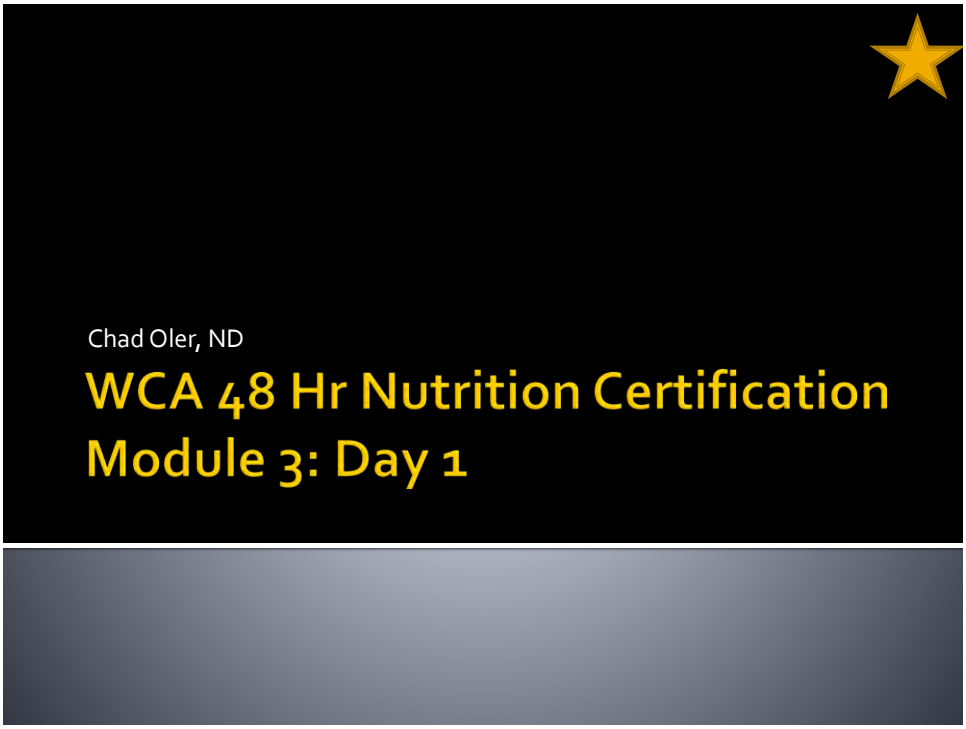


1

48 Hr Nutrition Certification Outline

- Module 1
  - Importance of nutrition/lifestyle medicine
  - Nutrition and body chemistry
  - Macronutrients: Protein, Carbohydrates, Fats
    - Artificial sweeteners, alcohol, fiber
  - Water and hydration
  - Micronutrients: Water/Fat soluble vitamins, Minerals/Metals
    - RDAs, deficiency, toxicity, therapeutic considerations
  - Conditionally essential nutrients
  - Glandulars & therapeutic enzymes
  - Organic Foods and Health

2

48 Hr Nutrition Certification Outline

- Module 2
  - Nutritional counselling
  - Nutritional screening/diet history assessment
  - Nutritional exam & testing
    - In-house testing
    - Laboratory data
    - Functional testing
  - Supplements and Nutrition
  - Supplement quality
  - Codex Alimentarius & DSHEA
  - Nutrient-Drug-Food Interactions

3

48 Hr Nutrition Certification Outline

- Module 3
  - Supplementation and Nutrition
  - Standard American Diet
  - Organ system dysfunction, diseases and conditions
    - Including etiology, signs & symptoms, lab/nutritional assessment and management with nutraceuticals/nutrition

Inflammation	Musculoskeletal Conditions
Gastrointestinal Disorders	Cardiovascular Conditions
Nervous system Conditions	Immune Conditions
Respiratory Conditions	Endocrine Conditions
Urinary Conditions	

4

48 Hr Nutrition Certification Outline

- Module 4
  - Nutrition across the lifecycle

Pregnancy/lactation	Infant nutrition
Children/adolescent	Teens
Young adults	Geriatrics

    - Nutrition & common conditions
      - Therapeutic use of diet & nutraceuticals
  - Obesity management and control
    - Children and adults
  - Sports nutrition

5

Module 3: Day 1

- Standard American Diet
- Inflammation and chronic disease
- Health Conditions by system:
  - Musculoskeletal conditions
  - Gastrointestinal conditions

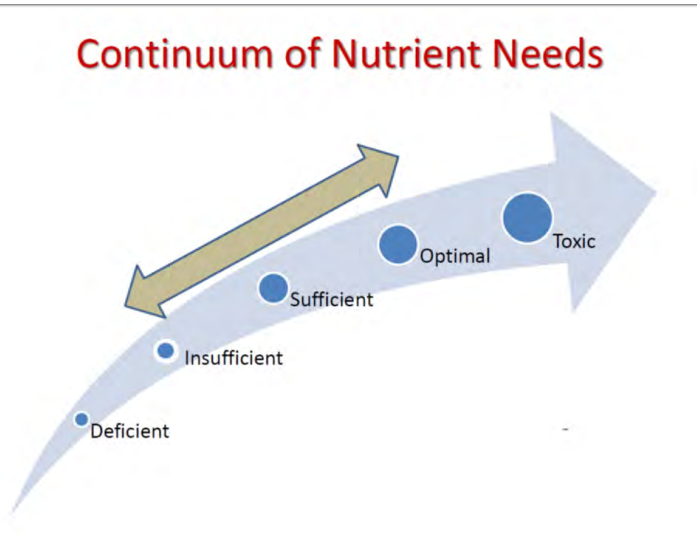
6

Module 3: Day 2

- Health Conditions by system:
  - Cardiovascular conditions
  - Nervous system conditions
  - Immune system conditions
  - Respiratory conditions
  - Endocrine system conditions
  - Urinary conditions

7

The Need for Supplementation



8

Really SAD Diet

- 92% do not eat enough vegetables
- 93% do not eat enough legumes
- 96% do not eat enough whole grains
- Over 90% over-consume solid fats, added sugars and alcoholic beverages

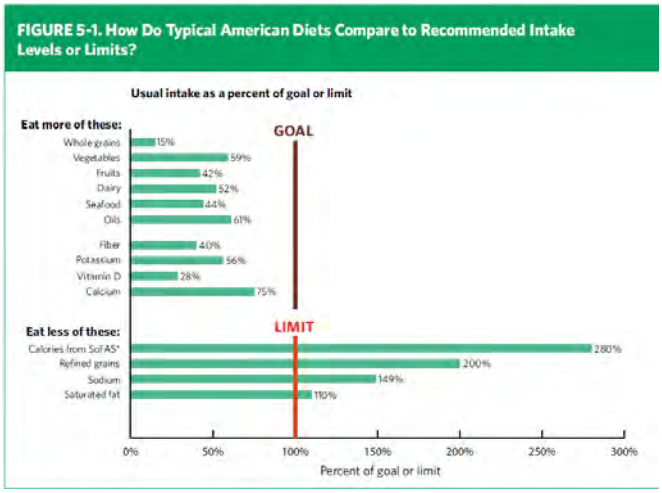
9

Sad SAD Diet

- 45% do not eat ANY fruit or fruit juice
- 22% do not eat ANY vegetables
- ¼ of all vegetables consumed = French fries
- 20-25% of Americans eat fast food/day
- 70% of all foods consumed are highly processed
- Average only 2-3 servings vegetables/day

10

We are plant deprived

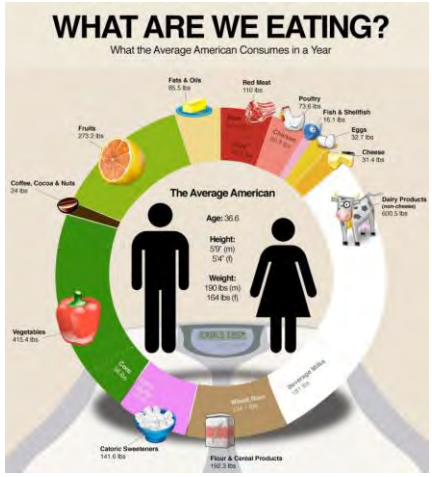


U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2010. 7th Edition*, Washington, DC: U.S. Government Printing Office, December 2010.

11

What Americans Eat

- Dairy products: 600.5 lbs
  - Ice Cream: 24 lbs.
- Cheese: 31.4 lbs.
  - Pizza: 23 lbs..
- Red meat: 110 lbs.
- Fats & Oils: 85.5 lbs.
- Coffee, Cocoa & Nuts: 24 lbs.
- Vegetables: 415.4 lbs.
  - French fries: 29 lbs.
  - Corn: 56 lbs.
- Caloric sweeteners: 141.6 lbs.
- Artificial sweeteners: 24 lbs.
- Soda: 53 gallons
- ➢ 2700 calories/day



https://visual.ly/what-americans-eat

12

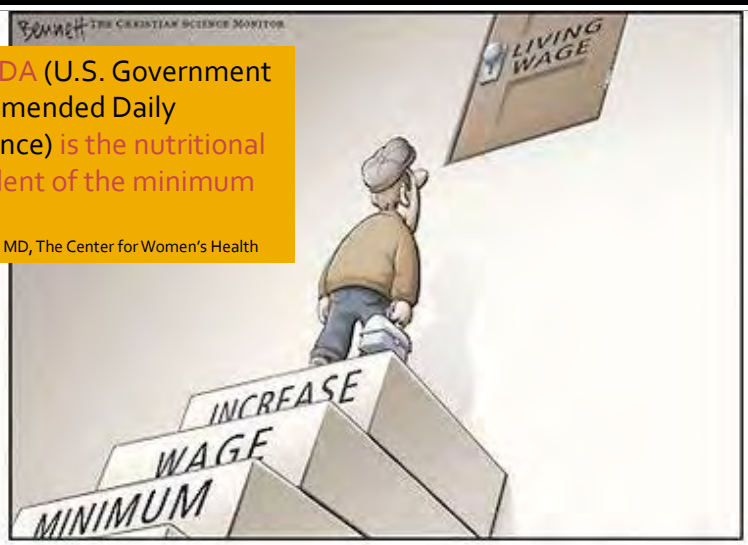
The NEED for Supplementation

"Nearly the entire U.S. population consumes a diet that is not on par with recommendations" – conclusion of a report published online on August 11, 2010 in the Journal of Nutrition.

J Nutr. 2010 Aug;140(8):1529-34

13

Supplementation for Optimal Health



"The RDA (U.S. Government Recommended Daily Allowance) is the nutritional equivalent of the minimum wage."
- Joel Evans, MD, The Center for Women's Health

14

Sad SAD Diet

- Most Americans eat foods that will kill them and avoid foods that will help them thrive

15

USDA Food Pyramid

16

Optimal Nutrition

- An adequate diet (USDA – Food Pyramid) prevents gross nutritional deficiency
- An optimal diet improves performance and promotes health and longevity

17

Comparison of Food Pyramid and Optimal Diet

	Optimal Diet	RDA	% RDA
Vitamins			
Vitamin A - IU (IU)	54596.31	3500.00	1559.89%
Vitamin A - RAE (RAE)	2549.54	700.00	364.22%
Vitamin A - Carotenoid RE (RE)	5039.54		
Vitamin A - Retinol RE (RE)	29.77		
Beta-Carotene (mcg)	26317.55		
Vitamin B1 - Thiamin (mg)	7.83	1.10	711.41%
Vitamin B2 - Riboflavin (mg)	8.37	1.10	760.91%
Vitamin B3 - Niacin (mg)	107.34	14.00	766.73%
Niacin Equivalents (mg)	71.63	14.00	511.62%
Vitamin B6 (mg)	58.32	1.30	4486.19%
Vitamin B12 (mcg)	68.56	2.40	2856.81%
Biotin (mcg)	328.82	30.00	1096.08%
Vitamin C (mg)	630.55	75.00	840.73%
Vitamin D - IU (IU)	796.89	200.00	398.44%
Vitamin D - mcg (mcg)	9.92	5.00	198.44%
Vitamin E - Alpha-Toco (mg)	14.08	15.00	93.89%
Folate (mcg)	1891.82	400.00	472.96%
Folate, DFE (mcg)	771.82	400.00	192.96%
Vitamin K (mcg)	1246.44	90.00	1384.93%
Pantothenic Acid (mg)	22.58	5.00	451.57%

18

Comparison of Food Pyramid and Optimal Diet

	Optimal Diet	RDA	% RDA
Minerals			
Calcium (mg)	1955.58	1000.00	195.56%
Chromium (mcg)	195.10	25.00	780.40%
Copper (mg)	4.46	0.90	495.65%
Fluoride (mg)	0.02	3.00	0.51%
Iodine (mcg)	166.35	150.00	110.90%
Iron (mg)	20.53	18.00	114.05%
Magnesium (mg)	763.43	310.00	246.27%
Manganese (mg)	6.35	1.80	352.67%
Molybdenum (mcg)	201.56	45.00	447.91%
Phosphorus (mg)	2219.64	700.00	317.09%
Potassium (mg)	6113.84	4700.00	130.08%
Selenium (mcg)	180.41	55.00	328.02%
Sodium (mg)	1165.93	2300.00	50.69%
Zinc (mg)	20.42	8.00	255.23%

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Optimal Nutrition

- An adequate diet (USDA – Food Pyramid) prevents gross nutritional deficiency
- An optimal diet improves performance and promotes health and longevity
- Know WHAT you should eat and avoid & WHY
  - Turns "I should" into "I choose to"
- Body chemistry and cellular nutrition vitally important for optimal nutrition

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Optimal Health

- Guarded, not taken for granted
- Is not covered under insurance
- Is an individual responsibility
- Optimal health depends on optimal nutrition
- Maximum number of years of active, enjoyable living
- Allow you and your clients to do what they need and want to do

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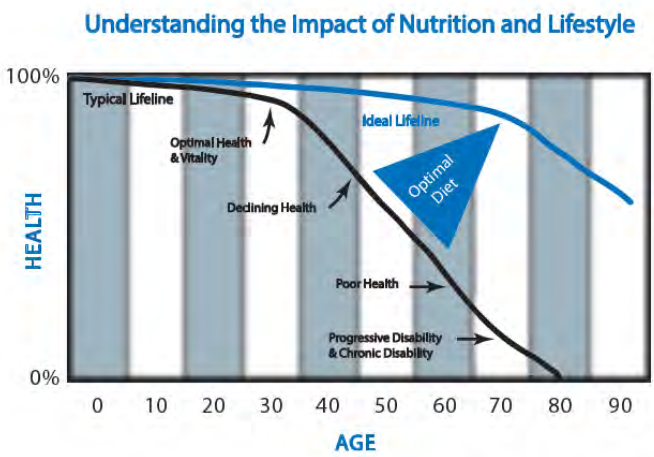
The Impact of Optimal Nutrition



22

We live too short and die too long!

- Quantity vs. Quality
- By 2030, nearly 150 million Americans will have at least 1 chronic health condition
- Elderly <30% of those with chronic conditions that cause limitation/disability
- 1 in 10 young adults and 1 in 15 children have activity-limiting chronic conditions
- Oxidative damage is a major cause of degenerative disease

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The Consequences of the SAD Diet

- Obesity
- Weakness and Fatigue
- Inflammatory conditions
- Abnormal Blood Sugar Regulation
  - Insulin resistance
  - Metabolic syndrome
  - Type II Diabetes
- Cardiovascular Risks
  - High blood pressure
  - High cholesterol

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Chronic Disease

- Chronic disease begins in childhood
- We are overfed and undernourished
- 'Fast-food' = harmful food
- Atherosclerosis now found in
  - Children 2-15 yrs old!
  - 30% of 16-20 yr olds!
  - 50% of 21-25 yr olds!
  - 75% of 26-39 yr olds!

G.S. Berenson, S.R. Srinivasan, W. Bao, et al."Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults: The Bogalusa Heart Study." New England Journal of Medicine 1998, 338:1650-56.

K.L. Munoz, et al."Food Intakes of US Children and Adolescents Compared with Recommendations." Pediatrics 1997, 100:323.

25

Treat or Change?

- Think of your body as a fish tank
  - Cells, organs and tissues as the fish
  - Pollute the water, put in too much or the wrong kind of food, slow down filtration/elimination = sick fish
  - Will you treat them or change the water and give them what they need to thrive?
- We need to change our internal environment to heal and thrive

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Health Conditions By System

Musculoskeletal Cardiovascular

Digestive Nervous

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Inflammation & Disease/Dysfunction

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Inflammation and Chronic Disease

- Psoriasis & eczema
- High blood pressure
- High cholesterol
- Alzheimer's Disease
- Diabetes/Metabolic Syndrome
- Rheumatoid Arthritis
- Cancer
- Asthma & Allergies
- Osteoarthritis
- Crohn's Disease/colitis
- Cardiovascular Disease
- Osteoporosis
- Obesity
- Fibromyalgia
- Chronic Fatigue
- Headaches
- Autoimmune disorders
- Chronic Pain
- Depression/Anxiety
- Multiple sclerosis
- Renal disease

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Inflammation and Chronic Disease

- In 2012, 50% of all adults in the US had one or more chronic health conditions
  - ~117 million people
  - 24.3% had 1 chronic diseases (28.5 million people)
  - 13.8% had 2 chronic disease (16 million people)
  - 11.7% had 3 chronic diseases (14 million people)
- Single largest contributor to medical burden in industrialized countries

30

Inflammation – Friend or Foe

- Inflammatory response is protective
- Excessive or uncontrolled inflammation delays healing and can cause disease
- Nutrients can be rate-limiting factors for tissue repair and healing
- ➢ Use food/nutrition to help change body chemistry to minimize prolonged inflammation & promote healing

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Inflammation, Chronic Pain & Arthritis

- Inflammation 101
  - Natural and protective response to initiate healing
  - Beneficial vs. harmful
    - Degree of inflammation
    - Time
    - Necessary nutrients
  - Inflammation is an immune response
  - Chronic inflammation is silent, but deadly

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Most Americans Live in PAIN

- 53% of Americans suffer from chronic/recurrent pain
  - Start with making sure they are in proper alignment
  - Identify physical/structural causes
  - Use nutrition & supplementation to modify the pain cascade

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Inflammation

- Inflammation is an immune response and is regulated by chemical mediators
  - White blood cells (neutrophils, monocytes/macrophages, basophils & eosinophils)
  - Cytokines (IL-1, IL-6, TNF-α)
  - Eicosanoids (prostaglandins, leukotrienes, thromboxanes)
  - Enzymes – Cyclooxygenase (COX) & Lipooxygenase (LOX)

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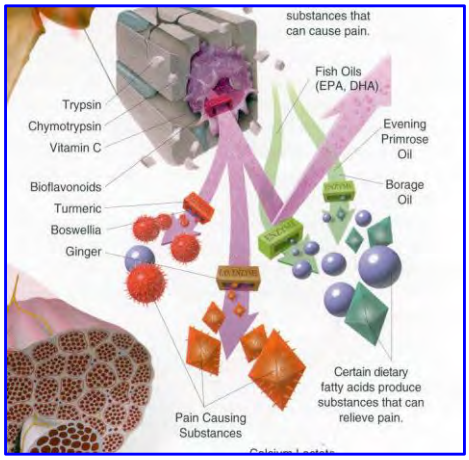
The Pain Cascade



The biochemistry of pain:

- White blood cells release cytokines
- Target cells react to cytokine by increasing the formation of cyclooxygenase (COX) enzymes
- COX enzymes covert *cellular* fat into pro-inflammatory compounds such as PGE2
- This cascade is "induced" by cytokine activity

35

The Pain Cascade

Tissue injury or immune threat initiates a response in the body that produces a series of chemicals that causes inflammation and pain in an attempt to heal the injury or address the immune threat.

This works well as long as there is a healthy balance between pro-inflammatory and anti-inflammatory compounds during this process.

Unfortunately, <u>many people experience chronic inflammation and pain because they have not given their bodies the tools it needs to maintain this balance</u>.

36

Etiology of Inflammation & Chronic Pain

- Trauma/injury
- Nutritional imbalances
- Inflammatory Diet
- Dehydration
- Immune challenge/dysfunction
- GI dysfunction/inflammation
- Toxicity

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Managing Inflammation

- Address the cause(s)
  - Trauma/injury
  - Nutritional imbalances
  - Inflammatory Diet
  - Dehydration
  - Immune challenge/dysfunction
  - GI dysfunction/inflammation
  - Toxicity

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Managing Inflammation

- Modulate the inflammatory process
  - Chiropractic adjustment(s)
  - Dietary Interventions
  - Stress management
  - Meditation and visualization
  - Supplementation

39

SAD & Inflammation

- 92% of individuals do not meet the total vegetable recommendation (1-2.5 cups/day)
  - 25% of all veg ANY vegetables
- 45% do not eat ANY fruit or fr fries
- Over 90% of individuals over-consume solid fats, added sugars and alcoholic beverages
  - High in trans fats, saturated fats, omega-6 fatty acids, sugars and alcohol

Super-Inflammatory American Diet

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Sugar – Sweet Inflammation

- The average American consumes 156 lbs of sugar each year
  - = 31 5-lb bags of sugar per person/year
  - 44 tsp of sugar EVERY DAY

41

Soft/Energy Drinks

- Account for more than 27% of total beverage consumption in the US
- Average American drinks over 54.5 gallons of soft drinks per year (almost 600 12 oz. cans)
- 36% of added sugar intake comes from soda
  - Single largest source of refined sugar in US diet!

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pH of Liquids

- Remember that the body must maintain an alkaline (pH>7.0) chemistry, so a low pH is BAD!

Substance	pH	Substance	pH
Pure water	7.0	Diet Mountain Dew	3.34
Cow's milk	6.5	Mountain Dew	3.22
Barq's	4.61	Orange Slice	3.12
Beer	4.4	Nestea	3.04
Diet 7Up	3.67	Gatorade	2.95
Wine	3.5	Coke / Pepsi	2.50
Diet Coke	3.39	Battery Acid	1.0

- Ditch the soda!

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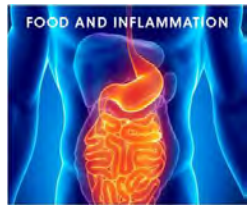
Eat to Heal

- Eat Food. Not too much. Mostly Plants
  - Strictly avoid: red meat, dairy, alcohol, soda, sugar, white flour products
  - Eat: vegetables, fish, whole fruits
    - 75%+ (3/4 plate) alkaline foods: deep colored vegetables/fruit
    - 25% MAX (1/4 plate) HEALTHY acidic foods: fatty fish, raw nuts/seeds & some whole grains (~1-2 servings/day)
- Chew, chew chew!
- Drink pure water throughout the day
  - *½ body weight in ounces every day in divided doses*



44

Managing Inflammation- Diet

- Anti-inflammatory diet

CATEGORY	AVOID	RECOMMENDED (organic preferred)
Dairy & Dairy Alternatives (protein, fat)	Animal milks (all, even "lactose-free"), buttermilk, yogurt, cheese, cream, ice cream, sour cream, cream cheese, chocolate; non-dairy creamer Soy milk, cheese, yogurt	Unsweetened milk alternatives: rice, hazelnut, hemp, almond, coconut, gluten-free oat Vegan cheese from rice or almonds
Meat, Poultry & Fish (animal protein)	Eggs, egg replacers, beef, pork Poultry fed hormones/antibiotics Shellfish; farm-raised seafood Breaded patties, fish sticks Processed/canned meats, sausages	Free-range lamb, chicken, turkey Wild game Wild-caught seafood: fresh, frozen, or water-packed in can Deep-sea fatty fish
Legumes, Nuts & Seeds (veg, protein, fat, carbs/fiber)	Soybean products: tempeh, tofu, textured vegetable protein, protein powder, edamame, wasabi peas Peanuts, peanut butter	All other canned, frozen, or dry beans/peas; hummus All other nuts/unsweetened nut butters All seeds/unsweetened seed butters
Grains, Breads, Cereals & Pastas (protein, carbs/fiber)	Cornmeal/flour, corn starch Foods with wheat and wheat flours (whole or white); processed cereals Spelt, kamut, rye, barley Oats (unless certified gluten-free)	Whole grains, flours, and other products from rice, millet, arrowroot, teff, tapioca, amaranth, quinoa, buckwheat Gluten-free oats/oatmeal Potato flour/starch*
Fruits (carbs/fiber)	Oranges, orange juice Fruits/juices/spreads/preserves with added sugars Grapefruit/juice	Fresh, unsweetened, dried, frozen, or canned, water-packed fruits 100% fruit juices
Vegetables (carbs/fiber)	Corn; nightshade veggies ~~(optional)*~~ Breaded or creamed vegetables Veggies in cheese/butter sauces	All other fresh raw, steamed, sautéed, or roasted vegetables, greens & potatoes* Unsweetened vegetable juices

45

Managing Inflammation- Diet

- Anti-inflammatory diet

CATEGORY	AVOID	RECOMMENDED (organic preferred)
Sugars & Sweeteners	Foods with: white/brown/powdered sugar, cane sugar/juice, corn syrup, sucanat, high fructose corn syrup (HFCS or corn sugar), molasses/sorghum, glucose, sucrose, dextrose Extracts (e.g., vanilla, almond)	Small amounts: raw honey, pure maple syrup, agave syrup/nectar, brown rice syrup, natural fructose, fruit sweeteners (juice concentrates), stevia Carob, cinnamon
Oils & Fats	Oil from soybeans, peanuts, palm Butter, margarine, shortening Processed and hydrogenated oils Mayonnaise and salad dressings with dairy, gluten, or sugars Fried foods	Oils: cold-pressed olive, flaxseed, canola, safflower, sunflower, sesame, walnut, pumpkin, almond, grapeseed, coconut Avocado; olives
Other Seasonings & Condiments	Soy sauce, wasabi (soy) BBQ sauce, ketchup, wet mustards Prepackaged seasonings with gluten/dairy/sugars	Lemon/lime juice All vinegars (except malt) Red pepper, cayenne, other peppers* Unsweetened salsa and tomato sauces* Garlic, onions, chives All other fresh or dry herbs and spices
Other Beverages	Flavored waters Sodas (all) Energy/sport drinks Drink mixes and mixers Beer, mixed alcoholic beverages	Water: tap, spring, sparkling, filtered, distilled, seltzer (add splash of fruit juice or slices to any water) Unsweetened tea and coffee (2 cups max.) Herbal teas (unlimited)

* Nightshade plants include tomatoes, tomatillos, pimentos, white/gold/red potatoes, eggplant (baba ganoush), peppers (bell, hot), and tobacco. Not in the nightshade family: black pepper, sweet potatoes, yams, and boniato (white sweet potatoes).

