

Anti-inflammatory diet and supplementation for inflammation

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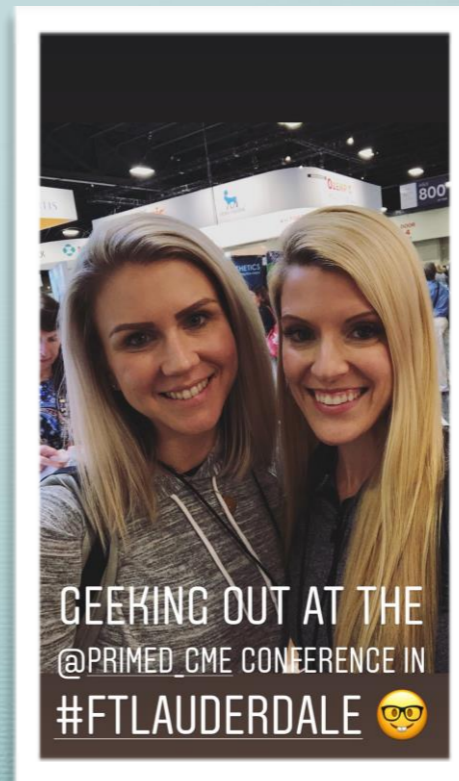
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Disclaimer: The information I am supplying is evidenced-based and any suggestions I make today please discuss and review with your physicians/medical team prior to incorporating into your daily routine.





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Presentation Overview

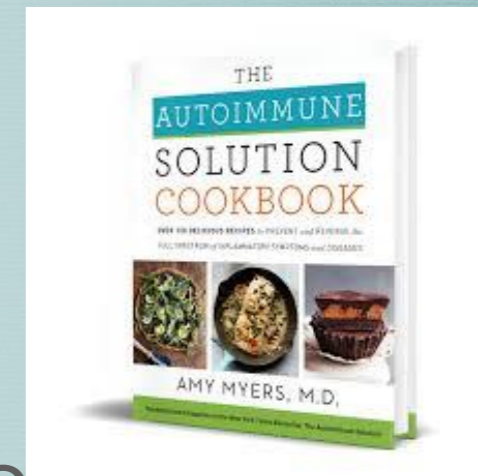
- What is an Anti-Inflammatory Diet
- Review of Macronutrients
- Specific sources/triggers that induce inflammation
- Anti-inflammatory Supplements
- Auto-immunity and Gut Health
- Auto-immunity and Ketogenic Diet

What is an Anti-Inflammatory Diet (AID)?

- No single, conclusive definition
- For the most part, agreed that the basis of AID surrounds the concept of **whole foods**
- **NO** processed foods
 - **NOTHING** from a box, can or bag—for the most part
 - Shopping the perimeter of the grocery store or visit local farmers markets

Basis of AID

- Avoid processed foods
- Eat more **whole foods**
- Avoiding sugars
 - Ex: high fructose corn syrup (HFCS)
 - Be careful of fruit
- High in vegetables
 - 1/2 of plate
- Bone-based broth
 - Buy or make your own (The Autoimmune Solution Cookbook by Dr Amy Myers, MD)
 - Decreases gut inflammation, supports joints, hair, skin, nails
- Moderate amounts of proteins
 - Increased amount of fish (higher in omega 3—salmon, albacore tuna, sardines, lake trout); be careful of fish high in mercury (tuna packed in water, swordfish, king mackerel)



What are “whole foods”?

- Fruits
 - Be careful—one too many can cause other issues
- Vegetables
 - Basic rule: Should be half your plate or maybe more
- Proteins
 - Animal and plant based
- Healthy fats (monounsaturated or polyunsaturated)
- Prebiotic and Probiotic affects
- All fresh—no additives (again, nothing from a can, bag, or box—for the most part)



Why an AID?

- In 2007, Rose Mary Istre discovered that patients with Myositis diseases who followed an AID for a 12 week period showed improvement in:
 - Grip
 - Arm and Leg strength movements
 - Improvement of activities of daily living
 - Decreased severity of depressive symptoms

Secondary diagnoses to consider.....

- With Myositis comes the association of other diseases to consider
 - Diabetes
 - Cancer
 - Alzheimer's
 - Heart Disease
 - Additional Auto-immune diseases
- Secondary diagnoses will quite possibly alter what YOUR anti-inflammatory diet might look like



**“One person’s food is another person’s
poison”**

-Joshua Rosenthal

**Founder and Primary Teacher of Institute of
Integrative Nutrition (IIN)**



Bio-Individuality

- Let this term resonate with you throughout this lecture
- What works for one might not work for another
- Everyone responds differently
- **LISTEN TO YOUR BODY** and how it responds (positively or negatively) to certain foods and supplements
 - Keep a food diary



Macronutrients



Carbohydrates

- There is a difference between GOOD and BAD carbs

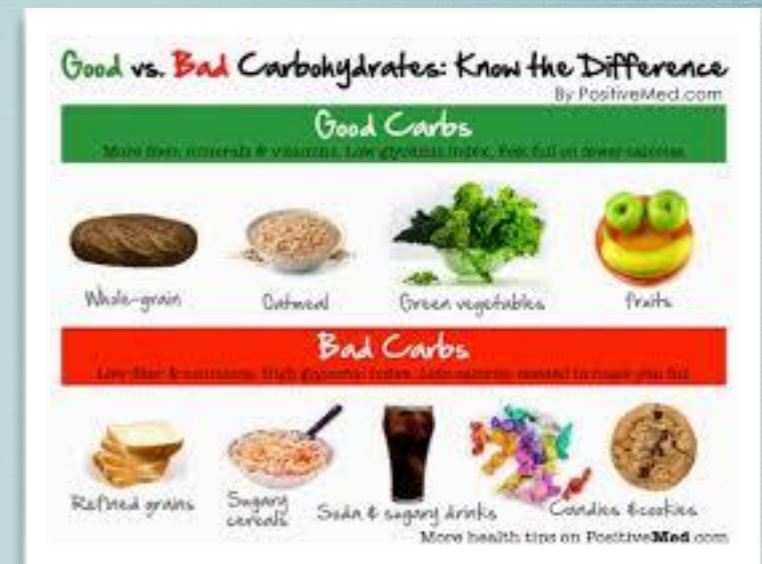
- GOOD Carbs

- Quinoa
- Brown rice
- Fruits
- Vegetables
- Legumes* (exception)

- BAD Carbs

- “White” carbs (breads, pasta, rice)
- High fructose corn syrup (HFCS)
- Syrup/sugar of any kind (too many to list because it goes by different names!)

