experimental animals. Bioflavinoids are membrane stabilizers known to increase capillary resistance and prevent damage to joint membranes and intimal lining of arteries. Supplements in doses of 500 mg to 1 gm have antithrombogenic, antiatherogenic and antiarthritic effects and enhance the immune stimulant effect of vitamin C.

L-Glutathione (99% reduced)
This is the primary ingredient among the three amino acids which form the building blocks for one of the most important antioxidant enzymes (glutathione peroxidase) to protect red blood cells from oxidation.

Iodine (Marine Organ Min. Complex)
Used to make thyroid hormone.

Calcium (Hydroxyapatite, Ascorbate)
Basic building block for bone formation.

Magnesium (Amino Acid Chelate Citrate, Aspartate)
Essential mineral -- the most abundant in the body for many cellular reactions, control of blood pressure, nerve transmission, muscle contraction.
Zinc (Picolinate)
Zinc is essential for the function of more than 70 enzymes and is involved in many biochemical processes. It is a free-radical quencher, membrane stabilizer, and is required for mobilization of vitamin A stores from the liver. It reduces the requirement for vitamin E in the RBC membrane to protect it from oxidative damage. It prevents the formation of MDA, another indicator of lipid peroxidation. It directly stimulates the immune system resulting in a ten-fold increase in B cell performance and three to five-fold increase in T cell activity. Zinc may be an alternative to penicillamine therapy for the treatment of Wilson's disease. The best reason for the use of zinc as a prophylactic is its role in enhancing SOD, which is protective against air pollution, arthritis, immune system decline, cross linking of skin and other structural organs, early mental and sensory decline associated with premature aging, as well as for its sparing of vitamin E and enhancement of vitamin A function.

Caution: Doses of 300 mg/day may actually result in decreased immune activity, and doses of 100 mg/day have been associated with a reversible fall in serum HDL levels during supplementation.

Potassium (Citrate)
Essential component of the body's electrolyte system needed for all cellular functions.

Manganese (Aspartate)
Makes up an energy component for the intracellular factories, the mitochondria.

Chromium (Aspartate)
Chromium in yeast enhances glucose utilization through maintaining the body's sensitivity to insulin. Glucose tolerance in chromium-deficient Turkish children was rapidly corrected when chromium was supplemented. Supplementation with chromium salts or with chromium-rich brewers yeast enhances glucose tolerance in prediabetic adults.

Selenium (Amino Acid Chelate)
Selenium is a free-radical quencher, primary antioxidant and immune system stimulant. It combines with L-cysteine to form an important part of the enzyme glutathione peroxidase. It enhances vitamin E activity. It is important in slowing uncontrolled cross-linking of skin and elastic tissue. It interferes with polynuclear aromatic hydrocarbon (PAH) activation and binding to DNA. Selenium when combined with BHT, zinc and other antioxidant nutrients benefits smoker's cough, arthritic attacks, age pigment removal, damage to hormonal responsive areas of the sexual apparatus, and risks of cancer and atherosclerosis from acetaldehyde due to smoking and alcohol consumption.

Warning: Excessive doses (greater than 600 mcg/day) of selenium may be toxic.

Copper (Amino Acid Chelate)
Only small amounts required for structural component in certain intracellular signaling mechanisms. Caution: Too much causes oxidation and free radical damage.

Molybdenum (Amino Acid Chelate)
Only small amounts required for structural component in certain intracellular signaling mechanisms. Caution: Too much causes oxidation and free radical damage.

Vanadium (Amino Acid Chelate)
Has insulin like effects, to enhance muscle uptake of glucose and energy metabolism.
Montmorillonite
Organic excipient used in tablet construction.

**Brain/Mind Formulations**

**Choline Bitartrate**
Choline is a dietary precursor to acetylcholine in the CNS. It has improved memory and learning in normal subjects. It also aids in the lubrication of membranes for sexual function.

Choline has relatively few side effects. Complaints related to high doses include diarrhea, abdominal cramps, and nausea. Bacteria in the intestine can change choline into an unpleasant, fishy smelling substance. Rarely, depressive people may become more depressed, or withdrawn or apathetic, even on small doses.

If you become depressed, or feel agitated or "revved up", reduce it and see how you feel. **Caution:** Should not be use in the presence of affective disorders. Bacteria in the intestine can change choline into an unpleasant, fishy smelling substance. High doses may cause diarrhea.

**Vitamin B-5 (d calcium pantothenate)**
Vitamin B-5 is involved in a number of biological reactions, including the synthesis of acetylcholine, and in the production of energy, the catabolism of fatty acids and amino acids, the synthesis of fatty acids, phospholipids, sphingolipids, cholesterol and steroid hormones.

Caution: it is contraindicated in those hypersensitive to any component. Pregnant women and nursing mothers should avoid doses greater that U.S. RDA (10 milligrams/day) unless higher dosage is prescribed by their physician. Those who have developed contact dermatitis from the use of dexpantherol may develop eczema from the use of oral pantothenic acid. The use of pantothenic acid for any medical condition must be medically supervised.

**DMAE bitartrate**

**Lecithin -Phosphatidyl choline**
Lecithin is a precursor in the synthesis of the neurotransmitter acetylcholine, is a major component of cell membranes and plays a role in the maintenance of cell-membrane integrity. It is essential for liver function and can help restore liver function in a number of disorders.

**Caution:** Those with malabsorption problems may develop diarrhea or steatorrhea.

**Pregnenolone**
Pregnenolone is a steroid naturally found in tissues, especially the gonads, adrenal gland and brain. It is reported to have memory-enhancing activity.

Caution: Pregnenolone is contraindicated in those with prostate, uterine and breast cancer. It should be avoided by children, nursing mothers and pregnant women, and by those with seizure disorders. Some people experience mild gastrointestinal effects like nausea. Pregnenolone may be converted to steroids such as DHEA, and DHEA can cause adverse effects like acne and hair loss (especially in women).

**Ginkgo Biloba Leaf**
Ginkgo is used for memory and increased circulation in the brain, and for the inhibition in age-related reduction of muscarinergic cholinceptors, as well as stimulation of choline uptake in the hippocampus. It has been demonstrated to improve concentration and
memory deficits as a result of peripheral arterial occlusive disease. Other clinical applications include inhibition of toxically or traumatically induced cerebral edema and retinal edema.

Caution: Ginkgo biloba has a strong inhibitory effect on platelet-activating factor and has the potential to interact with antithrombotic therapy. It is contraindicated in patients known to be hypersensitive to Gingko biloba preparations. Mild gastrointestinal complaints sometimes occur, and allergic skin reactions have been observed on extremely rare occasions. Possibly hypersensitivity reactions are spasms and cramps, and in cases of acute toxicity, loss of muscle tone and weakness.

Inositol
Inositol is necessary for the formation of lecithin within the body and aids in the breakdown of fats and is often used to reduce cholesterol.
Caution: Should be avoided by pregnant women and nursing mothers due to lack of long term safety studies.

Pyroglutamate
Cognitive enhancer. Use under physician's guidance.

Growth Hormone Releasing
L-Ornithine HCl
L-Ornithine facilitates release of growth hormone and directly stimulates T cells and thymus gland immune function.
Caution: GH releasers counteract the effect of insulin; symptoms of schizophrenia and herpes simplex can be increased. Not Recommended for diabetics, growing children, pregnant or lactating mothers. Should be avoided with MAO inhibitors or melanomas.

L-Tyrosine
L-Tyrosine acts as a growth hormone releaser through production of norepinephrine and L-dopa. It has antidepressant, stimulatory and anorexigenic effects.
Important Note: Most effective when used with vitamins C and B6.
Caution: Should not be taken concomitantly with MAO inhibitors. Avoid with Patients with melanomas, high or low blood pressure.

L-Arginine
Facilitates release of growth hormone.

L-Carnitine
Facilitates release of growth hormone.

Vitamin B-6 (pyridoxine HCL)
Cofactor, needed to help the above work.

Vitamin C (ascorbic acid)
Cofactor, needed to help the above work.
My dear friends, Dave and Patty, are a Spencer Tracy/Katherine Hepburn pair if I ever met one. He's a retired Marine officer and aviator who has flown the unfriendly skies in combat missions in three wars, and commanded thousands of men. He's highly knowledgeable on a variety of subjects, and thoroughly likeable, and very republican. She's a writer, an entrepreneur, a forever charming peacenik, and a total democrat.

Patty once offered me the quote "For longevity, make love your priority". I suggested "Just leave off the 'your priority' part."

Medical Details -- and Follow Your Doctor's Guidance

Review the "friendly" disclaimer at the start of this manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctor's approval before implementing any of the ideas in this manual.

If You Have a Medical Condition

As with nutrition, if you have a medical condition, that changes things. The information below would need to be modified to meet your special needs.

Joyful SEX

So for longevity, make love with a willing (and hopefully wildly enthusiastic) partner every day. OKOKOK, I'm just kidding about the "wildly enthusiastic" part -- don't hurt yourself.

Lovemaking reduces physical and emotional tension, and burns calories -- very good things. It doesn't have to go to the point of orgasm. It is estimated that you will expend about 240 calories having sex, so it even contributes to weight loss. And it's believed that an active sex life is beneficial due to endorphin production and release (although long-term studies on that point are lacking). But I can personally verify that it feels good.

And of course, great sex satisfies deep emotional needs. A buildup of sexual energy that is unrelieved can be stressful and cause depression or even impotence from constant self-repression.

It's fun. It's an anatomy lesson. And, it is a spiritual connection with your significant other.

Bedroom athletics may not be necessary to reap health benefits from sexual activity, University of Bristol in England researchers suggest. And even non-vigorous sex may be enough to significantly reduce the risk of heart attack and stroke.

Although testosterone is not the hormone of love, adequate amounts of testosterone are necessary for sexual desire and fulfillment in both men and women. While most aphrodisiacs produce questionable results that are difficult to reproduce, for me avena sativa can really get your motor running. Most testosterone is bound to albumin (a soluble
protein carrier). The avena sativa is thought to unbind some of it, thereby temporarily making it available for use on receptor sites in the brain.

And if you are a guy there's more good news for whoopee makin': exercise results in -- get this -- an ongoing ability to get an erection throughout later years! OK, so that's great news for a gal too! Just as exercise causes the growth of micro-capillaries throughout your body, it also causes the you to grow micro-capillaries in your private parts, as well as keeping them free from the artery clogging blockage that causes heart disease and impotence. So none of those limp, embarrassing moments!

Henry Feldman, an impotence expert at the New England Research Institute in Watertown, Mass., and a co-author of a recent study in the journal *Urology*, tells us that exercise is most likely an erection-friendly pastime because it boosts overall cardiovascular health. Hopefully it goes without saying, but just in case you haven't heard: There are a lot of STDs (sexually transmitted diseases) like HIV, etc. going around, and you don't want them. With the skill that HIV is able to mutate, I wouldn't be surprised if some time soon (if not now) it could be transmitted by kiss. So reduce risk to zero by being in a monogamous relationship with someone who is free of these kinds of complications.

While there may be times that driving to your whoopee session would be more dangerous than the whoopee itself, practice safe sex and fasten your seat belt. While driving there, silly, not during the sex. And definitely no sex while driving.

Also, you do know where babies come from, don't you? So unless you want to have a baby, practice birth control.

Dr John Leiper, an expert in fluid balance and hydration at Aberdeen University, stresses the importance of drinking water after sex. A survey carried out for the Highland Spring mineral water company showed that couples run out of steam after having sex because they fail to drink enough water. Doctors say the finding could explain why many people develop headaches or become lethargic after makin' whoopee. They have warned that couples who work up a sweat in bed risk dehydration unless they replenish their fluids. It is said that French couples, on the other hand, do not have such problems because they drink five times as much water (and have even more sex) than their British counterparts. This particular study found that just two out of five people drink water after sex, to be precise.

And if you do not have a willing (and hopefully wildly enthusiastic) partner, well, then it's a daily menage-a-un for you (pardon my French).

**Los Angeles Gerontology Research Group**

The Los Angeles Gerontology Research Group is an association of physicians, scientists and engineers dedicated to the quest to slow and ultimately reverse human aging within the next 50 years. Meetings are typically on the second Monday of the month at UCLA in Los Angeles. Topics include a very wide range of medical and scientific interests. The group is lead by Steve Coles, M.D., PhD. Steve is highly knowledgeable in a broad range of scientific and medical issues.

Some of the topics presented each month:
1.0 Administrative Matters: Handouts; Future Meetings; Announcements
2.0 Demographics of Aging (Centenarians)
3.0 Theoretical Foundations of Aging (Hormonal Clocks; Telomere Shortening; Basal Metabolic Rate)
4.0 Biomarkers of Physiological Age
Ionizing radiation (i.e. sunlight) promotes the 2 stages of the carcinogenic process, initiation and promotion. It'll tan your hyde, Clyde. This happens mostly because the rays damage your skins DNA, as well as protein and immune system cells.

The irony is that a great looking tan can be the first sign of skin cancer. Most skin cancers will not kill you. But malignant melanoma is a deadly form of skin cancer, which quickly spreads to the vital organs of the body, and that will kill you.

Even if you didn't do a lot of tanning earlier in your life, it would be a good idea to occasionally check for blemishes that are larger than a pencil eraser, multi-colored or a symmetrical in shape. If you have any questions, see a dermatologist.

Tanning also makes you look wrinkled and old because it damages protein fibers that hold the cells together.

The American Academy of Dermatology suggests that, regardless of skin type, a sunscreen with an SPF (sun protection factor) as high as possible (but at least 15) should be used year-round, and applied every few hours while exposed to the sun. The sun emits rays in different spectrums, called UvA and UvB. The shorter wave UvB rays are responsible for burning. But the longer wave UvA rays go deeper into the skin and are linked to aging, cancer and damage to the immune system so they are the greatest danger. The UvB rays make it to the earth's surface (and to you) only from around 11:00 am to 2:00 pm.

However, there is some evidence that chemical sunscreens are toxic to the cells. The ideal sunscreen is a "physical" sunscreen that blocks in the sun, such as titanium dioxide or zinc. The problem is that these are white, and you can't get really high SPF.
Tanning salons should be avoided. Tanning beds emit about 90% UvA -- about twice that received while sunbathing at noon on the beach in the summer.

The sun's rays will go right through glass, so they're even hitting you while you're driving. This is one of the causes of cataracts in the eyes. It takes years to show up, that's why it is considered a disease of "old age". Most sunscreens shield for UvB only. You'll want a sunscreen that protects you from both UvA and UvB. Sunscreens with the chemical sounding "zinc oxide" or "titanium dioxide" are preferred. "Neutrogena Chemical Free Sunscreen", is one example.

Also, it is recommended that eyewear (both regular glasses and sunglasses) be coated to screen for UV.

**Smoking (yuck)**

If you smoke, it's probably the single biggest hazard to your health, outweighing the others combined. If you have tried to stop smoking and failed, just keep trying.

Smoking is known to directly stimulate LDL cholesterol oxidation through free radical production. This is why, in addition to the lungs, the heart, the entire cardiovascular system, and immunity is particularly affected.

Try smoking only one half of the cigarette and throw the other half out (after extinguishing it, of course). There is said to be seven times as much yuck is in the second half as the first, and doing this really helped reduce the addiction. Hypnosis and the "patch" have worked for many people. The kind of affirmations found in the "Behavior Modification and Motivation" section can be highly effective.

If you still smoke, do what you need to do to in order to quit as soon as possible. Until you finally do quit, additional antioxidant supplementation would be appropriate, particularly vitamins C and E, beta carotine, B₁ and B₆, selenium. A lot of people who would like to quit are worried about gaining weight. Well, following this system will help that. And be assured, it would take tremendous amounts of overweight to cause the amounts of damage done by smoking. So if you still smoke, find what works for you and just keep trying to quit. Just keep trying.

**Floss or Die**

*Floss or Die: Implications for Dental Professionals* was the ominous title of the lead story in the July 1998 issue of *Dentistry Today*. Periodontal disease paired with a number of potentially life-threatening disorders? I'm afraid so. There appears to be a causal relationship between certain plaque bacteria and aberrant blood platelet activity. There is also a great deal of circumstantial evidence linking untreated periodontal disease with endocarditis (inflammation of the valves or lining membrane of the heart) and lung infections in patients with chronic obstructive pulmonary disease. The plaque bacteria get into the bloodstream resulting in an increased risk for blood clots associated with myocardial infarction. This spells heart attack.

Chronic Obstructive Pulmonary Disease (COPD) is the sixth leading cause of death in the U.S. and nearly 16 million Americans suffer from the it. A study published in *Journal of Periodontology*, suggests that simply taking better care of their gums might help COPD patients to avert the progression of the disease. Oral biologists from the University of Buffalo studied the gums and lungs of 13,792 patients. Those patients with periodontal
disease, they found, had a one-and-a-half times greater risk of COPD than did those with sound gums. Lung problems worsened with declining oral health. "We know that the onset and progression of COPD is dependent on smoking, and that repeated bacterial infections can worsen the lung disease," says team member Frank A. Scannapieco. "It is possible that periodontal bacteria could travel to the lungs through saliva or normal breathing and in some way promote lung infection. Another possibility is that the inflammation caused by periodontal disease may contribute to inflammation of the lining of the lung airway, which limits the amount of air that passes to and from the lungs." Not brushing one's teeth won't cause lung disease, but for those who already have lung disease, it is especially important to take care of the teeth and gums.

