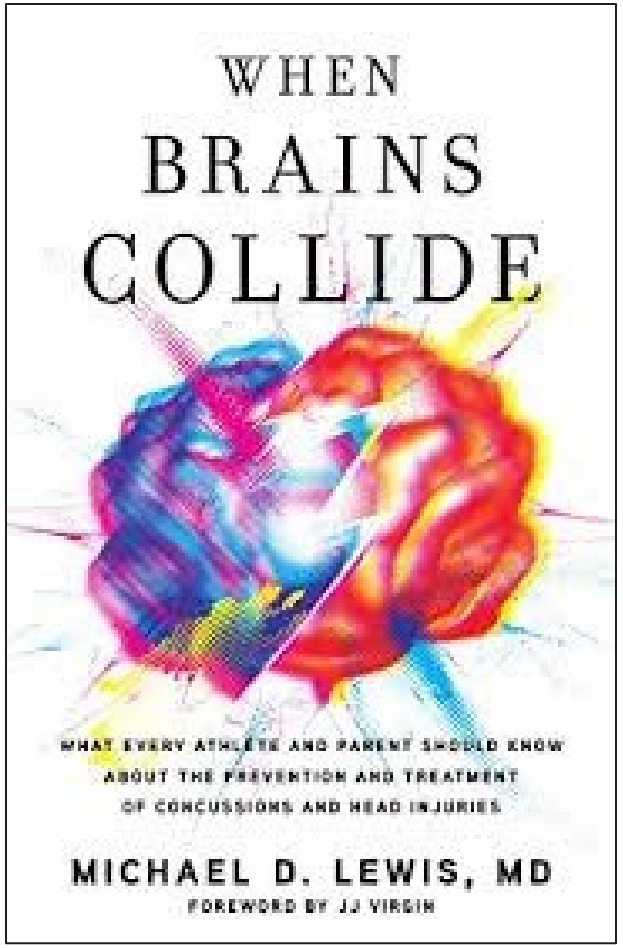
Different causes of brain injury

- Traumatic Brain Injury
- Concussion
- Anoxic injury
- Encephalopathy

Symptoms of a concussion you might not think to look for

- Mood swings: irritability, anger, feelings of depression, anxiety or generally more intense emotions
- Poor concentration
- Excessive fatigue
- Forgetting things, amnesia
- Problems with balance
- Sensitivity to noise
- Sensitivity to light
- Loss or change in taste
- Ringing in the ears, change in hearing
- Vertical heterophoria: pupils stop “lining up” properly because one keeps drifting slightly vertically and can cause a host of symptoms, like seeing double, experiencing motion sickness, nausea, feeling nauseous

When Brains Collide



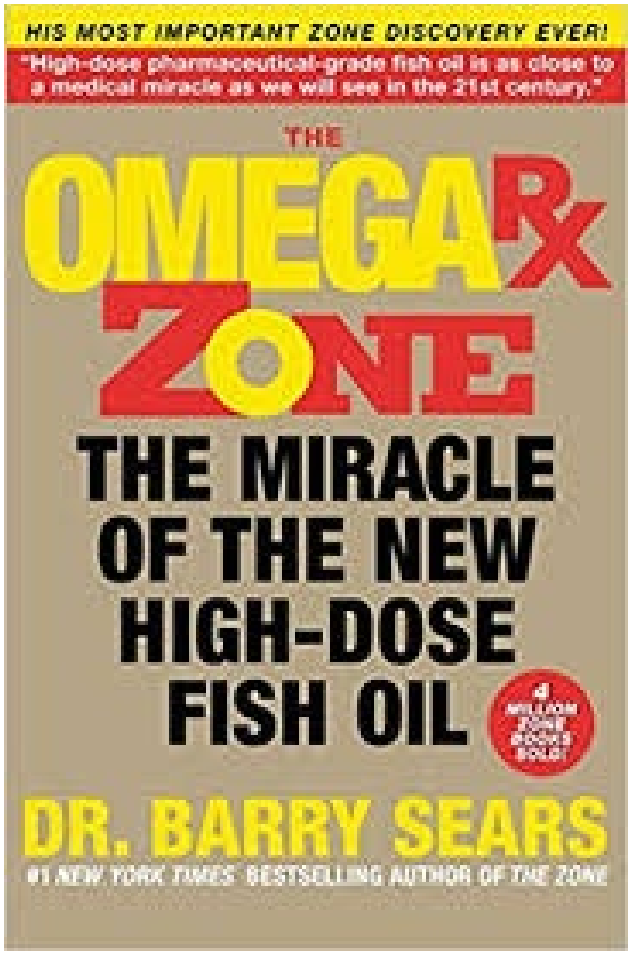
- Concussions are not always preventable, but they are treatable
- Outlines the role EFAs are play in our brain health
- The development of the Omega-3 protocol for TBI and concussions
- Provides specific protocols
- Grassroots approach to research and education

