

Quenching the Fire: Natural Treatments for Inflammation

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Today's Agenda

- * What Is Inflammation and Why Do We Care?
- * Inflammation as Foundation for Disease
- * Quenching Inflammation
- * Role for Integrative Medicine in Cancer
- * Q & A

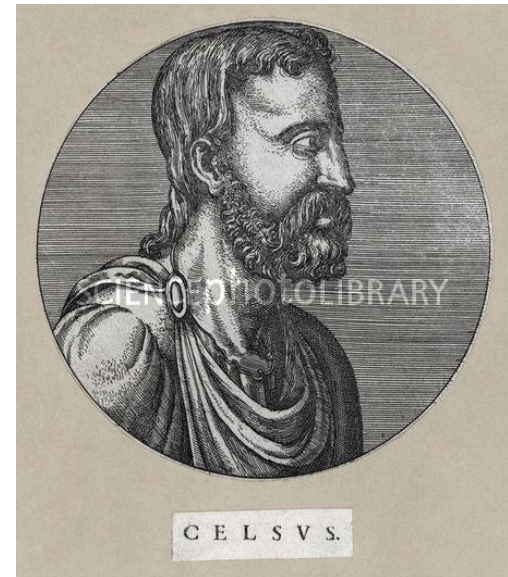


What Is Inflammation?

- * Complex biological process that is necessary for defense, repair, and healing
- * Essential for survival
- * Caused by external things like foreign objects, pathogens, and trauma.
- * Also caused by internal things like hormone/biochemical imbalance, degenerative processes, auto-immunity, and stress.

What is Inflammation?

- * Four Characteristics
 - * Dolor (Pain)
 - * Calor (Heat)
 - * Rubor (Redness)
 - * Tumor (Swelling)



Celsus

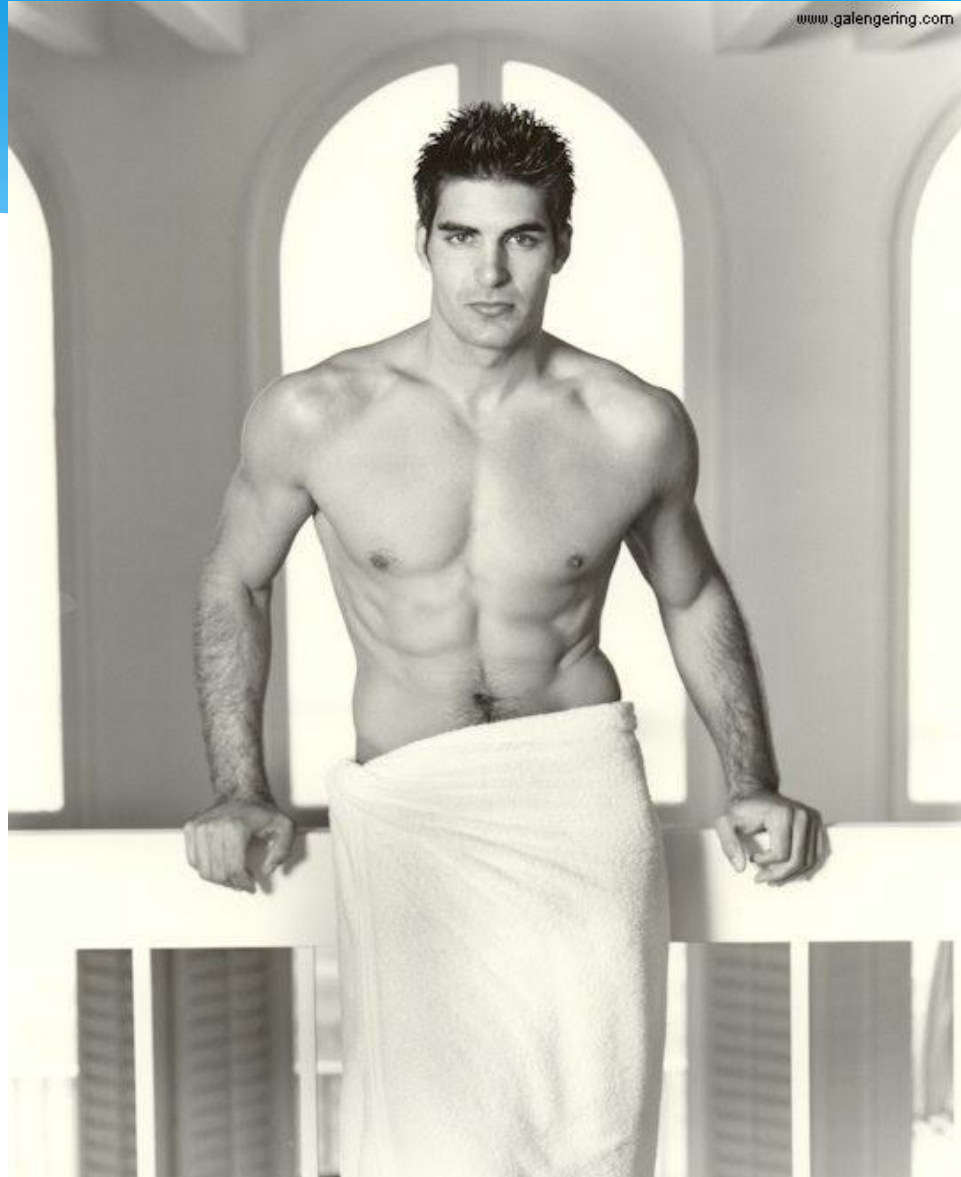
What is Inflammation?

* *Functio laesa* (loss of function)