- Refined/Processed



Carbohydrates

First and foremost, carbohydrates are considered an “*enemy*” in an AID

WHY????

- Inflammation
- Increasing weight/obesity
- Increase glucose—risk of Type 2 Diabetes
- Gut dysbiosis/imbalance—leaky gut syndrome
- Increase symptoms of brain fog, fatigue, digestive issues, skin issues, and underlying chronic autoimmune diseases



GOOD Carbohydrates

- Quinoa
 - Carb high in protein
 - A seed
 - Protein called **Saponins**
 - These can damage gut lining
 - Soak and rinse before use- can damage gut lining
- Brown Rice
 - Complex carbohydrate—high in fiber
 - Can also cause same inflammatory response as gluten in some patients
 - **BIO-INDIVIDUALITY**
- Fruits
 - Eat with caution
 - No “set” amount of servings
 - Some fruits are considered a “no-go zone” - can feed gut bacteria (SIBO)
- Vegetables
 - Leafy green—high in vitamin K so caution with certain medications (coumadin)
 - Contain needed anti-oxidants and micronutrients (Vit C, B vitamins, iron, selenium)
- Legumes
 - “Caution Carb”
 - Black bean, lentils, chickpeas—less inflammatory properties
 - Some contain too much sugar—feed bad gut bacteria and induce inflammatory process

BAD Carbohydrates

- High fructose corn syrup (HFCS)
 - Increases risk for non-alcoholic fatty liver disease
 - Similar effects on liver compared as in an alcoholic
- Refined/processed sugars
 - Increase glucose—risk for T2DM
 - Obesity—chronic inflammation
 - Worsens inflammation of chronic autoimmune diseases
- Anything WHITE
 - Automatically converts into sugar
 - Sugar turns into fat
 - Increases chronic inflammation
- Artificial sweeteners
 - Cause brain to crave carbohydrates
 - Disrupt Ca⁺ being absorbed into the bones—osteopenia/osteoporosis
 - Disrupt gut microbiome
 - Center of our immune system

Proteins

- Unknown amount of protein recommended for Myositis but it is necessary
- Dietary Recommended Intake of protein is 0.8grams per kilogram of body weight
- Example: Weight 200 pounds. Divide 200 by 2.2 x 0.8 = rounded up 73 grams daily
- For women protein intake tends to be lower
- Aim for 15-20g/meal
- Proteins to consider
 - Eggs
 - Steak
 - Chicken
 - Plant based proteins (pea-protein)
 - Fish
 - Quinoa (est. 8gram/cup)



With proteins, always consider the concept of **BIO-INDIVIDUALITY** as one protein may work for one person but “flareup” the cytokines (inflammatory markers) in another. It’s the process of “Crowding Out” versus eliminating

Fats

- Difference between Good Fats and Bad Fats
- Fats have a bad wrap!
- Obesity is NOT caused by fats
- Omega 3s are **ANTI**-inflammatory
 - Ex: Flaxseeds and walnuts
 - EPA and DHA: oily fish and eggs
 - Rec: Wild-caught oily fish 1-3x/week
 - Supplements: fish oil EPA + DHA; fungal sources have DHA
 - Fish oil supplements should be used cautiously prior to procedures/surgery
- Omega 6s induce inflammation
 - Ex: Sunflower oil, Safflower, Soy, Corn
 - Still recommended to avoid—induce inflammation (cardiovascular, muscular, joint etc)



Cats and Dogs can live together.....

Why can't we incorporate good fats into our dietary regimen?

Fat: The Good, The Bad and The Ugly



Cardiovascular disease is the leading global cause of death. Not only is this detrimental to our existence, it is also one of the most expensive health expenditures in the world!

As a healthcare provider, we are taught in school that if your patient has "cholesterol issues" they need to avoid "bad fats." But what exactly does that mean?

BAD FATS

Bad fats, or trans/saturated fats, are a solid type of fat. This includes, but is not limited to, butter, margarine, animal meat, lard, coconut oil (yes we said coconut oil....we will get back to that in a little bit), and palm oils.

In the 1990s, trans fats were no longer considered GRAS (Generally Recognized as Safe) by the FDA. This type of "bad" fat (and it really is a **BAD FAT**) is found in foods containing "partially hydrogenated oil" such as doughnuts, pizza, cookies, and crackers. When eating these types of foods, it wouldn't hurt to ask if they did make it with this type of oil so that you are aware. Trans fats have been proven to cause an elevation in your LDL (bad cholesterol), lower your HDL (your good, protective cholesterol), cause inflammation in the arteries both in and surrounding your heart, brain, legs, and carotids, and increase your risk for type 2 diabetes. ⁽¹⁾ Overall, this is a

