

Nutrition and Myositis

What we know
(and don't)

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Talk Outline

- ✿ Eating healthy in general
- ✿ Nutritional abnormalities in chronic disease
- ✿ Specific supplements and diets related to myositis

“It’s not rocket science”

- ✿ Eat healthy foods
- ✿ Eat moderate portion sizes
- ✿ Eat a varied diet
- ✿ Enjoy your meals
- ✿ Involve yourself in meal preparation

We are so much more than our myositis

- ✿ We are what we are thanks to our genes and our environment
- ✿ We do have control over some things
- ✿ We unfortunately can also get:
 - ✿ Diabetes
 - ✿ Heart disease
 - ✿ Cancer
 - ✿ Alzheimer's

Anti-oxidants

- ✿ Decrease oxidative stress, especially in heart disease and cancer
- ✿ Water-soluble, e.g. vitamin C
- ✿ Fat-soluble, e.g. carotene, vitamin E, CoQ10
- ✿ Found in vegetables, fruits, beans, nuts, herbs and spices
- ✿ Supplements are not as effective as whole foods (? fiber, other compounds)

Anti-oxidants

✿ Foods richest in antioxidants:

- ✿ Beans, like red, kidney and pinto
- ✿ Artichoke hearts
- ✿ Berries
- ✿ Apples and plums
- ✿ Green tea
- ✿ Dark chocolate!!

✿ Balance!!

- ✿ Over-eating of one type can result in mineral binding, e.g. calcium, zinc, iron
- ✿ Oxalates (cocoa, spinach), phytates (legumes, whole grains), tannins (tea, beans, cabbage)

Eat Your Veggies (and Fruits)



- ✿ All vegetables provide good nutrients and fiber with some exceptions:
- ✿ Corn and white potatoes have a high-glycemic index
- ✿ Other veggies can nearly be eaten in unlimited quantities with a healthy preparation
- ✿ Fruit: “One is a serving; two or more is dessert”
- ✿ Juice: how many apples or oranges would you eat?



Carbohydrates:

Our love-hate relationship

- ✿ Sugar really can be addictive; eliminating it causes decreased desire
- ✿ Learn to lower your glycemic load
- ✿ Avoid all processed foods
- ✿ “Fight the white”: Grains should be whole-grain, such as bulgur wheat, brown rice, quinoa
- ✿ No high-fructose corn syrup!!
- ✿ Avoid soda: sugary ones are worse, but diet ones still contain phosphoric acid

And then there are the fats...

- ✿ Our society has an imbalance of omega-6 and omega-3 fatty acids, also called PUFAs
- ✿ Major factor responsible for obesity epidemic
- ✿ Omega-3 = anti-inflammatory
- ✿ Omega-6 (in excess) = pro-inflammatory
- ✿ Early human diet was 1:1 of 6:3 PUFAs; now it is 10:1 -15:1 or higher

Fatty Acids: Omega-6

- ✿ Food sources: linoleic acid (LA)
 - ✿ Soy, safflower, corn, sunflower, grapeseed
 - ✿ May be more pro-inflammatory than helpful
- ✿ GLA (*gammalinolenic acid*)
 - ✿ May be anti-inflammatory and helpful for autoimmune disorders
 - ✿ Found in black currant, borage and evening primrose oils
 - ✿ Avoid doses of borage oil over 2 grams/day, unless free of pyrrolizidine alkaloids, which may damage the liver

Fatty Acids: Omega-3

- ✿ Alpha-linolenic acid (ALA): flaxseeds and walnuts richest sources as well as canola; ALA → EPA → DHA
- ✿ EPA and DHA: oily fish major sources as well as enriched eggs
- ✿ Supplements: fish oil has EPA and DHA; algal and fungal sources have DHA

Fatty Acids: Omega-3

- ✿ Can decrease production of inflammatory molecules, including TNF-alpha
- ✿ May increase the efficacy of anti-TNF-alpha therapy
- ✿ Eating oily (wild-caught) fish 1-3 times a week may be enough
- ✿ EPA 2-3 grams per day as supplement

What fats to eat?

- ✿ Cooking oils: olive (extra-virgin), walnut, flaxseed, coconut (medium chain saturated fat), expeller-pressed organic canola, sunflower or safflower
- ✿ Food sources: fish (salmon, sardines, herring), omega-3 fortified eggs, hemp, chia seeds and flaxseeds
- ✿ Nuts, especially walnuts, cashews, almonds
- ✿ And....a weed??

