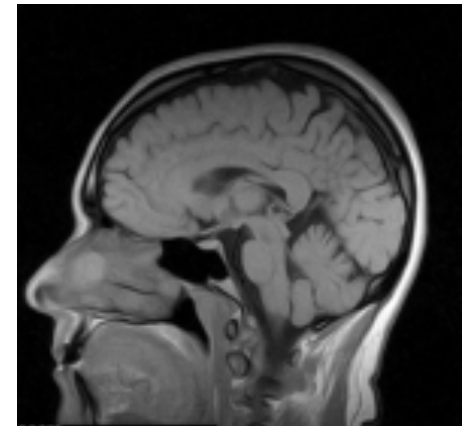# Deciphering my new onset "Brain Fog"

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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,
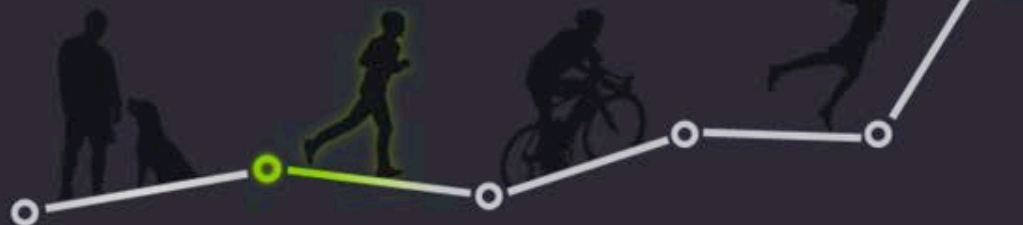
so I start tracking blood biomarkers

"...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?

Benefits

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

Low Vitamin D

NUTRITION RECOMMENDATION

Optimized Vitamin D

Optimize
Mood

100

100

Boost
Energy

LIFESTYLE RECOMMENDATION

Improve
Sleep

Your optimized zone

60

Your optimized zone

60

Raise
Metabolism

40

42 ng/mL

40

Enhance
Performance

SUPPLEMENT RECOMMENDATION

30

30

Fitness - Assess your overall fitness and well-being by measuring key biomarkers for essential systems.
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

- ○ **Fer** Ferritin
- ○ **Ca** Calcium
- ○ **Glu** Glucose
- ○ **Mg** Magnesium
- ○ **CK** Creatine kinase
- ○ **B12** Vitamin B12
- ○ **Fol** Folic acid
- ○ **D** Vitamin D
- ○ **Chol** Total cholesterol
- ○ **Hb** Hemoglobin
- ○ **HDL** HDL
- ⦿ **LDL** LDL
- ○ **Tg** Triglycerides
- ○ **Tes** Testosterone
- ○ **K** Potassium
- ○ **Na** Sodium
- ○ **Zn** Zinc
- ○ **Cr** Chromium
- ○ **WBC** White blood cells
- ○ **CRP** 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:
Fer | Hb | Mg | Cr | Tes
▼ Lowers levels of:
Chol | LDL | WBC | CRP | Tg

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

trout
▲ Raises levels of:
B12
▼ Lowers levels of:
Chol | CK | LDL | Tg | Na

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

bran cereal
▲ Raises levels of:
B12 | Mg | Cr
▼ Lowers levels of:
Chol | LDL | Glu | Cor

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

almonds
▲ Raises levels of:
Ca | Mg | K | Tes | HDL
▼ Lowers levels of:
Chol | LDL | WBC | CRP | Tg

Almonds are especially high in polyunsaturated fats that lower cholesterol.

pistachio nuts
▲ Raises levels of:
K
▼ Lowers levels of:
LDL

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:
Cr | HDL
▼ Lowers levels of:
Chol | LDL | WBC | CRP | Tg

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

flaxseed
▲ Raises levels of:
Ca | Mg | Tes | HDL
▼ Lowers levels of:
Chol | LDL | WBC | CRP | Tg

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

olive oil
▼ Lowers levels of:
Chol | LDL | WBC | CRP | B12

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:
B12 | Ca | D | Tes
▼ Lowers levels of:

tuna
▲ Raises levels of:
B12 | D | K | Tes | HDL
▼ Lowers levels of:

salmon
▲ Raises levels of:
B12 | D | K | Tes | HDL
▼ Lowers levels of:

peanuts
▲ Raises levels of:
Fol | Mg | Tes
▼ 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
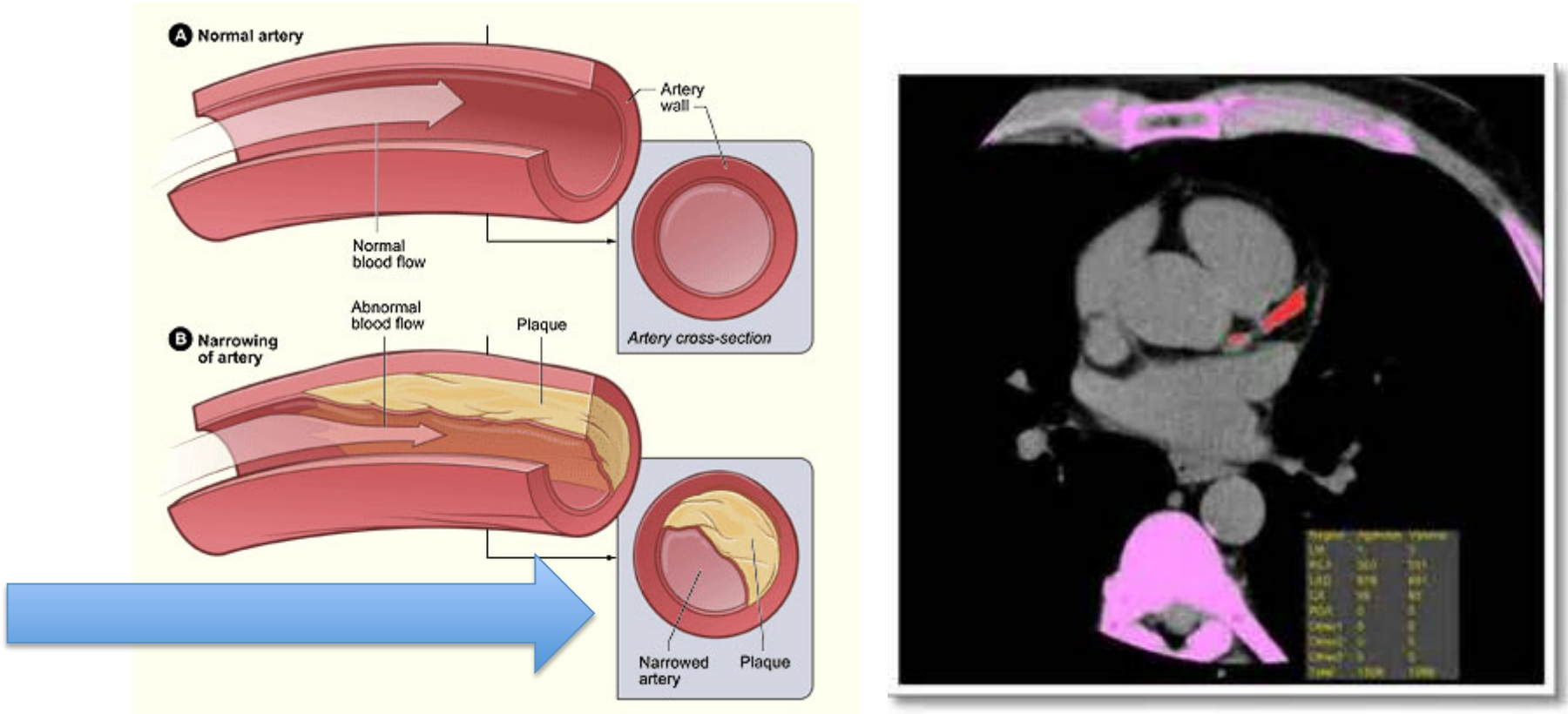
...marked calcification and narrowing in main coronary artery

"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
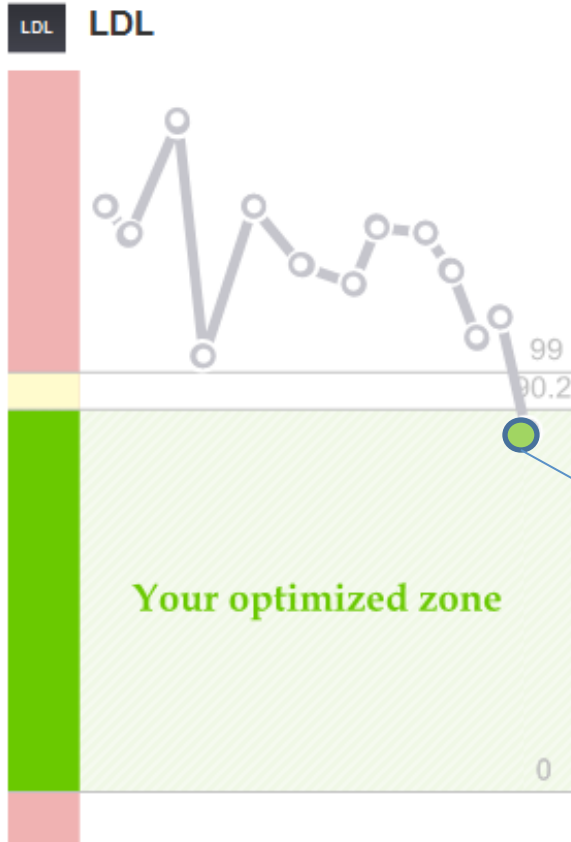
LDL

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.