GOOD FATS

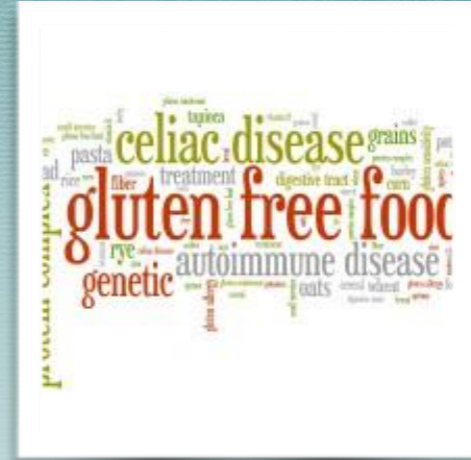
Good fats, or monosaturated/polysaturated/unsaturated fats, stay as a liquid at room temperature. They are mainly in an oil formulation, or the foods they come from can be made into an oil (ie: avocado, walnut etc). These are the fats that have exploded the whole ketogenic revolution which focuses on a high monounsaturated fat, low carbohydrate diet. Good fats contain more omega-3 fatty acids than saturated fats. Foods high in saturated fats tend to also have a higher ratio of omega-6 fatty acids (which are responsible for inflammation in cardiovascular disease) to omega-3 fatty acids, hence the reason for being "bad." Omega-3 fatty acids (as explained in our supplement series newsletter this past week) decrease overall inflammation. It has been shown in certain clinical studies to improve symptoms of depression in post-

Examples of GOOD Fats

- Oily fatty fish: salmon, sardines (yes...I know), trout, mackerel
- Grass-fed (preferably organic) beef and pork
- Omega-3 fortified eggs (preferably pastured raised, organic)
- Chia seeds, flax seeds
- Nuts: walnuts, cashews and almonds are highest
- AVOCADOS!!!!
- Ghee—clarified butter
- Oils such as avocado, coconut, EVOO



Gluten



- What is Gluten?
 - According to the Celiac Disease Foundation
 - **Gluten**—proteins found in wheat, rye, barley and triticale – a cross between wheat and rye.
 - **Gluten** helps foods maintain their shape—acts as glue
 - **Gluten** found in many different types of foods
 - **Wheat Breads**, baked goods, soups, pasta, cereals, sauces and salad dressing
 - **Barley Malt**, food coloring, soups, certain beers, Baker’s Yeast
 - **Rye Bread**, beer, cereals
 - **Triticale** A newer grain, specifically grown to have a similar quality as wheat, while being tolerant to a variety of growing conditions like rye. It can potentially be found in breads, pastas and cereals
 - **Oats** Be careful of “gluten free” brands being cross-contaminated
 - **Celiac Disease Foundation**- great resource of what foods are best for gluten-free diet, recipe options, support etc

Gluten

- Questionable association with gluten sensitivity/ceeliac disease and myositis
 - Should question **ceeliac disease** if unexplained diarrhea and weight loss are noted.
 - Transglutaminase 2 (**TG2**) associated with **Celiac disease** and other autoimmune diseases
 - “An **elevated expression of TG2 has been found in muscle tissue from patients with myositis** compared to normal muscle, and **TG2 is suggested to be a marker of idiopathic inflammatory myopathies** (56–58). There have been **reports of an increased frequency of gluten-sensitivity among patients with myositis** but screening for autoantibodies against TG2 in serum has so far been negative and needs to be further investigated.”

(Loell, I., & Lundberg, I. (n.d.). Nutrition and Polymyositis and Dermatomyositis. In *Nutrition and Health: Nutrition and Rheumatic Diseases* (p. 202).



Gluten

- **“Anti-gliadin**, another antibody associated with celiac disease, has been **found with increased frequency in patients with myositis**. Thus, **celiac disease should be considered in patients with myositis who experience intestinal problems such as diarrhea or weight loss that cannot be explained otherwise**. Celiac disease is diagnosed by presence of anti-TG2 autoantibodies or anti-gliadin autoantibodies and a small bowel biopsy. Implementation of a gluten-free diet is important in these cases to avoid malnutrition”

(Loell, I., & Lundberg, I. (n.d.). Nutrition and Polymyositis and Dermatomyositis. In *Nutrition and Health: Nutrition and Rheumatic Diseases* (p. 202).



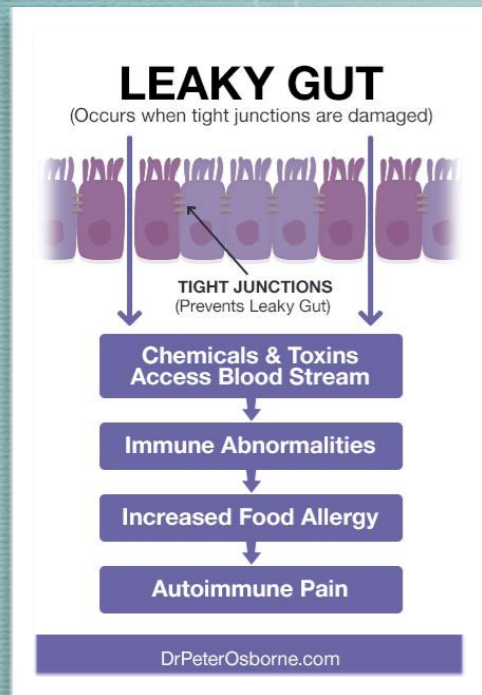
Gluten

- In June 2014, *International Ophthalmology* reported first case of Orbital Myositis and Celiac disease in a 26 year old patient
- There have been more reports of orbital myositis and celiac diseases being associated with one another
- So.....what is **Celiac disease**?
 - “Celiac disease is a malabsorption syndrome resulting from a small-bowel enteropathy related to the intake of dietary gluten in susceptible individuals (2–4). Gluten is thought to cause both direct and immune-mediated toxicity.”



Gluten

- There is light at the end of the tunnel.....
 - Discovery of **Zonulin** (protein responsible for damaging tight junctions of the digestive tract causing leaky gut syndrome) in 2000 by **Dr Alessio Fasano** (he found this by accident while researching a new drug to treat Cholera)
 - Better understanding of the process of gluten affecting the digestive tract and gut microbiome, which in turn causes effects of autoimmune diseases (including Myositis) to flare-up and worsen.