Galen

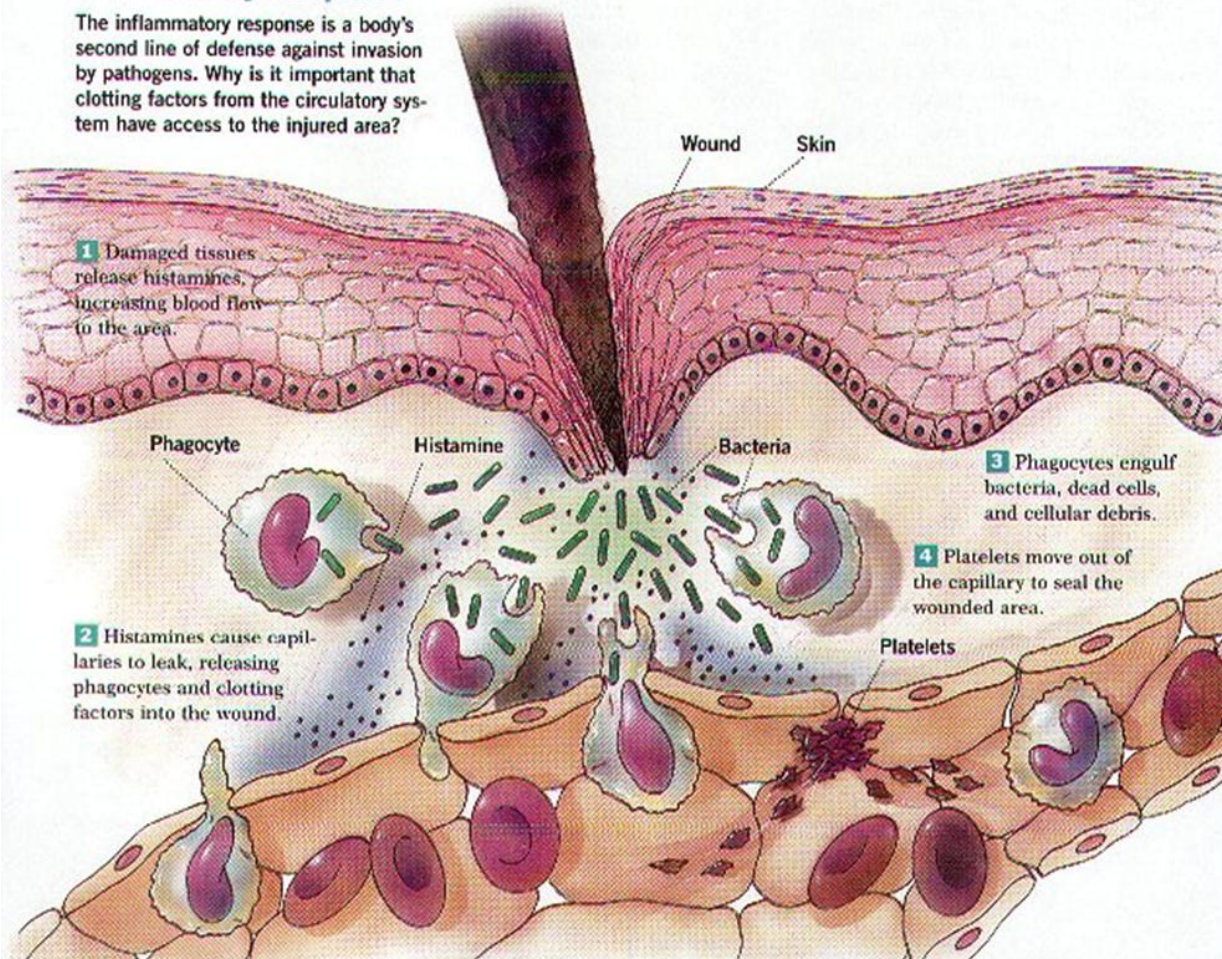
www.galengering.com



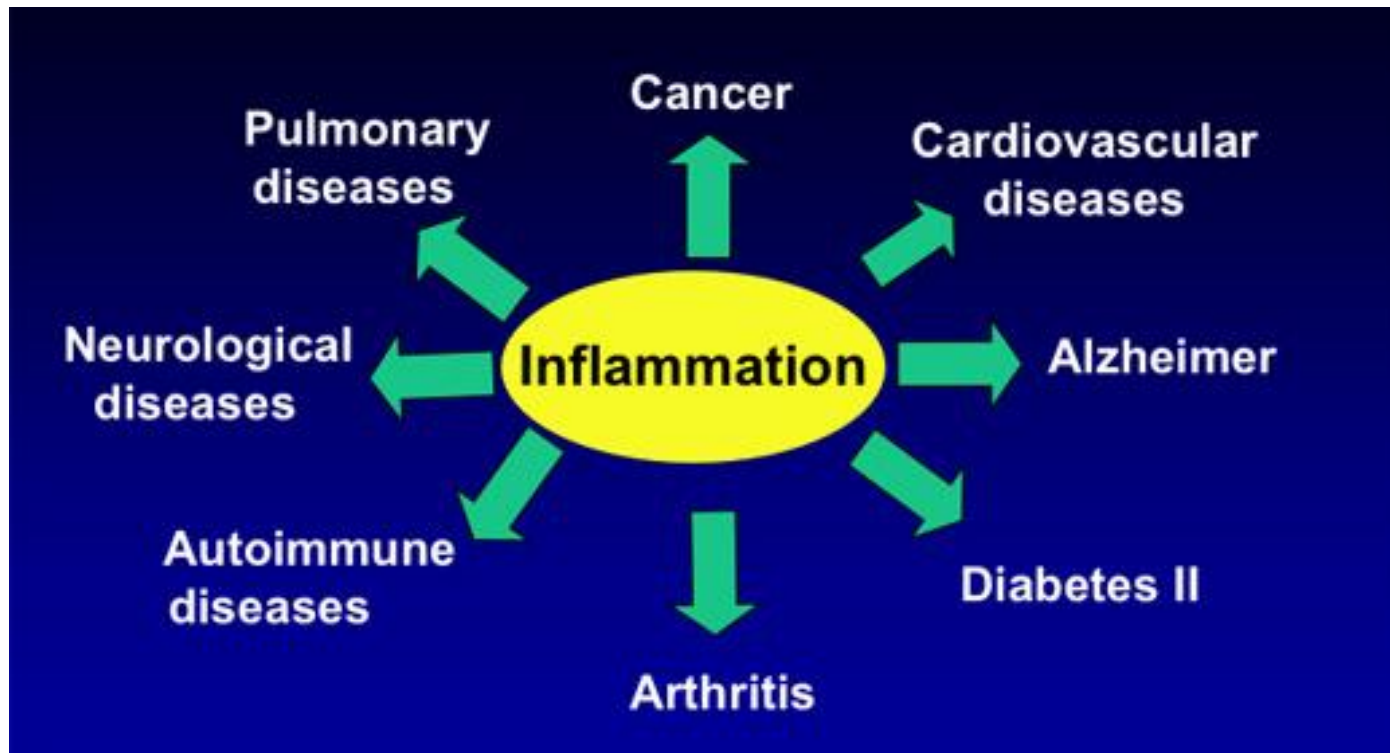
What is Inflammation?

Steps of the Inflammatory Response

The inflammatory response is a body's second line of defense against invasion by pathogens. Why is it important that clotting factors from the circulatory system have access to the injured area?



Why Do We Care?