With a bit of DNA detective work on centuries-old dental pulp, researchers have confirmed that the disease we know as the plague was responsible for epidemics centuries ago in southern France. The work, which appears in this week's issue of the Proceedings of the National Academy of Sciences, is the oldest confirmation of Yersinia pestis--the bacterium that causes the plague--with DNA-detection techniques. Until now, historians and scientists studying ancient plagues have relied on symptoms recorded by contemporary observers. Led by Michel Drancourt from the Université de la Méditerranée in Marseille, the team settled on dental pulp--which is both durable and likely to harbor infection--as the place to find intact DNA evidence.

**GREAT News!**

I just came from a dental checkup. I had been away and having an extremely busy working in the biotech industry in San Diego and had gone without a checkup for about a year (shame on me). I was braced for the worst, but for the first time in a long time -- no caps, no crowns, no root canals, not even a cavity! This is a first, because each year for over 1-1/2 decades I have had at least a crown -- sometimes two along with a couple of cavities and even a root canal. This has cost a lot of money, not to mention the time. No, I'm not running out of teeth. Decay and gum disease can still occur in teeth and gums with crowns.

To what do I owe this improvement? I'm finally really taking care of the teeth and gums with the dental program described below. But the single thing I have been doing during for the last year is daily flossing. 40% of the tooth surface can only be reached with dental floss. That means that if you're just brushing, you're only cleaning 60% of the surface of your teeth -- the remaining 40% is unprotected against decay!

And it was Shannon, my dental hygienist, who gave me some great advice that, if you're not flossing daily (or like me, think of it as about as boring as a stop light) I'll now pass along to you: **Put the floss right next to the toothbrush. Think of the two of them as going together. This will help you make daily flossing a habit.** Thanks Shannon!

Tooth decay, or dental caries, is the disease that begins when bacteria produce an acid that diffuses into the teeth and demineralizes them. This acid is a byproduct of the fragmentation of carbohydrates -- especially sugars. Dental caries (tooth decay) is preventable.

Run your tongue over the surface of your teeth. They should not feel velvety or fuzzy. "Disclosing tablets" made from vegetable dye will stain the plaque. Look for colored areas near the gum line.

You'll want a dental team that provides dental education, as well as high quality dental treatment. My dentist, Dr. Nicholas Davis in Newport Beach -- and his entire staff -- are truly excellent in this regard.
Robin, who is also my dental hygienist (I'm lucky -- I get two dental hygienists) advises using light pressure with the toothbrush. Light pressure assures that the tips will get right into the areas where needed. Excessive pressure can be destructive to the tooth, and can even brush away gum tissue and cause recession of the gum and expose the root.

Dr. Davis recommends to start by brushing all the surfaces of the teeth, then wedge the tips of the bristles down under the gum at about a 45° angle and slowly rotate in circles (the brush, not you) and finally pull the debris up and out. Like a hula -- it shouldn't be particularly fast or hard. The tips of the bristles will splay, helping to remove plaque and debris. Be sure to get the hard to reach areas, like behind the wisdom teeth. The toothbrush with a little extended tuft on the end can be good for this. Dry brushing can be effective, especially in areas that are concave, like behind and in front of the upper and lower front teeth. Get a new toothbrush every couple of months or so.

My weapon of choice is the Oral-B "Advantage" (medium) toothbrush. Watch out for those toothbrush handles with the heavy-duty industrial strength grips that make it too easy to brush the teeth with hard pressure.

Brush at least twice a day, and preferably after every meal, and definitely before bedtime. Use a rubber tip at the gum line and between the teeth (inner and outer side of the teeth). Flossing should be at least once a day, and preferably twice a day.

It takes 24 hours for dental plaque to "organize" -- or form a matrix. We need to totally disorganize it from every tooth surface, at least once each 24 hours.

I use Colgate PreviDent 5000 Gel (1.1% Sodium Fluoride) which I get from my dentist (if you use PreviDent, follow the instructions and your dentist’s instructions – it’s not a dentifrice). I first brush using my electric toothbrush, then apply the PreviDent to the surface of teeth with a regular toothbrush, then floss.

Every second of the day your teeth lose minerals -- particularly calcium. Minerals in saliva re-mineralize teeth. When you use fluoride toothpaste it substitutes fluoride (a better mineral for your teeth) for calcium that has been naturally lost. This makes teeth harder and more resistant to decay, at any age. As age increases, sometimes saliva flow decreases -- particularly if you are on medications. That is why sometimes when people start taking certain medications (for example, certain high blood pressure or heart medications) they experience dry mouth syndrome and rapid decay. Saliva substitutes can help with this -- along with drinking adequate water. Water run through reverse osmosis pulls out minerals from your teeth. Don't swallow the fluoride.

Or, brush with baking soda and water, or with baking soda mixed with hydrogen peroxide to form a thick paste (baking soda is probably the best dental cleaner there is). There has been a lot of negative press about fluoride, especially regarding its edition to municipal water supplies. Some municipal water has lots of chlorine, which is not good. However, studies have shown that the limited amounts of fluoride in toothpaste or mouthwash is not a problem. If you do not use a fluoride toothpaste, rinse with a fluoride mouthwash. Brush for at least 3-5 minutes. Massage with a pointed tip at the gums between the teeth to break up the colonies of bacteria. Don't eat or drink the fluoride toothpaste or mouth wash, and be sure that children do not eat or drink the fluoride toothpaste or mouth wash. And some people, especially children, who use too much fluoride developed a discoloring of the teeth called dental fluorosis.

Unwaxed floss works best. No rinse, as that would wash the fluoride away. The American Dental Association recommends this method: Break off about 18 inches of floss and wind most of it around one of your middle fingers. Wind the remaining floss around the same finger of the opposite hand. Holding the floss between phones and for fingers,
guide the floss between the teeth, using a gentle rubbing motion. Avoid snapping the floss into the gums, which can cause bleeding. With the floss reaches the gum line, curve it into a "C" shape around the sides of one tooth, gently sliding into the space between tooth and gum. Holding the floss tightly against one tooth, rub the side of the tooth from gum line to top, using an up-and-down motion. (Avoid side-to-side, or sawing, motion; some people do this so vigorously they actually wear a groove in the tooth over time). People who have difficulty grasping a toothbrush, such as arthritics, can push the handle into a styrofoam ball to use as a more comfortable handle.

A hand held toothbrush works great for most people, but sometimes an electric toothbrush is advised. The Braun brand of electric toothbrush comes highly recommended because it comes with a smaller head than many others and can be more localized to the area you want to brush, it doesn't vibrate much, and is easy to control.

Stay away from mouthwashes with alcohol. Alcohol causes drying, which results in adverse effects to gums. Most bacteria that cause bad breath are on the tongue, and it's OK to dip the toothbrush into a mouthwash that has alcohol and brush the tongue.

Saliva doesn't flow much when we're sleeping. So if and when you wake up in the middle of the night for a feeding you'll need to give the teeth another quick brushing.

Dentists are recommending you keep your toothbrush in a medicine chest or in a room other than the bathroom because flushing the toiled aerates bacteria that can land on your toothbrush.

And of course, see your dentist regularly and have a cleaning at least once every six months. I have found that taking some ibuprofen before a cleaning will reduce any potential discomfort. And of course, great home care will reduce the need for the discomfort of cleaning and dental work.

**Mercury Fillings**

While there may be some validity that mercury fillings emit some harmful mercury gas, it is costly to remove and replace them, and the process is fraught with complications. Long term studies are lacking. The vacuum extraction process requires a special hood, and drilling them out releases mercury.

So there's another reason to take care of those toothies. Until we figure out away to genetically engineer new ones, they're all you'll get.

**Posture**

There is a feedback system between the position of your body and your body’s chemical and emotional states. This effects your physical health, and especially the health of your brain and mind.

Craning the neck forward can cause neck, shoulder and arm pain along with headaches and dizziness. Rounded shoulders may cause back and neck strain. Overall postural imbalance can cause fatigue, joint pain, neuritis, sciatica and pain throughout the entire body.

Strong abdominal and back muscles developed by proper weight training can help you maintain proper, healthy posture.

So sit and stand straight with the head directly above the line parallel with your shoulders, and with your shoulders back. This will help with your breathing. If you work
with a computer, see the discussion on ergonomics in the "Reduce Risks and Stay Safe" section.

**Clothing**

You'll feel better in natural fibers, like cotton.

**Our Animal Friends**

Ya gotta just love those dogs, cats, raccoons, llamas -- all our animal friends, even the ones who aren't so cute and cuddly. Kind of hard for me to warm up to goats, they seem to butt me a lot. It has been reported that blood pressure drops when stroking a dog or a cat, and they seem to like it too. Also, seniors with pets are reported to have fewer health problems and less visits to the doctor. It's worth the hair and cleaning up an occasional mess. Sure does hurt when it's time for them to go to pet heaven. But it's worth it.

One more thing, let me preach a bit and just remind ourselves that animals have feelings too. If you're going to have a pet, please be sure you are ready to take care of it -- and for the eventual veterinarian bills. As stewards of the world we have a responsibility to not inflict suffering on them. Spay and neuter your pets, and for gosh sakes please don't dump them on an Animal Shelter or Humane Society if you can no longer care for them. Imagine what it would be like to sit there in a cramped cage listening to a lot of loud yapping. You may be assured that they will be adopted, but don't necessarily believe it -- most of them are put to death. Some hints on pet care can be found at the Humane Society site at [http://www.hsus.org/ace/12531](http://www.hsus.org/ace/12531).

**How to Find a Really Good Doctor**

Antiaging medicine is not yet a recognized specialty and a good practitioner is immensely hard to find. It took me a long time of trial and painful error to find Dr. Lee-Benner. So this applies to finding specialists in areas where you may have a specific medical problem or a disease. Most medical practitioners follow fairly standard methods of diagnosis and treatment. A few are very bad, and a few are very good. You want the very best, even for seemingly minor ailments. The very best will know how to handle the minor problems most quickly effectively, and they will be best able to identify serious problems that may have gone undetected. Local newspapers sometimes publish surveys of the "best" doctors in the area. Typically they are marketing information gleaned from county medical societies which, of course, want to promote their members. This is their only criteria for who are the "Best Doctors".

A doctor who teaches in a medical school is usually a good bet. They tend to be current on the latest medical technologies, leading the others in private practice by many years. Also, they can be among the smartest and less likely to be swayed by the procedures that are the most profitable.

The best doctors are typically involved in research. A number of years ago when I discovered I had glaucoma, I was motivated to find not only the best ophthalmologist around, but one who specialized in the kind of glaucoma that I had (pigmentary glaucoma). I did a search on the "Medline" database. Medline is a National Library of Medicine system that categorizes medical research, and tracks an immense number of studies. My search turned up Dr. Schaffer of the University of CA San Francisco. That's several hundred miles from me and a little far travel, so I called up there and asked if they knew of someone in the Southern California area. Dr. Donald Minckler of the world class Doheny Eye Clinic had trained with Dr. Schaffer. So I got together with him, and ever since I've been getting world-class treatment.
Back then I had to go to a medical library to use it, and it was kind of complicated. It's now available on the web, it's easier to use and it's free at www.nlm.nih.gov, or go directly to Medline's PubMed at: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?CMD=&DB=PubMed

**Alternative Medicine**

Alternative medicine should be approached with caution. Caveat emptor (Let the buyer beware). Alternative medicine can be defined as therapeutic (healing) practices which are not currently considered an integral part of conventional allopathic medical practice. They may lack biomedical explanations, but some, as they become better researched (like physical therapy, diet, acupuncture) become widely accepted and others (radium therapy, humors) fall into disrepute. "Complementary" therapies are used in addition to conventional treatments and alternative therapies are used instead of conventional treatment.

Alternative medical therapies range from more familiar sounding methods such as herbal therapy, acupuncture and yoga -- to moonbeam therapy. They run the range of innovative and scientifically proven methods of credible professionals, to offbeat treatments with unusual sounding names and questionable scientific evidence, down to those offered by practitioners who go to a weekend seminar then hang out their shingles, or decide to sell some worthless yet highly profitable product.

Herbs and tonics are often like drugs and can have powerful, and undesirable, chemical effects.

Although many alternative therapies are now being evaluated in leading hospitals and research institutions by conventionally trained physicians, a great many have not been evaluated in controlled studies, so their effectiveness is debated. And even effective products or therapies can be worthless or damaging if misapplied. And by investing your hard-earned dollars and your valuable time in therapies that don't work you are not spending your money and your time in things that will.

In 1998 the National Institutes of Health turned its Office of Alternative Medicine into the National Center for Complementary and Alternative Medicine -- and increased the budget from $2 million to $100 million.

Some alternative therapies can reduce the effectiveness of conventional therapies.

Your aging intervention or conventional physician should be able to help you evaluate alternative therapies and you should discuss them with him or her.

Several organizations provide information on alternative treatments. The American Cancer Society publishes an Complementary and Alternative Cancer Methods Handbook. Info here

[http://www.cancer.org/docroot/PUB/content/PUB_1_1_American_Cancer_SocietysbrC omplementary_and_AlternativebrCancer_Methods_Handbook.asp](http://www.cancer.org/docroot/PUB/content/PUB_1_1_American_Cancer_SocietysbrComplementary_and_AlternativebrCancer_Methods_Handbook.asp)

You can order it online, or directly from the American Cancer Society by calling 1-800-ACS-2345. Or mail your check to:

NCICFUL
PO Box 102454
Atlanta, GA 30368-2454
The Pharmacist's Letter (a digest and advisory service on developments of interest to the pharmacist) and the Prescribers Letter (a newsletter with alerts and advice, for prescribers, on developments in drug therapy) jointly publish the Compiled Natural Medicines Comprehensive Database. Details here:


3120 W. March Lane
PO Box 8190
Stockton, CA 95208
Tel:209/472-2244 Fax:209/472-2249

The Physicians Desk Reference (PDR) is a comprehensive resource with information on more than 1,000 prescription medications, including side effects and possible food and drug interactions. There is a PDR for Nutritional Supplements to help you separate fact from fiction. It's available here:


or at (800) 232-7379.

Or at this site: http://www.pdrhealth.com/

And specifically at this page: http://www.pdrhealth.com/drug_info/index.html

These are the selections:
- Prescription Drugs A-Z
- OTC Drugs A-Z
- Herbal Medicines A-Z
- Nutritional Supplements A-Z

Many of the concerns and words of caution discussed in the section on nutritional supplements apply to alternative medical treatment. Many alternative practitioners have a bias (or even greater bias than their conventional counterparts). They often are not critical of their therapies and find evidence to support their bias where there is none. My opinion is that the field of alternative medicine is overrun with self-styled experts, and my personal experiences have been mostly negative.

Alpha and theta brain waves are associated with restfulness, creativity and sleep. The idea was to entrain the brain to a slower brain wave frequency so that you can enter a more relaxed, peaceful state. I once went to a practitioner who used a system with lights affixed to goggles that flashed at the same rate as alpha and theta brain waves (brain waves are oscillating electrical voltages in the brain). I told him to set the system on "relax", but he set it on "psychedelic". After a half hour of this I left feeling dizzy.

One female attorney who has been active in aging intervention in her practice developed breast cancer. An alternative medical practitioner with a questionable therapy told her that this therapy was all that was needed, and to forgo conventional treatment. Surely this course of action would have killed her.

Last week I had a conversation with an alternative practitioner who was selling a nutritional supplement. I asked for evidence that it would provide health benefits. He adopted an aggressive posture and replied that a doctor had created it, but confided that he was now dead. I commented "It didn't save him." He replied "He lived a lot longer than he
would have without it." Snappy comeback, but no evidence. I bit my tongue and did not reply "Probably too much of his own product." He left me with the revelation that he was on the cutting edge of medicine. Again I bit my tongue -- he's on the cutting edge of confusion.

See the appendix for more information on alternative medicine.

**Quack Spotting**

While some quacks are thoroughly unprincipled ("ethically challenged"), most are well-meaning but just don't recognize their ineptitude. Ones who are mad at the system may lack the skills to work within it. "Take some of this and more of that, and this and this and this, and more of that." Next thing you know you're a walking toxic waste dump.

Some define a quack as anyone who fraudulently pretends to medical skills they do not possess. They distinguish among three types: dumb quacks (ignorant), deluded quacks (self-righteous, true believers), and lastly dishonest quacks (genuine con artists, confidence men, swindlers, mountebanks, or grifters). They go on to outline thirty ways to spot a quack, including

1) exclusive reliance on anecdotes and testimonials in support of extravagant claims;
2) display of unrecognized credentials;
3) claims that they are persecuted by orthodox medicine or that their work is suppressed because it is controversial;
4) intimidation of their critics due to threats of law suits or litigation;
5) encouragement of patients to use their political support to publicize their treatment methods; and
6) charismatic individuals capable of exploiting any "placebo effect" to the maximum advantage.

Item 6 above is actually a good thing. Many doctors of this type, having no rigorous controlled animal or clinical trials to support their claims, can still attract thousands of patients and are treated as heroes. Improvements are often a result of the "Placebo Effect". A placebo is something that has no pharmacological effect on the condition for which it is used, but the patient believes it to be a medicine. The Placebo Effect is when patients sometimes have significant improvements or cures to their diseases for no medical reason. It is often attributed to the connection between the mind and the immune system. Such is the power of the mind. Sometimes after a period of time the body will heal itself without medical treatment. For example, in the case of tumors there are sometimes spontaneous remissions with no treatment at all. Sometimes, for reasons not fully understood, the immune surveillance system suddenly "wakes up" after the patient's tumor mass exceeds a critical threshold and "cures" him or her, in spite of, rather than because of, the aggressive radiation and chemotherapeutic treatments provided by unwitting oncologists. Spontaneous remissions can be the result of the placebo effect.

