Quantified Self
self knowledge through numbers

# Deciphering my new onset "Brain Fog"

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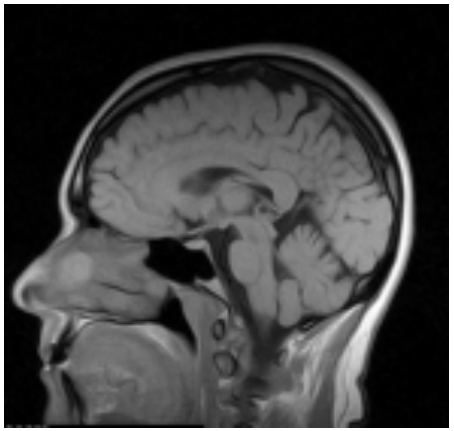
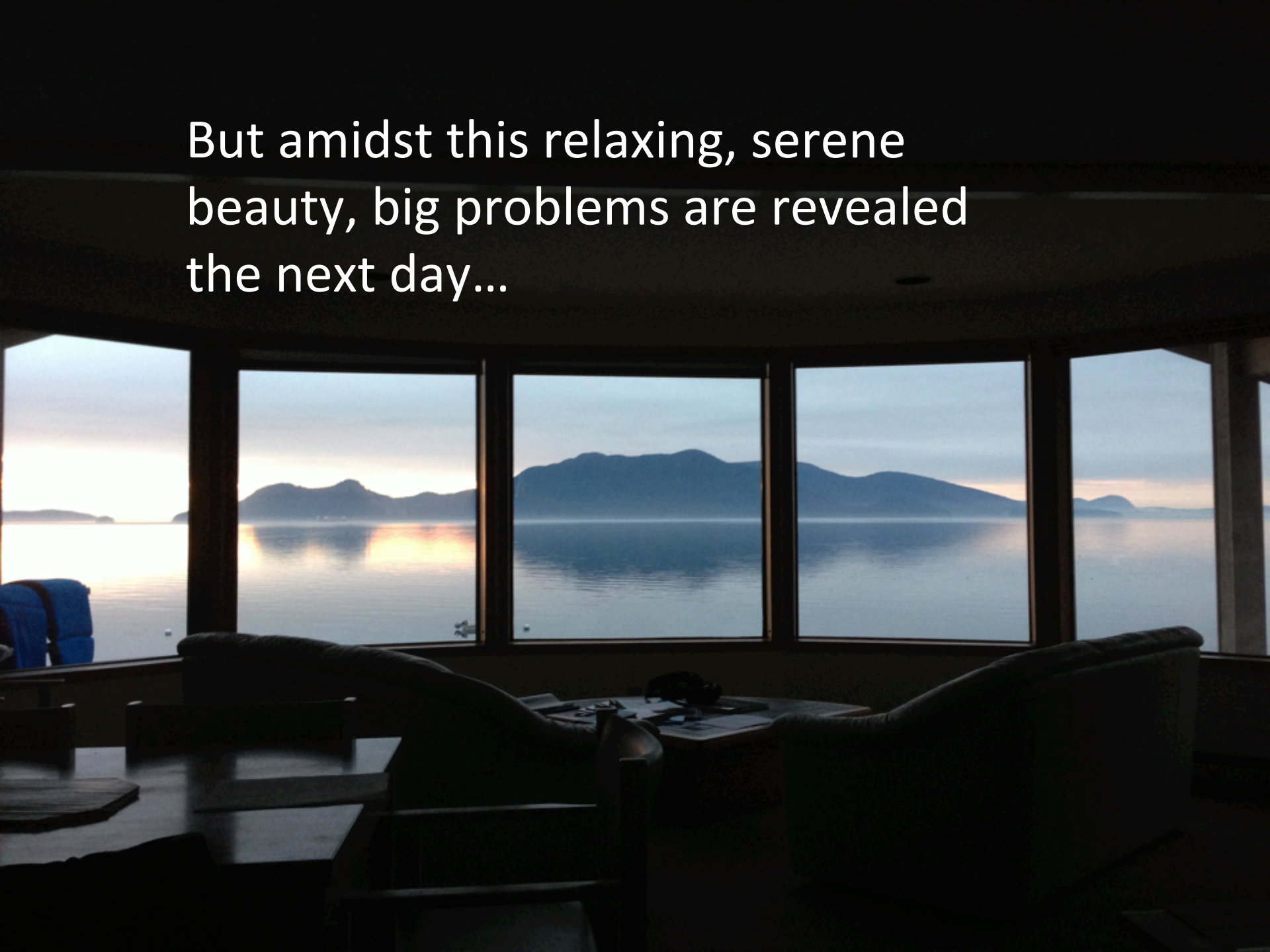


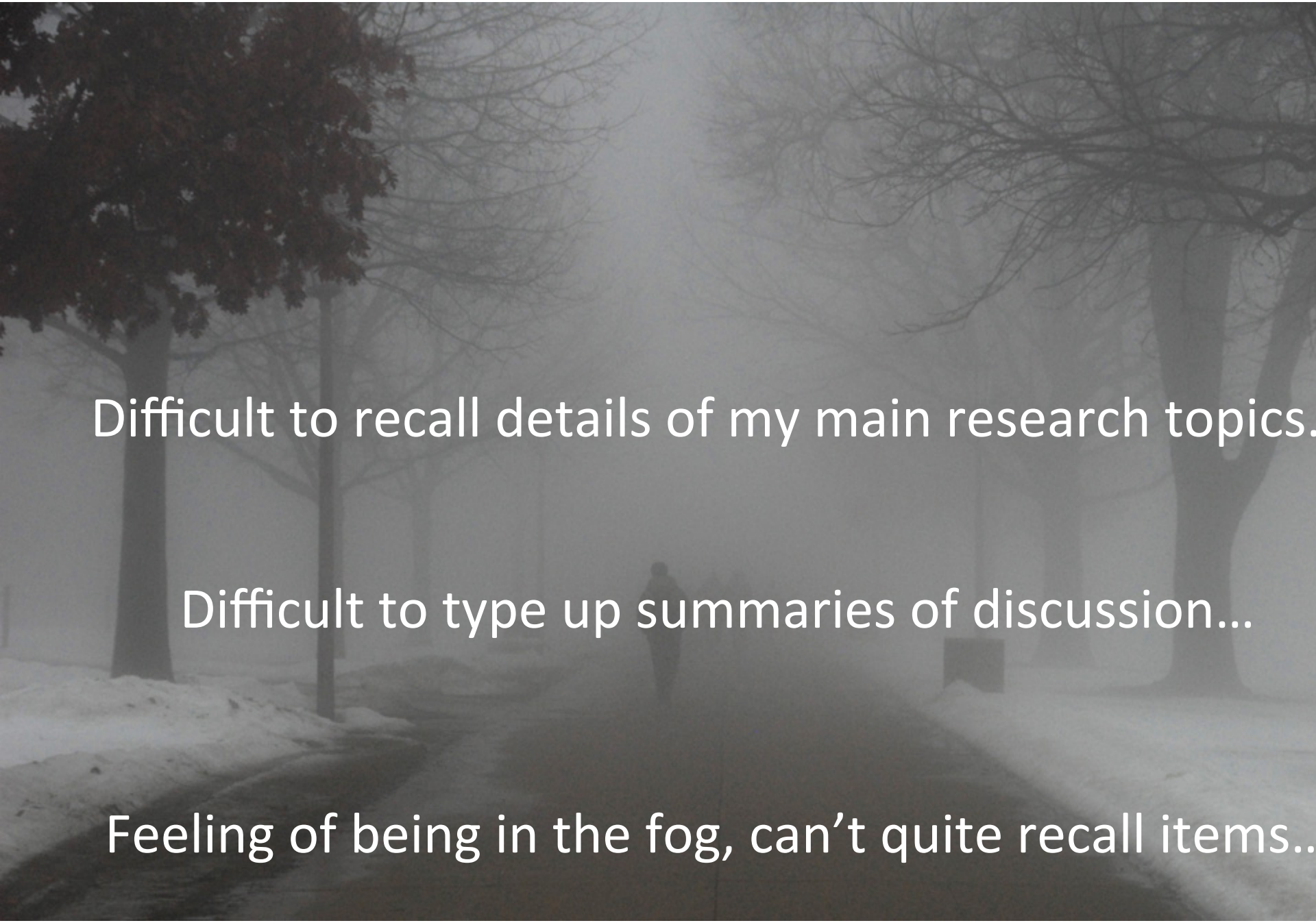
**International Orofacial Neurodiagnostics Research Group**