Brain Health and Education & Research Institute website

www.brainhealtheducation.org

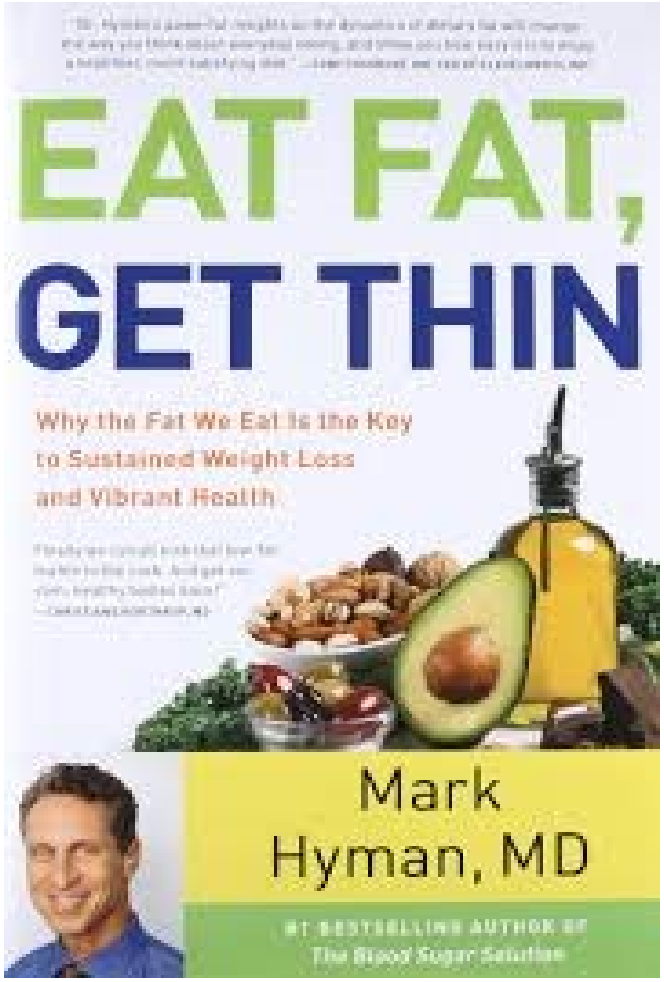
www.eatfatgetthin.com
resources
The Fat Bible

The Omega RX Zone



- Balancing insulin and optimizing AA:EPA determines overall health
- Dosing with high doses of fish oil will correct chronic inflammatory conditions like diabetes, HTN, CAD, DJD, Cancer, MS, infertility etc.
- Optimal levels allows your brain to work at peak efficiency.
- Audible version

Eat Fat Get Thin



- Dr. Mark Hyman is one of the leading voices in Functional Medicine.
- Has authored many NYT best selling books on health and nutrition.
- Outlines exactly which fats are pro-flammatory and anti-inflammatory.
- He reviews the actual research on saturated fats and polyunsaturated fats and explains how government interests have ultimately left us confused and deceived.