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Managing Inflammation - Diet

- Dietary recommendations:
  - Anti-inflammatory diet
  - Determine/eliminate food hypersensitivities and any other food triggers, especially dairy, gluten & sugar
  - Avoid nightshade vegetables (tomatoes, white potatoes, eggplant and bell peppers)
  - Avoid citrus (tomatoes, oranges, grapefruit)
  - Get plenty of EFAs (fatty fish, flax)
  - Eat an alkaline (at least 50-75%) & varied diet (stress deep colored vegetables and fruits)

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Additional Dietary Guidelines

- Eat more sulfur containing foods:
  - Asparagus, garlic, onions, green leafy vegetables, whole grains, oatmeal, brown rice, fish
  - Needed for repair of bone, cartilage & connective tissue; support detoxification
- Eat/juice *fresh* pineapple/papaya frequently
- Get some fiber daily – legumes, ground flaxseeds, oat bran, rice bran; lots of vegetables/fruits; and whole grains
- Reduce the amount of saturated fat in the diet. Eliminate cow's milk/dairy & red meat/organ meats.
- Avoid caffeine, salt, tobacco, corn/peanut oil and everything that contains sugar or white flour – all ⇑ acidity/inflammation

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Dietary Considerations - Inflammation

- Do not take iron supplements
- Eat iron & Vitamin C rich foods
  - Blackstrap molasses, broccoli, Brussels sprouts, cauliflower, fish, lima beans & peas
- If remodeling bone, focus on calcium rich vegetables and foods, not dairy products – better body chemistry

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Calcium rich foods

There are plenty of ways to get sufficient calcium in your diet without resorting to calcium pills and milk products. Here is a list of calcium rich foods. The calcium content is based on 3.5 oz portions and the amount in mg is approximate.

Food	mg Calcium	Food	mg Calcium
Hijiki*	1400	Sunflower seeds	175
Wakame*	1300	Watercress	150
Kelp*	1100	Garbanzo beans	150
Kombu*	800	White beans (dried)	145
Wheat/barley grass	515	Quinoa	140
Sardines	445	Mustard greens	140
Agar agar*	400	Black beans	135
Nori*	260	Pinto beans (dried)	135
Sesame seeds (hulled)	200-300	Broccoli	130
Amaranth	220	Yogurt	120
Canned salmon (w/ bones)	200-250	Milk	120
Hazelnuts	210	Beet greens	120
Parsley	200	Tofu	115
Turnip greens	190	Spinach (cooked)	105
Collard greens	190	Walnuts	85
Brazil nuts	185	Eggs	55
Dandelion greens	185	Brown rice	35
Kale	185	Halibut	15

* Sea vegetables

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Calcium-Rich Foods: How much to eat

Each of the following servings contains about 300 mg calcium (1 serving); note: most people should consume 1000-1500 mg calcium/day or about 4 servings of the foods below.

- 3 cups cooked dried beans (Great Northern, navy, pinto)
- 10 dried figs
- 2 corn tortillas
- 2 ½ tablespoons blackstrap molasses
- 1 ¾ cup broccoli
- 1 ½ cups cooked mustard or turnip greens
- 1 ½ cup cooked kale
- 1 cup collard greens
- 2-3 tablespoons ground sesame seeds
- 3 ½ ounces canned Pacific mackerel with bones
- 3 ounces canned sardines with bones
- 4 ounces canned salmon with bones
- Soy milk and soy protein – varies by brand
- 1 cup low-fat or nonfat plain yogurt
- 1 ¾ cup low-fat cottage cheese
- 8 ounces skim or 1% milk

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Alkalizing Ideas

- Eat a breakfast of alkalizing fruits or veggie juice
- Eat at least 2 cups of alkalizing vegetables at both lunch and dinner
- Drink the juice of ½ a lime/lemon or 1 tsp of apple cider vinegar in 6-8 oz. water a few times daily
- Eat at least 2 cups of alkalizing greens (kale, mustard & turnip greens, collards or endive) daily
- Add miso and seaweed to soups and other dishes
- Enjoy liberal amounts of fruit, especially watermelon
- If gas/bloating a problem, cook vegetables/fruit and have small amounts of fresh vegetable juice

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The Dehydration Epidemic

What America Drinks *Servings per day in order of quantity*	
▪Water – 4.6 ▪Coffee – 1.8 ▪Milk – 1.3 ▪Juices – 1.4 ▪Soda with caffeine – 1.3	▪Tea – 1.0 ▪Soda without caffeine – 0.6 ▪Beer – 0.5 ▪Wine or other alcoholic beverage – 0.3

- Coffee, soda, caffeinated beverages, and alcohol are all diuretics – which means they are *dehydrating*
- Net is that the average American consumes only ~3 eight (8) oz. servings of hydrating beverages daily!

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Functions of Water in the Human Body

- Improves oxygen delivery to the cells
- **Transports nutrients**
- Enables cellular hydration
- Cushions and lubricates bones and joints
- Absorbs shocks to joints and organs
- Regulates body temperature
- **Removes wastes and flushes toxins**
- **Improves cell-to-cell communications**
- Maintains normal electrical properties of cells
- **Allows immune system to function properly**

Reduces Inflammation!

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Detrimental Effects of Dehydration

Early Signs of Dehydration	Mature Signs of Dehydration	
▪Fatigue ▪Anxiety ▪Irritability ▪Depression ▪Cravings ▪Cramps ▪Headache	▪Heartburn ▪Joint and back pain ▪Migraine headaches ▪Fibromyalgia ▪Constipation/colitis ▪Anginal pain	▪Asthma and allergies ▪Adult onset diabetes ▪Hypertension ▪Autoimmune disorders ▪Skin disorders (psoriasis, eczema, etc.)

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Our Body's Water Needs

- We lose 2-3 quarts of water per day through normal perspiration, respiration, urination and metabolism
- Can increase dramatically with exercise, changes in temperature, humidity, altitude, stress & body size.
  - *Drink ½ your body weight in ounces every day + water lost during excessive sweating*
  - *Must drink in divided doses – 2-4 oz. every 20-30 minutes ideal*
  - Drink the purest water available – distilled, reverse osmosis, filtered bottled water, bottled spring water
- It can take weeks to months to become properly hydrated

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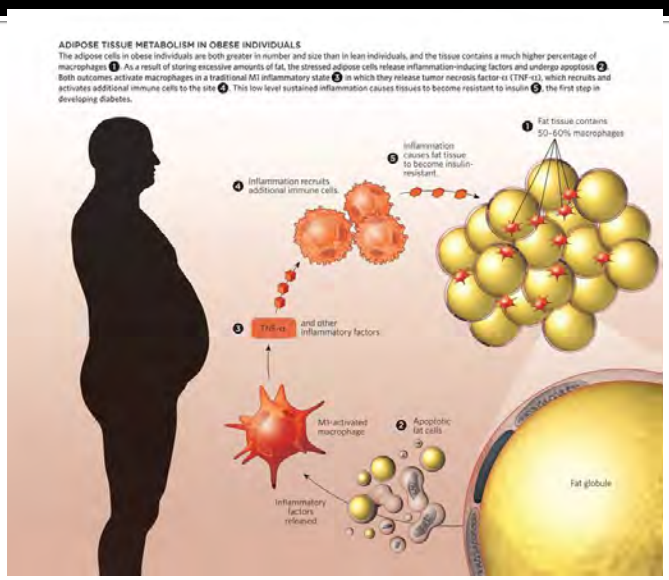
Fat Is Inflammatory

- Body fat produces inflammatory chemicals
  - Organ of Inflammation

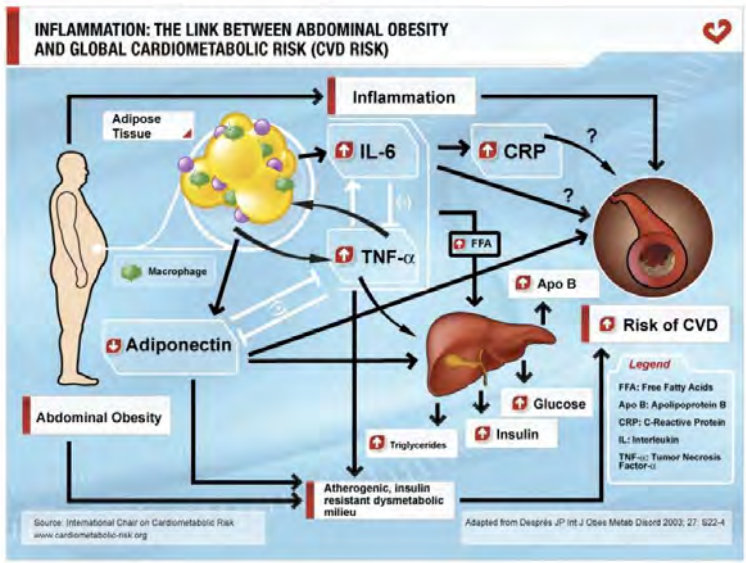
57

Fat = Organ of Inflammation



58

Fat = Organ of Inflammation



59

Obesity = Inflammatory Disorder

- ***Being overweight or obese is actually an inflammatory disorder & CAUSES***
  - Diabetes, atherosclerosis, stroke, heart disease, depression, immune dysfunction, asthma, arthritis, Alzheimer's, dementia, cancer…
  - ➢ Being overweight/obese is killing you

60

Stress and Inflammation

- Everyone that is chronically ill is chronically stressed
- Stress increases inflammation
  - Chronic cortisol production
    - Leads to insulin resistance and increased body fat
  - Negative stress directly increases IL-6

61

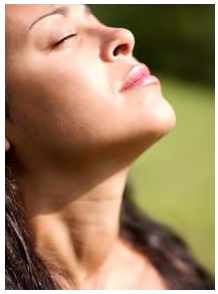
Stress Management

- Anti-inflammatory diet
- Deep Breathing
- Stretching
- Meditation & Relaxation Response
- Progressive Muscle Relaxation
- Visualization
- Find FUN
- Sleep

62

Deep Breathing

- Incorporate into *daily* routine
  - Helps you slow down
  - Increase oxygen
  - Eliminates CO_2
  - Relaxes tense/tired muscles
  - Calms the adrenal response



63

Sleep and Rest

- Poor quality sleep and too little sleep causes
  - Adrenal dysfunction
  - Fat deposition
  - ↑ INFLAMMATION
- Get 8-10 hours/night
  - The more before midnight the better
  - Correct sleep apnea if necessary
- If naps are restorative, take them
- 8-9 hours/night ↓ inflammation

Papanicolaou DA et al. The pathophysiologic roles of interleukin-6 in human disease. Ann Int Med 1998, 128:127-37.
Vgontzas AN, et al. Adverse effects of modest sleep restriction on sleepiness, performance, and inflammatory cytokines. J Clin Endocrinol Metab 2004, 89:2119-26.
Irwin MR, Wang M, Ribeiro D, et al. Sleep loss activates cellular inflammatory signaling. Biol Psychiatry. 2008 Sept 15;64(6):538-40.

64

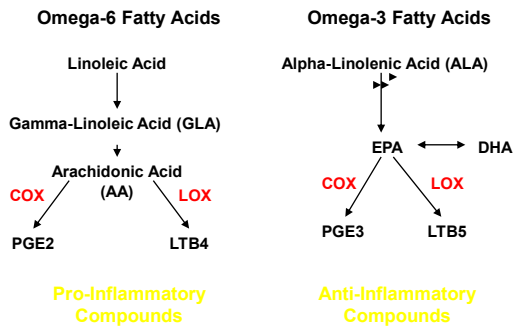
Chronic Pain Management

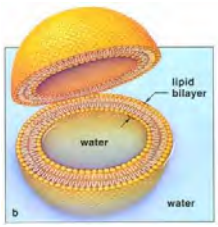
- The goal of a healthy, nutritional approach to pain relief is to:
  - Modulate the inflammatory response
    - Reduce production of pro-inflammatory compounds
    - Increase production of anti-inflammatory compounds
    - Reduce the production of inducible COX activity without affecting constitutive COX production
  - Repair the damage
  - Support proper GI/gut ecology
  - Support proper GI/gut integrity

65

Eicosanoids

- Produced from ω-6 and ω-3 EFA present in cell membranes



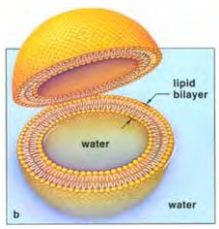


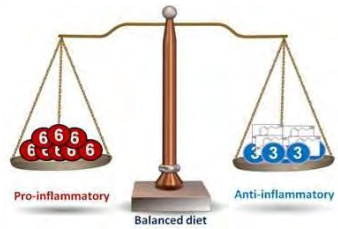
- ω-6 : ω-3 in US ~25:1; we need a ratio ~2:1

66

Balancing Act

- By balancing a typically ω-6 and AA rich diet with ω-3 EFA:
  - Displace AA (ω-6) from cell membranes
  - Change the balance of eicosanoid synthesis toward anti-inflammatory mediators and away from pro-inflammatory mediators.





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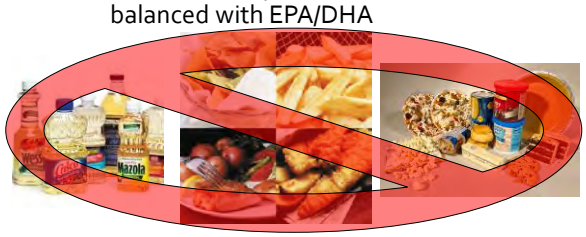
Modulation of the Inflammatory Process

- Essential fatty acids (EFAs)
  - Typically, diet high in ω-6 (corn, sunflower, safflower oils), AA (red meat, eggs, peanuts) and saturated, hydrogenated or partially hydrogenated fats – intensify inflammation – ELIMINATE THESE
  - ω-3 – EPA and DHA – cold water fish (salmon, trout, halibut), leafy green vegetables, flax – anti-inflammatory – EAT THESE

⇒ Consume 1-2 Tbsp flaxseed oil/day and/or take 2-10 grams EPA/DHA (fish oils) w/ meals

⇒ Skin disorders/hormone imbalances: consume GLA – 240 mg 1-2x/day balanced with EPA/DHA



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Modulating the Inflammatory Process in Chronic Inflammation

- ***Essential Fatty Acids (EPA/DHA)***
  - ***Molecularly distilled/enteric coated – no burping***
  - ***Also good for dry/itchy anything, headaches, asthma***
- *Omega Pure EPA-DHA 1000* – 1 softgels 2-3x/day

Ingredient	Amount
Calories	15
Total Fat	1.5 g
Cholesterol	5 mg
Total Omega-3 Fatty Acids	1.1 g
EPA (Eicosapentaenoic acid)	730 mg
DHA (Docosahexaenoic acid)	270 mg
Additional Omega-3 Fatty Acids	100 mg

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Determining EPA/DHA Content

Each Capsule contains 1000 mg Fish Oil….

Supplement Facts

Serving Size 1 Soft Gel
Servings Per Container 60

1 Soft Gel Contains	Amount Per Serving	% Daily Value
EPA	420 mg	*
DHA	300 mg	*

* % Daily Value not established

Ingredients: Purified marine triglyceride concentrate Vitamin E mixed tocopherols, gelatin, glycerin and purified water.

3 grams EPA/DHA = 4 softgels

Supplement Facts

Serving Size: 4 Soft Gel Capsules
Servings Per Container: 30

4 soft gel capsules contain	Amount Per Serving	% Daily Value
DHA	185 mg	*
EPA	105 mg	*

* % Daily Value not established

Ingredients: Highly Purified and Concentrated Omega-3 Fish Oil, Gelatin, Glycerin, Purified Water, Natural Mixed Tocopherols, Orange/Berry Flavor, Rosemary Extract and Ascorbyl Palmitate.

3 grams EPA/DHA = 40 softgels

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Modulation of the Inflammatory Process

- Herbs
  - Ginger & Turmeric - ↓inducible COX/LOX
    - Curcumin – ↓ morning stiffness and joint swelling
    - Ginger – ↓ pain, swelling and muscular discomfort
  - Boswellia – potent LOX inhibitor
    - ↓ joint pain & swelling and morning stiffness
    - ↓ symptoms of RA in 50-60% of patients
    - Unlike NSAIDs – no side effects or toxicity reported
  - Cayenne pepper - ↓ COX, powerful antioxidant
    - Reduces pain and inflammation
    - Antioxidant, reduces platelet aggregation and promotes circulation

Salmon, JA, Higgs, GA. Prostaglandins and leukotrienes as inflammatory mediators. *Br Med Bull* 1987;43(2):285-96.
Shils, ME, Olson, JA, Shike, M, *et al*. Modern nutrition in Health and Disease. 9th Ed. Baltimore: Williams and Wilkins;1999.
Flynn, DL., Rafferty, MF. Inhibition of human neutrophil 5-lipoxygenase activity by ginger-dione, shogaol, capsaicin and related pungent compounds. *Prostaglandins Leukotr Med* 1986;24:195-98.
Srivastava, K.C., Mustafa, T. Ginger (*Zingebar officinale*) in rheumatism and musculoskeletal disorders. *Med Hypoth* 1992;39:342-48

71

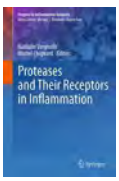
Modulation of the Inflammatory Process

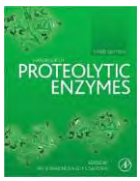
- Sizzlin' Lemonade
  - Juice of ½ lemon
  - 6-8 ounces water (hot or cold)
  - 2 tsp pure maple syrup (less to taste)
  - 1/10 tsp cayenne pepper (gradually increasing to ½ tsp)
- Combine all ingredients, stir well and enjoy!

72

Modulation of the Inflammatory Process

- Proteolytic enzymes
  - Bromelain (pineapple), papain (papaya), proteases, trypsin, chymotrypsin, pancreatin
    - Reduce pain and inflammation and promote recovery
    - Inhibit pro-inflammatory compounds, remove wastes and improve circulation to speed healing
    - Significantly reduce pain and inflammation
    - Also very good for acute pain/trauma





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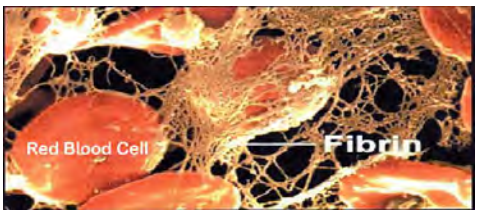
Modulation of the Inflammatory Process

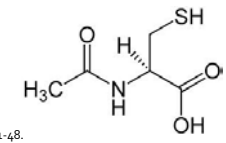
- Proteolytic enzymes
  - Improve circulation
    - Speeds nutrient deliver and waste removal
  - Reduces swelling
  - Reduces pain
  - Speeds healing



74

Modulation of the Inflammatory Process

- Bioflavonoids (rutin, quercetin)
  - ↓ pro-inflammatory compounds & protect connective tissue
- Niacinamide
  - Need can be 10x normal amount
  - Especially for those with RA or OA
- N-acetylcysteine (NAC)
  - ↓ pro-inflammatory chemicals
  - Antioxidant; ↑ GSH and SOD
  - Synergistic effects with niacinamide

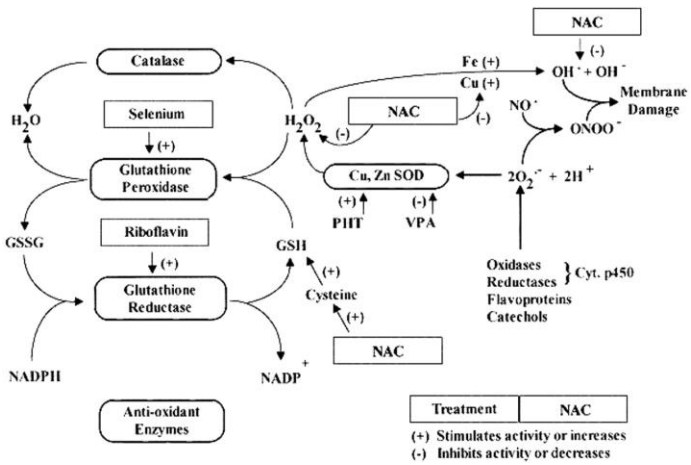


Havsteen, B. Flavonoids, a class of natural products of high pharmacological potency. *Biochem Pharmacol* 1983;32(7):1141-48.

75

Modulation of the Inflammatory Process

- N-acetyl cysteine



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Modulating the Inflammatory Process

- Essential Fatty Acids (EPA/DHA) – 2-10 g/day
- Herbs
  - Ginger – 200 mg (std. 5% gingerols) 2-4x/day
  - Turmeric – 300 mg (std.95% curcuminoids) 2-4x/day
  - Cayenne Pepper – 50 mg 2-4x/day
  - Boswellia – 400 mg (std. 70% boswellic acid) 2-4x/day
- Bioflavonoids (quercetin) – 500 mg 2-4x/day
- Niacinamide – 1000-5000 mg/day
- N-acetyl cysteine – 750-3000 mg/day
- Proteolytic Enzymes – as directed sf

77

Conventional Approaches to Pain

- Non-steroidal anti-inflammatory drugs (NSAIDs)

Aspirin	Ibuprofen (Motrin)	Diclofenac (Voltaren)
Diflunisal (Dolobid)	Naproxen (Aleve, Naprosyn)	Sulindac (Clinoril)
Indomethacin (Indocin)	Ketoprofen (Orudis)	Keorolac (Toradol)
Nabumetone (Relafen)	Etodolac (Lodine)	Oxaprozin (Daypro)
Piroxicam (Feldene)	Salsalate (Amigesic)	Celecoxib (Celebrex)

  - Inhibit COX-1 and COX-2 enzymes
  - Inhibit *both* Inducible and Constitutive COX enzymes

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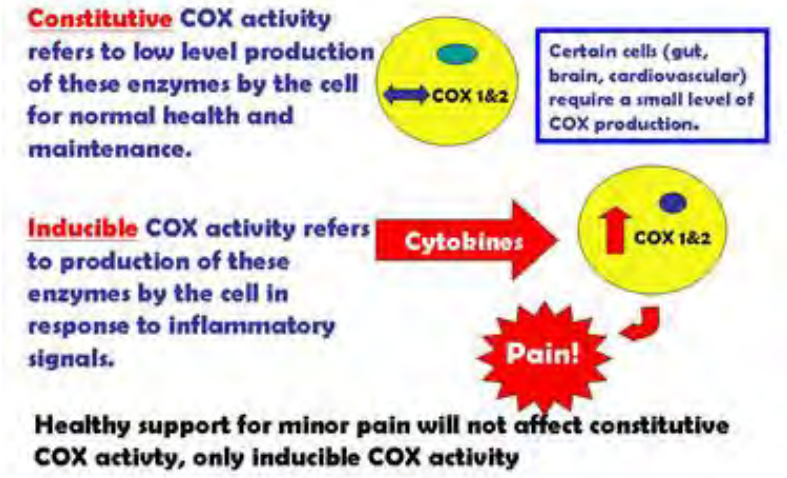
Conventional Approaches to Pain



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The Need for COX Enzymes

In many organ systems, a certain level of COX activity (constitutive) is required for tissue health:

COX-1 – maintains integrity of GI tissue, regulates blood flow to the kidneys, and supports platelet function.