**The Power of Placebo**

**Placebo Defined**

The "placebo effect" has a number of definitions:
The placebo effect is the measurable, observable, or felt improvement in health not attributable to treatment. This effect is believed by many people to be due to the placebo itself in some mysterious way.

A beneficial response to a substance, device, or procedure that cannot be accounted for on the basis of pharmacologic or other direct physical action. Feeling better when the physician walks into the room is a common example.

Some holistic researchers say that the placebo does not cause anything in the body, it triggers its natural response, which is defined as the healing force of nature.

Alternatively, it has been defined as a non-medication, or inactive treatment that is used to satisfy a patient's psychological need for medicine.

Another definition is: "a dummy treatment administered to the control group in a controlled clinical trial in order that the specific and non specific effect of the experimental treatment can be distinguished"

**Placebos in Action**

The word itself is derived from the Latin word *placebo*, which means "I shall please." The patient expects the "medication" to cause improvement, and sometimes it does. Many studies suggest that placebos can relieve a broad range of symptoms. In many disorders, one third or more of patients will get relief from a placebo. Temporary relief has been demonstrated, for example, in arthritis, hay fever, headache, cough, high blood pressure, premenstrual tension, peptic ulcer, and even cancer.

In these and other diseases, tension is often a contributing factor. So lessening of tension often helps. A sympathetic ear or reassurance that no serious disease is involved can be therapeutic in itself.

Confidence, hopefulness and enthusiasm in the treatment on the part of the patient and the practitioner makes it more likely that a placebo effect will happen.

Researchers have found that when patients using placebos experience relief from pain, their own brains are releasing endorphins that help relieve the pain. Other studies on depression show that 45 percent of the people who improve while using a placebo show measurable changes in brain chemistry. One recent study showed that a placebo helped improve the symptoms of Parkinson's disease.

People suffering from chronic symptoms are often depressed, and depression often produces symptoms that the patient attributes to the disease itself. If a practitioner's suggestions make the patient hopeful, the depressive symptoms may resolve leading the patient to believe (at least temporarily) that the approach has been effective against the disease.

A person's beliefs and expectations about a treatment, combined with how suggestible they are, may have a biochemical effect that affects their neurochemistry. The body's neurochemical system affects and is affected by other biochemical systems, including the immune and hormone systems. So a person's hopeful attitude and beliefs may be very important to their physical well-being, as well as their recovery from illness and injury.

But a part of the behavior of a "sick" person is learned (as well as part of the behavior of a person in pain). This is not as faking it, or malingering. The placebo may play a part in their changing the role they're playing, and again affect their chemistry.

Some studies suggest that problems with vague causes, like the fatigue or aches, respond better than those resulting from obvious structural damage, like broken bones.
Danish scientists have studied the differences in effects between clinical trial groups that receive the medication being studied, as well as a placebo and no medication at all. They found that the improvements in the patients who received a placebo and no treatment were often the same -- leading them to wonder whether people who improve on placebos would do as well without any medication.

**One EXTREME Example of Placebo**

It was in the 1950s. To test the effectiveness of a new surgical treatment for angina (chest pain), surgeons at the University of Kansas Medical Center performed real operations on one group of patients, and "placebo" or "sham" operations on another group. In this extreme experiment the group of placebo patients were told that they were going to have heart surgery and were given a local anesthetic and incisions were made in their chests. But no real therapeutic procedure was performed -- the surgeon simply worked his hands around in the chest wall for show. The patients left the hospital with scars and with pain from the incisions, and with no reason to believe they had not undergone the real surgery. Seventy percent of the patients who had the real surgery reported long-term improvement, but all the placebo patients did. Many placebo patients declared themselves fully cured and returned to physically demanding jobs.

**Other Effects of Placebo**

Response to the treatment can also be negative ("nocebo effects"). In one experiment some subjects were warned of possible side effects of a drug were then given injections of a placebo. Many of them reported dizziness, nausea, vomiting, and even depression. A recent review of 109 double-blind drug trials found that the overall incidence of adverse events in healthy volunteers during placebo administration was 19%.

The placebo effect may also result from various procedures, devices and physical techniques. Chiropractors, naturopaths, and various other nonmedical practitioners may use heat, light, diathermy, hydrotherapy, manipulation, massage, and various gadgets. In addition to any physiologic effects, their use can exert a psychologic force that may be reinforced by the relationship between the patient and the practitioner. Of course, devices and procedures used by scientific practitioners can also have placebo effects.

For example, vitamins used as placebos may not be as dangerous in the short term, but the habitual use of products that are not needed can be.

**Psychological and Physiological Implications of Placebo**

By lessening anxiety, placebo action may relieve symptoms caused by the body's reaction to tension (psychosomatic symptoms). In certain circumstances, a lactose tablet (sugar pill) may relieve not only anxiety but also pain, nausea, vomiting, palpitations, shortness of breath, and other symptoms.

The *American Journal of Psychiatry* published a the first-of-its-kind study suggesting that patients with major depression who receive placebos experience changes in brain function similar to changes caused by medication. The double blind study conducted by UCLA researchers used quantitative electroencephalography or QEEG imaging to look at brain activity in 51 patients who were assigned to receive either placebos or one of two antidepressant medications. After nine weeks, patients were classified as being medication responders, placebo responders, or non-responders to either medication or placebos. "The placebo responders and the medication responders had changes in the same brain region," says Dr. Andrew Leuchter, lead author of the study and director of adult psychiatry at the
UCLA Neuropsychiatric Institute and Hospital. Placebo responders showed more activity in the prefrontal cortex while medication responders showed less activity. Additionally, the decrease in depression with the placebo was the same as the improvement with medication.

**Here's the Bottom Line on the Placebo Effect**

If it works, it can be a GREAT idea to use it.

But . . . often when someone responds to placebo in the short-term, the effect doesn't last. And, placebo responses, like feeling less pain or having more energy, may not affect the actual cause and course of the disease. Placebo responses can obscure real disease, which can lead to delay in obtaining appropriate diagnosis or treatment.

**Health Insurance**

Health insurance can mean the difference between getting medical treatment when you need it, and not getting it. Obviously, you need high quality health insurance. Do what you need to do in order to get it and keep it.

An indemnity plan (also known as fee-for-service, or FFS) allows you to go to any medical provider. PPO (Preferred Provider Organization) plans combine some aspects of both Indemnity and HMO plans. HMOs are liked by the extremely cost conscious and are discussed in the next section. Although many good practitioners are providers for PPOs, ideally you will have PPO coverage that also pays something for any provider. But often they will cover only around 50% or so. Coverage with a higher deductible will be at a lower rate and is often preferred, and will cover you in case of catastrophic illness.

Major insurance carriers negotiate much lower rates for things like lab work, so even if you're paying on the deductible out of your own pocket it can be at a smaller percentage of the cost.

Cost of care can go into the millions of dollars and today the maximum amount is an important consideration. Having at least $2,000,000 maximum is a advised, but around $5,000,000 is better.

Companies offer health care coverage as part of their compensation package in order to attract and retain employees. But consider what will happen when you get laid off, and have developed what will be a pre-existing condition with regard to your next health insurance coverage? CORBA (Consolidated Omnibus Reconciliation Act) could provide a short-term safety net, but it's expensive and doesn't last long. At best there will be a waiting period for pre-existing conditions on your next coverage, but more likely it will be excluded altogether.

You can often get health insurance at attractive rates through trade or professional associations, union or school alumni organization.

Study and understand the information on your health insurance, and pay attention to details like when forms are due for submission, etc.

But sometimes a health insurance card from even a budget, no-name carrier can mean the difference between being admitted into a hospital or getting care when you need it, or not. Someone once advised me that if you are really sick and homeless or living in your car, if you show up at a major medical center or hospital that you can get treatment.

See the appendix for more information on health insurance.
**HMOs**

This reminds me of the old joke about not wanting to ride in an airplane that was built by the lowest bidder. HMOs are based on cost reduction and denial of service. HMOs are the junk food of health care. They’re cheap, and fast too -- many HMO doctors are frustrated because they must treat six patients per hour.

I often hear “I’m only having such and such treatments because that’s all my insurance will pay for.” What sense does this make when dealing with your most important asset -- your health, and therefore you.

Don't get me wrong -- I am sure that almost all employees of HMOs are compassionate professionals. But treatment is often dictated by administrators. I wouldn't be surprised if they begin drive-thru service soon to save more money. But their top executives are paid millions each year.

I think that next to the implementation of the health, fitness and antiaging system, the selection of medical insurance (and therefore selection of health care system and professionals) is one of the most important health decisions a person will make. Volumes are written about the ins & outs of medical insurance, and finding affordable insurance is a challenge -- particularly if you have a pre-existing condition. I personally belong to plan with a $1000 deductible. It's a PPO but allows members do see doctors outside of their network. Originally it paid for 70% of the cost of the out-of-network doctors but recently that was dropped to only 50%. Rarely will I see a doctor within the network, so the cost of this plan is high. But I won't be a member of a medical plan which does not allow me to select the best doctor, and I won't go near an HMO.

The following sections are not medical or scientific, so were not reviewed as such.

**Reduce Risks to Live Longer and Better**

Picture this: You're out for a Sunday drive with your family. Laughing, maybe even singing. Life is good. Not care in the world . . . then Whammo! Out of nowhere a drunk driver plows into your car. Some of your family members are lucky, some are dead. You wake up paralyzed in hospital -- for the rest of your life. Try just laying there not moving for a few hours like a quadraplegic or rolling around in a wheelchair for a day or so like a paraplegic sometime to get a hint of this experience.

Yup, pretty grisly. But it's happened to many, many people. I've personally known a number of them. Just ask Christopher Reeve and a host of others whose lives have been turned around in an instant.

You may know someone who has had a life-shattering event. I've known quite a few, which proves how often it happens. The result -- paralysis, permanent disability, immense pain for the rest of their (could be your) life. And it can happen in an instant.

To get just a brief slice of the life of a quadraplegic, for example, try laying in bed for an hour or two, and just don't move. Have someone turn you when you get uncomfortable. Have them help you go to the bathroom (remember, you can't move). Of course this exercise is entirely inadequate to understand what it would be like.

Safety and reducing risks are often overlooked in components of an antiaging system. But some of the greatest causes of serious injury are things like auto accidents and falling off of an unstable stool while changing a light bulb. Here are some ideas on how to avoid bone and life-shattering events, as well as the daily occurrences that slowly wear you down.
Use common sense, and pay attention to your intuition regarding safety in any situation.

Some Defensive Driving Tips

- It's easy to forget that while driving, we're hurling down the pavement in machines made of steel, glass and rubber -- and that either striking or being struck by other large machines can tear us to pieces. So staying separated from other large machines (defensive driving) is obvious.
- Insist that everyone in your car wear their seat belt.
- Always drive defensively. Consider taking into our refresh or driving course or study a book on the subject.
- Don't follow other drivers too closely -- allow at least one car length for each 10 mph you are traveling.
- Look down the road -- get the big picture.
- Leave yourself a way out -- away from cars and from potential accident situations.
- Drive a safe car, not a tin can.
- Stay alert -- don't drive drowsy.
- Always use your turn signals and brake lights to signal your intentions.
- Make sure you have plenty of room when you want to merge.
- Don't drink or use drugs (prescription or otherwise) and drive
- Allow more time for your trip. Instead of trying to "make good time," try to "make time good."
- Pull over and stop your car to use a cellular phone
- Let irate drivers pass you. Don't get mad.

Top Reasons Why Good Drivers Get Injured or Killed According to the National Safety Council

- Head-on Collision -- caused by drivers passing at the wrong time and happens around curves. But mostly happen when drivers are following a straight path, usually in dry weather, day or night. Probably a result of being distracted -- by kids, changing a tape or CD, or talking on a cell phone. Safest highways are ones with center dividers or spaces, and where there are on and off ramps.
- At a STOP sign -- other drivers failed to stop. Be extra careful at intersections. Make sure the other car is stopping and look at the other driver to see that they are not distracted and sees you.
- A majority of accidents happen on side roads and "byways" -- stick to major highways when you can.
- Serious accidents, and resulting deaths, happen in places as apparently unlikely as parking lots, in driveways, at unmarked side roads and shopping center parking lots. This often happens where there are no stop signs or traffic lights,
- By drivers running a red light. Even when your light has turned to green, take one more look both ways to be sure no one is coming. I have my own real life tale about this one. I used to have a small sports car. One night (it happened to be raining, but this would have been the same if it weren't) I was stopped at a red light. The light turned green, but due to a glitch in the clutch it stopped temporarily. Just as I got rolling a HUGE car (travelling so fast I couldn't tell what kind it was) barreled through the intersection from left to right, and right in front of me. It must have been doing 60, and I don't think it had it's lights on. So,
dear reader, had it not been for lucky intervening glitch in the clutch, you just wouldn't be reading this.

**Road Rage**

- Watch out for people with road rage -- and don't be a road rager yourself.
- Don’t slam on the brakes if someone’s tailgating you, just signal, pull over to let them pass. If you are in the left lane and someone wants to pass, move over to the right and let him or her by.
- If someone cuts you off, slow down and give the car plenty of room to merge into your lane. Just send them unconditional love.
- Don’t offend other drivers. Remember, you may be "right" because you’re traveling at the speed limit, but you can also be putting yourself in danger by enraging someone behind you -- don't be "dead right".
- Keep as much distance as possible between yourself and another driver who wants to pick a fight. Motorists you might have offended can "snap" at any time, so don't let your ego get you into trouble.
- Give the other motorist the benefit of the doubt. A driver who’s speeding or constantly changing lanes may be a volunteer fireman responding to a call, a physician rushing to a hospital or an undercover cop.
- For too many motorists, driving becomes a contest. Forget about winning, listen to soothing music or a book on tape. Seek help if you have a problem with aggressive drivers or if you yourself are getting angrier behind the wheel. Courses in anger management have been shown to reduce heart attacks.

See the appendix for more information on safe driving.

**Safe Home Checklist**

- Surprisingly, falling off of chairs is a major source of injury and death while changing light bulbs, cleaning high places, etc -- so use a step ladder to reach those high places and make sure you are well balanced and don't use the upper steps.
- Keep fire extinguishers nearby. Unless you have a special kind of environment, ones that are rated for class A, B and C fires are usually the most appropriate. When things are happening quickly in an emergency, most people have great difficulty in using a fire extinguisher. Practice so that you and your family can use them quickly. Also be aware that different fire extinguishers are rated for different kinds of fires, so use the right kind of fire extinguisher for a particular kind of fire, and keep a multi-purpose extinguisher nearby.
- Post emergency telephone numbers by every telephone -- numbers should be clear enough and large enough to be easily read from a distance in an emergency.
- Keep a first aid kit and emergency guide handy, and know how to deal with emergencies such as choking, bleeding, burns and poisoning in advance.
- Install smoke detectors and test them regularly.
- Store flammable materials away from the furnace, fireplace, and other heat sources.
- Never leave fire unattended.
- Don't let anyone smoke in bed -- or anywhere else for that matter.
- Inspect electrical equipment regularly -- replace frayed or cracked electrical cords, and broken sockets and plugs.
- Lock up drugs and hazardous materials out of children's reach.
- Keeps stairs, sidewalks and hallways well lit a clear of clutter.
- Follow the manufacturers recommendations for the safe use and maintenance of power tools.
- Beware of overhead power lines when trimming trees or installing antennas.
Fumes can build up and confined areas around the home with toxic substances are used. Take precautions.

A kitchen tends to stock pollutants and environmentally harmful products alongside devices like appliances, can openers and utensils. Food that is stored, prepared, and eaten in a chemical-laden space can soak up toxins.

Black mold can be a cause of toxicity, particularly in sensitive people. (see section on black mold below)

See the appendix for more information on home safety.

**First Aid Basics**

According to the American Red Cross, if you encounter someone who is injured, apply the emergency action steps: Check-Call-Care. Check the scene to make sure it is safe for you to approach. Then check the victim for unconsciousness and life-threatening conditions. Someone who has a life-threatening condition, such as not breathing or severe bleeding, requires immediate care by trained responders and may require treatment by medical professionals. Call out for help. There are some steps that you can take, however, to care for someone who is hurt, but whose injuries are not life threatening.

**Control Bleeding**

Cover the wound with a dressing, and press firmly against the wound (direct pressure). Elevate the injured area above the level of the heart if you do not suspect that the victim has a broken bone.

Cover the dressing with a roller bandage.

If the bleeding does not stop:

Apply additional dressings and bandages.

Use a pressure point to squeeze the artery against the bone.

Provide care for shock.

**Care for Shock**

Keep the victim from getting chilled or overheated.

Elevate the legs about 12 inches (if broken bones are not suspected).

Do not give food or drink to the victim.

**Tend Burns**

Stop the burning by cooling the burn with large amounts of water.

Cover the burn with dry, clean dressings or cloth.

**Care for Injuries to Muscles, Bones and Joints**

Rest the injured part.

Apply ice or a cold pack to control swelling and reduce pain.

Avoid any movement or activity that causes pain.

If you must move the victim because the scene is becoming unsafe, try to immobilize the injured part to keep it from moving.

**Be Aware of Biological/Radiological Exposure**

Listen to local radio and television reports for the most accurate information from responsible governmental and medical authorities on what's happening and what actions you will need to take.

**Reduce Any Care Risks**
The risk of getting a disease while giving first aid is extremely rare. However, to reduce the risk even further:
Avoid direct contact with blood and other body fluids.
Use protective equipment, such as disposable gloves and breathing barriers.
Thoroughly wash your hands with soap and water immediately after giving care.

