

Pathology Lesson 1 Immune System

Pathology is the study of disease, etiology is the cause of disease and pathophysiology is the study of how normal physiology is altered by disease.

Etiology of a weakened immune system

poor sleep/lack of protein or other building nutrients/poor digestion (potentially causing inflammation & dysbiosis & preventing extraction of nutrients from food) /lack of beneficial microflora/skin disorders weakening the skin as a first level of defence against infection/stress (excess cortisol is immunosuppressive) therefore weakened or stressed adrenals can lead to a suppressed immune system/food and environmental toxins strain the body detox system and weaken immunity/steroid drugs such as cortisol are immunosuppressive/anything that kills good bacteria like antibiotics, chlorine, severe diarrhea, illness or starvation/persistent viral infections like Epstein Barr virus can lead to long term impairment of the immune system/infections in general make a person more susceptible to other threats/lack of exercise impairs lymphatic drainage and decreases immune cell function/drug use and abuse impairs the body's detox systems and weakens immunity/ weakened or stressed liver directly impairs the immune system

Signs and Symptoms of an impaired immune system

reoccurrent, frequent or lasting infections/slow wound healing/

inflammatory disorders/allergies/ autoimmune disease/fatigue (including fibromyalgia)/dysbiosis/ herpes outbreaks

Stressors on the immune system

food sensitivities & food allergies/ sugar & alcohol/caffeine/artificial sweeteners/smoking/chlorine & fluoride/allergens/exposure to mold

Recommendations for the Immune System

Diet:
eat a healthy diet/adequate protein/ fresh garlic and onions /avoid food sensitivities/avoid coffee. tea. caffeine, stimulants and carbonated beverages/avoid sugar, alcohol and artificial sweeteners/drink lots of pure water/ increase fibre intake/ avoid trans and hydrogenated fats/ decrease refined and simple carbohydrates / alkalinize the diet/ increase dark green leafy vegetables and other chlorophyll-containing foods

Supplements:

probiotics/immune builders and boosters (see below) /vitamins A, C, D, E and B's/minerals zinc, selenium, iron. copper. magnesium/essential fatty acids (EFAS), especially omega-3 fatty acids (when purchasing and using EFAS it is imperative that polyunsaturated fats are unrefined, cold pressed and

stored in the freezer in dark amber glass bottles. They should be consumed quickly and are never heated (damage to the oil results in the formation of trans- fats and free radicals like hydrogen peroxide which will favour cancer) /plant sterols and sterolin/ thymus extracts / thymus homeopathics/glyconutrients (beta-1,3-D-glucan) / shark cartilage/ other anti-oxidants (Coenzyme Q10, lipoic acid, glutathione) / inositol triphosphate/hexaphosphat/ bioflavonoids (i.e. quercetin), carotenoids, octacosanol/proteolytic enzymes/ anti-microbials (i.e. oregano oil)

Lifestyle and Other Factors:

avoid stressors on the immune system (see above) / see Immune Builders and Immune Boosters below/ get ample, regular, good quality sleep/eat regular meals/ practice stress management/ exercise/meditation/ support the adrenal glands, gut and liver/ improve lymphatics and blood circulation/warming socks

Immune Builders

1) probiotics- good bacteria protects and supports us/ **2) protein-** antibodies are made of protein, all WBC & immune system tissues require sufficient complete protein/ methionine can reduce histamine in the blood/glutamine is needed for immune cells to grow/ **3) zinc-** necessary for thymus development & the integrity of epithelia/it is involved in almost every enzyme reaction in the body/ **4) Vitamin A-** strengthen mucous membranes/ stimulates

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WBC production, especially killer T-cells (cells found in the blood and lymph: defend the body against both infectious disease and foreign invaders)/ **5) Vitamin C** with bioflavonoids (act as antioxidants)- immobilizes microbes directly, neutralizes microbial toxins, increases production of interferon, increases lymphocyte mobility, in high doses acts as a anti histamine, essential to macrophages activity/ **6) Vitamin D**- increases the self destruction of mutated cells/reduced the spread and reproduction of cells/ **7) Vitamin E**- improves the functioning of lymphocytes **8) EFA's**, especially omega 3's- important for immune function/people with low levels are less able to produce interferon/ **9) B-complex**-B2 increases T-cells/Vit.B6 in interleukin 2 production/Folic acid, pyridoxine, and pantothenic acid are all essential in immune response and antibody production/ **10) Copper, iron, selenium and magnesium** are important for immune function/ *natural killer immune cells & macrophages use free radicals to kill microbes, so it may not be the best idea to take excessive amounts of antioxidants