How to read a fish oil label

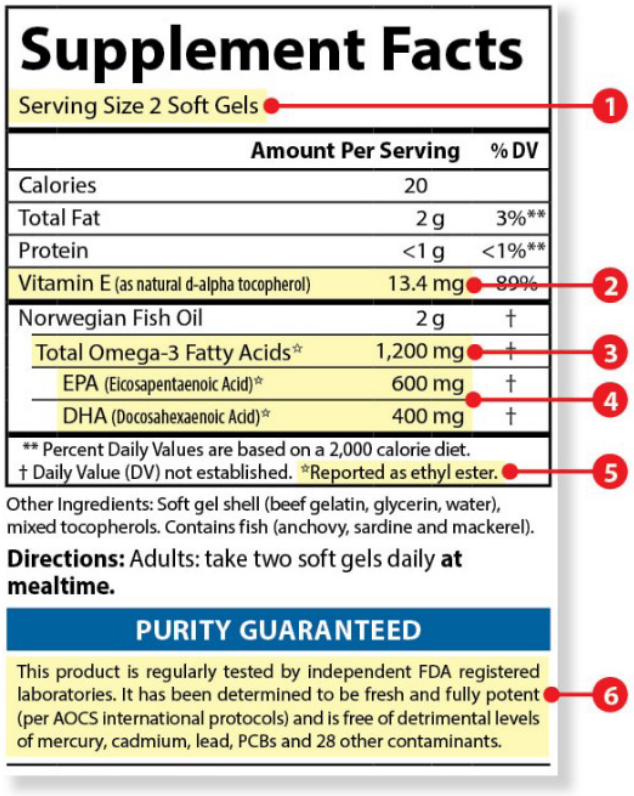
1. **Start Here:** Serving size is the amount of fish oil necessary to receive the EPA and DHA dose listed. Higher potency fish oils contain more EPA and DHA in fewer capsules or spoonfuls.

2. **Check for Antioxidants:** Antioxidants help preserve fish oil purity and freshness, and protect our cells from free-radical damage.

3. **Look at the Omega-3 Totals:** Omega-3s should be the most prevalent form of fatty acids in each dose because they're the most beneficial for our body.

4. **Add the EPA and DHA Levels:** Quality supplements should contain substantial amounts of EPA and DHA.

5. **Fish Oil Form:** There are three forms of marine oils - natural triglyceride (TG), ethyl ester (EE), and re-esterified triglyceride (rTG).



Supplement Facts

Serving Size 2 Soft Gels ● 1

	Amount Per Serving	% DV
Calories	20	
Total Fat	2 g	3%**
Protein	<1 g	<1%**
Vitamin E (as natural d-alpha tocopherol)	13.4 mg	89% ● 2
Norwegian Fish Oil	2 g	†
Total Omega-3 Fatty Acids*	1,200 mg	† ● 3
EPA (Eicosapentaenoic Acid)*	600 mg	† ● 4
DHA (Docosahexaenoic Acid)*	400 mg	†

** Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value (DV) not established. *Reported as ethyl ester. ● 5

Other Ingredients: Soft gel shell (beef gelatin, glycerin, water), mixed tocopherols. Contains fish (anchovy, sardine and mackerel).

Directions: Adults: take two soft gels daily **at mealtime.**

PURITY GUARANTEED

This product is regularly tested by independent FDA registered laboratories. It has been determined to be fresh and fully potent (per AOCS international protocols) and is free of detrimental levels of mercury, cadmium, lead, PCBs and 28 other contaminants. ● 6