**We will talk more
about the Gut
Microbiome in a little
bit**

• Dr Fasano—reason why we have “Gluten free” choices on menus

Dairy



- “Neutral” to some and a “no-no” to others
- In AID resets, such as Whole 30, it is recommended to eliminate dairy (specifically lactose and Casein protein) for a minimum of 4 weeks up to 90 days to evaluate if it is a “trigger”
- Lactose (sugar) and Casein (protein)—difficult to digest for patients with autoimmune diseases, including Myositis (Celiac disease?)
- Only way to know—eliminate for certain period of time and then reintroduce slowly
- **Non-dairy sources** of Calcium: Almonds, Kale, Oranges, Collard greens, Broccoli, Figs, Spinach, Rice/Almond/Hemp/Coconut milk, Sesame seeds, Tofu

Sugar

- We are all addicted to sugar—and don't even really know it
- FDA recommends less than 50g daily (4 tbsp) though average American consumes double that
- Causes inflammation—elevates levels such as CRP (c-reactive protein).
 - In one study, consuming 50 grams of fructose caused these levels to spike within 30 mins and remain elevated for over 2 hours!
- Diet high in sugar—low grade chronic inflammation-worsens inflammatory markers—worsening a chronic inflammatory condition such as Myositis



Your brain on SUGAR.....



<https://mic.com/articles/88015/what-happens-to-your-brain-on-sugar-explained-by-science#.KONXiaFIK>



Sugar

- Increases gut permeability
 - Alters gut microbiota/bacteria causing bad to overtake the good
 - Leaks endotoxins into bodies causing chronic low grade inflammation (leaky gut syndrome)
- Causes weight gain/ obesity
 - Feeds fat cells (fat does not cause fat—sugar causes fat)
- Causes LDL (bad cholesterol) to increase
 - As weight goes up, so does the bad cholesterol
 - As LDL increases, HDL (good cholesterol that protects) decreases
 - LDL increases inflammation causing CRP to stay elevated



Natural vs Added Sugars

- Good Sugars
 - Whole Foods
 - Fructose in fruits
 - Come with other nutrients such as **fiber and protein**, which allows sugars to be absorbed slowly thus preventing glycemic index from spiking dramatically
- Bad Sugars
 - Taken out of its original source and added back into foods and drinks
 - High Fructose Corn Syrup (HFCS)
 - Corn Sugar
 - Glucose
 - Evaporated cane sugar (hidden in Kombucha!)



Alcohol

- QUESTION: Is this a friend or a foe?
- Alcohol causes inflammation in our gut- begins a systemic effect
- “Alcohol and its metabolites can trigger a persistent systemic inflammation, mediated by pro-inflammatory cytokines released from activated Kupffer cells in the liver and from monocytes in the circulation”





Alcohol

- Red wine contains polyphenols (which are consistently being investigated for their anti-inflammatory and antioxidant effects)
- Many studies have been conducted in the positive effects red wine (? Raise HDL, lower LDL, increase insulin sensitivity, and improve blood pressure)
- **MYOSITIS PATIENT CONCERNS**
 - Alcohol interacts with many medications used while treating Myositis (methotrexate, cyclosporine, prednisone etc)
 - Worsening inflammation and dehydration
 - Increased feelings of depression
 - Increased fatigue
 - Elevation of CPK levels



Soda



- Bottom line: Soda is bad for **EVERYONE!**
- Soda Stroke Study
 - Published April 2017 in STROKE journal
 - Linked with increased cardiovascular and neurological events
 - “2888 participants aged >45 years for incident stroke (mean age 62 years; 45% men) and 1484 participants aged >60 years for incident dementia (mean age 69 years; 46% men).”
 - **Conclusion:** Increased risk of stroke, all-cause dementia and Alzheimer’s dementia
 - Meaning people who are drinking diet sodas on a daily basis have a 3x higher incidence of developing dementia or having a stroke
- Study published in the Journal of Nutrition in January 2018 showed a direction association between elevated CRP (C-reactive protein) and soda consumption in Mexican Women
 - 825 Mexican women free of diabetes, cardiovascular disease and cancer
 - Premenopausal women had 56% higher CRP when compared to women in lower category

(Pase, M. P., Himali, J. J., Beiser, A. S., Aparicio, H. J., Satizabal, C. L., Vasan, R. S., . . . Jacques, P. F. (2017). Sugar- and Artificially Sweetened Beverages and the Risks of Incident Stroke and Dementia. *Stroke*, 48(5), 1139-1146. doi:10.1161/strokeaha.116.016027)



Anti-Inflammatory Supplements



Curcumin

- Active ingredient: Turmeric
 - Curry spice; Chinese medicinal herb
 - Inhibits inflammation, cell growth and cell death in most chronic inflammatory conditions
- Alleviates oxidative stress—brought on by chronic inflammatory conditions
- *Molecules* 2015 concluded Curcumin “therapeutic potential for various chronic inflammatory diseases”
 - Anti-inflammatory and anti-oxidative properties
 - Worrisome thing is the bioavailability (how well it is absorbed, distributed metabolized and eliminated from the body)

(He, Y., Yue, Y., Zheng, X., Zhang, K., Chen, S., & Du, Z. (2015). Curcumin, Inflammation, and Chronic Diseases: How Are They Linked? *Molecules*, 20(5), 9183-9213. doi:10.3390/molecules20059183)

F•Y•G

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Curcumin

- Things to consider before taking this supplement
 - Increases bleeding risk
 - Need to combine with piperines (black pepper) for better absorption
 - May increase risk for cardiac disease (inhibits effect on Cox-1 to Cox-2—increases cardiac inflammation)
 - Make sure your cholesterol is controlled due to this risk

Vitamin D

Vitamin D—Whats all the hype about?