Purslane

- ✿ You probably have it in your yard
- ✿ More Ω -3 fatty acids (ALA) than any other leafy plant
- ✿ Use as you would spinach
- ✿ Can be eaten raw, stir-fried, in soups



What fats not to eat?

- ✿ Simple: Avoid any partially hydrogenated fats
- ✿ Avoid corn, cottonseed, safflower, vegetable, and sunflower oils*
- ✿ Avoid fried foods: potential for *trans*-fats or toxic compounds with high heat

*unless expeller-pressed, organic

Anti-Inflammatory Diet

- ✿ Avoid processed foods: eat “whole foods”, the way nature intended it
- ✿ Avoid sugar, high-fructose corn syrup
- ✿ Eat lean protein, more fish and whole soy products, less animal protein



Anti-Inflammatory Diet

- ✿ Remember those vegetables
- ✿ Broth-based soups
- ✿ Green, white or oolong tea
- ✿ Chocolate! (at least 70% cocoa)
- ✿ Consider eating organically

Positive Effects of Anti-Inflammatory Diet

- ✿ In a 2007 study, Rose Mary Istre found those with myositis who followed an AID over 12 weeks had improved:
 - ✿ Ease of routine activities
 - ✿ Severity of depression
 - ✿ Grip, arm and leg strength measurements





Consider Eating Organic

- ✿ Unclear if pesticides, etc. are harmful for (or trigger??) autoimmune disease
- ✿ Organic foods are also non-genetically-modified (non-GMO)
- ✿ GMO foods can have animal genes inserted into fruit/vegetable genes

The “Dirty Dozen”: “Buy organic or not at all”

- ✿ Peaches
- ✿ Apples
- ✿ Bell peppers
- ✿ Celery
- ✿ Nectarines
- ✿ Strawberries
- ✿ Carrots
- ✿ (Lettuce)
- ✿ Cherries
- ✿ Kale
- ✿ Grapes
- ✿ Blueberries
- ✿ Spinach
- ✿ Potatoes
- ✿ Grapes (imported)

The “Clean Fifteen”: Lowest in Pesticides

- ✿ Onions
- ✿ Avocados
- ✿ Sweet corn
- ✿ Pineapple
- ✿ Mango
- ✿ Asparagus
- ✿ Sweet peas
- ✿ Sweet potato
- ✿ Kiwi
- ✿ Cabbage
- ✿ Eggplant
- ✿ Papaya
- ✿ Watermelon
- ✿ Broccoli
- ✿ Tomatoes

So remember...

✿ Eat the rainbow!

- ✿ Include lots of foods - whole and fresh - that are red, orange, green, blue and yellow

✿ “Fight the white”: Avoid...

- ✿ White sugar (or too much of any kind, really)
- ✿ White potatoes
- ✿ White rice
- ✿ White bread (or maybe all wheat bread....)



Curcumin

- ✿ Active ingredient in turmeric (think curry and mustard)
- ✿ Inhibits inflammation with interest in cancer, inflammatory disease and Alzheimer's
- ✿ 2007 study in mice: blunting of CK increase with exercise-induced muscle damage
Davis J. Am J Physiol Integr Physiol 2007;292:R2168
- ✿ 2008 study in mice improvement with muscular dystrophy
Pan Y. Mol Cells. 2008;25(4):531



Curcumin

- ✿ Seems to accumulate best in colon
- ✿ Holds promise for GI-related conditions
- ✿ Curcumin is very poorly absorbed
- ✿ Doses less than 4 grams per day were not detected in serum in human clinical studies
- ✿ New formulations, such as nanoparticles are being investigated to increase its availability

Curcumin

- ✿ Need to combine with piperines (black pepper extract) to improve absorption
- ✿ May increase bleeding in those taking drugs like coumadin
- ✿ Because of its inhibitory effect on COX-1 and COX-2, might increase risk of cardiac disease
- ✿ Have a good lipid profile as safeguard

Coenzyme Q10 (ubiquinone)

- ✿ Reduction in CoQ10 could cause abnormal mitochondrial dysfunction
- ✿ Statins lower CoQ10, but studies have not shown that supplements increase levels
- ✿ “The present evidence does not support [its] supplementation in statin-induced myopathy.”

