

Nutrition and Functional Assessment And Designing Patient Programs

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Unless otherwise indicated the nutritional considerations for new health conditions covered in this subject matter is derived from the following referenced texts:

1. Integrative Medicine -3rd edition (editor: Dr. David Rakel MD – Elsevier Saunders 2012)
2. The Encyclopedia of Natural Medicine – 3rd edition (Murray M and Pizzorno J – Atria Paperback 2012)
3. The Healing Power of Herbs- 2nd edition. Michael Murray ND. (Prima Publishing 1995)

We've come along way and now it's time to put all the pieces together in a proposed clinical approach to patient/client assessment and programming:

- Dietary Program
- Exercise Program
- Supplementation
- Other Lifestyle Interventions
- Recommended Further Investigations or Referrals (i.e. Urinary Organic Acids Test, IgG food Sensitivity etc.)

I have provided some intake, assessment, feedback and monitoring forms that I have used in my practice to help you implement this approach, which I will address at the end of this section or subject, as we wrap up.

We will also look at some common health conditions not yet covered in this program (i.e. RLS, Tardive Dyskinesia etc.)

How The Process Works and Topic Overview

1. Anthropometric Assessment
2. Diet History and Trends
3. Signs of Nutrient Deficiencies
4. Nutrient Depletion Factors
5. Exercise Considerations
6. Health Issues Affected by Nutrition and Supplementation
7. Family History (Gene-Nutrient Interactions)
8. Drug-Nutrient Interactions and Other Precautions
9. Standard Blood Work Assessment
10. Patient Feedback and Program
11. In-office Follow-Up Programs (e.g. Weight Management)
12. Popular Dietary Programs

Before We Begin

You can add any other assessment or treatment interventions to what is presented in this program (e.g. homeopathy, electrodermal screening, dark field microscopy, applied kinesiology, urinary organic acid test, IgG antibodies, etc.)

Your responsibility is to use evidence-based assessment and treatment interventions as foundation of your practice – defensible in a court of law, and are expected of you from insurance carriers who insure you, and within the controlled acts of your profession. (i.e. DC's in Ontario cannot use hyperbaric oxygen or Vega Testing- 2018)

Anthropometric Assessment

1. Body Mass Index (wt/ht²)

To calculate the body mass index:

- A. Take person's weight in pounds and multiply it by .45 to get their weight in kilograms.
- B. Take their height in inches and multiply it by .025 to get their height in meters. Then multiply their height in meters times their height in meters to get meters squared.
- C. Once you have their height in meters squared divide their weight in kilograms by their height in meters squared. This gives you their Body Mass Index.

The Body Mass Index also provides a good indicator of a person's overall percentage of body fat, unless the person has increased muscle development from weight training, in which case the Body Mass Index is not a true reflection of health risk or body fat percentage.

However, waist circumference remains a good indicator of health risks even in individuals who have muscle development from weight training.

- BMI between 20-25: this is a good reading and is associated with a low risk for the development of many degenerative conditions, including type II diabetes, cardiovascular disease, postmenopausal breast cancer and prostate cancer in men
- BMI between 26-29: this is regarded as Grade 1 obesity and is associated with a mild to moderate increase risk for the degenerative diseases mentioned above. Individuals should strive to get their body mass index below 26, unless they are highly muscular with a body fat percentage below 13% for men and 16% for women.

(candidate for weight management program)

- BMI between 30-40: this is regarded as Grade 2 obesity and is associated with a moderate to severe risk for the degenerative diseases mentioned above.

(candidate for weight management program)

- BMI over 40: this is regarded as Grade 3 or morbid obesity and is associated with a severe risk for the degenerative diseases mentioned above.

(candidate for weight management program)

2. Waist Circumference:

Men – below 36 in – metabolically active fat

Women – below 33 in – metabolically active fat

Other Girth Measurements To Track If On Weight Loss Program Or Resistance Training Program:

Hip, Bicep, Upper Thigh, Calf, Chest (men)

3. Percentage Body Fat (eg Futrex, Bioimpedence)

Men 9-14%

Women 14-22% (depends on body type)

Calculating Ideal Weight

$$PW \text{ (lbs)} - \left\{ PW \text{ (lbs)} \times \frac{P\%BF}{100} \right\}$$

$$1 - X \text{ (where } X = \text{Ideal \%BF in decimal form)}$$

PW = Present weight in pounds

P% BF = Present percentage body fat

Ideal %BF = Ideal percentage Body fat

Dietary Assessment

1. Food Frequency Questionnaire
2. 7- Day Diet Diary (complete with food, beverages, supplements, exercise)

20 Question Food Frequency Questionnaire

1. On average, how often do you eat any of the following foods:

- Ground beef, Steak, Hamburger
- Luncheon meats (e.g., salami, bologna, hot dogs)
- Bacon, Spare ribs, other pork products
- Chicken wings?

Daily

3 or more times per week

1 to 2 times per week

2 to 3 times per month

Less than 2 times per month

2. How often do you consume any of the following foods:

- Cheeses with greater than 20% Milk Fat (MF) e.g., cheddar, mozzarella, Monterey Jack, brick, cream cheese, parmesan
- Homogenized milk
- Yogurt that is more than 1% MF
- Regular Ice cream?

Daily

3 to 6 times per week

1 to 2 times per week

2 times per month

Less than 2 times per month

3. Do you use cream in your coffee or tea on a daily basis?

Yes

No

4. Do you routinely use butter on bread products such as toast, bagels, ?.

Yes

No

5. Do you routinely use butter for cooking or on baked potatoes or vegetables?

Yes

No

6. Do you use regular sour cream or high saturated fat salad dressings (e.g., French, Thousand Islands, etc.) more than once per week?

Yes

No

7. What is your weekly whole egg consumption on average?

12 or more eggs per week

8-11 eggs per week

5-7 eggs per week

2-4 eggs per week

Less than 2 eggs per week

8. How often do you eat fried foods? (deep-fried or pan-fried?)

7 or more times per week

5-6 times per week

2-4 times per week

0-1 times per week

9. Do you choose poultry or fish in place of red meat, pork or fried foods in most situations?

Yes

No

10. Are you a vegetarian or near vegetarian?

Yes

No

11. How often do you consume any of the following:

- 2% milk
- margarine
- yogurt that is 2% MF
- low– fat sour cream

7 or more times per week

4-6 times per week

2-3 times per week

0-1 times per week

12. How often do you consume any of the following foods:

- pastries such as cakes, donuts, croissants, turnovers, cookies (3 or more)
- non low fat muffins
- rich desserts
- premium ice cream

7 or more times per week

4-6 times per week

2-3 times per week

0-1 times per week

13. On average, how often do you consume any high fat snack foods: e.g., potato chips, nachos, any type of fried chips, Cheesies, regular chocolate bars, other chocolate treats?

7 or more times per week

4-6 times per week

2-3 times per week

0-1 times per week

14. How often do you consume sugary carbohydrate snacks & drinks:

- regular soft drinks
- licorice, jujubes, hard candies, gummy bears, ?.
- sweet, refined breakfast cereals, rice crispy squares

7 or more times per week

4-6 times per week

2-3 times per week

0-1 times per week

15. On average, how many servings of garden vegetables do you consume on a daily basis? (e.g., carrots, tomatoes, broccoli, cauliflower, peppers, romaine lettuce, spinach, collard greens, kale)

5 or more servings/day

3-4 servings/day

1-2 servings/day

0 servings/day

16. On average, how many servings per day do you consume of any starchy carbohydrate foods, such as pasta, rice, beans, peas, corn, oatmeal, etc.?

5 or more servings/day

3-4 servings/day

1-2 servings/day

0 servings/day

17. On average, how many servings of fruit do you have per day?
Note: 1 serving = 1 whole fruit (e.g., apple, orange, peach), 1/2 cup chopped fruit (e.g.), fruit salad), 8 oz. fruit juice

5 or more servings/day

3-4 servings/day

1-2 servings/day

0 servings/day

18. What is your average alcohol consumption? Note: 1 drink
= 1 beer, or a 5-oz. glass of wine, or 1 cocktail

3 or more drinks per day

1-2 drinks per day

2-3 drinks per week

2-3 drinks per month

Do not drink

19. How often, on average, do you consume any food or drinks containing high amounts of artificial sweeteners and/or food additives, colors, artificial flavors?

Examples of these food/drink items: diet and regular soft drinks, potato chips, nachos, Cheesies, corn chips, licorice, jujubes, gummy bears, gelatins, ice cream, fruit ices, sherbet, rice crispy squares, granola bars, or other similar types of snacks.

3 or more per day

1-2 per day

2-3 per week

once per week or less

20. Do you take a multiple vitamin and mineral supplement daily?

Yes

No

Should follow up with a 7-Day Diet History

- Fiber (soluble and insoluble)
- Type of Carbs
- Types of Treats
- Hydrogenated Fats
- Exercise Patterns

General GI-Screening

Do any of the following apply to you:

- Sensitivity or allergy to any foods, drugs or supplements? (list them and describe) _____

- Crohn's Disease
- Ulcerative Colitis
- Irritable bowel syndrome
- Celiac disease
- Gluten Sensitivity
- Gastritis
- Stomach or duodenal ulcer
- Diverticular Disease
- Gastroesophageal Reflux Disease GERD)
- Barret's esophagus
- Hiatus Hernia

- Any surgery to your stomach, gallbladder, intestines or colon/bowel? (describe) _____

Medications- Supplements-Surgeries

What Medications Do You Take Daily or on some level of regularity,
and for what condition(s)

Supplements: _____

Surgeries _____

- Do you eat fewer than 5 fruit and vegetable servings per day, on average?

Insufficient intake of fruits and vegetables (less than 5 servings per day) deprives the body of many necessary nutrients including antioxidants, B-vitamins and phytonutrients

- Do you often experience a scaly, flaky, seborrheic condition at the outer nose margins above the lips?

Flaky seborrheic conditions on the face are associated with deficiencies in Vitamins B2, B6

Seborrheic dermatitis

Pyridoxine (Vitamin B₆)

Most diets supply more than the 2 mg required daily. Several rare pyridoxine dependency syndromes have been described including cystathioninuria, homocystinuria (255 & 256), familial xanthurenic aciduria and a pyridoxine-responsive anaemia. Treatment necessitates the daily administration of many times the normal infant require-

ment of about 0.25 mg. Convulsions and abnormal electro-encephalographic recordings have been reported in infants fed a formula in which pyridoxine had been destroyed by heat treatment. Dramatic response occurred when pyridoxine was administered.

111 Pyridoxine deficiency. The scaling seborrhoea-like dermatosis in this patient and the glossitis in the next figure were induced in volunteers by giving the pyridoxine antagonist desoxypyridoxine. Such lesions have not been proved to occur spontaneously although it is suspected that some instances are due to pyridoxine deficiency.

111



- Do you have soft nails or do they chip, crack or peel easily, and/or are they brittle or contain ridges (not smooth)?

Soft nails or nails that chip, crack or peel easily, and/or are they brittle or contain ridges (not smooth) are often caused by deficiencies in calcium, and other minerals

- Are there white spots under your fingernails?

White spots under your fingernails is often a sign of zinc deficiency

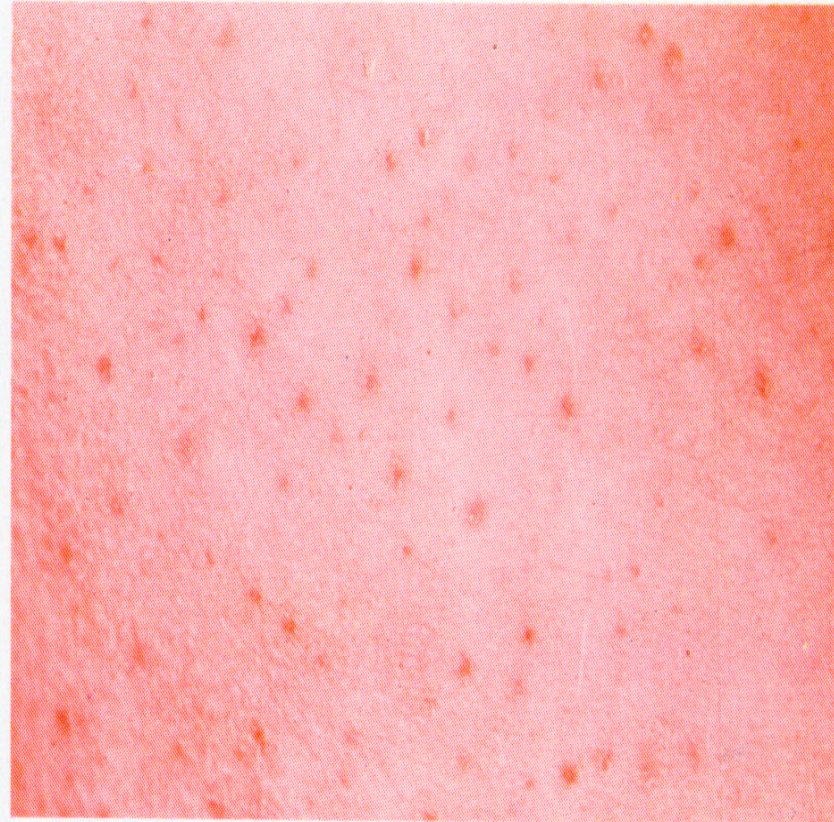
- Have you noticed small red spots under your skin? (see next slide)

Red spots under the skin are often an indicator of vitamin C deficiency.