- COX-1 inhibition can lead to GI bleeding, ulcers, kidney damage, heart attack and stroke

COX-2 – constitutively expressed in the kidneys, heart, brain, and the reproductive organs.

- Selective COX-2 inhibition can lead to heart attacks

80

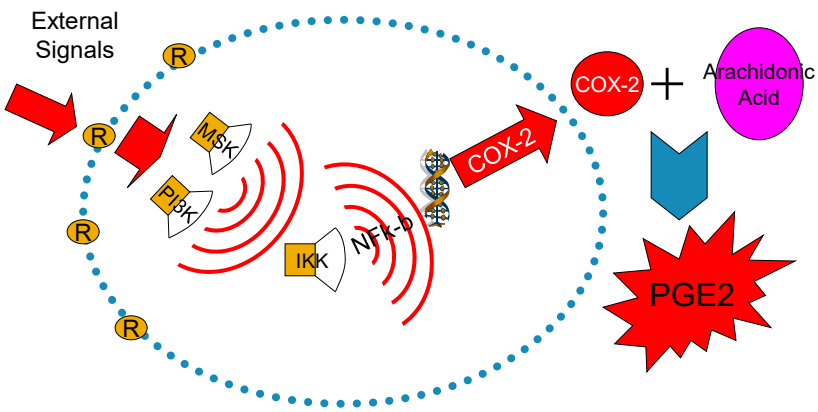
Rx Side Effects

- Using NSAIDs (e.g., ibuprofen, naproxen, aspirin) with SSRIs:
  - 900% increase in gastrointestinal bleeding risk
  - 67% of upper GI bleeding cases occur in patients taking both NSAIDs and SSRIs
- Do NOT stop taking ANY medications without consulting prescribing physician

81

Choose natural molecules to calm the signals and restore balance in your clients

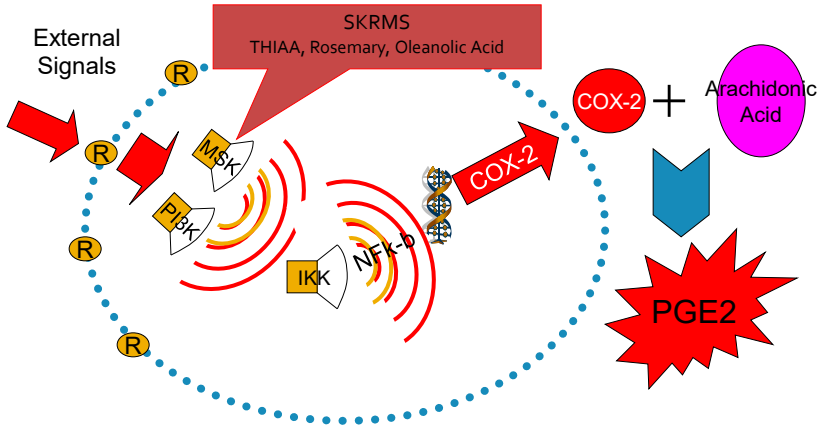
Selective Kinase Response Modulators affect target kinases implicated in inflammation and joint pain



82

Choose natural molecules to calm the signals and restore balance in your patients

Selective Kinase Response Modulators affect target kinases implicated in inflammation and joint pain



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Modulation of the Inflammatory Process

- Inflammation Management
  - *High EPA formula* – 1-2 softgels BID/TID with meals
  - *Hops, boswellia, turmeric, ginger, cayenne* – 4 tablets immediately with a full glass of water, then 2 tablets every half hour until pain subsides. Then 3-9 tablets/day until no longer needed.
  - *Niacinamide + NAC* – 2 tablet BID (esp. with RA/OA and morning stiffness)
  - *Proteolytic enzymes* – 5 capsules immediately, then 3-4 every 3 hours between meals on an empty stomach (7-28 days/PRN)

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Modulating the Inflammatory Process

Hops, boswellia, turmeric, ginger, cayenne

Ginger Powder (root; *Zingiber officinale*) ..... 800 mg
Proprietary Mix of ..... 250 mg
Curcumin (rhizome; *Curcuma longa* L. 35% curcuminoids)
Extract and Fenugreek Galactomannans (seed; *Trigonella foenum-graecum*) Extract (CurQfen®)
Boswellia serrata Extract (65% boswellic acid) ..... 250 mg
Hops Extract (cone; *Humulus lupulus*) (5% xanthohumol) ..... 100 mg
Black Pepper Extract (fruit; *Piper nigrum* L.) (95% piperine) (Bioperine®) ..... 5.3 mg

Proteolytic enzymes

Two tablets supply:

Chymotrypsin ..... not less than 6000 USP units
Trypsin ..... not less than 6000 USP units
Raw Pancreas Concentrate (porcine) ..... 100 mg
Bromelain (2400 GDU/g) ..... 133 mg

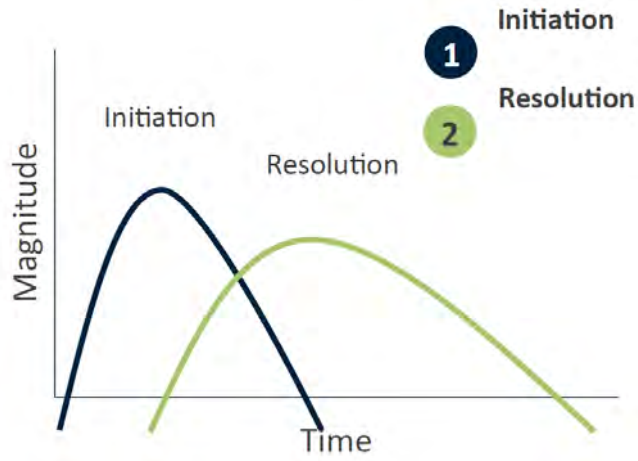
85

Modulating->Resolving the Inflammatory Process

- Pro-Resolving lipid Mediators (PRMs)
  - Encourage specialized pro-resolving mediator (SPM) production in the body
  - Novel solution to *resolve* the inflammatory process
  - Provides an independent, complementary solution for managing inflammation
  - Does not block, inhibit or suppress inflammation
  - *Resolves the inflammatory process to avoid prolonged inflammation and chronic disorders*

86

Inflammation has two stages

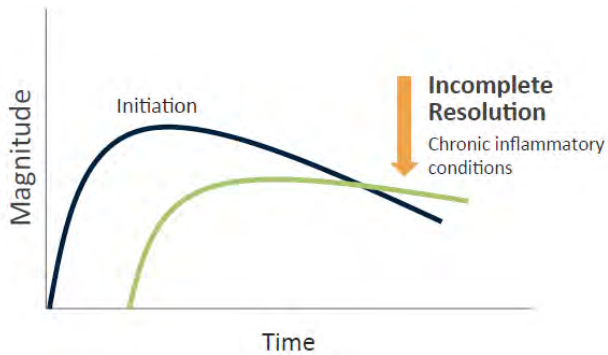


Serhan CN. Nature. 2014;510:92-101.
Spite et al. Cell Metab. 2014;19:21-36.

87

The Pathway to Chronic Inflammation

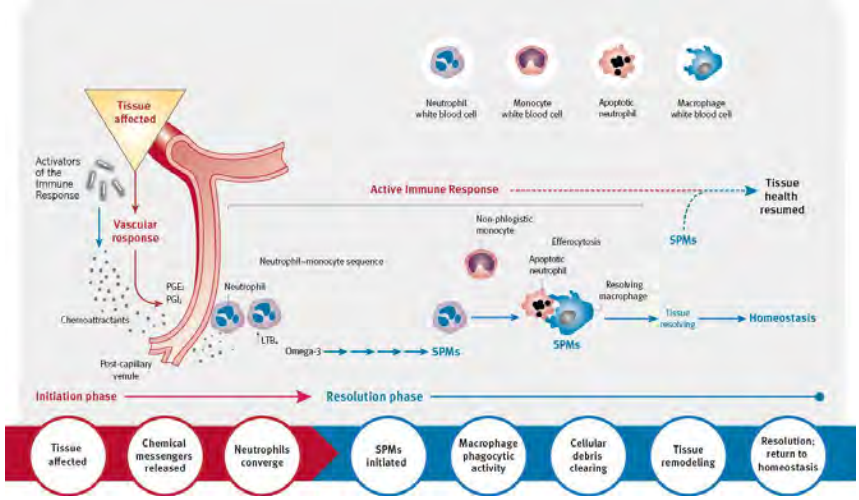
- Without resolution, inflammation can become persistent and chronic



Serhan CN. Nature. 2014;510:92-101.
Spite et al. Cell Metab. 2014;19:21-36.

88

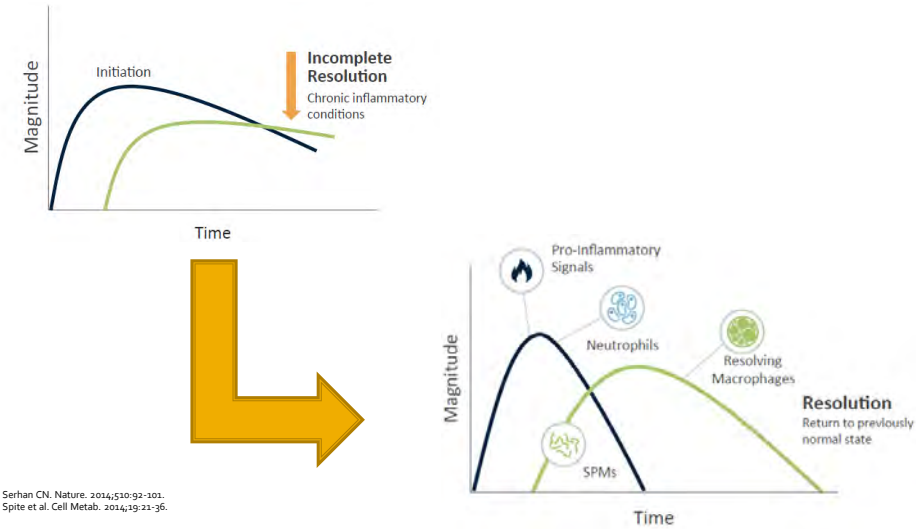
The Immune Response



1. Serhan CN. Nature. 2014;510: 92-101.
2. Serhan CN, et al. Semin Immunol. 2015; Apr 6 (Epub ahead of print)
3. Lopez-Cicario C, et al. Eur J Pharmacol. 2015; May 15 (Epub ahead of print)
4. Recchiuti A. *J Gerontol Geriat Res*. 2014;3:151.

89

Inflammatory Process



Serhan CN. Nature. 2014;510:92-101.
Spite et al. Cell Metab. 2014;19:21-36.

90

PRMs and EPA/DHA

- PRMs have biological actions independent of EPA and DHA
- PRMs are not a substitute for EPA & DHA
- EPA and DHA may be converted into PRMs
  - Health status and lifestyle factors can impact this immensely
- PRMs aid in the resolution of the immune response without suppressing immune defenses

Serhan CN. *Nature*. 2014;510:92-101.
Recchiuti A. *J Gerontol Geriat Res*. 2014;3:151.
Spite M, Claria J, Serhan CN. *Cell Metab*. 2014;19:21-36.
Polus A, et al. Omega-3 fatty acid supplementation influences the whole blood transciptome in women with obesity, associated with pro-resolving lipid mediator production. Biochimica et Biophysica Acta – Molecular and Cell Biology of Lipids. 1861(11); 1746-1755.

91

Resolving the Inflammatory Process

- PRM Formula
  - Contains standardized levels of PRMs derived from a specialized fraction of fish oil
    - Standardized to 17-HDHA & 18-HEPE
  - Help the body's natural transition to resolution of the immune response
    - Decreases/resolves inflammation
  - Dose: 2-8 gelcaps/day
    - Begin with 4/day for 4-6 weeks; if no improvement, increase to 8/day
      - May take 6-16 weeks to resolve
    - Reduce to 2/day for maintenance (once inflammation resolved/under control)

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Modulation of the Inflammatory Process

- Inflammation Management
  - *PRM Formula–* 2 gelcaps BID (up to QID) for 4-6 weeks; if no improvement, increase to 8 gelcaps/day; 2 gelcaps QD for maintenance
  - *High EPA formula* – 1-2 softgels BID/TID with meals
  - *Hops, Bioflavonoid, boswellia, turmeric, ginger, cayenne* – 4 tablets immediately with a full glass of water, then 2 tablets every half hour until pain subsides. Then 3-9 tablets/day until no longer needed.
  - *Niacinamide + NAC* – 2 tablet BID (esp. with RA/OA and morning stiffness)
  - *Proteolytic enzymes* – 5 capsules immediately, then 3-4 every 3 hours between meals on an empty stomach (7-28 days/PRN)

93

Repairing the Damage

- Antioxidants
  - Vitamin E – 200-600 IU/day mixed tocopherols
  - Vitamin C – 1-3 grams buffered or esterfied
  - Selenium – 100-150 mcg
- Glucosamine sulfate (500 mg TID)
  - Joint repair, ↓ pain/tenderness and swelling
  - ↑ mobility
- Chondroitin sulfate (300-400 mg TID)
  - Inhibits breakdown of joint tissue and promotes repair

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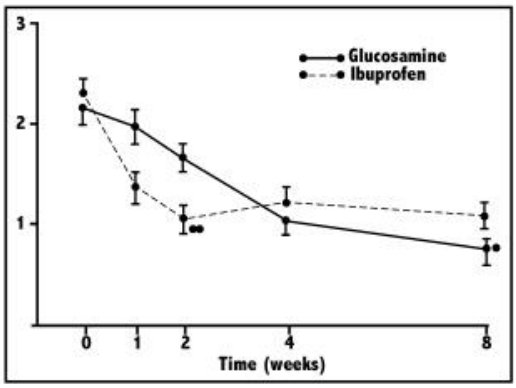
Glucosamine Sulfate vs. Ibuprofen

- Positive Clinical Trials Against Placebo
- Positive Clinical Trials Against NSAIDs



2.Vaz, A.L. Double-Blind Clinical Evaluation of the Relative Efficacy of Ibuprofen and Glucosamine Sulfate in Management of Osteoarthritis of the Knee in Out Patients. Curr. Med. Rs, Opin.,: 145-149, 1982

95

Repairing the Damage

- Antioxidants
  - *Vitamin E* – 200-600 IU/day mixed tocopherols
  - *Selenium* – 20 mcg
  - ➢ *Multi-vitamin, mins & phytonutrients* – 1 tablet BID
  - ➢ *Buffered Vitamin C* – 1-3 grams daily at a minimum
- *Glucosamine HCL* – help joint repair, reduce pain, tenderness and swelling and increase mobility (500 mg TID)
- *Chondroitin sulfate* – inhibits breakdown of joint tissue and promotes repair (300-400 mg TID)

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Glucosamine HCL & chondroitin sulfate formula

Three capsules supply:

Vitamin C (Manganese ascorbate)..... 98 mg
Manganese (Manganese ascorbate)..... 45 mg
Glucosamine HCl..... 1500 mg
Chondroitin Sulfate..... 1200 mg

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Supporting Proper GI/Gut Ecology

- GI plays a major role in inflammation
  - If needed, use GI Protocol(s) to heal GI tract
- Dysbiosis can initiate/exacerbate inflammation
  - Use Dysbiosis Protocols to remove harmful organisms
- Probiotics – bifidobacterium Bi-07 and lactobacillus acidophilus NCFM
  - Promote healthy gut ecology
  - ~7.5 billion live organisms each of bifidobacterium & Lactobacillus acidophilus 2-3x/day between meals (empty stomach)

  ⇒ *L-Acidophillus NCFM, B. Lactis Bi-07* – 1 cap BID/TID
- Prebiotics – fructooligosaccharides (FOS)
  - Provide food for health-promoting bacteria
  - Honey, onions, asparagus, bananas, oats, Jerusalem artichokes, chicory

  ⇒ *Immunoglobulin's, whey formula* – 4 tablets 1-3x/day

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Health Benefits of Flora Balance

- Support vitamin and short chain fatty acid production
  - Promotes healthy intestinal tissues, energy production and repair processes
- Support the assimilation of nutrients
- Facilitate lactose digestion
- Support healthy mucosal and systemic immune response
- Help to protect the intestinal mucosa from increased permeability and toxins

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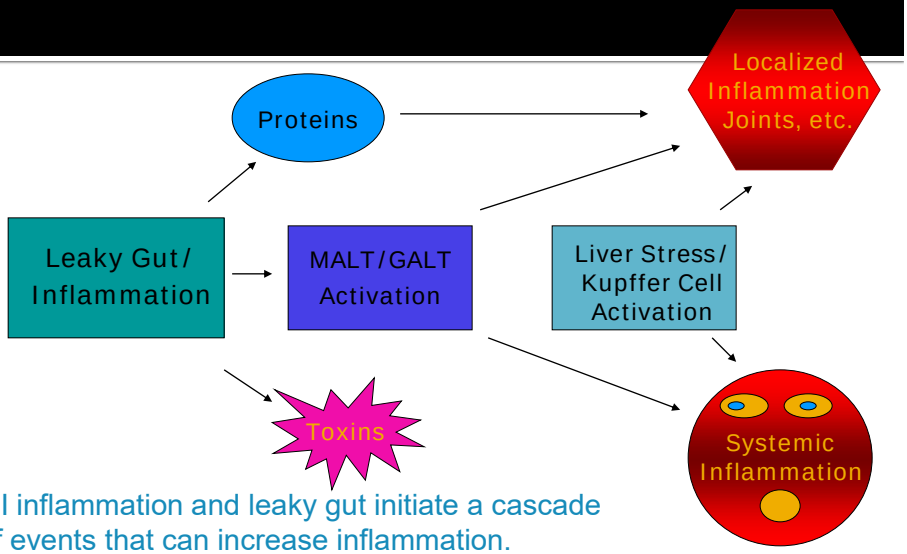
Supporting Proper GI/Gut Integrity

- Tissue injury and increased intestinal permeability ('leaky gut') are critical propagating factors in many chronic inflammatory conditions
- By calming gastrointestinal inflammation and supporting the repair of increased intestinal permeability we can calm systemic inflammation, inflammation in non-GI tissues and balance the immune response

100

The GI-Liver Connection



GI inflammation and leaky gut initiate a cascade of events that can increase inflammation.

Scharz B, et al. Intestinal ischemic reperfusion syndrome: pathophysiology, clinical significance, therapy: *Wien Klin Wochenschr*1999;111(14):539-48.

101

Leaky Gut Syndrome

- When the intestines are not providing adequate "barrier" function, an increased burden is put on the liver.
- *Leaky gut syndrome* forces the liver to process higher quantities of internally and externally derived toxins. This stress can lead to a heightened systemic inflammatory state (through immune, eicosanoid and free radical functions)

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Supporting Proper GI/Gut Integrity

- L-glutamine – maintains integrity of intestinal lining and promotes optimal immune response
  - Glutamine + NSAID significantly lower permeability as compared to NSAID alone
  - 3000-4000 mg 3x/daily
- Deglycyrrhizinized licorice (DGL) – enhances gastric lining
  - Especially important for those recovering from NSAID use
  - ~500 mg of a 10:1 extract 3x/daily
- Aloe vera – promotes GI tract healing and immune support
  - 50-100 mg of aloe leaf extract 3x/daily

⇒ *Glutamine, DG licorice formula* – 1 tsp TID before or between meals

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Dynamic Inflam-Eze: Multiple Pathway Support

- Synergistic product for inflammation
- Inhibits pro-inflammatory pathways
  - Calms inflammation in MALT/GALT tissues with turmeric, ginger, quercetin, cat's claw, & other nutritional factors
- Support anti-inflammatory pathways
  - Maximize conversion of omega-3 to anti-inflammatory compounds
- Combats oxidative stress with a host of antioxidants
- Supports both phases of liver detoxification
- Promotes healthy GI function/integrity
  - Calms GI inflammation & promotes integrity with glutamine, zinc and other nutrients
- Hypo-allergenic formula
- Great support materials for patient education/compliance

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Modulation of the Inflammatory Process

- Chronic Pain/Inflammation Management (Ongoing)
  - *Synergistic Product for inflammation* – per instructions – 1-2 scoops 1-2x/day
  - *PRM Formula*– 2 gelcaps BID (up to QID) for 4-6 weeks; if no improvement, increase to 8 gelcaps/day; 2 gelcaps QD for maintenance
  - *High EPA formula* – 1-2 softgels BID/TID with meals
  - *Hops, boswellia formula* – 4 tablets immediately with a full glass of water, then 2 tablets every half hour until pain subsides. Then 3-9 tablets/day until no longer needed.
  - *Niacinamide + NAC* – 2 tablet BID (esp. with RA/OA)

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Supportive Therapies

- Joint repair: Glucosamine & Chondroitin Sulfate
  ⇒*Glucosamine, Chondroitin formula* – 1 tablet TID
- GI distress, RA, dysbiosis: Probiotics & Prebiotics
  ⇒*L. Acidophillus NCFM, B. Lactis Bi-07* – 1 cap BID/TID on empty stomach
  ⇒ *Immunoglobulin, whey formula* – 4 tabs 1-2x/day (diarrhea)
- NSAIDs use, GI distress, leaky-gut: Glutamine, DGL, Aloe vera
  ⇒ *Glutamine, DG licorice formula* – 1 tsp TID

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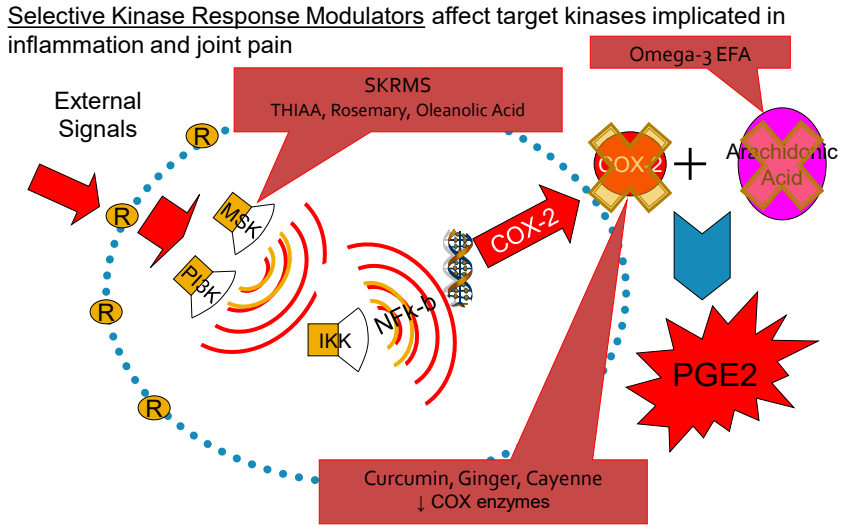
Choose natural molecules to calm the signals and restore balance in your patients



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Natural is Better

- Unlike traditional anti-inflammatory drugs, these essential fatty acids, herbs, bioflavonoids, and proteolytic enzymes appear to exhibit no significant side effects or toxicity
- If taking medications, check for interactions with herbs used OR don't use herbs

108

Inflammation, Chronic Pain & Arthritis

- Lab work:
  - hs-CRP/CRP
  - Erythrocyte sedimentation rate (ESR)
  - Fibrinogen
  - Interlukin-6 (IL-6)
  - Vitamin D – 25 OH Vitamin D
    - Ideal 50-60 ng/ml for healthy person
    - Ideal 80-90 ng/ml for chronic inflammation/autoimmunity

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Inflammation Recommendations

- Modified Anti-inflammatory diet
  - Alkaline, remove foods identified on LRA
- Hydration
- Stress management – daily
- Supplement recommendations
  - Based on stage of inflammation

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Inflammation Management

- The goal of a healthy, nutritional approach to pain relief is to:
  - Modulate the inflammatory response
    - Reduce production of pro-inflammatory compounds
    - Increase production of anti-inflammatory compounds
    - Reduce the production of inducible COX activity without affecting constitutive COX production
  - Repair the damage
  - Support proper GI/gut ecology
  - Support proper GI/gut integrity

111

Questions on Inflammation??