99
90.2

Your optimized zone

0

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	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"

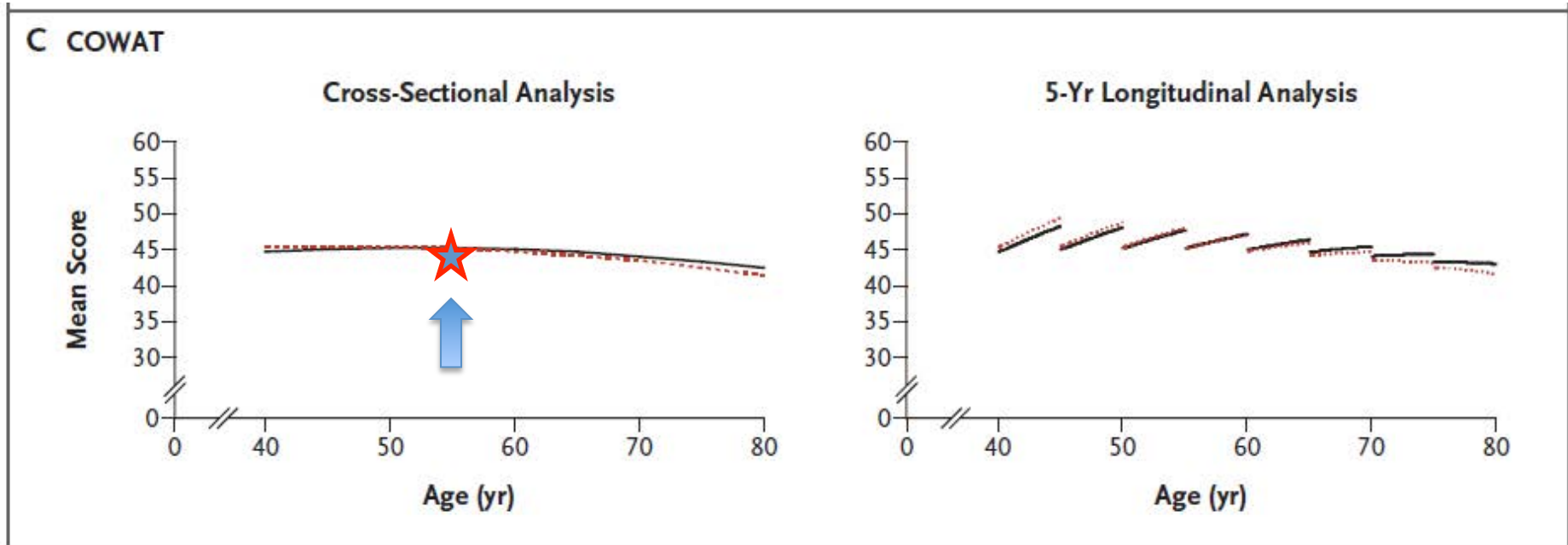"you don't have encoding deficits as in Alzheimer's"