Vitamin C Deficiency – Petechial Hemorrhage

137 Perifollicular petechiae. Minimal bleeding into the hair follicles is pathognomonic of vitamin C deficiency and is often the earliest clinical manifestation. In vitamin K deficiency, thrombocytopoenia and other conditions petechiae are situated in areas of skin unrelated to the hair follicles. In perifollicular hyperkeratosis (71 & 72) there is no bleeding and hyperkeratosis is present. Ecchymoses develop in more advanced deficiency and are the most frequent sign in 'workhouse' scurvy in old men. Wound healing is markedly delayed.

137



- Do you consume more than three alcoholic beverages per week, on average?

Consuming more than three alcoholic beverages per week, on average, is associated with depletion of the following nutrients:

- **Folic Acid**
- Vitamin A
- Beta-carotene and other carotenoids
- Vitamin B1
- Vitamin B2
- Vitamin B3
- Vitamin B6
- Vitamin B12
- Pantothenic Acid
- Calcium
- Vitamin C
- Vitamin D
- Vitamin E
- Potassium,
- And produces increased exposure to free radicals

- Do you drink more than two cups of coffee or caffeinated tea (of any kind) per day, on average?

Drinking more than two cups of coffee or caffeinated tea (of any kind) per day, on average depletes the body of vitamin C, many B-Vitamins, and minerals

- Are you a smoker?

Smoking cigarettes increases free radical exposure and depletes the body of antioxidants, B-vitamins and minerals

- Has your skin been damaged by sunlight and/or do you use a tanning bed more than once per month

Damage to the skin from sunlight and tanning beds results in the production of free radicals and depletion of antioxidants that protect the skin from future ultra-violet light exposure.

Desirable AO Supplementation For The Skin

- Vitamin C – 1,000 mg
- Vitamin E – 400 IU (natural) – no anticoag
- Beta-carotene – 10,000 IU – some Vit A con
- Vitamin A – 2,500 IU – no birth defects, tox
- Selenium – 100 mcg (avg intake is 25- 50)
- Zinc – 15 mg (avg intake is 8 mg)
- Also bioflav-50 mg, lycopene-6 mg, lutein – 6mg
- Niacin – 50-100 mg- DNA repair

ABCD Of Melanoma Detection

- **Asymmetry**--one half unlike the other half.
- **Border** irregular-- scalloped or poorly circumscribed border.
- **Colour** varied from one area to another; shades of tan and brown; black; sometimes white, red or blue.
- **Diameter** larger than 5mm (diameter of a pencil).



Melanoma Variations



Asymmetry



**Border
irregularity**



Color



**Diameter:
 $\frac{1}{4}$ inch or
6mm**

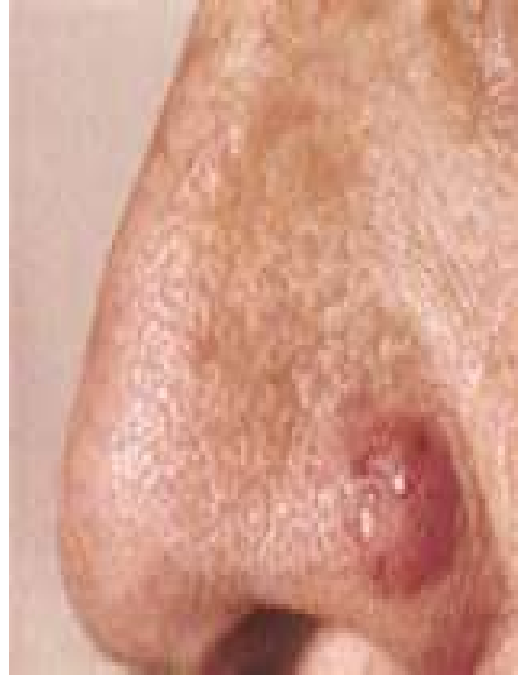
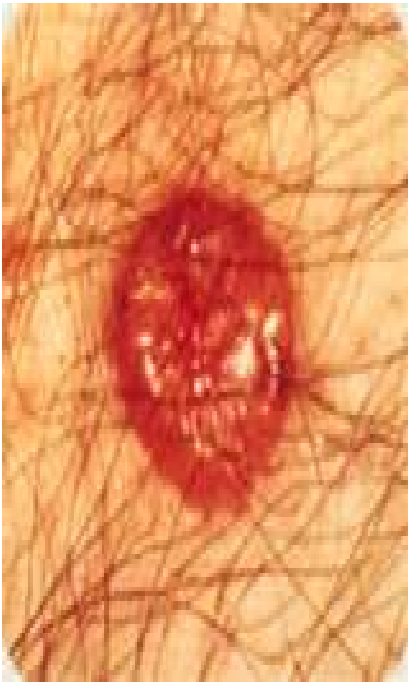
Melanoma Variations



Melanoma.



Basal Cell Carcinoma



Squamous Cell Carcinoma – often scaly and ulcerated



Psoriasis – Left Eczema - Right



- On a scale of one to five, what level of stress do you experience in your daily life?

(A=1, B=2, C=3, D=4, E=5) **Answer of C, D, E triggers following response**

It appears that your stress level is at level sufficient to create hormonal imbalances that can lead to the depletion of Vitamin C, many B-Vitamins, and Minerals.

See also Perceived Stress Index (course notes)

- Do you often experience cracks at the margins of your lips - see next slide (angular stomatitis)

Cracks at the margins of the lips is often associated with Vitamin B2 Deficiency

- Do you often experience a sore or burning tongue?

A sore or burning tongue is often caused by deficiencies in Vitamins B2, B6, B12 Deficiency

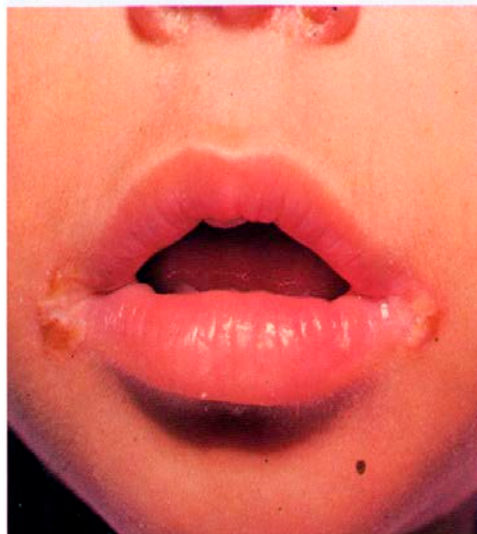
101 Angular stomatitis. The muco-cutaneous junctions at the angles of the mouth are sodden, macerated and excavated with fissuring. Both angles are affected but often unequally. On healing angular scars or rhagades occur (103) and must be differentiated from those that follow congenital syphilis. Besides riboflavin deficiency it may also occur in other B vitamin deficiencies and in iron deficiency. Ill-fitting dentures may be responsible. The angles of the eyelids may also be affected – angular palpebritis.

101



102 Perlèche. In cases of neglect the lesions of angular stomatitis may be colonized by *Candida albicans* giving rise to an exuberant yellowish growth of fungal material. The muco-cutaneous junction of the nose is similarly affected in this young child.

102



103 Rhagades. Chronic erosions and scarring at the angles of the mouth in a schoolboy in the north-east of Iran where widespread riboflavin deficiency has recently been demonstrated biochemically.

103



Cheilosis

104 Cheilosis. This term should be reserved for vertical fissuring, later complicated by redness, swelling and ulceration of the lips, other than the angles. The centre of the lower lip is usually most affected. Climatic factors, such as cold and wind, may sometimes be responsible.

104



- Have you experienced a reduce ability to taste food?

A reduce ability to taste food is often caused by a zinc deficiency

- Do your gums bleed easily?

Gums that bleed easily is often a sign of Vitamin C deficiency

- Do you bruise easily?

Skin that bruises easily is often associated with a deficiency in Vitamin C, Calcium, and/or Vitamin K

(can also be genetic factors or anti-coagulant drugs)

- Are you a slow healer from bruises and cuts?

Slow healing capabilities is often an indication of sub-optimal nutrient status of Vitamin C

- Do you feel chronically fatigued?

Feeling chronically fatigued in the absence of disease is often associated with multiple vitamin and mineral deficiencies

- Do you have irregular eating patterns?

Irregular eating patterns tends to contribute to a inadequate intake of essential vitamins and minerals and often leads to at least marginal deficiencies in many vitamins and minerals.

- Are you on a weight loss or calorie restricted diet?

Calorie restricted diets cannot provide optimal intake levels of all vitamins and minerals and thereby, contribute to marginal deficiency states of many vitamins and minerals.

Individuals on calorie-restricted diets (under 2,000-2500 calories per day) are advised to derive the missing nutrients from a multiple vitamin and mineral

- Do you feel run down and/or are you experiencing a weakened state of immunity?

Feeling run down and/or in a weakened state of immunity suggests that multiple nutrient deficiencies may be a factor.

Studies reveal that supplementation with certain antioxidant vitamins, as well zinc and selenium can bolster immune function in older and elderly subjects and in those with certain types of compromised immune function

- Does your hair fall out easily, and/or is it dry and brittle and/or does it lack optimal luster and sheen?

Hair falling out easily, and/or dry and brittle hair and/or lackluster hair that is dull in appearance are all associated with multiple vitamin and mineral deficiencies

Pellagra – Niacin Deficiency

85 Casal's necklace. This fairly broad band or collar of dermatosis running right round the neck, and sometimes extending downwards like a bib, is a classic sign of pellagra. Other parts of the body exposed to the sun are usually also affected.

85



86 Extensive pellagrous dermatosis. The symmetrical involvement of the exposed parts of the body and the clear demarcation of the lesions from the normal skin on unexposed parts are striking in this elderly African female patient. It is not clear why the face is frequently unaffected.

86



Early Pellagra

84 Early pellagra affecting the arms. The dermatosis begins as an erythema with pruritus and burning. Blebs may run together to form bullae and burst. At the slightly later stage shown the skin becomes hard, rough, cracked, blackish and brittle. In the dark skinned, as in this young Tanzanian male, the dermatosis may be easily overlooked. The symmetrical distribution on parts of the body exposed to the sun is characteristic but lesions are not necessarily confined to these areas. In this case the only other hyperpigmented areas were over those parts of the toes rubbed by ill-fitting shoes.

84



Pellagra Continued

90 Symmetrical chapping of dorsum of hands. This is a common site for the skin changes of pellagra to occur. A careful history and full examination will permit the distinction to be made.

90



91 Scarlet tongue. The tongue in pellagra is frequently scarlet in appearance and extremely painful. However, this may occur in many non-nutritional conditions and other signs, especially those in the skin, have to be present to make the clinical diagnosis. Fissuring of the tongue alone is not of significance.

91



Healing From Niacin Treatment

88 Dermatosis of pellagra. The backs of the hands and fingers are often the most severely involved parts of the body. The lesions are healing here and the dead skin is being exfoliated.

88



Hyperpigmentation of Skin In Folic Acid and/or Vit B12 Def

Vitamin B₁₂ (Cobalamin)

This vitamin is stored in the liver and when the dietary intake is low or absorption is impaired, as in pernicious anaemia due to absence of intrinsic factor, deficiency signs appear only after many months. The daily requirement is about 3 μg .

Vitamin B₁₂ occurs only in animal products and strict vegetarians (vegans) may become deficient.

Several rare forms of vitamin B₁₂ dependency have been described requiring massive doses (up to 100 μg daily) for their control.

117 Hyperpigmentation of the skin. This patient also had a megaloblastic anaemia and recovery, including the skin, resulted from treatment with folic acid. Similar pigmentation occurs in vitamin B₁₂ deficiency (120).

117



Zinc Deficiency From Lack Of Absorption - genetic

Zinc

212 Acrodermatitis enteropathica. This is an inherited, previously fatal, disorder characterized by a psoriasiform dermatitis, often affecting the whole body, diarrhoea, hair loss, paronychia and growth retardation. It is due to a defect in the absorption of zinc and responds dramatically to this trace element.

A syndrome of growth retardation and hypogonadism responding to zinc has been described in the Middle East. Low zinc status may occur in many diseases and is probably sometimes responsible for failure to thrive and hypogeusia (impaired taste) in children, and night blindness in adults with liver disease or malabsorption.

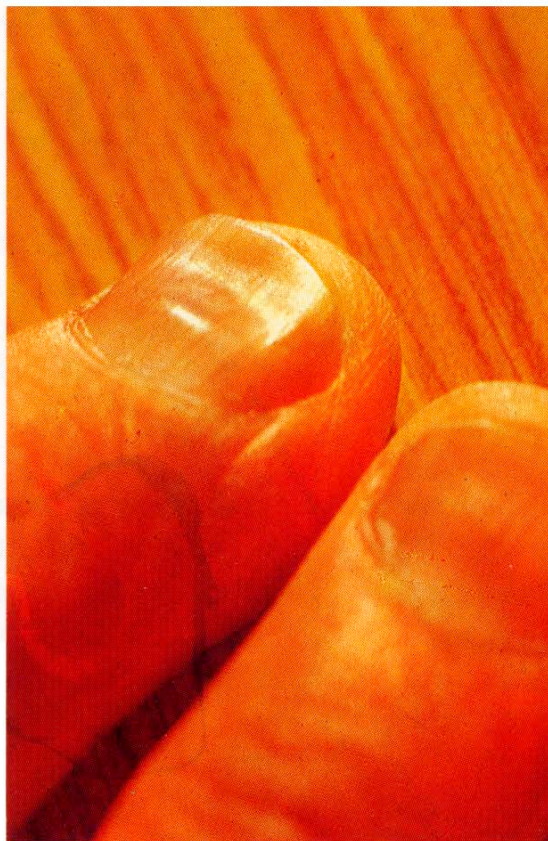
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Advanced Iron Deficiency – Spoon Nails

170 Koilonychia. Thinning, flattening and finally a concave or spoon-shaped appearance of the nails, as here, is typical of advanced iron deficiency. Brittle or longitudinally ridged nails are non-specific. Koilonychia is thought to be rare in young children with iron deficiency, but it was present in at least one study in a considerable proportion. The mechanism is not clear, nor is it understood why it does not occur in other forms of anaemia. It may result from prolonged exposure to soap suds and other caustic agents. When associated with fungal diseases of the skin the nails are irregularly pitted. Spoon-shaped toe nails are common in bare foot communities and are of no significance.