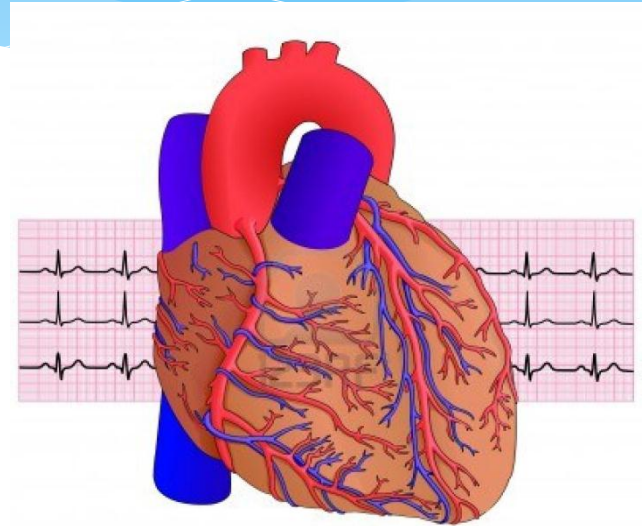


Inflammatory Diseases

- * Acne vulgaris
- * Allergies
- * Asthma
- * Atherosclerosis/
CVD
- * Autoimmune
diseases
- * Celiac disease
- * Chronic prostatitis
- * Diabetes
- * Glomeruloneph-
ritis
- * Hypersensitivities
- * Inflammatory
bowel diseases
- * Myopathies
- * Pelvic
inflammatory
disease
- * Rheumatoid
arthritis
- * Sarcoidosis
- * Transplant
rejection
- * Vasculitis
- * Interstitial cystitis

Inflammatory Diseases: Heart

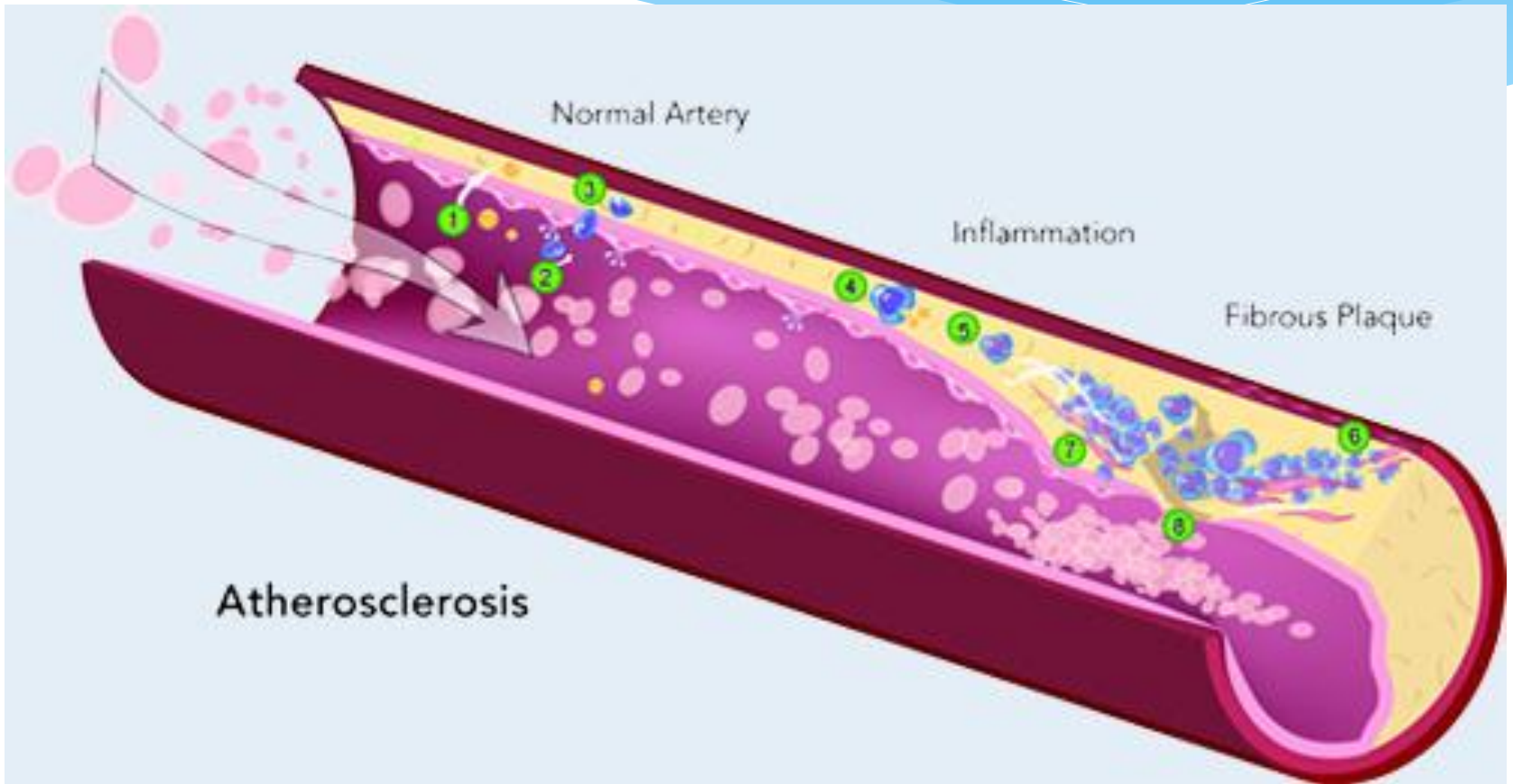
- * Coronary heart disease (CHD) is the leading cause of death of women in the US
- * 1 in 4 women die every year from CHD
- * 64% of women who die suddenly from CHD had NO symptoms
- * Inflammation underlies much of the pathogenesis of disease



Inflammatory Diseases: Heart

- * CHD includes high blood pressure and atherosclerosis, increasing risk of MI and stroke.
- * Atherosclerosis involves an ongoing inflammatory response.
- * Elevation in markers of inflammation predicts outcomes of patients with acute coronary syndromes, independently of myocardial damage.
- * Low-grade chronic inflammation, as indicated by levels of C-reactive protein, can define risk of AS complications

Inflammatory Diseases: Heart



Inflammatory Diseases: Heart

- * Markers of inflammation useful in predicting stability of plaques
- * Measurement of cholesterol and subtypes predictive of MI risk
- * Cholesterol and arterial inflammation directly affected by changes in lifestyle and diet!

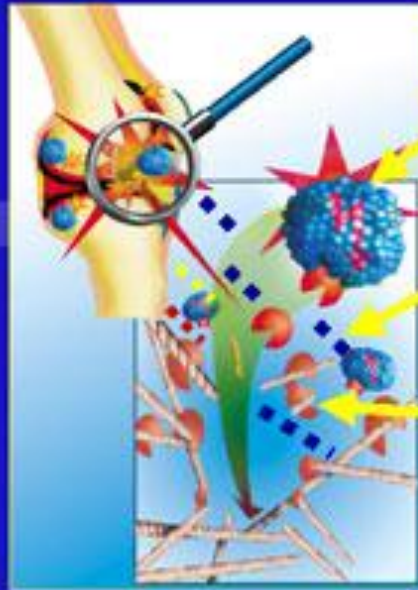
Inflammatory Diseases: Joint

- * Arthritides: rheumatoid, osteo, psoriatic, gout
- * More than 100 forms
- * Arthritis is leading cause of disability in the US
- * 22% of adults have doctor-diagnosed arthritis
- * Contributes to inactivity
- * Prevalence of obesity 54% higher in adults with arthritis