July 15, 2018



Vitamin D. Everybody is talking about it. These days, we very rarely encounter a patient who does not either want their vitamin D levels checked or want to know much they should be taking. But honestly, do you know what the hype really is all about? Well, we are about to tell you. And you'll be blown away by how detrimental to both our current and future health a deficiency in this vitamin can be.

Vitamin D is a fat-soluble vitamin that helps increase the absorption of calcium (important for your bones), magnesium (important for your heart and muscle function), and phosphorus (helps with formation of bones and teeth and allows the body to make protein for cellular growth). Vitamin D itself is more effectively absorbed when taken along with vitamin K. It is known as the "sunshine vitamin" because of the fact that sun exposure stimulates its production from cholesterol in the skin. But there is always a catch. Unfortunately, because of the use of sunscreens, expanding rates of obesity, and increasingly common gut and kidney problems, we as medical professionals are seeing more and more patients with deficiency and

<https://followyourgutmdnp.wordpress.com/2018/07/15/vitamin-d-whats-all-the-hype-about/>

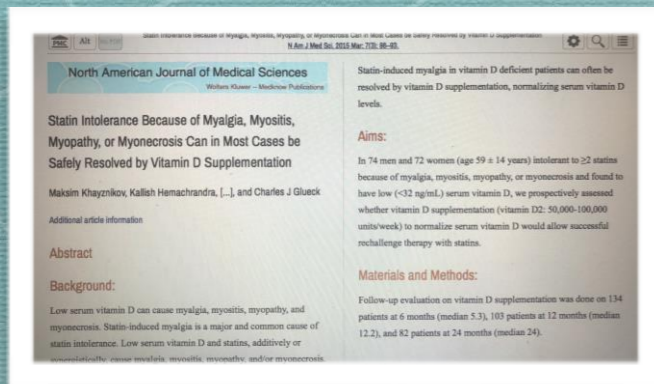


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Vitamin D

- AANP Conference 2012—“Designer D”
- Important for bone health but also..
 - Cardiovascular disease (deficiency linked)
 - Type 2 diabetes
 - Gestational issues (diabetes, preeclampsia etc)
 - Multiple autoimmune diseases
 - Colorectal and Breast Cancer (deficiency linked)
 - Migraine treatment (still questionable)
 - Major depressive disorder—meta analysis (top notch study type) showed supplementation had a favorable effect with a moderate effect size (just scratching the surface)
- Ideal range varies provider to provider—speciality to speciality (I use the range of 50-90 being ideal)
- Clinical studies showing Vitamin D “benefits” with range > 35
- Has been studied in so many different disease processes including Myositis disease





Vitamin D

- Correlation between low Vitamin D levels and **statin-induced** myositis-like symptoms
- Patients initially found level < 32
- After supplementation (50,000-100,000iu/week) rose > 50
- Patient were able to tolerate statins without myositis/muscle pains/muscle wasting with therapeutic effect on their bad cholesterol (LDL)
- At 6, 12, 24 month mark—88%, 91%, and 95% were free of symptoms while on statin therapy
- There doesn't seem to be much evidence as far as Vitamin D treating Myositis diseases such as PM, IBM or DM

Vitamin D

- 2013 Study published in *Annals of Rheumatic Diseases*
 - Correlation between low serum Vitamin D levels and patients with idiopathic inflammatory myopathies (PM, IBM, & DM)
- 76 PM, 52 DM, 15 IBM and 6 JDM
- IIM patients avg serum (38) vs patients without IIM (68)
- No significant difference between myositis subgroups
- IBM (68%) DM (65%) and IBM (53%) had deficient levels (<50) when compared to non-IIM patients (21%)

• This questions if low vitamin d levels may be risk

factor for adult myositis diseases as like other



Vitamin D

In regards to the main food sources of vitamin D, the following foods contain the highest levels:

- Fish oil (400–1000 IU/spoon of oil)
- Wild caught salmon (600–1000 IU/100 g)
- Eel (1200 IU/100 g)
- Herring in oil (400–800 IU/100 g)
- Sardines (300 IU/100 g)
- Salmon in a tin can (300–600 IU/100 g)
- Herring in a tin can (250 IU/100 g)
- Tuna in a tin can (230 IU/100 g)
- Shiitake mushrooms (100 IU/100 g) E
- Egg yolk (20–50 IU/1 egg yolk)
- Cow milk (0.4–1.2 IU/100 mL)
- Mothers milk (1.5–8 IU/100 mL)
- Cheese (7–28 IU/100 g)

Vitamin D

- Supplementation needs to be discussed with your GP or Specialist(s)
 - Kidney function needs to be considered
 - Risk for kidney stones
 - Toxicity rare: s/s nausea, bone pain, increased weakness, increased urination
- Over the counter supplementation ranges from 400iu to 5000iu—(liquid or capsules)
 - Dose needs to be decided by provider and yourself—what is the goal?
 - Which type should you take?
- Repeat level usually 4-6 weeks if just on OTC supplement. If on prescription for 8 weeks, recheck after that, or after starting OTC supplement for 4 weeks

Fish Oil

- **Anti-inflammatory:** Omega-3 EPA and DHA
- Reduces inflammation (including TNF-Alpha—cell signaling protein in systemic inflammation—one of the cytokines in acute phase)
- Dosage depends on different factors (age, medication interaction, risk of fall, bruising etc)
- **HOLD** prior to surgery per recommendation of physician/medical practitioner due to blood thinning side effect
- Usually eating *wild-caught* oily fish 2-3 times a week is enough (salmon, albacore tuna, mackerel, herring, sardines) Most high in mercury!
- No concrete data in regards to treating myositis symptoms/disease
- Not recommended for cardiovascular protection
 - No evidence
 - Can lower triglycerides but “makes labs look good”