Remodeling the Home
- Remodeling a home presents special health hazards from the toxic fumes, dust, etc. One excellent method is for the work area to be sealed off with plastic sheeting and tape, with a negative pressure system that uses a fan to draw the contaminants out through a vent.
- Inexpensive materials are often more toxic than those that cost more money.
- Avoid enamel paint if at all possible. Water based paint is less toxic -- but be aware that many of these, particularly inexpensive ones, are more toxic. One professional maintenance man mentioned to me that the Evr-Gard and Schreuder brands were lower than most others.
- Carpteing has been a major contributor to toxic effects -- and particularly the liner used underneath.
- One person I heard of had marble tiles installed instead of carpet -- unfortunately the adhesive used to hold them down turned out to be more toxic than the carpet and liner!
- The National Association of the Remodeling Industry web site at http://www.nari.org/ can give you a lot of construction-related information, and on hiring a contractor.
- New federal guidelines are under development to determine how contractors should handle and dispose of lead laden materials during remodeling or renovation. You can contact your local health department for referrals to professionals trained in lead detection and removal. Use only inspectors certified by your state or local government's health department, the EPA or those with The Lead Listing organization sanctioned by the U.S. Department of Housing and Urban Development's (HUD) Office of Lead Hazard Control. A trained inspector will use a portable X-ray fluorescence machine to measure the amount of lead in the paint or will send samples to a certified lab. Don't count on do-it-yourself test kits for definitive results. Their sensitivity is limited and it may be difficult to get accurate readings on surfaces with multiple layers of paint. (see section on lead paint below)
- If you are about to perform major renovations which involve tearing out materials, consider determining if asbestos is present first. But if disturbed, it can release microscopic asbestos fibers that are hazardous (see section on asbestos below).
- Improper construction can result in black mold -- building materials should be kept dry to prevent mold, and other measures should be taken (see the section on black mold below).
- Do not hesitate to question a contractor or repairman about their qualifications to deal with hazardous materials.

Workplace Checklist
- Hazards in the workplace are often caused by the use of materials, tools, machinery and chemicals -- and people!
- Notify all co-workers of hazards
- Ensure that you and all team members follow established safety procedures and policies.
- Always wear appropriate safety eyewear, clothing, footwear and protective equipment.
- Be aware of, and follow all safety practices specific to your occupation and industry.
- Maintain ongoing safety education.
Study and thoroughly understand safety information for any piece of equipment you operate.
Safety is everybody's job.
All of the tips in the other sections above and below apply to the Workplace.

Carcinogens and Toxins

Everyday our bodies are bombarded with toxins and carcinogens. These cancer-causing substances include the ingredients in household cleaners, pesticides, automobile emissions, food additives, tobacco and other kinds of smoke, industrial pollutants. As described in the first chapter, toxins can change base pairs, and they can add or subtract base pairs to your DNA. This amounts to rewriting your DNA, and as a result the gene that has been rewritten cannot code or express itself properly, or cause a cell to multiply out of control. So avoid them, and put this system into practice in order to combat them.

Toxins can be ingested by eating or drinking hazardous substances or contaminated food and water, and can be inhaled in the form of gases, vapors, and sprays. Toxins can be absorbed through the skin if you come in contact with hazardous substances.

Avoid aerosol products. Aerosol disperses the substance in tiny droplets than can be inhaled deeply into the lungs and absorbed into the bloodstream. In addition, aerosol cans may become explosive bombs when heated.

Read all labels carefully before using hazardous products. Be aware of their uses and dangers, and use proper safety equipment when working with them.

Leave products in their original containers with the label that clearly identifies the contents. And never put hazardous products in food or beverage containers.

Don't mix products unless directed to do so by label directions. Mixing can cause toxic and even explosive chemical reactions. Even different brands of the same product can contain incompatible ingredients.

Follow label directions regarding proper use and amounts. Use only what is needed for a job. More product doesn't mean more results.

Guidelines For Safe Disposal of Toxic Products

This info applies to household use only -- different sets of laws often apply to businesses.

Dispose of hazardous wastes properly -- we already have too much toxins in our environment. Recommendations for proper disposal will depend upon both the particular type of waste and the waste disposal options available in your community. Local laws pertaining to disposal may vary. For example, landfill owners have the right to decide what they will and will not accept for disposal. As a general rule, liquids containing hazardous substances (paint for example) are discouraged in landfills as they create hazardous leachate which may contaminate the groundwater. If in doubt, check with your local officials for what is appropriate in your community.

When products are fully used up as intended there is no hazardous waste to dispose of. If you only need a small amount of paint, pesticide, or other hazardous product, check with friends, relatives, or neighbors to see if they have any excess they are trying to use up. Be a wise consumer. Buy only the amount you need and look for safer alternatives whenever possible.
When Throwing In The Trash -- When it is recommended that a waste be thrown into the trash, it means the final destination is the landfill. No other dumping, burning, or burying of hazardous waste is safe or legal. Trash disposal of hazardous materials which are flammable, explosive/reactive, corrosive/caustic, radioactive, or toxic can cause health risks to waste handlers and an environmental hazard if toxicants leach from the landfill into the groundwater. Be very careful about what you throw away and if you have any doubts, make sure that your waste handler knows the substance is in there and be certain it is securely wrapped.

Objects that can puncture skin, such as hypodermic needles, broken glass, and metal shards, are known as a "sharps." Sharps should be placed in a rigid, puncture-resistant container. Seal the container with heavy tape and place in the trash. Large breakable items, such as fluorescent light bulbs, should be placed alongside your trash container. These actions will help trash haulers avoid injury.

Some of the hazardous wastes which are acceptable at some landfills include empty aerosol cans, autobody repair products, fertilizer (without pesticides), shoe polish, crystallized oven cleaner, empty and triple-rinsed pesticide containers. If solidified, these products may also be acceptable -- paints, adhesives and epoxies, nail polish, solvent-based polishes, solvent-based cleaners and thinners.

Some household hazardous wastes that can be flushed down the drain (the toilet is recommended) with plenty of water -- (note: this recommendation is given when the hazardous waste is neutralized by water or when the municipal or sanitary sewage system is able to remove the toxins or render them harmless. If you use a septic system or lagoon, it is preferable to give hazardous waste acceptable for flushing to a friend who is on a sanitary sewage treatment system. Heavy concentrations of certain chemicals in a septic tank can slow down or destroy the microorganisms which make the system work properly). If flushing down the drain, take the following precautions:
- If you have any doubts, call your local wastewater treatment plant.
- Never pour any chemicals down a basement drain or storm sewer; these lead directly into the waterways.
- Make sure there is adequate ventilation in the area where you are flushing the waste.
- Avoid disposal of chemical wastes in food preparation areas.
- Never mix chemicals together either while pour or when they are in the stool or sink. Wait at least two to three hours between flushing ammonia and flushing bleach.
- Wear gloves and goggles when disposing of wastes to avoid eye and skin contact. Pour slowly and carefully to avoid splashing.
- Flush wastes during the working day so that waste will be carried quickly through the system and will not be left in the sewer system overnight.
- Flush wastes using a large volume of water.
- Rinse the empty container with water before placing in the trash.

**Lead**

Typically, the older the home, the higher the concentration of lead-based paint and contaminated soil. Higher contamination means higher risk. Soils can also be a source of contamination. Paint breaks down into a chalky, powdery substance as it ages and these tiny particles accumulate in the soil around the house.
According to the U.S. Environmental Protection Agency, homes and apartments built before 1978 almost always contain some lead-based paint, which when disturbed can release toxic dust and fumes.

According to the Centers for Disease Control and Prevention, in adults, lead can decrease learning ability, cause hearing loss, high blood pressure, muscle aches, joint pain, lower sperm count, and early death. If you have, or suspect you have, lead-based paint in your home, it is important to have young children under 6 tested by your physician or local health department. For kids, when it comes to toxins, lead is considered the worst offender -- especially for infants and toddlers, who put a lot of things in their mouths. Children's bodies absorb lead more readily than adults, and children who inhale or ingest lead run the risk of developing motor coordination problems, reading disabilities, vocabulary deficits, hyperactivity and attention deficit disorder (ADD).

According to the EPA's National Lead Information Center, you should not attempt to remove lead based paint by dry sanding, scraping, brushing or blasting. These techniques can generate dust which is toxic when inhaled. Lead-based paint is particularly hazardous when burned. The fumes contain lead and other toxins which are poisonous when inhaled. What is recommended is regular damp mopping, dust control, picking up loose paint chips with duct tape and frequent washing of your child's hands and toys to help reduce exposure. Vacuuming, on the other hand, can disperse dust particles back into the room.

The Federal Residential Lead-Based Paint Hazard Reduction Act of 1992 requires that when you sell your home, you or your agent disclose known or potential lead hazards in any residential property built before 1978. Landlords must also make the disclosure to new tenants and those renewing leases. This includes handing the prospective buyer or new tenant a copy of the EPA's "Protect Your Family from Lead in Your Home" brochure. And some states also require that general contractors, working in your home, provide you with disclosures about the dangers of lead poisoning.

EPA guides and information from the National Lead Information Center cover safety, testing, remodeling and disclosure procedures.

**Asbestos**

Asbestos was banned in 1997, the mineral fiber asbestos was previously used in a range of home building products to provide heat insulation, to strengthen and add fire resistance. In older homes, roofing, siding, insulation, acoustical materials and floor tiles are potential sources of asbestos, according to the EPA. Many states also require disclosures for other hazardous materials, such as asbestos.

As long as the asbestos material remains intact, it doesn't pose an immense threat. But if asbestos-laden material is disturbed, it can release microscopic asbestos fibers. Excessive or long-term exposure creates risks of cancer and lung disease. Children, pregnant women, smokers and others with pulmonary system problems are particularly at risk.

You can't tell if a material contains asbestos simply by looking at it unless it's labeled. Hire an accredited laboratory through the National Institute for Standards and Technology (NIST) or contact your state or local health department for assistance. Don't just take these matters into your own hands. If done improperly, even just taking a sample for lab analysis can be hazardous. Have professionals who know how to remove the sample safely, and provide the solutions. Asbestos removal is very expensive. The recommended alternative is usually covering the material or sealing it so the asbestos is not released.
Do not hesitate to question a contractor or repairman about their qualifications to deal with hazardous materials.

**Black Mold**

Black mold -- a colored, fuzzy black mold growth -- can be a cause of toxicity. The colonies usually emit a very unpleasant, musty odor. Exposure to black mold spores can cause mild to severe allergic reactions, and possibly more serious problems, depending on individual sensitivity -- and sometimes there are much more serious effects.

- Do not touch mold or moldy items with your bare hands.
- Do not get mold or mold spores in your eyes.
- Do not breathe in mold or mold spores.
- Consult a professional for Personal Protective Equipment (PPE) and containment guidelines. PPE should be worn when disturbing mold. The minimum PPE is an N-95 respirator, gloves, and eye protection.

Environmental testing and sampling of a mold-contaminated structure is often necessary to determine proper remediation procedures. An environmental professional who is trained for this should perform mold testing and sampling.

Preventing mold involves mostly controlling moisture and humidity. Building materials should be kept dry to prevent mold. Tips on mold prevention can be found here:

http://www.toxic-black-mold-info.com/prevent.htm

The Environmental Protection Agency has released a publication titled "Mold Remediation in Schools and Commercial Buildings." It guides building owners and managers through identifying, remediating and preventing mold (though it does not discuss specific mold exposure limits for health purposes). It's available at:

http://www.epa.gov/iaq/molds/

**EPA Indoor Air Quality Publications**

Other publications about indoor air quality are available at:

http://www.epa.gov/iaq/pubs/index.html

**How to Order EPA Publications:** These indoor air quality publications are also available through the IAQ INFO Clearinghouse.

IAQ INFO
P.O. Box 37133, Washington, DC 20013-7133
1-800-438-4318/703-356-4020
(fax) 703-356-5386
iaqinfo@aol.com

or you can order these publications directly via EPA's National Service Center for Environmental Publications (NSCEP) (http://www.epa.gov/ncepihom/). web site. Your publication requests can also be mailed, called or faxed directly to:

U.S. Environmental Protection Agency
National Center for Environmental Publications (NSCEP)
P.O. Box 42419
Cincinnati, OH 42419
1-800-490-9198/(513) 489-8695 (fax)
Be sure to use the EPA Document Number, which is usually bolded or highlighted, when ordering from NSCEP or from IAQ INFO.

**Disasters and Terrorist Attacks**

If disaster strikes or there is a terrorist attack, the American Red Cross recommends that you:

- Remain calm and be patient.
- Follow the advice of local emergency officials.
- Listen to your radio or television for news and instructions.
- If the disaster occurs near you, check for injuries. Give first aid and get help for seriously injured people.
  - If the disaster occurs near your home while you are there, check for damage using a flashlight. Do not light matches or candles or turn on electrical switches. Check for fires, fire hazards and other household hazards. Sniff for gas leaks, starting at the water heater. If you smell gas or suspect a leak, turn off the main gas valve, open windows, and get everyone outside quickly.
  - Shut off any other damaged utilities.
  - Confine or secure your pets.
  - Call your family contact—do not use the telephone again unless it is a life-threatening emergency.
  - Check on your neighbors, especially those who are elderly or disabled.

To prepare for a terrorist attack the American Red Cross recommends that you create an emergency communications plan, establish a meeting place, assemble a disaster supplies kit and check on the school emergency plan of any school-age children you may have.

Other recommendations also would apply, such as creating a shelter-in-place and having adequate and appropriate food and water, among others.

As we learned from the events of September 11, 2001, the following things can happen after a terrorist attack:

There can be significant numbers of casualties and/or damage to buildings and the infrastructure. So employers need up-to-date information about any medical needs you may have and on how to contact your designated beneficiaries.

Heavy law enforcement involvement at local, state and federal levels follows a terrorist attack due to the event's criminal nature.

Health and mental health resources in the affected communities can be strained to their limits, maybe even overwhelmed.

Extensive media coverage, strong public fear and international implications and consequences can continue for a prolonged period.

Workplaces and schools may be closed, and there may be restrictions on domestic and international travel.

You and your family or household may have to evacuate an area, avoiding roads blocked for your safety.

Clean-up may take many months.
Evacuation

If local authorities ask you to leave your home, they have a good reason to make this request, and you should heed the advice immediately. Listen to your radio or television and follow the instructions of local emergency officials and keep these simple tips in mind-

Wear long-sleeved shirts, long pants and sturdy shoes so you can be protected as much as possible.

Take your disaster supplies kit.

Take your pets with you; do not leave them behind. Because pets are not permitted in public shelters, follow your plan to go to a relative's or friend's home, or find a "pet-friendly" hotel.

Lock your home.

Use travel routes specified by local authorities—don't use shortcuts because certain areas may be impassable or dangerous.

Stay away from downed power lines.

Listen to local authorities.

Your local authorities will provide you with the most accurate information specific to an event in your area. Staying tuned to local radio and television, and following their instructions is your safest choice.

If you're sure you have time:

Call your family contact to tell them where you are going and when you expect to arrive.

Shut off water and electricity before leaving, if instructed to do so. Leave natural gas service ON unless local officials advise you otherwise. You may need gas for heating and cooking, and only a professional can restore gas service in your home once it's been turned off. In a disaster situation it could take weeks for a professional to respond.

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Detailed information prepared by the American Red Cross can be found on the following web sites:

http://www.redcross.org/services/disaster/beprepared/
http://www.redcross.org/services/disaster/keepsafe/unexpected.html

Their shelter-in-place fact sheet can be found here:

http://www.redcross.org/services/disaster/beprepared/shelterinplace.html

Food and water

http://www.redcross.org/services/disaster/beprepared/foodwtr.html

Helpful information about the specific effects of chemical or biological agents can be found on the following Web sites:

Centers for Disease Control and Prevention: http://www.bt.cdc.gov
High Voltage Power Lines, Microwave Radiation

Like other issues where there are millions of dollars at stake, there is great controversy over the effects of ambient radiation, such as living near high voltage power lines and being around the kind of the radiation generated by microwave ovens and other devices.

Personally, I wouldn't live next to high voltage power lines or a cell phone tower, and I will stay several yards away from a microwave oven when it's operating, and well out of the range of radar. Also, I use a cell phone hands free with an extension earpiece and microphone which keeps the antenna away from the head. Cordless phones like those used in the home have a much lower power than mobile phones, because their range is 200 meters maximum, while the range of mobile phones is several kilometers.

Urban Living


They found that living in a city carried an excess hazard of mortality only for men under the age of 65, and particularly for white men. Black men had an equal likelihood of dying living in the city or a suburb. While researchers saw the increased risk of death in all types and sizes of cities, they found that urban men were more likely to have died from infections and tumors. “Elevated levels of tumor deaths suggest the influence of physical, chemical and biological exposures in urban areas,” Dr. House says. “Living in cities also involves potentially stressful levels of noise, sensory stimulation and overload, interpersonal relations and conflict, and vigilance against hazards ranging from crime to accidents.” The stresses of urban life may exacerbate immune suppression in men.

"Women don’t seem to carry the same risk because they might have some social, psychological or biological resources that buffer or protect them from the hazard of city life. And the majority of blacks who live in the suburbs are not better or worse off.
socioeconomically than those who live in nearby cities, and their death risk was equal in both places. Living in cities also involves potentially stressful levels of noise, sensory stimulation and overload, interpersonal relations and conflict, and vigilance against hazards ranging from crime to accidents,” House says.