Schaars C and Stalenhoef, 2008 Current Opinion in Lipidology

The problem with CoQ10

- ✿ No great data for its use in myositis (IIM)
- ✿ As we age, CoQ10's absorption, biosynthesis and conversion to ubiquinol decreases
- ✿ Ubiquinol form is better absorbed and probably more effective
- ✿ Does it matter? (Serum vs. tissue levels)
- ✿ Interest in cardiac, neurologic and **periodontal** diseases
- ✿ 150 mg daily of ubiquinol used in studies
- ✿ Avoid if on coumadin



Boswellia

- ✿ May have positive effects on the immune system
- ✿ Clinical studies suggest efficacy in some autoimmune diseases including rheumatoid arthritis, Crohn's disease, ulcerative colitis and bronchial asthma

Vitamin D

- ✿ Clearly seems to have a role in *preventing* autoimmune disease (patients with DM/PM, RA, SLE, etc. found deficient)
- ✿ Its role in *treatment* less clear
- ✿ However, supplementation in statin-induced myositis patients reversed symptoms in 87% of the 150 patients studied

Glueck C. Current Med Res Opin 2011;27:1683

Vitamin D

- ✿ Important to support bone health, mental health and especially those avoiding the sun
- ✿ Blood levels above 30 considered adequate
- ✿ Treatment for deficiency: 2000 IU/day of vitamin D₃ or 50,000 IU/week of vitamin D₂
- ✿ Decreased by steroid use

Folate (folic acid or B9)

- ✿ A must for anyone taking methotrexate to decrease its side effects:
 - ✿ Decreased white blood cells, GI symptoms, hair loss, liver and lung toxicity
- ✿ One should also ensure adequate vitamin B₁₂ intake since its deficiency can be masked by folate deficiency

Probiotics

- ✿ Observed increase in autoimmune disease with decrease in beneficial bacteria
- ✿ Autoimmunity associated with “leaky gut”, allowing antigens to enter and stimulate the immune system
- ✿ In many autoimmune conditions, improving intestinal inflammation improves symptoms

Probiotics

- ✿ Use of probiotics in mice:
improvements or prevention of RA, MS
and type-1 diabetes
- ✿ Improvement seen with **periodontitis**
- ✿ Dietary sources: yogurt, kefir or lassi
with live cultures, aged cheese,
fermented foods (brine-cured, non-
vinegar pickles, sauerkraut, kimchi,
miso)

Probiotics

- ✿ Bacterial supplements should have billions of cultures and include Bifidobacterium, lactobacilli (casei, rhamnosus)
- ✿ Caution in those immune-suppressed:
 - ✿ Bacterial infections may result; rare cases of sepsis reported in infants and adults with malignancy, cardiac (valve) disease, diabetes or advanced age
 - ✿ Rare fungal infections reported in those taking the probiotic yeast, *Saccharomyces boulardii* (Florastor)

Other supplements

- ✿ Vitamins C and E: no good data
- ✿ L-carnitine: no good data
- ✿ Glutamine:
 - ✿ Because it inhibits muscle wasting and preserves muscle protein, it may help myotonic muscular dystrophy
 - ✿ Can raise methotrexate levels; no good data on myositis

Supplements that may do more harm than good

✿ Spirulina (*S. platensis*) and blue-green algae (*Aphanizomenon flos-aquae*)

- ✿ At least two patients with DM had a flare or onset of their disease after taking these