Bottom line: Atherosclerosis of the small vessels in your brain

General Effect is to slow transmission and recall of stored information in the brain.
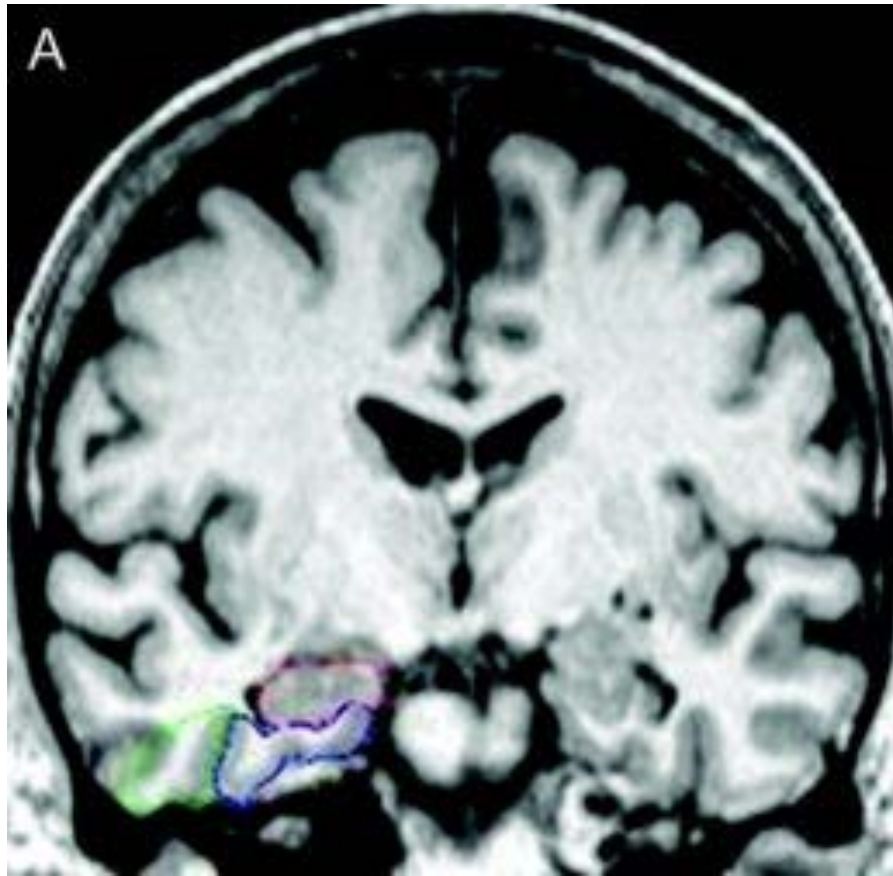
Long term memory recall
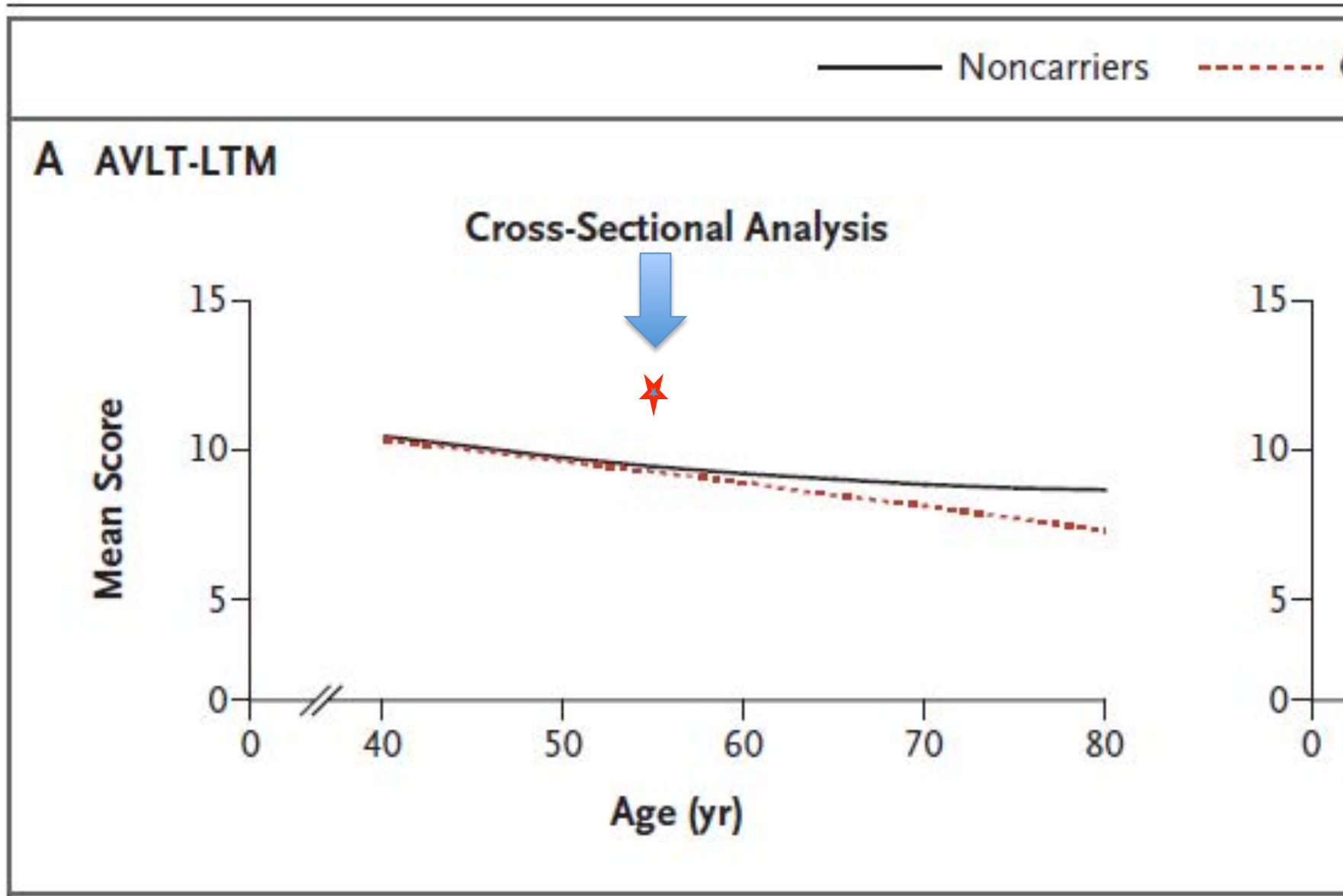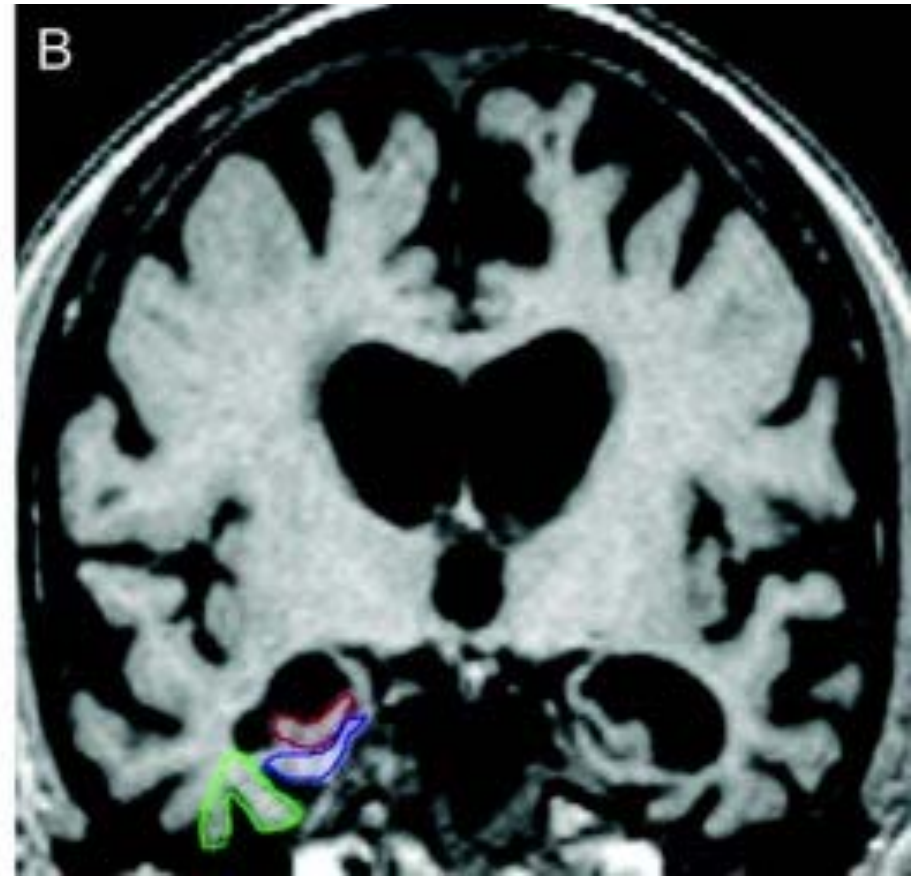
Language fluency – F, A, S naming