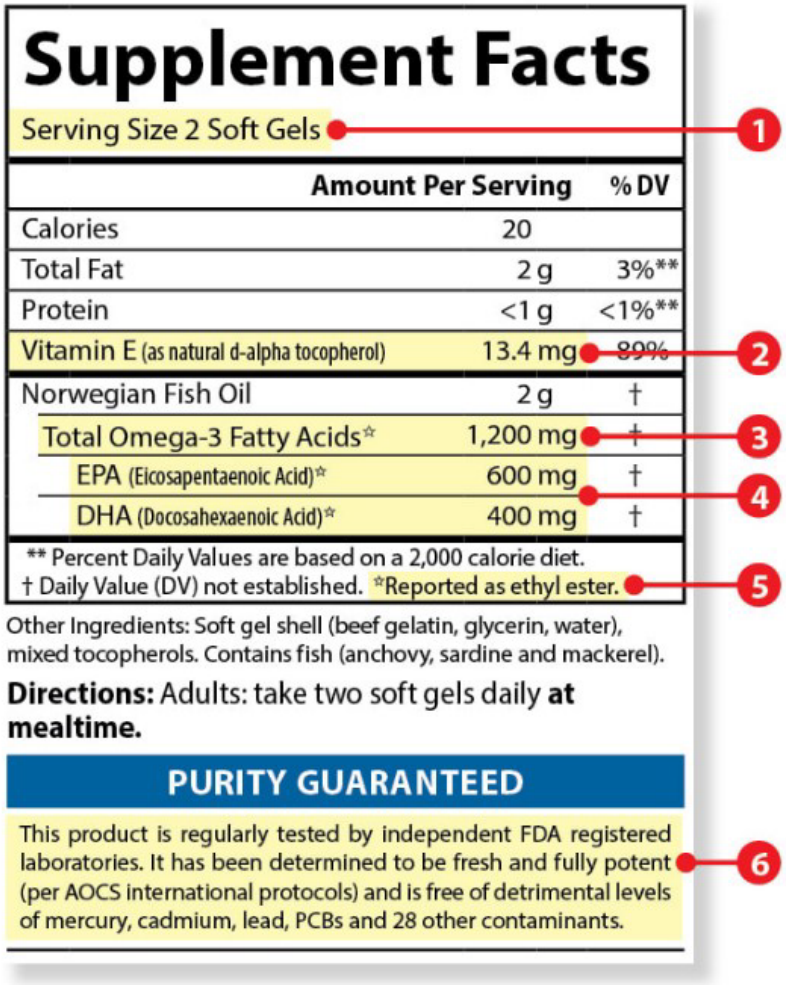
6. **Confirm Testing:** Make sure the product is tested for freshness, potency, and purity and that it's low in contaminants and heavy metals.

Week One
Phase 1 – loading dose:

- Start with fish oil that provides 3 grams of combined EPA+DHA of the best quality concentrated product
  - Soft gels: 1000 mg (1gm) EPA+DHA per soft gel
  - Liquid: 2500-3000mg (3gm) EPA+DHA per teaspoon (5ml)/dose

- **Take 3grams 3X's a day (total of 9grams/day)**
- Take for at least 7 days
- If the injury is more severe or occurred months/years prior and symptoms are still an issue, consider extending this phase out to one entire month.

How to measure out a 3 gram serving:



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Two capsules =1,200 mg EPA+DHA
Therefore one capsule is 600 mg
5 x 600 = 3,000mg
3,000mg = 3 grams

So for phase one you are taking 15 capsules/day of this product

Week Two
Phase 2 – tapering down:

- Continue with **3 grams** of the combined concentrated EPA/DHA for **2x's a day** for 7 days (total 6 gram/day)

- IMPORTANT NOTE:

  If symptoms are improving, but not yet back to where you and your healthcare provider think you should be then strongly consider staying at Phase 1 for a longer period of time until you achieve the results you believe you and your healthcare provider believe you should achieve.

Phase 3 – maintenance

- Take **one dose** of **3 grams** of EPA/DHA every day ongoing.

WHAT TO EXPECT

- Patients typically notice improvements within the first week, often in the first several days.
- Depending on the individual and the injury, patients have described being able to think more clearly, more energy throughout the day, decrease headache frequency and/or intensity, and a sense of calm.

Flexibility in the protocol

- Every individual is different.
- This protocol has been developed as a guideline and patients and their healthcare provider may consider adjusting the dosage.
- For example, if the injury is more severe or happened months or years prior, the patient may find they need to be on the higher doses for a longer period of time.
- Importance of testing