112

Musculoskeletal Conditions

Bone	Osteoporosis, Osteopenia, Fracture
Joint	Osteoarthritis, Degenerative Disc Disease
Inflammation	Bursitis, Tendonitis, Carpal Tunnel, Surgery/Trauma
Soft Tissue	Muscle cramps/spasms, Tension headaches, Trauma, Sprains

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Skeletal System Disorders

Condition/Disorder	Etiology
Fracture	Broken bone/trauma
Osteopenia: T=(-1.0) – (-2.5)	Demineralization of bone
Osteoporosis: T-score = > -2.5	Loss of bone density (1.5-2%/year post 40 yo)
Considerations: age, activity level, diet, alcohol/soda/caffeine use, body size, smoking	

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Osteoporosis: Definition

- Osteoporosis is a condition of:
  - accelerated bone loss
  - enhanced bone fragility
  - increased susceptibility to bone fractures
- Osteoporosis is one of the most prevalent health hazards facing women past menopause, more common than heart disease, strokes, diabetes, rheumatism, arthritis, or breast cancer
- Also very prevalent in men

National Osteoporosis Foundation, May, 2002

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Osteoporosis: Facts and Prevention

- 10 million Americans with OP; 34 million with osteopenia
- 80% are women; 20% are *men*
- The rate of OP is increasing – 5x in last 10 years
- Osteoporosis ***is not*** part of normal aging
- Osteoporosis can be prevented with calcium supplementation when bones are forming
- All calcium supplements are not the same
- Calcium is crucial to maintaining high bone density, but its not the only mineral required
- Studies show that certain whole bone extracts can be very beneficial to patients with osteoporosis

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Calcium Content of Foods

- Bone health – Calcium & Vitamin D

Hijiki*	1400	Sunflower seeds	175
Wakame*	1300	Watercress	150
Kelp*	1100	Garbanzo beans	150
Kombu*	800	White beans (dried)	145
Wheat/barley grass	515	Quinoa	140
Sardines	445	Mustard greens	140
Agar agar*	400	Black beans	135
Nori*	260	Pinto beans (dried)	135
Sesame seeds (hulled)	200-300	Broccoli	130
Amaranth	220	Yogurt	120
Canned salmon (w/ bones)	200-250	Milk	120
Hazelnuts	210	Beet greens	120
Parsley	200	Tofu	115
Turnip greens	190	Spinach (cooked)	105
Collard greens	190	Walnuts	85
Brazil nuts	185	Eggs	55
Dandelion greens	185	Brown rice	35
Kale	185	Halibut	15

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Is Calcium from dairy foods enough?

- Findings from the ***American Journal of Public Health***, indicated that consumption of milk and other food sources of calcium do not protect against hip or forearm fractures.
- Calcium is essential for building peak bone mass, therefore therapeutic levels of calcium supplementation may prevent against osteoporotic fractures in certain women, but calcium from dairy is unlikely to offer protective effects against hip/forearm fractures.

American Journal of Public Health 1997;87:992-7

118

Preventative Treatments

- The best steps are to make choices early in life to optimize the peak bone density.
- Prevention begins during childhood.
  - Bone mass is continually acquired until ages 30-35
  - Maximizing calcium intake during the growth years can greatly affect an individual's peak bone mass
- However, its **never too late** to reduce the risk of osteoporosis.
  - Evidence indicates that proper calcium supplementation, in a form that maximizes absorption, may slow the progression of bone loss and even increase bone density in postmenopausal women
  - Comprehensive bone nourishment is an even better measure.

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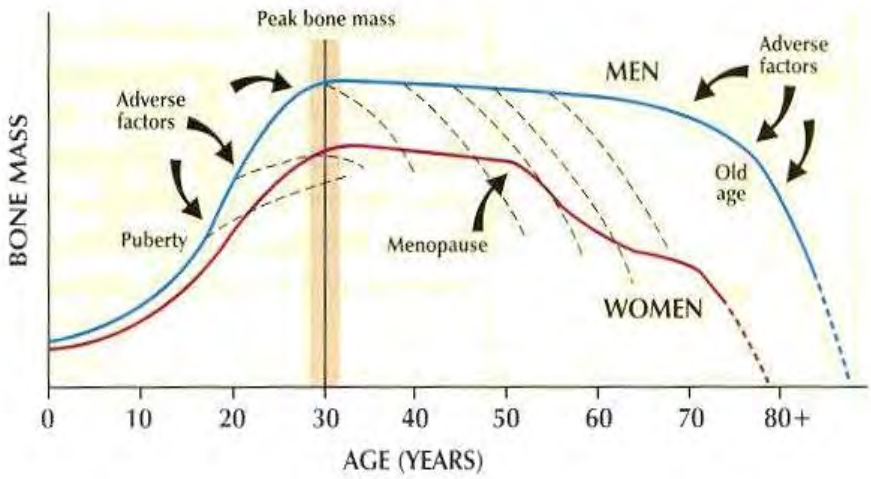
Optimize Peak Bone Mass



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Osteoporosis Prevention

- ⇑ Bone Mass before Menopause/Andropause
  - Hormone balance
  - Calcium & Vitamin D
  - Exposure to sunlight
  - Physical Exercise
  - Anti-inflammatory diet
  - Don't smoke
  - NO soft drinks
  - Avoid caffeine & alcohol
  - Eliminate need for bone-destroying meds
- ⇓ Bone Loss After Menopause/Andropause
  - Hormone balance
  - Avoid fluorinated water & soft drinks
  - Physical exercise
  - Anti-inflammatory diet
  - Don't smoke
  - Avoid caffeine & alcohol
  - Eliminate need for bone-destroying meds
  - Take supplements

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Bone-destroying Medications

- Proton-pump inhibitors (PPIs)
  - Heartburn, gastritis, ulcers
  - 3rd most prescribed drug in US
  - Long term use sig weakens bones & ↑ risk of hip fracture (HF)
    - >1 yr = 44% ↑ risk HF
    - ↑ dose PPIs = 245% ↑ risk HF

- Selective Serotonin Reuptake Inhibitors (SSRIs)
  - Used for depression, menopause, insomnia
  - Significantly ↓ bone mineral density (BMD)
    - >1 yr = 5.9%↓ lumbar spine & 3.9% ↓ hip BMD
    - Risk of non-vertebral fracture ↑ >200%
    - Risk continues to ↑ with prolonged use

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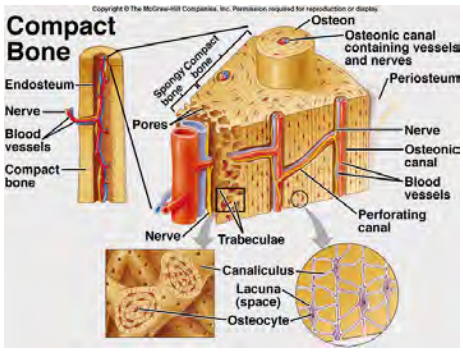
Bone Destroying Medications

- Sedatives
  - Valium, Xanax, Lunesta, Ambien
- Anti-epileptics
- Anti-psychotics
- Anti-anxiety
- Dopaminergic agents
- Glucocorticoids
  - Prednisone
- Opioids
  - Codeine, Morphine, Hydrocodone, Oxycodone
- Analgesics
  - NSAIDS, COX-2 inhibitors
- Loop diuretics
  - Flurosemide
- Iron compounds

123

What is comprehensive bone nourishment?

- Bones are formed of a composite structure. They consist of fibrous organic factors which serve as a foundation onto which the bone matrix forms
- This matrix consists of:
  - Calcium
  - Phosphorus
  - Sodium
  - Magnesium
  - Zinc
  - And other minerals



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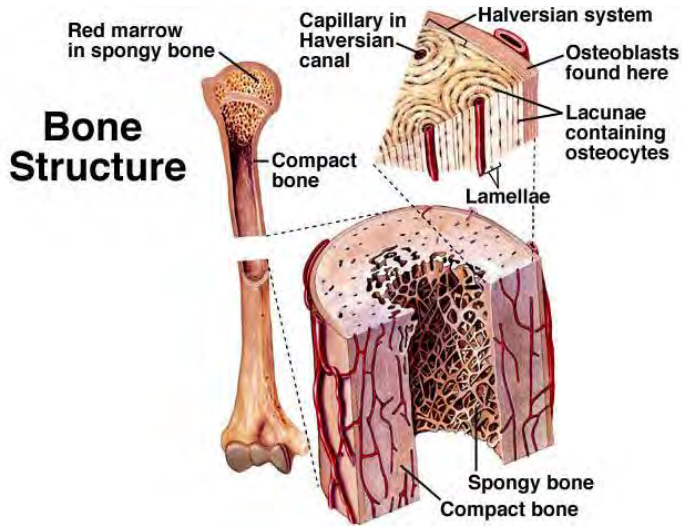
Bone Structure



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Comprehensive Bone Nourishment, cont.

- Comprehensive bone nourishment provides a broad range of essential nutrients needed to build and maintain strong bones.
- Derived from whole bone extract, the calcium-rich supplement microcrystalline hydroxyapatite concentrate (MCHC) provides many minerals found in bone, in the correct proportions, along with proteins and other organic factors.

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Study on Effects of MCHC

Study of 64 postmenopausal women with primary biliary cirrhosis were assigned to 3 groups to see how supplementation affects bone density:

1. No mineral supplementation
2. MCHC supplementation at 8 grams/day
3. Calcium gluconate supplementation

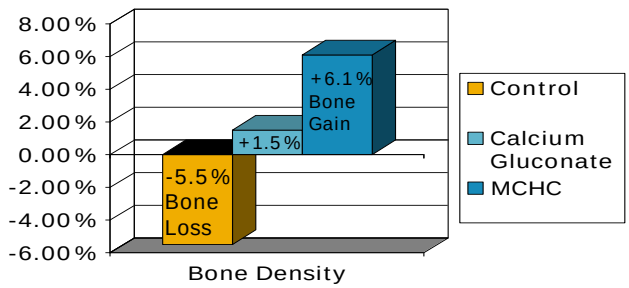
All subjects received Vitamin D supplementation

127

MCHC Effects: Case Study

- Results: After 14 months, there was no significant change in serum calcium or inorganic phosphate

But, there were significant differences in bone density.



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Calcium Types and Absorption

Type	Advantages	Disadvantages
ASPARTATE (10% Ca)	• Well Absorbed	Expensive
ASCORBATE (10% Ca)	• Well Absorbed • Non-acidic Vitamin C	Expensive
LACTATE (18% Ca)	• Well Absorbed	May contain allergens
AMINO ACID CHELATE (20% Ca)	• Well Absorbed	• Soy Sensitivity • Often incorrectly made • Sometimes not a true chelate
PHOSPHATE (29% Ca)	• Inexpensive • Antacid	• Fair absorption • Possible lead contamination
CALCIUM CARBONATE (40% Ca)	• Inexpensive • Antacid	Poorly absorbed

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Calcium Types and Absorption

Type	Advantages	Disadvantages
CITRATE (22% Ca)	•Very well absorbed • Reduces risk to kidney stones • Absorbed by those with poor digestion	Doesn't provide all the building blocks necessary for bone formation
MCHC (24% Ca)	• Best absorbed calcium source • Increases cortico bone density • Arrests trabecular bone loss • Absorbed by malabsorbers • Proven scientific studies on humans	None

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MCHC Provides Complete Bone Food

Active Ingredients	ORGANIC MCHC	Bone Ash/ Bone Meal	INORGANIC Hydroxy-apatite Crystals	Other Calcium (carbonates, chelates)
Mineral Complex	√	√	none	none
Hydroxyapatite	√	√	√	√
• Calcium	√	√	√	√
• Phosphorus	√	√	√	none
Trace Minerals	√	√	none	none
• Magnesium, Zinc, Sodium, Boron, Manganese, Copper	√	√	none	none
Protein	√	TRACE	none	none
Biologically Active Growth Factors	√	none	none	none
• IGF I & II	√	none	none	none
• TGFβ I & II	√	none	none	none
• Calcitonin	√	none	none	none
Type I Collagen	√	TRACE	none	none
Bone Amino Acids	√	TRACE	none	none
Chondroitin Sulfate	√	none	none	none

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MCHC is MCHC, right?

- All MCHC products are not the same! The source of the bone extract as well as the processing procedure determine the quality of MCHC.
- Some sources may contain high levels of lead and other contaminants
- High heat processing and excessive grinding can destroy the matrix leading to a simple bone meal product
- MCHC: Type 1 collagen: 17-21%; bone meal = <1%

MCHC ≠ MCHC

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Osteoporosis & Osteopenia

- Bone Health:
  - Weight bearing exercise – 3 or more sessions/week; at least 30 min/session
  - Sunshine and calcium rich foods
  - Avoid extremely acidic foods/habits
- Bone maintenance:
  - Bone Support Formula – 1 tablet BID w/ food
- Osteopenia:
  - Bone Support Formula – 2 tablets BID w/ food
- Osteoporosis:
  - Bone Support Formula – 2 caps TID w/ food OR
  - Bone Support Formula Prime – 2 caps TID w/ food

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Bone Support Formula

Serving size: Two capsules
Servings per container: 90
One serving supplies:

Vitamin D3 (cholecalciferol).....50 mcg (2,000 IU)
Calcium..... 428 mg
[as Microcrystalline Hydroxyapatite Calcium (MCH-Cal™)]
Phosphorus ..... 168 mg
[as Microcrystalline Hydroxyapatite Calcium (MCH-Cal™)]
MCH-Cal™ (Microcrystalline Hydroxyapatite Calcium)..... 1.9 g

Other ingredients: Hydroxypropyl methylcellulose, microcrystalline cellulose, vegetable stearic acid, vegetable magnesium stearate.

Bone Support Formula Prime

Serving size: Three tablets
Servings per container: 90
One serving supplies:

Vitamin D3 (cholecalciferol).....15 mcg (600 IU)
Calcium..... 660 mg
[as Microcrystalline Hydroxyapatite Calcium (MCH-Cal™) and DiCalcium Phosphate]
Phosphorus ..... 380 mg
[as Microcrystalline Hydroxyapatite Calcium (MCH-Cal™) and DiCalcium Phosphate]
MCH-Cal™ (Microcrystalline Hydroxyapatite Calcium)..... 1.5 g
Ipriflavone..... 150 mg

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Osteoporosis & Osteopenia: Testing

- Further Testing
  - 25-hydroxy vitamin D: ~60-80 ng/ml
  - Estradiol
  - Testosterone
  - Fasting blood lipids
  - Bone resorption assessment
  - DEXA

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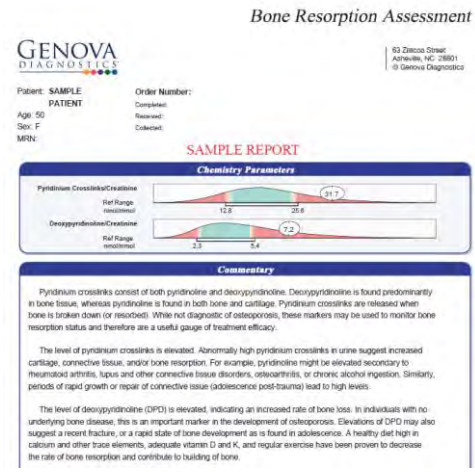
Bone Resorption Assessment


Bone Resorption Assessment

GENOVA DIAGNOSTICS

63 Zillicoa Street
Asheville, NC 28801
© Genova Diagnostics

Patient: SAMPLE PATIENT
Age: 50
Sex: F
MRN:

Order Number:
Completed:
Received:
Collected:

SAMPLE REPORT

Chemistry Parameters

Pyridinium Crosslinks/Creatinine — 31.7 — Ref Range nmol/mmol 12.8 – 25.6

Deoxypyridinoline/Creatinine — 7.2 — Ref Range nmol/mmol 2.3 – 5.4

Commentary

Pyridinium crosslinks consist of both pyridinoline and deoxypyridinoline. Deoxypyridinoline is found predominantly in bone tissue, whereas pyridinoline is found in both bone and cartilage. Pyridinium crosslinks are released when bone is broken down (or resorbed). While not diagnostic of osteoporosis, these markers may be used to monitor bone resorption status and therefore are a useful gauge of treatment efficacy.

The level of pyridinium crosslinks is elevated. Abnormally high pyridinium crosslinks in urine suggest increased cartilage, connective tissue, and/or bone resorption. For example, pyridinoline might be elevated secondary to rheumatoid arthritis, lupus and other connective tissue disorders, osteoarthritis, or chronic alcohol ingestion. Similarly, periods of rapid growth or repair of connective issue (adolescence post-trauma) lead to high levels.

The level of deoxypyridinoline (DPD) is elevated, indicating an increased rate of bone loss. In individuals with no underlying bone disease, this is an important marker in the development of osteoporosis. Elevations of DPD may also suggest a recent fracture, or a rapid state of bone development as is found in adolescence. A healthy diet high in calcium and other trace elements, adequate vitamin D and K, and regular exercise have been proven to decrease the rate of bone resorption and contribute to building of bone.

- Identifies elevated levels of bone loss before excessive damage has occurred, enabling early treatment intervention
- Monitors effectiveness of therapies to slow bone loss and rebuild bone.

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Osteoporosis & Osteopenia: Recommendations: Diet

- Anti-inflammatory diet

CATEGORY	AVOID	RECOMMENDED (organic preferred)
Dairy & Dairy Alternatives (protein, fat)	Animal milks (all, even "lactose-free"), buttermilk, yogurt, cheese, cream, ice cream, sour cream, cream cheese, chocolate; non-dairy creamer Soy milk, cheese, yogurt	Unsweetened milk alternatives: rice, hazelnut, hemp, almond, coconut, gluten-free oat Vegan cheese from rice or almonds
Meat, Poultry & Fish (animal protein)	Eggs, egg replacers, beef, pork Poultry fed hormones/antibiotics Shellfish; farm-raised seafood Breaded patties, fish sticks Processed/canned meats, sausages	Free-range lamb, chicken, turkey Wild game Wild-caught seafood: fresh, frozen, or water-packed in can
Legumes, Nuts & Seeds (veg, protein, fat, carbs/fiber)	Soybean products: tempeh, tofu, textured vegetable protein, protein powder, edamame, wasabi peas Peanuts, peanut butter	All other canned, frozen, or dry beans/peas; hummus All other nuts/unsweetened nut butters All seeds/unsweetened seed butters
Grains, Breads, Cereals & Pastas (protein, carbs/fiber)	Cornmeal/flour, corn starch Foods with wheat and wheat flours (whole or white); processed cereals Spelt, kamut, rye, barley Oats (unless certified gluten-free)	Whole grains, flours, and other products from rice, millet, arrowroot, teff, tapioca, amaranth, quinoa, buckwheat Gluten-free oats/oatmeal Potato flour/starch*
Fruits (carbs/fiber)	Oranges, orange juice Fruits/juices/spreads/preserves with added sugars	Fresh, unsweetened, dried, frozen, or canned, water-packed fruits 100% fruit juices
Vegetables (carbs/fiber)	Corn; nightshade veggies (optional)* Breaded or creamed vegetables Veggies in cheese/butter sauces	All other fresh raw, steamed, sautéed, or roasted vegetables, greens & potatoes* Unsweetened vegetable juices

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Osteoporosis & Osteopenia: Recommendations: Diet

- Anti-inflammatory diet

CATEGORY	AVOID	RECOMMENDED (organic preferred)
Sugars & Sweeteners	Foods with: white/brown/powdered sugar, cane sugar/juice, corn syrup, sucanat, high fructose corn syrup (HFCS or corn sugar), molasses/sorghum, glucose, sucrose, dextrose Extracts (e.g., vanilla, almond)	Small amounts: raw honey, pure maple syrup, agave syrup/nectar, brown rice syrup, natural fructose, fruit sweeteners (juice concentrates), stevia Carob, cinnamon
Oils & Fats	Oil from soybeans, peanuts, palm Butter, margarine, shortening Processed and hydrogenated oils Mayonnaise and salad dressings with dairy, gluten, or sugars Fried foods	Oils: cold-pressed olive, flaxseed, canola, safflower, sunflower, sesame, walnut, pumpkin, almond, grapeseed, coconut Avocado; olives
Other Seasonings & Condiments	Soy sauce, wasabi (soy) BBQ sauce, ketchup, wet mustards Prepackaged seasonings with gluten/dairy/sugars	Lemon/lime juice All vinegars (except malt) Red pepper, cayenne, other peppers* Unsweetened salsa and tomato sauces* Garlic, onions, chives All other fresh or dry herbs and spices
Other Beverages	Flavored waters Sodas (all) Energy/sport drinks Drink mixes and mixers Beer, mixed alcoholic beverages	Water: tap, spring, sparkling, filtered, distilled, seltzer (add splash of fruit juice or slices to any water) Unsweetened tea and coffee (2 cups max.) Herbal teas (unlimited)

* Nightshade plants include tomatoes, tomatillos, pimentos, white/gold/red potatoes, eggplant (baba ganoush), peppers (bell, hot), and tobacco. Not in the nightshade family: black pepper, sweet potatoes, yams, and boniato (white sweet potatoes).

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SKRMs, Berberine, Vit K

- SKRMs = selective kinase receptor modulator
  - Regulate upstream cell signals that influence markers of bone remodeling
    - Send more "healthy" signals
- Complements MCHC Formula
- In combination with Anti-inflammatory diet and aerobic exercise, has been clinically shown to improve bone remodeling more than diet and exercise alone

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Osteoporosis & Osteopenia: Recommendations

Recommendation	Dosage
Bone Support Formula	1-2 tablets TID
SKRMs, Berberine, Vit K	1 tablet BID
Bioidentical Hormone Replacement	Per testing
Vitamin D3	Per testing: 5000-10,000 IU typical
EPA:DHA 720	1 gelcap BID
Avoid caffeine, soda, smoking;	
Get as much sun on as much skin as often as possible	
Do weight bearing exercise 15-30 minutes daily	

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SKRMs, Berberine, Vit K

One tablet supplies:

Vitamin D (as cholecalciferol) .....500 IU
Vitamin K (as phytonadione) .....500 mcg
Berberine HCl (*Phellodendron amurense* bark extract)..... 90 mg
Reduced Iso-Alpha Acids Complex ..... 370 mg
(from hops extract, *Humulus lupulus*)

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Osteoporosis & Osteopenia: Safety and Follow up

- Contraindications
  - Poor estrogen detoxifier; estrogen dependent disorder -> No Bioidentical hormones
- Side effects
  - Muscle cramping/spasms if too much calcium
    - Use calcium/magnesium combination; add magnesium glycinate
- Follow up
  - DEXA every 2 years
  - Hormones every 6 months
  - Vitamin D every 3-6 months
  - Bone Resorption Assessment: 3, 6, 12 months

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Osteoporosis Case Study

- Barb W. 56 y.o. female
  - Chief Concern
    - Osteoporosis
    - 2003 T-Score -1.4 spine, -2.4 Hip
    - 2009 T-Score -2.7 spine, -2.4 hip
    - Dx: Significant/severe osteopenia/osteoporosis with a significant decrease of mineralization since baseline exam
    - Criteria for osteoporosis is T-score at or below -2.5 SD
  - Current supplements
    - Multivitamin
    - Calcium (complete bone meal 1500 mg MCHC) with magnesium
    - EFA's

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Osteoporosis Case Study

- Additional labs
  - Vitamin D
    - 26.7
  - Hormone panel (all tested low)
    - Estradiol
    - Progesterone
    - DHEA
    - Testosterone

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Treatment Plan – 6/3/09

Supplements	On Rising	Bkfst	Mid Morn	Lunch	Mid Aftern	Supper	Mid Even	Before Bed
Bone Support Formula		2		2		2		
Vitamin D		2000 IU		2000 IU		2000 IU		
Bio-identical hormones (estradiol & progesterone)	3							3
EPA DHA 720		1				1		
Multivitamin		2				2		

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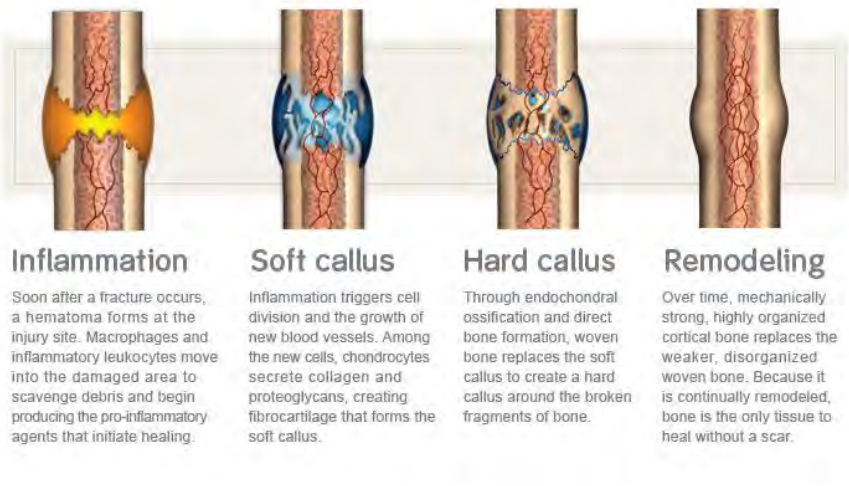
Osteoporosis Case Study

- Barb W. 56 y.o. female
  - 02-2003 T-Score -1.4 spine, -2.4 Hip
  - 02-2009 T-Score -2.7 spine, -2.4 hip
  - Treatment plan started 06-03/09
  - 02-2010 T-Score -2.4 spine, -2.1 Hip

146

Bone Fractures



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Bone Fractures: Recommendations

Recommendation	Dosage
Bone Builder Active Formula	2 tablets TID (4-6 weeks)
Proteolytic Enzymes – empty stomach	5 tablets 3-4x/day for 5 days
Vitamin D3	Per testing: 5000-10,000 IU typical
EPA:DHA 3:2	1 gelcap BID
Avoid caffeine, soda, smoking; anti-inflammatory diet	
Get as much sun on as much skin as often as possible	
Exercise: • Passive: For each joint on either side of fracture, begin as soon as possible within limits of pain. Do not overdo. Be cautious of creating muscle spasms. • Water Exercise: Lower extremities for stress fractures.	