Memory is fine, but word retrieval is mildly impaired
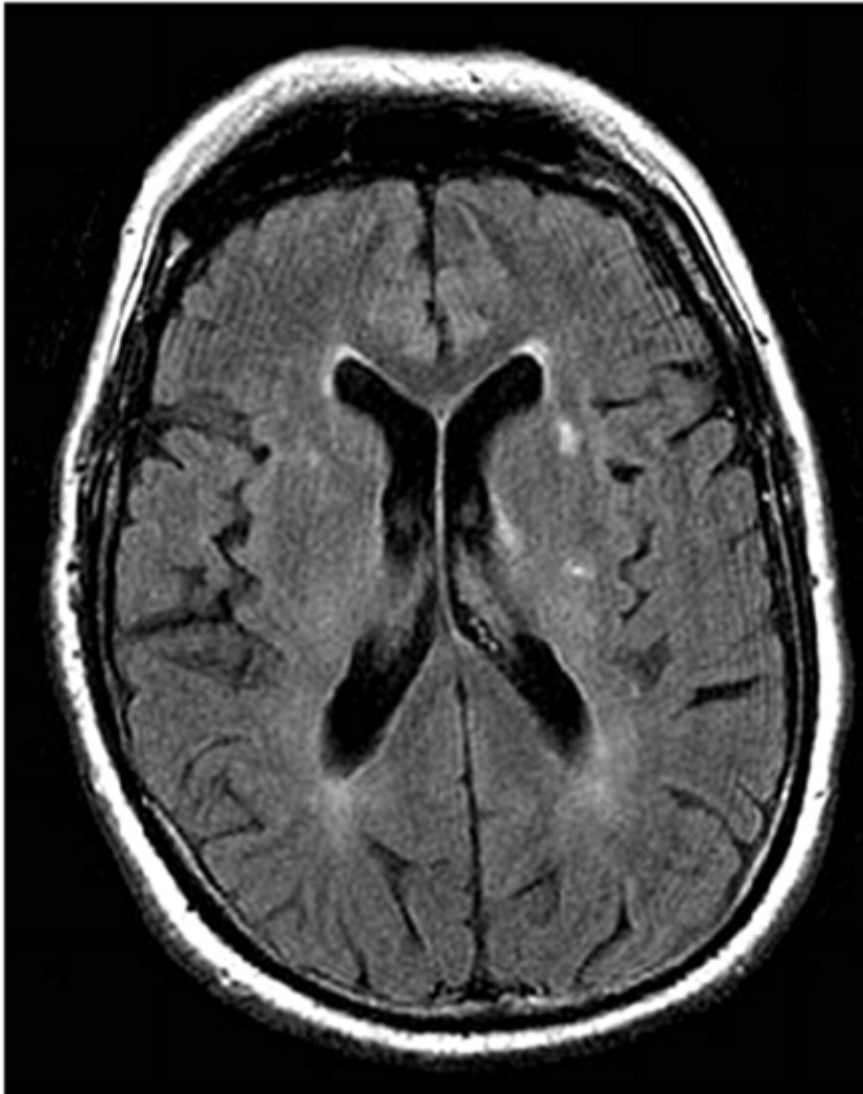
MRI of Brain is done next...
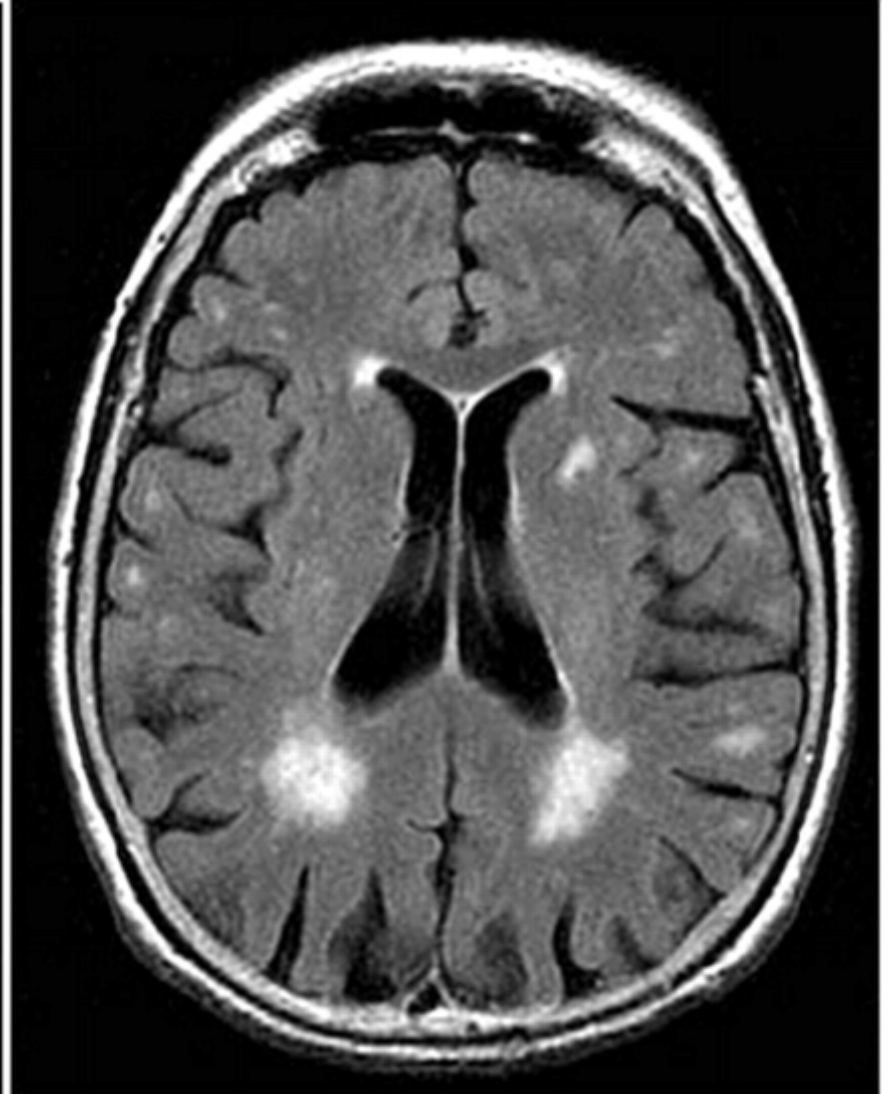