**IADR Satellite Meeting**

**Orcas Island, WA  March 23 to 26, 2013.**

DRAFT 2 Schedule of events


But amidst this relaxing, serene beauty, big problems are revealed the next day…


Difficult to recall details of my main research topics.
Difficult to type up summaries of discussion…
Feeling of being in the fog, can’t quite recall items..

Just before this research retreat, I decide to have a general medical physical plus a cardiology reevaluation… So,

I visit my primary care MD

I visit my cardiologist

They tell me…

*You're Healthy Mark – You're a triathlete!*

I may not have obvious disease,

so I start tracking blood biomarkers

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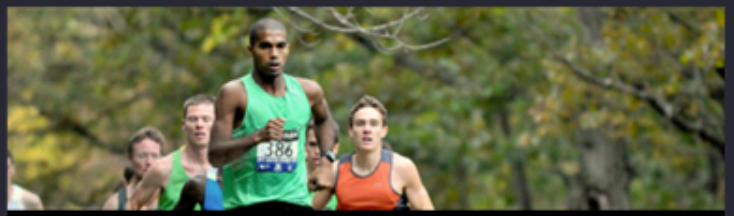


"...an essential tool...."
Ruben Sanca, All-American Distance Runner

# You can't manage what you don't measure

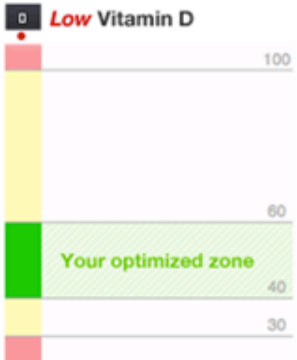
View Live Demo

or purchase a plan ▸

Read about us: WIRED SHAPE POPS

## How does InsideTracker work?

**1 FIND YOUR BASELINE**
by getting your blood tested




**2 OPTIMIZE YOUR BIOMARKERS**
using our recommendations

**3 SEE YOUR PROGRESS**
as you improve over time

## Benefits

Optimize **Mood**

Boost **Energy**

Improve **Sleep**

Raise **Metabolism**

Enhance **Performance**

**Performance -** Optimize healthy living, improve athletic performance, and reduce injury.

LDL TOO HIGH

VIT D TOO LOW

| BIOMARKERS | | FITNESS | PERFORMANCE |
|---|---|---|---|
| **Energy and Metabolism** | Glucose | ● | ● |
| | Cholesterol | ● | ● |
| | LDL | ● | ● |
| | HDL | ● | ● |
| | Triglycerides | ● | ● |
| **Bone and Muscle Health** | Calcium | ● | ● |
| | Vitamin D | ● | ● |
| **Strength and Endurance** | Hemoglobin | ● | ● |
| | Ferritin | ● | ● |
| | Creatine Kinase | ● | ● |
| | Testosterone | – | ● |
| **Brain and Body** | Magnesium | ● | ● |
| | Folic Acid | ● | ● |
| | Vitamin B12 | – | ● |
| **Minerals** | Potassium | – | ● |
| | Sodium | – | ● |
| | Zinc | – | ● |
| | Chromium | – | ● |
| **Inflammation** | C-reactive Protein | – | ● |
| | White Blood Cell Count | – | ● |
| **Availability*** | | US | **US** |
| **COST** | | $149 | **$299** |
| | | Order Fitness | Order Performance |

# Nutrition Recommendations

**Foods that will help with**

- [ ] Ferritin
- [ ] Calcium
- [ ] Glucose
- [ ] Magnesium
- [ ] Creatine kinase
- [ ] Vitamin B12
- [ ] Folic acid
- [ ] Vitamin D
- [ ] Total cholesterol
- [ ] Hemoglobin
- [ ] HDL
- [x] LDL
- [ ] Triglycerides
- [ ] Testosterone
- [ ] Potassium
- [ ] Sodium
- [ ] Zinc
- [ ] Chromium
- [ ] White blood cells
- [ ] C-Reactive Protein

## Eat more...

*Congratulations, you have healthy levels of LDL cholesterol. To maintain your heart health, eat lean protein, soluble fiber, antioxidants, and healthy fats.*

### oatmeal

▲ Raises levels of:

▼ Lowers levels of:

Oatmeal is an excellent source of soluble fiber, which lowers cholesterol. Add fruit for more fiber.

### trout

▲ Raises levels of:

▼ Lowers levels of:

Lake, or rainbow, trout is an excellent source of omega-3 fatty acids.

### bran cereal

▲ Raises levels of:

▼ Lowers levels of:

Soluble fiber, such as bran, helps to reduce blood cholesterol.

### almonds

▲ Raises levels of:

▼ Lowers levels of:

Almonds are especially high in polyunsaturated fats that lower cholesterol.

### pistachio nuts

▲ Raises levels of:

▼ Lowers levels of:

Animal products are high in dietary cholesterol, and can lead to increases in LDL. Choose nuts instead, which help decrease LDL and increase HDL.

### walnuts

▲ Raises levels of:

▼ Lowers levels of:

Walnuts are an especially good source of polyunsaturated fats that reduce blood cholesterol.

### flaxseed

▲ Raises levels of:

▼ Lowers levels of:

Flaxseed provides fiber and omega-3s that lower blood cholesterol. Consume ground flaxseed for maximal health benefits.

### olive oil

▼ Lowers levels of:

Monounsaturated fatty acids in olive oil help lower LDL and raise HDL levels. Use in place of butter, shortening, and margarine.

