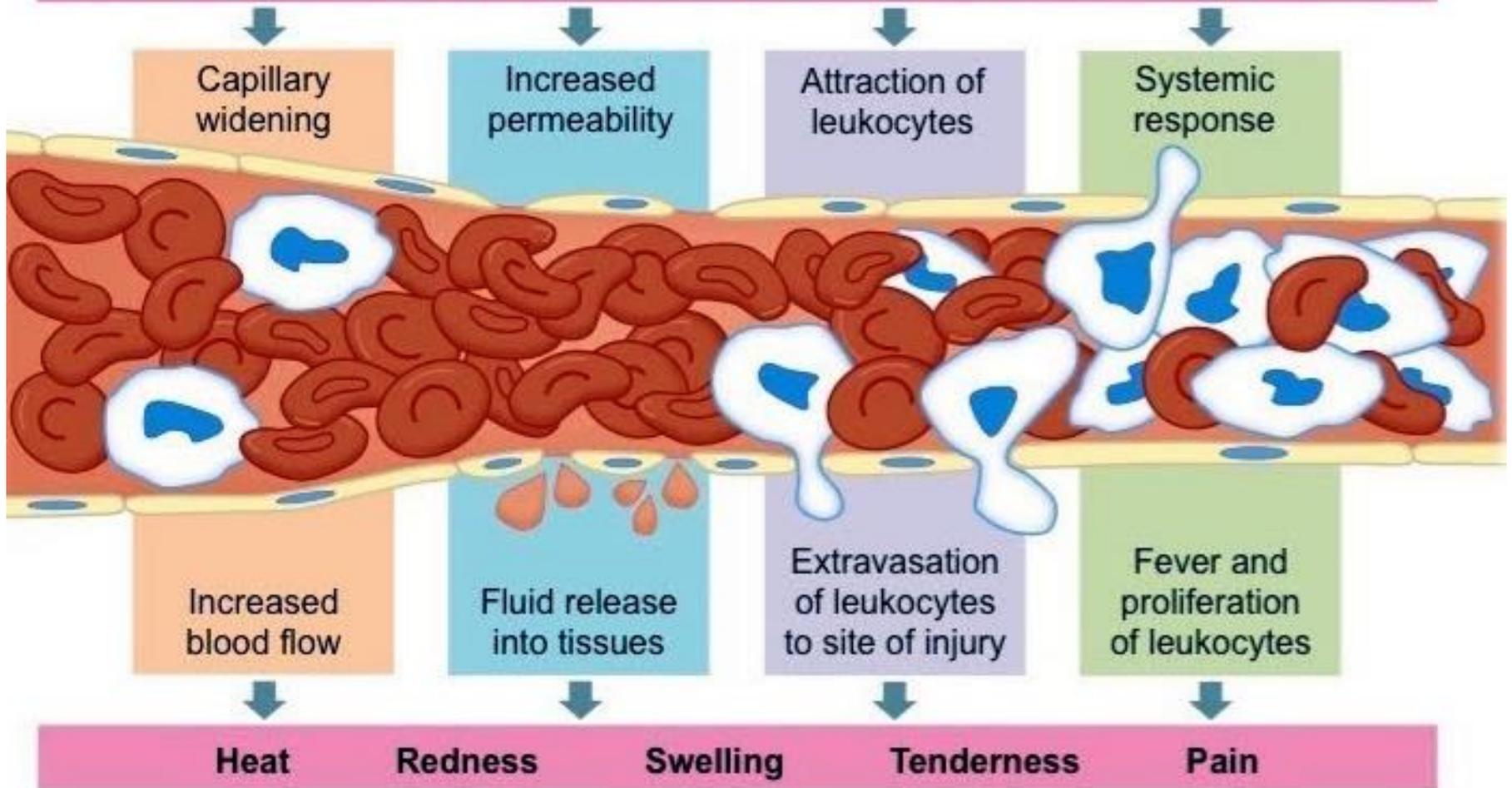


Inflammation

- ▶ 3 main processes occur in acute inflammation
 1. Increased blood flow to the area. Capillaries enlarge and become more permeable. Proteins and blood components move from serum into interstitial space creating edema.
 2. Granulocytes migrate out of capillaries into the area as macrophages and monocytes are attracted to the area. Outside of the capillaries, neutrophils and other granulocytes are guided to the injury site as they sense the presence of inflammatory cytokines.
 3. Damaged tissue becomes walled off from the rest of the body, and macrophages clear cell debris through phagocytosis.

