Intro: This is kept simple and to the point with details on the most important aspects that can vastly improve your healthspan, lifespan, and quality of life.

The most important parts are yellow highlighted so you can find them easily.

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Attn Scientists Who Are Aging SOLUTION CREATORS:

If you are developing a new aging therapy with outstanding potential, then I can help – along with my wide network – in many ways including:

funding, patent, business, legal, scientific, promotion among others.

Conversations are CONFIDENTIAL.
You stay in control.
We’re in this to solve aging.

Call me at 1 949 922-9786
or email JAdams -at- AgingInterventionFoundation.org
or JAdams -at grg.org

Others Active in the Aging Space: Let’s Partner Together

If you would like to work together to advance on biological aging solutions

Call me at 1 949 922-9786
or email JAdams -at- AgingInterventionFoundation.org
or JAdams -at grg.org
PART 1: SYSTEM

The SYSTEM in SIMPLEST terms:

1. Select a therapy we believe will facilitate healthspan and lifespan, and make us biologically younger.
2. Select an appropriate set of biomarkers and objective measures -- typically lab tests, and cognitive and physiological tests.
3. Do the tests
4. Take/do the therapy
5. Retest -- look for a shift towards a more youthful profile.

I wish it were always that simple, but that's basically it.

Then consider combinations and dosages.

We’ll continue this until more effective aging intervention therapies are developed.

MISSION

There are many ways to say it:

- Increase Healthspan and Lifespan
- Slow and ultimately reverse biological aging and age-related decline for more years of healthy living
- Shift objective measures toward youth. These include lab tests like safety, DNA methylation age, inflammation, phenotypic age and other calculations derived from lab tests, and cognitive and physiological measures
- Increase healthy lifespan
- Gain healthier and longer lives.
- Solve the problem of aging so we can stay young and healthy, feeling great, doing the things we love to do for a very long time.
- Age reversal / Rejuvenation / Regeneration
- Skip the misery that comes with growing old
- “Fountain of Youth”

Methods and therapies range from conventional and common sense to experimental pharmaceutical and biological.

Here our focus is on practical SOLUTIONS -- therapies, methods, biomarkers, etc. -- we can use right now to stay younger longer, along with aging intervention therapies to be developed in coming years that will have much greater healthspan and lifespan increasing effects.

Biological measurements are taken to evaluate the results and improve. Frequency and dosing are fine tuned, and methods and therapies are carefully combined for best effect.
A few core concepts I keep in mind:

- **SAFETY** - Be safe, and rely on supervision by an EXPERIENCED physician or qualified medical expert.
  Note: A number of so called “experts” don’t know much about practical application. I found out the hard way once.

- **Self reliance**

  Aging is 100% fatal. After thorough study and under physician guidance you are free to choose how to take intelligent risks accordingly, or not.

End Results We Seek
A clear understanding of the end results we seek will facilitate an age management program. Most of us are looking to maintain or enhance these end results – and to have them last a very long time. You might equate them to physical, mental, emotional and spiritual.

- **Physical**
  - Mobility* – ability to easily move around in, and interact with, our environment
  - Sensory – vision**, hearing, smell, taste, touch, kinesthetic, balance, proprioception.
  - Healing – rapid recovery from injuries, infections, other damage. Or avoid them completely.

- **Cognitive/Mental function** – clarity of thought, problem solving, productivity

- **Emotional and Spiritual** - Subjective feeling of well-being, enjoyment of life, fulfillment, joy, connection with others, feeling that life is meaningful, engagement in life. Freedom from pain.

*Re Mobility -- you have to be on crutches for a while, or in a walker, or stuck in a wheelchair or hospital bed to truly appreciate this.

**Since I’ve had six eye surgeries, and many kinds of strange instruments stuck in my eyes, several laser treatments including a spot weld job, and countless ophthalmologist visits and tests for the last 35 years or so, maintaining vision happens to be near and dear to my heart.

You could list others, but most affect the above. There are sophisticated systems to quantify physical, mental, emotional, social functioning and other domains but here it’s kept simple.

MEASURING RESULTS with biomarkers and other objective measures is key. They are indicators of how well a therapy is working, and how we might expect to enjoy the core benefits we are seeking (some are described above) into the future.
My Short term Plan (since 1999 and into the future):
Use currently available therapies to slow aging, reverse some of its effects
A list is in part 2.
Test, refine and measure results of aging intervention therapies, and evaluate combinations and dosing program, using currently available therapies and methods to gain added years or a decade or two.
Biomarkers/objective measures will be applied to determine the best personal program.

Long term Plan ongoing:
Create, and partner with researchers and labs, in the development of new therapies that will keep us youthful and healthy, and making the world a better place, for a great many years to come – perhaps someday as long as we choose.

Right now top new candidates look like:
- Reset the epigenome (DNA methylation and others) to a more youthful biological age / cellular reprogramming -- possibly using Yaminaka factors and others.
- Gene editing/therapy -- greatest interest is knock-ins of youth enhancing genes.
- Perhaps HIF-1α enhancers, cultivate cytotoxic T cells (CTL) shown to attack tumor cells and protect against viruses (in mice), nanotechnology, synthetic body components, supercentenarian (oldest humans 110+) research to understand why they are so long lived. And this one will seem highly visionary and extreme, and even bizarre -- full body transplant with lab-grown bodies (obviously this one is very long term).

And many other innovative advances yet to be conceived.

Goal setting
High achieving people tell us we need goals, and they should be factual and specific, with dates for accomplishments.

Here’s mine: You, and me and everyone we care about – everyone in the world via whatever form of social media exists – to join us at my big 100th birthday party on Dec 17, 2049 1:00 pm. We are all in great health. There’s music, singing, dancing, great conversation.

That’s when the long-term planning will begin.

These quotes come to mind:
There is no wealth but life
Too soon old, too late smart
What we can conceive, we can achieve
Impossible only means that you haven’t found the solution yet
Success is where opportunity meets preparation

Nothing is impossible for the person who refuses to listen to reason

Do not go gently into the night . . .
take wise and decisive action to keep the lights on

I am often reminded of this one in particular:
History is littered with the sun bleached bones of those, who at the dawn of victory sat down to rest . . .
and while resting, died.

Someone really smart once said
“Be careful what you wish for, lest it come true.” -- Aesop

Seeking individuals practicing innovative aging therapies you believe are working, or will work
- and -
Those about to begin a new therapy
I can help you — possibly provide biomarkers and objective testing at low or possibly no cost.

Call me at (949) 922-9786,
or email JAdams@AgingInterventionFoundation.org

VERY IMPORTANT: Before pharmacological therapies, start with the fundamentals.
Begin with a foundation of:

SOME TOP ONES:
• Regular health and disease screenings -- get early diagnosis and treatment for disease conditions -- medical and dental checkups, blood tests, eye screenings, colonoscopy, flu/pneumonia/shingles/tetanus shots, pap smear and others advised by your doctor.
  o Catch problems early and fix them.
  o Some prominent researchers in our aging intervention community are now dead, but had they detected diseases and received treatment early would probably still be with us today.
• Great nutrition with reduced calories (may include some form of fasting)
• Exercise – like weight/resistance training, aerobics, high intensity interval training, moving the body in all possible ways, vary it with others
• **Mental/brain health** – includes stress reduction, adequate sleep, meditation, positive thinking, compassion, forgiveness, and grounding in the present with a vision for the future.

**Add to that:**

• Dental care, moderate and appropriate amounts of well-designed nutritional supplements from trustworthy sources, adequate amounts of pure water (my personal program it’s around 1/2 gallon a day spread with small amounts throughout the day - possibly filtered or alkaline), reduce toxicity, reduce risks, personal safety and security, sexuality, spirituality.

• Challenge the body (not in excess of course). Have variety. Plan for tomorrow, but live for today.

• Personal development, variety, art, music, joy, laughter and fun, and appreciation of the wonders of the world each day.

• Well rounded life – tending to health, family, social, financial, business, civic, spiritual aspects.

• Laughter, joy and fun!

• **ONLY THEN** on to careful evaluation in use -- with emphasis on safety and under guidance and approval by a qualified physician or medical practitioner -- of pharmacological therapies like metformin, rapamycin, senolytics, NAD, GDF-11, exosomes, and others described in PART 2.

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**A philosophical, and practical question:**

Are you happy and fulfilled right now on this journey toward longer healthier life? If not, what makes you think you’ll be happy after you achieve it?

OK, maybe after implementing a health and age management program we’ll get more joy out of life.

Another one: Why? What will you do with all the extra years, decades, centuries after aging is solved? I suggest considering a purpose, and that might be creating a better world.

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**Key Words and Concepts:**

**Small study / N=1 format**

Self Directed Aging Intervention Researchers, Aging Solutions, Healthspan, Longevity "Fast Trackers", innovators, visionaries, early adopters, explorers, creators, adventurers, pioneers, citizen-scientists, DIY biohackers, “self selected lab rats”.

Fast track, practical, ethical, small, informal, cautious and low risk with high potential for increasing healthy years.

Safety, reducing risk, informed consent and do no harm, forward thinking, even bold – but not reckless.
As a Self-Directed Aging Intervention Researcher
I use what you would call a Fast Track Proof of Concept Trial, or pilot/beta/small study format in humans
Conducted by a small group of associates, or individually (N=1) as opposed to a large formal clinical trial.

N=1 can render valuable information under the right conditions – especially if the N = you.

Everyone’s different, and different people experience a wide range of responses to different therapies.

What works in one person may not work in another – and another may experience a negative effect.

Personalized dosing can be important.

How therapies are combined is important. Results can be improved (linearly or exponentially), or therapies can negate one another, or effects can be negative – sometimes very much so.

Uses aging biomarkers and biological/health outcome measures for
- Safety (such as liver, kidney, blood, lipids)
- Efficacy

MD or qualified professional monitored/supervision
In my personal view an Investigational Review Board (IRB) is optional.

Be aware of potential negative consequences of self-diagnosis and independent action.

First do no harm -- be as sure as possible that no harm will come from it.

There are some risks to any therapy. Hardly anything – like driving to your doctor’s appointment -- is completely risk-free.
We’re on a frontier here. Unchartered territory.
Weigh risk vs reward carefully.

Essential part of the strategy: Find the best personalized aging therapy dosing, combination and rotation that works best.

Dose intervals, and skipping intervals can be important depending on the therapy.
Look to expert input and use your best judgment.

If you are doing doses at different intervals, keep in mind the time after the therapy for it to become effective, and how long it maintains / point at which the effect declines. You will probably only know that by your biomarkers and other objective measures.

ADME / Tox
absorption, distribution, metabolism, excretion, and toxicity.
You Can’t Manage What You Don’t Measure
MEASURING RESULTS with biomarkers and other objective measures is key.
Measure indicators of any harm that may be done.
If you are testing a compound that has had a positive effect in animal studies, measure for those effects in the humans.

Be cost-effective, but don't scrimp on lab work.

Highly accomplished age management physician, Philip Lee Miller MD, advises:
I have some repeated sayings these days. Virtually everything you read is wrong. So when you read any citation be careful. Is this original thinking? Is this a regurgitation or part of an echo chamber? Which is usually the case. This is why even at the Longevity Therapeutic conference, which I thought was excellent, I still think there is imprecision of language and specificity of critical thinking. So I question everything. I take nothing at face value. I ask how did you come to these conclusions? What is your mission? What are you trying to sell me? Everyone in their own way is trying to sell you something. Whether it be goods or ideas or conclusions.

I don't trust rodent studies. These are synthetic models. This is how I come to original thinking.

Specificity of language is so important. Precisely what do you mean? Define your terms.

In presentations and in the literature I see a lack of specificity and transparency. Overuse of acronyms. "We found this result." How? In what compartment?

My motto is, "question everything." Assume nothing. That is how we arrive at great discoveries.

So often I look at various experiments, most notably hormonal studies, and ask the question, "what if you did the opposite?"

Partial day fasting
I'm still not necessarily sold on long-term fasts. Early in my training I learned that the body has a continued need for protein, and if it doesn't get it it will start to consume muscle, organs, and neurons.

OK, I may need to update the knowledgebase on that. Today we hear about how fasting results in the consumption of senescent cells. But for now I'm still clinging to some of that old thinking and doing moderate forms of fasting - in moderation and balance in other components of a personal aging intervention program.