### herring

▲ Raises levels of:

▼ Lowers levels of:

### tuna

▲ Raises levels of:

▼ Lowers levels of:

### salmon

▲ Raises levels of:

▼ Lowers levels of:

### peanuts

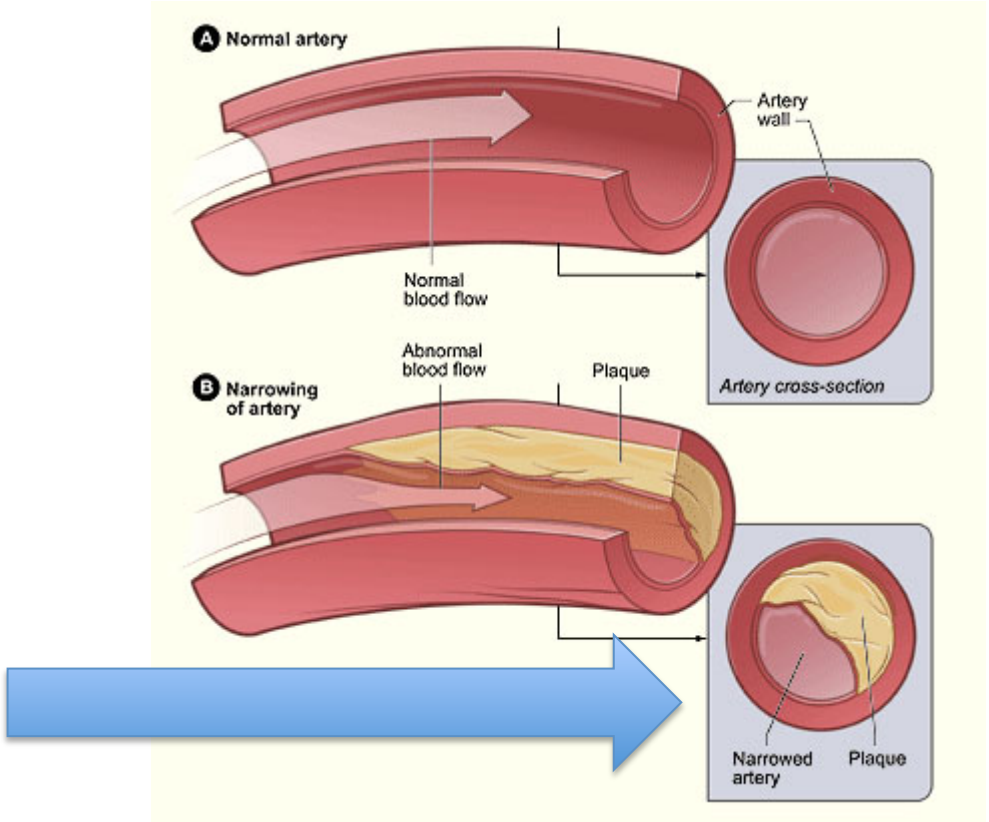
▲ Raises levels of:

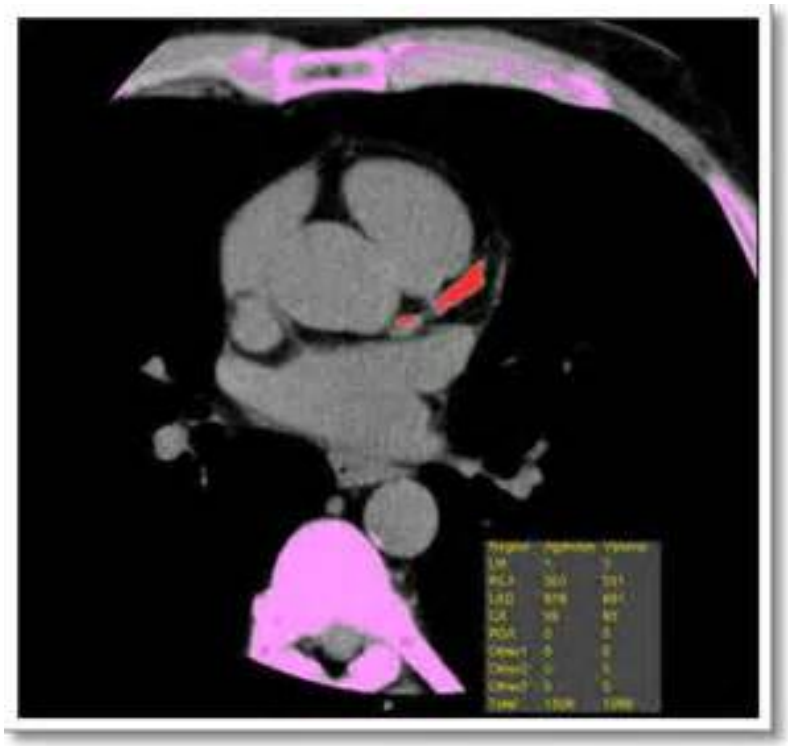
▼ Lowers levels of:

**Meal/Diet Preferences**

- [ ] Vegetarian
- [ ] Vegan
- [ ] Raw Vegan
- [ ] Paleo
- [ ] Paleo for Athletes
- [ ] Nut free
- [ ] Gluten free
- [ ] Dairy free
- [ ] Beef free
- [ ] Pork free
- [ ] Shellfish free
- [ ] Fish free
- [ ] Ready to eat
- [ ] Minimal Preparation

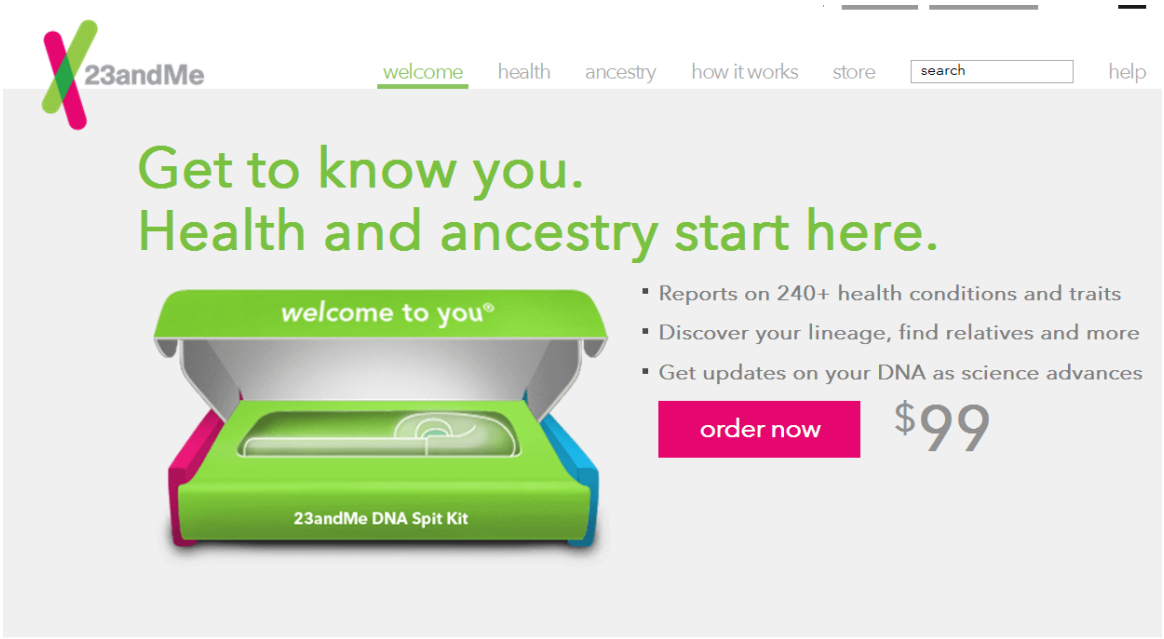
# I order optional coronary calcium scan