170



Do you regularly use any of the following medications or agents? Indicate Yes or No beside each item.

- **Laxatives**

Your regular use of laxatives is associated with depletion of the following nutrients :

- Vitamin A
- Vitamin D
- Vitamin E
- Calcium

- **Long term antibiotic therapy**

Your regular use of antibiotics is associated with depletion of the following nutrients :

- Vitamin B1
- Vitamin B2
- Biotin
- Pantothenic Acid
- Vitamin C
- Vitamin E
- Vitamin K
- Potassium
- Magnesium
- Zinc
- Friendly Gut Bacteria (requires Probiotic and Prebiotics)

Cholesterol - lowering drugs? (any of the following Bile Acid Sequestrants)

- Cholestyramine
- Colestipol
- Questran
- Colestid
- Atromid-S

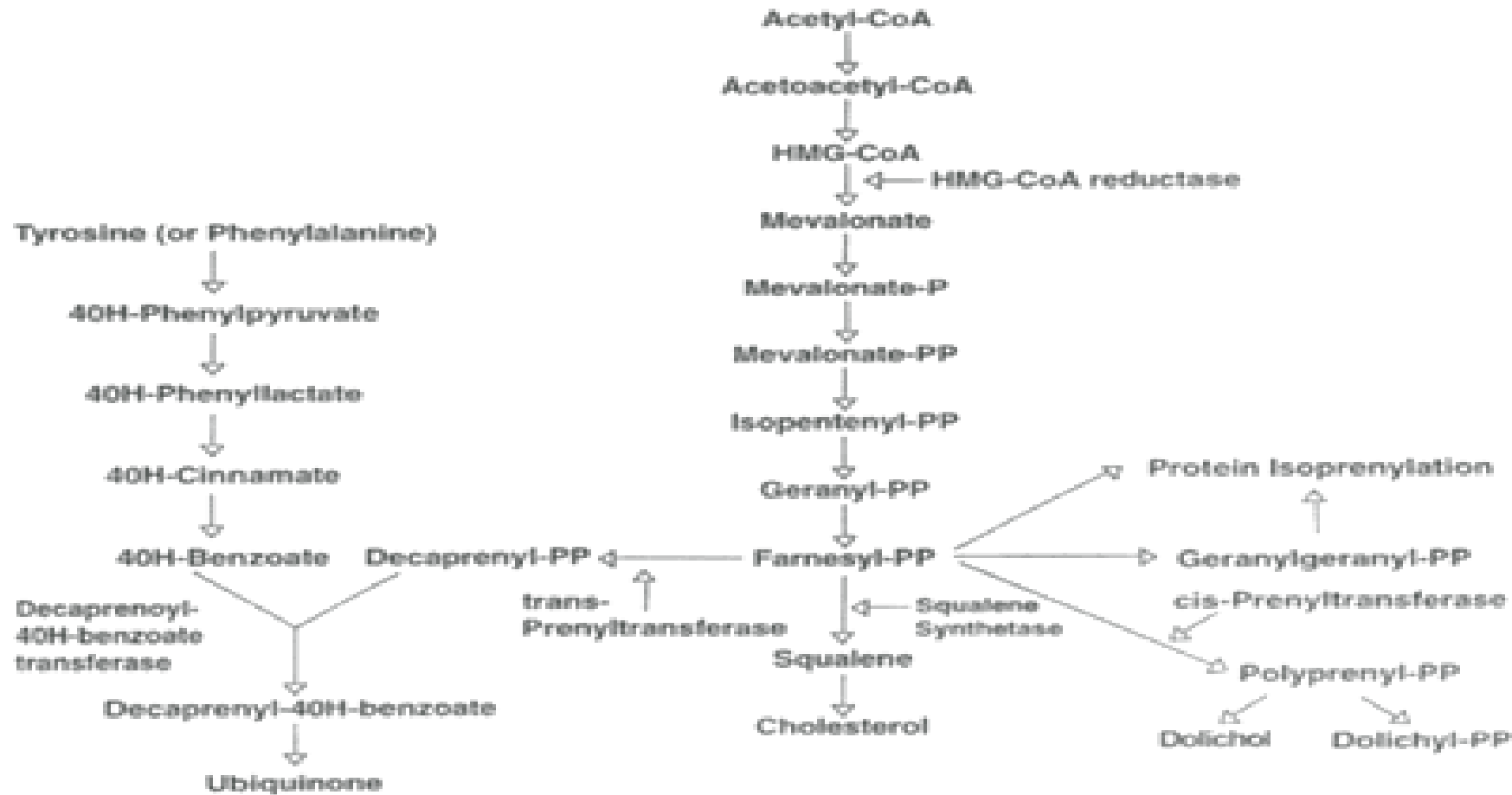
Your regular use of cholesterol-lowering drugs is associated with depletion of the following nutrients :

- Vitamin A
- Vitamin B12
- Beta-carotene
- Folic Acid
- Vitamin D
- Vitamin E
- Vitamin K
- Iron

Do you take a statin drug to lower cholesterol (e.g. Lipitor, Crestor)?:

Depletion of CoQ10 is a concern for high blood pressure and congestive heart failure - may require up to 90-100 mg per day of supplementation

Statin Drugs Inhibit CoQ10 Synthesis



- Anti-gout drug called Colchicine

Your regular use of colchicine to treat gout is associated with depletion of the following nutrients :

- Vitamin A
- Vitamin D
- Vitamin B12
- Folic Acid
- Iron

Steroid hormones?

- i.e., Cortisone, Prednisone

Your regular use of of certain steroid drugs is associated with depletion of the following nutrients :

- Folic Acid
- Vitamin D
- Zinc
- Magnesium
- Vitamin C
- Calcium

- **Aspirins for arthritis or any other reason (or other nonsteroidal anti-inflammatory drugs – i.e., Ibuprofen, Naproxen**

Your regular use of non-steroid anti-inflammatory drugs is associated with depletion of the following nutrients :

- Folic Acid
- Vitamin C
- Vitamin K
- Iron

- **Antacids** (i.e. Maalox, Tums, Mylanta, Rolaids, Diovol)

Your regular use of antacid drugs is associated with depletion of the following nutrients :

- Vitamin A
- Vitamin B1
- Folic Acid
- Vitamin B12
- Chromium
- Iron

- **Oral contraceptives**

Your regular use of oral contraceptive drugs is associated with depletion of the following nutrients :

- Beta-carotene
- Vitamin B1
- Vitamin B6
- Folic Acid
- Vitamin B12
- Biotin
- Pantothenic Acid
- Vitamin C
- Magnesium
- Zinc

- **Sedatives / Barbiturates (i.e. phenobarbital, fiorinal, phenaphen, atropine)**

Your regular use of sedative and/or barbituate drugs is associated with depletion of the following nutrients :

- Vitamin B2
- Vitamin C
- Vitamin D
- Folic Acid
- Vitamin B12
- Pantothenic Acid

- **Estrogen Replacement**

Your regular use of estrogen replacement therapy is associated with depletion of the following nutrients :

- Vitamin B1
- Vitamin B2
- Folic Acid
- Vitamin B12
- Biotin
- Pantothenic Acid
- Vitamin C
- Magnesium
- Zinc

- **Caffeine (caffeinated coffee, tea, espresso etc.)**

Your regular intake of caffeine is associated with depletion of the following nutrients :

- Vitamin B1
- Potassium
- Zinc
- Calcium

- **Antidepressants** (i.e. prozac, paxil, zoloft, celexa, amitriptyline etc.)

Your regular use of antidepressant drugs is associated with depletion of the following nutrients :

- Vitamin B2
- Vitamin B6
- Calcium
- Magnesium
- Coenzyme Q10

- **Amphetamines** (i.e. adderall, cylert, ritalin, benedrine, dexedrine)

Your regular use of amphetamines is associated with depletion of the following nutrients :

- Vitamin B1

- **Levodopa**

Your regular use of levodopa is associated with depletion of the following nutrients :

- Vitamin B6
- **Anti-convulsants** (i.e. dilantin, celontin, zorontin, carbamazepine, phenobarbital)

Your regular use of anticonvulsant drugs is associated with depletion of the following nutrients :

- Folic Acid
- Biotin
- Vitamin D
- Vitamin E
- Zinc

- **Digoxin or Digitalis**

Your regular use of digoxin is associated with depletion of the following nutrients :

- Vitamin B1

- **Indomethacin**

Your regular use of indomethacin is associated with depletion of the following nutrients :

- Vitamin B1

- **Diuretics (i.e. thiazide drugs, hydrochlorothiazide, moderet, apo-trizide, midamor)**

Your regular use of diuretic drugs is associated with depletion of the following nutrients :

- Vitamin B1
- Calcium
- Potassium (thiazide)
- Magnesium
- Zinc

- **High Blood Pressure, ACE-Inhibitor drugs (captopril, capoten, lotensin, vasotec, ramipril, altace, prinivil)**

Your regular use of ACE-Inhibitor drugs for high blood pressure is associated with depletion of the following nutrients :

- Zinc

- **High Blood Pressure, Beta-blockers (atenolol, metoprolol, propranolol, acebutolol)**

Your regular use of beta-blocker high blood pressure drugs is associated with depletion of Coenzyme Q10

- **High Cholesterol, Statin drugs (lipitor, crestor, mevacor, zocor, lescol, pravachol)**

Your regular use of statin drugs for high cholesterol is associated with depletion of Coenzyme Q10

Exercise Section

Do any of the following statements apply to you:

- Your doctor has informed you that you have heart trouble or a heart condition of some kind
- You frequently have pain in your chest or have had chest pain recently
- You often feel faint or have spells of severe dizziness that are not caused by an inner ear condition
- You have been informed that you have high blood pressure
- You are over the age of 65 and are unaccustomed to vigorous exercise

Describe Your Present Exercise Routine as well As Physical Activity At Work and Leisure and Sports Activities_____

Aerobic Testing

- **VO2 max** (also **maximal oxygen consumption**, **maximal oxygen uptake** or **aerobic capacity**) is the maximum capacity of an individual's body to transport and utilize oxygen during incremental exercise, which reflects the physical fitness of the individual.
- The name is derived from V - volume per time, O2 - oxygen, max - maximum.

Higher Aerobic Fitness is associated with decreased risk of heart disease as it affects a number of important parameters:

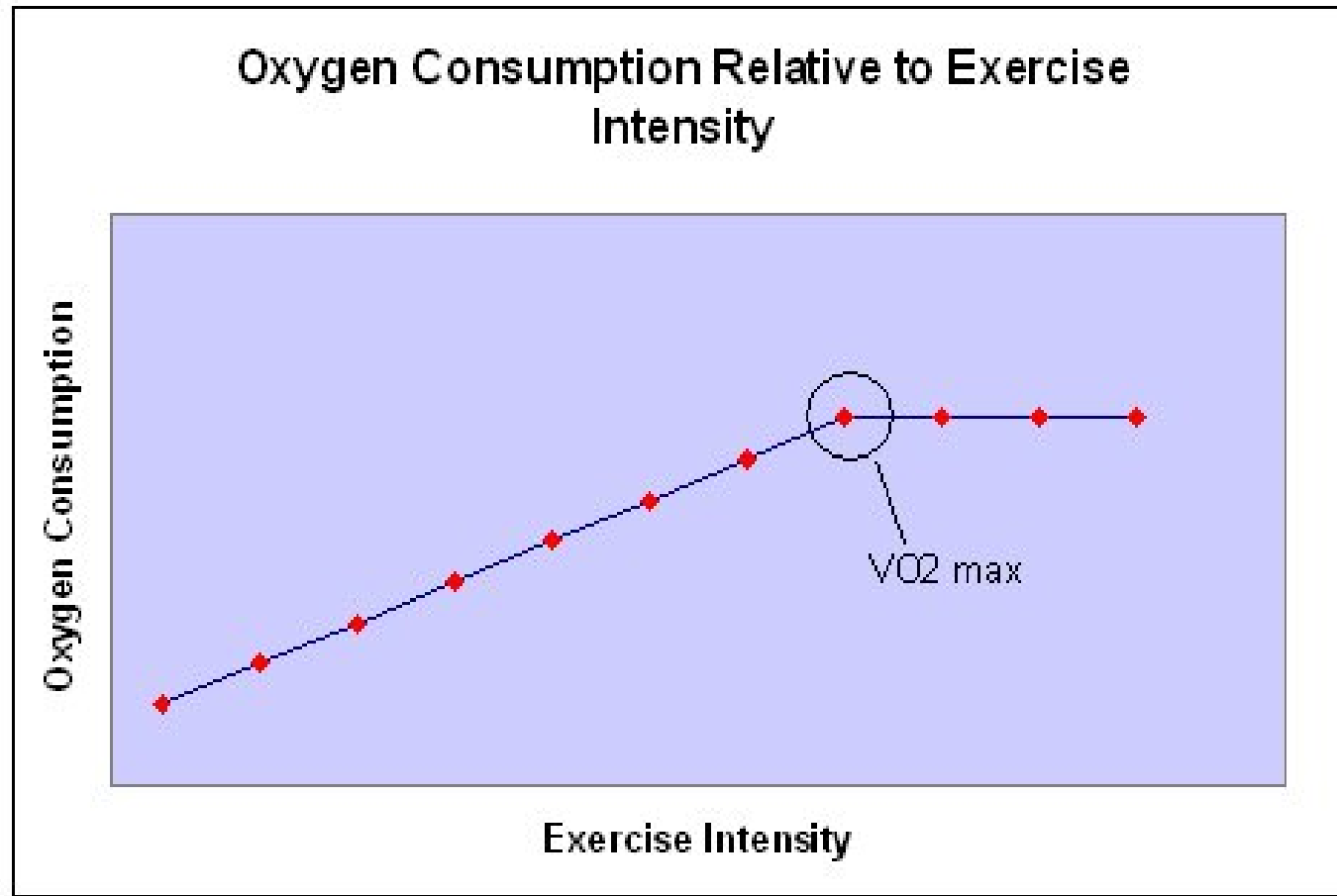
- Athlete's Pulse – improved blood flow to myocardium
- Collateral circulation to myocardium
- Improved insulin sensitivity
- Reduced sensitivity to catecholamines affecting heart muscle (less arrhythmias)
- Decreased blood pressure
- Decreased blood stickiness and clot formation
- Weight management

- VO₂ max is expressed either as an absolute rate in liters of oxygen per minute (L/min) or as a relative rate in milliliters of oxygen per kilogram of bodyweight per minute (**ml/kg/min**), the latter expression is often used to compare the performance of endurance sports athletes.