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Bone Builder Active Formula

Three tablets supply:

Vitamin C (as Ultra Potent-C®*)	249 mg
Vitamin D (as cholecalciferol)	201 IU
Niacin (as niacinamide ascorbate)	18 mg
Calcium (as MCHC and dicalcium phosphate)	612 mg
Phosphorus (as MCHC and and dicalcium phosphate)	396 mg
Magnesium (as magnesium bis-glycinate*)	111 mg
Zinc (as zinc citrate)	7.5 mg
Copper (as copper lysinate HCl)	0.99 mg
Manganese (as manganese citrate)	0.48 mg
Chromium (as chromium nicotinate glycinate)	120 mcg
Microcrystalline Hydroxyapatite (MCHC)	1344 mg
Horsetail (*Equisetum arvense*) Aerial Parts	75 mg
D-Glucosamine Sulfate (as D-glucosamine sulfate KCl)	249 mg
Boron (as boron citrate)	195 mcg

Proteolytic Enzymes

Two tablets supply:

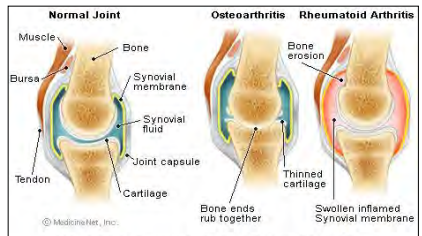
Chymotrypsin	not less than 6000 USP units
Trypsin	not less than 6000 USP units
Raw Pancreas Concentrate (porcine)	100 mg
Bromelain (2400 GDU/g)	133 mg

149

Joint Inflammation & Degradation

- Caused by wear & tear, overuse, trauma
- Worse with rest, cold, damp
- Better with movement, heat, dry
- 80% of Americans 50+ have some degree of OA

- Labs
  - X-ray, MRI
  - hs-CRP, SED rate
  - 25-OH Vitamin D

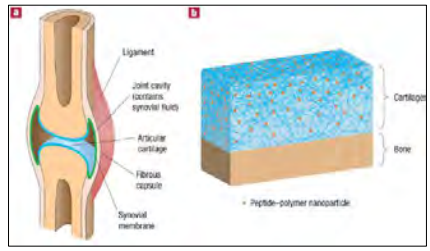


Normal and Arthritic Joints

150

Articular Cartilage

- 5% Chondrocytes
- 95% Matrix
  - Collagen (mostly type II)
  - Proteoglycans (glycosaminoglycans, chondroitin sulfates, keratin sulfate
  - Hyaluronic acid
  - Water (70%)



151

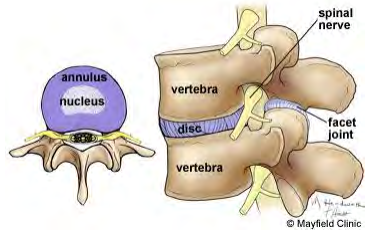
Intervertebral Disc Disease

- IVD represent the largest structure within the body *without* vascular supply

152

Intervertebral Disc Disease

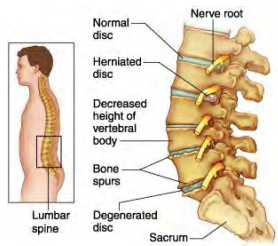
- Nucleus – gel-like substance
  - Water (80%)
  - Solid/dry component:
    - Proteoglycans (PG) (65%)
    - Type II collagen fibers (17%)
    - Small amount of elastin fibers
- Annulus
  - Made up of 15-25 collagen sheets glued together with proteoglycans
  - Water (65%)
  - Solid/dry component:
    - Collagen (Type 1 and II) (55%)
    - Proteoglycans (20%)
    - Elastin fibers (10%)



153

Intervertebral Disc Disease

- IVD deterioration occurs over many years (from nucleus outward)
  - Before age 40: ~25% of people show evidence of disc degeneration
  - After age 40: >60% show evidence of disc degeneration
  - Occurs most often in lower lumbar discs
- IVD influenced by:
  - Genetic inheritance
  - Dehydration
  - Nutrient availability/transport
  - Injury



Intervertebral Disc Disorders". MDGuidelines. Reed Group. 1 December 2012.
Roberts S, Evans H, Trivedi J, Menage J (April 2006). "Histology and pathology of the human intervertebral disc". J Bone Joint Surg Am 88 (Suppl 2): 10–4.

154

Intervertebral Disc Disease

- IVD deteriorate from the nucleus outwards
- Often painful because nerves in the annulus or endplate can be sensitized by inflammatory-like changes arising from contact with blood or displaced nucleus

Adams MA, Stefanakis, M, Dolan P. Healing of a painful intervertebral disc should not be confused with reversing disc degeneration: Implications for physical therapies for discogenic back pain. Clinical Biomechanics 2010;25(10):961-971.

155

Intervertebral Disc Disease

- Objectives:
  - Reduce pain and speed/improve healing
  - Restore optimal function
  - Effective healing occurs only in the outer annulus and endplate
    - Metabolite transport greatest
  - Healing the disc periphery has the potential to relieve discogenic pain
    - Re-establishes a physical barrier between nucleus and nerves, reducing inflammation

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Glucosamine & Chondroitin Sulfate Combined may Support Overall Musculoskeletal Integrity

BMC Complement Altern Med. 2003 Jun 10;3:2. Epub 2003 Jun 10.

Glucosamine and chondroitin sulfate supplementation to treat symptomatic disc degeneration: biochemical rationale and case report.

van Blitterswijk WJ, van de Nes JC, Wuisman PI.

Division of Cellular Biochemistry, The Netherlands Cancer Institute, Antoni van Leeuwenhoek Hospital, Plesmanlaan 121, 1066CX Amsterdam, The Netherlands. w.v.blitterswijk@nki.nl

BACKGROUND: Glucosamine and chondroitin sulfate preparations are widely used as food supplements against osteoarthritis, but critics are skeptical about their efficacy, because of the lack of convincing clinical trials and a reasonable scientific rationale for the use of these nutraceuticals. Most trials were on osteoarthritis of the knee, while virtually no documentation exists on spinal disc degeneration. The purpose of this article is to highlight the potential of these food additives against cartilage degeneration in general, and against symptomatic spinal disc degeneration in particular, as is illustrated by a case report. The water content of the intervertebral disc is a reliable measure of
objectively determined by Magnetic Resonance Imaging (
glucosamine and chondroitin sulfate for two years associa
in a case of symptomatic spinal disc degeneration. We pro
efficacy of these nutraceuticals. They are bioavailable to c
biosynthesis and inhibit the breakdown of their extracellu
suggests that long-term glucosamine and chondroitin su
disc degeneration, particularly at an early stage. Howeve
trials with these food supplements, in which disc de-/rege
number of biochemical reasons (that mechanistically nee
may have cartilage structure- and symptom-modifying eff
osteoarthritis in general.

"The case suggests that long-term glucosamine and chondroitin sulfate intake may counteract symptomatic spinal disc degeneration."

BMC Complement Altern Med. 2003 Jun 10;3:2

157

Intervertebral Disc Disease: Study

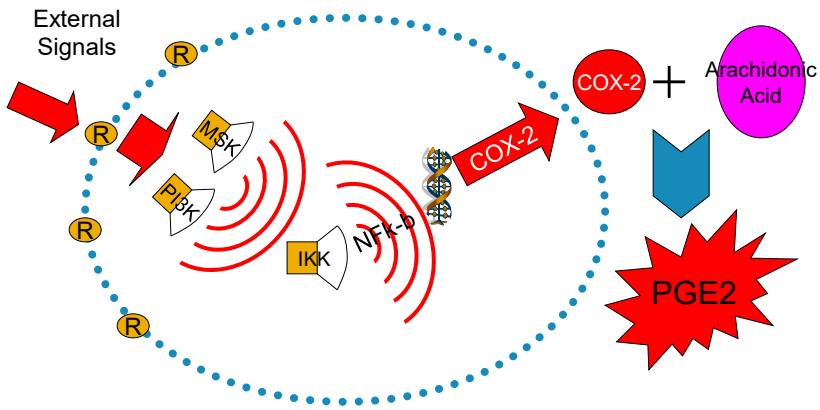
- 30 patients with low back pain (mean age 51)
- Given chondroitin sulfate: 1 g/day for 24 weeks
- 73.3% of patients showed pain relief and improved spinal function
- ➢ Include in treatment of low back pain as a chondroprotective therapy

Shostak NA, et al: Low back pain in spinal osteochondrosis: experience of treatment with chondroprotective drug (article Russian). Terapevtichjeskii Arkhiv 74(8):2002;67-69

158

Choose natural molecules to calm the signals and restore balance in your clients

Selective Kinase Response Modulators affect target kinases implicated in inflammation and joint pain



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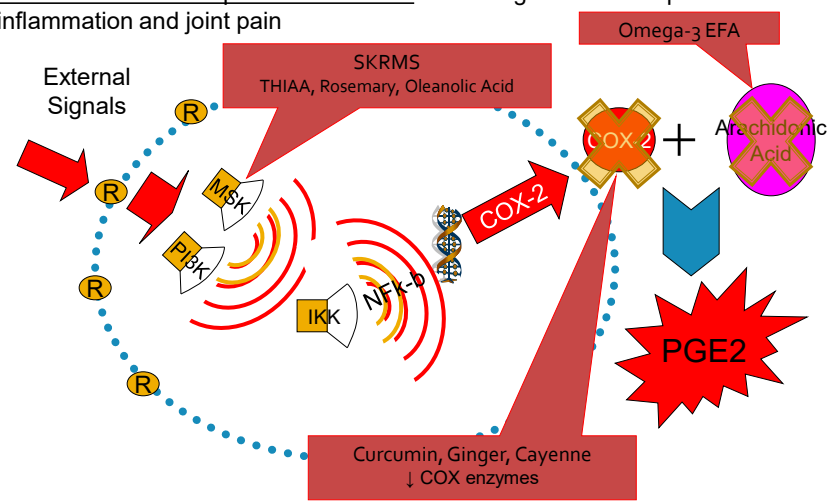
Choose natural molecules to calm the signals and restore balance in your patients

Selective Kinase Response Modulators affect target kinases implicated in inflammation and joint pain



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Joint Inflammation & Degradation

- Conventional Treatments
  - NSAIDS/Cox-2 Inhibitors
    - Inhibit both inducible and constitutive COX enzymes
      - Side effects: GI, kidney, liver, heart
      - Inhibits fracture healing
    - Suppress proteoglycan synthesis in chondrocytes
      - Weakens joints, inhibits healing
  - Salicylates
    - Depletes glycosaminoglycan synthesis and weakens bones

Cottrell J, O'Connor JP. *Effect of non-steroidal anti-inflammatory drugs on bone healing. Pharmaceuticals 3: 1668–1693, 2010.*
Cottrell JA, Meyenhofer M, Medicherla S, Higgins L, O'Connor JP. *Analgesic effects of p38 kinase inhibitor treatment on bone fracture healing. Pain 142: 116–126, 2009.*
Burd TA, Hughes MS, Anglen JO. *Heterotopic ossification prophylaxis with indomethacin increases the risk of long-bone nonunion. J Bone Joint Surg Br 85-B: 700–705, 2003.*
Cohen DB, Kawamura S, Ehteshami JR, Rodeo SA. Indomethacin and celecoxib impair rotator cuff tendon-to-bone healing. Am J Sports Med 34: 362–369, 2006.

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Joint Inflammation & Degradation: Recommendations

- MSM (Methyl Sulfonyl Methane: 1000 mg/day
  - Organic source of sulfur; utilized in the formation of connective tissue and glutathione formation
- Glucosamine & Chondroitin Sulfates
  - Helps with "shock-absorbing" components of cartilage (proteoglycans/cartilage matrix)
  - Chondroitin is the most abundant glycosaminoglycan & inhibits enzymes that break down cartilage matrix: 400-1200 mg/day
  - Glucosamine is a precursor to glycosaminoglycans & proteoglycans: 500-1500 mg/day
- Hyaluronic Acid
  - Supports resiliency, reduces friction and acts as a natural shock absorber
  - Antioxidant and protects against repetitive wear and tear
- MSM, glucosamine & chondroitin – synergistic
  - More effective if given together

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Joint Inflammation & Degradation: Recommendations

- Perna Canaliculus (Green Lipped Mussel)
  - Anti-inflammatory
    - More effective at reducing inflammation than aspirin or ibuprofen
  - Increase glycosaminoglycan production
    - Cartilage and synovial fluid
    - Assist with disc regeneration
  - Dosage: 1000 mg/day
  - May be contraindicated with shell-fish allergy

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Joint Inflammation & Degradation: Recommendations

Recommendation	Dosage
Joint & Soft Tissue Formula	1 packet BID
Hops, boswellia formula	2 tablets TID until pain subsides
Vitamin D3	Per testing: 5000-10,000 IU typical
High EPA Formula	2 gelcap BID/TID
Synergistic Product for Inflammation	2 scoops BID (use if pain is severe)
Anti-inflammatory diet; avoid nightshades; supportive nutrients: Vitamin C, E, A, B3, beta-carotene, zinc, selenium, manganese	
Body composition management; exercise as energy/pain/ROM permits	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour	

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Joint & Soft Tissue Formula

Two packets supply:

Vitamin C (as manganese ascorbate)	98 mg
Manganese (as manganese ascorbate)	45 mg
D-Glucosamine HCl	1500 mg
Chondroitin Sulfate	1200 mg
Green Lipped Mussel (*Perna canaliculus*) Powder†	1000 mg
MSM (methylsulfonylmethane)	1000 mg
Ginger (*Zingiber officinale*) Root Extract Powder [standardized to 5% gingerols and 6-shogaols]	900 mg
Turmeric (*Curcuma longa*) Root Extract†† [standardized to 95% curcuminoids]	500 mg
Boswellia (*Boswellia serrata*) Gum Extract††† [standardized to 30% acetyl-11-keto-beta boswellic acid (AKBA)]	250 mg
Hyaluronic Acid (low molecular weight)	100 mg
Black Pepper (*Piper nigrum L*) Fruit Extract†††† [standardized to 95% piperine]	5.3 mg

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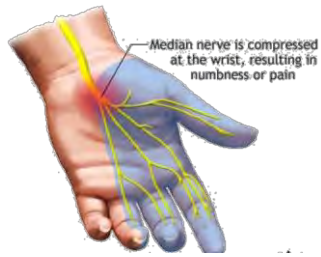
Joint Inflammation & Degradation: Safety and Follow up

- Contraindications
  - Shell fish allergy
    - Vegetarian sources available for glucosamine
  - Appropriate for long term use
- Side effects
  - Itchy, nausea, diarrhea at excessive doses
- Follow up: every 6-12 months PRN
  - X-ray/MRI
  - Labs: hs-CRP, SED rate, 25-OH Vitamin D

166

Soft Tissue Inflammation

- Any soft tissue inflammatory condition
  - Red
  - Swollen
  - Pain



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Soft Tissue Inflammation: Recommendations

Recommendation	Dosage
Hops, boswellia formula	4 tablets immediately with a full glass of water, then 2 tablets every half hour until pain subsides. Then 3-9 tablets/day until no longer needed.
Vitamin D3	Per testing: 5000-10,000 IU typical
High EPA Formula	1 gelcap BID/TID
Synergistic Food for Inflammation	2 scoops BID (if pain is severe)
Anti-inflammatory diet; avoid nightshades; supportive nutrients: Vitamin C, E, A, B3, beta-carotene, zinc, selenium, manganese	
Body composition management; exercise as energy/pain/ROM permits	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour	

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Muscle cramps/spasms

- Dehydration/sodium loss
- If taking Ca supplements, consider Ca/Mg
- Magnesium deficiency
  - Can test Packed RBC Magnesium
- Potassium deficiency
  - Can test Potassium
  - Eat bananas

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Muscle cramps/spasms

- Sports Drinks
  - Ingredients:
    - water, sucrose syrup, glucose-fructose syrup, citric acid, natural and artificial flavors, salt, sodium citrate, monopotassium phosphate, ester gum, sucrose acetate isobutyrate, blue #1

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Electrolyte Drinks	Mg-rich Electrolyte Drink	Gatorade	Powerade	Vitamin water	Propel Zero Water
Improve cellular energy metabolism	✓	×	×	×	×
Replace all key electrolytes lost during intense exercise/sweating	✓	×	× (Provides only Na and a little K)	×	×
Provides easily absorbable magnesium	✓	×	×	×	×
Designed to get fuel into cells quickly	✓	×	×	✓/× (Power-C only)	×
Provides key vitamins and minerals essential for high-performance exercise	✓	×	✓/× (Provides B_2 & B_6 only)	✓/× (Each flavor provides some; none provides all)	✓/× (Provides Vit C, E, B_5, B_6, niacin, K, PO_4)
Provides malic acid to help muscle recover faster	✓	×	✓	×	×
Vegetarian	✓	✓	✓	×	✓
Contain patented amino acid chelates	✓	×	×	×	×
All-natural	✓	×	×	✓	×
No high fructose corn syrup	✓	✓	×	✓	✓
No Artificial Color	✓	×	×	✓	✓
No brominated vegetable oil / glycerol ester of rosin	✓	×	×	×	✓
No Artificial Sweetener	✓	✓	×	✓	×
No Artificial Flavors	✓	×	✓	✓	✓

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Muscle cramps/spasms: Recommendations

- Mg-Rich Electrolyte Drink
  - Delivers ALL key electrolytes (magnesium, potassium, calcium, chloride, phosphorus and sodium)
  - Maintains proper hydration
- Ca:Mg – ideally 1:2-1:3
  - Muscle relaxation and prevents over excitability
- Magnesium glycinate: 200-400 mg day/night
  - Initiate muscle relaxation
- Passion Flower
- Valerian Root

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Muscle cramps/spasms: Recommendations

VALERIAN ROOT

- Helps relax the CNS & promote a feeling of calm
- Dosage: 100-200 mg
- Contraindications
  - Use caution with anti-anxiety/ sedative medications
- Side effects
  - Drowsy (at doses over 600 mg)

PASSION FLOWER

- Promotes relaxation
- Anti-anxiety
- Antispasmodic, sedative and vasodilator
- Dosage: 300 mg
- Contraindications
  - Use caution with anti-anxiety/ sedative medications
- Side effects
  - Drowsy (at doses over 600 mg)

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Muscle cramps/spasms: Recommendations

Recommendation	Dosage
Mg-Rich Electrolyte Drink	1 scoop in 16 oz. water 1-2x/day
Magnesium Glycinate	1-2 capsules BID
Ca:Mg with Calming Herbs	2-4 tablets before bed and PRN
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour PLUS one (1) quart of water for every 2 lbs. lost due to sweating (athletes/laborers)	

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Mg-Rich Electrolyte Drink

Ingredient	Amount	Daily Value
Calories	15	
Total Carbohydrate	3 g	1%*
Vitamin C (ascorbic acid)	120 mg	133%
Vitamin E (as dl-alpha tocopheryl acetate)	12.9 mg	86%
Thiamin (as thiamin hydrochloride)	2 mg	167%
Riboflavin	5 mg	385%
Niacin (as niacin)	10 mg NE	63%
Vitamin B6 (as pyridoxine HCl)	5 mg	294%
Folate (as (6S)-5-methyltetrahydrofolic acid, glucosamine salt) (Quatrefolic ®)	20 mcg DFE (12 mcg folic acid)	5%
Vitamin B12 (as methylcobalamin)	6 mcg	250%
Pantothenic Acid (as calcium-d-pantothenate)	28 mg	560%
Calcium (from dicalcium phosphate and calcium D-glucarate)	103 mg	8%
Phosphorous (as dicalcium phosphate)	69 mg	6%
Magnesium [as magnesium oxide and magnesium bisglycinate chelate (TRAACS ®)]	200 mg	48%
Zinc (as zinc oxide)	0.005 mg	<2%
Chromium (as chromium picolinate)	83 mcg	237%
Chloride (from potassium chloride and sodium chloride)	162 mg	7%
Sodium (as trisodium citrate and sodium chloride)	96 mg	4%
Potassium (as potassium chloride and potassium aspartate)	176 mg	4%
Taurine	500 mg	**
L-carnosine	20 mg	**

Ca:Mg with Calming Herbs

Three tablets supply:

Calcium (as calcium lactate)..... 75 mg
Magnesium (as magnesium citrate)..... 150 mg
Passionflower Flower 5.5:1 Extract (*Passiflora incarnata*)..... 60 mg
Valerian Root Extract (*Valeriana officinalis*)..... 30 mg
Hops Cone 7.5:1 Extract (*Humulus lupulus*)..... 60 mg
Lemon Balm Leaf 5:1 Extract (*Melissa officinalis*)..... 150 mg

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Soft Tissue Trauma: Phases of Healing & Care

Phase 1: Acute | **Phase 2: Repair** | **Phase 3: Remodeling** | **Phase 4: Wellness**

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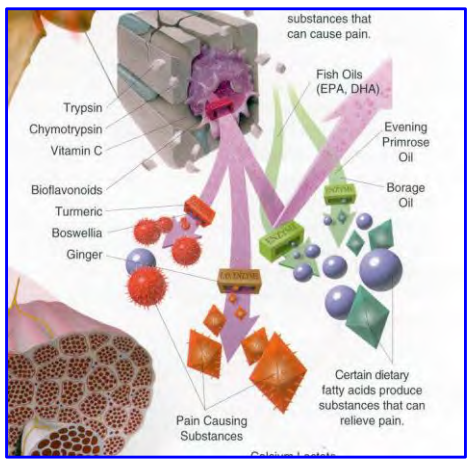
Soft Tissue Trauma: Phases of Healing Overview

- Physiology of phase tells us what to do
  - Acute, Repair, Remodeling, Wellness
- Biochemistry, physiology and biomechanics must work together to accelerate recovery
- Too much passive care creates disability and doctor dependency
- The longer it takes to heal the less chance of healing correctly

177

Phase 1: Basic Physiology of an Injury



The biochemistry of pain:

- White blood cells release cytokines
- Target cells react to cytokine by increasing the formation of cyclooxygenase (COX) enzymes
- COX enzymes covert *cellular* fat into pro-inflammatory compounds such as PGE2
- This cascade is "induced" by cytokine activity

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Phase 1: Acute Inflammatory Phase

- Symptoms = redness, heat, swelling, pain
- Healing begins immediately
- Acute inflammatory phase typically lasts 2-4 days
- Tissue injury creates inflammatory response
- Poor diet/lifestyle habits will greatly increase pain/inflammation
  - Acute pain ⇒ chronic pain/inflammation

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Phase 1: When Healing Begins

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Phase 1: Acute (Inflammatory) Phase

- Factors that slow the resolution of the acute inflammatory phase:
  - Edema/hemorrhage – pressure separates tissue, inhibits NMS control & debris removal
  - Poor vascular supply – impedes nutrient delivery & waste removal
  - Spasm – separates tissue -> Increases scar size & impedes circulation (vasoconstriction)
  - Lack of movement – muscle atrophy, stasis, proprioceptive loss
  - Acidic body chemistry & dehydration

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Phase 1: Acute (Inflammatory) Phase

- Objectives:
  - Manage pain
  - Reduce excessive swelling/congestion
  - Relax tight muscles/spasms
  - Use strategies to restore ROM
  - ➢ BEGIN HEALING PROCESS!!