Inflammatory Diseases: Joint

Chronic Inflammation Destroys Tissues



White blood cell

**Cytokines attract
more white blood cells**

**Enzymes digest
collagen**

Tissue destroyed

Inflammatory Diseases: Joint

- * Many inflammatory joint diseases have auto-immune component (RA, PA, SLE)
- * Severity of inflammation can be monitored using blood markers such as sed rate, CRP
- * Duration of inflammation causes joint destruction and deformity

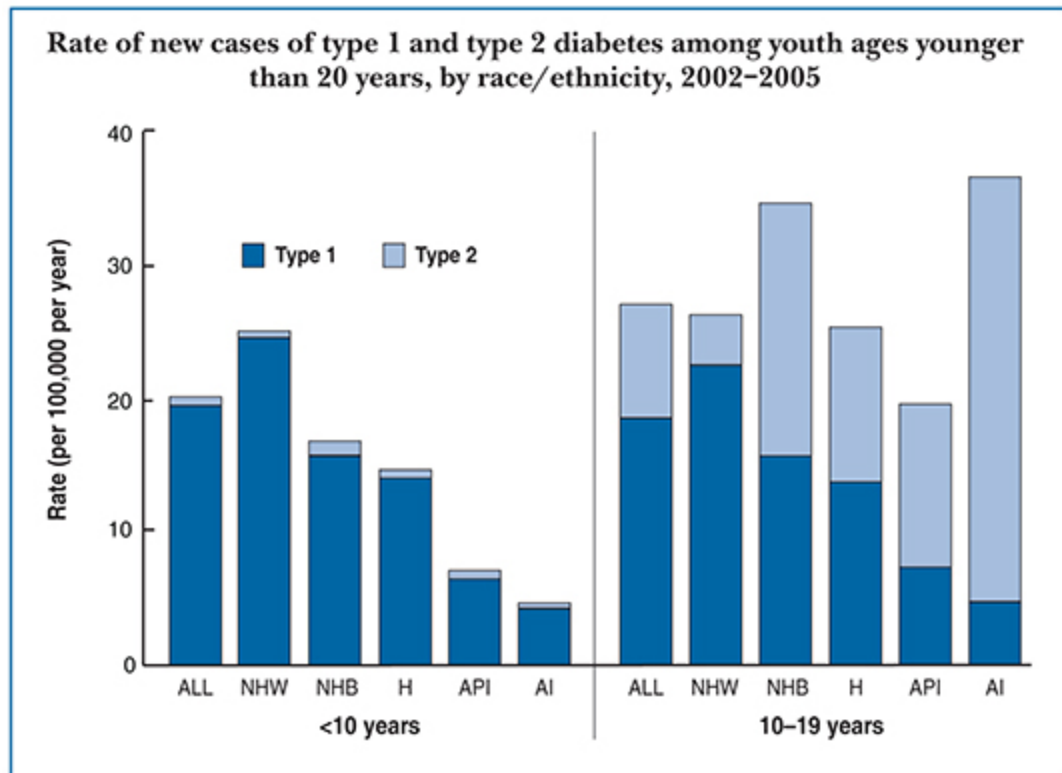
Inflammatory Disease: Joint

- * Dramatic changes can be affected with dietary and lifestyle changes
- * Exercise benefits joint mobility
- * Food sensitivities often play a role in joint inflammation

Inflammatory Diseases: Diabetes

- * Diabetes affects 25.8 million Americans
- * 8.3% of US population
- * 18.8 million diagnosed, 7.0 million undiagnosed
- * 35% of Americans age 20+ with “pre-diabetes” based on HgA1c or fasting glucose
- * Leading cause of kidney failure, non-traumatic limb amputation, and blindness
- * Major cause of heart disease and stroke

Inflammatory Diseases: Diabetes



Inflammatory Diseases: Diabetes

- * Type II DM results from impaired beta cell function combined with insulin resistance acting on susceptible genes
- * Generally increased body weight
- * Chronic low-grade tissue inflammation related to obesity
- * However, inflammation without obesity appears to also be a culprit

Inflammation and Cancer

- * Inflammation underlies cancer development, promotion, and angiogenesis
- * Inflammation orchestrates the microenvironment around tumors, contributing to proliferation, survival and migration.
- * Cancer cells use selectins and chemokines and their receptors for invasion, migration and metastasis.

Inflammation and Cancer

- * Systemic low-grade inflammation creates inflammatory cytokines IL-6, CRP, TNF- α , fibrinogen
- * IL-6 and CRP adversely affect cancer
- * High insulin, depression upregulate IL-6 and CRP too!