- Maximal oxygen uptake (VO₂max) is widely accepted as the single best measure of cardiovascular fitness and maximal aerobic power.
- Absolute values of VO₂max are typically 40-60% higher in men than in women.
- Clearly, then, VO₂max varies considerably in the population, with sex being a primary determining factor in this variability.

- The average young untrained **male** will have a VO₂ max of approximately 3.5 liters/minute and **45 ml/kg/min**.
- The average young untrained **female** will score a VO₂ max of approximately 2.0 liters/minute and **38 ml/kg/min**.
- These scores can improve with training and decrease with age, though the degree of trainability also varies very widely: conditioning may double VO₂max in some individuals, and improve only modestly in others.

- World class male athletes, cyclists and cross-country skiers typically exceed 75 ml/kg/min and a rare few may exceed 85 ml/kg/min for men and 70 ml/kg/min for women.
- Three time Tour de France winner Greg LeMond is reported to have had a VO2 max of 92.5 at his peak - one of the highest ever recorded, while cross-country skier Bjørn Dæhlie measured at an astounding 96 ml/kg/min.
- By comparison a competitive club athlete might achieve a VO2 max of around 70 ml/kg/min.
- To put this into perspective, thoroughbred horses have a VO2 max of around 180 ml/kg/min. Siberian dogs running in the Iditarod Trail Sled Dog Race sled race have VO2 values as high as 240 ml/kg/min.



Aerobic Fitness Testing

Kenneth Cooper (born 1931) is an M.D. and former Air Force Colonel from Oklahoma. Cooper is the author of a 1968 book *Aerobics* which emphasized a point system for improving the cardiovascular system.

- In his Air Force career, Cooper had devised a simple test (the Cooper test, originally the distance run in 12 minutes) which correlated quite well with VO₂max, and so could conveniently be used to quickly establish the fitness level of large numbers of people.
- Cooper is the founder of the **Cooper Aerobics Center** in Dallas and McKinney, Texas. He is also the founder of the non-profit research and education organization, The Cooper Institute, which was opened in 1970

The Cooper 12 minute run - is a popular **Maximal** running test of aerobic fitness. (not a sub-max test)

Purpose: to test aerobic fitness (the ability of the body to use oxygen to power it while running)

Equipment required: flat oval or running track, marking cones, recording sheets, stop watch.

Description / procedure: Place markers at set intervals around the track to aid in measuring the completed distance. Participants run for 12 minutes as fast as they can – trying to cover as much distance as possible in 12-minutes.

Total distance covered is recorded. Walking is allowed, though the participants must be encouraged to push themselves as hard as they can.

May also find a route where you can drive your car to know exact distance, but free from traffic lights or anything that may interrupt the run.

Scoring: There are several equations that can be used to estimate VO2 max (in ml/kg/min) from the distance score (a formula for either kms or miles):

- $\text{VO2max} = (35.97 \times \text{miles}) - 11.29.$
- $\text{VO2max} = (22.351 \times \text{kilometers}) - 11.288$

Validity: Cooper (1968) reported a correlation of 0.90 between VO2max and the distance covered in a 12 min walk/run.

12 Minute Run Results And VO2 Max Correlation

1. Run 1 mile in 12 minutes = VO2 max – 24.28 ml/kg/min (avg 12 minute miles)
2. Run 1.25 miles in 12 minutes = VO2 max -33.67 ml/kg/min (avg 9:36 sec miles)
3. Run 1.5 miles in 12 minutes = VO2 max - 42.67 ml/kg/min (avg 8 minute miles) – *this is lifelong minimum threshold respectable target to aim for*
4. Run 1.75 miles in 12 minutes = VO2 max – 51.66 ml/kg/min (avg 6:51 sec miles)
5. Run 2 miles in 12 minutes = VO2 max – 60.65 ml/kg/min (avg 6 minutes per mile)

12 Minute Run-Walk Categories

Results Table for Adult Males *distance*

- Excellent > 2700 m
 - Good 2300 - 2700 m
 - Average 1900 - 2300 m
 - Below average -1500 - 1900 m
 - Poor < 1500 m
-
- See Cooper's Book for exact male/female scoring by age group, or the following website:

http://en.wikipedia.org/wiki/Cooper_test

Variations / modifications: The test can also be conducted by running on a treadmill for 12 minutes, set to level 1 (1 percent) incline to mimic outdoor running.

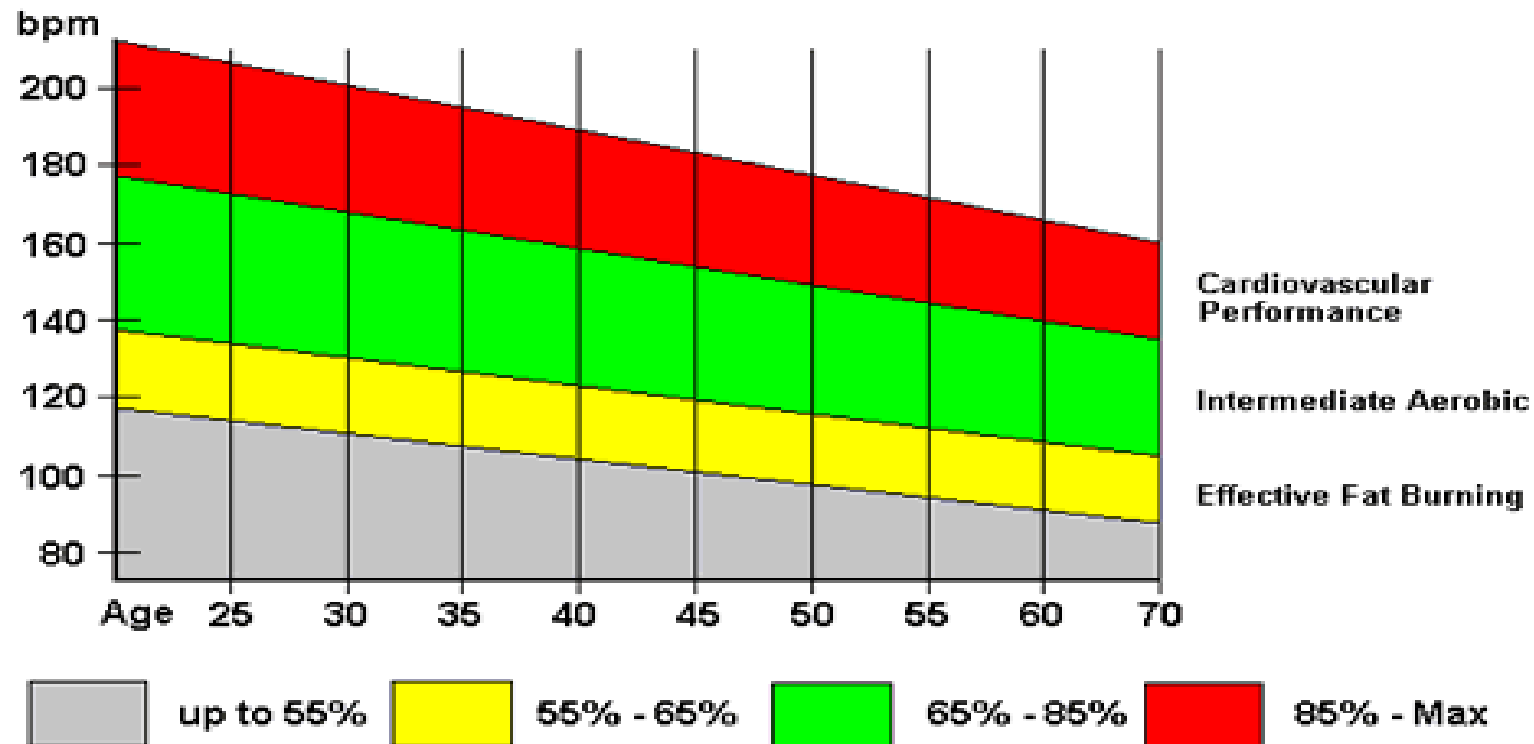
References: The original article that describes this test: Cooper, K. H. (1968) *A means of assessing maximal oxygen uptake.*
Journal of the American Medical Association 203:201-204

- Fitness Clubs – Use Submax Aerobic test
- A submax test can estimate one's aerobic capacity and is less risky than performing a Max Aerobic Test (exhausting and very rapid heart rate)
- 12 – lead electrocardiogram Stress Test is a Max Aerobic Capacity Test used for screening and monitoring of heart disease in high risk patients and executive medicals – usually followed by an echo cardiogram immediately after test (assess heart valves while heart is still pumping very hard)

In -Office Aerobic Prescription Using Estimated Target Heart Rate Zone Charts:

- $220 - \text{age} = \text{max attainable heart rate/min}$
- 60%-85% = zone where aerobic and fat burning benefits are optimal
- Midpoint of Training Zone = $180 - \text{Age}$

Aerobic Training Zone



Resistance Training: General Principles

Purpose:

- Gain Lean Mass or Preserve Lean Mass in Aging Process
- Speed Up Metabolism (reduce body fat)
- Improve or Maintain Bone Density in Aging Process
- Body Contouring
- Improved Functionality and Sports Performance

Options

- Weights (barbells, dumbbells) and weight-machines are not the only way to provide resistance. Resistance can be generated with springs, rubber bands, or exercise machines like Bow-Flex(tm).
- Resistance training can also be achieved by using your body weight (for example, pull-ups, push-ups, dips, squats, and sit-ups). Even isometric exercises produce increases in strength.
- In fact, using barbells isn't even an option for some exercises: push-ups, pull-ups, sit-ups, dips. To add resistance to these exercises, consider wearing a weighted vest. Some can hold anywhere from 1 to 84 pounds of weight.

Some Definitions:

- **Intensity and Volume:** "intensity" is the amount of weight lifted; "volume" is calculated from the amount of weight lifted and how many times that weight is lifted or repetitions performed
- **Muscular Endurance:** generally, reflects how long a muscle can work before becoming fatigued, or repeated bouts of muscle work with short rest interval between sets
- **Muscular Strength:** determined by the maximum amount of weight that can be lifted once. The 1-RM value is a measurement of muscular strength.

"1-RM": stands for "1 repetition maximum." The most weight you can lift one-time-only is your "1-RM" for that exercise.

So, if you can only bench-press 120 lbs once, then your 1-RM for that exercise is 120 lbs.

If you can bench-press a particular weight 8 times in a row (but no more than that), then that weight is known as your "8-RM".

Overload Principle of Strength Development - As you get stronger, make the weight heavier so you can still only perform the same number of repetitions per set (i.e. 8 reps per set) – usually about 80% of 1RM for strength development with low risk of injury

TYPES OF SETS

- A "set" is one series of repetitions. If you bench-press a certain weight 12 times, rest 5 minutes, and then bench-press it again 12 more times, you have done 2 sets of 12 reps. Here are types of sets:
- **Straight Sets:** the "standard" weight-lifting workout: a number of reps followed by a rest period, then one or more sets of that same exercise.
- **Super Sets:** a set of each of two different exercises performed back-to-back without resting between each one.
- **Tri-Sets:** Three different exercises performed one after another, without any rest in between.
- **Drop Sets (aka, descending sets):** Three or four sets of one exercise performed without rest, using a lighter weight with each successive set.
- **Circuit Sets:** a series of exercises (usually 6) that are completed in succession without rest.

INCREASING MUSCULAR STRENGTH:

- Most important factor in developing muscular strength is the amount of resistance (i.e., the amount of weight lifted).
When a muscle is repeatedly forced to contract against resistance, it responds by getting stronger and it lays down more myofibrils (protein contractile bands) within muscle fiber cytoplasm.
- the "magic" weight that stimulates muscle strength to increase, according to William Kraemer, PhD, lies between 50% and 100% of the 1-RM for a given muscle group (Kraemer WJ. 2003).

Weight-Training for Strength: Normally begin with a weight that brings you to momentary muscle failure after 8-12 repetitions.

- Power Lifting for Max Strength = 4-6 Reps per set to (near) muscular failure
- For Healthy Muscle Development with Lower Risk of Injury = 8-12 Reps per Set to (near) muscular failure

Weight-training for Muscle Endurance and Injury Rehab: Decrease the weight and perform a higher number of repetitions (i.e., 12-20 reps).