*…marked calcification and narrowing in main coronary artery*

"You have moderate heart disease"




# I order newest genetic tests

# APOE-4 gene

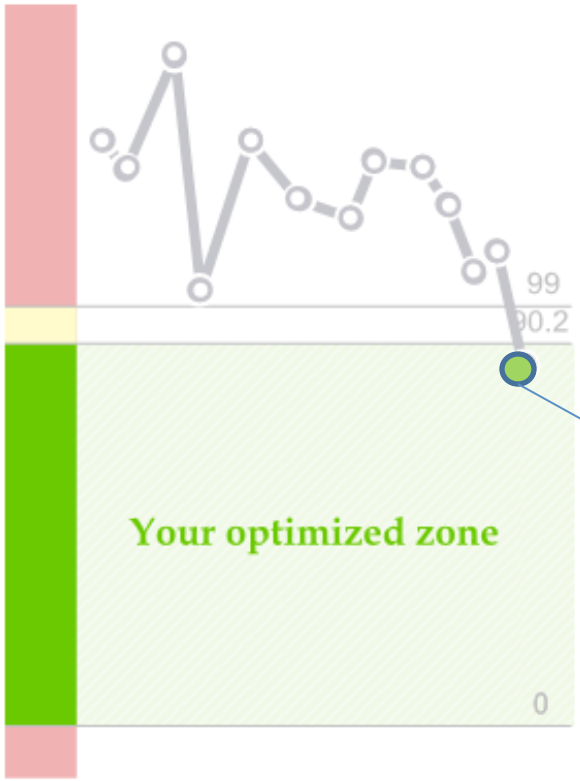
- Only ~12% of Americans have gene
- Increases risk of Alzheimer's by 3 to 4 x with 1 copy
- Increases risk of Alzheimer's by 30 to 40 x with 2 copies!
- Creates BIG defects in ability to process saturated fat
- Increases risk for heart disease

# Adopt low saturated fat diet

- Much more fruits and vegetables, nuts
- Stopped eating all cheese, butter, high sat. fat
- Stopped eating red meat, increased salmon
- Substitute soy milk for regular milk
- About 20+ other changes

RESULTS | ANALYSIS

LDL




## LDL

Low-density lipoproteins (LDL) carry cholesterol throughout your body, delivering it to different organs and tissues. LDL is often referred to as "bad" cholesterol because deposits of excess LDL, called plaques, may narrow blood vessels and constrict blood flow. Optimal levels of LDL correlate with increased energy, improved metabolism, and better heart health.

85 !!

56 days after low fat diet

# Email MD Neurologist friend – why memory problems in male in his mid-late 50's?

1. *Depression [not present]*
2. *Medication side effects [not present]*
3. *Overly concerned about common or usual memory problems [no – real problems]*

I tell my primary MD about my memory problems a few months later – they are not going away

Referral to neuropsychologist

4 hours of neuropsychological tests on December 26, 2013

# Neuropsych Test Example: Verbal Fluency Tests

*"Name as many words as you can starting with the letter "F"*

…can't name many… only 9 words in 60 secs

…I realize that something is really wrong.

TEST RESULTS:

| TEST | Raw Score | Standardized Score | Qualitative Description |
|---|---|---|---|
| **Intellectual Functioning** | | | |
| WASI-II | | eFSIQ=126 | Superior |
| **Premorbid Estimate** | | | |
| WTAR | | eFSIQ=123 | Superior |
| **General** | | | |
| Montreal MOCA | 26/30 | | Borderline |
| **Memory** | | | |
| AVLT-Learn Total (5 trials) | 46/75 | z score=-0.2 | Average |
| AVLT Delayed Recall | 13/15 | z score=0.97 | High Average |
| AVLT Recognition | 15/15 | z score=0.79 | High Average |
| WMS-IV Logical Memory I | 25/50 | Scale Score=10 | Average |
| WMS-IV Logical Memory II | 25/50 | Scale Score=12 | High Average |
| WMS-IV Logical Memory Recognition | 26/30 | | WNL |
| WMS-IV Verbal Pairs I | 45/56 | Scale Score=14 | Superior |
| WMS-IV Verbal Pairs II | 13/14 | Scale Score=14 | Superior |
| WMS-IV VP Recognition | 39/40 | | WNL |
| WMS-IV Designs I | 64/120 | Scale Score=10 | Average |
| WMS-IV Designs II | 60/120 | Scale Score=12 | High Average |
| WMS-IV Designs Recognition | 17/24 | | WNL |
| WMS-IV Visual Reproduction I | 37/43 | Scale Score=11 | Average |
| WMS-IV Visual Reproduction II | 27/43 | Scale Score=11 | Average |
| WMS-IV VR Recognition | 7/7 | | WNL |

| | | | |
|---|---|---|---|
| WMS-IV VR Recognition | 7/7 | | WNL |
| Rey-O Figure 3' Recall | 25/36 | T score=65 | Superior |
| Rey-O Figure 30' Recall | 26/36 | T score=68 | Superior |
| **Language and Language Related** | | | |
| Token Test | 41/44 | | WNL |
| Phonemic Fluency (FAS) | 27 in 3 min | T score=33 | Mildly Impaired |
| Semantic Fluency (Animals) | 17 in 1 min | T score=39 | Low Average |
| Boston Naming Test | 57/60 | T score=43 | Average |
| **Visuospatial** | | | |
| Rey-O Complex Figure | 36/36 | | WNL |
| WMS-IV Visual Reproduction-Copy | 43/43 | | WNL |
| **Attention, Processing Speed, and Executive Functioning** | | | |
| Trails A | 47seconds | T score=30 | Mildly Impaired |
| Trails B | 79seconds | T score=40 | Low Average |
| Phonemic Fluency (FAS) | 27in 3 min | T score=33 | Mildly Impaired |
| Semantic Fluency (Animals) | 17in 1 min | T score=39 | Low Average |
| Stroop (Golden) Word trial | 102in 45 sec | T score=42 | Low Average |
| Stroop (Golden) Color trial | 63in 45 sec | T score=35 | Mildly Impaired |
| Stroop (Golden) Color-Word trial | 41in 45 sec | T score=45 | Average |
| **Psychosocial** | | | |
| PHQ-9 | 0 | | WNL |