Still, because two characteristics are found together doesn't mean that one causes the other. Is the city risky in itself or if certain types of people choose to live in the city. Charles Longino, professor of sociology at Wake Forest University, in Winston-Salem, N.C., commenting on the study. “They contain higher proportions of people with high stress levels, frustrated ambitions and fewer personal resources,” he adds. “How many of these factors would change if they moved to rural areas? It may not be location but the people in those locations that is key to understand these findings.”

**International Travel**

Here's a web site to advise you of risks of international travel, such as the incidence of the major diseases that may arise from international travel, hazards related to the environment, like bathing, altitude, heat and humidity, sun, insects, and accidents, and risks from food and drink: [http://www.who.int/ith/english/risks.htm](http://www.who.int/ith/english/risks.htm)

**Ergonomics**

We were designed for movement. Standing is our most natural posture. Sitting for long periods of time strains the spine, muscles, tendons and ligaments. The help alleviate pressure on the vertebrae, it is critical to support the lower back. This is accomplished by the bottom of the chair with a lumbar (lower back) support that is "outdented" or formed with a fairly broad area so as to press somewhat into the spine just above the pelvis and support it. A separate back support or a small pillow can do much the same thing.

Repetitive strain (not to be confused with carpel tunnel syndrome) happens as a result of a maladaptive body position. It creates long-term stress, pulling muscles and nerves in directions that are not usual for the body parts involved. It can even be permanently disabling. Symptoms include numbness of the fingers, tingling, coldness and discomfort and the hands, burning of the fingers and pain at night. Lower and upper back, and other body parts can be affected.

Sit up straight with your head above the shoulders. Don't bend forward (which often accompanies working on a computer) as this decreases lung capacity, reduces oxygenation, causes fatigue, and results in a permanent "turtleneck".

The front edge of your chair should not press behind your knees -- you should be able to the your fist between the end of the seat and back of your knee.

Thighs should be at a 90 degree angle from your body, and ideally the feet will be flat on an elevated and angled foot rest. You'll need a quality chair that fits you properly. And ideally it will adjust up and down, the seat will tilt forward and back, the chair's back tilt will be adjustable, it will have armrests, and the chairs seat will fit your seat.

If you work on a computer, then focus your eyes away from your computer or from your work at least every 15 minutes. Documents should be at eye-level, and the top of the monitor should be 0 to 15 degrees below eye level. Forearms should be supported on a soft armrest -- slightly above the position where they hang relaxed from your shoulders. The armrest of your chair his fine, but you may even want to go as far as using a forearm support. I use the "Ergo Rest" attachment from Sweden. Wrists should be straight plus or minus 10 degrees.
Get up and walk around at least once in hour. Stretch in all directions, and lean over to gently try to touch your toes while letting your head dangle. Come back up slowly so as to not cause muscles to spasm. Shrug your shoulders up & down and forward & back and in big circles. Move your head from side to side and front & back around in big circles about 10 times each. Clench your hands in a fist and move them with 10 circles and then 10 circles out. Put your hands together in a praying position and squeeze together for a few seconds, then put the backs of your hands together for a few seconds. Spread your fingers apart and bring the back together. Bring your palms up and down in a big wave. Turn palms up, then turn palms down. Just move your head, shoulders and hands every which way. Set a timer for these to help you remember.

To reduce repetitive motion strain on the hands I use a voice recognition system. I talk and it types into my word processor. I first tried one system and lost almost 1/2 day of work with it as well as experienced an awful lot of frustration. Twice it took over in hour to train it to recognize my voice, and when it was time to save the speech files, the system stalled and I lost my work. When I called their technical support people I was told that there was a problem with a couple of "DLLs" (software components), and that they were aware of this and had heard of it before. I brought this up to the company's representatives at a trade show and they acted dumb. I took the system back and got the Dragon NaturallySpeaking System and it has performed generally acceptably. Although I do have to frequently touch up my work, it has saved an awful lot of typing and strain to the hands.

See the appendix for more information on ergonomics.

**Making Your Home Safer**

Robbers, burglars, bandits, rapists and other intruders who would break into your home to do you harm really don't like lights - either interior and exterior. Security lights with heat or motion sensors that turn on when someone passes are highly advised, and they are relatively inexpensive.

If you are away, use a light timer that goes on and off at various intervals to give the appearance that someone is home. Exterior lighting are critical areas like common parking lots or underground garages if you need to walk to your front door. You want to see who is around you, and avoid any potential threats. Because criminals don't want to be seen or identified it is also a deterrent.

You will also want to keep the outside of your home or apartment well lighted, especially the entryway. Lights should be on a timer or photo-cell so they come on at dusk and off at dawn -- lights left on all day is a giveaway that you are away from home for an extended time.

Decals that indicates an alarm system, a dog, or block watch or operation identification can be good deterrents.

While sophisticated alarm systems can be effective, so is a very yappy dog.

Walk around your home and evaluate it as though you were a burglar. Try to break in. Correct any access points right away. Although no home is completely safe from a determined and experienced burglar, if you make it difficult and less likely for someone to break in to your home.

By far, the most common threat to a home is burglary. Most occur during the daytime when people are away, but they also occur at night when it looks like nobody is home. Robbers and burglars often use ordinary household tools like screwdrivers, channel-lock pliers, pry bars, and hammers to get in. They usually involve a selection process, which is
simple -- a home with the easiest access, the greatest amount of cover and with the easiest escape are their first choices.

The garage door is usually the weakest entry, and then it's by the back door. Use high quality Grade-1 or 2 locks on exterior doors to resist twisting, prying and lock-picking. A quality deadbolt lock will have a beveled casing to inhibit the use of channel-lock pliers used in forced entry. A quality door knob-in-lock set will have a 'dead latch' mechanism to prevent slipping the lock with a shim or credit card.

The most common forced entry method through a door with a wooden frame is to kick it open. The weakest point is usually the "strike plate" that holds the latch or lock bolt in place. The average door strike plate is secured with only two half-inch screws in the door frame molding. These moldings are often lightweight and tacked on to the door frame, and can be broken with a hard kick. Upgrade to a four-screw, heavy-duty, high security strike plate available in many hardware stores. Install it with 3-inch wood screws to cut deep into the door frame stud. Use these longer screws in the knob lock strike plate as well and use at least one long screw in each door hinge. This one alone will deter or prevent most through-the-door forced entries. A wide-angle peephole is advised.

Windows, particularly first floor windows, are often left unlocked and are the targets of intruders. Some upper windows can be accessed by trees, balconies etc. They should be secured to prevent sliding open from the outside. Thick sticks (like a broomstick) should secure them so they cannot be opened more than six inches. Through-the-frame pins work well for vertical sliding windows. Be sure you can't reach in from the outside and remove the blocking device. But -- make sure they can be removed quickly in case of fire. Other blocking devices are available at hardware stores.

Arrange your furniture and furnishings such as lamps so as to obstruct windows. If they knock something over when coming in chances are good you will hear it, and they may even flee. If you awake and find an intruder in the same room, acting as though you are still asleep can be a good tactic until you can either flee, or fight if necessary.

Don't hide keys in obvious places outside your home -- intruders know to look for them.

Sliding glass doors are usually installed at the rear of a home or apartment which often makes them the choice for entry. Intruders know that sliding glass doors are often left open. Since they slide horizontally, it is important to have a blocking device in place to prevent sliding the door fully open from the outside. This can be easily accomplished by inserting a thick wooden stick (like a broomstick) into the track to prevent opening. Other blocking devices available include metal fold-down blocking devices called "charley bars" and various track-blockers that can be screwed down. The inexpensive metal becomes worn, or out of adjustment, and the sliding door can often be lifted out of it's track. Keep the door rollers in good condition and properly adjusted to prevent this. You can also install anti-lift devices such as a pin that extends through both the sliding and fixed portion of the door. Many hardware stores carry locking and blocking devices to prevent a sliding door from being lifted or forced horizontally.

Get to know your neighbors and watch out for each others homes. If you go on vacation, have your neighbors pick up your mail, newspapers, etc., and chick the outside and inside to make sure all is well. Perhaps they could occasionally park in your driveway to give the appearance of occupancy while you are on vacation.

Home Security Systems
Alarm systems range in sophistication and price -- everything from do-it-yourself kits that set off a siren or lights to professionally installed systems that hook directly to the police station or a monitoring service. Sensors detect an intruder and send a signal to a control unit, which in turn sets off an alarm.

Considerations include burglary protection, fire safety, carbon monoxide poisoning prevention and child and senior safety.

Security systems should include alarms that are installed in your house as well as a 24-hour home monitoring system that will detect trouble even when you're away.

Have a system that is monitored for burglary, as well as fire and medical emergencies.

An ounce of prevention is worth a ton of cure. Prevent burglary -- ensure your security system has a loud alarm, detectors at all exterior doors and motion detectors throughout the house.

Get one with a monitored panic buttons that you can push for help when an emergency arises are a great way to ensure assistance will arrive as soon as possible.

An array of high-tech devices are available, such as surveillance cameras, and driveway and perimeter sensors that detect motion and transmit the alert back to the house.

See the appendix for more information on home security.

**How About Some of Those People**

I live in a beach area which in the summer has an unending supply of erratically and unpredictably darting modes of transportation -- razor scooters, skateboards, rollerblades, bi/tri/unicycles, mopeds, sports cars and pogo sticks -- many propelled by beach-crazed young 'uns. I have learned to be especially careful when driving my car as they can at any time burst out into the street directly in front of my car from all over the place.

Just last week I had an interesting little incident to learn from. I approached an intersection as a fairly large guy was pulling up, being briskly towed by just the cutest pit bull. He looked awfully upset, even before I went in front of him, missing him by many yards, but causing him to slow down some. I soon heard "Watch where you're going!" followed by not a four letter word, the (gasp) seven letter "a" word (it refers to a part of the anatomy that we would hard to live without, but we would probably rather be something like a brain, or an eye, or even a spleen). Realizing my error and not having any particular personal sensitivity to another guy who is behaviorally challenged, I just said "Sorry about that" as he pedaled on. I kind of nodded and he kind of nodded, and I was a little relieved that no more 4, 7 or 12 letter words spewed forth.

In situations like this it probably would be better to just drive on. But I kind of got to thinking "Hmmm, this wasn't all my fault." And if he continues, he could get himself and that cute little pit bull run over! Ever willing to service to my fellow man, I said in a fairly loud but not antagonistic tone "Hey, ya know you were on the wrong side of the street and going kind of fast." as he's pedaling into the intersection (luckily for him, he waited for the "walk" light). I then got invited to meet him on the other side to "discuss" it. I just said "That's all I have to say." He must have really needed to talk to someone because at about 1/2 way through the intersection I heard, again "Well meet me on the other side and we'll 'discuss' it."

Anyway, my 20/20 hindsight tells me that I managed this just about right, for once. Could have hit the gas and made a run for the border at any time. But next time maybe I'll just yell "OK I'm sorry! But youuuuuuu were on the wrong side of the street and going
wayyyyy too fast! And you're a big pottymouth!! See ya, butthead. Grow up!" If I am, say, challenged to a duel, without hesitation I will reply: "I ACCEPT! But it's my choice of weapons. COW PIE S AT TEN PACES!" And if I get chased I'll just hit the gas and drive in the opposite direction, and see how fast he can pedal after me.

OKOK, only kidding. So what was the last paragraph really about? It was about an ego (mine, actually) trying to make itself feel better and not under the control of another ego. And maybe a little more important. But by falling into an anger trap, we really are being controlled by someone else.

We aspire to a level of living that is beyond what most people will settle for. And such ego-driven habits are without meaning and just not worthy of our energy and time. You are above such trivial concerns. Your consciousness is higher. It's not because we're better than anyone else. We wish all people well. We have just been fortunate enough to have come to position in life where we recognize some the insignificant, and just won't get pulled into piddly contests.

So do not rattle a hornets nest, play with fire, tease alligators, prod a llama (they may not have much of an armory when it comes to claws or fangs, but the sure can spit) or antagonize someone with an attitude. The best way to handle it is probably just to kind of apologize or just say nothing and move on, and resolve to continue your very safe and defensive driving habits, or whatever, in the future.

Situations and people seem to come into our lives for a reason, usually for training. This situation involves an ego trying to make itself feel better (or less bad), and my better learning how to handle it. And remember it's only practice. And you'll cause harm to your own self just by getting emotionally all worked up, as well as impede the solution. Follow your's intuition, and let's just stay away from dangerous situations and dangerous people.

**Stayin' Alive -- If You Are Absolutely, Positively, 100% For Sure Your Life Is In Danger and Must Defend Yourself**

I felt a gnawing feeling in my tummy as I wrote the next part. I hesitated for a long time after and wanted to cut it out because it's not pretty. But after plenty of consideration about today's climate and some of the people on the streets today, for your ongoing health and ability to remain here on the planet, I had to put this in.

Again, dangerous situations and dangerous people are to be avoided. If you are walking on the side walk and you sense trouble heading toward you, cross the street and avoid it. Pay attention to your initial gut feelings about a potentially dangerous person or situation. Don't give an acquaintance a lift in your car if your senses go on alert. And rude and ambiguous comments from a thug can be like quicksand -- don't respond in anger to let yourself get pulled in.

Unless you are one, you would be at a distinct disadvantage when up against an experienced street fighter or a drugged-up thug on his (or her) own terrain. And with legalities as they are, particularly regarding assault with weapons, we should consider that a prison term resulting from hastily entering a brawl would put you living with the people you would want to avoid.

Often aggressors will attempt to size up their victims before starting a confrontation. Their motives may not be violence pre se, but rather to evaluate whether the victim will be a target for theft, or rape.
Body language, or how you maintain your body posture, can do much to divert this. For example, appearing to lack confidence with slumped shoulders and looking at the ground can send a signal that you are a potential victim.

Most violent confrontations begin with some form of verbal exchange. A timid, apologetic appearance, along with body language that shows a lack of confidence, can encourage an aggressor. On the opposite end of the spectrum, a highly reactive and overly-aggressive response can result in the escalation of a situation that could have been avoided. An approach that takes the middle ground is to be assertive (but not aggressive), look the aggressor in the eye, hold the hands up with the palms toward the aggressor (this non-verbally says "stay back" -- but also puts you in a position to block if he should attack), and strongly say "Back off" or "Keep your distance".

Sometimes aggressive people will “set you up” by creating a situation where you cause some minor offense, then goad you into a confrontation with some righteous indignation. Hopefully just saying “I’m sorry. That was not my intention.” (loudly so any witnesses will hear), then walking away. But glance over your shoulder from time to time to make sure you’re not being followed – and either stay in a public place until you’re sure they have left, or get out of there fast.

Don't kid yourself into believing that after a few weeks or even years of karate school type martial arts lessons, or even "tae bo", that your body will be a deadly weapon. You need the appropriate mind-set and some practical experience. Many karate school instructors haven't been in many fights and don't really know how to instruct others in the dirty art of survival.

The body releases a tremendous surge of adrenaline in a physical confrontation. The result is that you will be thinking less clearly, and you will not be able to execute fancy self defense moves you may have done very well in a practice situation. This happens even with experienced street fighters. The solution is to use only simple, and highly effective moves that you have practiced.

Real life boxing is one way for you to develop real life fighting skills. Of course, the downside is that punches to the head are very damaging, so you are intentionally causing the kind of damage you are training to avoid yourself and on others. So I would avoid actual head contact.

I have watched the "Ultimate Fighting Championship" on cable TV. Very enlightening. You can check these out on video sometime. I was really surprised at the number of punches these guys would eat without being slowed down. But they've been at this a long time and have been in a lot of fights. Even though I had a few years martial arts training in my younger days and thought I knew just a little something, what I found most impressive was the use of "submission" holds of the kind used in jiu-jitsu. This is where a combatant gets his opponent in an arm lock, leg lock, choke hold or similar hold and puts on the pressure. Usually the opponent will "tap out", or give up, rather than experience intense pain and then have the twisted limb broken. In one match the Brazilian master, Royce Gracie, was being held upside down against the 6" chain link fence. Mr. Gracie somehow got a hold on a wrist or an arm or a leg (or maybe something more personal, I really couldn't tell in the fray), and must have done something very painful because his opponent immediately submitted.

There are a number of ways of dealing with dangerous people.

- It is often heard that you must immediately "stand up" to a bully -- never give an inch. Personally I don't thing this is usually the best way to handle it, and that it's your "manly
manliness" (or womanly womanliness) -- i.e. ego -- taking over. You can often avoid confrontation if handled properly.

- Another method is to immediately stun the bully with a swift, powerful blow, then shout ("Fire! Fire!") is often suggested), then run like crazy before your attacker knows what hit him.

And for women (or men) -- if you are being coerced to go somewhere else, that place is seldom safer for you than the place you are now at.

Whatever you do to handle what you believe is a physical situation with an attacker, just be sure it's really a dangerous situation and not just your imagination playing tricks on you.

What follows are some methods that almost anyone could do with very little training or practice. Many of these will result in permanent, irreversible, lifelong (that means for the rest of their life) injuries to your opponent. That's another reason why we wouldn't want to fight. But this is reserved for a point where it's them or you. And after all, you have done your very best to just stay away from dangerous situations and people. You have loudly said "Leave me alone! Go away!" -- preferably in the presence of witnesses who will come forward to testify that you did everything you could to avoid confrontation

- The aggressor "only" intends to push or hold on to the victim in an attempt to intimidate or coerce, but serious or deadly action is not intended -- so the victim uses some method to break the hold, and possibly deliver a punch or kick that will stun the aggressor in order to get them to leave you alone. But how do you know the aggressor's actual intent? How do you know just how much force to apply in order to "neutralize the threat"?