Basic 6 Strength Training Program

3 Sets of 8-10 Repetitions of the Following, 3X per Week:

1. Chest Press
2. Lat Pull Downs
3. Overhead Press
4. Hip Extension (Squats or Leg Press)
5. Knee Extension
6. Hamstring Curl

Also ensure adequate Protein Intake for Lean Mass Gains (BCAA, Glutamine etc.)

Consult other Exercise Courses, Programs and Certifications: National Strength and Conditioning Association; American Council on Exercise (ACE), CanFit Pro, University and College Programs etc.

Health Conditions

A. Cardiovascular Disease

Do you have any of the following health conditions:

- High cholesterol levels?
- High triglyceride levels?
- High blood pressure?
- Congestive Heart Failure
- Arrhythmia

Practitioner Cardiovascular Disease Screening Form

- **Patient's Name** _____
- **Assessment Date** _____
- **Gender** _____ **Age** _____ **Systolic Blood Pressure** _____ **Diastolic Blood Pressure** _____
- **Diabetes:** Yes ___ No ___ comment: _____
- **Smoking:** Yes ___ No ___ comment _____
- **Total Cholesterol** _____ (to convert cholesterol from mmol/L to mg/dL divide by 0.025) (at or below 3.9 mmol/L)
- **LDL-Cholesterol** _____ Below 1.8 – 2.0 mmol/L (72-80 mg/dL)
- **HDL-Cholesterol** _____ Men: above 1.17 mmol/L (45 mg/dL) Women: above 1.42 mmol/L (55 mg/dL)
- **TC:HDL Ratio** _____ 3:1 or lower

- **Fasting Glucose** _____ (ideal is under 90 mg/dl or 5 mmol/L – conversion factor is .055)
- **Fasting Triglycerides** _____ (ideal is 132 mg/dl or 1.5mmol/L – conversion factor is 88.57)
- **C-Reactive Protein** _____ (less than 0.24 mg/dL or 2.4 mg/L) – conversion factor is 10

- **Fibrinogen** _____ (less than 300 mg/dL or 0.88 umol/L - conversion factor is 0.0294)
- **INR** _____ (0.8 – 1.3)
- **Body Mass Index or BMI** (wt/ht squared) – wt is kg and ht is in metes-squared)
Multiply weight in pounds by .45 to get weight in kg
Multiply height in inches by .025 to get height in meters (then multiply height in meters by itself to get height in meters squared)
(BMI of 27 or higher increases risk of high BP, Diabetes, Dyslipidemia and some cancers) BMI = _____
- **Waist Circumference:** _____ inches (under 36 for men and 33 for women)

- **Personal History** of Heart Disease, Stroke, Deep Vein Thrombosis, Chronic Renal Disease or any vascular problems or vascular procedures (angioplasty, by-pass surgery, coronary stent) Yes___ No___ Comment:

- **Exercise Program**

- **GFR** (eGFR < 60 mL/min is a concern) _____
- **Blood Creatinine** _____ Normal is 0.6 to 1.2 mg/dl 60-110 μ mol/L) in adult males and 0.5 to 1.1 mg/dl (45-90 μ mol/L) in adult females
- **Albumin:Creatinine Ratio** (An elevated albumin/creatinine ratio (men: > 2.0 mg/mmol, women: > 2.8 mg/mmol) is associated with an increased risk of heart disease and stroke _____.
- **Homocysteine** - _____ Ideal is 6.3 μ mol/L or lower (0.85 mg/L)

Metabolic syndrome: determined by having three or more of the following criteria:

- Abdominal obesity (waist circumference: men > 102 cm or 40 inches; women > 88 cm or 35 inches)
- Triglycerides ≥ 1.7 mmol/L
- HDL - men < 1.0 mmol/L; women < 1.3 mmol/L
- BP > 130/85 mm Hg
- Fasting glucose 5.7-6.9 mmol/L (103 -124 mg/dl) – conversion from mg/dl to mmol/L is .055.

Is There Evidence of Metabolic Syndrome?

Yes_____ No_____

- 10 Year Heart Disease Risk Score (based on LDL reference form)_____ % - completed in office
- 10 Year Heart Disease Risk Score (based on Total Cholesterol reference form)_____ % - completed in office

(See Accompanying Framingham Forms)

- Current CVD Medications (cholesterol, triglyceride, blood pressure, other):

Cancer

Do you currently have or have you ever had any of the following:

- Prostate cancer (men only)
 - Breast Cancer (women only)
 - Colon or rectal cancer
 - Any other cancer
-
- Leukoplakia (precancerous condition of the mouth)
-
- Are you interested in knowing about scientifically-based nutrition, lifestyle and supplementation practices that can lower your risk of cancer, in general?

Skin Conditions

Do you have any of the following skin problems:

- Dry skin
- Little bumpy lesions on the backs of your elbows, or along your forearms, shins or on your back
- Acne
- Psoriasis
- Eczema
- Rosacea
- Frequent exposure to direct sunlight and/or use a tanning bed more than once per month
- Toenail or fingernail fungus
- Dark circles under your eyes, have irregular facial pigmentation and/or have a dull or poor complexion
- Warts
- Seborrhea or Seborrheic Dermatitis
- Are you interested in knowing about ingestible and topical nutrients proven to slow and/or reverse wrinkles and skin aging (topical hyaluronic acid and Matrixyl with CoQ10)

Skin Conditions

Dry Skin

Supplement Considerations:

1. Essential Fatty Acid Supplement
2. High Potency Multivitamin and Mineral

Perifollicular Hyperkeratosis (dry bumps) – see next slides

1. Essential Fatty Acid Supplement
2. High Potency Multivitamin and Mineral

Essential Fatty Acid Deficiency Or Vitamin A Deficiency

71 Perifollicular hyperkeratosis (phrynoderma, toad skin). Spinous papules appear at the tips of the hair follicles against the background of a generally dry and rough skin. Areas first affected are the postero-lateral parts of the arm (as in this case) and the antero-lateral aspects of the thighs. There is steady spread to the extensor surfaces of the limbs, shoulders and lower part of abdomen. The chest, back and buttocks are usually only involved in very extensive cases. It is only seen in undernourished subjects and has most frequently been associated with vitamin A deficiency and general undernourishment. It is easily differentiated from the perifollicular haemorrhages of scurvy (137). Ichthyosis is familial and affects the entire skin. Keratosis pilaris is similar but occurs in well nourished adolescents. Acne vulgaris has a different distribution and features pustulation. Perifollicular hyperkeratosis is not seen before school age.

71



72 Perifollicular hyperkeratosis. The shin is a common site as in this Turkoman child.

72



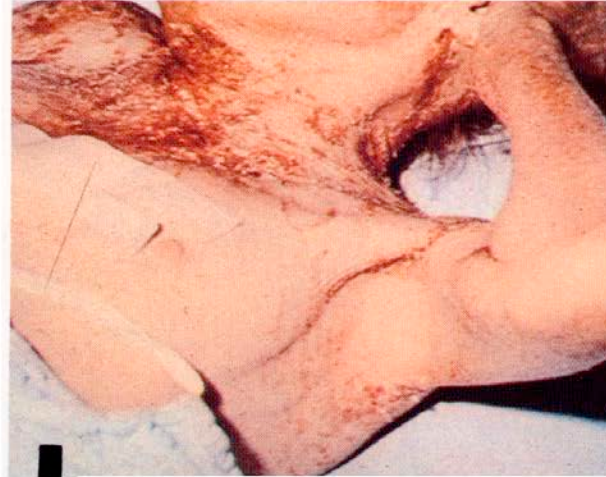
Essential fatty acids

165 Essential fatty acid deficiency. Linoleic, linolenic and arachidonic acids are essential dietary constituents and in this respect resemble vitamins. They are necessary for growth, membrane formation and integrity of the skin. They are precursors of the prostaglandins.

Clinical deficiency is rare as most normal dietaries supply the body's requirements. Patients receiving fat-free parenteral nutrition have developed biochemical abnormalities and skin lesions as shown here.

166 Essential fatty acid deficiency. Complete resolution in the same patient after 2 weeks of treatment with Intralipid.

165



166



Acne Vulgaris

- Acne vulgaris is the most common skin disease, affecting 80% of the population between ages 12 and 25.
- Acne is caused by excess oil in the skin (also known as sebum). This oil comes from sebum secretion by the sebaceous glands at the root of the hair follicles.
- This oily build up occludes the pores in the skin causing blockage and infection. The well-known practice of "popping" a pimple forces the occluding plug to pop out of the pore, thereby allowing drainage of the sebaceous glands at the root of the hair follicle and providing temporary relief. However, popping pimples can lead to permanent scarring, which also occurs when individuals pick at acne lesions.

- Acne tends to occur when the sebaceous glands in a person's skin make too much oil (sebum). The oil combines with cells that line the walls of these glands and clogs the person's skin pores.
- Clogged pores lead to pimples, whiteheads or blackheads on the face, neck, shoulders, back or chest. Sebaceous glands are the largest at birth and then reduce in size until adolescence. They once again enlarge during pre-puberty with changes in hormone levels influencing sebaceous gland secretion. This increase in production of sebum is the reason that acne is so prevalent in adolescents and teenagers.
- With excess sebum production, bumps called comedones appear on the skin due to blockage of follicles by sebum. Inside these comedones, there are bacteria and yeast that work on the sebum causing it to release free fatty acids, which cause inflammation and sometimes rupture of the comedones.
- The causes of acne are very complex and involve many different systems and chemicals within the body. Hormones, enzymes, and the immune system all interact together resulting in different reactions in each individual.

- In recent years researchers have identified how various dietary factors influence acne incidence and severity. Several studies have shown that acne can be improved to varying degrees through targeted dietary measures, sometimes in conjunction with the use of specific, targeted supplements.
- The degree to which dietary factors can influence acne might surprise you, based on recent insights into the mechanisms through which dietary factors affect signaling agents within sebaceous glands. Dietary factors that overstimulate these signaling mechanisms can increase the rate of cell division and/or prompt sebaceous gland cells to over-secrete acne-promoting sebum.

Acne (see review paper in course notes)

Dietary Factors

- Reduce intake of refined sugars –high insulin overstimulate sebaceous gland activity and IGF-1 levels, which up-regulates release of androgens and cortisol.
- Reduce intake of high fat animal products and foods with a high content of hydrogenated fats (e.g., margarine, commercial peanut butter, and shortenings).
- Reduce dairy products, which are high in Leucine, which stimulates the mTOR pathway (increasing sebum formation). High sugar plus dairy products are highly problematic – ice cream, whipped cream, milk plus high sugar breakfast cereal)
- Chocolate – not cocoa, but cocoa butter (dairy chocolate – milk and sugar)
- Avoid fried foods
- Avoid heavily salted foods
- Omega-3 fatty foods appear to be helpful
- Higher plant-based, low glycemic diet is desirable

Dr. B. Melnik

- “Epidemic acne of Westernized societies should be considered as a visible model disease of exaggerated mTORC1 signaling promoted by the Western diet. Dermatologists should not needlessly waste time with controversial discussions concerning isolated food components in the pathogenesis of acne but should realize the emerging whole network of exaggerated mTORC1 signaling mediated by Western diet.
- The most important task of preventive dermatology will be the reduction of mTORC1. All three major stimulatory pathways of mTORC1 activation have to be attenuated.
- Dietary intervention in acne should thus (1) decrease total energy, glucose and fat intake, (2) diminish insulin/IGF-1 signaling predominantly mediated by high dairy protein consumption, and (3) should limit the total leucine uptake predominantly provided by increased animal protein intake including meat and dairy proteins.

Source:

Melnik B. Dietary Intervention in Acne. Dermatoendocrinology. Jan1; 4(1): 20-32 (2012) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3408989/>

Supplements and Acne (see review paper in course notes)

- Various vitamins and minerals are important for the health of the skin and supplementation and some of these nutrients have been shown to be helpful in the complementary management of some acne cases.
- Vitamin A and Vitamin D – 50% of adults get only 50% of RDA for vitamin A. Vitamins A and D are the first group of nutrients that have been reported to exhibit properties as skin hormones. In that property, they control metabolism, activation, inactivation, and elimination of specialized skin cells
- Vitamin D – helps slow rate of cell division, including sebaceous gland cells
- Accutane – is based on vitamin A properties
- Vitamin E – shows decreased skin inflammatory effects
- Vitamin E and Selenium Study showed impressive results in small acne study
- Vitamin Cocktail - . A vitamin combination of niacinamide (nicotinamide) 750 mg, folic acid 500 mcg, zinc 25 mg and copper 1.5 mg (put in to prevent copper deficiency, which can be caused by zinc supplementation), was shown to improve acne. (But this is very high nicotinamide- requires liver enzyme monitoring)

Some Supplements Can Make Things Worse. In some cases, excess vitamin intake has also worsened acne. For instance, a few case reports show the formation of acne caused by “megadoses” of vitamins B6 and B12.

- These occurrences are consistent with previous reports of injectable vitamin B12 causing a monomorphic acneiform eruption.

References: Vitamins and Minerals

1. <https://www.the-dermatologist.com/article/6571>
2. Pappas A. The Relationship of Diet and Acne. Dematoendocrinology Sept-Oct;1(5):262-267 (2009)
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2836431/>
4. http://www.coenzyme-a.com/acne_vulgaris.html
Pantothenic Acid in the Treatment of Acne Vulgaris
"A Medical Hypothesis" by Lit-Hung Leung, M.D.