- ✿ Lee A. *Arch Dermatol* 2004;140:723

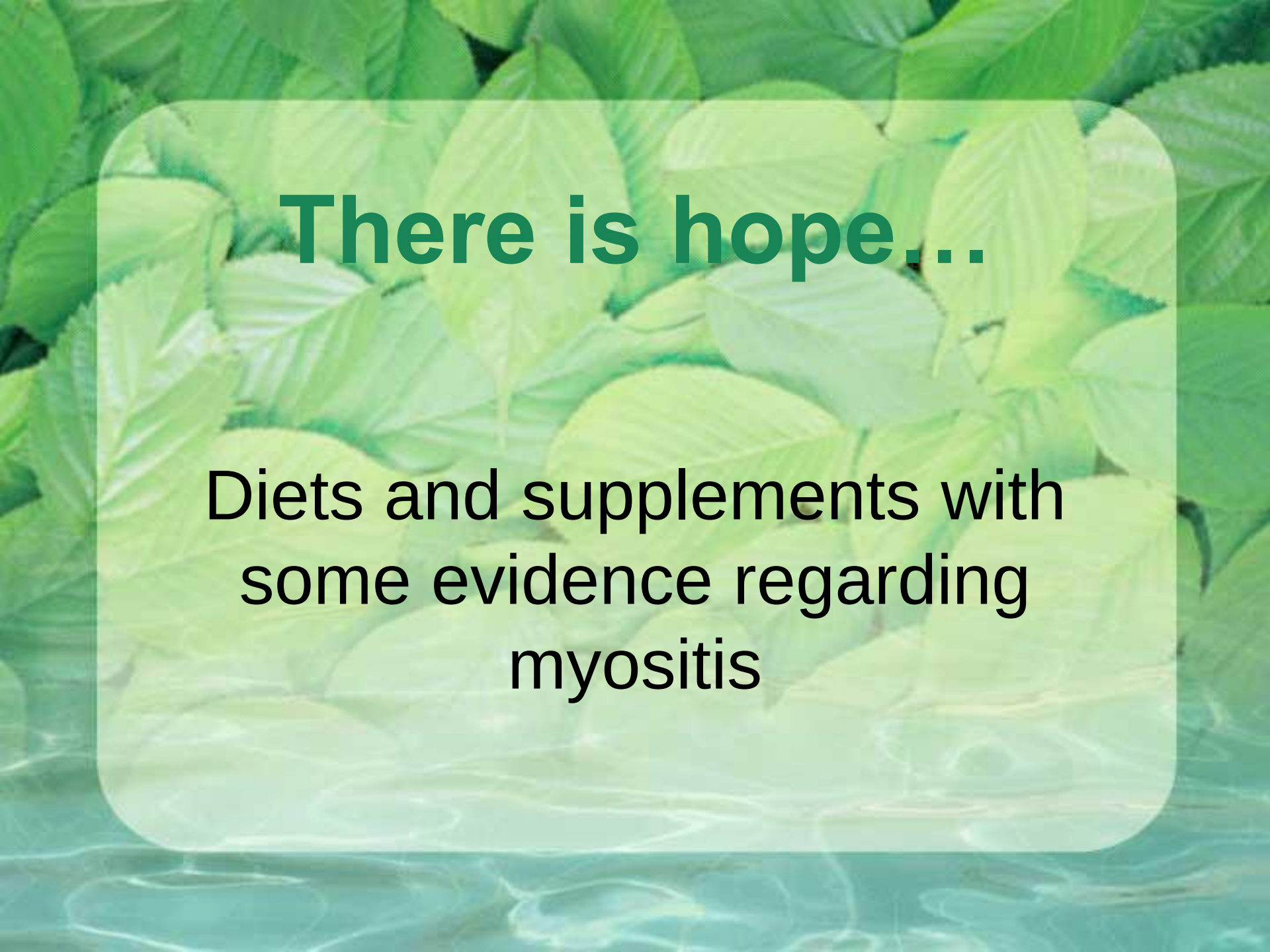
- ✿ Konno T. *Rinsho Shinkeigaku* 2011;51:330

✿ Echinacea (purple coneflower)

- ✿ Has produced flares of lupus, including kidney-related complications

✿ Alfalfa

- ✿ Has caused lupus-like symptoms in animals
- ✿ Sprouts and tablets have been linked to lupus in humans

The background of the slide features a close-up of vibrant green leaves with prominent veins, some showing serrated edges. Below the leaves, there are soft, concentric ripples on a light blue-green surface, suggesting water. A semi-transparent white rounded rectangle is centered over the image, containing the text.

There is hope...

**Diets and supplements with
some evidence regarding
myositis**

Gluten Sensitivity

- ✿ Association of myositis with gluten sensitivity described since at least 1976
- ✿ There have been reports of clinical improvement following a gluten-free diet in **PM, DM and IBM**
- ✿ Not all patients will have positive antibodies (anti-glutaminase/gliadin/endomysial, etc.)