- Here's how another option, and it's basically an "all or nothing" strategy. If in a situation where:

THE VICTIM (YOU) HAS APOLOGIZED, NEGOTIATED, IF DONE SOMETHING WRONG TRIED TO MAKE IT RIGHT, GIVEN UP THE MONEY, ASKED TO BE LEFT ALONE, AND RUN AWAY ONLY TO BE CAUGHT, AND OTHERWISE EXHAUSTED ALL MEANS OF PEACEFUL RESOLUTION AND IS

* ABSOLUTELY, POSITIVELY, 100% SURE HE OR SHE MUST DEFEND HIM/HERSELF *

* OR ELSE DEATH OR RISK SERIOUS INJURY TO SELF OR LOVED ONES *

Then the best defense can be a strong offense that is explosive and fierce -- "neutralize the threat" then get out of there to safety. It is best launched quickly so as to take advantage of the element of surprise. And your assailant should be very surprised, as you were just requesting him to just leave you alone before he caught up with you and started trying to punch, kick, choke you or whatever.

Now the most important part: your mental attitude. You are transformed from a loving being of light into someone with immense resolve. You will survive. You now have an intense will to do whatever it takes to protect yourself and your family and to live another day with love.

Unleash hell. Take the boxer's fighting stance, stare with hatred into the eyes of this thing you must overcome and escape from. If you have another chance, shout "Leave me
alone! Go away. Let me go. I know how to fight and I can hurt you!" But don't use this as a reason for unnecessary delay. Thugs prey on the weak. Hopefully he will recognize the dangerous person you are and leave, or allow you to go in peace.

There are usually a number of objects, or "invisible weapons" available, like:

A table lamp, book, or just about any object.

A key or pen -- best with the object butted against the palm and extending out in the direction of the fingers

Throw your cup of hot coffee in his face

A belt wrapped around your fist with the buckle hanging about 3"

A padlock -- either swung with the curved locking part that lifts up held in your middle finger and the body outside, or with the body of the lock held in your fist and punching with the curved part outside of your middle finger

Just about any heavy object, either held in the hand or thrown

A coat hanger or a narrow stick will make a big thwack and cause sharp pain and damage when swiftly and forcefully applied to an assailant's face

Hair spray into the eyes

A small keychain exacto type knife with about a 3/8" blade of the kind sold in supermarkets can cause severe lengthy cuts and bleeding. If you are bent over and taking a thrashing you can even rip quite a few long slashed in your assailant's leg and cause him to bleed a whole lot.

A few quick and dirty alternatives and moves:

Use your brain. If you are about to be attacked tell the thug that you have AIDS and have nothing to lose, and threaten to spit on him if he comes close -- or bite him if he starts a fight.

Pepper spray, if legal in your area

Stun guns, if legal in your area

Kick to the kneecap. Standing in your fighting stance, first lift your forward leg, then thrust your foot sideward and downward onto your attacker's kneecap. Or first punch or fake high, then quickly deliver one or more kicks to the kneecap. Then you will be able to run faster than he'll be able to hobble on a broken knee. Kicks must be delivered fast and with a snap, quickly returning back to a balanced stance

Eye gouge -- hold fingers apart and stiff, and thrust. Or thumb over top of fist and thrust

Bite -- bridge of the nose and fingers are good targets

Punch, palm heel, kick or area above knee to a vulnerable area -- throat, solar plexus, groin

Head butt -- best delivered to the nose. Put your back into it.

Grasp an ear firmly and rip it off

Hold of to his forward arm with one hand and repeatedly punch with your other fist.

Pull a couple of fingers apart sideways or one back over the top of the hand
Drop to the ground and while keeping your legs toward the attacker, kick to the knees, legs, groin, and other targets that present themselves.

When striking, strike through the head or body -- as if you're punching the back of the head (the face is just getting in the way).

An attacker will often drop their shoulder before doing a "sucker punch" (punching you without warning) and "telegraph" their punch.

Knees are easy to shatter or dislocate, so if you're going to use them as weapons, strike with the fleshy area just above the knee. And they make great targets. But elbows and upper forearms can deliver a lot of force, especially when in close with an assailant. Keep your hand close to the body when striking with an elbow.

If you are a woman and find yourself in a situation with a rapist or where you are about to get beat up, attempt to run and escape at the first, or any opportunity. If you are being taken somewhere, that place is seldom more safe than the initial place where you were about to be abducted. The initial spot is as good as it gets. Don't hesitate to run. React immediately. If you can't run, then fight. Victims say that even mild resistance like screaming and striking back helped them focus and become the aggressor. Tap your primitive rage. If you're abducted in your car, try to crash it, or if you're in an abductor's car try to get him to crash it.

If your lapels are grabbed with both hands or you are choked, you can stun the attacker with a punch or slap, then bend your knees while clasping both hands and drive upward between the attacker's forearms to cause him to release. Alternatively (although this takes some training) you can grab both of the attacker's hands just behind and over the thumb and bring them to the outside and downward in two wide circles. Bringing them further downward will bring him to his knees (or have wrists broken), allowing you to then bring your knee upward and strike with the fleshy part just above the knee, or punch.

If your wrist is grabbed, a good release is to pull through the thumb -- the weakest part of the hold).

If you are grabbed from behind, stomp the top of the foot, elbow the solar plexus or throat, or make a backward strike to the groin.

Regarding using a boxing type defense: Many police departments recommend a strike with the palm of an open hand rather than a fist. Be careful not to jam your fingers backward. A fist should be made with fingers curled tight, with top part of fingers pretty much in a straight line and thumb over the index finger and part of the middle finger. Forearm and top of fist are in a straight line, and punches should be with the knuckles of the index and middle fingers. Maintain your balance, with feet directly under your body about shoulder width apart with preferred leg forward. In boxing a "southpaw" stance (with the right hand forward) is generally considered somewhat confusing to an opponent and can be more difficult to defend against because it is backwards. Hands are up, with forward fist protecting your jaw and elbows somewhat downward to protect your body. Carry your head slightly forward and downward, chin slightly tucked behind your forward shoulder. Don't fall into holding the head way back thinking this will better avoid punches as it will throw you off balance. Most punches are best thrown in a straight line, not in "haymaker" fashion, although a hook (a roundabout punch, striking with the knuckles) and a backfist (a snappy punch where the fist stays pretty much in an upright position) are effective.
Stay loose and don't hold your breath. Muscle tension will slow you and burn energy, and make you less effective. Look for openings and punch. When punching, shift your body and bodyweight behind it in an explosive movement. Shift your shoulder and hip. You are actually anchoring your power through your body and to the ground. Don't just punch at your target, punch through it. Return to the initial position quickly. Don't drop your hand after a punch. Move fluidly and maintain your balance, don't dance.

Choose targets like the nose, eyes, point of the chin, hinge of the jaw, throat, solar plexus, crotch, kidneys or temples. Avoid the forehead and teeth, as teeth will cut your hand and you don't know what kind of disease this guy is carrying. If you sense you have hurt your attacker, punch to the same spot two or three more times if at all possible.

Jiu-jitsu (or Brazilian jiu-jitsu) style take-downs, arm locks and leg locks are very effective. These are best learned by personal instruction, and instructional videos are also available.

This is just an overview. It is best learned in person from someone with a lot of experience, not from a couple of paragraphs out of a book. Still, by practicing this you are likely to get the feel for it and be better prepared should you absolutely have to use it someday. You could practice throwing punches and kicks a part of your aerobic routine. Rehearse and visualize the attacker in front of you and what you will do when practicing.

You want to stun your attacker and escape. Size does matter, and trying to punch it out with someone bigger than you can lead to disaster

Only continue until you can get yourself or your loved ones out of there quickly and safely.

And don't hurt yourself or anyone else when practicing these.

A bigger opponent definitely has an advantage over a smaller one, that's why boxers are divided into weight divisions.

After following this system you will be in good condition. But the physical strength and power from your weight training is your single best asset. Today more criminals are aware that much stiffer penalties come with weapons assaults, so they will often just commit the crime unarmed. Rehearse and visualize what you will do when you practice these.

Defense against a knife attack is best kept at a distance with kicks to the knees. If you can get past a knife or a club the above defenses could work.

Firearms

Let the police handle breakins if at all possible. If you are in your own home, that allows a greater possibility and legality for the use of firearms. If you keep a firearm in your own home:

Learn how to use it effectively and SAFELY!

Take a class or private lessons and go to the target range and practice with it

And

KEEP IT LOCKED AND OUT OF THE REACH OF CHILDREN!
With all the violence they see on TV and in the movies, children are very curious about guns. If given a moment's opportunity they'll find a way to "play" with it, and you can expect disaster.

TV and movies have given some false ideas about gunfights. Most are over within a couple of seconds and with just a few shots fired. Greater speed is preferred to pinpoint accuracy. In a crisis, it's easy to miss easy shots. It has been advised that if you must fire your weapon, shoot to kill, and that trying to just "wing 'em" will spell disaster. But it has also been said that it all happens so quickly and there is no time for careful aiming, so shoot to hit. And someone who gets shot doesn't just fall over instantly like in the movies.

You know the terrain of your home which gives you a certain advantage over someone who doesn't. Usually try to remain behind cover (protected against bullets), or at least concealed (hidden as much as possible, but not protected from bullets), and in the dark if at night. When looking around a corner or around a piece of furniture, get as low as possible or in a crouching position and move just the tip of the gun and as small an area of your head and hands around it as possible in order to take aim or look, making as small a target as possible and in a lower position that's unexpected.

Think, be cautious, but act quickly. Fire in bursts of two or three rounds, and don't stay in the same position unless you have good cover. There is a thing called "dead man's five seconds", where the one who has been shot has that amount of time before becoming unconscious or dying.

A small caliber weapon like a .22 is of lesser value compared to a weapon that packs some firepower. Many an angry or drugged-up thug will just take the small bullet and keep on coming. But -- the greater the firepower, the more skill is needed to control it. And there is a saying: "I'd rather be missed by a .45 than hit by a .22."

There is great debate over the reliability of revolver vs. automatic in terms of reliability and speed. Also debate over a high speed bullet that fragments vs. a heavier cartridge. Each has different effects on soft tissue, bone and organs. Much of this is based on research and is a numbers game. You must first hit your opponent to cause damage.

Using two hands to control the gun is preferred, but since it can happen fast you may not have time, and may have to "shoot from the hip", or with one hand very quickly after your gun is drawn. If there is time, shooting from a crouching position will make you a smaller target.

You will want ammunition that is accurate in the range of the place that you want to defend. Also, reliability (no misfires) is preferred. This one is pretty far out -- poisoned bullets. And I'm not too sure of the legality of this and you want to stay in compliance of the law. A pellet made of potassium or sodium cyanide from a photographic supply house, or nicotine sulfate from a garden or exterminator shop is placed in the hollow point. While this sounds strange and it would take a while to have an effect on your opponent, it could make a difference if the two of you wind up scrambling for cover, and prevent him from harming your family afterwards if you are out of the picture.

Your best choice for home protection is usually a shotgun, preferably with a short barrel. The pellets disperse so that even if your aim isn't all that good, or you're scared doodyless, you still stand a great chance of hitting your mark. In the middle of the night many an intruder will back right out of the window he was just crawling through after hearing the resounding shak shoink' sound of a 12-gauge shotgun being cocked. They know it means business and can make large holes in them.
You are likely to react as you have practiced or been trained. It is best to practice things like removing the lock and taking the safety off -- but **be extremely careful if this is being done with a loaded weapon. In fact, always assume your gun is loaded.** "There is nothing more dangerous than an unloaded gun." In a real gunfight, with real bullets whizzing around you, it is possible that you will vomit or even defecate in your pants. It is not uncommon in combat. You will need to keep your mind on your shooting. Be mentally prepared to kill. Try not to panic, as your opponent is probably as frightened as you are. Understand that you will be fearful and that your heart rate will speed up. Practice under different conditions -- like low light or from awkward positions, or after running hard. Practice will build confidence for the day or night you hope never comes.

And be aware of the positions of other occupants in your house or your neighbors, as you don't want to hit them. And too powerful a cartridge can penetrate walls and hit others. Situations are different, but it's usually best to fire upward, thereby the shot clears above the heads of your family or others in other rooms of the house.

**Closing This Subject**

Regardless of the kind or location of the confrontation, when it's over the hero or heroine don't just ride off into the sunset like in a B movie. The police are likely to want to ask you some questions. You may have to prove your case in a court of law, and hopefully witnesses will come forward to testify that you did everything you could to avoid confrontation. This guy may have fellow gang members or equally vicious relatives, so do what you need to do to stay safe later. You may be very upset. Don't hesitate to get psychological help and perhaps temporary medication if you need it, or get involved in a victims' support group. A Course in Miracles would help you.

Well, enough of this. We endeavor to be filled with love and compassion. I felt this was necessary to provide you with the most comprehensive information on living longer. And I've never used any of this part -- avoided trouble, never had too. Actually, I'm a big wuss. "Make love not war". Now let's talk about something of beauty -- you (and little kitty cats).
**Beauty and Cats**

My kitty friend, Catie Greystroke (she's grey and likes to be stroked), was gazing enviously at the cover of a recent issue of *Cosmopolitan* featuring Catherine Zeta-Jones. Katie proudly proclaimed that from that moment on she is to be known as Catherine Zeta-Greystroke. And she wants a boob job. Where will this perpetual body fixation in the younger generation cats end, I ask you?

Catie is a charmer, and she's about to make the formal announcement of a career change from housecat to a supermodel and actress cat.

Catherine idolizes Jim Carrey for all his facial contortions. She has developed a character she calls "FrankenPuss". It's based on a combination of the cult classic "Frankenweenie" and Pamela Anderson Lee's character in the movie *Barbed Wire* (which was based on the movie *Casablanca*). It's alive!

Just kidding, animals don't really talk to me. Not in words anyway.

Ach! And just as Catherine Zeta-Jones began to appear just a little pregnant, guess who else does? Yep, Catherine Zeta-Greystroke! Note: All kittens now have good homes, and it's assured that Catherine won't be heeding the call of the wild, breaking out and making more kits.

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**Your Better Appearance**

My friend Maureen, an effervescent and high-energy drug counselor asked for some info on appearance and beauty. Sure, if we're going to feel younger, we might as well look younger. And obviously, the well-toned physique, nice skin and great posture look better than flab, skin that hasn't been nourished and an old bowed carriage. This system will help keep your skin (the most noticeable physical part of you) healthy and reduce the effects
from aging. Antioxidants in your system help prevent wrinkles which come from the oxidation of fat and loss of elastic tissue in the underlying supporting structure of the skin. Adequate water intake will help plump your skin and remove toxins, reduce wrinkles and keep skin healthy. Protein helps maintain and build the underlying muscle structure of your face and body. Staying out of the sun will prevent damage.

People who are healthy look better. When you are healthy and feel good, you will radiate good health and confidence. Other people are drawn healthy, confident people.

**Cosmetics**

Similar to vitamins, cosmetic products carry a lot of inflated claims. For example, you may hear absurd statements like "specially formulated amino acids merged into deepest layers of the skin where they fuse with your DNA to build new layers of strong cells that will make your face you look younger" or the like. My gosh, it's worse than the vitamin hype!

Often a $50 product is no better than be $10 product. The wrinkling of the skin as we age is a very complex process. Ingredients like DNA, RNA, herbal, seaweed & placenta extracts, liposomes, etc., do absolutely nothing to reverse the underlying process. One big difference between over skin and younger skin is that younger skin has more fat cells in the permits them over skin. This is one reason older skin looks more thin and transparent. And for some unknown reason, the skin keeps growing and expanding as we age despite the fact that the fat padding decreases. That's why skin sags. We also lose bone, and facial muscles lose their shape and firmness resulting in a drooping appearance. What we learned earlier about DNA holds true in the face, as well. Proteins and other chemical messengers no longer work as well, and we lose our ability to retain water. No cosmetic can fix this, but the aging intervention methods in this manual can partially it.

Fancy fashion magazines don't tell you this. Guess what? Cosmetics companies spend millions of dollars advertising in them.

So here's all you need:

1) A water soluble cleanser.
2) A moisturizer. And you don't need a special creme for around the eyes, a regular moisturizer does just fine.
3) An oxidizer if you have blemishes (such as 3% hydrogen peroxide or benzoyl peroxide), or and irritant-free toner if you don't.
4) A sunscreen with as high an SFP (sun protection factor) as possible. This can be combined with the moisturizer. Sunscreen needs to be reapplied every few hours to maintain protection while you are exposed to the sun's radiation.
5) A skin scrub. Baking soda will do just fine.
6) As an alternative to a skin scrub, possibly an exfoliant. An exfoliant peels off the top layer of dead skin, resulting in smoother skin and less wrinkles. There are two categories of these. Note: Do not use the two of these together, and excessive use can cause wrinkles.
   A) Alternatively (under physician guidance): Retin-A -- But this is not a cosmetic, it's a prescription drug, and subject to some guidelines for use.
   B) -or - Also physician guidance would be a good idea: Over-the-counter alpha hydroxy acids. DO NOT USE Retin-A AND alpha hydroxy acids TOGETHER.
This just in form one of the health Email services I subscribe to: Skin specialists are warning that anti-wrinkle creams containing AHAs (alpha hydroxy acids) may actually make the skin age more rapidly. Research from the US Food and Drug Administration suggests that people who use AHA products have greater sensitivity to the sun's ultra violet rays. The chemicals appear to increase the number of cells that are damaged, and to stimulate reddening, blistering and burning. Experts are saying that although studies done to date show some worrying data - but those studies have only been performed over the short term and what is needed are long term studies assessing the long term risk of using these creams on a daily basis as women would do under normal circumstances. Some experts say that people using the creams should not necessarily throw them away, but if used, also use a sun screen with an SFP of 15 or higher and that should be adequate.