- How saturated they are
- How long they are

- Saturated fats (SFA's)
  - We can make these
  - Solid at room temperature
  - Milk, butter, lard, cream, cheese, coconut, palm oil
- Polyunsaturated fats (PUFA's)
  - A lot of confusion because there are differences between natural PUFA's (good) and the highly processed PUFA's (bad)
  - Primary "good" dietary sources include nuts and seeds, whole grains, grass fed meat, grass fed dairy produce, pastured eggs, wild caught fish and seafood
  - Primary "bad" dietary sources are processed vegetable and seed oils: corn, soybean, safflower, cottonseed, etc
  - Canola oil…not so good! (the great con-ola)
  - Omega-6's and -3's are types of polyunsaturated fats
  - We cannot make omega-6's or omega-3's, therefore we must consume them
- Monounsaturated fats (MUFA's)
  - We can make these
  - Liquid at room temperature
  - Olive oil, avocados, almonds

Omega-6s and omega-3's

- Polyunsaturated fats (PUFAs)
- Both are essential meaning we must consume them
- They can be short chain or long chain

  - The 6's are now considered "bad" because most are coming from highly inflammatory, processed vegetable and seed oils. These are over abundant in the Standard American Diet.

  - EPA and DHA are the long-chain Omega-3's
    These are critical for the brain and mental health

The omega-3 fatty acids:

Short chain: ALA: alpha linolenic acid

- Chia seed
- brussel sprouts
- flax seeds
- flax seed oil
- hemp seeds
- Walnuts…
- ……
- perilla oil
- dark leafy greens
- seaweed

Long chain:

- **EPA: eicosapentaenoic acid (anti inflammatory and immune health)**
- **DHA: docosahexaenoic acid (brain health)**

EPA and DHA mostly found in marine sources
They are also found in land animals as well

- Fish oil
- breast milk
- Salmon
- Mackerel
- Trout
- cod liver oil
- Oysters
- Sardines
- Anchovies
- pastured beef (contains smaller amounts)

The omega-6 fatty acids:

Short chain: LA (linoleic acid)

- Borage seed oil
- Evening primrose oil
- black currant seed oil
- Brazil nuts
- pine nuts

Long chain: AA (arachidonic acid)
"Standard American Diet" (AKA the S.A.D. diet)

Processed vegetable and seed oils:

- soybean oil
- corn oil
- cottonseed oil
- safflower oil
- sunflower oil
- peanut oil
- sesame oil
- rice bran oil
- canola oil

Essential Fats: Metabolism and Dietary Sources

Omega-6

18:2n-6 linoleic acid, LA

Soy bean oil
Safflower oil
Corn oil

20:4n-6, arachidonic acid AA

Meat, Organs

22:5n-6 DPA n-6

Omega-3

18:3n-3 linolenic acid, ALA

Flax
~ Canola
Leaf plants

20:5n-3,eicosapentaenoic acid, EPA

Seafood
Breast milk
(DHA)

22:6n-3, docosahexaenoic acid, DHA
(brain, retina, testis)

Series 2 Prostaglandins Thromboxanes
Series 4 Leukotrienes

Series 3 Prostaglandins Thromboxanes
Series 6 Leukotrienes

immune - metabolic - developmental responses

Conversion

- We can make EPA and DHA from ALA (flax, hemp, chia)
- But the conversion is very, very poor (only 0.5%-15%)
- Why we need to eat the long chain EFAs. (ie: animal sources)
- Omega-6s = linoleic acid (LA)
  - Vegetable oils (think standard American diet)
  - "bad oils" soybean oil, safflower oil, corn oil, etc

- If Omega 6s are present they preferentially use the enzymes that your body would otherwise be using to convert the short chain omega-3's (ALA) to the long chain omega-3s (EPA/DHA)
- Vegans tend to have a ratio of 10:1 to 15:1

Omega-9

- Not essential because our bodies can make these
- Found in vegetable and animal fats.
- Also known as oleic acid, or monounsaturated fats
- Found in olive oil, avocados, nut oils and nuts such as almonds.

AA:EPA Ratio

Japanese	**1.5 :1**
Americans	**15 :1**
Depression	**20 :1**
ADHD	**25 :1**

- AA:EPA Ratio is highly reliable
- 2:1 or a 4:1 is ideal (omega-6:omega-3)
- Anti-aging experts suggest maintaining a 1:1 ratio
- The average American ratio is anywhere from 12:1 to 25:1
- Military is even worse

What dosages???