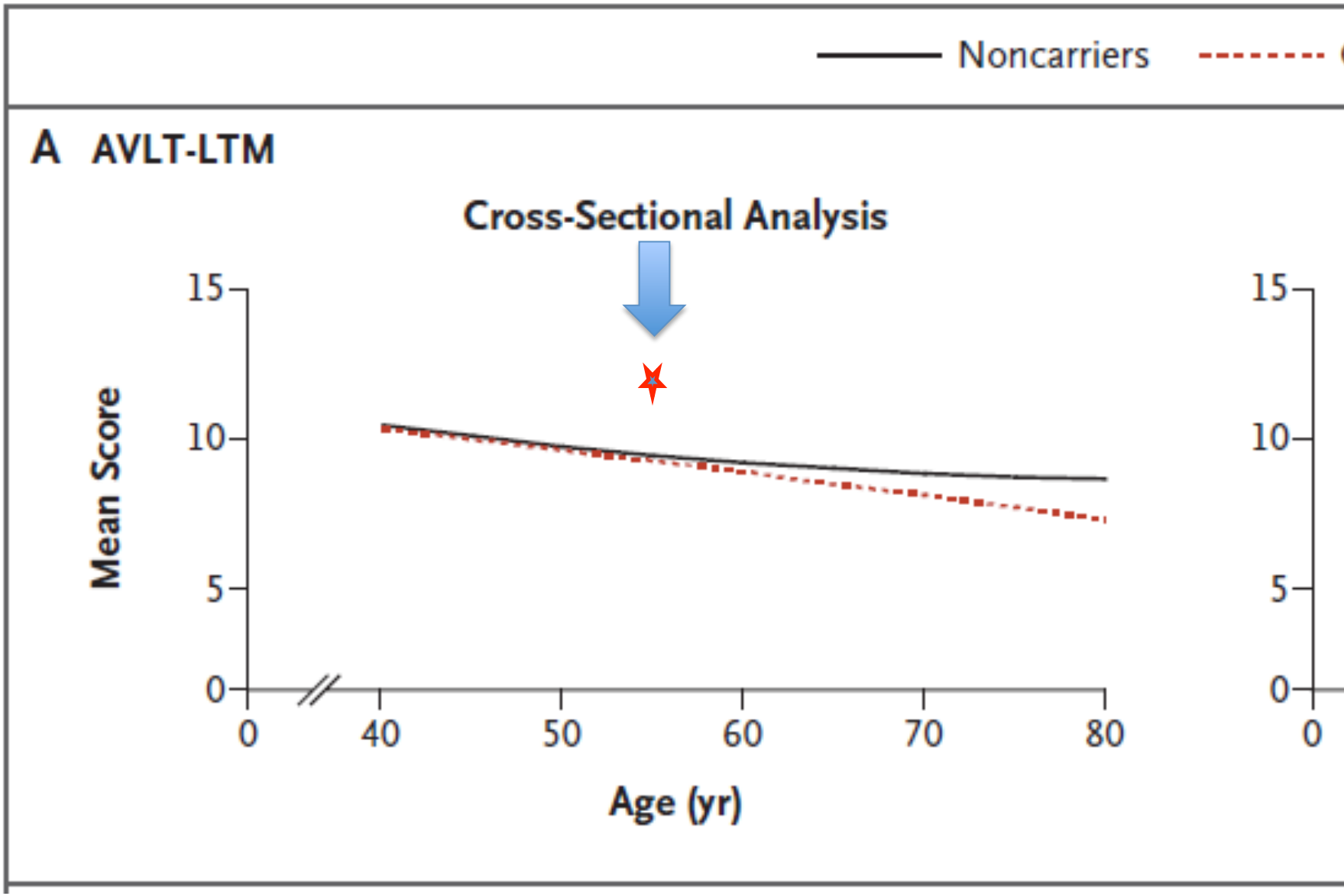
“you likely have early subcortical white matter dysfunction”

“you don’t have encoding deficits as in Alzheimer's”

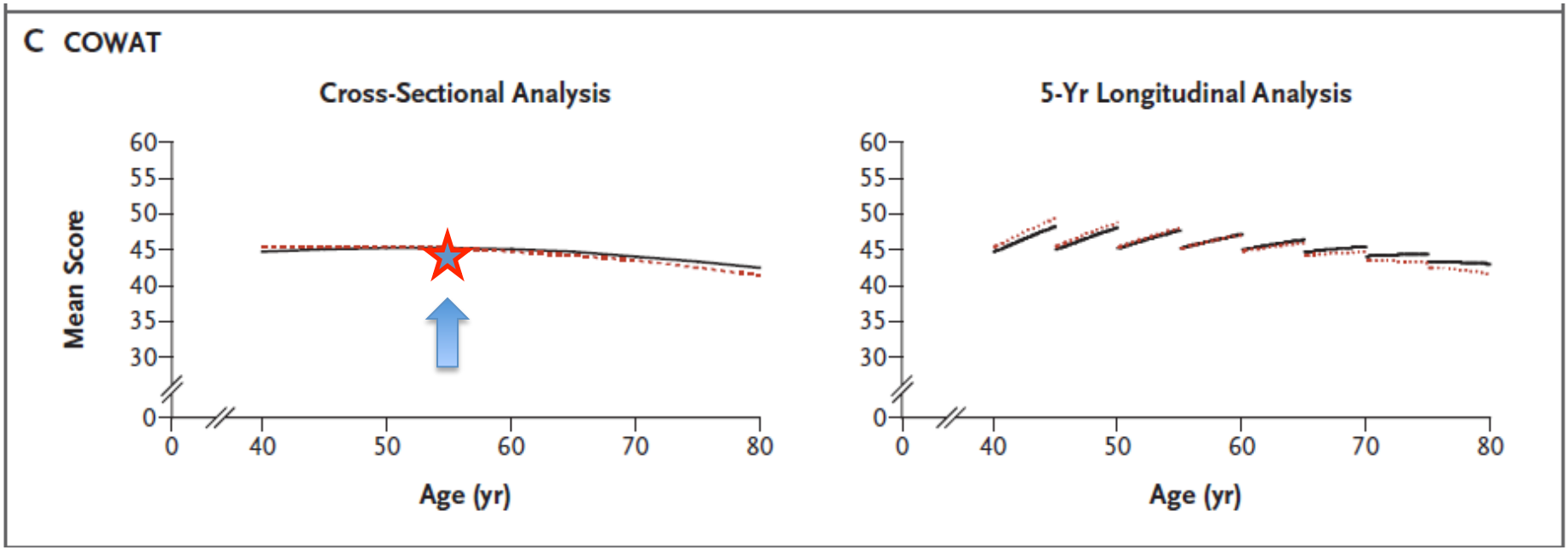
Bottom line: Atherosclerosis of the small vessels in your brain

General Effect is to slow transmission and recall of stored information in the brain.