Tissue injury caused by physical / chemical agent or pathogenic microorganism



Heat

Redness

Swelling

Tenderness

Pain

Inflammation Support

- ▶ During acute inflammation, the goal is to reduce swelling while supporting the body's efforts to rid itself of damaged tissue and decayed materials.
 - ▶ As healing proceeds, we shift focus to support repair and rebuilding of damaged tissue.
- 

Inflammation Nutrition

- ▶ Proteolytic enzymes digest cellular debris, extracellular proteins, clotting and fibrous material. They are most effective in an acute condition but also useful in chronic conditions. They also increase effectiveness of other anti-inflammatory and other analgesic products when used together.
- 



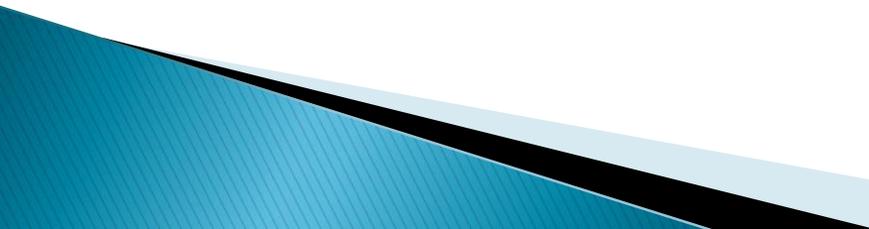
Foundational support

- ▶ Nutritional deficiencies, especially those of Magnesium, Zinc, Vitamin B6, and other B vitamins, predispose one toward a pro-inflammatory state. Consider for foundational support:
- ▶ ProMulti Plus

Check Adrenal Status

- ▶ Many injuries occur in hypoadrenal clients
- ▶ Shin splints, low back pain, SI sprain/strain, knee problems, foot/ankle problems – all signs of failing adrenal health
- ▶ Additionally, the adrenal hormone cortisol is an anti-inflammatory, endogenous hormone. When injured, cortisol levels will spike for anti-inflammatory purposes. In hypoadrenia, there will be a deficiency in cortisol.
- ▶ Consider: Cytozyme AD, ADB5 Plus, ADHS, L-Tyrosine

Eicosanoids

- ▶ Eicosanoids are signaling molecules made by oxidation of twenty-carbon essential fatty acids, (EFAs).
 - ▶ They exert complex control over many bodily systems, mainly in inflammation or immunity, and as messengers in the central nervous system
 - ▶ The networks of controls that depend upon eicosanoids are among the most complex in the human body
- 

- ▶ Eicosanoids derive from either omega-3 (ω -3) or omega-6 (ω -6) EFAs. The ω -6 eicosanoids are generally pro-inflammatory; ω -3s are much less so. The amounts and balance of these fats in a person's diet will affect the body's eicosanoid-controlled functions, with effects on cardiovascular disease, triglycerides, blood pressure, and arthritis. Anti-inflammatory drugs such as aspirin and other NSAIDs act by downregulating eicosanoid synthesis.

- ▶ There are four families of eicosanoids—the prostaglandins, prostacyclins, the thromboxanes and the leukotrienes. For each, there are two or three separate series, derived either from an ω -3 or ω -6 EFA. These series' different activities largely explain the health effects of ω -3 and ω -6 fats

Diacylglycerol or phospholipid

Phospho-
lipase C Phospho-
lipase A₂

Arachidonic acid

Lipoxygenase
(FLAP, Alox5)

HPETE (hydroperoxy-
eicosatetraenoic acid)

PGH₂ synthase
(cox-1 or cox-2 and
peroxidase)

PGD
synthase

Prostaglandin H₂(PGH₂)

H₂O
Leukotriene A₄

Glutathione
Glutathione-
S-transferase

PGD₂

PGE
synthase

PGE₂

Prostacyclin synthase

Thromboxane synthase

Leukotriene C₄

Glutamic acid
Leukotriene D₄

PGF₂

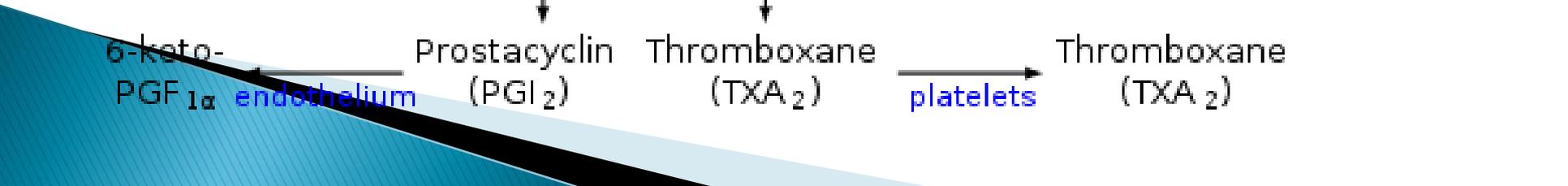
Leukotriene E₄

6-keto-
PGF_{1α} endothelium

Prostacyclin
(PGI₂)