Gluten Sensitivity

✿ Symptoms can range from none to:

- ✿ Weight loss
- ✿ Abdominal cramping
- ✿ Bloating
- ✿ Loose stools
- ✿ Anemia
- ✿ Evidence of bone loss
- ✿ Vitamin E deficiency

Gluten sensitivity: Substitutions



✿ Brown rice

✿ Quinoa

✿ Buckwheat

✿ Millet

✿ Sorghum

✿ Teff

✿ Amaranth

✿ Tapioca

Many available as:

✿ Breads

✿ Pasta

✿ Cereals

✿ Flours

Creatine: Definitions and clarifications

- ❖ Creatinine: metabolized end-product of creatine, found in blood, muscle and urine; *measured to assess renal function*
- ❖ Creatine kinase (CK) or creatine phosphokinase (CPK): muscle enzyme involved in energy production; *measured to assess skeletal muscle inflammation or damage*, as well as in brain and heart muscle

Supplements: Creatine

- ✿ Taken as a daily *supplement* to improve muscle strength and/or mass
- ✿ A 2011 Cochrane review deemed it a worthwhile supplement with few side effects for those with DM and PM
- ✿ Most data was taken from a 2007 study done in the UK and Sweden (Dr. Ingrid Lundberg was a co-author)
 - ✿ Chung et al. *Arthr Rheum* 2007;57:694-702

Supplements: Creatine

- ✿ Dosage used in the 2007 study:
 - ✿ Start with 20 grams per day for 8 days (loading dose)
 - ✿ Continue with 3 grams per day (maintenance dose)
- ✿ Noted improved performance, ability to undertake high-intensity exercise and endurance work
- ✿ Effect maintained over 5 months



Supplements: Creatine

- ✿ Safety: there were no side effects noted
- ✿ Previous concerns about renal (kidney) toxicity do not seem warranted, as long as there is no underlying renal disease
- ✿ Unfortunately, this does not seem to be effective for inclusion-body myositis (IBM)



Summary

- ✿ Eat a varied diet of mainly fresh plant-based foods, lean (wild, organic?) protein, good fats, avoiding bad fats processed and high-glycemic foods
- ✿ Focus on whole foods rather than supplements
- ✿ For all: consider probiotics (especially if antibiotics used frequently)
- ✿ Probably avoid spirulina and blue-green algae, possibly alfalfa, echinacea

Summary

- ✿ For all, but DM especially: check vitamin D level
- ✿ For anyone on MTX: take folic acid
- ✿ For PM, DM, IBM: consider gluten-free trial
- ✿ For PM, DM: consider creatine
- ✿ Stay hopeful for more data on coenzyme Q10 and curcumin-piperine, but worth a try

Resources: General

✿ Center for Science in the Public Interest

✿ www.cspinet.org

✿ American Society for Nutrition

✿ www.nutrition.org

✿ Tufts University Healthletter

✿ Healthletter.tufts.edu

Resources: Drug interactions

- ✿ http://drugs.com/drug_interactions
- ✿ <http://reference.medscape.com/drug-interactionchecker>
- ✿ <http://www.doctoroz.com/videos/drug-interaction-checker>
 - ✿ Very detailed with options for interactions between drug, herbs and supplements, and labs, some as positive interactions

Resources: Supplements

- ✿ Office of Dietary Supplements

- ✿ [Dietary-supplements.info.nih.gov](http://dietary-supplements.info.nih.gov)

- ✿ Linus Pauling Institute (Oregon State U.)

- ✿ <http://lpi.oregonstate.edu/>

- ✿ National Center for Complementary and Alternative Medicine (NIH)

- ✿ nccam.nih.gov

- ✿ www.consumerlab.com

- (Reports on independent supplement testing)

Resources: Books

- ✿ *Wheat Belly* by William Davis, MD
(gluten sensitivity); www.wheatbellyblog.com
- ✿ *Eat to Live* and *Super Immunity* by Joel Fuhrman, MD
(general healthy eating); www.drfuhrman.com
- ✿ *The Probiotics Revolution* by Gary Huffnagle, PhD
- ✿ *Integrative Rheumatology* by Randy Horwitz, M.D. and David Muller, M.D.
- ✿ *Nutrition and Rheumatic Disease*, edited by Laura Coleman, PhD, RD (textbook)