- Where are you starting AA:EPA?
- "Nix the 6's" and "up the 3's" and balance insulin
- Majority of experts recommend a minimum of **250-500 mg** or **2.5-5 gms** combined EPA and DHA each day for healthy adults.
- Higher amounts are recommended for certain health conditions.
- There is no official recommended daily allowance of omega-3s.
- FDA: 3gm per day is GRAS (generally recognized as safe)
  This is a measurement of the EPA and DHA, not grams of fish oil
- TBI patients received 15-20 gm/day

Mental Health

- Depression:

  In 2006, the American Psychiatric Association started to recommend:

  1 gram/day EPA or EPA+DHA for adults with clinical depression & other major psychiatric disorders as an addition to any standard treatment, not as a substitute (*Freeman et al, J. Clin Psychiat. 2006)*

  Dr. Hibbeln & Dr. Cott:

  Major Depression is often effectively treated with 2-8 grams/day of EPA+ DHA

- Bipolar:

  Work with a knowledgeable health professional

  Use a combined EPA/DHA fish oil. Not EPA or DHA alone

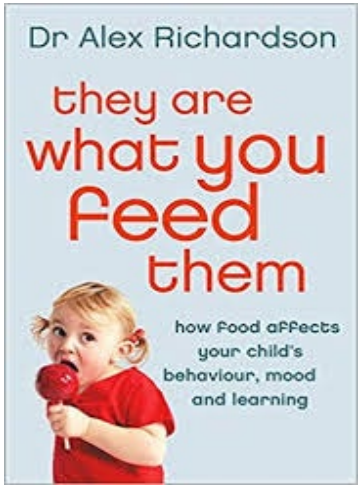
  There is potential to polarize toward manic or depression otherwise

Homicides and Suicides

- Hibbeln is very passionate about this topic and has extensively researched it
- 9,000 studies and 2,000 clinical trials for evidence
- Rates of homicide are 30% higher in countries who have low levels of DHA.
- Rates of violence decrease in prison inmates by 40% with DHA supplementation (replicated in numerous studies)
- Studied blood samples of 800 soldiers who died from suicide and found in ALL of them were extremely low in omega-3's

Dr Alex Richardson

"Learning is easier for your kids when their brains are well fed"



FAB: Food and Behaviour Research

FAB Research is committed to improving current knowledge and awareness of the effects of nutrition and diet on human behaviour, learning and mood.

www.fabresearch.org

The Oxford-Durham Study 2005:

- 117 underachieving kids

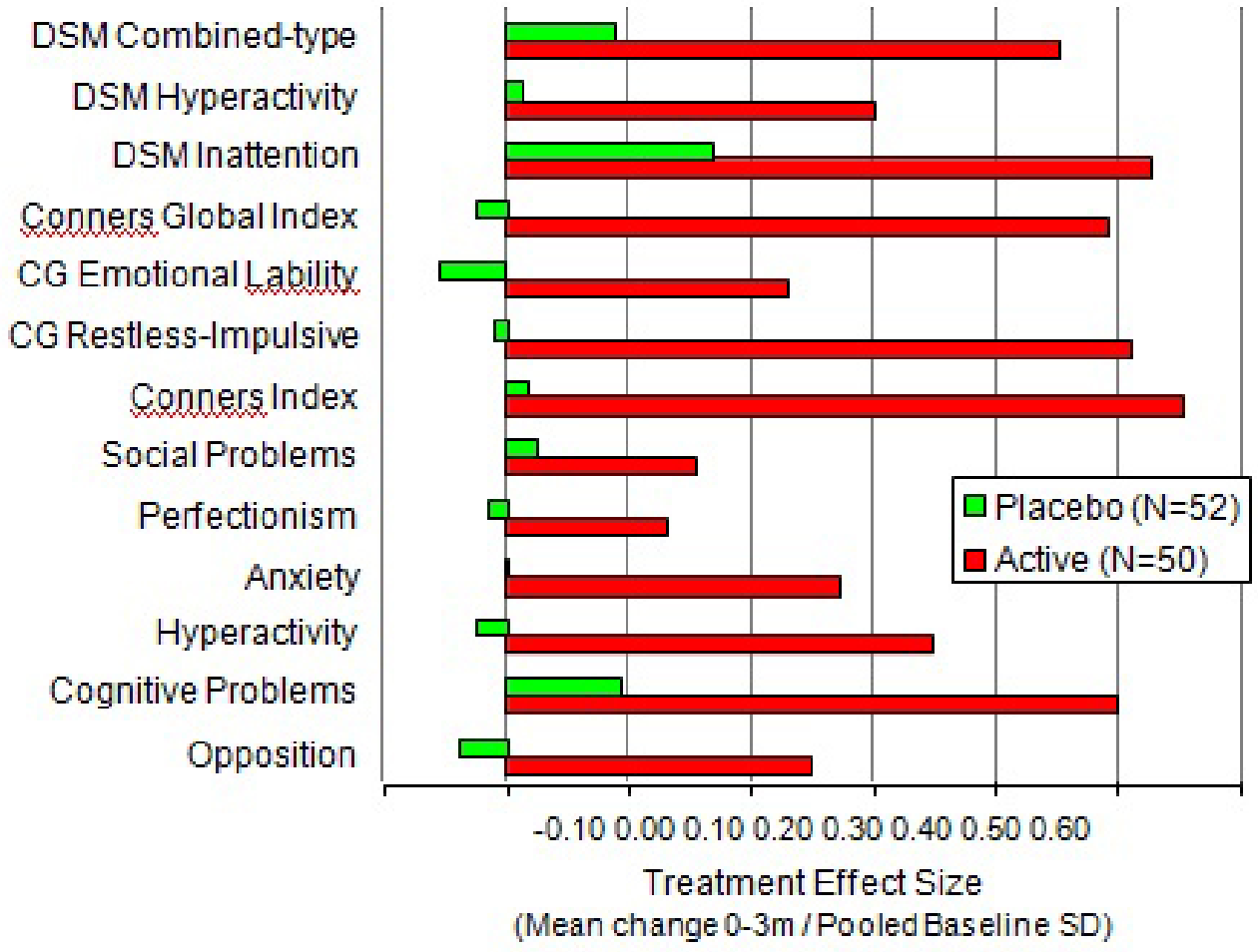
  ages 5-12 from mainstream schools:
  - 40% were behind in reading and spelling
  - 30% were ADHD

- Divided into 2 groups:
  - Active group=fish oil
  - Placebo=olive oil

- 3 months later they took measurements
- Then gave the placebo group fish oil and re-measured

Behaviour: ADHD-type symptoms

Richardson AJ & Montgomery P. Pediatrics, 2005, 115:1360-6



The Oxford-Durham study results:

3 months after treatment:

- Only 24 children (23.5%) in the fish oil group still had scores that placed them in the clinical range for ADHD.
- In the olive oil group, only 1 of 16 improved in this way.
- Fish oil group: Everything improved. In 3 months reading and spelling showed a 9 month improvement.
- Olive oil group made 3.4 months of progress in three months, or about as you would expect for an average class of average readers.
- Remember, the fish oil group made a gain of 9.6 months in reading age in just three months!

omegaquant.com

- Omega-3 Index Basic test is $49.95. This includes a collection kit, the envelope and postage to send in your blood spot, and a detailed report of your results. Your results will include your Omega-3 Index.
- Omega-3 Index Plus test is $74.95. This includes a collection kit, the envelope and postage to send in your blood spot, and a detailed report of your results. Your results will include your Omega-3 Index, Trans Fat Index and AA:EPA ratio and Omega-6:Omega-3 ratio.
- Omega-3 Index Complete test is $99.95. This includes a collection kit, the envelope and postage to send in your blood spot, and a detailed report of your results. Your results will include your Omega-3 Index, Trans Fat Index, full fatty acid profile, AA:EPA ratio and Omega-6:Omega-3 ratio.

lipidlab.com

- $160 : The Holman Kit Omega3 test
- Omega 3 index
- EPA
- DHA
- Total Omega-3
- AA/EPA ratio
- Omega6/Omega3 ratio
- 50 different areas areas rated

An at-home method for obtaining a blood spot sample, which is analyzed by Lipid Technologies using their precision proprietary method for high sensitivity blood-spot omega 3 analysis. This test identifies your complete fatty acid profile, specifically focusing on your omega 3 and omega 6 fatty acid levels

What about bleeding?