Other Supplement Considerations:

- Oil of Oregano (wild P73) – Topical cream and ingestible capsules – kills acne bacteria inside and out (must take with probiotic and maybe prebiotic)
- Gum Guggul - A controlled clinical trial found that Guggul supplements (also known as guggulsterone) outperformed standard tetracycline acne treatment. In the study, 500 mg of Gum Guggul (standardized to 2.5% guggulsterone content = 25 milligrams of guggulsterone) was taken twice daily for three months.
- The results showed a reduction of acne, but more importantly, 50 percent fewer participants had acne relapses, which outperformed the group given the antibiotic tetracycline. Researchers noted that patients with oily skin responded remarkably better to guggul than others in the study. A second study in 1990 noted similar benefits in acne patients. The researchers attributed the success of gum guggul treatment to its ability to reduce sebum formation and/or reduce the fatty metabolism of sebum fats by skin bacteria.

References: Gum Guggul

1. <https://www.ncbi.nlm.nih.gov/pubmed/7798429>
2. <http://www.ijdv.com/article.asp?issn=0378-6323;year=1990;volume=56;issue=5;spage=381;epage=383;aulast=Dogra>

Conventional Acne Treatment:

Treatment of acne differs somewhat depending on the severity. Mild acne, which is most common, may be treated with simple hygiene and over-the-counter (OTC) creams or topical treatments. Treatment for mild acne may include:

- Washing gently with soap and water: Scrubbing your acne or using a harsh soap doesn't help in the treatment of acne. In fact, it may make your acne worse.
- Using Over-the-Counter (OTC) treatments: Ingredients in these treatments include benzoyl-peroxide, sulfur, resorcinol, and others.
- Practicing relaxation techniques: If you're under a lot of stress, using relaxation techniques may help speed up the healing of your acne.

If these fail, topical creams such as retinoids may need to be prescribed.

- Treatment for moderate to severe acne is often treated with topical or oral prescription medications prescribed by your doctor. These include antibiotics, retinoids (derived from vitamin A), and others that your doctor may suggest.
- In cases of severe acne, a dermatologist may try some of the treatments listed previously. But if those don't help, they may prescribe a medication called isotretinoin (Sotret, Claravis).
- This medication helps reduce severe acne. However, it does have some side effects you'll want to ask your dermatologist about. It can cause birth defects, so women who're pregnant or thinking about pregnancy shouldn't take it. This drug is a vitamin A-like derivative (**13-*cis*-retinoic acid**), which can cause vitamin A toxicity-related side effects.

Stress and Acne

- For a long time, doctors have suspected that stress worsens acne, but evidence for this was mostly anecdotal. In 2003, a Stanford University study published in the *Archives of Dermatology* found that college students had acne flare-ups during exams, a period in which they reported more stress, compared to periods without testing.
- Acne severity correlated highly with increasing stress, the researchers concluded. Stress does not appear to cause acne in those not prone to acne, but it appears to exacerbate acne in those who are prone to acne outbreaks. The speculation is that stress hormones (i.e. cortisol) aggravate acne in some yet undetermined way. As such, practicing stress reductions (yoga, progressive relaxation, deep breathing exercises, meditation) may be helpful to minimize acne flare-ups and frequency of break outs.

Psoriasis

Dietary Considerations:

1. Reduce the build up of arachidonic acid within skin cells by reducing intake of the following foods:

- A) High fat meat and dairy products
- B) Corn oil, sunflower seed oil, safflower seed oil and mixed vegetable oils.
- C) Alcohol, hydrogenated fats (e.g., margarine, commercial peanut butter, shortenings)

2. Replace the above foods with the following:

- Chicken, turkey, fish, Cornish hen
- 1% milk or yogurt, no cheese above 3% milk fat.
- Olive oil, canola oil, or peanut oil (for salad dressings, to sauté vegetables or stir fry, only)

Psoriasis - Supplement Considerations – attempting decrease immune-inflammatory reactions:

Primary Support

1. Herbal Detoxifiers and Immune Support (Milk Thistle, Indole-3-Carbinol, Medicinal Mushrooms, Astragalus)
2. Digestive Enzymes and Prebiotics
3. Oil Of Oregano Capsules and Topical Cream – to kill streptococcus bacteria

Secondary Support

1. High Potency Multiple Vitamin and Mineral
2. Essential Fatty Acid Supplement

Thymus Extract – For Autoimmune Diseases

Product: **Thym-Uvocal – subcutaneous or intramuscular injection delivery system**

Thymus Ampoules

Composition:

Active ingredient: Low-molecular thymus peptides (Australian bovine origin) 1x 2ml ampoule contains:

Medically active ingredient: 22 mg low-molecular thymus peptides. Other ingredients: Sodium chloride, phenol, water for injection purposes

Website:

http://www.eternitymedicine.com/english/04_eternity_medicine_products/Thymus/thymus_ingredients.htm

Eczema

- There are three main objectives in the treatment of eczema. These include, reduce inflammation, relieve itching of the skin, and moisturize dry patches. Attention to diet and supplementation can help accomplish all three main objectives.

Dietary and Lifestyle Considerations

- Avoid any known dietary or environmental irritants or allergins.
- Reduce the build up of arachidonic acid within skin cells, as arachidonic acid, a polyunsaturated fat, is the direct building block of inflammatory prostaglandin hormones. To accomplish this, reduce the intake of the following foods:
 - High fat meat and dairy products
 - Corn oil, sunflower seed oil, safflower seed oil, and mixed vegetable oils.
 - Alcohol, hydrogenated fats (e.g., margarine, commercial peanut butter, shortenings)
- Replace the above foods with the following:
 - Chicken, turkey, fish, Cornish hen
 - 1% milk or yogurt, no cheese above 3% milk fat
 - Olive oil, canola oil, or peanut oil (for salad dressings, to sauté vegetables or stir fry, only)

Supplement Considerations:

- Primary Support:

1. Essential Fatty Acid Supplement
2. High Potency Multiple Vitamin and Mineral,
3. Hyaluronic acid serum applied to lesions, twice daily

- Studies indicate that many cases of eczema are caused by a **genetic defect**, whereby individuals with eczema are missing (or have sub-optimal function) an enzyme that synthesizes an essential fatty acid known as GLA (gamma-linolenic acid). **GLA** is required for normal skin cell development. Supplementation with a combination of borage seed, flaxseed and fish oil can correct this deficiency by providing the body with GLA and other essential fatty acids, enabling skin cells to form normally, reducing skin inflammation and reversing eczema.
- Skin cells require sufficient concentrations of specific vitamins and minerals as cofactors to convert essential fatty acids (like GLA) into the hormones within the skin that reverse reduce eczema lesions and improve skin softness and smoothness. For this reason consider an essential fatty acid supplement (containing borage, flaxseed and fish oil) in conjunction with a high potency multivitamin and mineral.
- **Hyaluronic acid** is chemical that is normally synthesized by skin cells and plays an important role in maintaining skin integrity and hydration. Studies reveal that the topical application of concentrated hyaluronic acid serum (50% concentration) can speed the healing of eczema lesions in many cases, and should used in conjunction with supplementation of essential fatty acids and a high potency multivitamin and mineral in eczema cases

Secondary Support:

1. Herbal Detoxifiers and Immune Support
2. Digestive Enzymes and Prebiotics

To reduce risk of immune inflammatory reactions that may aggravate the conditions

Rosacea

Aggravated by consumption of hot drinks, alcohol and spicy foods.

Other irritants are too much sun, extreme temperatures (either air or water), excessive physical activity and stress.

Can be aggravated in women by an imbalance of estrogen and progesterone.

Rosacea - Supplement Considerations

Primary Support

- 1. Oil of Oregano capsules and cream** – the active ingredients in the P-73 wild oregano blend has been shown to kill the skin mite and bacteria that are associated with rosacea.

It is best to use both the ingestible capsules and the topical cream to fight the mite and bacteria from the inside and the outside of the body.

Oil of oregano can be taken in conjunction with other rosacea treatments and medications in cases where concurrent therapy is being applied.

Secondary Support

- 2. Herbal Detoxifiers and Immune Support** (milk thistle, indole-3-carbinol, reishi mushroom extract, astragalus, digestive enzymes and prebiotics)

To decrease immune inflammatory reactions that may aggravate condition

Frequent Exposure to UV-light

- **Supplement Considerations:** studies reveal that skin cells extract various antioxidant vitamins and minerals from the bloodstream, which serve to intercept free radicals in the skin, helping to contain the extent of free radical damage that occurs from ultra-violet light exposure. These studies reveal that optimal skin protection against ultra-violet light requires an intake level beyond that provided by a healthy diet, which can only be provided through the use of supplementation
- **References:** Eberlein-Konig, B et al. *Protective effect against sunburn of combined systemic ascorbic acid (vitamin C) and d-alpha-tocopherol (vitamin E).* J Am Acad Dermatol 1998; 38(1): 45-8; Podda, M et al. *UV irradiation depletes antioxidants and causes oxidative damage in a model of human skin.* Free Radic Biol Med, 1998; 24 (1): 55-65; Emonet-Piccardi, N et al. *Protective effects of antioxidants against UVA-induced DNA damage in human skin fibroblasts in culture.* Free Radic Res 1998; 29 (4): 307-13; Firkle, T et al. *Antioxidants and protection of the skin against the effect of ultraviolet rays.* Cas Lek Cesk 2000; 139 (12): 358-60.

1. **High Potency Multivitamin and Mineral** – studies reveal that antioxidant supplementation of vitamin C, vitamin E, beta-carotene, selenium and zinc are essential in the fight against free radical damage to skin cells. High doses of niacin (B3) have also been shown to help skin cells repair damage (via DNA repair enzyme activity) caused by ultraviolet light in experimental studies (Gensler, HL et al. *Oral niacin prevents photocarcinogenesis and photoimmunosuppression in mice*. Nutr Cancer 1999; 34 (1): 36-41). As such, a high potency multivitamin and mineral is an important supplement consideration in these cases.

2. **Additional Vitamin C** – 1,000 mg (for a total daily supplement intake of 2,000 mg) – according to the research of B Eberlein-Konig et al, noted above, individuals who were administered 2,000 mg of vitamin C per day from a supplement showed a remarkable ability to reduce skin damage from ultraviolet light compared to individuals who were not given the antioxidant supplement. This may be a level of intake one should consider on days where exposure to ultra-violet light is likely to be more excessive.

3. **Additional Vitamin E** – 600 IU Succinate (for a total daily supplement intake of 1,000 IU) - according to the research of B Eberlein-Konig et al, noted above, individuals who were administered 1,000 IU of vitamin E per day from a supplement showed a remarkable ability to reduce skin damage from ultraviolet light compared to individuals who were not given the antioxidant supplement. This may be a level of intake one should consider on days where exposure to ultra-violet light is likely to be more excessive.

Nail Fungus

Supplement Considerations:

- 1. Oil of Oregano** - The P73 research tested blend of oil of oregano has been shown to kill certain types of fungus that cause nail fungal infections. Ingesting oil of oregano capsules, in addition to applying oregano oil to the nail bed, topically, twice per day, is required to kill the fungus from the inside out and on the nail bed surface. The ingestible capsules should contain a minimum of 250 mg of P73 wild oregano blend per capsule. One should consider taking 2 capsules, twice per day.
- 2. Herbal Detoxifiers and Immune Support** – optimizing immune function can help the body fight off a variety of infections. As such, supplementation with reishi mushroom extract and astragalus should be considered in these cases, in addition to nutrients that support detoxification of foreign substances from the blood stream. Two important agents that boost detoxification enzymes include milk thistle and indole-3-carbinol. The typical daily dosage to consider would be: reishi mushroom extract (standardized to 10% polysaccharide and 4% triterpene content) - 60-120 mg; astragalus (2:1 grade) – 200-400 mg; milk thistle (80% silymarin content) – 600 mg; indole-3-carbinol – 50-100 mg.

Dark circles under eyes, irregular facial pigmentation and/or a dull or poor complexion

Can be genetic from hypermelanin secretion, in which case a tyrosinase inhibiting cream can inhibit conversion of tyrosine to melanin. <https://www.tandfonline.com/doi/full/10.1080/14756366.2016.1256882>

Some cases of poor complexion are caused or aggravated by a build-up of impurities in the bloodstream that trigger immune inflammatory reactions that adversely affect the skin.

Supplement Considerations:

- 1. Herbal Detoxifiers and Immune Support** - as a means to reduce immune inflammatory reactions it is prudent to supplement the diet with nutrients that boost the liver's detoxification capacity, and help regulate immune function. Such nutrients include a combination of milk thistle, indole-3-carbinol, reishi mushroom extract and astragalus.
- 2. Digestive Enzymes and Prebiotics** - it is also prudent to prevent the absorption of partially digested food matter and bacterial toxins from entering the bloodstream from the intestinal tract (problems that are associated with a variety of skin complexion problems and other inflammatory conditions) by supplementing with a high potency, full spectrum blend of digestive enzymes and prebiotics. This will help to improve digestion and foster the growth of the friendly gut bacteria, which in turn, improves detoxification, elimination, immune function, and has been shown to reduce inflammatory reactions throughout the body, including the reversal of various complexion problems.

3. High Potency Multiple Vitamin and Mineral - To develop normally, skin cells require adequate concentrations of vitamins and minerals, which help to improve skin appearance. For this reason it is prudent for individuals with complexion problems to also supplement their diet with a high potency multiple vitamin.

4. Essential Fatty Acid Supplement (containing borage seed, flaxseed and fish oil) - essential fatty acids derived from these medicinal oils provide the raw material from which skin cells manufacture important prostaglandin hormones (PG-1 and 3) that enhance the smoothness and softness of the skin.