Immune Boosters

- 1) all antioxidants- protect the immune system from free radical damage
- 2) inositol- boosts natural killer cells, present in human cells and in certain foods, IP6 may be effective in lowering tumor incidence and slowing their growth
- 3) Garlic- strong antioxidant, stimulates the production of glutathione (liver detoxifier) deactivates toxins and inhibits tumors
- 4) sterols and sterolins- immune modulating plant fats

- 5) Glutathione- lymphoid cells need glutathione to function optimally
 - 6) Lipoic acid and Coenzyme Q10- antioxidant that protects the immune system from stress
 - 7) Shark Cartilage- stimulates the immune system
 - 8) Proteolytic enzymes- breaks down undigested protein, cellular debris and toxins in the blood (sparing the immune system from having to)
 - 9) Thymus Extract –increase and improve T cell activity through activation via increase in the release of the hormone thymosin
 - 10) Anti microbial supplements- boost the immune system through decreasing workload of system (freeing up resources)
 - 11) Eliminate sugar- sugar impairs cell-mediated immunity (T-cells for 2 hours) and depresses neutrophil phagocytosis (for up to 5 hours)
 - 12) moderate exercise- boosts immune system
 - 13) warming socks/alternating hot and cold treatments/castor oil packs/ sunlight/earthing/grounding (walking barefoot on the ground)
 - 14) Herbs: Echinacea/Astragalus/ ligusticum (osha)/cat's claw/ginseng/ licorice/elecampane/boneset, yarrow and lemon balm (boost immune system, stimulate sweating and lymphatic drainage) for more info on herbs and contraindications see p. 12 & 13 of text
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Critical nutrients to accelerate healing:

* critical window for healing is the first six to eight weeks
zinc/Vit A/Vit C/Vit E/protein/EFA's/ enzymes

Factors that impair healing

- 1) Deficiency in Vit.C, bioflavonoids and sulphur amino acids (cysteine, methionine, taurine)-impairs collagen formation
 - 2) Insufficient complete protein-slows healing/glycine, arginine & proline for collagen formation
 - 3) Deficiency of galactosamine and glucosamine result in weakened ground matrix in all connective tissues (bone, ligament, tendon or cartilage)
 - 4) Elevated cortisol suppresses repair
 - 5) Zinc deficiency weakened collagen synthesis and impair normal immune functioning
 - 6) Movement-can disrupt the re knitting of the injured tissue (although some movement may be necessary to orient the collagen fibres along the planes of movement)
 - 7) Other factors: age, local blood supply and the amount of tissue destroyed
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Main recommendations in the text that applies to virtually all disease:

Diet :

- 1) Avoid avoid coffee, tea, caffeine, stimulants and carbonated beverages
- 2) Avoid sugar, alcohol and artificial sweeteners
- 3) Avoid refined and processed foods
- 3) Drink lots of pure water
- 4) Decrease refined and simple carbohydrates
- 5) Increase fibre intake
- 6) Avoid trans- and hydrogenated fats
- 7) Alkalinize the diet
- 8) Avoid food sensitivities
- 9) Ensure adequate complete protein
- 10) increase dark green leafy vegetables and other chlorophyll containing foods

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Supplements:

- 1) probiotics
- 2) essential fatty acids

Lifestyle:

- 1) get ample regular good quality sleep
- 2) maintain consistent, frequent exercise, including meditative forms of exercise such as yoga, tai chi or qi gong
- 3) reduce stress and practice stress management techniques
- 4) obtain ample safe exposure to sunlight
- 5) avoid exposure to cigarette smoke and other pollutants
- 6) treat dysbiosis
- 7) maintain consistent, frequent exercise

Recommendations for cancer prevention

Mutated cells can be produced and destroyed on any given day. When the immune system fails to destroy them, they are capable of mutating into cancer cells. Cancer is hyperplasia of largely abnormal tissue (it can be benign (self limiting) or malignant (spreading)). Most tumours start growing 5-10 years before the cancer is diagnosed.

How do cells become mutated:

damage from toxins and free radicals/ weakened immune system (dysbiosis, chronic inflammation, poor nutrition, stress, toxins), ongoing subclinical nutrition deficiencies, genetic predisposition to weakness in specific tissues, suboptimal liver function/emotional triggers which depress the immune system

Prevention:

antioxidants, avoid toxicity whenever possible, handle stress, treat dysbiosis and chronic inflammation,

improve nutrition density of the diet, improve digestion and absorption, build immune system, regular cleansing and detoxification (especially liver), eat optimal fibre, avoid xenoestrogens (eat organic, drink filtered water, use natural cleaning supplies, don't spray lawns, avoid plastic wrap and plastic containers)

Recommendations: text p. 46-50

Reduce Acidity:

In general acidic, hypoxic (lacking oxygen) tissues support the development of cancer.

Recommendations: text p. 51 & 52