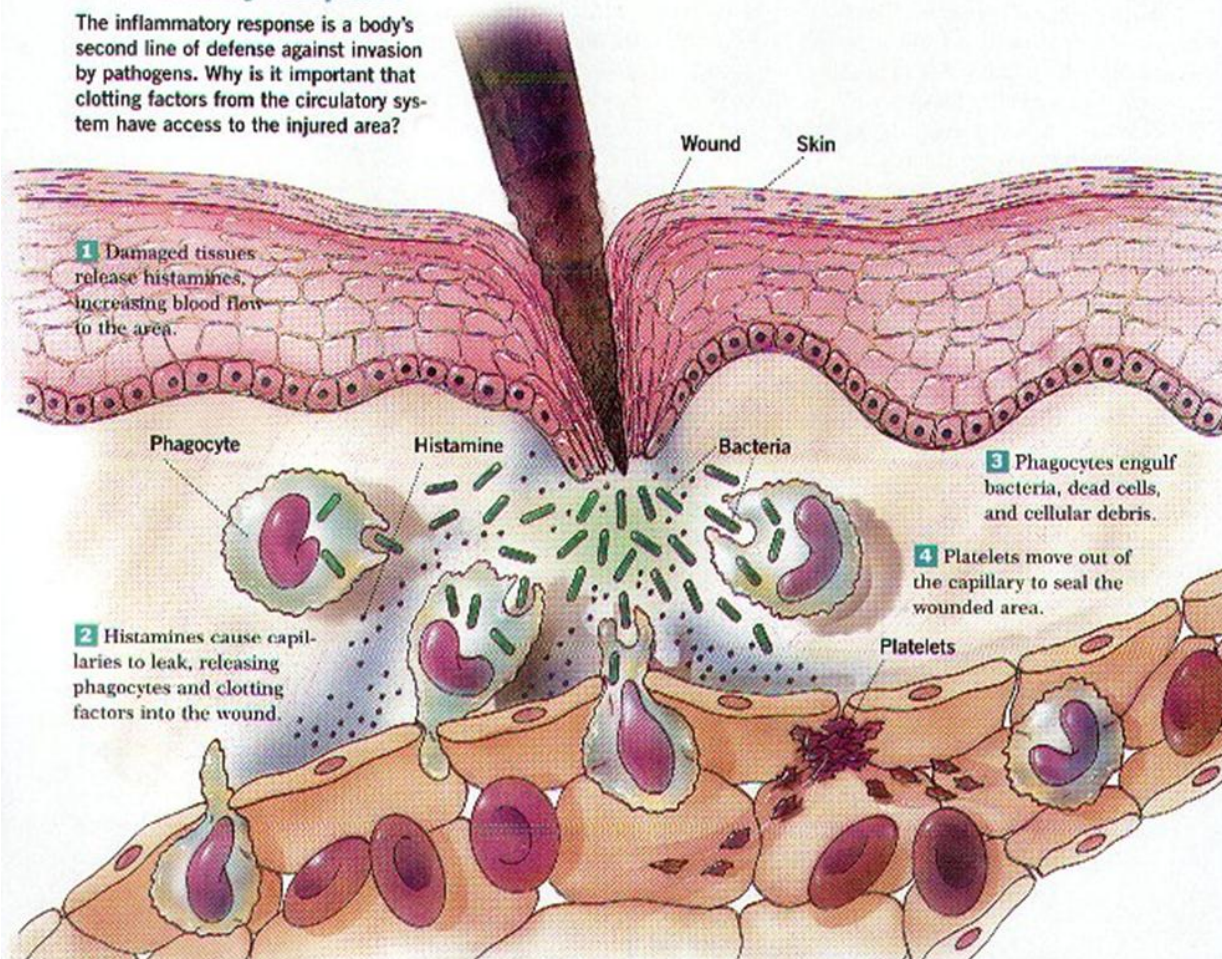
Inflammation and Cancer

- * Elevated cortisol from stress increases insulin and creates abdominal (visceral) fat
- * Dysregulation of insulin and visceral fat promote tumor cell proliferation and inflammatory cytokines
- * High cortisol and insulin → obesity, inflammation → poor outcomes for cancer survival

What is Inflammation?

Steps of the Inflammatory Response

The inflammatory response is a body's second line of defense against invasion by pathogens. Why is it important that clotting factors from the circulatory system have access to the injured area?



Inflammatory Biochemicals

- * Acute phase proteins: **hsCRP**, **sed rate**, serum amyloid A and P
- * Systemic inflammatory interleukins: IL-6, IL-8, IL-18
- * TNFa, nfKB, **fibrinogen**
- * Markers of Diabetes: **insulin**, **glucose**, **leptin**, **hemoglobin A1c**

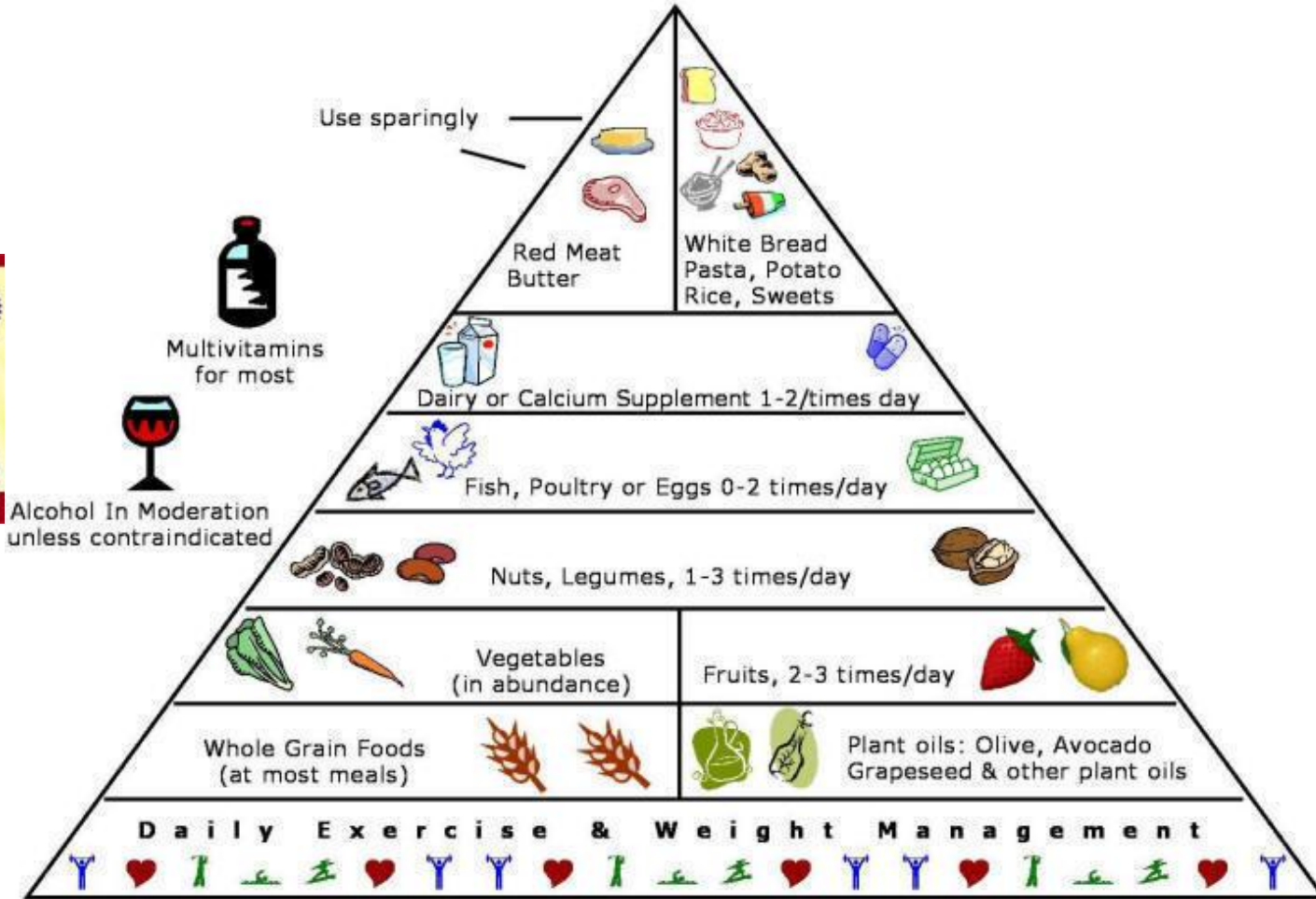
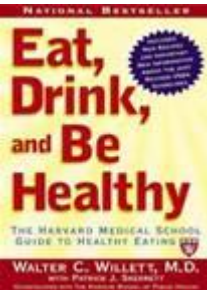
How Do We Stop Inflammation?