CoQ10

- Combine with statin to prevent muscle pains, aches, myositis, or muscle wasting
- No great data supporting use primarily with myositis diseases
- In a March 2016 study conducted on obese **rats**,
 - Multiple regimens of statin used with/without various doses of CoQ10 was observed. When combined with Atorvastatin—generic Lipitor, CoQ10 at the 270mg/kg dose lowered CK (creatine kinase) levels and aspartate aminotransferase levels, which are markers for myopathies.
 - Lowered bad cholesterol levels (LDL and TRG), increased good (HDL) and noted an “anti-obesity effect”
 - Doesn’t mean this will help you lose weight if you take it
 - Does mean could help reduce inflammatory markers seen elevated with myositis diseases, but no data in regards to specific myositis subgroups



Folic Acid

- Supplement needs to be mentioned as it is important while taking **Methotrexate**
 - Avoid hair loss, GI symptoms, low WBCs, lung/liver toxicity
 - Usually rec 1mg daily but again, per recommendation of your specialist
 - Take in conjunction with B12
 - Sublingual formation only
 - Good food sources: red meats, dark green leafy veggies, eggs
 - If deficient, the only way to supplement is through sublingual or intramuscular injections

Glutamine

- Known to help prevent muscle wasting and preserve muscle
- ? Help with muscular dystrophies
- Has been known to **raise** methotrexate levels so use with caution and under strict supervision of your practitioner

Supplements to be leary of.....

- **Whey protein**

- Unsure if it helps with myopathies/autoimmune diseases
- Can cause inflammatory response—Casein as well which is a protein found in milk
- Lactose intolerant—have better response to pea proteins vs whey

- **Vitamin C**

- No good data
- Can aid in wound healing but no data in regards to muscle
- Good data to aid in fighting colds
 - “Meta-analysis has indicated that vitamin C supplementation with doses of 200 mg or more daily is effective in ameliorating the severity and duration of the common cold, and the incidence of the common cold if also exposed to physical stress” (FollowYourGutMDNP Blog)

- **Vitamin E**

- Data weak for myositis
- Can increase bleeding risk
- Does show anti-inflammatory properties for other autoimmune diseases and questionable anticancer properties

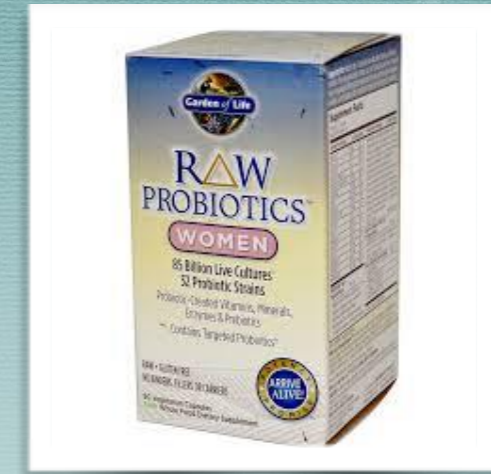
- **L-carnitine**

- No strong data supporting use in conjunction of Myositis disease
- Can help with muscle recovery
- ? Aid in weight loss (some studies do show it can aid in weight loss—prevents oxidative stress (inflammation and free radical attack on cells) and improves mitochondria function)





Probiotics



- Translates to “For Life” (Greek decent)
- Definition “live microorganisms which when administered in adequate amounts confer a health benefit to the host” (WHO)
- Many studies shown benefits of probiotics and prevention/treatment of autoimmune diseases
- In 2013 an “up-to-date” review of probiotics —probiotics could not be generally recommended at that time.
- **Now** probiotics might not be on the forefront of “prevention/therapy” for autoimmune diseases, but they do contribute to balancing the microbiome and microbiota so.....
- Foods that are considered “probiotics”
 - Yogurt/Kefir with live culture sources
 - Kombucha
 - Fermented foods such as sauerkraut, kimchi, miso, non-vinegar pickles
 - Aged cheeses

Probiotics

- If they are “live cultures” they do need to be refrigerated
- What to look for in a “good” probiotic
 - High CFUs (colony forming units) Amount
 - Strains (should be diversified)
 - Stability (refrigerated vs dry storage)

Gut Healthy Supplements

followyourgutmdp February 6, 2018



Welcome to Part 2 of our series about gut health! Now that we've set the stage and clarified exactly what the gut is and WHY it is so important, we wanted to go over a few key supplements that you should consider incorporating into your diet to support the digestive system and help heal a “leaky gut.”

You might ask “what exactly is a leaky gut?” It is actually quite common- and you may not even know you have it! Leaky gut is the less fancy name for “increased intestinal permeability” and refers to when the tight junctions (the spaces between the single layer of cells lining the intestinal wall) have been damaged. This disruption in the integrity of the intestinal walls allows everything from undigested food particles to bacteria to “leak” through the wall and into the blood stream. What is the problem with this? One word- inflammation. Your immune system sees these undigested food particles as “foreign invaders” and mounts a response against them. This response, while helpful in the case of infection with bacteria or viruses, causes inflammation throughout the body and can lead to everything from joint pain to skin issues and thyroid disorders. Perhaps a little more obvious, it can also lead to a plethora of digestive issues including nutrient malabsorption, gas/bloating, and irregular bowel habits. What can cause leaky gut in the first place? So. Many. Things! Gluten and an overgrowth of unhealthy gut bacteria (aka

SIBO, Small Intestinal Bacterial Overgrowth) and yeast are perhaps the most common culprits. Its also suspected that excess sugar, alcohol, and dairy play a role. I could go on and on about how exactly all of this happens, but I will spare you for now!

Even if you don't have leaky gut or other digestive issues, you could stand to support your GI system a little better. As Jaci alluded to in last week's post, the gut is central to EVERYTHING in the body. Your mental AND physical health depend on a well-functioning digestive system. While your diet is by far the most important factor in the gut health equation, I am going to leave that one to Jaci in next week's post- so stay tuned! For now, we are going to direct our focus to what supplements you can take to support your gut.