Previously, I would start a fast in the evening. Mornings are my most productive time, and the main problem was that I need full brainpower (limited as it may be) starting from the time I get up.
What follows made partial day fasting much easier for me. It might work for you.

If you're like this, initially try starting your fast just after noon at about 12:30 or 1 pm, or maybe a little later then gradually move it back to earlier and earlier. You will be sleeping during the last part of the fast. Then start a little earlier, say, 11:30.

Initially just go 12 hr or so. Or less. With repeated effort you will probably find it gets easier and you can fast longer and longer. This morning I did 20 hr -- sure, no big deal for those of you with more experience or of it happens to come easy. But since we are all individuals it's a big deal to me.

Our GRG member and friend Ted Coombs sent this useful guide:
https://www.healthline.com/nutrition/6-ways-to-do-intermittent-fasting

Research grade pharmaceuticals/compounds
A GRG member and friend Dayan Goodenowe advises us:
It comes down to
- Where sourced from
- Buyer beware.
- Certain compounds are touchy - and they have temperature considerations depends on the research molecule using. Theres no one answer.
- Comes down to whether you trust the supplier.
- Be cautious about res gr mats coming fr 3rd parties -- where are they getting it
- The biologics - proteins and antibodies (certainly injectibles) have more purification and stability issues
- Others like lipids are more simple and stable.
- Whether they’re the source or whether they’re reselling it can be important.
- You have to look at the stability issues.
- Sometimes it's actually pharmaceutical grade that’s labeled as research grade.
- Find out who’s manufacturing it, who their other customers are.

Testing Pharmaceuticals Purchased Offshore and Elsewhere for Safety and Efficacy
I do not trust drugs from sources other than licensed pharmacies. I’ve been burned. Counterfeit products is a huge international problem. It’s not just jeans, Gucci bags, Barbie dolls and GI Joes -- others include counterfeit airplane parts, pharmaceuticals and other mission-critical products. Whatever makes money. A doctor once told me about fake Lasix medicine made seriously ill patients even sicker because it had been mixed in a container that had previously been used to mix pesticide, and had traces of the pesticide in the “Lasix”.

Appearance and packaging are VERY convincing. I read that a a phoney Apple store was opened in China with real looking Apple products.

So I do not automatically trust that offshore suppliers will provide pharmaceuticals that are pure or contain the specified content.
This concept also applies to nutritional supplements. Some suppliers use cheap ingredients that do not contain the specified amounts, and may even contain toxins.

According to some of my sources: So-called “Canadian” pharmacies are usually not in Canada – they’re usually in Asia, India or somewhere else. It is illegal for a Canadian pharmacy to ship to the US, with or without a prescription. Unless the web address has a “.pharmacy” extension it is not legitimate. The legitimate way to get a Canadian pharmaceutical is to go to Canada and get it from a Canadian doctor, then go to the pharmacy.

Pharmaceuticals can be tested against a generic (known) sample using high-performance liquid chromatography (HPLC) and other methods. Testing labs can be found on Science Exchange [www.scienceexchange.com](http://www.scienceexchange.com). For example, my close circle of associates and I compared dasatinib from a US pharmacy and dasatinib from an offshore pharmacy with a generic (known) sample of dasatinib, which I acquired from Sigma: CAS: 302962-49-8. [www.sigmaaldrich.com/catalog/buildingblock/product/matrixscientific/mat370173661?lang=en &region=US](http://www.sigmaaldrich.com/catalog/buildingblock/product/matrixscientific/mat370173661?lang=en &region=US)

Testing Resource:
Qualitative testing evaluates for purity, and that it contains the indicated pharmaceutical. Quantitative evaluates for the exact amount of the pharmaceutical.
For a more detailed discussion on qualitative vs quantitative, along with other useful information pertaining to senolytics, see this document: [https://www.aginginterventionfoundation.org/Senolytics.pdf](https://www.aginginterventionfoundation.org/Senolytics.pdf)

This lab is for qualitative testing.
Echelon now has qualitative test data and reports for dasatinib and rapamycin. They are available to test samples from other members of our community. My group has covered the initial cost, which is greater than the cost of testing additional samples.

Contact me if you plan to utilize Echelon’s services. Inefficiency and confusion will be eliminated if you have me in the loop.
Johnny Adams JAdams@grg.org (949) 922-9786
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675 Arapeen Drive Suite 302
Salt Lake City, UT 84108
mnelson@frontiersci.com
801-588-0455 ex 308

Quantitative testing:

Emory Pharma
[https://emerypharma.com/](https://emerypharma.com/)
Neeku (Niki) Mahdavian
Business Development Manager
Tel: (510) 899-8825
neeku@emerypharma.com
Prescriptions May Need a Diagnosis Code
Unfortunately according to medical and other dictionaries \textit{aging} does not fall into the category of a disease. So it is unlikely that the World Health Organization, American ICD-10-CM (diagnosis) and ICD-10-PCS (procedure) medical billing codes, or other major organization will categorize aging as a disease.

\textbf{2019 ICD-10-CM Diagnosis Code \texttt{R54} -- \textit{Age-related physical debility}} -- as close to getting aging classified as a disease as we’ll get – at least for now.

\url{https://www.icd10data.com/ICD10CM/Codes/R00-R99/R50-R69/R54/-/R54}

The above web page reference begins with:

\textbf{Age-related physical debility}

- \texttt{R54} is a billable/specific ICD-10-CM code that can be used to indicate a diagnosis for reimbursement purposes.
- The 2019 edition of ICD-10-CM R54 became effective on October 1, 2018.
- This is the American ICD-10-CM version of R54 - other international versions of ICD-10 R54 may differ.

ICD-10-CM Coding Rules
- \texttt{R54} is applicable to adult patients aged 15 - 124 years inclusive.

\textbf{Applicable To}
- Frailty
- Old age
- Senescence
- Senile asthenia
- Senile debility

Type 1 Excludes
- age-related cognitive decline (\texttt{R41.81})
- sarcopenia (\texttt{M62.84})
- senile psychosis (\texttt{F03})
- senility NOS (\texttt{R41.81})

The following code(s) above \texttt{R54} contain annotation back-references that may be applicable to \texttt{R54}:
- \texttt{R00-R99}  
  Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified

\textbf{Approximate Synonyms}
- Frailty

ICD-10-CM \texttt{R54} is grouped within Diagnostic Related Group(s) (MS-DRG v36.0):
- \texttt{884}  Organic disturbances and intellectual disability

Some major pharmacies have an application and qualification process for off label drugs. CVS required the completion of forms and a qualification process to get dasatinib. But on one occasion an associate found a university pharmacy required less formality and was faster.

\textbf{Feedback Inhibition}
Homeostasis is where a body’s mechanisms go into action to achieve a stable, often preset state. When augmenting a substance (often “natural”), you may get a boost in biological measures, and feel great -- at first. You may even want to write a glowing testimonial about the product that’s causing it. Then homeostasis begins and the body may compensate by reducing its own production, seeking to achieve the previously set level. Eventually the body can become dependent, so if the external source is stopped you are now deficient, and dependent on the external source -- very possibly with feelings like weakness, illness, emotional upset or depression, and other really bad things because you’re now deficient. It takes a long time to get back to where you originally were – if ever.

A classic example of this is **testosterone and other hormones**. Early on (circa 1999) I got into physical trouble with large amounts of testosterone and other mega doses of nutritional supplements and pharmaceuticals.

A user feels good at first, later not good. I would only take testosterone if diagnosed as deficient by a highly qualified endocrinologist – definitely not one who had minimal training in age management/anti-aging medicine, such as a few courses. Hormone actions are complex. Same goes for any hormone.

If you wrote a testimonial about a product, try to get it removed and the current story posted.

This might be a pretty good case for intermittent use -- of any exogenous substance.

The senior scientist associated advised:
“one way to minimise this is to ingest supplements in a "pulsed" manner. For example, if a dose of a supplement is cleared from the body in, say 24 hours, then I would not take that supplement daily but perhaps on alternate days. For what it's worth.”

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**Sometimes Things Don’t Go Exactly To Plan**
Welcome to small trials and N=1.

Some benefits of small/N=1 trials are that they’re quick turnaround and tailored to you. Drawbacks: Some certainty (for you) mixed with uncertainty mostly due to circumstances beyond our control.

We’re not lab rats living in a big controlled environment. “Life” may well happen – right at a critical time in your self directed age management therapy experiment. This can be a problem particularly when you have a lab test or other objective measure scheduled in a particular window of time, so you would now be taking it under an unusual condition.

You may get sick just at the time followup tests are planned. You may be unexpectedly called to travel and help someone in distress. A heat wave may hit and you feel not completely well – and not sure whether it’s the therapy or the weather. Your phlebotomist may miss the appointment or quit, leaving you to find another and delay a lab test or therapy. Or you’re about to start a mental test or other test that requires concentration and gardeners or workers will come and start lawnmowers and jackhammers. Your work may require unexpected travel during the testing time period. A loved one may die and your state of mind, concentration and even physiology
will be different. Relatives may visit for a few days. And a thousand other things that can throw it off.

For example, I recently had lab work scheduled at an exact time following a therapy. But I had an unusual swelling in a finger, and had picked up about an extra 1.5 pounds of body weight and was concerned this might have an effect on the results, particularly inflammation. I did the lab work anyway, and noted it in my summary.

And how will flu season affect your experiment? Will you get the flu just at the time of an important followup measurement?

After completing your therapy, you may discontinue. Then you learn of a new test, or remember a different kind of test you once had before. That would provide useful information. So now, after the gap you restart the therapy and do the new test later.

So I do what successful businesspeople, doctors, and others do – make the best possible decisions based on often incomplete information, or dealing with the uncertainties that life throws at you.

_________________________________________________________________

**Multiple therapies can have synergistic, or multiplicative, or negative effects.**
One reason is they may be competing for the same clearance channel. Safety first, follow doctor’s guidance, measure results.

*If you have side effects or don’t feel well, under your physician’s guidance consider stopping immediately.*

_________________________________________________________________

**Personalization, Dosing and Combinations**
Different people can experience a wide range of responses to different therapies. What works in one person may not work in another – and another may experience a negative effect. And personalized dosing can be important.

Re combinations – it’s good to affect multiple aging systems. Sometime therapies with the intended effect or target that don’t work individually will work when combined or will work better when combined. And it would probably be desirable to combine different therapies with different effects or targets on aging systems. Dosing becomes even more important, as sometimes when combined therapies that worked well with no side effects will now result in side effects. For example, they may compete for the same clearance pathways resulting, in effect, to something like overdoses.

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**To be determined – the order or therapies**
Example recently discussed and being researched -- first senolytics THEN cell or other therapies.
Seasonal Influences

Holiday months -- November and December
Mistakes by service providers and labs – and our own mistakes -- happen a lot more during the holidays.

Delivery people are overwhelmed and shipments get lost or delayed – and that’s a big problem if it’s a sample on dry ice and the dry ice melts and the sample thaws and is ruined. Delivery people and service providers go to the wrong locations. Labs and medical people are overwhelmed due to large numbers of patients using up their medical insurance deductibles and holiday overload in general.

Lab work may be time sensitive. Many customer support and lab staff are out for the holidays. Or the A-team, and B-team are out and this results in disorganization and samples being stored longer than usual – and increases the potential for mistakes, especially errors in lab values.

For example in Dec. 2017 I sent two blood samples to a lab. One of them either arrived there damaged or was damaged by the lab. Also around the same time a delivery driver missed my sample delivery on his route, which was frozen. Fortunately I had a great relationship with this lab and they called me. Most don’t. I had to waste time and call the UPS supervisor and demand the driver backtrack to the lab and deliver it – otherwise I would have to drive to the main facility myself, pick it up and take it over to the lab. It was delivered later that day.

My preferred shipper is FedEx. This seems to be the case with other major labs.

And since we’re humans many of us partake in holiday indulgences, which is outside our normal routine and could make a difference. If we have a therapy and lab work during that time, I suppose it’s best to continue the same eating and lifestyle habits until all followup lab and biomarker work is complete. Counterproductive, and is that condition the norm in which to test a therapy?

And how will flu season affect your experiment? Will you get the flu just at the time of an important followup measurement?

Seasonality, or even seasonal affective disorder may affect your results.

At a major academic conference on aging a researcher at a university described the same kind of problem. The lab shut down completely for weeks during the holidays. They were unaware of this when they began working with them, and it resulted in serious problems.