Stopping Inflammation

- * Anti-inflammatory diet
- * Exercise & Lifestyle changes
- * Anti-inflammatory supplements
- * Medications

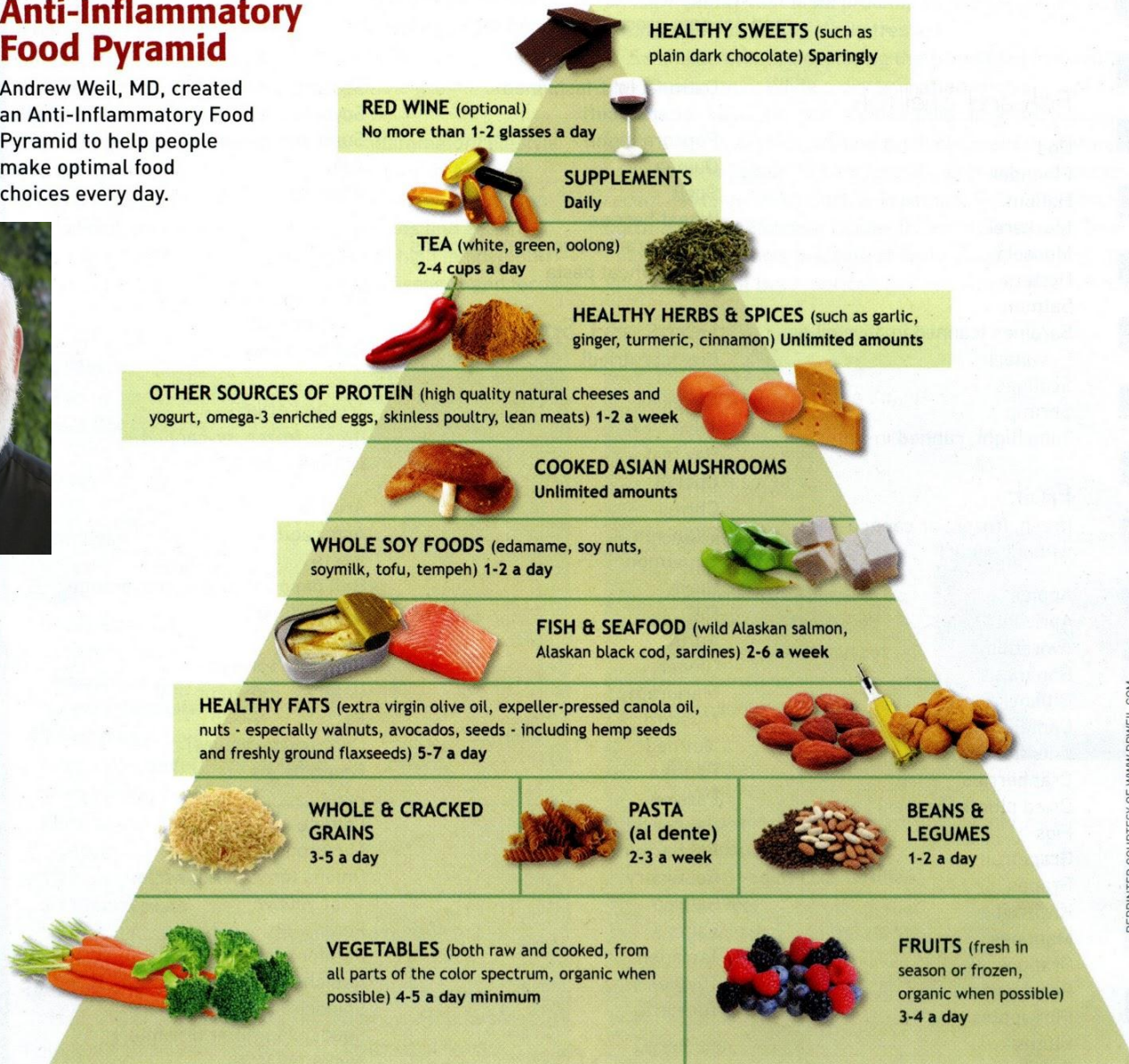
Stopping Inflammation: Diet

- * Balanced, whole foods diet
- * Mediterranean/low glycemic index foods
- * Greens drinks
- * Green tea
- * Limit alcohol
- * Improve digestion and elimination
- * Identify food sensitivities
- * Balance hormones, neurotransmitters, blood sugar



Anti-Inflammatory Food Pyramid

Andrew Weil, MD, created an Anti-Inflammatory Food Pyramid to help people make optimal food choices every day.



Exercise & Lifestyle Changes

***Come to my break
out session at 2:15!!**

Stopping Inflammation: Supplements

- * Many natural compounds work at the same biochemical locations as conventional pharmaceuticals
- * Supplements generally have fewer side effects than drugs
- * Natural compounds can have synergistic and complementary effects that go beyond primary target

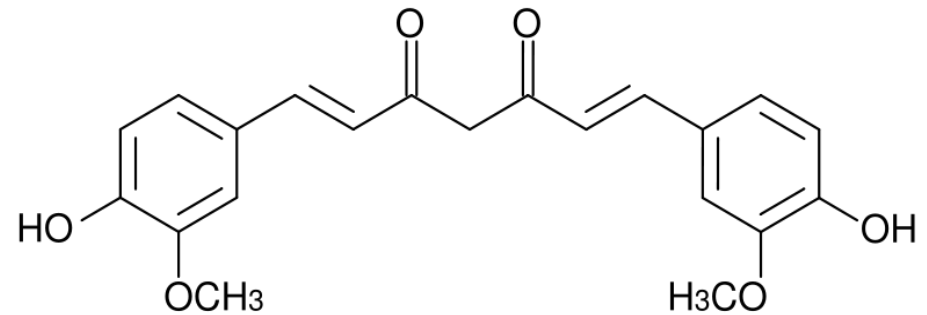
Supplements DO NOT
replace the benefits of a
healthy diet and lifestyle!!!

Stopping Inflammation: Supplements

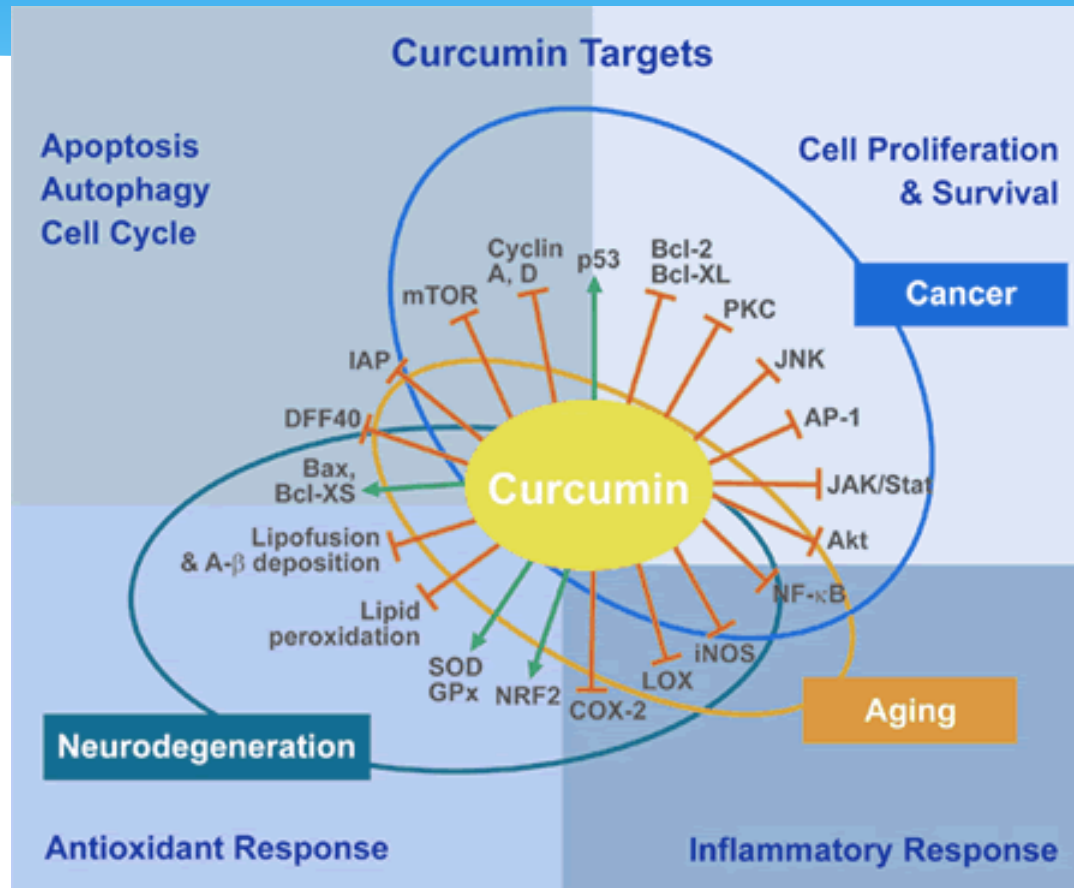
- * Curcumin
- * Fish oil
- * Vitamin D
- * Boswellia
- * SAmE
- * Ginger
- * Antioxidants and Bioflavonoids