Probiotics-

Your gut contains both beneficial and harmful bacteria. Healthy gut bacteria are responsible for numerous functions including protection from infection, absorption of nutrients, production of B vitamins and vitamin K2, and maintenance of healthy GI motility (in other words, keeping you “regular”) (1, 2). In a healthy gut the number of beneficial bugs FAR outweighs the number of nasty ones. However, anything and everything from antibiotics to stress and processed foods can throw off this delicate balance- a condition known as dysbiosis. A probiotic can be helpful in bringing this ratio back into balance. But not just any probiotic will do! Here are a few things to consider when shopping for a probiotic-

1. **High CFUs**- CFUs can be thought of as the “dose” of the probiotic supplement and stands for Colony Forming Units. You should look for a probiotic with 10-100 billion CFUs, depending on if you want one for digestive health or have a specific digestive problem (ie. IBS or antibiotic associated diarrhea). This is just a general rule as optimal doses of probiotics have yet to be fully clarified by the research.
2. **Strain Diversity**- Look for a probiotic supplement with multiple strains of bacteria in it. Similar to CFUs, the research has yet to fully

clarify exactly which strains are the most helpful for specific conditions, but B. longum, B. bifidum, B. infantis, L. acidophilus, L. rhamnosus, and L. fermentum are ones to look for.

3. **Stability**- The last thing you want to do is invest money into a probiotic supplement that doesn't give you what you pay for! Check the label for a statement that says the company guarantees the potency until the time of expiration. You also want to pay close attention to whether the product needs refrigeration. If not, keep it in a cool, dry place.

Digestive Enzymes-

Digestive enzymes are especially important if you have any digestive issues (3). Enzymes help to properly break down the proteins and carbohydrates that you ingest, thereby increasing nutrient absorption and taking some of the stress off of the GI tract. If you aren't breaking down your food properly, undigested particles can provide food for the “bad” bacteria in your intestine and lead to dysbiosis.

In addition to those with IBS (irritable bowel syndrome), patients with acid reflux may benefit from taking digestive enzymes. When shopping for digestive enzymes, be sure and look for a broad spectrum one that contains a variety of enzymes including amylases (break down complex carbohydrates), proteases (break down proteins), lipases (break down fats), lactases (break down lactose in dairy), and invertases (break down simple carbohydrates). Take your enzyme BEFORE you eat your meal rather than with it.

DGL-

DGL, aka deglycrrhizinized licorice root, can help maintain the integrity of the mucosal lining of the GI tract. Licorice root that has not had the glycyrrhizinized component removed can cause issues with hypertension, therefore DGL is a safer option to use long term. I would still recommend that you be cautious and monitor your blood pressure while taking it if you have a history of hypertension. The typical dose of DGL is 300-500mg twice daily



F•Y•G

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Auto-immune diseases and Gut health

- HOT TOPIC in Medicine
 - **80% immunity produced in the gut**
 - 90% serotonin (“feel good hormone) produced
- “2nd brain”—Gut-Brain Axis—Gut not happy, brain is not happy
- Microbiota
 - Refers to the trillions of microbes
- Microbiome
 - Refers to the genetic makeup, categories and how they live
 - Affects digestion, mental health, AUTOIMMUNITY and SYSTEMIC INFLAMMATION, aging, overall physical health
- Correlation with “leaky gut syndrome” and activating autoimmune diseases (remember the gluten slide about Zonulin?)