In future it will be extremely unlikely that I will test an important therapy during the holiday months of Nov. and Dec., or during July and Aug.

Spring
Allergies may affect your results. Then there’s spring fever.

Summer -- vacation months of July and August
If you are working with scientists, my experience has been that they are on vacation or otherwise unavailable during August, and almost as much in July.
From the above you may conclude that there is no time to do an experiment. I suggest dramatic changes will occur under just about any conditions. Take action, wisely.

References


www.joshmitteldorf.scienceblog.com/2017/06/06/aging-gets-personal
PART 2: THERAPIES
Aging Intervention Therapies as Part Of A Personal Aging Intervention Program

Aging Intervention Therapies I’m doing, have done and plan for the future are below in SECTION 3-- but first:

WHAT AGING INTERVENTION THERAPIES ARE YOU CREATING, OR KNOW OF?
*** Be assured our conversation will be CONFIDENTIAL if you want. ***
Contact me at JAdams@AgingInterventionFoundation.org or call (949) 922-9786 (US)

SECTION 1
When I learn of a new aging intervention therapy, some of the many questions I ask include:
Top 2:
How do we know it works?
Is it safe?
Examples of questions to ask:
  Are there any side effects? Remember everyone’s different and you may have an undesirable effect that most other people don’t have.
  Would there be undesirable effects from interactions with other aging therapies?
    Example: Would it compete with another therapy for a clearance channel, resulting in a higher amount in the system? Metformin drug advisory says not to take metformin with grapefruit juice. I believe metformin and some other drugs have the same effect.
    Combining aging therapies can be complicated.
  Would we become dependent on it –
    Would there be feedback inhibition like testosterone or other hormones if we’re not deficient? (The body reduces its own production so you’re now dependent on the external source)
  Allergies
    Would it result in replication senescence – example: a therapy that stimulates stem cell production and draws on capacity to produce later
More questions:
  What pathway does it act on? (Multiple therapeutics may become less effective as more therapies acting on the same pathway are introduced)
  What’s the right personalized dose?
  Where would it fit in the priority of available therapies?
  How do we get it?
    What’s the cost and is it cost effective?
    Legal considerations
  How to test/evaluate results? How to test/evaluate results?
ADME/Tox: absorption, distribution, metabolism, excretion, and toxicity.

The body may well have problems clearing excess supplements and drugs. I want found out the hard way and got very sick on an overly aggressive and naïve drug plus and supplement program.

Sometimes nutritional supplements contain undesirable ingredients that are not on the label.

And surely feedback inhibition applies to nutritional supplements as well as drugs.

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**Personalization, Dosing and Combinations**
Different people can experience a wide range of responses to different therapies. What works in one person may not work in another – and another may experience a negative effect.
And personalized dosing can be important.

Re combinations – it’s good to effect multiple aging systems. Sometime therapies with the intended effect or target that don’t work individually will work when combined -- or will work better when combined.
And it would probably be desirable to combine different therapies with different effects or targets on aging systems.
Dosing becomes even more important, as sometimes therapies that worked well with no side effects, will now result in side effects. For example, they may compete for the same clearance pathways resulting, in effect, to something like overdoses.

To be determined – order of therapies. For example, first senolytics to clear old cells (including stem cells) THEN any stem cell therapy.

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**SECTION 2 – Some Aging Intervention Therapies I have heard of – planning to evaluate many of them.**
Let me know of others you know of.
*** Be assured our conversation can be CONFIDENTIAL if need be. ***
Contact me at JAdams@AgingInterventionFoundation.org or call (949) 922-9786.

These would be considered ONLY AFTER conventional, common sense methods like regular health screenings, nutrition, exercise, brain/mental health, and others listed in PART 1.

I AM NOT ENDORSING ANY OF THESE. It’s just a list.

Everyone is different. This is not intended as a list for you to follow -- but rather information on what I have done, and plan to do in the future -- so you and your doctor can make informed choices about what’s best for you.
You should study and understand these therapies before beginning. Everything should be done with emphasis on safety and doing no harm, and under guidance and approval by a qualified physician or medical practitioner.

A list of therapies I have personally done and plan for the future is BELOW this list in SECTION 3.

ADME/Tox: absorption, distribution, metabolism, excretion, and toxicity.

Again, a GENERAL WARNING:
The body may well have problems clearing excess supplements and drugs.
I want found out the hard way and got very sick on an overly aggressive and naïve drug plus and supplement program.

Sometimes nutritional supplements contain undesirable ingredients that are not on the label.

And you and your doctor consider these AFTER the conventional common sense fundamentals in section on approx. p 5 labeled:
VERY IMPORTANT: Before pharmacological therapies, start with the fundamentals. Begin with a foundation of . . . (see the list below it)

<table>
<thead>
<tr>
<th>Cellular reprogramming (resetting DNA methylation and others) to a more youthful state, probably using Yaminaka factors and others</th>
<th>Gene editing - mostly knock-ins at first</th>
<th>HIF-1α enhancers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic catalysts</td>
<td>Circulating Cell-Free Respiratory Competent Mitochondria</td>
<td>Immunity super gene - Expansion of cytotoxic CD4 T cells</td>
</tr>
<tr>
<td>Extracellular Vesicles / Exosomes</td>
<td>Senolytics (dasatinib, quercetin, fisetin, FOXO4-DRI, theaflavins and others) <em>SEE WARNINGS BELOW</em></td>
<td>Metformin</td>
</tr>
<tr>
<td>Nutritional supplements -- Safe, effective and proven. **</td>
<td>Conservative program with basics of ongoing health checkups, great nutrition with reduced calories, exercise, stress reduction and others</td>
<td>GDF-11</td>
</tr>
<tr>
<td>Umbilical cord plasma</td>
<td>Rapamycin and rapalogs</td>
<td>GCSF granulocyte-colony stimulating factors</td>
</tr>
<tr>
<td>NAD – Infusion, patch, RealNAD buccal lozenges, nicotinamide riboside, other NAD precursors and supplements</td>
<td>Stem cells</td>
<td>Combinations – and whether therapies are used with (or on the same days as) exercise and fasting. Examples: on exercise days don’t take metformin, rotate through different therapies on different days or weeks or months.</td>
</tr>
<tr>
<td>Heart Rate Variability (HRV) management</td>
<td>Fasting -- Partial day fasting (16:8), Valter Longo prolon fasting mimicking diet. Will also evaluate 5:2, DASH diet, Warrior diet and others.</td>
<td>Compounds that promote ketogenesis – beta-hydroxybuterate (BHB), others</td>
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<tr>
<td>High intensity interval training (HIIT)</td>
<td>Antibiotics – azithromycin, doxycycline, tetracycline, minocycline and others as</td>
<td>HMR (Health Management Resources) diet, nutrition and fat loss program</td>
</tr>
<tr>
<td>Microbiome management -- probiotics and prebiotics. Test whether akkermasia muciniphila will promote cholesterol reduction and weight loss, and veillonella or Fithiomics probiotic improves athletic performance.</td>
<td>senolytics and other age management effects</td>
<td>Oxytocin – upregulated by lactobacillus reuteri 6475. BioGaia Osfortis.</td>
</tr>
<tr>
<td>Resveratrol 1 teaspoon (1 gram) daily, 98+% pure, from legitimate seller, and pterostilbene (chemically similar)</td>
<td>Under guidance of expert neuro endocrinologist: hGH, testosterone DHEA, other hormones and precursors</td>
<td>Proprietary anti-inflammatory with novel delivery system. Soon to be disclosed and available by a leader in our community</td>
</tr>
<tr>
<td>Meditation, Yoga, Mindfulness -- Examples: meditation, chanting, mudras, pratyahara, QiGong breathing, Muse meditation headband and other methods to improve heart rate variability and blood pressure</td>
<td>Peptides – BPC-157, others</td>
<td>Ultrasound, electromagnetism, ontogenetics or other medium with particular attention on frequency.</td>
</tr>
<tr>
<td>Platelet rich plasma</td>
<td>Methylene blue</td>
<td>C60</td>
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<tr>
<td>Plasmalogens</td>
<td>Alpha-Ketoglutarate (AKG)</td>
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<tr>
<td>Everolimus</td>
<td>Statins</td>
<td>Low dose naltrexone</td>
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<tr>
<td>Deprenyl</td>
<td>boron (may be included in multivits)</td>
<td></td>
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<tr>
<td>Nitric oxide nitric supplement for athletic performance/endurance</td>
<td>RTB101</td>
<td>Repatha</td>
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<tr>
<td>Spermidine</td>
<td>Nilotinib</td>
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<tr>
<td>Florbetaphir</td>
<td>oxytocin</td>
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<tr>
<td>SS-31 / elamipretide</td>
<td>PBT-2 (quinoline)</td>
<td>Algerbium / ALT-711</td>
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<tr>
<td>Klotho</td>
<td>CoQ10 (Note: one scientist advised me that CoQ10 is harmful, another advised excess CoQ10 is harmful)</td>
<td>Low dose lithium</td>
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<tr>
<td>Alk5i (with oxytocin)</td>
<td>J147</td>
<td></td>
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<tr>
<td>Grounding exercises to connect you to the Earth</td>
<td>Astaxanthin</td>
<td></td>
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<tr>
<td>Anti-retrovierals / HIV drugs</td>
<td>Green, white and black tea, and coffee</td>
<td>Lion’s mane</td>
</tr>
<tr>
<td>Bacopa for mood improvement, creativity, memory</td>
<td>Cat’s claw (Percepta brand)</td>
<td>Purple sweet potatoes</td>
</tr>
<tr>
<td>Viagra (so-called surprise blockbuster age management benefits of PDE5 inhibitors)</td>
<td>Sulfuraphane</td>
<td>Epigenetic reprogramming</td>
</tr>
<tr>
<td>Magnesium (for aches)</td>
<td>ozone sauna</td>
<td>Develop new therapies and find personal combination of methods/therapies available now with human on a chip</td>
</tr>
<tr>
<td>Unique proprietary plasma fraction containing youth enhancing components under development by two of our associates</td>
<td>Therapy to simultaneously turn on the rejuvenation process, and block cancer</td>
<td>Nanotechnology -- nanobots to repair cellular components and DNA, and remove debris</td>
</tr>
<tr>
<td>TEX264 and other enzymes to remove toxic proteins adhering to DNA, causing them to become damaged and cause aging on a cellular level</td>
<td>Find your personal weak link and fix – kidney, liver, eyes, ears, etc</td>
<td>Engineering new mitochondrial genes to restore mitochondrial function – example take some of our own cells, grow them up in quantity, isolate the mitochondria from them (maybe after testing for low mutation load), and inject them back into ourselves</td>
</tr>
</tbody>
</table>
Solution for autodigestion -- digestive enzymes escape the gastrointestinal tract and digest your body resulting in cell and tissue loss so loss of function

Cultivate cytotoxic T cells (CTL) shown to attack tumor cells and protect against viruses (in mice). Needs research

Very long term and this is way out there -- Lab grown bodies for full body transplant (head onto new body)

* SENOLYTICS WARNING -- Caution is advised re. excessive senolytics.
Note: What’s excessive may be different between individuals

Vince Giuliano advises senolytic signaling is critical for cell renewal -- you need enough inflammation and senescence to signal for regeneration factors -- so if you go overboard in senolytics therapy it’s bad, you will miss out on cell renewal.


More is often not better. Quote by Reason: All senolytics, so far, look like things you would take once every few years at most. More won't be any more effective than that one dose - it will kill the senescent cells it can kill the first time, and won't be helpful again until more senescent cells turn up in volume.


Senescent cell researcher Dorota Skowronska-Krawczyk PhD personally discourages us from having long treatments with senolytic drugs. In fact she suggests they should only be taken for short periods interspaced with longer recovery times.

Stan Goldfarb has decades of applied nutritional supplement and aging intervention experience. He advises: I think even 2.5mg per KG is a higher than I want to take, especially when combining it with EMIQ (which in itself has no bad side effects till very high doses). I weigh 137 and am going to take 100mg once only. You should also be taking at least 10000iu of D3 to complete apoptosis and don't take any blood thinners such as aspirin or omega supplements as it has been proven to go after fat cells for several days before and after. Without doing all of this a person is simply taking an unnecessary risk. When I did my first test of this in 2015, there were some really sharp people to say exactly what to do and when. I don't see that now with the current crop of people and it concerns me. People have died from overdosing this drug! I also remember that several people who did take multiple doses experienced minor problems after the second dose (especially flu like symptoms but not after the first. One group is saying take what you're doing twice one week apart. This is potentially risky. The effect Dasatinib has lasts longer than many people seem to think and that is why I think a second dose just one week later makes no sense.