# Long term memory recall

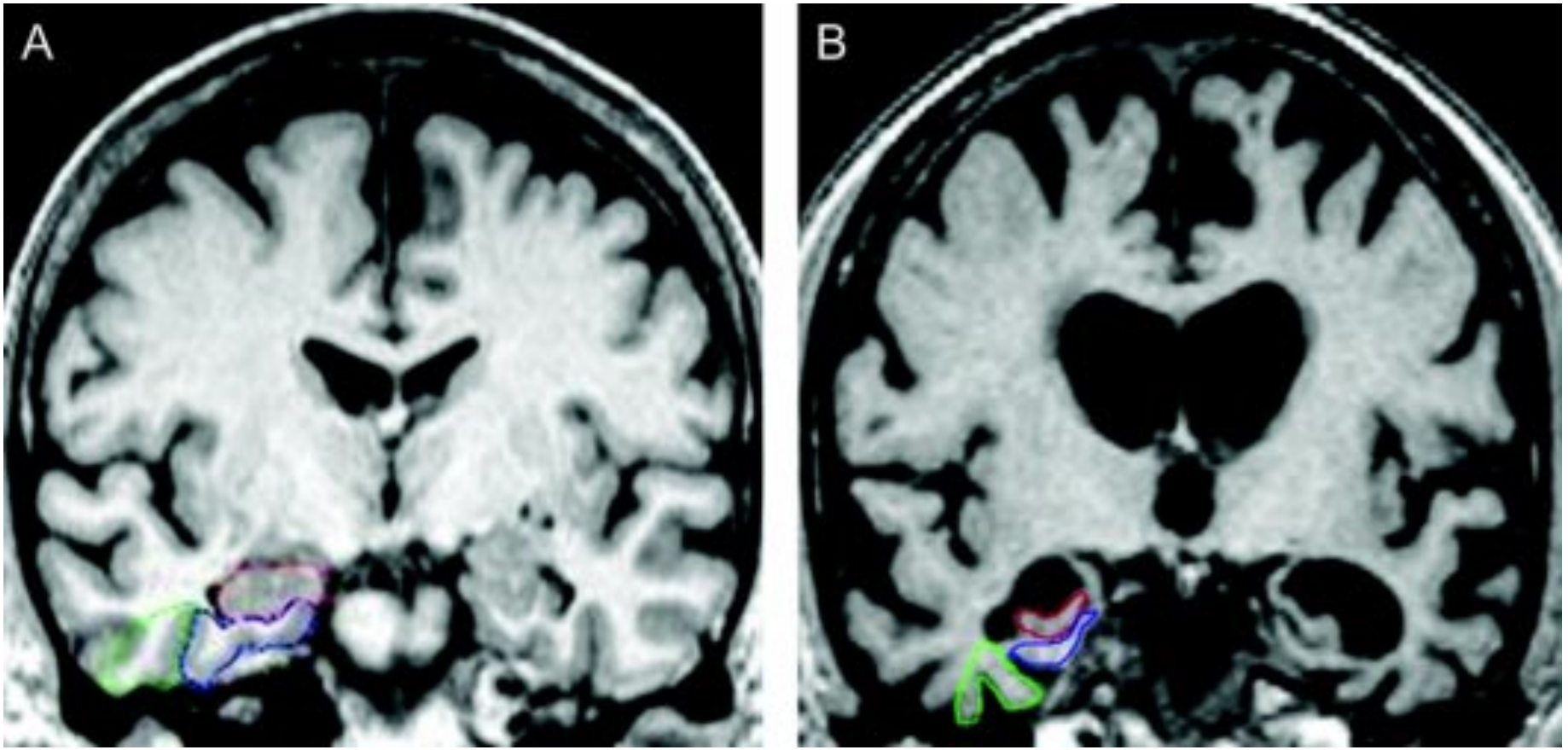


# Language fluency – F, A, S naming




*Memory is fine, but word retrieval is mildly impaired*

MRI of Brain is done next…

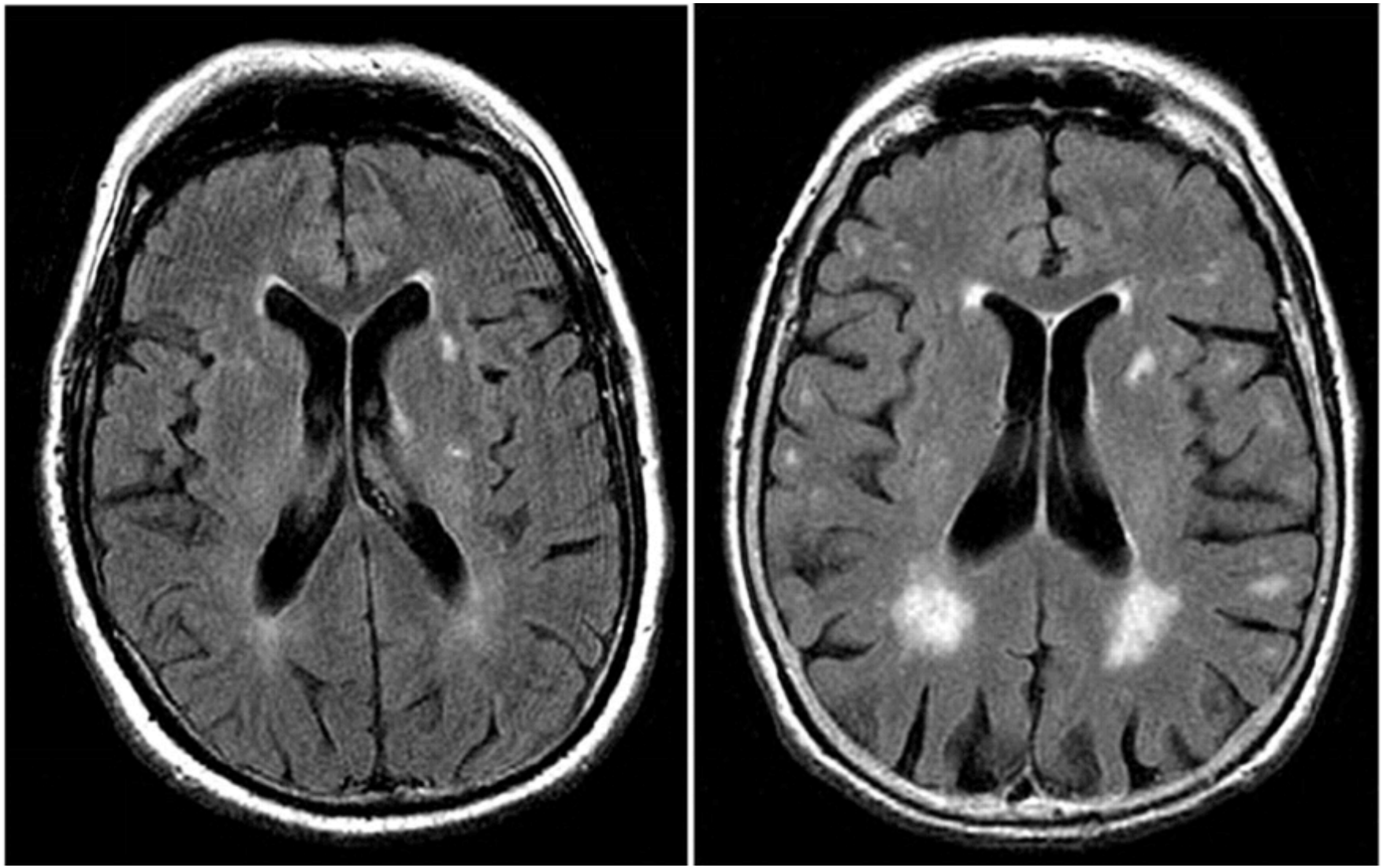



Normal

Alzheimer's Disease

Hyperintensities