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Phase 1: Acute (Inflammatory) Phase: Recommendations (Day 1-4)

- Essential Fatty Acids (EPA/DHA) – 2-10 g/day
  - 2000-3000 mg EPA/DHA (not EFAs)
- Anti-Inflammatory Herbs
  - Ginger – 200 mg (std. 5% gingerols) 4-2x/day
  - Turmeric – 300 mg (std.95% curcuminoids) 4-2x/day
  - Cayenne Pepper – 50 mg 4-2x/day
  - Boswellia – 400 mg (std. 70% boswellic acid) 4-2x/day
- Bioflavonoids – 500 mg 4-2x/day
- Proteolytic Enzymes –take on an empty stomach
- Ca, Mg, Valerian root, Passion Flower – for spasm

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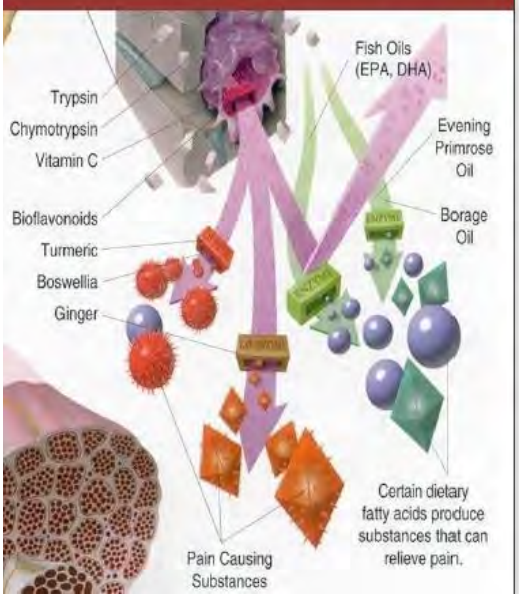
Nutrients to Address Swelling (within the First 72 Hours)



Trypsin & Chymotrypsin
(Proteolytic Enzymes)

Some studies suggest that patients who received proteolytic enzymes showed reduced swelling, pain, and inflammation — and experienced faster recovery rates.

Tricket P. Proteolytic enzymes in treatment of athletic injury. *Appl Ther* 1964;30:647-652.

184

Use Bromelain and Protelytic Enzymes to Address Swelling and Pain

Fortschr Med. 1995;113(19):303-306

[Bromelain in blunt injuries of the locomotor system. A study of observed applications in general practice]

[Article in German]
Masson M.

METHOD: In an open case observation
blunt injuries to the musculoskeletal s
tolerability of high-dose Bromelain PO
preparation, were investigated. The in
orthopedic surgeon who, in addition t
measures, treated 59 of his patients w
The duration of the application was de
severity of the lesion, and varied between one and three weeks. The test criteria were swelling, pain at rest and during movement, and tenderness. These parameters were evaluated on the day of the injury and on five subsequent dates.

"Treatment with bromelain resulted in a clear reduction in all four parameters tested. Both swelling and the symptoms of pain had improved appreciably."

Fortschr Med. 1995;113(19):303-306

185

Nutrients to Address Muscle Tissue

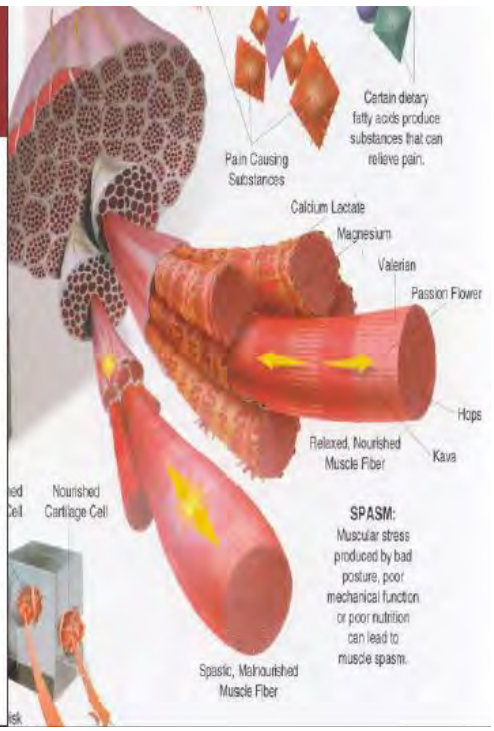
Calcium & magnesium

- **Calcium may work to relieve spasms by acting via pre-synaptic inhibition at neuromuscular junction**
- **Magnesium promotes muscle relaxation**
- **A balance of these minerals reduces spasm and cramping**

Lemon balm, passion flower & valerian root

These herbs have been traditionally used to promote relaxation and are considered to be safe and effective

Iseri LT, French JH. Magnesium: nature's physiologic calcium blocker. *Am Heart J* 1984;108(1):188-194.



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Phase 1: Acute (Inflammatory) Phase: Recommendations (Day 1-4)

Recommendation	Dosage
Hops, boswellia formula	4 tablets immediately with a full glass of water, then 2 tablets every half hour until pain subsides. Then 3-9 tablets/day until no longer needed.
High EPA Formula	1 gelcap TID
Ca:Mg with Calming Herbs	2 tablets 3-4x/day & before bed
Proteolytic Enzymes – empty stomach	5 tablets immediately, 3-4x/day for 4 days
Anti-inflammatory diet OR Eat To Heal (simple)	
Exercise as energy/pain/ROM permits, use non-affected muscles/joints	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour	

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Eat to Heal

- Eat Food. Not too much. Mostly Plants
  - Strictly avoid: red meat, dairy, alcohol, soda, sugar, white flour products
  - Eat: vegetables, fish, whole fruits
    - 75%+ (3/4 plate) alkaline foods: deep colored vegetables and whole fruit
    - 25% MAX (1/4 plate MAX) acidic foods: fatty fish, raw nuts/seeds & some whole grains
- Chew, chew chew!
- Drink pure water throughout the day
  - *½ your body weight in ounces every day*
  - *Drink in divided doses – 2-4 oz. every 20-30 minutes*

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Patient Language

- You can heal fast or slow – it's up to you
- We can cut your recovery time in ½
- It will be a little more money initially, but provide a large money and time savings in the long run
- Pain isn't your problem
- I give you support/knowledge, you give the commitment

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Phase 2: Fibroblastic 'Repair' Phase

- Starts within a few hours/days
  - Can last 4-6 weeks if do nothing
  - Can be 1-2 weeks implementing program
- Cardiovascular process: nutrients in/wastes out
- Physiology of repair:
  - Capillaries grow into the wound to deliver nutrients & remove waste
  - Fibrin plug breaks down & granulation tissue forms
  - Fibroblasts secrete collagen & ground substance
  - Leads to scar formation (3 weeks if do nothing; can be 3-4 days following program)

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Phase 2: Fibroblastic 'Repair' Phase

- Objectives
  - Joint stability
  - Reducing scar tissue formation
  - Increase ROM
  - Minimize tissue degeneration
  - ➢ Reduce scar tissue formation
  - ➢ Reduce risk of re-injury and degeneration

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Phase 2: Fibroblastic 'Repair' Phase: Recommendations

- Start ASAP
  - Nutrients/supplements – speed healing and prevent random scarring
  - Chiropractic adjustments – improve ROM, joint stability, minimize degeneration
- Supply building blocks for connective tissue:
  - Ground substance/compression
    - Glucosamine sulfate, niacin, vitamin C, zinc, manganese, copper, antioxidants
  - Collagen/tensile strength
    - MSM, Vitamin C, amino acids, manganese, magnesium, B6, B5, zinc, copper
- Continue to control inflammation if necessary
    - Ginger, Turmeric, Cayenne, Boswellia, Enzymes
- Follow Anti-Inflammatory Dietary Guidelines
- If they need additional protein
    - Whey: Cross-filtered, ion exchanged, hydrolyzed
    - Pea or brown rice: non-GMO, hydrolyzed

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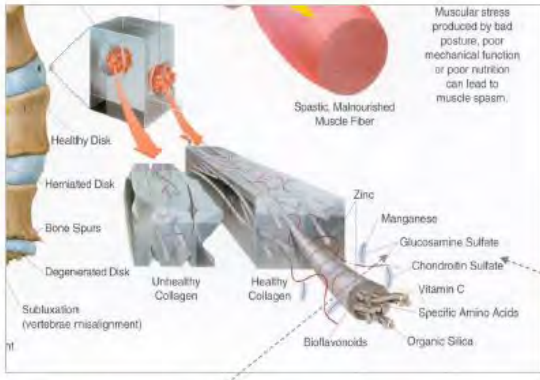
Nutrients to Support Connective Tissues and Joint Stability



Antioxidant Promotion

SOD Induction Complex

Powerful Nutrients For Building Cartilage

Glucosamine Sulfate

Chondroitin Sulfate

Methyl-Sulfonyl-Methane (MSM)

193

Phase 2: Fibroblastic 'Repair' Phase: Recommendations (Weeks 2-4)

Recommendation	Dosage
Hops, boswellia formula	2tablets TID until no longer needed.
High EPA Formula	1 gelcap TID cf
Ca:Mg with Calming Herbs	2 tablets 3x/day - PRN
Proteolytic Enzymes – empty stomach	3 tablets BID sf
Rehab Formula + Collagen Renew	2 caps BID/TID + 1 scoop/day
Anti-inflammatory diet OR Eat To Heal (simple)	
Chiropractic adjustments - PRN	
Exercise as energy/pain/ROM permits; water exercise often works well	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour	

194

Rehab Formula

Two capsules supply:

Vitamin C (ascorbic acid)	500 mg
Niacinamide	200 mg
Vitamin B6 (as Pyridoxine HCl)	60 mg
Calcium (as calcium amino acid chelate)†	39 mg
Magnesium (as magnesium amino acid chelate)†	20 mg
Zinc (as zinc amino acid chelate)†	7 mg
Copper (as copper amino acid chelate)†	less than 1 mg
Manganese (as manganese amino acid chelate)†	5 mg
Potassium (as potassium sulfate)	90 mg
Bioflavonoids (from Sweet orange peel extract)	200 mg
Chondroitin Sulfate	50 mg
Rutin	50 mg

Collagen Renew

Calories	60
Protein	15 g
Sodium	35 mg
Collagen Peptides	17.5 g
Gelatin Hydrolysate (FORTIGEL®)	5 g
Gelatin Hydrolysate (FORTIBONE®)	5 g
Gelatin Hydrolysate (TENDOFORTE®)	5 g
Gelatin Hydrolysate (VERISOL®)	2.5 g
Amino Profile	
Alanine	1,290 mg
Arginine	1,100 mg
Aspartic Acid	870 mg
Glutamic Acid	1,530 mg
Glycine	3,330 mg
Histidine	150 mg
Hydroxylysine	240 mg
Hydroxyproline	1,790 mg
Isoleucine	210 mg
Leucine	410 mg
Lysine	540 mg
Methionine	140 mg
Phenylalanine	320 mg
Proline	1,910 mg
Serine	480 mg
Threonine	270 mg
Tyrosine	120 mg
Valine	360 mg

Other ingredients: Bovine Collagen Peptides.

195

Phase 3: Remodeling Phase

- Three weeks to 12 months or longer
- Progression:
  - New tissue orients along lines of stress and/or electromagnetic fields
  - Leads to increased tensile strength
  - Leads to normal structure
  - Normal function
- Tissue must be stressed and receive appropriate nutrients for optimal remodeling

196

Phase 3: Remodeling Phase

- Objectives
  - Address residual/chronic inflammation
    - Improve cellular fatty acid profile
    - Modify pain signaling (SKRMs)
  - Achieve optimal tissue integrity
    - Reduce risk of re-injury
  - Achieve full ROM

197

Phase 3: Remodeling Phase: Recommendations

- High Quality Multi-Vitamin/Minerals
  - One-a-days don't work
  - Need nutrients spread out over the day with meals
- Additional antioxidant support
- Buffered vitamin C – 3-5 grams in divided doses with food
- Essential Fatty Acids (EPA/DHA)
- Collagen/tensile strength
  - MSM, Vitamin C, amino acids, manganese, magnesium, B6, B5, zinc, copper

198

Phase 3: Remodeling Phase: Recommendations

Recommendation	Dosage
Phytonutrient Multi	1 capsule BID cf
Buffered Vitamin C	3-5 grams daily in divided doses
Joint & Soft Tissue Formula	2 tablets BID
EPA:DHA 720	2 tablets BID/TID
Hops, Boswellia Formula	1-2 tablet BID - PRN
Synergistic Produce for Inflammation	1 scoopss BID (if pain is severe)
Anti-inflammatory diet OR Eat To Heal (simple)	
Chiropractic adjustments - PRN	
Body composition management; exercise as energy/pain/ROM permits	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour	

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Phase 3: Remodeling Phase: Recommendations – Exercise/ROM

- Sequence:
  - Joint motion ⇒ stretch/relax ⇒ increase speed of contraction ⇒ improve motor control (under control!) ⇒ mass movement
- Specific ideas:
  - Adjust/mobilize ⇒ stretch ⇒ advanced sensorimotor training (i.e., rocker board) ⇒ core stabilization ⇒ agility training ⇒ sport specific training (gym, sport)

200

Phase 4: Wellness Phase

- Get well, stay well
- Ongoing proactive preventative care is essential
- Find "it" and resolve "it" before you know "it" is there
- Monitor ongoing progress and health

- Phytonutrient multi-vitamin/mineral and EFA
- Other supplements per individual need

201

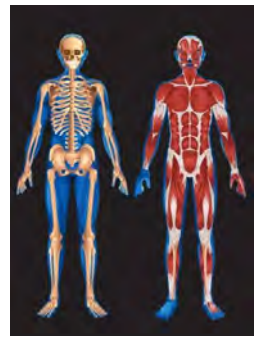
Guidelines to Reduce Inflammation

- Check for possible food allergies
- Rotate foods eaten – do not eat the same foods everyday
- Avoid using antacids and antibiotics
- Consider eating a more vegan diet – this will dramatically decrease pro-inflammatory compounds
- Do deep breathing exercises throughout the day – decreases acidity and pain
- Exercise as energy/pain permits
- Weight loss – excess fat increases inflammation
- Get help/testing to determine your client's specific root causes/imbalances

202

Questions on Musculoskeletal Conditions??

Bone	Osteoporosis, Osteopenia, Fracture
Joint	Osteoarthritis, Degenerative Disc Disease
Inflammation	Bursitis, Tendonitis, Carpal Tunnel, Surgery/Trauma
Soft Tissue	Muscle cramps/spasms, Tension headaches, Trauma

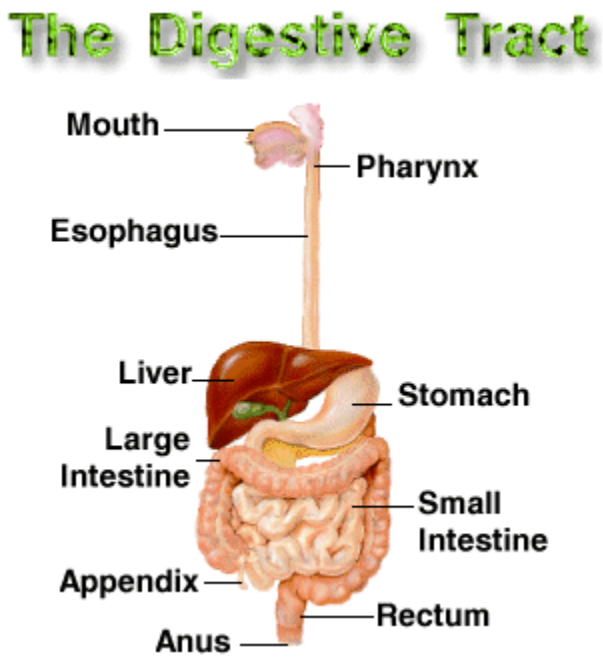


203

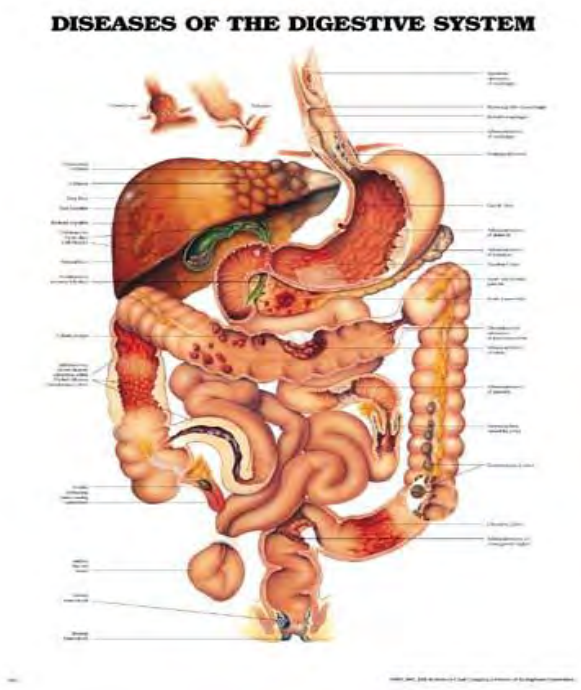
Gastrointestinal Conditions

Mouth	Gingivitis, halitosis, ulcers, cold sores
Stomach	Indigestion/poor digestion, Acid reflux/GERD, gastritis, gastric ulcer
General Intestines	IBS/Leaky gut, diarrhea, constipation, diverticulosis/diverticulitis, Hemorrhoids, Dysbiosis, Food hypersensitivity
Liver	Gallstones, Gallbladder spasm, fat malabsorption

204


The Digestive Tract
Mouth
Pharynx
Esophagus
Liver
Stomach
Large Intestine
Small Intestine
Appendix
Rectum
Anus

205


DISEASES OF THE DIGESTIVE SYSTEM

206

Gastrointestinal Conditions

Mouth	Gingivitis, halitosis, ulcers, cold sores
Stomach	Indigestion/poor digestion, Acid reflux/GERD, gastritis, gastric ulcer
General Intestines	IBS/Leaky gut, diarrhea, constipation, diverticulosis/diverticulitis, Hemorrhoids, Dysbiosis, Food hypersensitivity
Liver	Gallstones, Gallbladder spasm, fat malabsorption

207

GI Conditions: Indigestion/Poor Digestion

- Causes:
  - Insufficient digestion
    - Chewing, lack of enzymes/HCl, antacid use
    - Dilution of digestive juices
  - Poor food choices
    - Processed foods/foods lacking enzymes
    - Poor food combinations
    - Known triggers – i.e. cooked tomatoes, spices, etc.
  - Stress

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GI Conditions: Indigestion/Poor Digestion: Recommendations

- Chew!
- Hydration
  - Drink ½ your body weight in ounces every day
  - Divided doses – 2-4 oz. every 20-30 minutes ideal
  - Drink minimal water with meals
  - No iced-drinks with meals
- Eat fresh, whole foods whenever possible
  - Contain enzymes and fiber crucial for digestion
- Decrease dairy, red meat and gluten
- Stress management
- Supplement when necessary

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GI Conditions: Indigestion/Poor Digestion: Recommendations

- Peppermint oil
  - Antispasmodic – relax intestinal smooth muscle by blocking calcium influx into muscle cells
  - Supports healthy colonic motility
  - Stimulates the flow of bile
- English lavender flower oil
  - Antispasmodic and carminative
  - Promotes relaxation
- Chamomile Flower extract
  - Antispasmodic
  - Anxiolytic and mild sedative

Hills JM, Aaronson PI. The mechanism of action of peppermint oil on gastrointestinal smooth muscle. Gastroenterology 1991;101:55-65.
Pittler MH, Ernst E. Peppermint oil for irritable bowel syndrome: a critical review and metanalysis. Am J Gastroenterol 1998;93:1131-35.
Avallone R, Zanoli P, Puia G, et al. Pharmacological profile of apigenin, a flavonoid isoloated from Matricaria chamomilla. Biochem Pharmacol 2000;59:1387-94.
Bluementhal M. ed. The Complete German Commission E Monographs. Austin, Texas: American Botanical Council; 1998.

210

GI Conditions: Indigestion/Poor Digestion: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1 capsules QD/BID
Peppermint, chamomile, lavender formula	1-2 caps b4 meals (esp with stress)
Pancreatic enzyme formula OR Vegetarian enzyme formula (if on antacids)	1-2 capsules with meals
Betaine HCl Formula (if not on antacids)	1-6 tablets with meals
Anti-inflammatory diet; eliminate food triggers; avoid cow's dairy, red meat and gluten	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Develop better stress management techniques/strategies	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

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7 Strain Spectrum probiotic

Saccharomyces boulardii DBVPG®†† ..... 5 Billion CFU†
Bifidobacterium lactis Bi-07®††† ..... 4.167 Billion CFU†
Lactobacillus plantarum LP-115®††† ..... 4.167 Billion CFU†
Lactobacillus salivarius LS-33®††† ..... 4.167 Billion CFU†
Lactobacillus acidophilus NCFM®††† ..... 4.167 Billion CFU†
Streptococcus thermophilus ST-21™††† ..... 4.167 Billion CFU†
Bifidobacterium lactis BL-04®††† ..... 4.167 Billion CFU†

Peppermint, chamomile, lavender formula

One enteric-coated softgel supplies:

Chamomile Flower Extract (*Matricaria recutita*) ..... 250 mg
[containing 2.5%-5.5% (6.25-13.75 mg) apigenin glycosides†]
Peppermint Leaf Oil (*Mentha x piperita*) ..... 0.222 mL (200 mg)
[supplies a minimum of 50%(100 mg) total menthol††]
Lavender Flower Oil (*Lavandula angustifolia*) ..... 0.023 mL (20 mg)
Sodium Copper Chlorophyllin ..... 0.15 mg

Other ingredients: Gelatin, rice bran oil, glycerin, purified water, silica, and enteric coating.

† Calculated as apigenin-7-glycoside by HPLC.
†† Total menthol comprised of L-menthol, L-menthyl acetate, neomenthol, and neoisomenthol.

Recommendations: Take one softgel three times daily before meals or as directed by your healthcare practitioner.

Vegetarian enzyme formula

Two tablets supply:

Protease I ..... 20,000 PC
Protease II ..... 200,000 USP
Protease III ..... 40,000 HUT
Amylase ..... 20,000 DU
Lipase ..... 2000 LU
Cellulase ..... 2000 CU
Peptidase ..... 600 Units
Maltase ..... 600 DP
Lactase ..... 400 LAC U
Invertase ..... 400 SUMNER
AmLa Fruit (*Phyllanthus emblica*) ..... 40 mg

Other ingredients: Enzyme blend† (milk, wheat, soy), microcrystalline cellulose, croscarmellose sodium, cellulose, stearic acid (vegetable), and silica. **Contains:** Milk, wheat, and soy.

Pancreatic Enzyme formula

One capsule supplies:

Amylase ..... 40,000 USP units
Protease ..... 40,000 USP units
Lipase ..... 7,500 USP units

Betaine, HCL formula

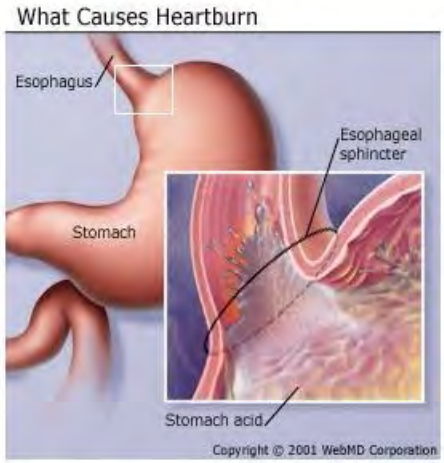
Serving size: Two Tablets
Servings per container: 135
One serving supplies:

Betaine HCl ..... 1,340 mg
Pepsin ..... 90 mg

212

GI Conditions: Acid Reflux/GERD

- Causes
  - Hypoacidity
    - Chronic stress, adrenal fatigue, age
    - H. pylori
  - Hyperacidity
    - Excessive acidic foods
      - Coffee, soda, alcohol, sugar
  - LES valve dysfunction
    - Scarring, stricture, hiatal hernia



213

Hypo- vs. Hyper-acidity

- Hypoacidity
  - Excessive burping
  - ***Fullness*** for extended periods after eating
  - Bloating
  - Poor appetite
  - Easily upset stomach
  - Hx of constipation
  - Food allergies
  - Weak, brittle, peeling nails

- Hyperacidity
  - ***Stomach/throat pain before and/or after meals***
  - Dependency on antacids
  - Difficulty belching
  - Ab pain esp with stress
  - ***Relief from drinking carbonated beverages, cream or milk***
  - Black stools (w/o Fe)
  - Chronic dysbiosis

214

Stomach acid and age

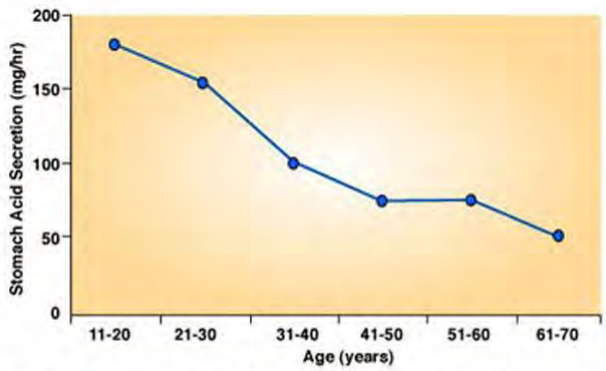


Fig. 1. Contrary to popular belief, stomach acid secretions drop with advancing age. This graph shows average decline in stomach acid secretion in humans between age 20 to age 80. (From "*Why Stomach Acid is Good For You.*")

215

GI Conditions: Acid Reflux/GERD

- How do you know?
  - HAQ – Part 1
    - Section A – Hypoacidity
    - Section B - Hyperacidity
  - BCA/litmus paper
    - ↓ salivary pH: hyperacidity
    - ↑ salivary pH: hypoacidity
  - H. Pylori (+)

216

GERD Medications

- Proton Pump Inhibitors (PPIs)
  - Omeprazole (Prilosec)
  - Lansoprazole (Prevacid)
  - Rabeprazole (Aciphex)
  - Pantoprazole (Protonix)
  - Esomeprazole (Nexium)
- H2 Antagonists
  - Famotidine (Pepcid/Pepcid AC)
  - Cimetidine (Tagamet, Tagamet HB)
  - Ranitidine (Zantac)
  - Nizatidine (Axid/Axid AR)

217

PPI Safety Profile

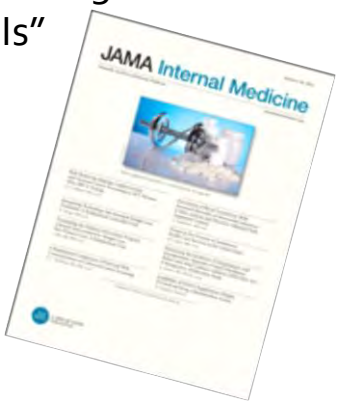
- Possible effects
  - B12 deficiency
  - Magnesium deficiency
  - Increased risk of Clostridia infection
  - Increased risk of pneumonia
  - Increased risk of hip, wrist and spine fracture
  - Increased weight gain
  - Severe reaction with Plavix
  - Increased risk of Alzheimer's disease
  - Increased risk of death after hospitalization
  - …

www.fda.gov/drugs/drugsafety/informationbydrugclass/ucm213259.htm

218

PPI Safety Profile

- "…physicians need to use caution and balance benefits and harms in long-term prescription of high-dose PPIs"
  - JAMA Internal Medicine 2013



Maggio M, Corsonello A, Ceda GP, Cattabiani C, Lauretani F, et al. Proton pump inhibitors and risk of 1-year mortality and rehospitalization in older patients dischrged from actue care hosptials. JAMA Intern Med. 2013;173(7):518-23.