James Kirkland MD PhD recommends not evaluating senolytics on our own at this early stage.

Senolytics resource
https://www.aginginterventionfoundation.org/Senolytics.pdf

Similar cautions apply to other therapies. There’s a lot we don’t know about this new frontier.
** I have found some overlap, as well as variation in nutritional supplement programs.

__SECTION 3 – My Personal Therapies And Methods__

Contact me for details on this.

As of this document date my program consists of carefully testing and evaluating (usually with lab, physiological and cognitive tests) multiple aging intervention therapies, from common sense approaches to advanced pharmaceuticals. The intention is to fine tune the program, dosing and combinations.

- My personal system is diversified, and most components of are not excessive (many are somewhat moderate).

- Subjectively I usually feel very good, am enjoying life, effective in my work and at age 70 at top performance ever. However, subjective impressions can be faulty so I rely on metrics -- biomarkers and objective measures.

Summary of some of the more recent advanced therapies I have taken/used, tested and evaluated (details below):

Common sense actions as described in part 1 - nutrition, exercise, mental/brain health etc.

Senolytics (dasatinib + quercetin), betahydroxybutyrate, umbilical cord plasma, oxytocin (upregulated by lactobacillus reuteri 6475). Proprietary anti-inflammatory supplement with liposomal delivery system, Lanasterol canine eye drops in left eye for cataract, nutritional modification to change LDL, some attempts to test, evaluate and modify microbiome.

Metformin – continue.

On to other advanced therapies, pharmaceutical and others. See list above.

Others in the more distant past -- many didn’t work out well.

An overly aggressive and naïve program, with few objective measures, managed by an MD with a great presentation but who didn’t know what he was doing - and later lost his license.

hGH, testosterone, vitamin megadoses, “anti-aging drugs” often from questionable sources.

- Moving on to evaluate the next therapy. So many to choose from, so little time. We need more time!
Now
Carefully evaluating nutritional supplements, implementing recommendations by top experts, adding selected ones to arrive at a practical personal program.

Next
RealNAD lozenges (per recommendation of expert physician specializing in NAD), probably along with supplements like niagen/nicotinamide riboside.
**DNA based nutrition recommendations** – Evaluate GenoPalate DNA test to optimize nutrition.
**Microbiome** - Evaluate following Viome analysis recommendations for food recommendations, and using recommended Klaire Labs Vital-10 probiotic.

BioGaia Osfortis for Lactobacillus Reuteri 6475 (upregulate oxytocin production) will either be a part of this, or a separate experiment.

Umbilical cord plasma (2nd round), umbilical and amniotic fluid based products, peptides, GDF-11, exosomes, and others.
Maybe doxycycline.

To evaluate and probably add:
Yoga, pratyahara and others throughout the day and during the evening.
Frequent/continual stress and HRV monitoring with a watch device (Garmin comes highly recommended).

Currently rotating through these on sequential days:
- Day 2) High intensity interval training -- 20 min aerobics including 3 20 second bursts of all-out high intensity interval training separated by walking and body movement.
- Day 3) 18-20 hr partial day fast beginning at about 12:00 pm. Around 6 pm -- 20 min relatively light aerobic movement consisting of moving every body part in every possible direction.
  - Repeat
  - Sometimes skip a day

Nutrition
Excellent nutrition, mostly low calorie, balanced combination of vegetables, fruits, meats, essential oils, daily salmon.
Often stay hungry, and sometimes have a little feast but not gorge.
A daily snack.
Contact me for details.

Supplements
I have had bad experience with access supplements and pharmaceuticals. Many that follow are taken very conservatively, hoping to fill the reservoir. I’m still refining the frequency and amounts.
Contact me for current amounts of the following.
My personal nutritional supplement program is under review and is listed below under **CURRENTLY TAKING AND EVALUATING**

**Normally it’s been**

**Daily**
Vitamin C (500 mg 2x daily), EPA/DHA / fish oil (2400-3600 mg), Vitamin D (1000 IU 2x daily).

**Every other day**
Multi vitamin supplement – alternate types.

Days with no multi-vitamin type supplement
Vitamin E 1000 IU

**2-3 times a week**
MCT, brain supplement (ginko biloba, vinpocetin, huperzine alkaloids), melatonin, BHB (betahydroxybutyrate).

**About every week**
Different formulations of multi-vitamins/minerals, B12, B1, CoQ10, B6, A, foliate/folic acid, K1, glutathione (before eating), SAMe (before eating), acetyl-l-carnitine, cordyceps Cs-4, niacin, astaxanthin, LifEx Broccole and Cruciferous Blend (substitute for astragulus /TA65), astragulus (on order).

**Once a week or more, when gym is open**
Sauna to elicit heat shock response and sweat out toxins, followed by cold shower.
Grounding to connect to the Earth – stand on grass, dirt or concrete for a couple minutes.

**Morning upon arising**
“Happy Blast” ("Joyful Bubble-Up") Start the day with feeling the joy bubbling up from midsection to the head. Hold hands with palms facing up, close to the midsection, move hands upward toward the head as though cultivating and moving the joy and love through the body. Then move hands around kind of like dancy tai chi, with a bit of swagger. Put on a big goofy grin, do a happy walk – think Monty Python Ministry of Funny Walks - down the hall while doing these.

**Dental Care**
Morning shortly after rising (before eating per recommendation by 2 dentists), and just before bed: WaterPik, floss, brush with fluoride toothpaste (except when fasting).

**Throughout the day**
Maintain an optimistic, carefree, visionary, “can-do”, even “aggressive, devil may care” outlook. Feelin’ stud – in a non-toxic loving kind of way.

**Think about just how damn lucky we are!** For thousands of years people struggled and suffered much, much more than most of us today.
Stay loose and positive, be the detached observer, appreciate life, nature and the simple things as well as complex benefits of today’s infrastructure (like being able to get water out of the faucet, roads, etc.), loose happy walk, etc.

“Happy blast” (“Joyful Bubble-Up”) sometimes during the day. When nobody’s watching. Or when they are -- so what? who cares?

And never allow the luxury of a negative thought -- just solutions.

**Other**

- Adequate amounts of water (around 1/2 gallon a day spread with small amounts throughout the day, later possibly filtered or alkaline), reduce risks, reduce toxicity, personal safety and security, sexuality, spirituality.

- Challenge the body (not in excess of course). Have variety. Plan for tomorrow, but live for today.

- Personal development, art, music, joy, laughter and fun, and appreciation of the wonders of the world each day.

**Evening before bed**

15-20 min meditation starting with about 2 min qi gong breathing (inhale for count of 7, hold for 8 count, deep exhale to 3 count).

Satanama with mudra – Satanama is translated as infinity (or birth, the beginning, infinity, the totality of everything that ever was, is, or will be), life, death, rebirth, so I just make it “sa” and “ta”. Mudra is touching the thumb to the index, middle, ring and pinky finger tips.

**Continual study of aging interventions and personal advancement.**

**CURRENTLY TAKING AND EVALUATING as part of my self directed research I may or may not continue depending on results.**

**Supplement Program**

Currently taking, and evaluating the results of, the following supplement program. It was arrived at by personally consulting with experts who have spent great amounts of their lives studying nutritional supplements and devising their own personal plans, and other resources.

I have had bad experience with access supplements and pharmaceuticals. Many that follow are taken very conservatively, hoping to fill the reservoir. I’m still refining the frequency and amounts.

It’s diversified, and for many it uses different brands. I’m hoping to reduce or avoid the possibility of sensitivity to binders and fillers, and any added ingredients not on the label.

It relies on managing multiple categories of aging, for example the seven principles in the book *The Kaufman Protocol* – Information system/Genetic, Mitochondria, Aging Pathways, Quality control, Immune system, individual cell needs, and waste management.
It’s based on a foundation of good nutrition.

Contact me for details about the above, and current amounts of the following.

About every few weeks I give it a break and take only Metformin, maybe vitamins C and D.

**Daily**
Vitamin C (500 mg 2x daily), EPA/DHA / fish oil (2400-3600 mg), Vitamin D (1000 IU 2x daily).

**Every other day**
Resveratrol 1 gram, 98+% pure, from legitimate seller alternating with pterostilbene.
Multi vitamin supplement – alternate types.

Days with no multi-vitamin type supplement
Vitamin E 1000 IU

**Different teas, every other day** – green, black, lions mane, yerba mate.

**Resistance/weight training days** - branched-chain amino acids (leucine, isoleucine, valine).

**2-3 times a week**
MCT, brain supplement (ginko biloba, vinpocetin, huperzine alkaloids), melatonin, liposomal wrapped 4 herb synergy mix (Curcumin, Boswellia, Sensoril™ Ashwagandha, and Ginger extracts), BHB (betahydroxybutyrate, triphala, green tea, black tea, lecithin, astaxanthin Astaxanthin (PurZanthin from Stop Aging), carnosine, nicotinamide (riboside), alpha-lipoic acid, sulforaphane, apigenin, pyridoxamine.
Astragalus (TA-65 or astragalus root).

**About every week**
Different formulations of multi-vitamins/minerals, B12, B1, CoQ10, B6, A, foliate/folic acid, K1+K2 (MK-7 and MK-4) mix, K2, LifeExtension mix and health booster, glutathione and SAMe (before eating), acetyl-l-carnitine, GreenTea extract w/ polyphenols, yerbe mate tea, cordyceps Cs-4, niacin, triphala, Mito-Q, quercetin

**About every 2 weeks**
Bioperrine, magnesium glycinate, PQQ, DHEA, AMPK metabolic activator, creatine, Rosemary extract (same as rosmarinic acid?), ecklonia cava, collagen (collagen hydrolysate?), liposomal GABA with 1-theanine, rosmarinic acid, piracetam, ecklonia cava, epigallocatechin gallate (EGCG), PeakATP, liposomal gaba with 1-theanine, pippali, pantothenic acid (b5), milk thistle extract powder, piracetam, thiamine hydrochloride.

**Every 3-4 weeks**
Trace minerals, fisetin, piracetam, Cognitex, Memory Protect
When an energy boost is needed
Creatine, or
Acetyl-L-Cysteine (NAC) 500 mg plus Acetyl-L-Carnitine 500 mg plus CoQ10 600 mg

For injuries
BPC-157 (peptide) creme (later maybe try injections), Boswella crème, DMSO.

PAST
- 2019-2020 Oxidized LDL (oxLDL or oLDL) although fairly low, it was reduced to somewhere in the “very good” to “significant” range with:
  Fish oil / EPA and DHA capsules - 3 to 4 1200 mg capsules daily, along with
  500mg vitamin C 2x daily, and
  continuing vitamin D 1000 IU 2x daily
  partial day fasting
  and maybe some recently added nutritional supplements contributed (B12, B1, CoQ10, A, foliate/folic acid, K (K-2), LifeExtension mix, cordyceps Cs-4, magnesium glycinate, glutathione, SAMe, niacin)
Continued three day cycle of day 1) resistance/weight training, day 2) 20 min aerobic with three 20 second all-out high intensity bursts, day 3) partial day fasting (worked my way up to 18-20 hr). Note: I have done some variation of fasting and calorie reduction for a long time. My records do not show the exact date partial day fasting was started or when it ramped up. But it will continue, to be sure.

- 2020 BPC-157 peptide for injuries
  BPC-157 (Body Protective Compound) is used for age management, and is sometimes combined with hormones. It is said to accelerate the wound healing wounds, tendons, ligaments, muscles, nervous system and other organs.
  Ironically, the three injuries I was seeking to improve are all a result of my aging intervention program or activities relating to it!
  Physician prescribed BPC-157 injection vial and cream from Tailor Made Compounding Pharmacy.
  Started with cream. It's simpler, but would move to injectable if no result. Within a few hours of application, the thumb seemed to feel better. Placebo? That's OK – I'll take it.
  Label says apply once a day.
  After 3 applications/days all original injuries are noticeably improved.