Curcumin

- * *Curcuma longa*; spice from ginger family used in Eastern cuisines
- * Curcuminoids



Curcumin



Curcumin

- * Anti-tumor: anti-inflammatory, pro-apoptotic, inhibits tumor cell proliferation, anti-angiogenic
- * Inhibits NFkB, EGFR activation, TK activity of HER2/neu receptor, chemokines (IL-8)

Curcumin

- * Regulates NFkB gene products, COX-2, cyclin D1, adhesion molecules, MMPs, inducible nitric oxide synthetase, Bcl-2, Bcl-X_L, and TNF.
- * Radiosensitization of cancer cells and radioprotection of normal cells

Curcumin

- * Curcumin administration increased body weight, decreased serum TNF-alpha levels, increased apoptotic tumor cells, enhanced expression of p53 molecule in tumor tissue, and modulated tumor cell apoptotic pathway in patients with colorectal cancer.

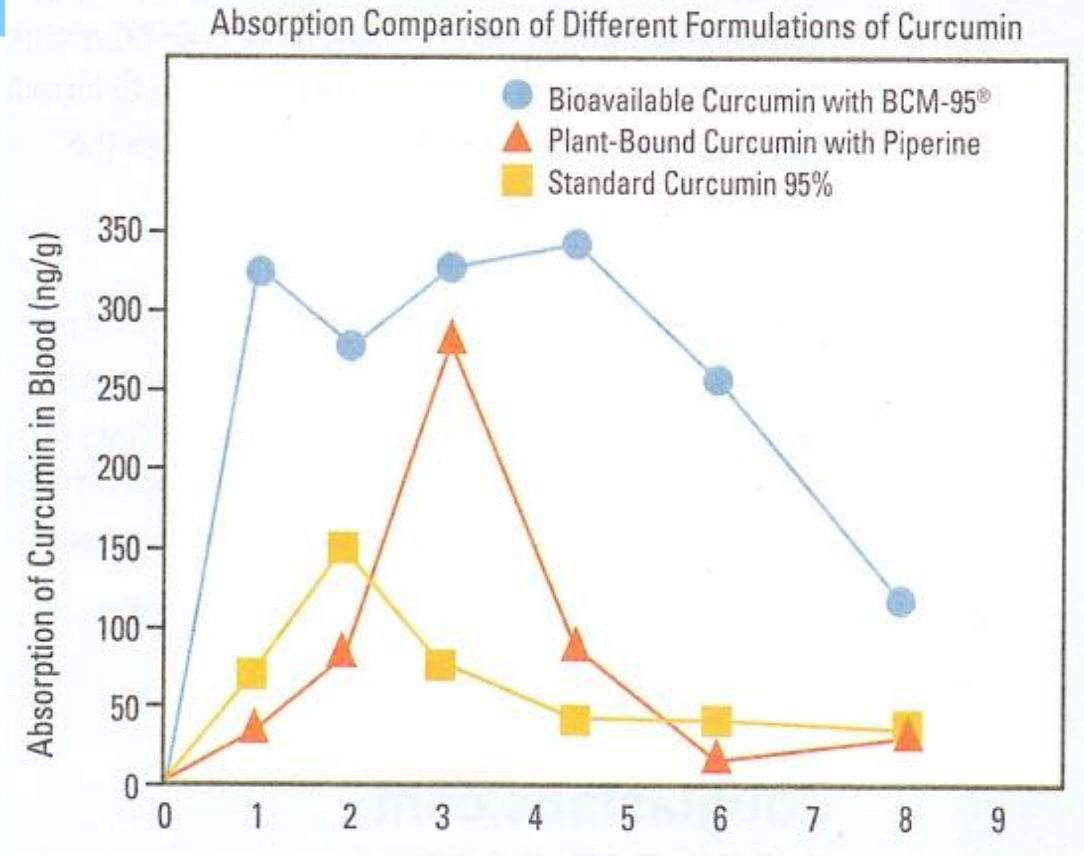
He Z. Cancer Invest. 2011, Mar;29(3):208-13.

- * Combined isoflavones and curcumin lowered PSA levels and suppressed androgen receptors in patients with prostate cancer.

Ide H. Prostate. 2010 Jul 1;70(10):1127-33.

Curcumin

- * Bioavailability of pure curcumin is poor
- * When combined with a fat and bioperine, it's better absorbed



Vitamin D

- * Fat soluble vitamin that plays a role in:
 - * Calcium metabolism
 - * Bone and cartilage strength
 - * Tooth and gum health
 - * Insulin production
 - * Lipid metabolism
 - * Immune system function
 - * Cancer development

Vitamin D

- * Made in the skin from sun (UVB) exposure
- * Synthesized in the liver, kidney
- * Active form is D₃, cholecalciferol
- * Acts more like a steroid hormone than vitamin
- * Partners with vitamin K in calcium regulation
- * Vitamin A competes with absorption of D
- * Calcium intake must be adequate

Vitamin D Deficiency

- * Linked to the exacerbation of many conditions:
 - * Osteoporosis, osteomalacia, osteoarthritis
 - * Muscle weakness and pain
 - * Periodontal disease
 - * Hyperparathyroidism
 - * Inflammation
 - * Cancer
 - * Autoimmune diseases: MS, Diabetes, RA, IBS, SLE, thyroiditis