219

GI Conditions: Acid Reflux/GERD: Recommendations

- Relax before and during meals
- Chew!
- Hydration
  - Drink ½ your body weight in ounces every day
  - Divided doses – 2-4 oz. every 20-30 minutes ideal
  - Drink minimal water with meals
  - No iced-drinks with meals
- Cook/steam most veggies (& possibly fruit) and add raw as tolerated
- Eat ripe fruit (only) in season daily
- Decrease dairy, red meat, sugar and gluten

220

GI Conditions: Hyperacidity: Recommendations

- Dietary recommendations
  - Eat smaller portions/meals
  - Chew food thoroughly
  - Eat a high-fiber, low-grain diet
    - ½-1 cup legumes daily
    - 5-9 cups of veggies daily
    - 1-3 servings whole fruit daily
  - Avoid irritating foods
    - Spicy foods, dairy, alcohol, coffee, strong tea, sugar
  - Cabbage juice – 4-8 oz. 1-2x/day

221

Dr. Cheney's Cabbage Cocktail

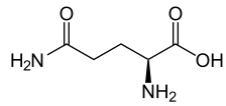
- ½ head or 2 cups of green cabbage
- 4 sticks of celery
- 2 carrots

- Green cabbages are best, but red cabbages are also useful. Cut the cabbage into long wedges and feed through the juicer followed by the celery and carrots.

222

GI Conditions: Hyperacidity: Recommendations

- L-glutamine
  - Source of fuel for enterocytes
    - Need to rebuild and repair
  - Important for immune function
  - Has anti-inflammatory effects
- Aloe vera (solids removed)
  - Anti-inflammatory
  - Promotes healing



Reeds PJ, Burrin DG. Glutamine and the bowel. J Nutr 2001;131:2505S-8S.
Newsholme P. Why is L-glutamine metabolism important to cells of the immune system in health, postinjury, surgery or infection? J Nutr 2001;131:2515S-22S.
Miller AL. Therapeutic considerations of L-glutamine: a review of the literature. Altern Med Rev 1999;4:239-48.

223

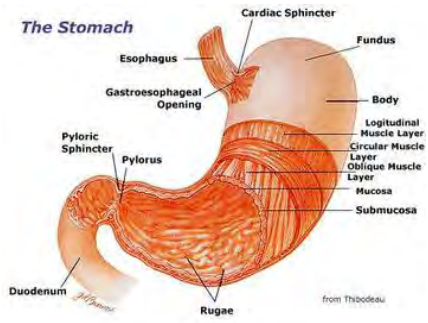
GI Conditions: Hyperacidity: Recommendations

- Deglycyrrhizied licorice root (DGL)
  - Soothes inflamed mucous membranes in GI tract
  - Protects stomach and duodenum by increasing production of mucin and secretin
  - Enhances killing of virus that cause cold sores and mouth ulcers
  - Appears to inhibit H. pylori

224

GI Conditions: Hyperacidity: Recommendations

- In order for pepsin/HCl to damage stomach, the mucous layer must be compromised
  - Nourish and protect the mucosal layer
  - Zinc Carnosine



225

Hyperacidity: Recommendations

- Zinc carnosine
  - Used in Japan since 1994 to promote healing of gastric mucosal lining and relieve dyspeptic symptoms
  - Over 20 published studies, including 6 human clinical trials
  - Useful with or without conventional treatments

Beneficial Effect	Proposed Mechanism
Inhibits H. Pylori	Anti-urease activity
Attenuates gastric inflammation	***Inhibits expression of TNF-α and IL-8 cytokines, without affecting PGE2 production***
Protects cellular integrity	***Antioxidant activity***
Protects gastric epithelium	***Stimulates mucus secretion***
Adheres to wound site	***L-carnosine transports zinc to would site; zinc is an important cofactor for many proteins***

226

GI Conditions: Hyperacidity: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1 capsules QD/BID
Zinc Carnosine Formula (75 mg each)	2 tablets 2x/day for 2 weeks, then 1 BID
Glutamine, DGL, Aloe Formula	1-2 tsp before or between meals
Anti-inflammatory diet; eliminate food triggers; avoid cow's dairy, red meat and gluten	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet (esp soluble fiber); cabbage juice – 4-8 oz. 1-2x/day (esp if suspect ulcer); avoid irritating foods	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

227

Glutamine, DGL, Aloe formula

Serving Size: One Scoop (7 g)
Servings Per Container: 28
One serving supplies:

Calories	15
Total Carbohydrate	4 g
Dietary Fiber	<1 g
Total Sugars	<1 g
Iron	0.49 mg
Zinc (as zinc-carnosine)	16.1 mg
L-Glutamine	1.5 g
Glucosamine HCl	1 g
Apple Pectin Powder (fruit; Malus pumila)	1 g
Deglycyrrhizinated Licorice Powder (root; Glycyrrhiza glabra)	400 mg
Aloe Vera Leaf Gel Extract	300 mg
Slippery Elm Powder (bark; Ulmus rubra)	200 mg
Mucin	200 mg
Marshmallow Powder (root; Althea officinalis)	100 mg
Chamomile Powder (flower; Matricaria chamomilla)	100 mg
Okra Powder (fruit; Abelmoschus esculentus)	100 mg
Cat's Claw Powder (bark; Uncaria tomentosa)	100 mg
MSM (methylsulfonylmethane)	100 mg
Quercetin (as quercetin dihydrate)	100 mg
Prune Powder (fruit; Prunus ssp.)	100 mg
L-Carnosine (as Zinc-Carnosine)	62 mg

Zinc Carnosine Formula

One tablet supplies:

Zinc (as zinc-carnosine)	17 mg
Zinc-Carnosine	75 mg

228

Hypoacidity: Recommendations

- CHEW!
- Dietary recommendations
  - Eat smaller portions/meals
  - Eat only when hungry
  - Do not eat when upset
  - Limit liquids with meals (dilute digestive juices)
- Apple cider vinegar – 1 Tbsp b4 meals
- Exercise – 15-20 min walk after eating
- Supplement when necessary

229

Hypoacidity: Recommendations

- Replace HCl – HCl Challenge
  - Begin with 1 tablet Betaine HCl with meals; if no burning or warmth sensation within 2 hours, increase by 1 tablet with meals until experience warmth or burning sensation in stomach/abdomen OR reach 6 tablets Betaine HCL with meals
  - If/when experience warmth or burning sensation, decrease by 1 tablet with meals and continue
  - May need to heal/repair stomach/GI tract first
    - Use Glutamine, DGL, Aloe formula and/or Chinese Herbal formula for 2 weeks prior to HCl Challenge
    - Continue with one or both formulas during challenge PRN

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HCl Challenge Example

- Jane begins with 1 tablet Betaine HCl with breakfast and does not experience warmth/burning in abdomen
- Increases to 2 tablets with lunch; no burning
- Increases to 3 tablets with dinner; has some mild warmth/burning
- Takes 2 tablets with meals ongoing until warmth/burning returns, then continues to decrease PRN

231

Hypoacidity: H. pylori

- Helicobacter pylori (H. pylori)
  - 2/3 of people infected with H. pylori
  - Increases risk of non-ulcer dyspepsia, peptic ulcers and gastritis
  - Leading cause of peptic ulcers
    - 80% of gastric ulcers & 90% of duodenal ulcers
  - Produces an enzyme that neutralizes stomach acid
  - Regular use of antacids increases risk of infection
  - Amoxicillin successful in only 60% of cases
  - Zinc-carnosine can help eliminate

232

Hypoacidity: Recommendations

- Zinc carnosine
  - Used in Japan since 1994 to promote healing of gastric mucosal lining and relieve dyspeptic symptoms
  - Over 20 published studies, including 6 human clinical trials
  - Useful with or without conventional treatments

Beneficial Effect	Proposed Mechanism
Inhibits H. Pylori	***Anti-urease activity***
Attenuates gastric inflammation	Inhibits expression of TNF-α and IL-8 cytokines, without affecting PGE2 production
Protects cellular integrity	***Antioxidant activity***
Protects gastric epithelium	Stimulates mucus secretion
Adheres to wound site	***L-carnosine transports zinc to would site; zinc is an important cofactor for many proteins***

233

Hypoacidity: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1 capsules QD/BID
Glutamine, DGL, Aloe Formula	1-2 tsp before or between meals PRN
Betaine HCl	Per HCl Challenge
Zinc Carnosine formula	2 tablets 2x/day for 2 weeks, then 1 BID
Anti-inflammatory diet; eliminate food triggers; avoid cow's dairy, red meat and gluten	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet (esp soluble fiber); cabbage juice – 4-8 oz. 1-2x/day (esp if suspect ulcer); avoid irritating foods; apple cider vinegar – 1 Tbsp/meal	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

234

GI Conditions: Gastritis

- Inflammation of stomach lining
- Causes:
  - Alcohol, caffeine, NSAIDS infections
  - Hypoacidity
  - H. Pylori
  - Ulcer

235

GI Conditions: Gastritis: Recommendations

- Address underlying dietary/lifestyle causes
  - Eliminate alcohol, caffeine, need for NSAIDs
- Address inflammation
  - Ginger, curcumin, bioflavonoids,
  - L-glutamine, DGL, Licorice
  - Probiotics
  - EFAs

236

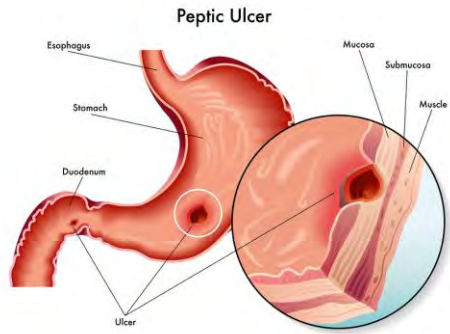
GI Conditions: Gastritis: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1 capsules QD/BID
Synergistic Product for Inflammation	1 scoop BID
Glutamine, DGL, Aloe Formula	1-2 tsp before or between meals
EFA:DHA 720	1-2 gelcaps BID with meals
Anti-inflammatory diet; eliminate food triggers; avoid cow's dairy, red meat and gluten; cabbage juice – 4-8 oz. 2x/day	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet (esp soluble fiber); avoid irritating foods	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

237

GI Conditions: Ulcers

- Gastric ulcer
  - Lesion in stomach
  - Often worse with food
  - Burning, cramping
  - Causes: stress, H. Pylori
- Duodenal ulcer
  - Lesion in duodenum
  - Often worse on empty stomach
  - Causes: alcohol, caffeine, NSAIDS, stress



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GI Conditions: Ulcers: Recommendations

- Address underlying dietary/lifestyle causes
  - Eliminate alcohol, caffeine, need for NSAIDs
  - Improve stress management
- Address inflammation/Heal Ulcer
  - Cabbage juice
  - Ginger, curcumin, bioflavonoids,
  - L-glutamine, DGL, Licorice
  - Zinc Carnosine
  - Probiotics
  - EFAs

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GI Conditions: Ulcers: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1 capsules QD/BID
Synergistic Product for Inflammation	2 scoops BID
Glutamine, DGL, Aloe Formula	1-2 tsp before or between meals
Zinc Carnosine Formula	2 tablets BID for 2 weeks, then 1 BID
EFA:DHA 720	1-2 gelcaps BID with meals
Anti-inflammatory diet; eliminate food triggers; avoid cow's dairy, red meat and gluten	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet (esp soluble fiber); cabbage juice – 4-8 oz. 1-2x/day (esp if suspect ulcer); avoid irritating foods	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

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Gastrointestinal Conditions

Mouth	Gingivitis, halitosis, ulcers, cold sores
Stomach	Indigestion/poor digestion, Acid reflux/GERD, gastritis, gastric ulcer
General Intestines	IBS/Leaky gut, diarrhea, constipation, diverticulosis/diverticulitis, Hemorrhoids, Dysbiosis, Food hypersensitivity
Liver	Gallstones, Gallbladder spasm, fat malabsorption

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GI Conditions: IBS vs. IBD

- Irritable Bowel Syndrome
  - Functional disorder
  - "Spastic colon"
  - Many concomitant disorders
  - No visible/permanent damage
  - No GI bleeding
  - No higher risk of colon cancer
  - Not likely to develop IBD
  - Symptoms mild to severe
  - Common - 10-20% of US
  - Stress often a trigger
- Inflammatory Bowel Disease
  - Disease of the bowel
  - Crohn's, Ulcerative Colitis, Celiac
  - Concomitant disorders
    - Arthritis, Osteoporosis, Auto-immunity
  - Visible/permanent damage
  - Immune involvement
  - GI bleeding common
  - Higher risk colon cancer
  - Less common – 1.4M in US

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GI Conditions: Clinical Differences

Intestinal symptoms	IBS	IBD
Alternating diarrhea/constipation	X	
Abdominal pain	X	X
Bloating/distension	X	X
Mucus	X	X
Persistent diarrhea	X	X
Rectal bleeding		X
Fistulas		X
Strictures		X

Non-Intestinal Symptoms	IBS	IBD
Symptoms worse during menses	X	X
Anemia		X
Delayed growth		X
Fever		X
Skin irritations	X	X
Weight loss		X

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GI Conditions: IBS/Leaky Gut: Causes

- Disturbance between brain and gut
  - Subluxation
- Highly refined diet
- Poor digestion
- Dysbiosis/intestinal infections
- Food hypersensitivity/intolerance
- Anemia
- High stress or poor stress tolerance

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GI Conditions: IBS/Leaky Gut: Recommendations

- Chiropractic adjustment(s)
- Stress management and/or therapy
- Acupuncture
- Avoid caffeine, alcohol and tobacco
- Regular aerobic exercise and/or yoga
- Anti-inflammatory diet
  - Identify/eliminate food allergens
- Supplementation

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GI Conditions: IBS/Leaky Gut: Recommendations

- Dietary recommendations:
  - Anti-inflammatory diet
  - Determine/eliminate food hypersensitivities and any other food triggers, especially dairy, gluten & corn
  - If severe gas/bloating, eliminate gas forming foods (legumes, cabbage, cauliflower, broccoli, onions and garlic); try reintroducing them (steamed/cooked) over time
  - Avoid nightshade vegetables (tomatoes, white potatoes, eggplant and bell peppers)
  - Avoid citrus (tomatoes, oranges, grapefruit)
  - Get plenty of EFAs (fatty fish, flax)
  - Eat an alkaline & varied diet (at least 50% veggies/fruit)

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GI Conditions: IBS/Leaky Gut: Recommendations – 4 Rs

- Remove (problem foods & microbes):
  - Food allergens; anti-microbials PRN
- Replace (HCl and/or enzymes):
  - *Pancreatic or Vegetarian enzyme formula* – 1-3 tabs cf PRN
- Reinoculate (beneficial bacteria):
  - *7 Strain Spectrum probiotic* – 1- 2 caps 2x/day
  - *Prebiotic formula* – 1 Tbsp 2-3x/day (constipation)
- Repair:
  - *Synergistic Product for inflammation* – see patient guide
  - *Glutamine, DGL, Aloe formula* – 1-2 tsp TID
  - *High EPA formula* – 1 softgel 2-3x/day

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GI Conditions: IBS/Leaky Gut: Recommendations – 4 Rs

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1 capsules QD/BID
Pancreatic or Vegetarian Digestive Enz.	1-2 tabs with meals
Synergistic Prodcut for Inflammation	1 scoop BID
Glutamine, DGL, Aloe Formula	1-2 tsp before or between meals
High EPA Formula	1 gelcap BID with meals
Anti-inflammatory diet; eliminate food allergens/triggers	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet (esp soluble fiber)	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

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Replace

Pancreatic enz. formula

One capsule supplies:

Amylase	40,000 USP units
Protease	40,000 USP units
Lipase	7,500 USP units

Vegetarian enz. formula

Two tablets supply:

Protease I	20,000 PC
Protease II	200,000 USP
Protease III	40,000 HUT
Amylase	20,000 DU
Lipase	2000 LU
Cellulase	2000 CU
Peptidase	600 Units
Maltase	600 DP
Lactase	400 LAC U
Invertase	400 SUMNER
AmLa Fruit (*Phyllanthus emblica*)	40 mg

Other ingredients: Enzyme blend† (milk, wheat, soy), microcrystalline cellulose, croscarmellose sodium, cellulose, stearic acid (vegetable), and silica. **Contains:** Milk, wheat, and soy.

†Microorganisms used for the manufacture of enzymes consume nutrient media containing milk, wheat, and soy during the process of growth. No additional milk, wheat, or soy derived nutrients were added outside this fermentation step.

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Reinoculate

7 Strain Spectrum probiotic

Saccharomyces boulardii DBVPG®††	5 Billion CFU†
Bifidobacterium lactis Bi-07®†††	4.167 Billion CFU†
Lactobacillus plantarum LP-115®†††	4.167 Billion CFU†
Lactobacillus salivarius LS-33®†††	4.167 Billion CFU†
Lactobacillus acidophilus NCFM®†††	4.167 Billion CFU†
Streptococcus thermophilus ST-21™†††	4.167 Billion CFU†
Bifidobacterium lactis BL-04®†††	4.167 Billion CFU†

Prebiotic formula

Four capsules supply:

Calories	10
Calories From Fat	0
Protein	1 g
Colostrum (Bovine)	1720 mg
Typically Provides:	
Immunoglobulin G (IgG)	550 mg
Other Immunoglobulins (IgA, IgM)	44 mg
Proline-Rich Polypeptides (PRP)	80 mg
Lactoferrin	8 mg

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Repair

Synergistic Product for inflammation

Calories	140
Total Fat	2 g
Total Carbohydrate	16 g
Dietary Fiber	1 g
Total Sugars	4 g
Includes 4 g Added Sugars	
Protein	13 g
Vitamin A (as retinyl palmitate)	900 mcg RAE
Vitamin C (ascorbic acid)	500 mg
Vitamin D3 (as cholecalciferol)	10 mcg (400 IU)
Vitamin E (as d-alpha tocopheryl acetate)	134 mg
Thiamin (as thiamine HCl)	0.375 mg
Riboflavin	0.425 mg
Niacin	5 mg
Vitamin B6 (as pyridoxal-5-phosphate)	0.5 mg
Folate (as [6S]-5-methyltetrahydrofolic acid glucosamine salt) (Quatrefolic®)	400 mcg DFE
Vitamin B12 (as methylcobalamin)	250 mcg
Biotin	75 mcg
Pantothenic Acid (as calcium-d-pantothenate)	2.5 mg
Calcium	320 mg
Iron	8 mg
Phosphorous (from dipotassium phosphate)	135 mg
Iodine (as potassium iodide)	37.5 mcg
Magnesium (as magnesium citrate & magnesium glycinate)	260 mg
Zinc (as zinc gluconate)	13 mg
Selenium (as l-selenomethionine)	52.5 mcg
Copper (as copper citrate)	1.5 mg
Chromium (as chromium picolinate)	120 mcg
Sodium	170 mg
Potassium	580 mg
L-Glutamine	2.5 g
Quercetin (as quercetin dihydrate)	500 mg
Turmeric Root Extract	400 mg
Ginger Root Extract	200 mg
Cat's Claw Bark Powder	200 mg
N-Acetyl-L-Cysteine	200 mg
Indian Frankincense Oleo Gum Resin Extract	150 mg
Rosemary Leaf Powder	100 mg
Trans-Resveratrol (from japanese knotweed root extract)	100 mg
Milk Thistle Seed Extract	100 mg
Green Tea Leaf Extract	100 mg
Alpha Lipoic Acid	50 mg
Broccoli Sprout Extract	30 mg
Devil's Claw Root Extract	20 mg
Amino Profile	
Cystine	0.27g
Methionine	0.17g
Aspartic Acid	1.6g
Threonine	0.53 g
Serine	0.74 g
Glutamic Acid	4.62 g
Proline	0.84 g
Glycine	1.04 g
Alanine	0.62 g
Valine	0.73 g
Isoleucine	0.67 g
Leucine	1.2 g
Tyrosine	0.49 g
Phenylalanine	0.76 g
Histidine	0.34 g
Lysine	0.99 g
Arginine	1.1 g
Tryptophan	0.15 g

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GI Conditions: IBS/Leaky Gut: Recommendations – Support

- L. plantarum 299v
  - Extensively researched
  - Relieves intestinal irritation & bowel discomfort
    - Beneficially influences levels of key cytokines (IL-10, IL-6)
  - Supports healthy intestinal mucosal barrier integrity and function
  - Supports a healthy immune response
  - ➢ Very useful for those with a high degree of GI inflammation; use 1-2 months PRN

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GI Conditions: IBS/Leaky Gut: Recommendations – Support

- *L. Plantarum 299v probiotic* – 1 cap daily PRN (inflammation)
- *D3 5000* – 1-2 capsules/day
- *Peppermint, chamomile, lavender formula* – 1-2 caps before meals (PRN - stress)
- *Mag Citrate* – 2 tab 2-3x/day (constipation)
  - Eat ½ raw white potato (sliced thin w/sea salt) before bed

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High EPA formula

One softgel supplies:

Calories	20
Calories from Fat	20
Total Fat	2 g
Cholesterol	5 mg
EPA (Eicosapentaenoic acid ethyl ester)	1200 mg

D3 5000

One softgel supplies:

Vitamin D3 (as cholecalciferol) ..... 5000 IU

Other ingredients: Highly refined soybean oil, gelatin, glycerin, and water.