White matter dysfunction



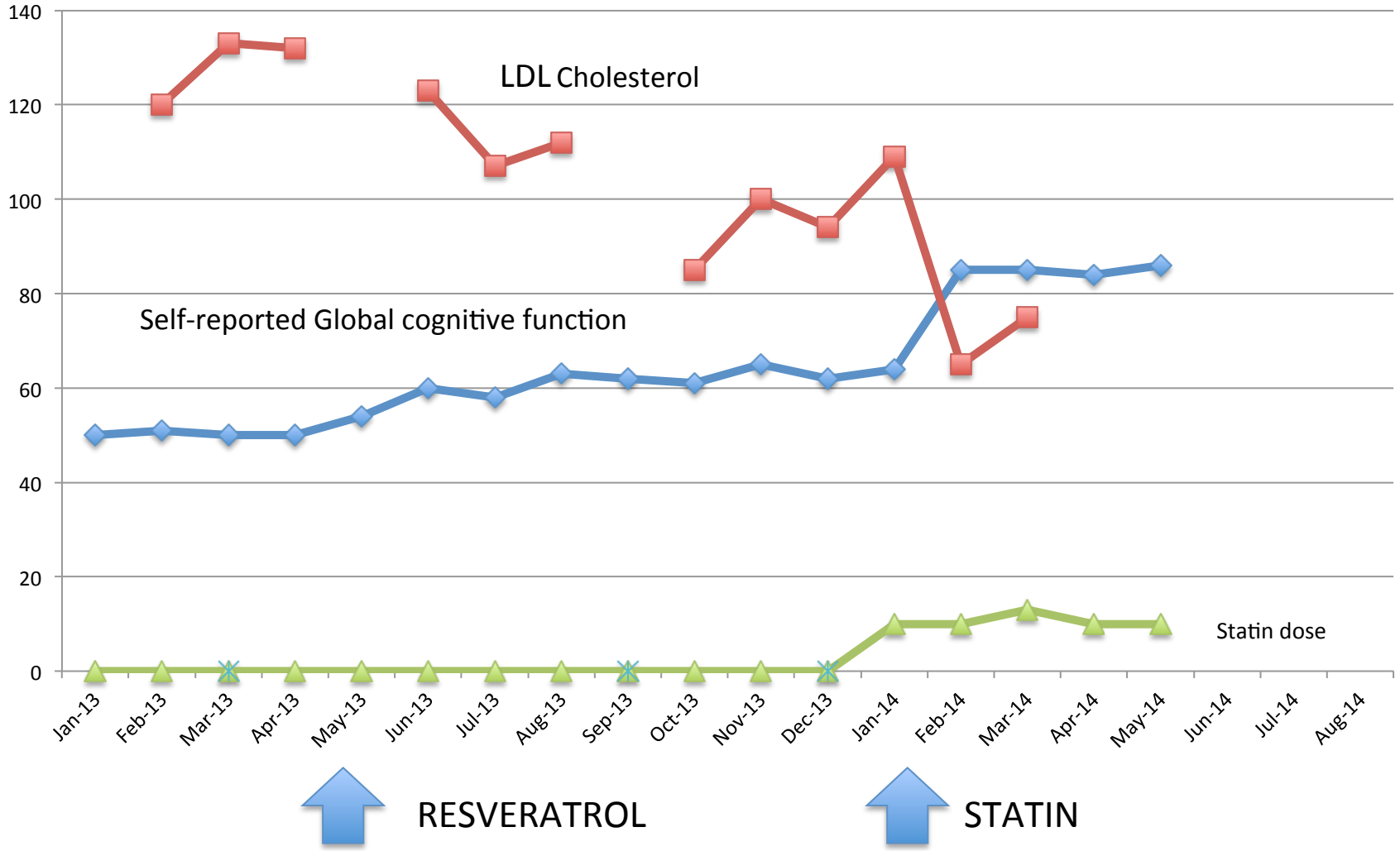
But *MY* MRI is normal – huge relief

# Search for all available scientific data on how to treat white matter dysfunction

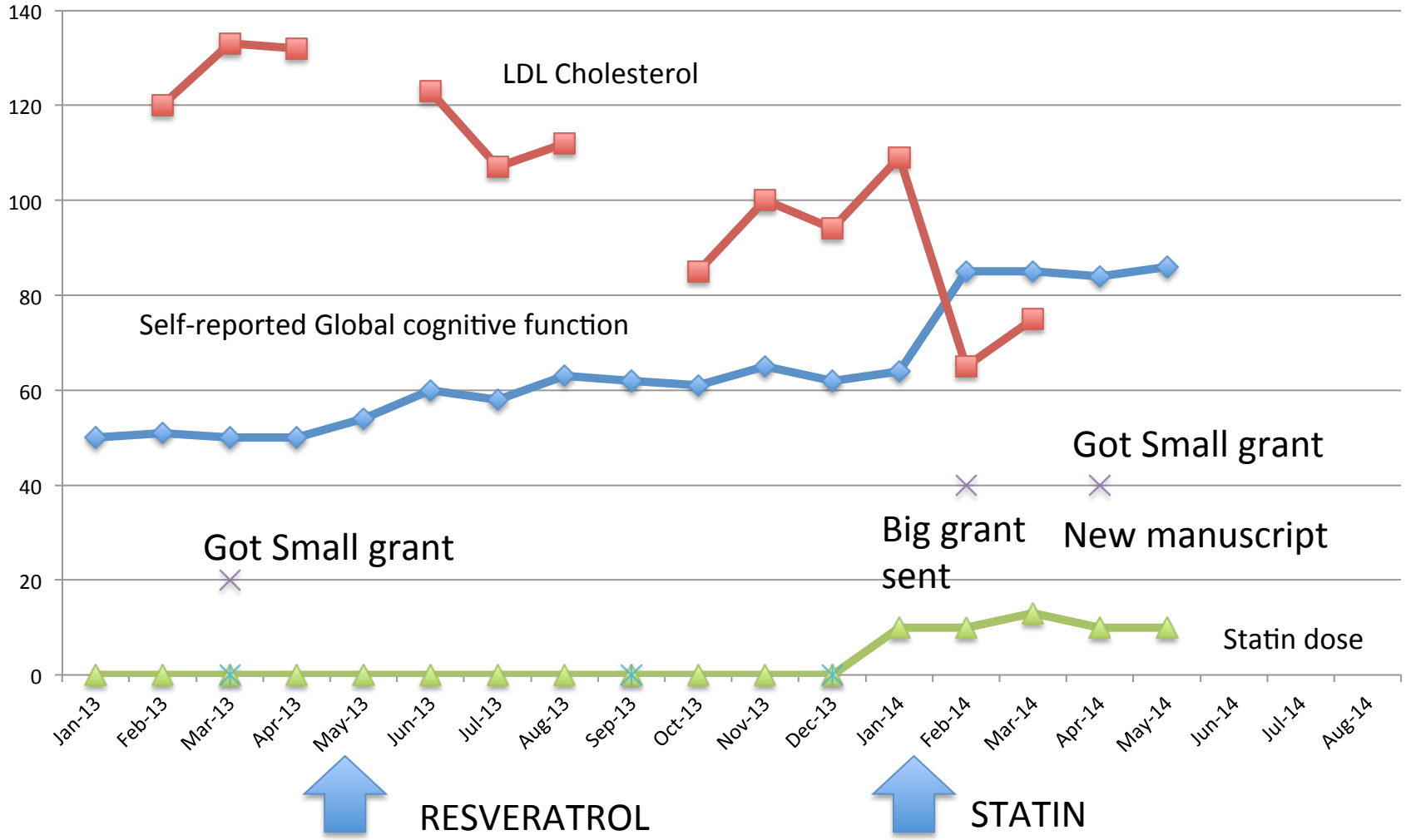
- Not much…some on resveratrol, statins…