Vitamin D Deficiency

- * Lack of sun exposure
- * Latitudes above 40°
- * Fat-binding drugs like statins
- * Fat malabsorption, problems with bile or digestive enzymes
- * Dark skin or dark tan
- * Obesity
- * Hormone imbalances
- * Aging

Vitamin D

- * Non-sun sources include:
 - * Cod liver oil
 - * Oily fish like mackerel, salmon, sardines
 - * Fortified orange juice, milk, cereals, and breads
 - * Supplements

Essential Fatty Acids

- * Polyunsaturated (good) fats: Omega 3 and Omega 6 fatty acids
- * “Essential” because body does not manufacture them
- * Alter inflammation severity by manipulating dietary fats
- * Cell flexibility, nerve communications, mood enhancement, brain function

Essential Fatty Acid Metabolism

**Linoleic Acid
(Omega-6)**



GLA



**Arachadonic
Acid**



Inflammation

**Linolenic Acid
(Omega-3)**



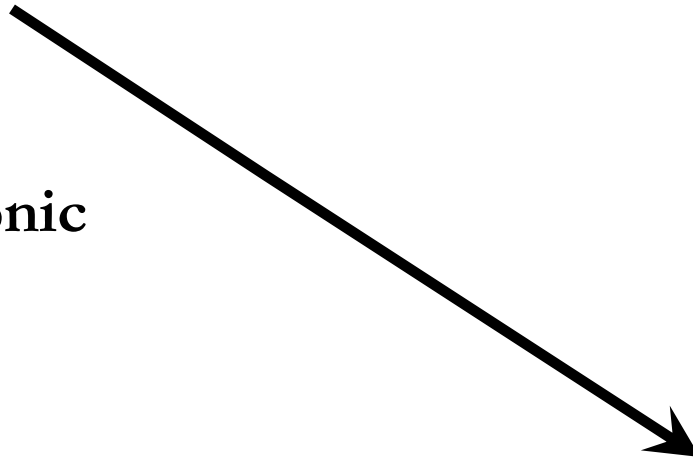
EPA



DHA



**Blocks
Inflammation**



Sources of EFAs

- * Most beneficial EFAs are EPA and DHA (Omega 3) from cold water fish like salmon, sardines, mackerel, and herring
- * GLA (Omega 6) can be found in evening primrose oil and borage oil
- * Animal-rich diets are high in Omega 6
- * Vegetable, fish, and whole grain-based diets are high in Omega 3

Concerns with EFAs

- * Source of fish oil may contain heavy metals
- * Farmed salmon is not high in Omega 3
- * Factors that reduce absorption of EFAs:
 - * Low levels of key vitamins and minerals
 - * Alcohol consumption
 - * Some prescription drugs
 - * A diet high in hydrogenated and trans fats
 - * Age
 - * Compromised immune status

Antioxidants

- * Vitamin C, E, Selenium, Zinc, carotenoids, alpha-lipoic acid, bioflavonoids, quercetin, green tea, milk thistle, ginkgo, CoQ10
- * Anti-inflammatory
- * Enhance immune function
- * Scavenge free radicals
- * Anti-viral, anti-bacterial
- * Vessel integrity
- * Vision enhancement

Bioflavonoids

- * Found in fruits and vegetables
- * Antioxidant, anti-inflammatory, connective tissue support, reduces platelet aggregation
- * Oligomeric proanthocyanidins (OPCs) and resveratrol exert anti-inflammatory action by inhibiting NF-kappaB, TNF-alpha, phospholipase A2, and cytokines

SAMe

- * S-adenosylmethionine occurs naturally in body from methionine and B12 and FA
- * Synthesis of neurotransmitters, melatonin, phospholipids, and cellular growth factors
- * Reduces TNF-alpha, fibromyalgia pain, joint damage
- * Increases joint regeneration in osteo and rheumatoid arthritis
- * Showed similar effectiveness as Celebrex for OA relief

Boswellia serrata

- * Ayurvedic anti-inflammatory
- * Resin extracts (boswellic acids) have been found to inhibit inflammation and reduce cartilage destruction
- * Improvement of respiratory symptoms, lung function, and bloodwork in asthma
- * Long term use has not been shown to cause GI irritation or ulceration like NSAIDS

Ginger

- * Inhibits inflammation (COX-1 and LOX) and platelet aggregation
- * Significant decrease in knee pain with movement in OA
- * Similar effect of ginger in OA pain as ibuprofen
- * Caution with blood thinning agents

Research: Heart

- * The Mediterranean diet pattern and its main components are associated with lower plasma concentrations of tumor necrosis factor receptor 60 in patients at high risk for cardiovascular disease.
 - * J Nutr. 2012 Jun;142(6):1019-25.
- * Effects of coenzyme Q10 supplementation on inflammatory markers (high-sensitivity C-reactive protein, interleukin-6, and homocysteine) in patients with coronary artery disease.
 - * Nutrition. 2012 Jul;28(7-8):767-72.
- * The effect of a one-year lifestyle intervention program on carotid intima media thickness.
 - * Mil Med. 2011 Jul;176(7):798-804.
- * Changes in emerging cardiac biomarkers after an intensive lifestyle intervention.
 - * Am J Cardiol. 2011 Aug 15;108(4):498-507.

Research: Joint

- * A vegan diet free of gluten improves the signs and symptoms of rheumatoid arthritis: the effects on arthritis correlate with a reduction in antibodies to food antigens.
 - * [Rheumatology](#). 2001 Oct;40(10):1175-9.
- * Anti-inflammatory effects of a low arachidonic acid diet and fish oil in patients with rheumatoid arthritis.
 - * [Rheumatol Int](#). 2003 Jan;23(1):27-36.

Research: Diabetes

- * Exercise with calorie restriction improves insulin sensitivity and glycogen synthase activity in obese postmenopausal women with impaired glucose tolerance.

- * [Am J Physiol Endocrinol Metab.](#) 2012 Jan 1;302(1):E145-52.

Research: Curcumin

- * Effect of endurance exercise training and curcumin intake on central arterial hemodynamics in postmenopausal women: pilot study.
 - * [Am J Hypertens.](#) 2012 Jun;25(6):651-6.

Media

- * Books:

- * *The Inflammation Syndrome* by Jack Challem
- * *Inflammation Nation* by Floyd H. Chilton
- * *The Inflammation Free Diet Plan* by Monica Reinagel

- * Movies:

- * *Forks over Knives*
- * *Fat, Sick, and Nearly Dead*

Integrative Medicine for Cancer

- * Science-based holistic approach treats body, mind, spirit
- * Use of body's innate healing power
- * Use of natural substances to promote healing
- * Herbs, nutrition, supplements, physical therapies, natural drugs, counseling, homeopathy and biofeedback
- * Pharmaceutical drugs if needed
- * Complementary to and supportive of conventional treatment for cancer

Summary

- * Inflammation as a unifying theory of disease
- * Heart disease, joint disease, diabetes, and cancer
- * Dietary choices and lifestyle measures can diminish inflammation and control disease

Q & A

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