Normal   Alzheimer's Disease

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
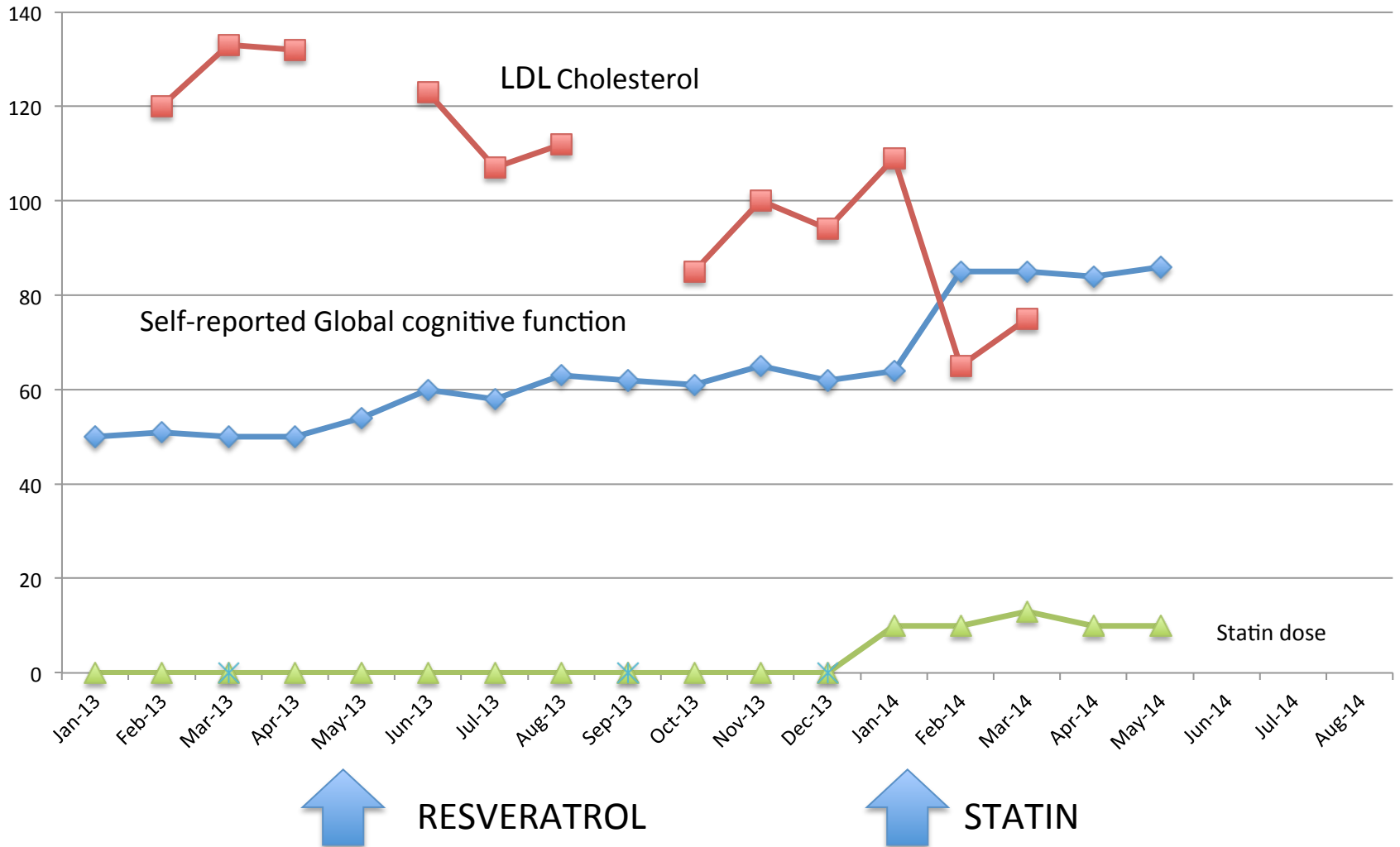
Self-reported global cognitive function vs. LDL and statin + key work
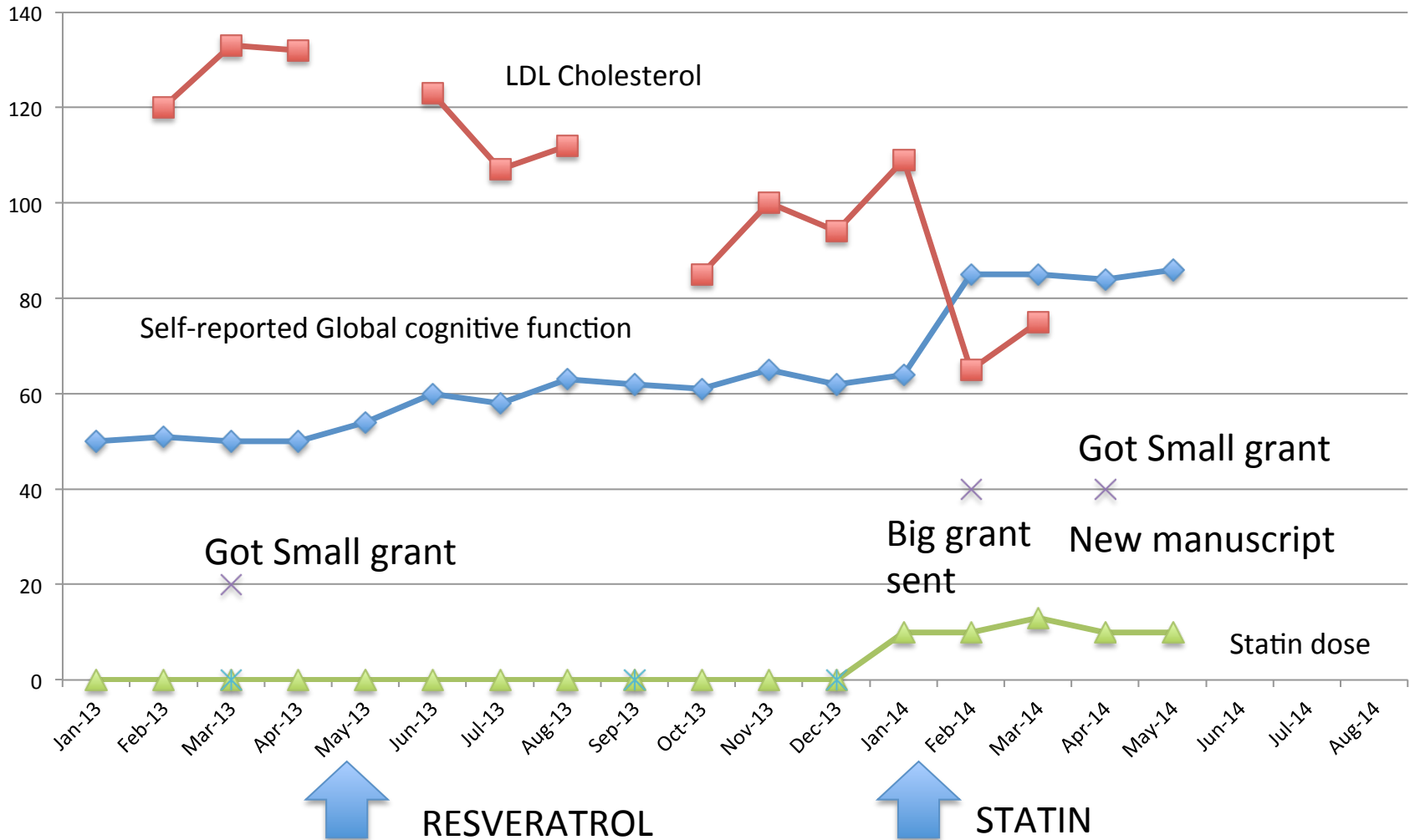
Other variables affecting neurocognitive (thinking) considered