- 2019 BHB (betahydroxybutyrate). HVMN brand D-betahydroxybutyrate ketone ester and Longevity Edge brand KetoGen. Planning to try this for around 6 weeks then evaluating results with biomarkers and objective measures.
  I was taking small amount (1 mL, 5 gram HVMN ketone ester) either first thing in the morning before a meal, or in the middle of the night. On one hand it objectively appeared to have resulted in weight loss. Subjectively appetite was reduced, maybe increased energy and creativity.
  But twice I tried HVMN and began to feel ill (first time: abdominal ache and slight nausea, second: felt kind of ill for about 1-2 days). Discontinued HVMN and then tried
KetoGen. After a couple consecutive days on small amounts (1/6 and 1/3 recommended dose) felt kind of ill for about 1-2 days. Now taking small amounts 2 – 3 times a week.

To be clear: this is not to be considered evidence that the BHB made me sick. But time is marching on and I’ve made the decision that BHB “probably” or “possibly” just does not agree with me. One close associate takes 1/2 the recommended dose of HVMN daily and reports no bad effects.

Also I’m fairly certain one senior scientist and friend was taking large amounts of it – and he suddenly died with what initially appeared to be a gastric ulcer that had become perforated or bled out.

Welcome to the uncertainties of N=1. Despite all that, nearing age 70 I still believe the self-directed/small trial age management system -- under my own control -- is better than waiting for the results of others conducting large trials etc.

READ ON for some more clear-cut information and a few successes.

- **Performance enhancing energy drink increased exercise stamina – but with negative effects.** I applied an objective measure of endurance measurement method with “Bang Energy Drink”. During the tests I felt I was doing better and measured performance increased 9%, but it took a toll in that after I felt it was really hard on me, and recovery took a lot longer. Something was wrong and I won’t be testing this again. Awaiting DNAm age test results.

- **Cycling through each of these on separate days:**
  - Day 1) Weightlifting.
  - Day 2) 20 min aerobics including high intensity interval training,
  - Day 3) 18-20 hr partial day fast beginning at about 12:00 pm with 20 min relatively light aerobic movement at around 6 pm on that day.

LevineCramer physiological age was a little higher than last check, but C-reactive protein tested at an all time low at .35.

- **2019 Partial day fasting (16:8) along with Vitamin C 500 mg 2x daily plus vitamin E 200 IU daily for epigenetic maintenance and prevent LDL oxidization, plus fish oil, and occasional multivitamin mental enhancement/brain mix (ginkgo biloba leaf extract, vinpocetine, and huperzine alkaloids).**

A high level epigenetic scientist advised me that vitamin C has positive effects on the epigenome. Another researcher who has devoted considerable time to studying vitamin C advised it prevents LDL from oxidizing, and should be used in combination with vitamin E.

Also I continue hearing about the positive effects of fish oil.

These have been added to my daily nutritional supplements (along with a multivitamin and brain supplement [ginkgo biloba, vinpocetin, huperzine a all alkaloids] about every other day).

- **2019 Dasatinib plus Quercetin**

One light dose 40 mg dasatinib and 400 mg quercetin.
After taking I felt OK, slight headache, maybe just a little wobbly and giddy for part of the day. Slight headache seemed to continue on and off, and I felt kind of “bad”, for a few days. Several other measures of inflammation, aberrant cells and others were inconclusive. An innovative senescent cell test for before and after senolytics therapy that measures gene activity by isolating RNA was developed by scientists at a top research lab. We are awaiting a final report with rejuvenation score. Lead researcher’s comments after preliminary report:

Without too much generalizing the data I think it is safe to say that senescence is much less present in the analyzed samples after treatment, which I think is a nice sign.

But at 14 days after the therapy, DNA methylation age had increased by .7 years, and LevineCramer phenotypic age increased 1.66 years. So maybe the D+Q did age me, but maybe this increase has something to do with artifact or measuring components that were released into the system.

- **2019 Heart Rate Variability (HRV).** Note: Higher HRV is associated with better health, better performance and greater relaxation. Used Elite HRV software and CorSense finger monitor. Followed breathing exercise instructions built into the Elite HRV software. HRV before: 45, after: 61. Repeated a some time later, HRV before: 40, after: 45. Will continue.

- **2019 Reduced LDL** I had allowed dietary “indiscretions” in the form of fatty foods creep in so I greatly reduced foods with fats in them. Over 7 weeks reduced LDL 18.9%, HDL by 2%, total cholesterol 11.6%, VLDL by about 5-8.3%, Total cholesterol/HDL ratio 12% and LDL/HDL ratio 19.7%.

- **2018-2019 High intensity interval training (HIIT)** Although this was not well controlled as data was taken 5 months prior to starting HIIT, not immediately before, I am confident the objective and subjective measures demonstrated positive results. HIIT should be worked up to, and previously as part of my walking 3-4 days a week I have been doing some fast running, but not nearly as intense as HIIT. Zymo DNA showed a reduction of 3.25 yr, and the Levine/Cramer spreadsheet results indicated about the same -- 3.35 reduction in phenotypic age. My subjective feeling is that it feels good and is very producing positive results. Next morning upon waking I definitely feel I had deeper more replenishing sleep. Like a car, sometimes it just feels good to open it up and run it on the autobahn.

Also I got married (but we were together for 10 years and living together for 6 so no big change). And my brother and my cats died so this brought a lot of sadness. Re. the cats though, there’s a lot less hair, dander etc floating around, and I no longer deal with cleaning up litter and breathing the fine particles so there could be a relief on the immune and other systems. Or maybe unfavorable shared microbiome was involved.

*Change was positive and significant, and I attribute it to HIIT although not completely certain.* This can be the case in N=1 human studies. We’re not lab rats in a controlled environment.
- **2018-2019 HMR (Health Management Resources) diet, nutrition and fat loss program through the Univ of California Irvine Weight Management Program**
  I personally didn’t do this, but since it had a positive result it’s worth describing here. Monitored close female associate (age 64) who lost about 1 pound per week for ten weeks.
  Glucose, LDH, LDL Cholesterol went from high out of range to within range.
  Levine/Cramer spreadsheet phenotypic age reduced 2.5 yr. Appearance improved. Persistent cough decreased dramatically.

- **2018 Proprietary anti-inflammatory supplement with novel delivery system.**
  Briefest summary: VERY informal test. Had CRP, IL6, Fibrinogen, TNFa tested. Next day took 1-1/2 teaspoon, retested. CRP, IL6, Fibrinogen decreased significantly. More detail is available, but I expect this is what you would predict. So many therapies to evaluate, so moved on to some others. Planning to ultimately include this as part of my program.

- **2017 Lanasterol, canine eye drops in left eye for cataract**
  Result: It did not remove the cataract. It’s possible that it slowed the progression, but I wanted clear vision so went ahead and had a lens replacement. Replacement worked and I’m happy with it.

- **2017 Umbilical cord plasma – 100 mL**
  Note: no babies are harmed in gathering the umbilical cord.
  Result: Shifts in multiple biomarkers and objective measures to a somewhat more youthful profile.
  Contact me for details.

- **2016 Started utilizing DNA methylation (DNAm) testing.**
  Eight person evaluation of Zymo DNA methylation test.
  Result: This proved to be a valuable measure of biological age and results of therapies. One subject did this before and after GDF-11 and had a positive result with lowered DNAm age.

- **2015 Novel therapy intended to upregulate oxytocin**
  Cultured lactobacillus reuteri 6475 in yogurt. Age 1 cup 2x daily
  Result: Our biomarkers and objective measures were simple and in early development – we only used CBC, CRP and grip strength. At first with CBC and CRP there appeared to be no discernable effect. However recent breakthrough was created consisting of an analytical method to evaluate phenotypic age i.e. apparent biological age, and apparent DNA methylation age, as implied by blood variables from a standard CBC and CRP tests. “Levine/Cramer spreadsheet”. It showed a 4.6 year reduction in phenotypic age.

- **2008 approx. Metformin**
  Result: Assuming positive effects based on research. Minimal side effect, somewhat greater inclination toward dessert foods.

- **2002 The Soy Experiment**
  I had heard that soy was good for you, so I began consuming large amounts of soy, like soy beans, soy milk, tofu. Later hormone panel indicated high, out of range estradiol.
Estradiol is a form of estrogen, a female sex hormone. The negative, and feminizing effects of estradiol unappealing to me so soy consumption was greatly reduced.

- **2001 hGH**
  It may have had some regenerative effects but I did not have access to nor any skill to interpret lab test results and other measures. But there were side effects -- I felt uneasy and sometimes angry.

- **2000 Conservative program with basics of great nutrition with reduced calories, exercise, stress reduction and other common sense approaches.**
  Result: Positive results. Improved lab results, increased sense of well being.

- **1999 Testosterone, megadoses of multiple nutritional supplements and multiple “anti-aging drugs” often from questionable sources.**
  Result: This overly aggressive and naïve program making me sick, even though it was under the supervision of an MD who had a great presentation and who I trusted. The MD later lost his license.

_____________________

**NOT ON MY LIST**
No plan B – it’s do or die.
- Cryonics.
- Upload the mind into a computer. Reasons why this is not such a good idea would take up too much space here. You’re welcome to contact me to discuss, or google “arguments against uploading mind into computer”
  [https://www.google.com/search?q=arguments+against+uploading+mind+into+computer&rlz=1C1CHBF_enUS723US723&oq=arguments+against+uploading+mind+into+computer&aqs=chrome..69i57.9273j0j7&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=arguments+against+uploading+mind+into+computer&rlz=1C1CHBF_enUS723US723&oq=arguments+against+uploading+mind+into+computer&aqs=chrome..69i57.9273j0j7&sourceid=chrome&ie=UTF-8)

OK, maybe transplant the brain into a device or onto a robot body would work. But personally, I’ll take a regular body -- enhanced to withstand disasters like assaults and plane crashes etc.

**Enough visionary, for now working on the MY LIST “here are now” above.**

_____________________

**DEVICES**
**Plan to get:**
Garmin continuous monitor
Dexcon continuous glucose monitor
https://www.dexcom.com

Various HRV software

Precision Xtra ketone meter
Ketone breath strips

**Used/Using:**
Tanita RD-545IM scale – has metabolic age, BMI, basal metabolic rate (BMR), bone mass, muscle quality score, tracking and graphing software (cell phone)

Elite HRV software with CorSense finger sensor.
Note: recently I had some unexpected results which caused me to question the validity of this unit. So I’m more carefully evaluating it, along with several others.
Previously used the Polar H7 sensor strap, finger sensor is much easier.
www.elitehrv.com/corsense

iHeart
Includes pulse oximeter, calculates “internal age” from aortic pulse wave velocity.
Measures bpm (pulse rate), SpO2 (blood oxygen level), AoPWV (aortic pulse wave velocity).
www.concordhealthsupply.com/Heart-Your-Internal-Age-p/75007.htm
www.concordhealthsupply.com/Articles.asp?ID=261

Muse meditation headband
Useful for relaxation and meditation.
https://choosemuse.com

Oura ring
Measurements related to sleep include readiness score, sleep score and nightlong HRV.
https://ouraring.com

Freestyle Libre Continuous Glucose Monitoring

Keto-Mojo Blood Ketone and Glucose Testing Kit
Monitors ketones, glucose, hematocrit, hemoglobin
https://keto-mojo.com/products/ketone-glucose-meter-basic-starter-kit
I was not able to get consistent readings.

What therapies are you planning?
What devices do you know of?
Let me know at JAdams@AgingInterventionFoundation.org
or call (949) 922-9786

Misc. reference
https://www.colorado.edu/today/2018/03/28/pill-staves-aging-its-horizon
PubMedCentral: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5876407/
Published paper: https://www.nature.com/articles/s41467-018-03421-7
PART 3: METRICS
Biomarkers and Objective Measures -- Practical, at a Reasonable Cost

These are biomarkers and objective measures I use. They may vary depending on the therapy. I have found these to be practical and reasonably priced for my own self-directed age management program and for the use of others.

This list is not perfect. I don’t claim to know it all, or even very much. CONTACT ME with your improvements and any corrections.

A rather large, not particularly well organized biomarker list collected over the years is also at www.aginginterventionfoundation.org/1_BiomarkersOfAgingAndHealthMeasures_AllInfo.pdf

In its simplest form, here's our method to evaluate and use therapies:
- Select a therapy we believe will facilitate healthspan and lifespan, and make us biologically younger.
- Select an appropriate set of biomarkers and objective measures -- typically lab tests, and cognitive and physiological tests.
- Do the tests
- Take/do the therapy
- Retest -- look for a shift towards a more youthful profile.