Peppermint, Chamomile formula

One enteric-coated softgel supplies:

Chamomile Flower Extract (*Matricaria recutita*) ..... 250 mg
[containing 2.5%-5.5% (6.25-13.75 mg) apigenin glycosides†]
Peppermint Leaf Oil (*Mentha x piperita*) ..... 0.222 mL (200 mg)
[supplies a minimum of 50%(100 mg) total menthol††]
Lavender Flower Oil (*Lavandula angustifolia*) ..... 0.023 mL (20 mg)
Sodium Copper Chlorophyllin ..... 0.15 mg

Magnesium Citrate

Three tablets supply:

Calcium (as calcium citrate)	60 mg
Magnesium (as magnesium citrate)	300 mg

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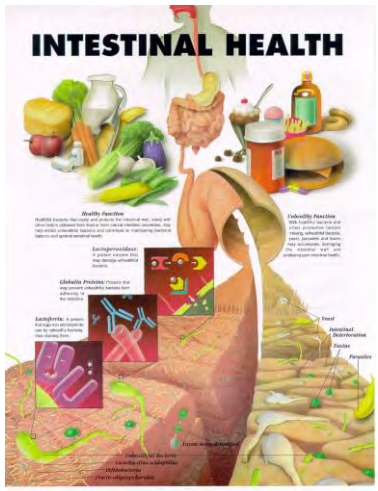
GI Conditions: Diarrhea

- Causes:
  - Antibiotics -> Dysbiosis
  - Osmotic
    - Carbohydrate, fat, protein malabsorption; Mg, Vit C
  - OTC medications
  - Laxative abuse
  - Infection
  - GI disease/disorder



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GI Conditions: Diarrhea: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1-2 capsules BID
Pancreatic or Vegetarian Digestive Enz.	1-2 tabs with meals
Soluble Fiber Formula	1 fl oz BID
Immunoglobulin, whey & synergist formula	4 tablets BID/TID between meals
Mg-Rich Electrolyte Drink	1 scoop in 16 oz. water 1-3x/day
Anti-inflammatory diet; eliminate food allergens/triggers	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet (esp soluble fiber)	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

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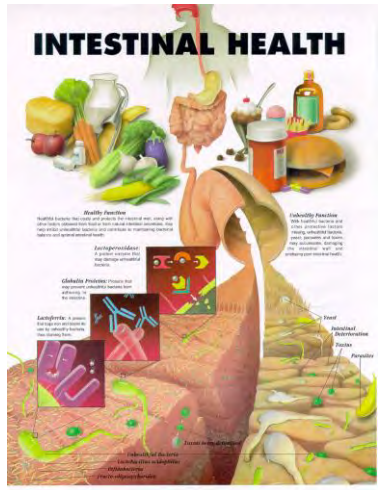
GI Conditions: Constipation

- Causes:
  - Dehydration
  - Lack of fiber
  - EFA imbalance
  - Dysbiosis
  - Medications
    - Pain medications, antacids, SSRI, Iron
  - Endocrine consideration
    - Thyroid, hormone imbalance



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GI Conditions: Constipation: Recommendations

- Decrease heavy/rich foods and foods lacking fiber
  - Red meat, cheese/cow's dairy, eggs, refined sugar
- Increase vegetables, fruits and legumes
- Increase EFAs: fish, flax oil, supplements
- Increase water/fluids
- Increase bounding exercise (i.e. walking)
- Improve stress management
- Further testing: thyroid, HAQ, hormones

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GI Conditions: Constipation: Recommendations

Recommendation	Dosage
7 Strain Spectrum Probiotic – empty stomach	1-2 capsules BID
Pancreatic or Vegetarian Digestive Enz.	1-2 tabs with meals
Fiber Formula	1 scoop in 8 oz liquid 1-3x/day
Magnesium citrate	100-200 mg 3-4x/day
EPA:DHA 3:2	1-2 gelcaps BID
Anti-inflammatory diet; eliminate food allergens/trigger; high fiber diet	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Daily exercise/walking after meals; deep breathing throughout the day	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

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Fiber Formula

Calories	35
Total Fat	0.5 g
Total Carbohydrate	7 g
Dietary Fiber	2 g
Total Sugar	<1 g
Protein	<1 g
Iron	0.84 mg
GI Blend	9 g
Rice Bran Powder	3.5 g
Organic Isomalto-Oligosaccharides (as VitaFiber™)	2.5 g
Psyllium Husk Powder	2 g
Apple Fruit Powder	500 mg
Oat Bran Powder	500 mg

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GI Conditions: Dysbiosis

- Imbalance in intestinal flora
- Can cause GI inflammation & associated symptoms
- Identify using Parasitology/Stool Culture

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GI Conditions: Dysbiosis - Causes

- Antibiotics, antifungals, antacids/PPIs/H2 antagonists, NSAIDS, steroids
- Viral, bacterial, fungal and/or parasitic infection
- Poor diet –↓ nutrient/fiber, ↑ allergens
  - Sulfur challenge
- Low stomach acid/digestive enzymes
- Stress
  - Significant changes in 1-6 days
- Environmental toxins

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GI Conditions: Dysbiosis - Symptoms

- GI Symptoms

Nausea/vomiting	Loose stools	Diarrhea
Constipation	Gas	Bloating
Heartburn/acid reflux	Belching/burping	Indigestion

- Non-GI Symptoms

Bad breath	Cravings	Runny nose
Itchy eyes/skin	Rashes/skin disorders	Joint pain
Hyperactivity	Fatigue	Sinus congestion
Headache	Mood swings	Acne
Muscle aches	Flu-like symptoms	

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Health Benefits of Flora Balance

- Support vitamin and short chain fatty acid production
  - Promotes healthy intestinal tissues, energy production and repair processes
- Support the assimilation of nutrients
- Facilitate digestion (lactose)
- Support healthy mucosal and systemic immune response
- Help to protect the intestinal mucosa from increased permeability and toxins

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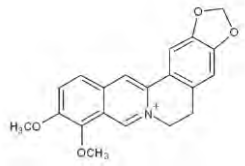
GI Conditions: Dysbiosis - Recommendations

- Berberine
  - Derived from several plants including
    - Oregon grape root, Goldenseal & Phellodenron root, Coptis root
  - Strong anti-microbial for bacteria and many parasites



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GI Conditions: Dysbiosis - Recommendations

- Red Thyme Oil & Oregano Oil
  - Anti-fungal and anti-bacterial properties
  - Promotes healthy GI and respiratory function
  - Support intestinal mucosal integrity

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Dysbiosis - Supplementation

- Based on susceptibility testing
- *Berberine herb formula (bacteria)* – 2 tablets TID
- *Aromatic herb formula (fungi)* – 1 cap TID
- *High allicin content garlic* – 2-3 tabs TID

- *Glutamine, DGL, Aloe formula* – 1-2 tsp TID

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Berberine formula

Two tablets supply:

Coptis (*Coptis chinensis*) Root and Rhizome 12:1 Extract..... 30 mg
(containing berberine)
Oregon Grape (*Berberis aquifolium*) Root 4:1 Extract..... 70 mg
(containing berberine)
Berberine HCl† ..... 400 mg
A 4:1†† proprietary extract of: ..... 300 mg
Coptis (*Coptis chinensis*) Root and Rhizome, Chinese Skullcap (*Scutellaria baicalensis*) Root, Phellodendron (*Phellodendron chinense*) Bark, Ginger (*Zingiber officinale*) Rhizome, Chinese Licorice Root (*Glycyrrhiza uralensis*), and Chinese Rhubarb (*Rheum officinale*) Root and Rhizome.

High allicin content garlic

One tablet supplies:

Calcium..... 80 mg
Phosphorus ..... 61 mg
Raw Garlic Concentrate† (*Allium sativum*)..... 600 mg

Aromatic herb formula

One softgel supplies:

Red Thyme Oil (*Thymus vulgaris*) ..... 0.2 mL
[provides 30% to 50% (55-91 mg) thymol†]
Oregano Oil (*Origanum vulgare*)..... 0.1 mL
[provides 55% to 75% (55-75 mg) carvacrol†]
Sage Leaf 5.5:1 Extract (*Salvia officinalis*)..... 75 mg
Lemon Balm Leaf 5:1 Extract (*Melissa officinalis*)..... 50 mg

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GI Conditions: Food Hypersensitivity

- Determine what they are:
  - Lymphocyte Response Assay (LRA)
  - Elimination Diets
    - Modified Elimination Diet
    - Food Allergy Determination Diet

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Modified Elimination Diet

FOOD GROUP	ALLOWED	AVOID
Meat, Fish, Poultry Legumes Eggs	Chicken, turkey, lean lamb All legumes, dried peas, and lentils Cold-water fish (salmon, halibut, mackerel, trout, tuna) Egg replacements	Red meat, cold cuts, frankfurter, sausage, canned meat, eggs, cholesterol-free egg substitutes
Dairy Products	Milk substitutes such as rice milk, nut milks, and goat milk	Milk, cheese, cottage cheese, yogurt, ice cream, cream, non-dairy creamers
Starch	Sweet potato, arrowroot, brown or wild rice, tapioca, buckwheat, millet, gluten-free products	All gluten-containing products, including pasta, all corn, and corn-containing products
Bread/Cereal	Any made from whole grain rice, oats, quinoa, amaranth, buckwheat, teff, millet, soy, potato flour, tapioca, arrowroot, or whole-grain gluten-free based products	All made from wheat, spelt, kamut, rye, barley, or gluten-containing grains
Vegetables	All vegetables, preferably fresh, frozen or freshly juiced; especially garlic and onions	Creamed or made with prohibited ingredients. Corn.

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Modified Elimination Diet

FOOD GROUP	ALLOWED	AVOID
Fruits	Unsweetened fresh, frozen or freshly juiced fruits.	Fruit drinks, ades, cocktails, and dried fruits preserved with sulfites
Soup	Clear, vegetable-based broth, homemade vegetarian soup, chili made with ground chicken or turkey	Creamed soup Any with gluten-containing flours or grains
Beverages	Freshly prepared or unsweetened fruit or vegetable juice, pure water, herbal tea	Milk, dairy-based products, coffee, black tea, cocoa, alcoholic beverages, soda pop, sweetened beverages, citrus drinks, cold drinks
Fats/Oils	Cold, expeller pressed, unrefined, light-shielded canola, flax, olive, pumpkin, sesame, and walnut oil, salad dressings made from allowed ingredients	Margarine, shortening, butter, refined oils, salad dressing, and spreads
Nuts/Seeds	RAW almonds, cashews, flax seed, pecans, pumpkin, sesame, squash seeds, sunflower seeds, walnuts, nut-seed butters made with allowed ingredients	Peanuts, pistachios, peanut butter and ALL roasted nuts/seeds
Sweeteners	Brown rice syrup, fruit sweetener, raw honey, molasses, Stevia	Brown sugar, sugar/sucrose, maple syrup, corn syrup, fructose

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Food Allergy Determination Diet

For one-three weeks eat only from the following list of foods in order to eliminate all food allergy symptoms:

- **Starches (cooked)**
  Brown rice, taro root, puffed rice (e.g., rice cakes), sweet potatoes, winter squash, tapioca
- **Green, Yellow, Orange Vegetables (cooked)**
  Beets and beet greens, celery, chard, summer squash, artichokes, string beans, asparagus, spinach, lettuce
- **Non-citrus Fruits (cooked)**
  Peaches, plums, prunes, cranberries, apricots, papaya, cherries
- **Condiments**
  Sea salt (tiny amounts)
- **Beverages**
  Spring water, distilled water

- Once previous symptoms have subsided, begin adding foods back in.
- Add only one food item at a time to your diet by eating it at all three meals for a day in moderately large quantities. If you have a negative reaction to the new food, you will know to avoid that food.
- If you have a negative reaction, you have to wait at least four days before adding a new food.

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GI Conditions: Food Hypersensitivity: Recommendations

- Eliminate offending foods/substances and ANY products made with them
  - 100% abstinence
- Use supplementation and lifestyle change:
  - Heal the GI tract
  - Calm/support immune function
- Add offending foods back in systematically and look for symptoms

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Heal the GI Tract

- Recommendation depends upon severity of symptoms and/or # of foods

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Heal the GI Tract

- Severe symptoms or >~5-6 foods:
  - *Synergistic Product for inflammation* – 2 scoops BID
  - *Glutamine, DGL, Aloe formula* – 2 tsp BID/TID
  - *7 Strain Spectrum probiotic* – 1 cap BID
  - *Pancreatic enz. formula* – 1-2 tabs TID
  - *Phytonutrient Multi* – 1 tab BID (✓ ingredients)

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Heal the GI Tract

- Mild/moderate symptoms or <~5 foods:
  - *Glutamine, DGL, Aloe formula* – 1 tsp TID
  - *7 Strain Spectrum probiotic* – 1 cap BID
  - *Pancreatic enz. formula* – 1-2 tabs TID
  - *Phytonutrient Multi* – 1 tab BID (✓ ingredients)

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Calm/Support Immune Function

- *D3-5000* – 1-2 caps/day
- *High EPA formula* – 1 softgel BID

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Adding Foods Back In

- Add back offending foods after a period of time
- Assumes ALL GI SYMPTOMS HAVE RESOLVED and FU testing normalized
  - If <3 foods and/or mild symptoms: 1 month
  - If mild/moderate symptoms & < 5 foods: 3 months
  - If severe symptoms and/or >5-6 foods: 6+ months

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Adding Foods Back In

- Add back ONE new food every 4 days
- Eat that food 2-3x the first 2 days
- Monitor symptoms
- If experience symptoms, STOP EATING THAT FOOD IMMEDIATELY
  - Wait 4 more days and/or until asymptomatic before adding in the next food
- If don't experience symptoms, that food OK

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Food Reintroduction Symptoms

Immediate

- Increased pulse
- Shortness of breath
- Rashes or itchy skin
- Light headedness
- Fatigue
- Heart palpitations
- Nausea
- Gas and bloating
- Diarrhea
- Nasal drainage
- Headache
- Mood swings

Delayed

- Stiffness/achy joints and muscles
- Constipation/diarrhea
- First morning stuffiness
- Throat mucus production
- Headache
- Mood swings
- Fatigue

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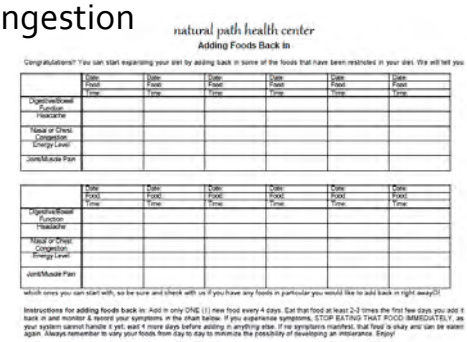
Adding Foods Back In

- Symptoms/changes to watch for:
  - Digestive/Bowel Function
  - Headache
  - Nasal/Sinus or chest congestion
  - Energy level
  - Joint/muscle pain



natural path health center

Adding Foods Back In

Congratulations!! You can start expanding your diet by adding back in some of the foods that have been restricted in your diet. We will tell you

	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:
Digestive/Bowel Function						
Headache						
Nasal or Chest Congestion						
Energy Level						
Joint/Muscle Pain						

	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:
Digestive/Bowel Function						
Headache						
Nasal or Chest Congestion						
Energy Level						
Joint/Muscle Pain						

which ones you can start with, so be sure and check with us if you have any foods in particular you would like to add back in right away!!

Instructions for adding foods back in: Add in only ONE (1) new food every 4 days. Eat that food at least 2-3 times the first few days you add it back in and monitor & record your symptoms in the chart below. If you experience symptoms, STOP EATING THAT FOOD IMMEDIATELY, as your system cannot handle it yet, wait 4 more days before adding in anything else. If no symptoms manifest, that food is okay and can be eaten again. Always remember to vary your foods from day to day to minimize the possibility of developing an intolerance. Enjoy!

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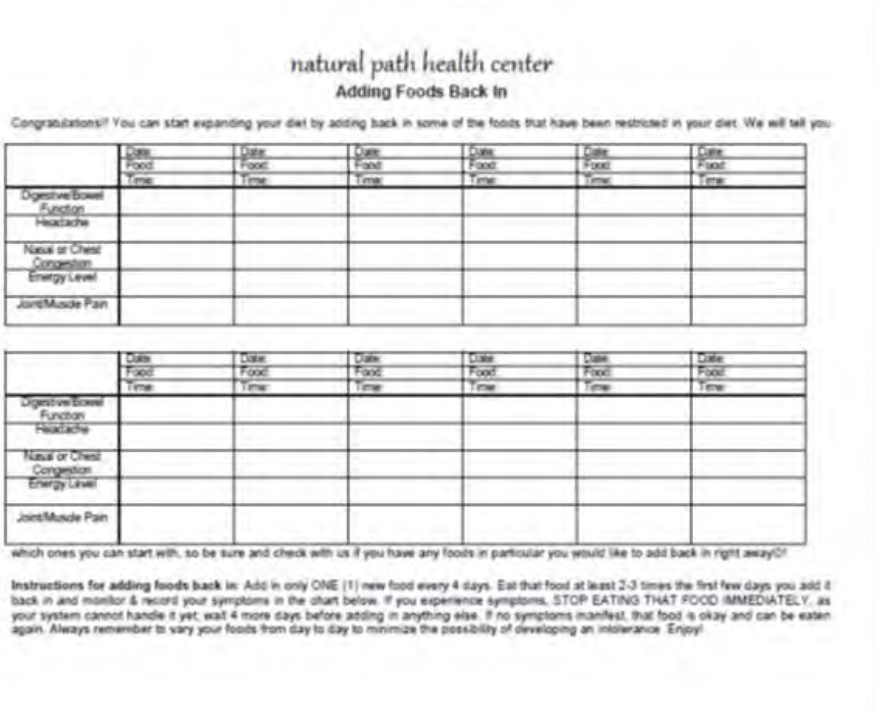

natural path health center

Adding Foods Back In

Congratulations!! You can start expanding your diet by adding back in some of the foods that have been restricted in your diet. We will tell you

	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:
Digestive/Bowel Function						
Headache						
Nasal or Chest Congestion						
Energy Level						
Joint/Muscle Pain						

	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:	Date: Food: Time:
Digestive/Bowel Function						
Headache						
Nasal or Chest Congestion						
Energy Level						
Joint/Muscle Pain						

which ones you can start with, so be sure and check with us if you have any foods in particular you would like to add back in right away!!

Instructions for adding foods back in: Add in only ONE (1) new food every 4 days. Eat that food at least 2-3 times the first few days you add it back in and monitor & record your symptoms in the chart below. If you experience symptoms, STOP EATING THAT FOOD IMMEDIATELY, as your system cannot handle it yet, wait 4 more days before adding in anything else. If no symptoms manifest, that food is okay and can be eaten again. Always remember to vary your foods from day to day to minimize the possibility of developing an intolerance. Enjoy!

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GI Conditions: Gallbladder

- Spasms
  - Usually caused by gallstone obstructing bile duct
  - Occurs 2-3 hours after fatty meal
- Gallstones
  - Small masses formed from cholesterol salts
  - Form slowly over time; often unnoticed until severe
  - Can cause severe pain and be life threatening if obstruct bile or pancreatic duct
  - Triggered by high fat/sugar, low fiber diet, obesity, rapid weight loss
- Fatty stools/fat malabsorption
  - Stools that float, are white/grey and greasy

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GI Conditions: Gallbladder - Causes

- Diets high in refined carbohydrates, hydrogenated fats/oils, fried foods, dairy
- Obesity/lack of exercise
- Dehydration
- Hypochlorhydria resulting in biliary insufficiency
- Foods sensitivities (diary and gluten common)
- Hormonal imbalances (thyroid, estrogen)
  - Estrogen increases cholesterol in bile
- Genetic pre-disposition

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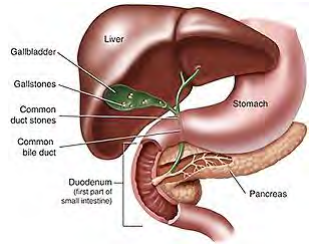
GI Conditions: Gallbladder - Symptoms



- Pain under right side of rib that may reflex to scapula
- Bloating, "full" feeling
- Belching, heartburn, gas, upset stomach, nausea
- Unexplained itching that is worse at night
- Yellowish cast to skin, eyes, nail beds
- Light/clay colored stools

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GI Conditions: Gallbladder: Recommendations

- Eliminate *all* hydrogenated fats/oils & fried foods
- Eliminate refined carbohydrates, alcohol, processed foods, dairy products, gluten and caffeine
- Increase water intake
- Increase intake of flax and EFAs
- Increase intake of apple juice
  - Contains malic acid – softens/dissolves gallstones
- Lecithin – 1-2 Tbsp/day
  - Helps with fat absorption/assimilation
  - Supplementation

Dekkers R. Apple Juice and the Chemical-Contact Softening in Gallstones. Lancet 1999 Dec; 354:2171.

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GI Conditions: Gallbladder: Recommendations

- Lipotropics
  - Increase production/secretion of bile
  - Promotes export of fat from liver
  - Help breakdown fat
  - Choline, inositol, lecithin, Betaine HCl, TMG, methionine, taurine
  - Artichoke Leaf Extract, Wild/Mandarin orange (Citrus retculata)
- Vitamin C
  - Increases nucleation time and composition of bile
  - Prevent and dissolve gallstones

Gaby AR. Nutritional approaches to prevention and treatment of gallstones. Altern Med Rev 2009 Sep;14(3):258-67.
Gustafsson U, Wang FH, Axelson M, et al. The effect of vitamin C in high doses on plasma and biliary lipid composition in patients with cholesterol gallstones: prolongation of the nucleation time. Eur J Clin Envest. 1997 May;27(5):387-91.

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GI Conditions: Gallbladder: Recommendations

- Artichoke Leaf Extract
  - Contain polyphenolic compounds that are potent antioxidants
    - Protect liver from oxidative stress
    - Anti-inflammatory
  - Promote healthy bile flow

Kuoroda, T., et al. Bile acids in hepatic bile in liver disease. Acta Hepato Gastroenterol. 21:120-126, 1974

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GI Conditions: Gallbladder: Recommendations

- Wild/Mandarin orange (Citrus retculata)
  - Contain flavonoids (tangeritin, herperidin, rutin)
    - Powerful antioxidants
      - Protect liver from free radical damage
      - Soothe gallbladder
  - Promote secretion of bile
  - Shown to dissolve gallstones

Plaisier PW, Vergunst H, Terpstra OT. Dissolution of gallstones. Dig Dis. 1993;11(3):181-88.
He Xingdong, et al. Lin Chuang Zhong Yao Shou Ce (Clinical Handbook of Chinese Materia Medica). Beijing: People's Medical Publishing House, 1998. 156.

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GI Conditions: Gallbladder: Recommendations

- See PCP for an abdominal ultrasound
- Eliminate all hydrogenated fats/oils & fried foods
- Eliminate refined carbohydrates, alcohol, processed foods, dairy products, gluten and caffeine
- Increase water intake
- Increase intake of flax and EFAs
- Increase intake of apple juice
- Lecithin – 1-2 Tbsp/day
  - Helps with fat absorption/assimilation
  - Supplementation

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GI Conditions: Gallbladder: Recommendations

Recommendation	Dosage
Fiber Formula	1 scoop 1-3x/day with 8 oz. liquid
Lipotropic Formula	2 tablets TID with meals
Anti-inflammatory diet; eliminate food allergens/triggers, hydrogenated oils, fried foods, dairy, refined carbohydrates, alcohol, gluten, caffeine	
Focus on chewing food until it is a liquid; at LEAST 30 times before swallowing	
Small meals (don't overeat); high fiber diet– 30 grams/day	
Increase apples/apple juice, flax seed/oil (1-2 Tbsp/day) and EFAs; lecithin – 1-2 Tbsp/day	
Water – ½ body weight in ounces/day; ~1/4-½ cup every ½ hour; swish in mouth	

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Lipotropic Formula

Choline (as choline bitartrate)	300 mg
Artichoke Extract (whole herb; *Cynara scolymus*)	400 mg
Dandelion Extract (root; *Taraxacum officinale*)	250 mg
Beet Powder (root; *Beta vulgaris*)	200 mg
Inositol	150 mg
Tangerine Extract (peel; *Citrus reticulata*)	100 mg
Gentian Extract (root; *Gentiana scabra*)	100 mg
Taurine	100 mg
L-Methionine	100 mg

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Questions on Gastrointestinal Conditions????

Mouth	Gingivitis, halitosis, ulcers, cold sores
Stomach	Indigestion/poor digestion, Acid reflux/GERD, gastritis, gastric ulcer
General Intestines	IBS/Leaky gut, diarrhea, constipation, diverticulosis/diverticulitis, Hemorrhoids, Dysbiosis, Food hypersensitivity
Liver	Gallstones, fat malabsorption

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Liver/Gallbladder Flush

Day 1:

- Take 8 oz. organic apple juice every hour on the hour from 8 am to 8 pm. Take 4-8 oz. water every hour on the ½ hour. Do not take any other food or drinks.
- Please note that the apple juice should be kept at room temperature or mixed with about 10% hot water before use because cold drinks chill the liver. If you have significant bile 'sludge' (stagnant bile), it may be expelled quickly with the apple juice and may feel like having diarrhea but is actually stagnant bile (brownish yellow).

Day 2:

- Repeat Day 1
- At 8:30 pm, take ½-cup (4 oz) of olive oil (extra virgin cold pressed) mixed with ½-cup of lemon juice (squeezed from 3 lemons).
- Go immediately to bed and sleep on your right side. If there is a large amount of stones, nausea may be felt after drinking olive oil but this feeling will largely disappear on the third day after taking some food.

Day 3:

- Upon rising in the morning, take 1 litre (approximately 4 cups) of warm distilled or filtered water containing two level teaspoons of un-iodized sea salt. Wait for at least half an hour before eating.
- Take vegetable broth and softly cooked vegetables only. The stones should be passed in the stool any time between midnight of Day 2 and morning of Day 4.

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Questions???

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