There is a bewildering array of skin care products out there.

**Face Exercises**

My friend Dyana tried some facial exercises. After a couple of weeks of pulling and stretching and making lots of funny faces (that scared the heck out of her family), it sure looked like there were more wrinkles than when she began.

**Electrical Stimulation Devices**

Devices have come available that stimulate the face muscles by means of electrical current. Electrical stimulation units for pain management, like the "TENS" units, have been banned for use on the head. There is great controversy regarding whether electromagnetic currents are dangerous. In view of the recent flap over the dangers of electromagnetic currents from cell phones, I personally avoid exposure of this type.

**Some Things You Need To Know Before Considering Cosmetic Surgery**

I have been noticing a lot of people around Newport Beach lately who look pretty young from the neck up, but awfully flabby and old from the neck down. Obviously not practicing precision nutrition and exercise, etc.etc. And some of the faces have that tight-as-a-drum "wind-blown" look with eyes-permanently-wide-in-surprise as a result of schlock plastic surgery.

My friend Marnie is an investment counselor who speaks fluent French, and has enough joie de vivre to fill a Renault. Marnie sleeps with her eyes partially open, a result of blephoplasty (cosmetic eyelid surgery) that was just a bit too aggressive.

Although cosmetic surgery can make you feel better which could result in positive physiological and some "antiaging" effects, don't confuse looking younger from cosmetic surgery with physically being younger. As previously discussed, the system in this manual will do much to improve your appearance. If youthful appearance is important to you, you'll have less of a need, and delayed need, for such cosmetic surgery.

There are some up-and-coming options to consider other than, or in addition to, cosmetic surgery. Most of these are to keep your skin looking younger. They include laser systems that are said to stimulate collagen growth, microdermabrasion and the fraxtel laser. Also dental whitening procedures performed by a dentist, and “Crest” brand whitening strips. There are mist procedures that apply a “tan” and other tanning cremes.
But regarding cosmetic surgery, well, like we talked about in the section on selecting an antiaging physician, you wouldn't perform your own brain surgery with you? If you're considering this, you'll want the best cosmetic surgeon. As with most any medical procedure, the quality and caliber of the practitioner are absolutely critical -- and a botched job would be extremely difficult to repair. You don't even want that taunt, wind-blown look characteristic of cheap facelift.

Any licensed physician can legally perform cosmetic surgery. There is even a report of a dentist doing boob jobs! Dermatologists and ear, nose and throat specialists also have made the transition to the potentially lucrative field of cosmetic surgery. While it would seem logical that a doctor who knows his or her way around skin, ears, noses and throats would be able to make this transition, this is not necessarily so. I would want one who had done cosmetic surgery, and only cosmetic surgery, (after initial training in other kinds of surgery) throughout their entire career. And I would want that career to have been a very long time and I would want for them to have performed many, many procedures.

Become informed by reading at least a dozen books and articles on the subject (but like with nutritional supplements, be prepared to sort out some misinformation), and talk to people about their experiences.

Plan on consulting with the least a dozen cosmetic surgeons. Some will charge you for an initial consultation and others will not. You will want one who has done a lot of procedures, and preferably one who is up on the latest micro-surgical techniques. Probably one who works on movie stars would be a good choice.

The American Society of Plastic and Reconstructive Surgeons has some excellent brochures describing the various procedures. They're at (708) 228-9900.

The face lift is probably the most common cosmetic procedure. There is a lot of disagreement over how it should be done. Some surgeons will lift only the skin and underlying fat, others will cut into and lift the "SMAS" (superficial musculoponeurotic system), and others will cut deeper and lift the sub-SMAS layer. The logic is that it is like making a bed, where lifting only the skin like only pulling up the top cover. Going into deeper layers is like pulling up more layers of covers. Surgery into the "SMAS" is somewhat riskier than only going into the skin, primarily because the surgeon is cutting in closer proximity to nerves. And even more risky for the sub-SMAS layer. Severed nerves do not heal well, and can leave the patient with permanent drool. Still, in the hands of a very highly experienced practitioner, surgery into the SMAS and even sub-SMAS layers are RELATIVELY safe. If you're considering this, gather a lot of information and decide on your own level of risk you would be willing to assume. If it were me, I would go only with a SMAS, and quite possibly a sub-SMAS procedure.

Cosmetic Surgery for Men vs. Women – “There is a difference”

Would you believe that standards of appearance are different for men and women? This goes beyond just thickness of features, size of jaw, various appendages, etc. In a woman, arched eyebrows are generally considered appealing. But in a man, thicker, lower "I mean business" eyebrows are considered generally more appealing. It works for Tom Cruise, Kevin Costner, Tom Selleck, and other film stars. There is a psycho-physiological reason for that. In the dawn of man and woman, thicker and lower eyebrows helped keep the sweat out of the guy's eyes when he was hunting, allowing him to bag more game. It's not surprising that a guy who could bring back more protein would come to be considered more attractive. This is one of those things that became hardwired in our neural circuitry.
So if you are a man who is considering cosmetic surgery, you just may want to avoid a brow lift procedure called a "coronal" brow lift. It's so '90s. I found something out the hard way once -- but luckily it was only temporary. I once went down to a local spa and got a "facial". The aesthetician asked me if I wanted to my "eyebrows done". So I said "Sure why not. But don't make me look feminine, OK?". When I left, my eyebrows were awfully thin and way arched. Not good. Very feminine. I had to buy a pair of horn-rimmed glasses to hide behind for about a week.

Here are some of my own humble opinions. If you are considering this gather a lot of information and decide for yourself. In my opinion, if a man or a woman has puffiness under the eyes (pretty typical among aging people) I would be skeptical of a cosmetic surgeon who does not recommend something be done about it. One procedure is called blepharoplasty (removal of skin and fat around the eye). Another kind of procedure is done with a laser. By the way, it is possible to take out too much fat from under the eye resulting in a sunken look. Lasering to tighten the skin and stimulate blood vessel growth below the eye is generally a good thing. Please note: If he or she recommends it, it does not necessarily mean they can perform the procedure well -- this is just one way to narrow the field. And I am convinced that a coronal brown lift would be a bad thing for most men because of the way it lifts the eyebrows (may look good on women but probably not on a man), as well as the way the lift raises the hairline. These are my own guidelines, study the subject and talk to a lot of cosmetic surgeons and form your own.

**Botox**

Botox® is the brand name of botulinum toxin type A that has been in use since about 1990. In 2001, botulinum toxin type B was introduced under the brand name Myobloc®. Both forms of this naturally occurring substance, are injected into muscle that is contracting abnormally. It is a temporary solution to frown lines. It partially weakens the nerve to the muscle for about four to six months.

Continued use of Botox® or its equivalent can result and sagging, and you'll look bad. The better solution is to be building the muscles and making them young again -- which will prevent them from sagging or wrinkling.

A better solution to frown lines is to not make them happen the first place by adopting a less stressful lifestyle.

The aging intervention system in this manual will do much to improve your appearance. Anyway, is it really necessary that you be one of the "beautiful people"? Will it truly satisfy you? Is it another way for your ego to clamor for attention? You're already purrfect.
Chapter 10 -- In Closing . . . Our Future on the Planet

"The mass of people lead lives of quiet desperation. What is called resignation is confirmed desperation."

Henry David Thoreau (politically corrected a little by yours truly)

Here's Some Great News!

Whatever your situation or struggles, you can be happy now. Life is ever-changing. For however long life lasts, make the most of it and be happy now.

As we look back on the past weeks, we can see that many great things happened -- and lots and lots and lots of bad things did NOT happen. Still, we live in a world that is sometimes uncertain . . .

Some a Few Things to Be Aware Of . . .

Just as an example -- Imagine that your 7 year-old daughter's playmates come over and they all go to a field just down from your house to play. It's dusk, they're laughing and playing tag. Your kid's "it", so she's chasing her friend.

Then all of a sudden, ka-blam! -- she's laying there in excruciating pain looking at the bloody stumps where her legs used to be growing. This is the situation faced by thousands of children due to the hidden land mines -- just down the streets from where they live. So far over 7,000 have lost a limb in this way and many have died.

Sometimes it seems there's a race between enlightenment and catastrophe. This writing is intended to be optimistic. We can design our future. But life isn't optimistic for many, especially those who can do little to change their lives.

Worldwide poverty, lack of adequate medical treatment, human rights, child abuse, hate, inequality, animal cruelty, pollution, encroachment on the forests, the dramatic loss of animal species, and world peace with freedom from tyrants are issues of weighty proportions, among others.

And long life vs. overpopulation is surely an issue here. So we need to stay in good condition.

I suggest that those of us with aspirations of youthful joyous living for years, decades and maybe even centuries make a commitment to making the world far better off than it would be if we were not here. You don't have to be Mother Teresa to make a difference. For those of us who are natural warriors and need enemies, consider the natural enemies in the form of the problems described above, or maybe in the personage of the Four Horsemen of the Apocalypse -- Famine, Pestilence, War and Death. They are far more worthy adversaries than one another.

Earlier we talked about the kinds of diseases and aging caused by toxins and pollutants that are being spewed into our environment. And you have seen how the body is constantly renewing itself and how you get almost an entire new body every year or so. This, of course, is made up of the food you eat, the water you drink, and the air you breathe.
-- and any toxins and pollution that come along for the ride. In turn, the toxins damage your DNA, cells, brain, and whatever else they come in contact with, bringing disorder and disease.

When I was seven my dad, my uncle and I went for a long walk in the fields far behind my uncle's farm in Iowa. It was a hot summer day and we were getting pretty thirsty. We came up to a well and there was a hand-operated water pump with a metal cup hanging to the side. I can still remember how the taste of the water. It was unlike any fancy imported bottled waters. I'm grasping at words to describe it's taste and purity and how it was in tune with the surrounding field and distant trees and sky. The words "clear", "natural", or even "bold" water do not do it justice.

I wonder what that water would taste like today. My guess: like sludge. Or maybe the whole damn states been paved over. Someday soon I'm going back there and look for that water pump.

Personally, I look to two sources of information in analyzing a situation. The first is the opinions of experts. While there is usually disagreement among experts on just about any topic, today a majority of experts on environmental matters agreed that global warming is happening -- with an increase of about one degree of average temperature so far.

My second source is what I can see, hear, feel, taste and smell for myself. As an example, I have been reading newspaper reports, and seen warning signs, in nearby Huntington Beach, CA warning swimmers to stay out of the ocean because of bacteria. Recently I have been seeing similar warning signs here in Newport Beach at Corona Del Mar (jewel of the sea), as well as Balboa Island -- both affluent oceanside areas. Pollution is getting pretty bad everywhere and for everyone. The Food and Drug Administration has warned pregnant women to avoid certain types of dark meat fish, particularly shark, swordfish, king mackerel and tilefish because they contain unusually high concentrations of mercury. High levels of this type of mercury may harm an unborn baby's developing nervous system. FDA is also advising nursing mothers and young children to avoid these fish as well. The FDA also says "there are many varieties that pose few health risks and many benefits, particularly for pregnant women." Surely this would be bad for anyone, not just unborn and nursing babies.

Global warming results primarily from greenhouse gases emitted into the atmosphere. These include carbon dioxide, methane (mostly from termites and cows), ozone and soot. At this point I've seen enough evidence and am personally confident that global warming is a reality. We've raised the temperature here on earth about one degree so far. And surely this will increase exponentially if allowed to continue. There is now significant melting of the ice caps. The increased heat, thereby increasing evaporation and energy in the atmosphere, is resulting in more storm activity that is killing and leaving thousands homeless. There has been other undesirable weather conditions in the past decade, and harsher, and colder, winters and more severe snowstorms. If you've read this far you're probably planning to live here on good old earth for a while. If all this continues, by the end of this century an 11 degree increase in overall temperature, and a 20 in. rise in sea level are predicted. Also plan on fierce storms with 200 mile per hour winds.
Most toxins, pollutants, and certainly global warming, know no boundaries, whether they be borders or gated communities.

Here in Orange County, CA beach closures are now common and there's a County Environmental Health Dept. telephone hot line advising of unhealthful beach and ocean bacterial levels. Today bacterial levels are high and people are advised to stay out of the water at numerous individual spots, as well as from Doheny State Beach down to Capistrano County Beach -- about a 1/2 mile span. The yuck tends to be particularly high near storm drains and other runoff.

Sunny C. Jiang and colleagues at the University of California at Irvine (UCI) have found potentially harmful human viruses in the sewage flowing into the Pacific Ocean. Jiang and her researchers surveyed 12 river mouths in Los Angeles, Orange, and San Diego counties. She found that four of the 12 sites sampled tested positive for the presence of a human adenovirus. They also found that the Los Angeles river mouth registered high fecal bacterial levels, the standard criteria now used in California to evaluate water quality. There are more than 100 viruses found in human waste that can survive for as long as 130 days in seawater.

There are those who believe that cleaning things up and keeping it clean would best be spearheaded by grassroots effort. And there are others who feel that it takes a 1200 pound gorilla (i.e. government) to keep the polluters in line. Ultimately, it really boils down to the lifestyle choices people make.

What will we do with those added years, decades, maybe even centuries?

**OK -- So Just Do It!!!**

These scientifically designed, precision methods go far beyond "trying to eat healthy" and "getting a little exercise". As you have found, this system has an amount of structure, requiring ongoing effort, attention to detail, and discipline. These are the characteristics that distinguish the elite Olympic athlete from the weekend hack.

But just put these things into action for 6 weeks and you will be off the road to bad health, illness and unhappiness.

You will experience a reduction in the pain, suffering, disease and tribulations that can come with poor health and aging.

Sure, you don't have to be all obsessive about it -- just a few extra calories here and there or missing a workout once in a while are no big deal.

But by following this system you will be greatly cushioned from the "thousand natural shocks that flesh is heir to". By following this system you will live a life filled with learning, happiness and fun, and lived to full potential, for a very long time.

**IT WILL DEFINITELY BE MORE THAN WORTH THE INVESTMENT!**

**YOU'LL BE HAPPY AND YOU'LL FEEL GREAT! -- AND YOU'LL STAY YOUNGER, BE HAPPIER AND LIVE LONGER!!**

You are now an Olympian in the triathlon of health, fitness & aging intervention. Your gold medal will be much more than a noticeable difference -- you will redesign yourself with new energy, vitality, performance and happiness. Your perception of the world, and the impact you can make on it, will never be the same. Once you experience the benefits of
this system, you will never give them up. Youthful, joyous living for years, decades, maybe even centuries.

We are honored that you have read this far.

How about using some of you're extra years, decades, or even centuries to make the world a better place?

Be good. Seek wisdom and truth. Learn and improve. Thank you, and bless you.
Quick Review

Make a copy of this and post it somewhere you'll see it every day.

A goal is for you to be dancing joyfully on this beautiful earth for a great many years to come. And along with extreme longevity, you're enjoying your best health ever -- vibrant, perfect health, no matter what your age. When we’ve lost our youth, our health and our vigor, we’ve lost everything. And the same goes for a life that is not filled with vigor and joy, or lived to anything less than full potential.

This system can help you attain a better quality of life. By following this system you are meant to experience much better health, more joy and happiness, more energy, a clearer mind with better concentration and improved problem solving abilities, a more carefree attitude, and a renewed enjoyment and spark of enthusiasm for life. You can also have a better personal appearance and beauty, higher consciousness with a greater understanding of and capacity for spirituality and for making contributions to others and to the world. Also will come a more joyous sex life (whooppee!). And a more keen wit (I amuse the heck out of myself these days, anyway). You will find that you have the ability to work longer, harder and smarter in your work, increasing your ability to make money (or in increased satisfaction with life itself, and a perhaps a decreased need for the material). And you will avoid making potentially hazardous mistakes.

I only wish you could experience the benefits of this before making the modest investment in time that it will require.

Medical Details -- and Follow Your Doctor's Guidance

Review the "friendly" disclaimer at the start of this manual. Have a complete physical exam (which is probably long overdue anyway) and get your doctors approval before implementing any of the ideas in this manual.

If You Have a Medical Condition

If you you have a medical condition, that changes things. The system below should be modified to meet your special needs.

Here's a Brief Recap

1. **Precision, scientifically designed nutrition** -- Six small, highly nutritious meals daily, 3 are regular food, 3 include protein powder as the protein source. A balance of protein & carbs, with high plant fiber and low-fat, but 10-20% (ideally the right amount prescribed depending on the results of your advanced testing like the Berkeley Labs test) of calories from appropriate fats like monounsaturated or essential oils. Have a variety, chew your food well, and include cold water fish daily. Drastically reduce sugar, fat, dessert-type treats, processed foods. Avoid polyunsaturated fats, as well as saturated fats. Limit caffeine. One or two alcoholic beverages per day (preferably red wine), responsibly consumed, can be beneficial. Refer to the OK to eat list and Glycemic Index List. Watch out for restaurant food. This nutrition system is coordinated with your exercise system.

2. **High-Performance Exercise** -- Start off slow and begin by stretching, and do not become injured. Exercise at least 20 to 30 min. each day. Do it first thing in the morning. Work out with weights on 3 of the 7 days each week, using proper form, single sets of three different exercises for any muscle group, and bringing down
the heart rate between sets. Aerobic exercise should be for 20 minutes, with your heart rate depending upon whether your goal is aerobic fitness or weight loss.

3. **It doesn’t matter if you have a healthy 120 year-old body if you don’t know your own name or where you are. This system is designed to keep your brain and mind healthy, as well as your body, so . . .**

   **Cut the Stress** -- Pay attention and recognize when you are stressed, remember how destructive it is, then do something about it. Utilize meditation, deep relaxation, hypnosis or prayer. Decide whether a high-powered lifestyle is worth the damage your incurring. Just take a day off.