I wish it were always that simple, but that's basically it.

Then combinations and dosages.

Reason for Biomarkers and Objective Measures
*** YOU CAN’T MANAGE WHAT YOU DON’T MEASURE ***
We hope an aging therapy will make us feel younger, but may not subjectively experience the effect of an age management therapy. Biomarkers and objective measures are useful indicators of the end results we seek, and how long we might expect them – or to feel as good as we feel now -- into the future.

We will generally have objective measures done before an aging intervention therapy, and at some time interval after – and are looking for a shift to a more youthful value. Some measures actually render a biological age. Or we might look for lower LDL cholesterol, or decreased inflammation.

List of categories of tests I believe are most important.
May vary depending on therapy.

- Various tests for Safety – these are MOST important. Your qualified physician or medical practitioner can best determine what to measure. Liver, kidney, blood, lipids, cerebrovascular are considered at the top. Many of these may be included in a Chemistry Panel & Complete Blood Count (CBC)
- Chemistry Panel & Complete Blood Count (CBC)
- DNA methylation (DNAm)
- Inflammation
- Spreadsheet for calculating phenotypic age (apparent biological age as implied by blood variables) and other measures from CBC and CRP. Details below.
- Mental / Cognitive
- Physiological – grip strength, measures of stamina etc.
- Subjective / self assessment

Worth consideration, may require expert interpretation:

- Immune
- Endocrine

Others are below

We use a number of tests (but not too great a number) and look for shifts in all or most of them toward a more youthful profile.

DEFINITELY read all the VALUABLE information after this section, and consult with your physician or project investigator to select biomarkers and objective measures that are best for your therapy.

Here’s ONE EXAMPLE -- used for our recent ______ small study. This set can be adapted for many other therapies.

Basic Biomarker Set/Protocol
Biomarker/objective measure plan for our ______ small study
Protocol Number/Identifier: E1
Johnny Adams
JAdams@grg.org
(949) 922-9786

Updated Nov 30, 2019
References:
www.AgingIntervention.org/AgingInterventionProgram.pdf

Some subjects’ tests may vary depending on injuries and other variables.
DNA Methylation Age
Before, and typically approx. 10 days and again at 6 weeks after therapy. Perhaps other dates depending on the situation.
Project lead schedules phlebotomist visits and logistics, and communications with Zymo Research.

Items for members to arrange
ONE SET BEFORE AND OTHERS AT INTERVALS AFTER TO BE DETERMINED

Blood tests through LabCorp either through subjects’ physician and insurance, or through Life Extension.

If your budget permits the Life Extension Age Management Panel would be better:
www.lifeextension.com/INE801E
* Call me if this is going to be done to avoid duplication with some of the tests below.

Chemistry Panel & Complete Blood Count (CBC)

We are working on effective tests for CHRONIC inflammation, but for now using the following which are probably better suited for short-term inflammation.
C Reactive Protein
https://www.lifeextension.com/Vitamins-Supplements/itemLC120766/C-Reactive-Protein-CRP-Cardiac-Blood-Test

Tumor Necrosis Factor alpha (TNF-α)
www.lifeextension.com/Vitamins-Supplements/itemLC140673/Tumor-Necrosis-Factor-Blood-Test

Fibrinogen
http://www.lifeextension.com/Vitamins-Supplements/itemLC001610/Fibrinogen-Activity-Blood-Test

IL-6/IGF-1 LEF: Item# LC375046
http://www.lifeextension.com/Vitamins-Supplements/itemLC375046/IL-6-IGF-1-Blood-Test

Possibly add IL-10

Start of OPTIONAL tests – CANCER AND OTHER MARKERS
We paid attention to these cancer markers and some others because we were working with a therapy that may have some effect, and were following the lead of one provider.
May not be relevant to all therapies.
CEA (Carcinoembryonic Antigen)
https://www.lifeextension.com/Vitamins-Supplements/itemLC002139/Carcinoembryonic-Antigen-CEA-Blood-Test

Carbohydrate antigen 19.9
https://www.lifeextension.com/Vitamins-Supplements/itemLC002261/Carbohydrate-Antigen-199-Blood-Test

PSA
Prostate Specific Antigen (PSA) Free with Total Ratio
https://www.lifeextension.com/Vitamins-Supplements/itemLC480780/Prostate-Specific-Antigen-PSA-Free-with-Total-Ratio-Blood-Test
or
Prostate Specific Antigen (PSA)
https://www.lifeextension.com/Vitamins-Supplements/itemLC010322/Prostate-Specific-Antigen-PSA-Blood-Test

PT/I – bleeding or excessive clotting disorder
https://www.lifeextension.com/Vitamins-Supplements/itemLC020321/PT-PTT-INR-Blood-Test

UA  -- Uric acid. Included in CBC
End of OPTIONAL tests

Also optionally -- exact tests to be determined
Immune
Hormone / Endocrine

Enter CBC and CRP data into Levine/Cramer spreadsheet. Calculate phenotypic age and others.
https://www.AgingInterventionFoundation.org/DNAmPhenoAge_gen_Enhanced.xlsx

Items med tech or administrator (Johnny) arranges
Optional Inflammation
Worth considering: Myriad InflammationMAP is an advanced 45 marker inflammation panel. But since it has very high variability among replicates, and interpretation of many of the markers is specialized, I’m not including it in this study. But you are free to get it done yourself. There is variability so we do replicates (2) – one set before therapy and one set after so total of 4 for each of us. Previous cost: $283 per sample. Myriad does not negotiate a discount for small quantities. Scheduling phlebotomist, dry ice shipping (phlebotomist handles it), purchase order beforehand, sending manifest, and probably reformattting their data reports into a spreadsheet.
https://myriadrbm.com/products-services/humanmap-services/inflammationmap/
Others FYI
www.myriadrbm.com/products-services/humanmap-services

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Physiological
Med tech or administrator (Johnny) meets with subjects to administer under normal, consistent conditions usually at subjects’ locations at around 11:00 am.
**Materials:**
cell phone with HRV software (currently Elite HRV, but evaluating others), and iHeart (calculates “internal age”) but evaluating others
CorSense HRV Sensor
iHeart pulse oximeter sensor
heart rate (bpm), blood oxygen saturation (SpO2)
grip strength meter
Trailmaking B printout
blood pressure meter (Omron 10)
tape measure
scale
Optional - Tanita RD-545 body composition monitor or similar

**Software installed on cell phone:**
Elite HRV software (but evaluating others)
iHeart Finger Sensor -- includes pulse oximeter, calculates “internal age”
Measures bpm (pulse rate), SpO2 (blood oxygen level), AoPWV (aortic pulse wave velocity)

Most efficiently done in the following order

**Measure**
- Height
- Weight
- Waist – tape measure, snug at navel
- Hips – snug at widest part
- Waist/Hip Ratio
- Blood pressure
- Heart rate variability (CorSense finger monitor with EliteHRV software)
- Pulse Oximeter – iHeart, calculates “internal age”

**Mental / Cognitive**
- Trailmaking B
  - Human Benchmark number, verbal, and visual memory, and reaction time. Optional hearing and typing.
  - [https://www.humanbenchmark.com/](https://www.humanbenchmark.com/)

**Back to Physiological tests**
Grip strength
30 Second Chair Stand [https://www.cdc.gov/steadi/pdf/STEADI-Assessment-30Sec-508.pdf](https://www.cdc.gov/steadi/pdf/STEADI-Assessment-30Sec-508.pdf)
Balance and stamina test -- How long can stand on one leg with arms held to the side
Walking speed / gait speed – walking at normal speed, the time it takes to cover 25 ft.
  - Alternate (better): 6 minute walk test
Optional -- Pushups -- Number of pushups can do

**Athletic stamina – subject must be in excellent physical condition**
Count the number of strides a subject can do – going all out -- on an elliptical machine, or the number of revolutions on a stationary bike machine, during 3 20 second bursts.
You may want to adapt it to just one burst, and/or only 10-15 seconds.
Do not pass out and fall off the machine.
You may want to have someone on both sides to spot you.

This can be adapted to a stationary bike machine.

Use the same machine each time.
There can be great variation in resistance, therefore your results may be different on different machines.
Contact me for the complete procedure, or see
**Athletic stamina – subject must be in excellent physical condition**
approx. p 44 in this document.
https://www.aginginterventionfoundation.org/AgingInterventionProgram.pdf

Also consider
**ASSESSMENT & PROGRESS QUIZ**
Kaufmann, Sandra. The Kaufmann Protocol: Why We Age and How to Stop It (p. 319).

That concludes ONE TEST SET EXAMPLE. Continue reading . . .

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There are comprehensive biomarker systems consisting of a great number of tests. With increased complexity, questions and problems can arise, like

- The logistics of doing a large number of tests.
- Costs of a large number of tests. Costs add up.
- Will the phlebotomy lab or mobile phlebotomist be able to handle it?
- What is the published – and real – error of the tests? (I’ve seen 50% error between replicates from an advanced state-of-the-art lab)
  - Will you need to do replicates (2 or 3) or multiple days to get desired accuracy?
- Will the test be available in the future?
- Do you get expert interpretation of the tests?
  - Will interpretation, or the same interpretation, be available in the future?
- Will the test change in the future, making for difficult comparisons? One example is reliance on Illumina chips, which have had upgrades resulting in modifying or upgrading the panel so apples to oranges comparisons.
- Be prepared to have to deal with managing the data.
  - Consider the practicality of sophisticated online systems
- Will data management systems be available in the future?
  - Will costs increase, will the design change, how will that affect interpretation
If you have complex testing, also having standard, simple lab tests done for ongoing comparison over the years might be a good idea.

_______________________

**Usually we use a basic set of tests - but ones that can be specialized depending on the therapy.**

_______________________

**Most tests listed below have a link to one resource (Life Extension) where you can buy the test without a doctor’s order, like this:**

*And one with a link to the LabCorp site where you would get it with a doctor’s order, and insurance may cover:*

_______________________

**Types – from James Kirkland MD PhD presentation at IAGG/GSA conference 2017**
Dosing and pharmacokinetics biomarkers
Pharmacodynamic biomarkers
Mechanism biomarkers
Surrogate endpoint biomarkers

_______________________

**Life Extension (LEF) blood tests – doctor’s order not needed, probably not covered by insurance (but you can try).**
I list them because I have found them easy to use with very good customer support. Others experience varies.

Others:
Empire Labs
HealthLabs https://www.healthlabs.com
WellnessFX www.wellnessfx.com
LabsMD www.labsmd.com
Kiosk Labs www.koslabs.net
Walk In Lab NOTE: I had a problem clicking on this. You may have to type it in your browser.
www.walkinlab.com
Google around for others.

The main lab I most rely on is LabCorp. My circle of associates standardizes on LabCorp. Quest is also top tier. They’re similar, but methods, reference ranges etc. are different and not exactly comparable, so suggest standardizing on LabCorp.
Some categories and a few details

**SAFETY -- By far the most important.**

Like liver, kidney, blood, lipids, cerebrovascular, and others. Chemistry Panel & Complete Blood Count (CBC) covers some of these. Discuss with your doctor.