- No studies are showing bleeding problems of clinical concern
- When Brains Collide: "These protocols should only be used under the guidance of an attending physician and monitored with a fatty-acid profile analysis on a weekly basis until levels are stable. The overall omega-6:omega-3 ratio should be brought down under 5:1 but not below 1:1. Bleeding is not a concern at these levels and can be used safely with 'blood thinning' pharmaceuticals such as heparin."
- Surgery:

  Role of Fish Oil in Post-Cardiotomy Bleeding: A Summary of the Basic Science and Clinical Trials

  John Alfred Carr, MD, FACS

  Department of Thoracic Surgery, Hurley Medical Center, Flint, Michigan

Best quality

- "Pharmaceutical Grade?"
  Lavasa (formally Omacor); Epanova; Vascepa; Omtryg
- Consumerlab.com

  Draxe.com
- PCBs may be present in the cheaper oils
- Remember to look at how much EPA & DHA is in the product, not just how much fish oil
- Fish oil versus Krill?
  - Krill has lower amounts of EPA &DHA. So need to take a lot to get up to 3 grams/day
  - Reportedly more bioavailable than fish oil plus extra antioxidants
  - Be careful if you have a shellfish allergy!

Vegans

Must get blood levels tested

- Algal oil: marine algae that produce DHA
- Limited amount of EPA
- Deva Vegan Omega-3 DHA
- Don't confuse algal oil with other types of algae, such as blue-green algae, brown algae, chlorella, or laminaria.
- Get the benefits of DHA without the worry of pollutants and toxins potentially found in certain fish
- If you work on nixing the 6's you may be able to free up the enzymes to convert the short chain omega-3s into the long chain EPA but it is very difficult to do this effectively

What about mercury in fish?

- The mercury is not soluble in the oil, but rather in the flesh of the fish so not a problem even in cheap oils
- Hibbeln and Avon longitudinal Study of Parents and Children: Recruited 14,541 pregnant mothers
  - Largest and most complete longitudinal study in the world.
  - Started in 1991, these kids are now in their 30's
  - Mothers eating most seafood: 14% of their kids had low IQ
  - Mothers eating no seafood: 31% of their kids had low IQ
  - Methyl mercury was shown to lower IQ points by .01%
  - Being omega 3 deficient lowered IQ by 6 points

Our brains

Brain is 60-80% fat, the majority of which is DHA

Neonatal development

- By the last trimester of the pregnancy, nearly 70 percent of all fetal energy is dedicated to brain cell development. This requires huge amounts of DHA. This DHA comes from only one place: the mother's body.

- The growing infant gets a good crack at mom's DHA in her brain if not enough is in the diet.

Tricks to take them

- Most people can get enough DHA and EPA by eating fatty, low-mercury fish—such as Alaskan salmon and sardines—at least twice weekly.
- Some complain that they don't like the taste of fish oil but when pressed further it is the mouth-feel they don't like. Cod liver oil is less viscous than the standard fish oil.
- Consume capsules with other fats to trigger your gall bladder to produce bile so they can be absorbed. And/or take a food enzyme with lipase.
- "Fish burp" not an issue with the fresh, refined oils but until your system adjusts to the oil maybe take with food at the beginning of a meal.
- Be sure to keep in the fridge to avoid rancidity!
- Some people report good results by freezing their pills
- Can go into a smoothie
- Take them in a form you will take!

In summary

- Up the 3's and Nix the 6's!
- Keep insulin (blood sugar) levels balanced
- TBI, concussion, stroke, depression, bipolar disorder, ADHD, autism, dementia, multiple sclerosis, etc are all conditions of inflammation in the brain.
- Incredible benefits can be realized within days to weeks of balancing AA:EFA ratio
- Don't ignore your head injury, your lack of focus, or feeling blue…there are options!