4. **Meditation** -- Twenty minutes a day.

5. **Get Happy** -- Decide to be happy, and do what you need to do to become happy.

6. **Sleep well**

7. **Breathe properly**

8. **Consider the value of spiritual and religious concerns**

9. **Water** -- Drink about ½ to 1 gallon of water each day.

10. **Use appropriate amounts of well-designed nutritional and perhaps hormonal supplements** -- Hormones, prescription medications, herbs and the like should only be taken under the guidance of a physician who was highly experienced in these forms of supplementation.

11. **Reduce Risks**

12. **Practice good dental care**

13. **Other ideas not covered above** -- Stay out of the sun, don't smoke, have some great sex, and so on.

14. **Learn and do good in the world -- make the world far better off than if you were not here.**

15. **Re-read the entire manual every two months**

These scientifically designed, precision methods go far beyond "trying to eat healthy" and "getting a little exercise". As you have probably found out by now, this system has a certain amount of structure, requiring ongoing effort, attention to detail, and discipline. These are the characteristics that distinguish the elite Olympic athlete from the weekend hack.

**IT'S WORTH IT!**

**YOU'LL BE HAPPY AND YOU'LL FEEL GREAT! – AND YOU'LL STAY YOUNGER, BE HAPPIER AND LIVE LONGER!!**

Just put these things into action for 6 weeks and you will be off the road to bad health, illness and unhappiness. You will experience a reduction in the pain, suffering, disease and tribulations that can come with poor health and aging.

The gold medal you will get will be much more than a noticeable difference -- you will redesign yourself with new energy, vitality, performance and happiness. Your perception of the world, and the impact you can make on it, will never be the same. Once you experience the benefits of this system, you will never give them up. Youthful, joyous living for years, decades, maybe even centuries.
"Far better is it to dare mighty things, to win glorious triumphs, even though checkered by failure...than to rank with those poor spirits who neither enjoy much nor suffer much, because they live in a gray twilight that knows not victory nor defeat."

Theodore Roosevelt

How about using some of you're extra years, decades, or even centuries to make the world a better place?
Appendix
If you are viewing this as a document on your computer you can usually access these links by clicking on them. You may already have to be logged on to your internet service.

A search engine is a web site you go to do find other web sites based upon a topic or a keyword. You type keyword, click a button, and a list of web sites is displayed, which may or may not match your actual selection. My favorite is www.google.com.

Medline's Pubmed (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi ) is available on the web for research into scientific articles. For Pubmed, enter the topic of interest in the text box after the word "for" and click the Go button. This often produces a few of the articles you're looking for, as well as some misses. When you find a good one, then click on " Related articles" for closer matches.

Reference Links
Introduction

We're Living Longer -- Aging Statistics:
World Health Organization Aging Statistics
http://www.who.int/hpr/ageing/index.htm

Federal Interagency Forum on Aging-Related Statistics
http://www.agingstats.gov/
http://www.agingstats.gov/chartbook2000/healthcare.html

Report “Older Americans 2000: Key Indicators of Well-Being”
http://www.agingstats.gov/chartbook2000/pr081000.html

Links from the Federal Interagency Forum on Aging-Related Statistics
http://www.agingstats.gov/links.html

Basic chemistry
http://education.jlab.org/atomtour/

Protein
MIT has excellent online resource for amino acid information:

and the Centre for Molecular and Biomolecular Informatics offers another:
http://www.cmbi.kun.nl/gvteach/aainfo/

The Swiss Course is a great source of information about protein:

Protein after workout:
Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR

Biolo G, Tipton KD, Klein S, Wolfe RR
Ferrando AA, Williams BD, Stuart CA, Lane HW, Wolfe RR
Oral branched-chain amino acids decrease whole-body proteolysis.
J PEN J Parenter Enteral Nutr 1995 Jan-Feb;19(1):47-54

Tipton KD, Ferrando AA, Phillips SM, Doyle D Jr, Wolfe RR
Postexercise net protein synthesis in human muscle from orally administered amino acids.
Am J Physiol 1999 Apr;276(4 Pt 1):E628-34

Wolfe R, Ferrando A, Sheffield-Moore M, Urban R
Testosterone and muscle protein metabolism.

Rennie MJ, Tipton KD
Protein and amino acid metabolism during and after exercise and the effects of nutrition.
Annu Rev Nutr 2000;20:457-83

Wolfe RR
Protein supplements and exercise.

Micronutrients:
Ames BN
Micronutrient deficiencies. A major cause of DNA damage.

Ames BN
Micronutrients prevent cancer and delay aging.
Toxicol Lett 1998 Dec 28;102-103:5-18

Torbergsen AC, Collins AR
Recovery of human lymphocytes from oxidative DNA damage; the apparent enhancement of DNA repair by carotenoids is probably simply an antioxidant effect.

The NIEHS Center for Environmental Health Sciences at the Univ. of California Berkeley
http://socrates.berkeley.edu/mutagen

Preventing Diet-related Cancer
Gladys Block, Bruce Ames
UC Berkeley, NIEHS Newsletter
http://socrates.berkeley.edu/mutagen/spr97.html

Benjamin C. Blont, Matthew M. Mack, Carol M. wehr, James T. MacGregor, Robert A. Hiatt, Gene Wang, Sunitha N. Wickramasinghe, Richard B. Everson, Bruce N. Ames
Folate deficiency causes uracil misincorporation into human DNA and chromosome breakage: Implications for cancer and neuronal damage

Phytochemicals:
Bear WL, Teel RW
Effects of citrus phytochemicals on liver and lung cytochrome P450 activity and on the in vitro metabolism of the tobacco-specific nitrosamine NNK.

Zheng J, Ramirez VD
Piceatannol, a stilbene phytochemical, inhibits mitochondrial F0F1-ATPase activity by targeting the F1 complex.
Biochem Biophys Res Commun 1999 Aug 2;261(2):499-503

Krishnaswamy K, Raghuramulu N
Bioactive phytochemicals with emphasis on dietary practices.

**Carbohydrates**
http://www.medical-library.net/sites/carbohydrates_in_nutrition.html
http://ull.chemistry.uakron.edu/genobc/Chapter_17/
http://www.dkfz-heidelberg.de/spec/

**Lipids (fats)**
The Indiana University School of Medicine has an excellent web site for lipids:
http://www.indstate.edu/thcme/mwking/lipids.html

**Free radicals, lipid oxidation, antioxidants:**
Thomas MJ
The role of free radicals and antioxidants: how do we know that they are working?

Addis PB
Occurrence of lipid oxidation products in foods.

Florence TM
The role of free radicals in disease.

Ottonello S, Foroni C, Carta A, Petrucco S, Maraini G
Oxidative stress and age-related cataract.
Ophthalmologica 2000 Jan-Feb;214(1):78-85

Donnelly JK, Robinson DS
Free radicals in foods.
Free Radic Res 1995 Feb;22(2):147-76

Harman D
Extending functional life span.

Maxwell SR, Lip GY
Free radicals and antioxidants in cardiovascular disease.

**Antioxidants**
Jovanovic SV, Simic MG  
Antioxidants in nutrition.  
Ann N Y Acad Sci 2000;899:326-34  

**Oxidative damage and DNA:**
Holmes GE, Bernstein C, Bernstein H  
Oxidative and other DNA damages as the basis of aging: a review.  
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**DNA Damage**
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Q Rev Biol 1981 Sep;56(3):279-303  

Niedermuller H  
Age dependency of DNA repair in rats after DNA damage by carcinogens.  

Rao KS  
DNA-damage & DNA-repair in ageing brain.  

Zahn RK, Jaud S, Schroder HC, Zahn-Daimler G  
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Mutat Res 1995 Oct;338(1-6):25-34  

DNA damage susceptibility and repair in correlation to calendric age and longevity.  

**Side-by-side comparison of the glycemic index and insulin index**
http://venus.nildram.co.uk/veganmc/insulin.htm.

Information on the glycemic index and insulin index  
At http://www.healthyeatingclub.com/info/articles/diseases/glycaemic-index.htm

**Exercise:**
Misc --
Sagiv M, Vogelaere PP, Soudry M, Ehrsam R
Role of physical activity training in attenuation of height loss through aging.
Gerontology 2000 Sep-Oct;46(5):266-70

Galloway MT, Jokl P
Aging successfully: the importance of physical activity in maintaining health and function.

Westerterp KR
Daily physical activity and ageing.

Laerum M, Laerum OD
Can physical activity counteract ageing?

Connective tissue & bone --
Stone MH
Implications for connective tissue and bone alterations resulting from resistance exercise training.

Hormonal improvements --
Kraemer WJ
Endocrine responses to resistance exercise.

Terblanche SE
Recent advances in hormonal response to exercise.

Pyka G, Taaffe DR, Marcus R
Effect of a sustained program of resistance training on the acute growth hormone response to resistance exercise in older adults.

Single vs. multiple sets --
Hass CJ, Garzarella L, de Hoyos D, Pollock ML
Single versus multiple sets in long-term recreational weightlifters.

Carpinelli RN, Otto RM
Strength training. Single versus multiple sets.

Stress
Changes of natural killer cells during acute psychological stress.  

Elenkov IJ, Chrousos GP  
Stress Hormones, Th1/Th2 patterns, Pro/Anti-inflammatory Cytokines and Susceptibility to Disease.  
Trends Endocrinol Metab 1999 Nov;10(9):359-368  

Elenkov IJ, Webster EL, Torpy DJ, Chrousos GP  
Stress, corticotropin-releasing hormone, glucocorticoids, and the immune/inflammatory response: acute and chronic effects.  

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Causal relationship between stressful life events and the onset of major depression.  

Meditation and stress  
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Jokes  
Some joke web sites and sources of Email joke lists.  
http://search.dogpile.com/texis/search?q=Email+joke+lists&geo=no&fs=web  
http://www.forbes.com/bow/b2c/category.jhtml?id=136

Reducing stress, cutting overhead, living more simply  
www.frugalitynetwork.com  
www.simplelifecorp.com
Forgiveness
www.christianityonline.com/ct/current/0107/0107a1.html
http://www.billAustin.net/forgiveness.htm
http://www.forgivenessweb.com/
http://www.shpm.com/articles/spirituality/patpart1.html

Safe Driving Tips
www.Drivers.com
http://www.highwaysafety.org/
http://www.nhtsa.dot.gov/
http://www.looksmart.com/eus1/eus53930/eus169532/eus56270/eus590835/r?

Ergonomics
www.engr.unl.edu/ee/eeshop/rsi.html
http://www.microsoft.com/products/hardware/ergo/default.htm

Reducing risks
http://www.albany.edu/sph/injury/injr_013.html

Home security
http://www.crimeaneca.com/
http://www.bhg.com/bhg/category.html;jsessionid=JVVZKMOVAUKXXQFIBQSCCZWAVABBWIV0?categoryid=/templatedata/bhg/category/data/sc_709.xml

Health Insurance
http://www.healthsymphony.com/assistance.htm
http://www.healthsymphony.com/buyingtips.htm
http://www.insure.com/health/
http://www.insure.com/health/basics.html
http://www.insure.com/health/individual.html

Alternative medicine
http://www.canoe.ca/HealthAlternative/home.html
http://www.quackwatch.com
http://www.chirobase.org
http://www.homeowatch.org
http://www.ihealthpilot.org
http://www.milnwatches.org
http://www.nutriwatch.org
http://www.ncahf.org

Pollution
http://www.the-scientist.com/yr2001/mar/research1_010319.html
Here are some web glossaries that are far more comprehensive. If you are viewing this as a document on your computer you can usually access these links by clicking on them. You may have to already be logged on to your internet service.

Highly comprehensive:
http://www.graylab.ac.uk/omd/contents/G.html

Excellent -- A number of specialized glossaries and other medical information can be found in these:
http://www.4woman.org/nwhic/references/dictionary.htm

Kimball's Biology Pages
http://www.ultranet.com/~jkimball/BiologyPages/

Biospace biotechnology
http://www.biospace.com/b2/gls_index.cfm (Note: there's an underscore [_] between the "gls" and the "index")

NIH's Glossary of Genetic Terms
http://www.nhgri.nih.gov/DIR/VIP/Glossary/

Beginner's Guide to Molecular Biology
http://www.iacr.bbsrc.ac.uk/notebook/courses/guide/

Multilingual
http://allserv.rug.ac.be/~rvdstich/eugloss/welcome.html

Chemistry glossaries
http://environmentalchemistry.com/yogi/chemistry/dictionary/

http://www.netaccess.on.ca/~dbc/cic_hamilton/dictionary/a.html
http://www.treasure-troves.com/chem/

Syrrx
http://www.syrrx.com/technology/dictionary.htm
Quotes

It always seemed there are so many things to do in life that the first thing to do is live longer.
   Roy Walford

All diseases will surely be cured, even old age.
   Benjamin Franklin

We are all amateurs; we don't live long enough to become anything else.
   Charlie Chaplin

There is not the slightest indication that nuclear energy will ever be obtainable.
   Albert Einstein 1932

Do not go gentle into that good night. Rage, rage against the dying of the light.
   Dylan Thomas

Health is the first wealth.
   Ralph Waldo Emerson

There is no wealth but life.
   John Ruskin, 'Unto This Last'

The mass of men (and women) lead lives of quiet desperation. What is called resignation is confirmed desperation.
   Henry David Thoreau (politically corrected a little by Adams)

Life's Tragedy is that we get old too soon and wise too late.
   Benjamin Franklin

To soon old, too late smart.
   old Dutch saying

Time marches on
   Albert Einstein? Fred Smith? All I know is that it does (and sometimes it flies).

Time is but the stream I go fishing in. All of us enter that stream at birth and for a period of years we float along in different directions; experience joys and sorrows; taste the fruits that life has to offer and, inevitably, one day the water disappears and suddenly we no longer exist. Death has arrived and our short time on earth has expired.
   Henry David Thoreau

Ours could be the last human generation to suffer involuntary mortality.
   Michael R. Rose, Professor of Biology at the University of California at Irvine

If man made it, don't eat it. If it tastes good, spit it out.
   Jack LaLanne

Tell me what you eat and I shall tell you what you are.
   Jean Anthelme Brillat-Savarin
   which has morphed into "You are what you eat."

Believe in the Magic of Your Dreams.
   Spotted on a license plate on MacArthur Blvd. in Newport Beach

Follow your spirit without hesitation.
   Bumper sticker, Syrrx parking lot in La Jolla

Correlation does not necessarily mean a causal relationship.
   Mr. Mason, my high school science teacher

All men are mortal, Socrates was a man, therefore, all men are Socrates.
Woody Allen

Is ditchwater dull? Naturalists with microscopes say it's teeming with quiet fun.

G. K. Chesterton, *The Spice of Life*, 1936

The cure for boredom is curiosity. There is no cure for curiosity.

Ellen Parr

Motivation is what gets you started. Habit is what keeps you going.

Unknown

Far better is it to dare mighty things, to win glorious triumphs, even though checkered by failure...than to rank with those poor spirits who neither enjoy much nor suffer much, because they live in a gray twilight that knows not victory nor defeat.

Theodore Roosevelt

Veins which by the thickening of their tunics in the old, restrict the passage of blood, and by this lack of nourishment destroy the life of the aged without any fever, the old coming to fail little by little in slow death.

Leonardo da Vinci

The rapid progress of the sciences makes me, at times, sorry that I was born so soon... Imagine the power that man will have over matter a few hundred years from now:

(1) We may learn how to remove gravity from large masses and float them over great distances;
(2) Agriculture will double its produce with less labor;
(3) All diseases will surely be cured, even old age.

If only the moral sciences could be improved as well. Perhaps men would cease to be wolves to one another, and human beings will learn to be human.

Benjamin Franklin

All the world's a stage, And all the men and women merely players; They have their exits and their entrances; And one man in his time plays many parts, His acts being seven ages. At first the infant, mewling and puking in the nurse's arms; Then the whining school-boy, with his satchel and shining morning face, creeping like snail Unwillingly to school.

And then the lover, sighing like furnace, with a woeful ballad made to his mistress' eyebrow. Then a soldier, full of strange oaths, and bearded like the pard. Jealous in honour, sudden and quick in quarrel, seeking the bubble reputation Even in the cannon's mouth.

And then the justice, in fair round belly with good capon lin'd, With eyes severe and beard of formal cut, Full of wise saws and modern instances; And so he plays his part. The sixth age shifts into the lean and slipper'd pantaloon, with spectacles on nose and pouch on side, His youthful hose, well sav'd, a world too wide for his shrunk shank; and his big manly voice,

Turning again toward childish treble, pipes and whistles in his sound.

Last scene of all, that ends this strange eventful history, Is second childishness and mere oblivion; Sans teeth, sans eyes, sans taste, sans everything.

William Shakespeare

I hope I die before I get old.

The Who

They say laughter is the best medicine. But sometimes the Heimlich maneuver is more appropriate.

Click and Clack radio show Car Talk
"After growing wildly for years, the field of computing appears to be reaching its infancy."
   John Pierce

"I hope you live to be 675 years old, and the last voice you hear is mine."
   Frank Sinatra

Live long and do good -- but whatever you do, be happy now.
   Johnny Adams

**Songs**

*In My Life*  
The Beatles

*Time in a Bottle*  
Jim Croce

*Yesterday When I Was Young*  
Roy Clarke

*Slip Sliding Away*  
Simon & Garfunkel

*Forever Young*  
Rod Stewart