**Suggested Safety Panel** (Dec 2015) – Yours may differ. Follow your doctor’s recommendations.

**Comprehensive Metabolic Panel (CMP)**

<table>
<thead>
<tr>
<th>Kidney functions</th>
<th>Liver functions</th>
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<tbody>
<tr>
<td>-Albumin</td>
<td>-Alkaline phosphatase (ALP)</td>
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<tr>
<td>-Calcium total</td>
<td>-Alanine Aminotransferase (ALT)</td>
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<tr>
<td>-Chloride</td>
<td>-Aspartate Aminotransferase (AST)</td>
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<tr>
<td>-Carbon dioxide</td>
<td>-Bilirubin total</td>
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<tr>
<td>-Creatinine</td>
<td>-Protein total</td>
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<tr>
<td>-Glucose</td>
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<td>-Potassium</td>
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<td>-Sodium</td>
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**Complete Blood Count (CBC) with Auto Differential WBC**

**Red blood cells (RBC)**

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<tbody>
<tr>
<td>-Hematocrit (HCT)</td>
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<tr>
<td>-Hemoglobin (HGB,Hgb)</td>
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<tr>
<td>-Mean Corpuscular Hemoglobin Concentration (MCHC)</td>
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<tr>
<td>-Mean Corpuscular Hemoglobin (MCH)</td>
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<tr>
<td>-Mean Corpuscular Volume (MCV)</td>
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</table>

| Platelets (PLT)                     |

**White blood cells (WBC)**

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<tbody>
<tr>
<td>-Basophils</td>
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<tr>
<td>-Eosinophils</td>
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<tr>
<td>-Lymphocytes</td>
<td></td>
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<tr>
<td>-Monocytes</td>
<td></td>
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<tr>
<td>-Neutrophils (ANC)</td>
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</tbody>
</table>

**Inflammation**

High sensitivity C-reactive protein (hsCRP)

**Lipid Panel**

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<tbody>
<tr>
<td>-Cholesterol</td>
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</table>
- High density lipoprotein (HDL)
- Low density lipoprotein (LDL)

**Muscle function (damage)**
Creatine Kinase (CK) also known as creatine phosphokinase (CPK)

**Misc**
Hemoglobin A1c (HbA1c) (glycated hemoglobin)

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**Chemistry Panel & Complete Blood Count (CBC)**
A basic test for any therapy


Description from the web site: A comprehensive metabolic panel (CMP) is a blood test that measures your sugar level, electrolyte and fluid balance, plus kidney and liver function. Our CBC/chemistry profile also includes a lipid panel and complete blood count (CBC) so you have the opportunity to detect signs of heart disease, anemia, clotting, and immune disorders, as well as metabolic conditions that could threaten your health.

LEF instructions say
This test may be done fasting (note from Johnny: that’s about 12 hr) or 2-6 hours after eating. Both ways provide valuable information, though 2-6 hours after a meal provides a more realistic assessment of the state of your blood in everyday life. Stay hydrated and take your medications as prescribed.

From LabCorp directly – with doctor’s order, insurance may cover TEST 005009 CPT: 85025 [https://www.labcorp.com/test-menu/23041/complete-blood-count-cbc-with-differential](https://www.labcorp.com/test-menu/23041/complete-blood-count-cbc-with-differential)

Description from the web site: To determine your general health status; to screen for, diagnose, or monitor any one of a variety of diseases and conditions that affect blood cells, such as anemia, infection, inflammation, bleeding disorder or cancer.

**DNA METHYLATION AGE / EPIGENETIC CLOCK**
I rely on Zymo Research.
There’s also Osiris Green, Steve Horvaths lab, Cygenia, MD Anderson, Malav at Nova Southwestern, Willard Freedman’s “Targeted DNA Methylation & Mitochondrial Heteroplasmy Core” at the University of Oklahoma Health Sciences Center

**INFLAMMATION – an effect and cause of aging**
Note: Chronic measures of inflammation are highly important.
As of 11/24/18 CRP, IL-6, TNF-alpha are beginning to be considered somewhat transient measures, and questions raised as to their validity as chronic measures.
Research is being conducted into whether measures like CXCL9 (Chemokine (C-X-C motif) ligand 9) = MIG (Monokine induced by gamma interferon), TRAIL, IFNG (Interferon gamma), EOTAXIN, GROA and some others are better long term measures, and how they can be measured.
Stay tuned.

C-Reactive Protein (CRP) – has been considered the most useful and reliable measure of inflammation
Fibrinogen
RANTES (T-Cell Specific Protein)
TNF-alpha

IL-6 Do IL-6 measurements in the morning as there’s a trough in the morning, peak in the afternoon.
One expert advised: FYI for anyone considering doing an IL-6 test for this purpose it would be best to not do any exercise for 1-2 days prior to taking the test to make the results are more reliable and comparable. This is because IL-6 is a myokine that is released from muscles into the blood circulation in response to exercise so if you exercised not long ago it's possible that IL-6 levels in the blood are still elevated in response to the exercise. I'm not sure how long it is elevated but it would depend on the half-life of IL-6 and the intensity and length of the exercise. 1-2 days of no exercise prior to the test would probably be sufficient for accurate results.

Other advanced
Haptoglobin
IL-10, IL-17, TNF tumor necrosis factor
Cystatin?

Top level inflammation biomarkers: Myriad RBM InflammationMAP
And do complete blood test and metabolic panel
Note: Myriad is state-of-the-art, but some of these can have high variations. Replicates are suggested.
www.myriadrbm.com/products-services/humanmap-services/inflammationmap
Others
www.myriadrbm.com/products-services/humanmap-services

Some “basic” inflammation biomarkers on a budget
C-Reactive Protein
LEF Item# LC120766: https://www.lifeextension.com/Vitamins-Supplements/itemLC120766/C-Reactive-Protein-CRP-Cardiac-Blood-Test

Tumor Necrosis Factor alpha (TNF-α)
LEF LC140673: www.lifeextension.com/Vitamins-Supplements/itemLC140673/Tumor-Necrosis-Factor-Blood-Test

Fibrinogen
LEF LC001610: http://www.lifeextension.com/Vitamins-Supplements/itemLC001610/Fibrinogen-Activity-Blood-Test
Labcorp directly:  Fibrinogen Activity  TEST: 001610  CPT: 85384  
https://www.labcorp.com/test-menu/25316/fibrinogen-activity

IL-6/IGF-1 LEF: Item# LC375046  
http://www.lifeextension.com/Vitamins-Supplements/itemLC375046/IL-6-IGF-1-Blood-Test  
Not available through LabCorp directly(?)

Interleukin 6 (IL-6) LEF Item# LC140916  
http://www.lifeextension.com/Vitamins-Supplements/itemLC140916/Interleukin-6-IL6-Blood-Test  
Labcorp: Interleukin-6, Serum 140916 CPT: 83520  
https://www.labcorp.com/test-menu/29791/interleukin-6-serum

Haptoglobin Special order through Life Extension  
LabCorp direct  Haptoglobin  
TEST: 001628 CPT: 83010  
https://www.labcorp.com/test-menu/26926/haptoglobin

Just found, considering – checking whether the reports have exact values, Myriad InflammationMap has reference range as “<XX”  
Cytokine Panel LCCYT  
www.lifeextension.com/Vitamins-Supplements/itemLCCYT/Cytokine-Panel-Blood-Test


SPREADSHEET FOR CALCULATING PHENOTYPIC AGE (APPARENT BIOLOGICAL AGE AS IMPLIED BY BLOOD VARIABLES) AND OTHER MEASURES.  
A highly useful spreadsheet that uses measures from inexpensive and easy to obtain blood tests to calculate phenotypic age (apparent biological age as implied by blood variables) and other measures.  
You can download it here -- includes some background information and enhancements I put in.  
Download it here:  
https://www.AgingInterventionFoundation.org/DNAmPhenoAge_gen_Enhanced.xlsx

It was developed by John Cramer from a Levine Paper:  

Download the original spreadsheet directly from John’s dropbox  
Note: click the download link on the upper right.  
I suspect there will be upgrades.  
https://www.dropbox.com/s/8wj94be28lt9k7q/DNAmPhenoAge_gen.xls?dl=0

Values:  
LinComb = linear combination of variables times weights that it the final input that generates the mortality scores and ages.  
MortScore = Mortality Score (probability of death in the next ten years)
Ptypic Age = Phenotypic Age, i.e., your apparent biological age as implied by your blood variables.
est. DNAm Age = apparent DNA methylation age
est. D MScore = revised estimate of probability of death in 10 years, based on the estimated DNAm age.

MENTAL / COGNITIVE
Note: Some experts advise some cognitive tests like Trailmaking B and others can be terribly misleading because practice effects will give a “blizzard of false positive results”.
On the other hand, one expert scientist with outstanding experience in human performance testing advised that with loss of cognitive function we lose our ability to learn with practice, so it is valid.

Trailmaking B (and A)
It can be downloaded here (it’s a powerpoint):


* Be aware some of the B tests you can find to download (typically the numbers and letters are in a box) are missing number 13.
After an innovative intervention one scientist had a pronounced improvement in Trailmaking B results. Upon retesting over a period of time (after no treatment) it went back, almost to baseline. Then within an hour after re-treatment a pronounced improvement in Trailmaking B – suggesting it had to do more with signaling than rebuilding neurons.

If any member would be interested in locating a version of the Trailmaking B test that varies the position of the numbers or letters – or a programming whiz would create an online version that places the numbers and letters in random positions – please proceed and keep us informed.

Reaction time, number memory, verbal memory, visual memory
Human Benchmark  www.humanbenchmark.com

New digit-span measurement page that can enable visitors to check the earliest cognitive changes at the very start of the 20-year pathway toward age-associated cognitive decline, MCI and Alzheimer's:
Digitspan Online Measurement www.HealthspanStudy.com/digitspan

Useful: Biomarkers of Alzheimers, see Early Indicators of Alzheimer's Disease
www.maxwellbiosciences.com/articles/research/biomarkers-alzheimers-disease

background on the central importance of digit-span data:

Worth considering
http://www.memtrax.com  $4.99/mo  $48/yr  Try it once for free
Along with these measurement pages, web pages currently used for the 2002-2018 Wild Blueberry Health Study will also be available to participants in the Microbiome SIG.

http://www.blueberrystudy.com

PHYSIOLOGICAL/PERFORMANCE/STAMINA

Basic
- Body weight
- Temperature
- Blood pressure
- Body Mass Index (BMI)
- Heart rate variability
- Grip strength
- Number of stand ups (chair rises) can do -- sit in chair, number of times can stand up and sit down. This is different from the usual 30 sec chair rise test.
- Number of push ups can do
- How long can stand on one leg with arms held to the side (hopefully >20 sec)
- Reaction time www.humanbenchmark.com/tests/reactiontime
- How many times subject can lift a weight from the ground to above head in a circular motion.
- Walking speed / gait speed
  - 4 meters, walking normally, how many meters/sec
  - 400 meters, walking normally, how many meters/sec at 0 and each 100 meter mark (measuring slow down)
  - How much ground you can cover in a minute, or 6 minutes

Cardiac Stress Test / Echo cardiogram

**Athletic stamina – subject must be in excellent physical condition**

Count the number of strides a subject can do – going all out -- on an elliptical machine, or the number of revolutions on a stationary bike machine, during 3 20 second bursts.

You may want to adapt it to just one, and/or only 10-15 seconds.

Do not pass out and fall off the elliptical machine.

You may want to have someone on both sides to spot you.

This can be adapted to a stationary bike machine.

Use the same machine each time.

There can be great variation in resistance, therefore your results may be different on different machines.

Warmup

Set your feet at the back of the pedals, and hold the handles at a comfortable place. Do one stride per second (right leg is one stride, then left is one stride) for five minutes.

Measure seconds on your stopwatch, or cell phone stopwatch.
Stop striding. If you’re using a cell phone clock to timer, set it to alarm after 20 sec. Start the timer or stopwatch, and start striding all-out. Count the number of strides at the end of 20 sec.

At the end you’ll be very tired. Get off the elliptical machine. Write down the number of strides.

Between high intensity intervals:
Set the cell phone to stopwatch so it shows seconds. Walk at a rate of one step per second for whatever time period it takes for you to feel you’re ready for another high intensity interval on the elliptical machine. I just do 5 minutes, but you may be ready at less.

Repeat the above high intensity bursts two more times.

Keep track of your results. Contact me and I’ll send you a spreadsheet to do this. And we can compare notes.

Bike machines – You can adapt the procedure above for elliptical machine.

**Rowing machine** – I have never done this, but it should work.
Concept 2 or other with digital readout. (benefit is that it’s working all muscles)
Ten pulls on the rowing machine -- measure calories (per hour), peak power, maybe watt output or other.
This depends on what machine in that lab is set up to do.

Stair ascending test (SAT)
I have never done this, but heard about it from a high level researcher.
Example: At start of trial and appropriate number of days after therapy (one senolytics test used 21 days). Subjects warm up, rest 5 min, then climb 180 steps at a rate of 2 steps per second. Measure blood pressure before, 10 minutes and 20 minutes post-exercise. Look for reductions in post-exercise blood pressure resulting from therapy.

After warming up with fast walking for 10 min, measure how much ground you can cover in 20 sec on an about a 15-20 degree upward hill.