Thromboxane
(TXA₂)

Thromboxane
(TXA₂)
platelets



- ▶ "Eicosanoid" is the collective term for oxygenated derivatives of three different 20-carbon essential fatty acids:
 - Eicosapentaenoic acid (EPA), an ω -3 fatty acid with 5 double bonds;
 - Arachidonic acid (AA), an ω -6 fatty acid, with 4 double bonds;
 - Dihomo- γ -linolenic acid (DGLA), an ω -6, with 3 double bonds.
 - Current usage limits the term to the leukotrienes (LT) and three types of prostanoids—prostaglandins (PG) prostacyclins (PGI), and thromboxanes (TX)

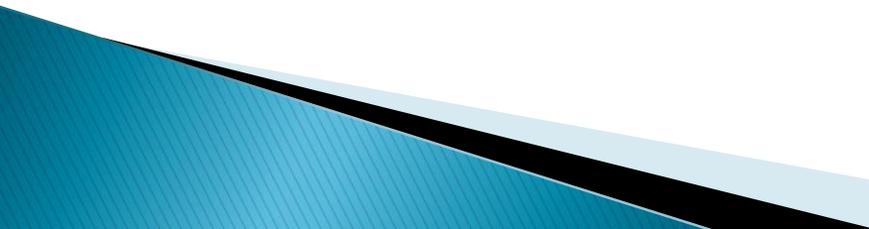
- ▶ Eicosanoids are not stored within cells, but are synthesized as required. They derive from the fatty acids that make up the cell membrane and nuclear membrane
- ▶ Eicosanoid biosynthesis begins when cell is activated by mechanical trauma, cytokines, growth factors or other stimuli.
- ▶ This triggers the release of a phospholipase at the cell membrane.
- ▶ .The phospholipase travels to the nuclear membrane. There, the phospholipase catalyzes ester hydrolysis of phospholipid (by A2) or diacylglycerol (by phospholipase C). This frees a 20-carbon essential fatty acid.

- ▶ Dietary omega-3 fats are considered anti-inflammatory
 - ▶ Excess of omega-6 fats relative to omega-3 tend to a pro-inflammatory state
 - Healthy non-oxidized omega-6 can be anti-inflammatory, but GLA is the omega-6 that is noted for anti-inflammatory properties
- 

- ▶ Eicosanoid metabolism requires:
 - ▶ Ca
 - ▶ Mg
 - ▶ Zn
 - ▶ Thiamin B1
 - ▶ Niacin B3
 - ▶ Pyridoxine B6
 - ▶ Vitamin C
 - ▶ Vitamin E
- 

- ▶ Anti-inflammatory medications like NSAIDs work by downregulating or blocking eicosanoid metabolism and prostaglandin synthesis
 - ▶ Steroids, alcohols, sugars, trans fats, heavy metals and toxins also interfere with eicosanoid metabolism and promote pro-inflammatory processes
- 

Acute to Chronic Inflammation

- ▶ Acute interventions are most effective within 2 weeks of injury.
 - ▶ Chronic inflammation is self-perpetuating and may be due to:
 - An acute process that doesn't resolve
 - Non-localized or systemic processes
 - Microbial agents and Endotoxins
- 

- ▶ A key goal with nutritional therapy in chronic inflammation is to downregulate pro-inflammatory NF-kappaB
- ▶ Supportive foods / herbs / nutrients:
 - Lemon, curcumin, ginger, green tea extract, flavonoids, resveratrol
 - KappArest
 - ReserveraSirt-HP
 - Optimal EFAs
 - Bio D Mulsion Forte – body pain is a cardinal symptom of vitamin D deficiency

Relevant Lab Values

- ▶ Systemic inflammation may result in:
 - Elevated C-reactive protein
 - Elevated erythrocyte sedimentation rate (ESR)
 - Elevated albumin
 - Also elevated IL-1 beta, IL-6, IL-18, TNF-alpha, and adhesion molecules