- Since not much data, and IT IS atherosclerosis, try to reverse like atherosclerosis (Dr. Ornish Plan):
  - Moderate exercise
  - Low saturated fat diet
  - Relaxation/Stress reduction
  - Consider statin

# Self-reported global cognitive function vs. LDL and statin



# Self-reported global cognitive function vs. LDL and statin + key work



# Other variables affecting neurocognitive (thinking) considered

- Mood – depression/anxiety - normal
- Body weight & percent lean/fat mass - optimized
- Physical activity – steps, training stress score
- Physical fitness – bike power, run pace
- Daily Blood pressure - slightly elevated & labile

# Summary of main effects

- Resveratrol seemed to sl. help earlier in year…
- Start statin med. on January 15 for heart disease-
  - I am told it may cause memory problems
- 15 days later, everything at work starts to feel easier. MUCH easier. Same Neurocog tests later show improvement.
- 4 weeks later, LDL Cholesterol has dropped a lot – from 109 to 65!
- Scientific work output increases. Statin has likely helped.

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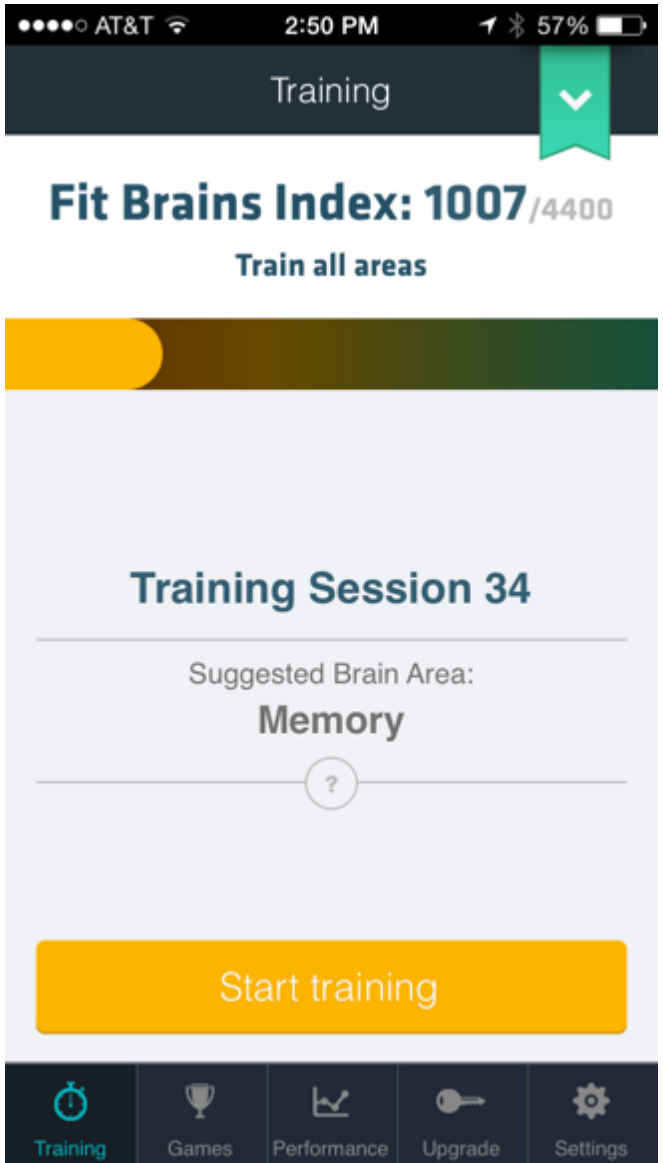
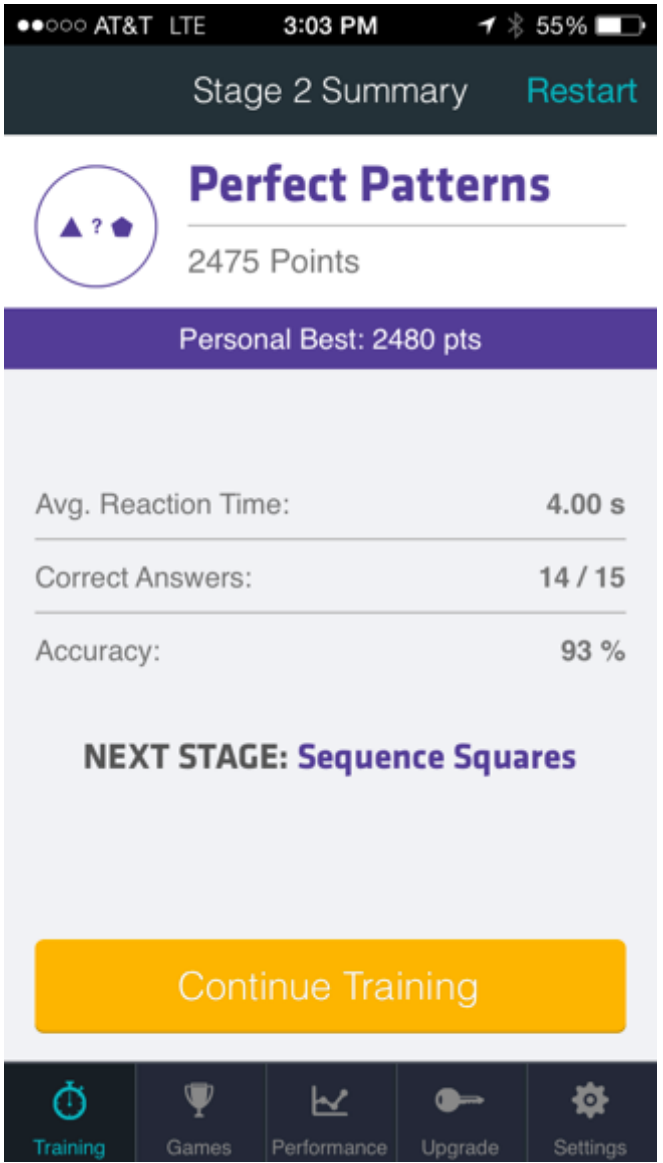
# Extra slides

# Fit Brain App



# Mild executive functioning impairment:

- 
- #3 – may complain of increased fatigue from the extra effort required to organize, plan and make decisions.