**Pulse Oximeter**
iHeart -- includes pulse oximeter, calculates “internal age” from aortic pulse wave velocity
Measures bpm (pulse rate), SpO2 (blood oxygen level), AoPWV (aortic pulse wave velocity).
https://goiheart.com/faqs
www.concordhealthsupply.com/iHeart-Your-Internal-Age-p/75007.htm
www.concordhealthsupply.com/Articles.asp?ID=261

**Ketones**
KETO-MOJO Blood Ketone and Glucose Testing Kit
Monitors ketones, glucose, hematocrit, hemoglobin
https://keto-mojo.com/pages/glucose-ketone-index-gki
https://keto-mojo.com/products/ketone-glucose-meter-basic-starter-kit
The next are measures of stamina. Consistency from test to test is important. This may be individualized depending on one’s available equipment, whether a track is available, and inclination.

There’s an element of subjectivity involved, but I suggest you know when you “really want to stop” so for your consideration.

Examples
- Time walking as fast as possible until you *really* want to stop
  (somewhat subjective, but useful and fairly accurate)
and/or
- Time on a treatmill at a fast speed and incline until you *really* want to stop
- **BE CAREFUL NOT TO FALL WITH THIS ONE:** Running on treadmill with 4% incline at 5 mph, how long until you feel a need to grab rails –

Evaluates how old a person looks from uploaded photo. Might be useful but I haven’t evaluated it.

[www.how-old.net](http://www.how-old.net)
Info: [www.lifewire.com/website-that-can-guess-your-age-3486143](http://www.lifewire.com/website-that-can-guess-your-age-3486143)

- Quality of Life self evaluation
  **Daily or Weekly**, rate from -10 to +10.
  0 is neutral, plus or negative numbers indicate better or worse than neutral.
  Overall health
  Peacefulness
  Sharpness
  Energy
  Mood
  Sleep quality
  Aches and pains
  Total for Score
  Weekly
  List anything new, like change to routine, exercise, foods, medicines, supplements etc this week

Worth considering but I don’t do these now
- Variability of blood cells (and mortality)
- Visual contrast sensitivity (eyes and olfactors are extension of the brain)
- FEV1 -- forced air velocity, although this takes a long time to change. (takes long time bef you can see changes)
- Is this energy production?--->Resting Metabolic Rate [www.bodyspec.com/what-is-rmr](http://www.bodyspec.com/what-is-rmr)
- VO2 max testing [www.bodyspec.com/what-is-vo2](http://www.bodyspec.com/what-is-vo2)
- lean body mass, total body fat, visceral adipose tissue, and bone density
  DEXA scan [www.bodyspec.com/what-is-dxa](http://www.bodyspec.com/what-is-dxa) (takes 2 yr bef you can see changes)

Various other assessment batteries are available
H-Scan
InSilico Medicine [www.aging.ai](http://www.aging.ai)  Is this ready for prime time?
[www.aging.ai](http://www.aging.ai)
HRV – Heart Rate Variability
CorSense finger sensor (better than Polar sensor strap)
Software:
EliteHRV software – cell phone, download from Android PlayStore or iPhone App Store

Cystatin C – kidney, and general measure of youthfulness

SENESCENT CELL MEASUREMENT
I worked with some high level scientists at a university lab to develop an innovative senescent cell test for before and after senolytics therapy. It measures gene activity by isolating RNA. It determines the differential expression of a panel of senescence associated genes in human PBMCs (peripheral blood mononuclear cells) before and after administering senolytic drugs. We’re evaluating it now, used it in our small D+Q test. More later.
As of Oct 2018 our group is using this in a senolytics small study.

Here’s a selection of LabCorp tests (available through Life Extension) for a relatively simple and low cost measurement of before and after senolytics results collected by our senior scientist friend Bryant Villaponteau. Note: this was created specifically for his product Senex, and may be useful for other senolytics.

<table>
<thead>
<tr>
<th>Description</th>
<th>Tests For</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Reactive Protein (CRP)</td>
<td>Inflammation</td>
</tr>
<tr>
<td>Carbohydrate antigen 19.9</td>
<td>Aberrant Cells</td>
</tr>
<tr>
<td>Carcinoembryonic antigen</td>
<td>Aberrant Cells</td>
</tr>
<tr>
<td>Fasting Glucose</td>
<td>Energy Metabolism</td>
</tr>
<tr>
<td>Hemoglobin A1C</td>
<td>Glycation</td>
</tr>
<tr>
<td>Interleukin 6 (IL6)</td>
<td>Inflammation</td>
</tr>
<tr>
<td>Insulin-Like Growth Factor 1</td>
<td>Growth &amp; Repair</td>
</tr>
<tr>
<td>Insulin</td>
<td>Energy Metabolism</td>
</tr>
</tbody>
</table>

C-Reactive Protein (CRP)
https://www.lifeextension.com/Vitamins-Supplements/itemLC120766/C-Reactive-Protein-CRP-Cardiac-Blood-Test
Carbohydrate antigen 19.9
www.lifeextension.com/Vitamins-Supplements/itemLC002261/Carbohydrate-Antigen-199-Blood-Test
Carcinoembryonic antigen
www.lifeextension.com/Vitamins-Supplements/itemLC002139/Carcinoembryonic-Antigen-CEA-Blood-Test
Tumor Necrosis Factor-alpha
www.lifeextension.com/Vitamins-Supplements/itemLC140673/Tumor-Necrosis-Factor-Blood-Test
Hemoglobin A1C (HbA1C)
Fasting Glucose AND Insulin (combined in one test)
IMMUNE
My circle of associates and I are seeking immune testing with interpretation from the Advanced sources below.
Note: Trying to be our own immunologist or relying on a physician who is not highly skilled in immunology can be a problem, in that we might miss something as basic as evaluating whether a pneumonia vaccination is needed.

If going to use the Stanford HIMC, then would becoming the patient of a Stanford immunologist be advised?

Advanced
We all need comprehensive testing with expert interpretation, standard for our group.
UCLA Immune Assessment Core is upgrading its panel to include more age related measures, starting with TEMRA, and naïve memory cells or naïve T cells.
www.pathology.ucla.edu/iac
www.pathology.ucla.edu/iac-services

Stanford HIMC http://iti.stanford.edu/himc.html
Stanford Immunological Center
Quantrex
National Jewish Labs www.NJLabs.org
A major initiative is underway to develop markers as a fee for service. Details later.

CD4/CD8 ratio
Senescent T cells
Produce naïve T cell (production)
Primary NK cells
T cells
B cells

Streptococcus pneumoniae Antibody IgG 23 Serotypes lab test
Seems best to evaluate the immune systems ability to mount a defense after a pneumonia inoculation.

IgA, IgG, IgE, IgM
Lymphocyte subset panel 5-quest
CBC with adiff blood, comprehensive metabolic panel

NLR, LMR, PMR
Most of the studies I could find were done on patients with diseases.
I would look forward to hearing from you about your experience using NLR, LMR and PLR. Neutrophil to lymphocyte ratio (NLR) NLR, LMR, PMR and age. See table 2
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6039688/

Individuals aged 18 to 50 years had significantly lower NLR (p=0.019) and PLR (p<0.05) than older individuals aged 51 to 85 years.
For cancer patients this study suggests that the survival advantage is in part due to having a low NLR.
www.nature.com/articles/s41598-018-22425-3

lymphocyte to monocyte ratio (LMR) – Is higher better (unless out of range)? >5 is good

platelet to lymphocyte ratio (PLR)
In this study lower PLR associated with younger subjects (and higher in males then females)

Also mean platelet volume (MPV) – not on LabCorp, but said to be part of standard CBC.

These LEF/LabCorp are useful but not comprehensive.
LC096925 T-Lymphocyte Helper/Suppressor Profile (has CD4, CD8 and ratio)
www.lifeextension.com/Vitamins-Supplements/itemLC096925/T-Lymphocyte-Helper-Suppressor-Profile-Blood-Test
LC505016 Natural Killer Cell Surface Antigen (CD3-CD56+ Marker Analysis)

What else?

HORMONE / ENDOCRINE
hGH
Testosterone
Free T4
Cortisol
TSH
Prolactin
FSH
Leutenizing Hormone
ACTH, Plasma
IGF I, Lc/Ms
Z Score (Male
Others?
LEF/LabCorp Male/Female panels can be useful
http://www.lifeextension.com/Search#q=male%20panel&sort=relevancy&f:hierarchicalcategory=[Products]
http://www.lifeextension.com/Search#q=female%20panel&sort=relevancy&f:hierarchicalcategory=[Products]

SELF ADMINISTERED HEALTH EVALUATIONS
Normally we don’t like subjective measures, but how we feel (even placebo) can be useful – or may even be the most important. “If it’s placebo – I’ll take it!”
Medical Outcomes Study Questionnaire Short Form 36
Health Survey (SF-36)
https://www.brandeis.edu/roybal/docs/SF-36_website_PDF.pdf
https://www.rand.org/health/surveys_tools/mos/36-item-short-form.html

Credit to Rolf Martin for these healthspanstudies@gmail.com
Do it yourself
Daily
Quality of Life rate from -10 to +10
Overall health
Peacefulness
Sharpness
Energy
Mood
Sleep quality
Aches and pains
Score (total of the above, or apply weights to each according to what’s important to you)

Weekly
List anything new, like observations, changes to routine, exercise, foods, medicines, supplements etc this week

www.HealthspanStudy.com/HowAreYouToday
www.HealthspanStudy.com/MyDiary

TELOMERES
www.LifeLength.com
Worth considering, less extensive www.TeloYears.com

The following may be too specialized and expensive:
MICROBIOME – our Microbiome Special Interest Group is researching this
uBiome
Second Genome – mostly for larger scale partnerships
Zymo?
Mapmygut?
AmericanGut www.americangut.org
Others to be determined

**ENERGY PRODUCTION. BIOLOGICAL**
- Sit in chair -- number of times can stand up and sit down
- Resting Metabolic Rate  [www.bodyspec.com/what-is-rmr](http://www.bodyspec.com/what-is-rmr)

- Zymo ATP test??
- Actions similar to pushups and chair stand-ups like: How many times about a 15 lb weight can be lifted from the floor to above the head with arms extended (in a somewhat circular motion)
- Indirect calorimetry
- The Urinary Metabolic Profile, US BioTek
- Mitochondrial energy assay

**DNA DAMAGE**
CONSIDERING 8-hydroxyguanine
[https://www.cellbiolabs.com/8-ohg-rna-damage-elisa](https://www.cellbiolabs.com/8-ohg-rna-damage-elisa) $419
[www.cellbiolabs.com/8-ohg-rna-damage-elisa](http://www.cellbiolabs.com/8-ohg-rna-damage-elisa)

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**Day of the Week to do lab draws**
This developed after conversation with my long time MD friend, recently retired head of pathology and lab.
I do lab tests on Tuesday mornings (or Wed if cannot do Tues)
Later in the week it’s possible the blood will be sitting around over the weekend or lab techs may not be as attentive.
Not Monday because I usually take Sunday completely off and rest, so hormones etc may not be representative of normal – and lab techs are coming off a weekend.

**Time of day**
Mornings, consistently same time. I go in 10:00-10:15 after fasting from 11:00 pm the previous night.

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Different labs use different techniques and different normalization standards for the same tests, so one to one comparisons of the same biomarker will not be accurate.

My circle of associates uses LabCorp

_______________________

Ratios of 2 different biomarkers can be useful.
Neutrophil/Lymphocyte ratio
CD4/CD8 (standard)

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Two professional statisticians recommended doing tests in sets of three and averaging them. If there is an outlier, omitted and average the two.
When you get an unexpected lab measurement, repeat it. Sometimes it’s wrong.

We want parameters that don’t have daily/weekly/monthly/yearly fluctuation. That show changes over a short period of time (like 3 month).

Do tests at the same time of day of the week.

**Lab Tests -- no MD order required**
Life Extension Foundation blood tests
You do not need doctor or prescription -- order through them. It’s done at LabCorp.
They send requisition and list of LabCorp locations near you
They often have sales
800-678-8989

LabsMD
[www.labsmd.com](http://www.labsmd.com)

Kiosk Labs
[www.koslabs.net](http://www.koslabs.net)

Walk In Lab
**NOTE: I had a problem clicking on this. You may have to type it in your browser.**
[www.walkinlab.com](http://www.walkinlab.com)

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Over the counter urine, saliva tests at drug stores, internet like glucose keytone

others only available w/physician prescription

Labs don’t want to be liable for self diagnosis – they could get sued.

Be aware of potential negative consequences of self-diagnosis and independent action
Very Bad Lifestyle: live about 55 - 65 years

Healthy Lifestyle: maybe 75 - 85 years die anyway