Nutraceutical Analgesics

- ▶ Bio Allay – botanical anti-inflammatory
- ▶ KappArest – downregulates NF-kappaB
- ▶ Bio D Mulsion Forte
- ▶ ResveraSirt-HP – modulates pain mediators
- ▶ Bio-FCTS – bioflavonoids block arachidonic acid cascade and pro-inflammatory metabolites
- ▶ Inositol – used for nerve pain i.e. sciatica and neuralgias

Rheumatoid Arthritis

- ▶ Eliminate sugars, excess starch, all artificial foods and potential allergens – no wheat, dairy, soy, caution with nightshades and corn
 - ▶ Promote healthy digestion and rule out chronic viral, yeast, parasitic conditions, heavy metals, environmental sensitivities
 - ▶ Focus on balancing adaptive immune response: TH1, TH2, T regs
- 

Rheumatoid Arthritis

- ▶ Or Autoimmunity in general...
 - ▶ Treat the gut barrier first along with a detox program
 - ▶ Then address the immune system directly and treat the joint for cartilage repair as the secondary issue
- 

Autoimmune and Arthritis

- ▶ IPS – support for healing intestinal barrier. Use for leaky gut, allergies, autoimmune issues
 - RA and other autoimmune conditions generally have an intestinal component.
 - With leaky gut the immune system will be inundated with foreign materials, which become antigens and ignite immune response.
- ▶ Gastrazyme – used to heal gastric and intestinal mucosa as found commonly in rheumatoid and autoimmune conditions

Autoimmune and Arthritis cont

- ▶ Gammanol Forte with FRAC – relieves muscle soreness, promotes gut healing and joint repair
 - ▶ Whey Protein Isolate – supports immune response, heals gut tissue, promotes glutathione
 - ▶ Immuno-gG – healing globulins for intestinal and immunological support
- 

Osteoarthritis

- ▶ “cooked food disease” – traced directly to dietary factors and lack of sufficient living foods
- ▶ Consider: Osteo BII, Osteo B Plus, EFAs, Trachea
- ▶ Often a need to support liver function:
 - Livotrit Plus, Beta TCP, phosphatidylcholine, B6 phosphate

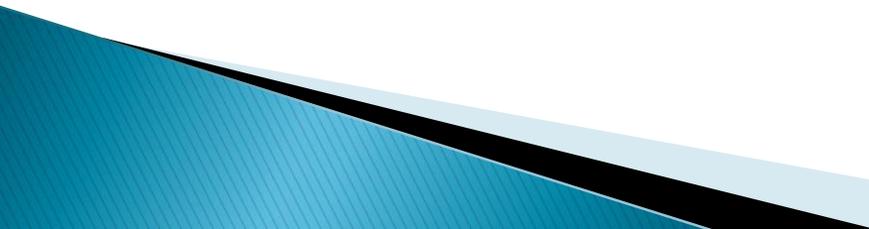
Bone and Heel Spurs

- ▶ Mineralization of tendon/ligament attachment along points of stress
- ▶ Bones remodel to stress and build solid structures along stress lines
- ▶ Predisposing factors:
 - Structural imbalance
 - Systemic pH imbalance (often too alkaline)
 - Connective tissue impaired with loss of function

Bone Spur considerations:

- ▶ Optimal EFAs– required for healthy mineral distribution and mobilization
 - ▶ Bio D Mulsion Forte – for optimal mineral distribution
 - ▶ Liquid Iodine – calcium mobilizer
 - ▶ Bio K Forte – calcium mobilizer
 - ▶ Osteo B II – for bone building
 - ▶ HCl Plus – digestive aid, for acidification
 - ▶ Super Phosphozyme – to balance pH and minerals
- 

Note on Phosphorus

- ▶ Phosphorus supplementation at sufficiently high doses will absorb mineral deposits in joints, bursa and spurs (as well as arterial plaque and kidney stones) pulling the minerals back into solution.
 - ▶ Dosed without regard to calcium and magnesium balance, it will result in deficiency and reports of skin irritations, sensitive/loose teeth, and joint instability.
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Muscle Spasms / Cramps

- ▶ Happens when there are mineral imbalances: calcium, magnesium, potassium, sodium with fluid loss. Vitamin E is secondary.
 - Bio-CMP
- ▶ Cramping with Restless Leg Syndrome
 - Bio-CMP
 - Bio-GGG-B
 - Ca/Mg-Zyme