Auto-immune diseases and Gut health

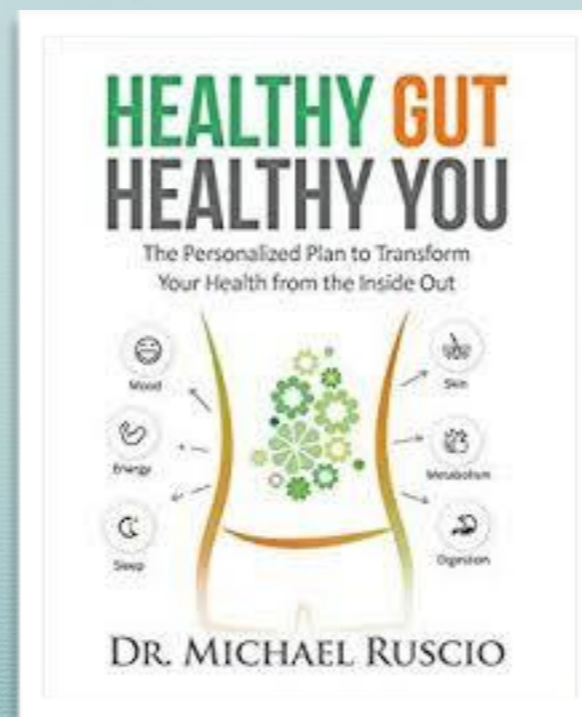
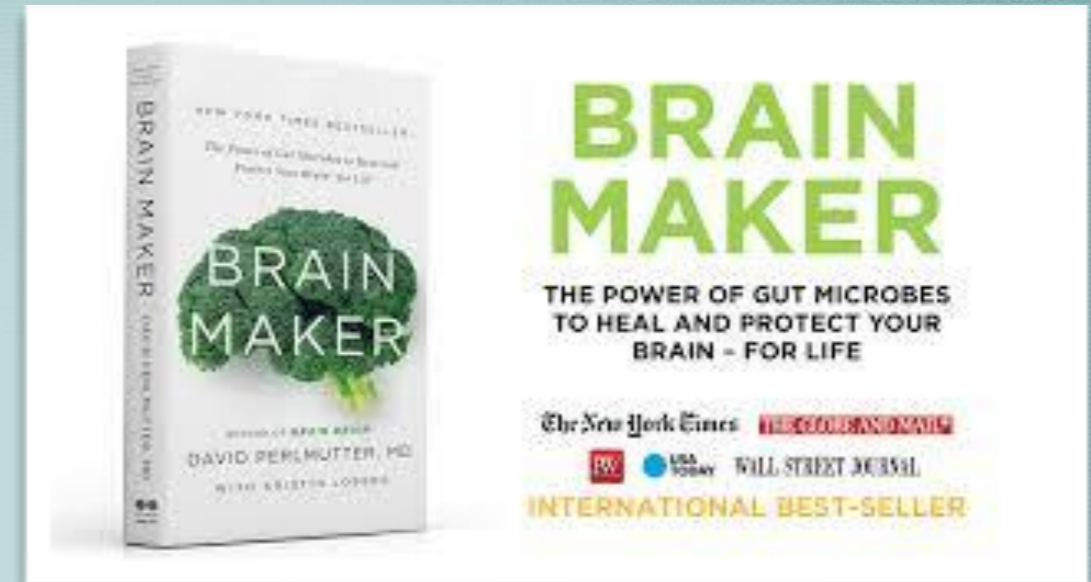
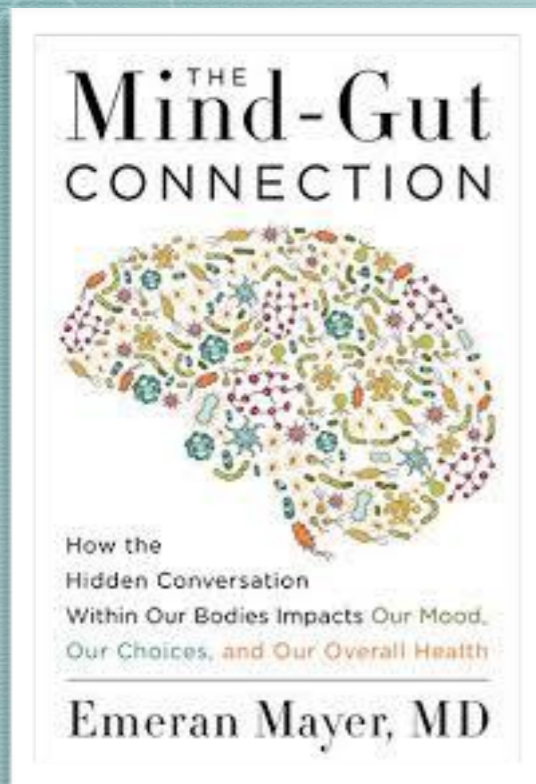
- Remember.....Dr Fasano's discovery fo Zonulin
- In 2011, Dr Fasano released "Leaky Gut and Autoimmune diseases"
 - Classic paradigm of autoimmune activation
 - Specific genetic makeup
 - Exposure to environmental triggers
 - Adding Intestinal Barrier Functional "Leaky Gut Syndrome"
 - Once gluten was removed, serum zonulin levels returned to normal, intestines went back to baseline barrier, autoantibody titers normalized, autoimmune process shut off and intestinal damage healed completely
 - Not saying this is a CAUSE but could be an addition to activation of autoimmune diseases
 - Study mentioned T1DM, Crohn's, Asthma, IBD, heavily on Celiac disease and being associated with these diseases
 - Celiac disease has a VERY HEAVY presence with Myositis diseases as well
 - This study questions autoimmunity, CD, and other autoimmune diseases association with one another



(Fasano, A. Clin Rev Allerg Immunol (2012) 42: 71. <https://doi.org/10.1007/s12016-011-8291-x>)



Books I recommend....



Autoimmune diseases and Ketogenic Diet

- High in fat, low carbohydrates. 4:1 ratio fat to combo of protein and carbs.
- Main source of energy is fat vs carbs.
- **Goal:** State of Ketosis (+ ketones in urine—not usually a good thing but goal when on ketogenic diet)
- Many studies have been performed or are being performed in benefit of ketogenic diet in autoimmune diseases
- Has been proven to improve epileptic activity in children (used for almost a century!)
- Improved cognition and memory in mice with autoimmune encephalomyelitis (<https://www.ncbi.nlm.nih.gov/pubmed/22567104>)
- Potential therapy to use in patients with Parkinson's and Alzheimer's



Autoimmune diseases and Ketogenic Diet

“A ketogenic diet improves motor performance but does not affect β -amyloid levels in a mouse model of Alzheimer’s Disease”

- **MICE** Study showed improvement in latency to fall after being on ketogenic diet for 2-3 months
- Mice fed ketogenic also weighed less—improvement in insulin resistance due to low carb intake
- Did not improve lowering B-Amyloid levels (causes inflammation)
- Did show decrease in grip strength but questions if this effects on certain muscle groups (quads vs paw flexors)
- Promising data coming as far as benefits of ketogenic diet with improving cardiovascular disease, type 2 diabetes, obesity etc. All of these are secondary



Summary

- AID (Anti-Inflammatory diet) overall consists of fresh, whole fruits and vegetables, lean proteins, good healthy fats, minimal to no carbohydrates
- Avoid processed foods, HFCS, increased amount of carbohydrates (if you have carbs make sure complex)
- Always remember “One person’s food is another person’s poison”
- Gluten has been shown to be a high trigger in regards to inflammation—correlation between CD and myositis
- Supplements to consider: Curcumin, Vitamin D, Fish Oil, folic acid, glutamine
- Probiotics are a must for your gut health
- Your GUT contains 80% of your immunity (and possibly even more..)
- Exciting data coming out about Ketogenic diet and inflammatory diseases
- In the end, ALWAYS DISCUSS WITH YOUR HEALTHCARE PROVIDERS any of these suggestions prior to starting any new dietary or supplemental regimen



And always remember
to....





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