- 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.

drangs@uw.edu

Extra slides

Fit Brain App
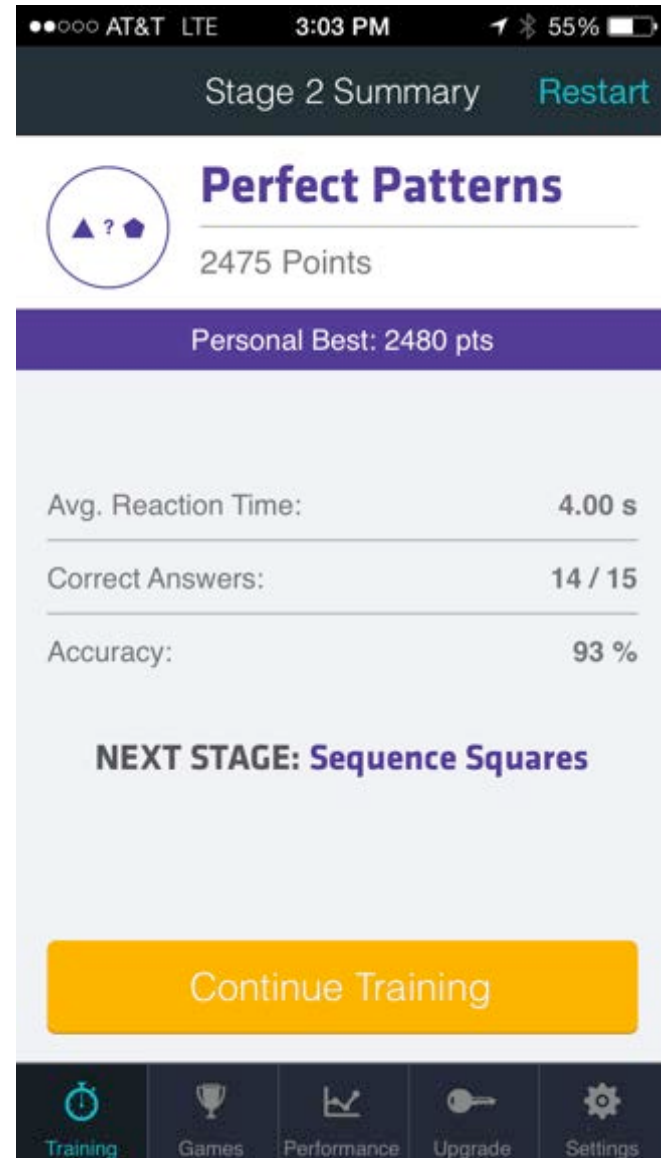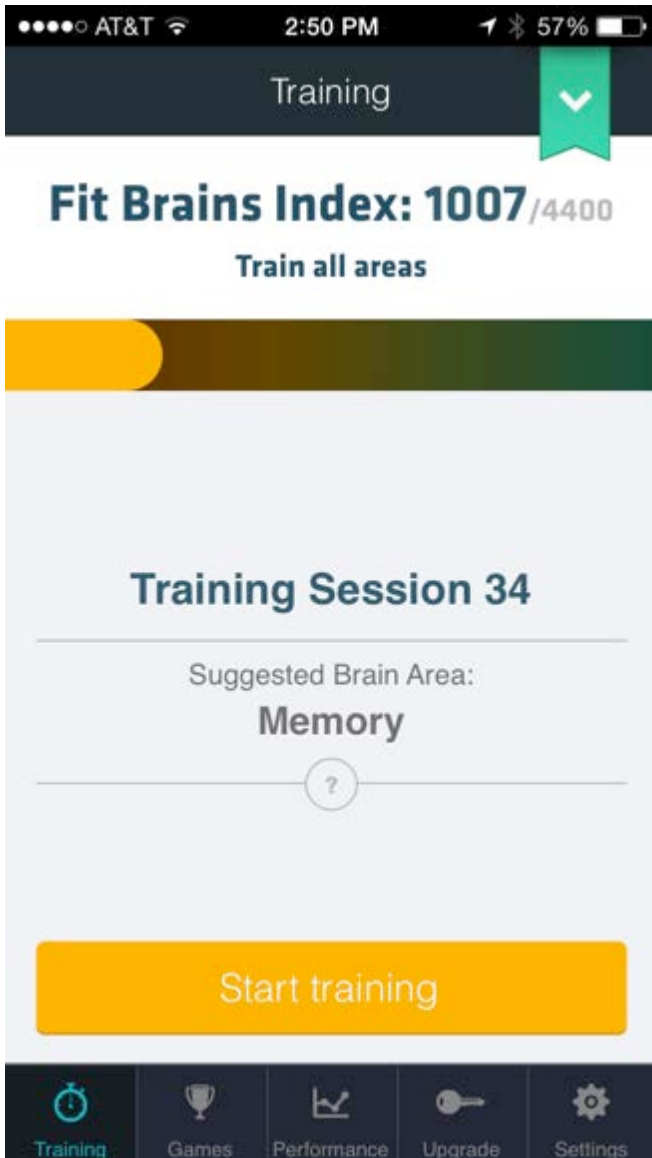
Mild executive functioning impairment:

-

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