Warts

Supplement Considerations:

- 1. Oil of Oregano Capsules and Oregano Topical Oil** - the P73 research tested blend of oil of oregano has been shown to kill various viruses that cause warts on the skin. Ingesting oil of oregano capsules, in addition to applying oregano oil on the warts topically, twice per day, is required to kill the virus from the inside out and on the skin surface.
- The ingestible capsules should contain a minimum of 250 mg of P73 wild oregano blend per capsule. One should consider taking 2 capsules per day.

Systemic And Metabolic Health Conditions

Do you have any of the following health conditions:

- Non-insulin dependent diabetic or have been diagnosed as a pre-diabetic
- Insulin-dependent diabetic
- Underactive thyroid (low thyroid function) and/or have desire to boost thyroid function through nutritional supplementation
- Osteoporosis or osteopenia
- Osteoarthritis or degenerative joint disease
- Rheumatoid arthritis, ankylosing spondylitis, lupus, Reiter's syndrome or any other rheumatic condition causing joint inflammation *
- Multiple sclerosis
- Parkinson's disease

- Gout
- Hepatitis-C, liver cirrhosis or history of liver infection
- Hay fever – probiotics, twice daily recently shown to decrease hay fever- 2017 study <https://www.ncbi.nlm.nih.gov/labs/articles/28228426/> (also Quercetin – 500-1,000 mg, twice daily)
- Chronic bronchitis, sinusitis, or bronchial asthma
- Frequent canker sores, cold sores, chronic shingles or other herpes infections
- Cataracts
- Macular degeneration of the eye
- Chronic fatigue syndrome, Epstein-Barr or chronic mononucleosis
- Fibromyalgia
- Varicose veins
- Frequent constipation
- Scleroderma
- Sarcoidosis
- Tendonitis, bursitis or muscle inflammation pain
- Raynaud's Disease
- Restless Leg Syndrome
- Tardive Dyskinesia
- Candida Albicans Infection
- HIV infection –details in Nutrition and Pathologies course

Chronic bronchitis, sinusitis, or bronchial asthma

Supplement Considerations:

- 1. Oil of Oregano** – The research tested P73 blend of oregano has been shown to kill a number of bacteria, viruses and fungi that can participate in the development and/or aggravation of chronic bronchitis and sinusitis. Anecdotal reports suggest that this form of oil of oregano can provide relief to individuals with these conditions and may help to minimize bronchial asthma attacks as well. A typical therapeutic dosage is 500 mg, twice per day until symptoms are markedly reduced, followed by a maintenance dosage of 250 mg or 500 mg per day.
- 2. High Potency Multiple Vitamin and Mineral** – numerous vitamins and minerals are required to support the health of the respiratory tract as well as the immune cells that protect these tissues. Studies indicate that supplementation with Vitamin A, Vitamin C, zinc and many B-vitamins can improve various aspects of respiratory tract function in individuals with the above-noted conditions. For example, Vitamin C has been shown to help reduce levels of histamine that cause inflammation of the respiratory tract and has been shown to help better regulate immune cell function.
- 3. Essential Fatty Acids** – (Borage Seed, Flaxseed and Fish Oil) - the combination of these sources of essential oils provides the body with the raw materials to make the anti-inflammatory hormones (prostaglandin series-1 and series-3), which are known to reduce inflammatory responses throughout the body, including the respiratory tract.

4. Coleus forskohlii - Coleus is extensively researched in India over the last twenty years. There have been studies to support its anti-asthmatic, and anti-spasmodic (muscle-relaxing) effects. A typical dosage is 250 mg (1% standardized extract), 2 times a day or 50mg (18% standardized extract), 2 times a day

5. Grapeseed Extract – Grapeseed extract contains flavonoids known as proanthocyanidins (PCOs), which have been reported to inhibit the release of inflammatory chemicals, such as histamine and prostaglandins. PCOs have been used in allergies and asthma because of their reported ability to slow histamine release from "mast cells. A typical dosage is 50 mg (standardized to 80-95% proanthocyanidin content), 2 times a day.

Chronic fatigue syndrome, Epstein-Barr or chronic mononucleosis

Supplement Considerations:

- 1. High Potency Multiple Vitamin and Mineral** – studies reveal that various B-vitamin marginally deficiencies may be present in these individuals and that supplementation with B- vitamins has been shown to be helpful in a few small clinical trials. The levels of vitamin C, vitamin E, selenium, zinc, beta-carotene, and vitamin A, found in a high potency multiple vitamin and mineral supplement, has also been shown to strengthen immune system function. These individuals have also been shown to have magnesium deficiency, according to some reports, which can also be corrected with this form of supplement
- 2. Oil of Oregano** – the P73 wild oregano blend has been shown to kill a host of viruses that adversely affect human health. As many experts believe that these problems are caused or aggravated by a low-grade, chronic viral infection, the use of Oil of Oregano Capsules (250 mg, twice per day), should be considered by individuals suffering from these afflictions.
- 3. Coenzyme Q10 and Hawthorn** - these nutrients work together to increase the production of energy at the cellular level. Coenzyme Q10 supplementation at 60-90 mg per day in conjunction with Hawthorn supplementation of 75-112.5 mg per day (standardized to 3-5% plant extracts or flavonoid content) should be considered by these individuals to help boost energy production.

4. Creatine Monohydrate – creatine supplementation has been shown to increase muscle power and endurance. Individuals with these problems should consider taking 5 grams of creatine monohydrate, twice daily. Creatine acts as a high-octane source of fuel for muscle tissue, enabling it to more efficiently generate energy required to perform exercise and other activities.

5. Herbal Detoxifiers and Immune Support – a natural way to further strengthen the immune system is to supplement with a combination of reishi mushroom extract and astragalus. Both of these natural agents demonstrate proven viral-killing properties and boost the overall function of the immune system.

- 6. NADH (nicotinamide adenine dinucleotide)** – NADH is the form of niacin (vitamin B3) used by the body as an essential agent for energy production. In a double-blind, cross-over trial, people with chronic fatigue syndrome received 10 mg of NADH or a placebo each day for four weeks. Of those receiving NADH, 31% reported improvements in fatigue, decreases in other symptoms, and improved overall quality of life, compared with only 8% of those in the placebo group
- 7. Vitamin B12 Injections** - In one preliminary trial, 2,500 to 5,000 mcg of vitamin B12 given by injection every two to three days led to improvement in 50 to 80% of a group of people with CFS; most improvement appeared after several weeks of B12 shots.

Fibromyalgia

Supplement Considerations:

1. **High Potency Multiple Vitamin and Mineral** – vitamins and minerals should be considered as a means to enhance overall nutritional status. As well, the antioxidant enriched formula provides anti-inflammatory effects and the B-50 complex may boost energy production in these cases.
2. **Essential Fatty Acids** (combination of Borage seed, Flaxseed and Fish oil) - the combination of these essential oils provides the body with the raw materials to make the anti-inflammatory hormones (prostaglandin series-1 and series-3), which are known to reduce joint and soft tissue inflammation.
3. **Anti-inflammatory Herbs** – anti-inflammatory herbs such as curcumin, boswellia, white willow extract and ginger work synergistically to block the production of inflammation-causing chemicals (e.g. prostaglandin series 2), and have been used in clinical trials to reduce the pain and swelling associated with various forms of arthritis and fibrositis problems.

4. **5-Hydroxytryptophan (5-HTP)** – people with fibromyalgia often have low serotonin levels in their blood. Supplementation with 5-HTP can increase serotonin synthesis by providing the brain with more of the raw material to make serotonin. Both preliminary and double-blind trials have reported that 5-HTP supplementation (100 mg three times per day), over a 30 day course of treatment, relieves some symptoms of fibromyalgia (note that 5HTP can not be used concurrently with anti-depressant medications).
5. **S-adenosylmethionine (S-AMe)** – S-AMe is a natural compound with anti-inflammatory, pain-relieving and antidepressant effects. A six-week double-blind trial with 44 patients receiving 800 mg/day reported the improvements in clinical disease activity, pain, fatigue, morning stiffness, and mood in the actively treated group compared to placebo. In an earlier double-blind crossover trial with 17 patients, S-AMe reportedly reduced levels of depression and a decrease in the amount of pain and number of trigger points.
6. **Melatonin** - one study reported that patients with fibromyalgia syndrome had nighttime melatonin levels that were 31 percent lower than placebo controls. This may contribute to impaired sleep at night, fatigue during the day, and altered pain perception. In a therapeutic trial, 3 mg of melatonin given daily at bedtime resulted in significant improvement in sleep, number of trigger points, and severity of pain at selected points. (note that melatonin can not be used concurrently with anti-depressant medications)

- 7. Digestive Enzymes and Prebioitcs** – this combination of nutrients is often beneficial for patients whose condition also involves intestinal problems. Since a significant number of patients with fibromyalgia fall into this category, supplementation with a full range digestive enzyme with prebiotics may provide relief from bloating, irritable bowel syndrome and other GI symptoms
- 8. Combination of Magnesium Hydroxide (300-600mg/day) and Malic Acid (1,200-1,400 mg/day)** - There are preliminary reports, which indicate that pain levels are reduced and that the symptoms of fatigue may improve within two weeks of supplementation with magnesium and malic acid. The combination of magnesium and malic acid is thought to increase energy production and reduce lactic acid, a source of the muscular tenderness and pain.

Varicose veins

Supplement Considerations:

- 1. Horse chestnut** - a number of studies have been done to test the efficacy of horse chestnut in the treatment of chronic venous insufficiencies. Horse chestnut has shown an ability to support collagen structures that help to seal blood vessels in such a way as to allow red blood cells to penetrate into the microcapillary system, while not allowing fluids to pass out of the capillary wall, thus preventing swelling. The usual dosage is 200 mg, 2-3 times per day (standardized to 40% escin content). Other references cite a daily dosage of 300 mg, 2-3 times per day (standardized to 50 mg: 16%-21% triterpene glycosides calculated as anhydrous escin per dose).
- 2. High Potency Multivitamin and Mineral** – various vitamins and minerals are required for the production of collagen which helps to seal blood vessels (preventing distension and leaking). Supplementation with 1000 mg of vitamin C, as well as 50 mg of Bioflavonoids, and various minerals (e.g. copper) can optimize collagen synthesis in the body.

- 3. Grape Seed Extract** – Grape seed extract contains proanthocyanidins (PCOs), an important active constituent, with free radical scavenging activity. Proanthocyanidins are claimed to support collagen structures and inhibit the destruction of collagen. A typical therapeutic dosage is 50 mg (standardized to 80-95% proanthocyanidin content), 2-3 times a day.

- 4. Gotu kola** – this herb is reported to have a positive effect on connective tissue. In the treatment of varicose veins and related problems Gotu Kola has been shown to increase the cement substance (ground substance or glycosaminoglycans) between cells and collagen fibers, forming a more effective seal in cases of chronic venous insufficiency and possibly other blood vessel leakage conditions. Standardized extracts of Gotu Kola contain up to 100% total triterpenoid content. In the management of venous insufficiency and varicose veins, the usual oral dosage is 60 mg, twice per day.

Scleroderma

Scleroderma is a disease of unknown cause that affects the connective tissues of the skin and various organs.

Common symptoms include thickening and tightening of the skin (beginning with the extremities), Raynaud's phenomenon (a condition characterized by an exaggerated reaction in the fingertips to cold exposure), joint pain (especially in the fingers and knees), esophageal reflux (heartburn), calcium deposits under the skin, and telangiectasias (mats of enlarged small blood vessels).

Scleroderma can lead to serious complications, such as fibrosis of the lungs, heart, and kidneys; for this reason, medical supervision is essential. There is no cure as yet for scleroderma, although drugs may be used to alleviate the various individual symptoms of the disease.

Supplement Considerations:

1. Gotu Kola - the herb gotu kola has a long history of use for various skin conditions; for this reason, it has been tried as a treatment for scleroderma. However, as yet there is no meaningful evidence that it is effective for this condition. Standardized extracts of Gotu Kola contain up to 100% total triterpenoid content. In the management of scleroderma one may consider an oral dosage of 60 mg, twice per day

2. High Potency Multi-Vitamin and Mineral – it has been suggested that antioxidants, at supplemented levels (vitamin C, vitamin E, selenium etc.) may help to slow the progression of this condition by decreasing free radical damage to tissues, as free radical production may be a component of the disease process. However, no clinical trials have been performed to demonstrate this effect.

Sarcoidosis

- Sarcoidosis is an inflammatory disease characterized by granulomas (small rounded outgrowths made up of blood vessels, cells and connective tissues) that can produce many different symptoms. It is generally a chronic disease, lasting for several years or a lifetime. Some people, however, may have a type that only lasts a few months. These tiny granulomas can grow and clump together, making many large and small groups of lumps. If many granulomas form in an organ, they can affect how the organ works. This can cause symptoms of sarcoidosis.
- Sarcoidosis can occur in almost any part of your body, although it usually affects some organs more than others. It usually starts in one of two places: lungs and lymph nodes, especially the lymph nodes in your chest cavity. Sarcoidosis also often affects the skin, eyes, and the liver. Less often, sarcoidosis affects the spleen, brain, nerves, heart, tear glands, salivary glands, bones and joints. Rarely, sarcoidosis affects other organs, including the thyroid gland, breasts, kidneys, and reproductive organs. Sarcoidosis almost always occurs in more than one organ at a time. As such, sarcoidosis can present with a wide range of signs and symptoms depending upon which organs and tissues are affected by the disease.

- Sarcoidosis is most common in young adults between the ages of 20 and 40. It affects more women than men, and occurs more often in African-Americans.
- There is no known nutritional management for sarcoidosis, however, certain nutritional supplements may be considered.

Supplement Considerations:

To help suppress the growth of granulomatous tissue in the lungs and other organs it may be beneficial to provide the body with specific nutrients that have been shown to reduce inflammatory reactions and free radical activity.

1. High Potency Multi-Vitamin and Mineral – the levels of antioxidants, B-vitamins and certain minerals in a high potency multiple vitamin and mineral supplement can help suppress the formation of inflammatory chemicals (prostaglandin-series 2 hormones). Note that individuals with sarcoidosis should avoid over ingestion of vitamin D. Check with your physician to see if the 400 IU of vitamin D found in most multiple vitamin and mineral supplements is permitted in your case.

2. Anti-Inflammatory Herbs - In these cases the use of a combination product containing Curcumin, Ginger, White Willow Bark Extract and Boswellia may be helpful, as these natural herbal agents directly block the production of the inflammatory hormone known as prostaglandin series-2.

3. Essential Fatty Acids (Borage Seed, Flaxseed, and Fish Oil) – the combination of these essential oils provides the body with the raw materials to make the anti-inflammatory hormones (prostaglandin series-1 and series-3), which are known to reduce the inflammatory process.

4. Additional Vitamin E – 400 IU per day (plus 400 IU from a high potency multi-vitamin and mineral yielding a total of 800 IU per day) to further suppress inflammation.

5. Additional Vitamin C – 2,000-3,000 mg (plus 1,000 mg from a high potency multi-vitamin and mineral yielding a total of 3,000-4,000 mg per day) to further suppress inflammation.

Raynaud's Disease

Supplement Considerations:

- 1. Ginkgo Biloba** – this herb has been reported to improve the circulation in small blood vessels. One preliminary trial found that 160 mg of standardized ginkgo extract per day reduced pain in people with Raynaud's disease. Ginkgo should be used as a standardized extract (containing 24% ginkgo flavone glycosides and 6% terpene lactones). Doctors who recommend use of ginkgo often suggest that people take 120–160 mg per day for this application.
- 2. Hawthorn** - is used as a vasodilator and circulatory stimulant. It has been used extensively by doctors in Europe to help manage various cardiovascular and circulatory conditions. It is also used for peripheral vascular diseases, such as Raynaud's disease. Hawthorn is often recommended at a daily dosage of 250 mg (standardized to 5% plant extract of 2% vitexin content), 3 times a day.
- 3. Essential Fatty Acids** (combination of Borage seed, Flaxseed and Fish oil) - the combination of these essential oils provides the body with the raw materials to make the prostaglandin hormones (especially PG-3), which dilates blood vessels and improves circulation.
- 4. High Potency Multi-Vitamin and Mineral** – a number of vitamins, antioxidants and minerals help to support normal circulation and blood vessel function throughout the body.

Restless Leg Syndrome (RLS)

RLS (Willis-Ekbom Disease) affects 7-10% of adults (US)

Presents as unpleasant or uncomfortable sensations in the legs and an irresistible urge to move them.

Symptoms commonly occur in the late afternoon or evening hours, and are often most severe at night when a person is resting, such as sitting or lying in bed.

This makes it difficult to fall asleep, thus leading to daytime fatigue, lack of productivity, and compromised quality of life.

The chronic sleep deprivation can lead to problems with depression and anxiety

Making it more dangerous than the benign condition that is, is the fact that medical treatment for RLS usually involves treatment with drugs that have strong addiction potential and/or documented withdrawal symptoms. These drugs include:

- A. Benzodiazepines (i.e. Valium)
- B. Anti-seizure medication Gabapentin
- C. Opioids (i.e. Oxycodone)

Reference: National Institute of Neurological Disorders and Stroke <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Restless-Legs-Syndrome-Fact-Sheet>

There are reports of patients become addicted to opioids after their introduction to the patient for the treatment of RLS. <https://www.consumerreports.org/cro/2012/04/relief-for-restless-legs-syndrome/index.htm>

As such, using natural, non-addictive, side-effect free, interventions to manage this condition should be the first line of treatment in my view. The following slides outline the research on this subject.

Restless Leg Syndrome and Nutritional Medicine

Supplement Considerations:

1. Iron supplementation - mild iron deficiency is common, even in people who are not anemic. When iron deficiency (an iron level below 20 ng/ml) is the cause of RLS, supplementation with 74 mg of iron taken three times a day for two months, has been shown to reduce symptoms in people with RLS. In patients with normal iron levels this dosage of iron supplementation can produce iron overload or iron toxicity and therefore, this intervention should only be used where iron deficiency can be established and monitored using proper blood testing procedures. (Wang j, O'Reilly, Venkataramen R et al. Efficacy of oral iron in patients with restless leg syndrome and low-normal ferritin: A randomized, double-blind, placebo-controlled study. Sleep Med. Vol 9:973-5. 2009. <https://www.ncbi.nlm.nih.gov/pubmed/19230757>)
2. Folic acid - people with a genetically-inherited form of RLS have an unusually high requirement for folic acid, a B-vitamin. Although not all people with RLS suffer from uncomfortable sensations, folate-deficient people with this condition always do. In one report, 45 people were identified to be from families with folic acid-responsive RLS. The amount of folic acid required to relieve their symptoms was extremely large, ranging from 5,000 to 30,000 mcg per day. Note that dosages this high should only be taken under the supervision of a healthcare professional. These patients should also be assessed for MTHFR polymorphism (Homocysteine, RBC Folate and Serum Vitamin B12 are helpful indicators).
3. Vitamin D – a 2015 study showed that raising blood vitamin D levels to above 50nmol/L markedly improved RLS symptoms in RLS patients with blood values below this level at baseline. (Wali S, Shukr A, Boudal A, et al. The effect of vitamin D supplements on the severity of restless leg syndrome. Sleep Breath. Vol 2:579-83. 2015 <https://www.ncbi.nlm.nih.gov/pubmed/25148866>)

4. Vitamin E – small studies suggest that supplementation with 300-400 IU per day of vitamin E may help to reduce symptoms of RLS.

5. Probiotics – studies show that Small Intestine Bacterial Overgrowth also known as SIBO, and implies dysbiosis, is a common finding in RLS (up to 69% of cases) and improvement of dysbiosis has helped to improve RLS symptoms in clinical studies using probiotics and possibly a low FODMap Diet (short period of low FODMap, followed by use of prebiotics to help gut friendly bacteria flourish).

References: IBS, Bacterial Overgrowth and Restless Leg Syndrome and Use of Probiotics:

<https://www.ncbi.nlm.nih.gov/pubmed/21570907>

<https://www.ncbi.nlm.nih.gov/pubmed/21381407>

<https://www.ncbi.nlm.nih.gov/pubmed/25244414>

Other Factors Aggravating RLS:

- Alcohol
- Caffeine
- Nicotine (smoking)

National Institute of Neurological Disorders and Stroke <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Restless-Legs-Syndrome-Fact-Sheet>

RLS is also associated with other health conditions and other factors which include:

- End-stage renal disease and hemodialysis
- Neuropathy (nerve damage).
- Use of certain medications such as anti-nausea drugs (e.g. prochlorperazine or metoclopramide), anti-psychotic drugs (e.g., haloperidol or phenothiazine derivatives), antidepressants that increase serotonin (**e.g., fluoxetine or sertraline**), and some cold and allergy medications that contain older anti-histamines (e.g., diphenhydramine)
- Pregnancy, especially in the last trimester; but in most cases symptoms usually disappear within 4 weeks after delivery

Tardive Dyskinesia

Tardive Dyskinesia (TD) is a condition involving abnormal, repetitive, uncontrollable movements that develop after long-term use of antipsychotic medications used to treat schizophrenia and related psychiatric disorders. Symptoms of TD include repetitive and involuntary movements (tics), most often of the facial muscles and tongue (such as lip smacking), although any muscle in the body can be affected (e.g., moving legs back and forth). Symptoms may be mild or severe and can interfere with eating and walking.

Supplement Considerations:

1. **Vitamin E** - has been found in a number of studies to reduce the severity of TD. Double-blind studies suggest that 800 IU, twice daily (total of 1600 IU of Vitamin E per day) is the optimum dosage.
2. **Lecithin (phosphatidylcholine)** – although there is less convincing evidence than exists for Vitamin E supplementation, several studies have shown that daily supplementation with 25 grams of lecithin may reduce the severity of symptoms in TD.
3. **Manganese** – Some researchers have found that administering the trace mineral manganese (15 mg per day) can prevent the development of TD and that higher amounts (up to 60 mg per day) can reverse TD symptoms.

4. Branched- chain amino acids - preliminary research has linked TD to the inability of the body to metabolize the amino acid phenylalanine. Supplementing with branched-chain amino acids (BCAA), including valine, isoleucine, and leucine, could reduce excess phenylalanine in people with this disorder. In one trial, researchers examined the effects of BCAA supplementation in people with TD (from 150 mg of BCAA per 2.2 pounds body weight, up to 209 mg of BCAA per 2.2 pounds body weight) after breakfast and one hour before lunch and dinner for two weeks.

The BCAA mixture included equal parts valine and isoleucine plus 33% more leucine than either of the other two amino acids. Of nine people treated, six experienced at least a 58% reduction in symptoms, and all nine had a least a 38% decrease in symptoms.

- 5. Mega-Vitamin Therapy** - during a ten-year period, doctors at the North Nassau Mental Health Center in New York treated approximately 11,000 people with schizophrenia with a megavitamin regimen that included vitamin C (up to 4 grams per day), vitamin B3—either as niacin or niacinamide—(up to 4 grams per day), vitamin B6 (up to 800 mg per day), and vitamin E (up to 1,200 IU per day). During that time, not a single new case of TD was seen, even though many of the people were taking neuroleptic drugs. Note however, that the dosages of niacin and vitamin B6 used in this study carry the risk of significant side effects, and thus, this approach requires intensive physician monitoring.
- 6. Melatonin** – a single double-blind trial, showed that supplementation with 10 mg of melatonin each night for six weeks reduced abnormal movements by 23.8% in patients with TD, compared with 8.4% in the placebo group. Note that this is a very high dosage of melatonin, which requires physician monitoring. As a rule, any dosage of more than 3 mg of melatonin per day is considered a high dosage.

Candida albicans

Supplement Considerations

- 1. Oil of Oregano** - The P73 research tested oil of oregano blend was proven to kill Candida albicans infection in trials conducted at Georgetown University. A typical dosage would be 2 capsules, two or three times per day. (based upon each capsule containing 250 mg of the P73 oregano blend).
- 2. High Potency Multiple Vitamin and Mineral** - It is advisable to also take a high potency multiple vitamin and mineral supplement daily to build up immune strength, enabling your body to suppress candida albicans activity.
- 3. Herbal Detoxifiers and Immune Support** – optimizing immune function can help the body fight off a variety of infections. As such, supplementation with reishi mushroom extract and astragalus should be considered in these cases, in addition to nutrients that support detoxification of foreign substances from the blood stream. Two important agents that boost detoxification enzymes include milk thistle and indole-3-carbinol. The typical daily dosage to consider would be: reishi mushroom extract (standardized to 10% polysaccharide and 4% triterpene content) - 60-120 mg; astragalus (2:1 grade) – 200-400 mg; milk thistle (80% silymarin content) – 600 mg; indole-3-carbinol – 50-100 mg.

Men Only Section

Do any of the following conditions or circumstances apply to you:

- Suffer from prostate gland enlargement (decreased urine stream, frequent nighttime urination)
- Interested in nutrition and supplementation information directed at enhancing sex drive and/or sexual performance capabilities

Women Only Section

Do any of the following conditions or circumstances apply to you:

- You are a woman who is 45 years of age or older?
- Experiencing any menopausal or peri-menopausal symptoms (i.e. hot flashes, night sweats, insomnia, skipped periods, irritability etc.)?
- Suffer from premenstrual syndrome (PMS) or painful menstruation?
- Fibrocystic breast disease
- Uterine fibroids
- Endometriosis
- Diagnosed with cervical dysplasia – covered in Nutrition and Pathologies Course
- Recurring bladder or urinary tract infections
- Interested in nutrition and supplementation advice to enhance sex drive and genital sensitivity

Recurring Urinary Tract Infections

Some doctors recommend that individuals with recurrent UTIs limit their intake of white sugar products and alcohol, which have been shown to suppress immune function.

Supplement Considerations To Prevent Recurrence:

1 Cranberry Extract and D-Mannose

Research has shown that active ingredients in **cranberry** can be effective against UTIs because they prevents *E. coli*, the bacteria that causes most urinary tract infections, from attaching to the walls of the bladder and urinary tract.

In addition, cranberry extract also helps to acidify the urine, which decreases the ability of bacteria to replicate. UTI-Clear contains 150 mg of cranberry extract per capsule, and the cranberry extract is standardized to contain 30% total acids, of which 10% are quinic acid and 3% polyphenols.

Standardized extracts of this nature are the type of cranberry product that have been shown to reduce recurrence of urinary tract infections, even in elderly women

- D-mannose is a simple sugar that the human body can not metabolize (so no calories to worry about and it does not affect blood sugar). However, once filtered by the kidneys into the urine, D-Mannose acts like a slippery glove around the tentacles of E. Coli bacteria, preventing these bacteria from clinging to the walls of the urinary tract.
- In the presence of D-Mannose the bacteria simply lose their grip and slide out of your body each time you urinate. E. Coli is the primary culprit in urinary tract infections. And it's a stubborn little germ, largely because it grips to the walls of the urinary tract with its tentacles that act like little suction cups. Thus, E.coli bacteria, is hard to eliminate even with the use of antibiotics, which are sometimes required when a UTI is in progress.
- But antibiotics may not kill all the E.Coli bacteria and the ones that remain, cling to the walls of the urinary tract, giving them a chance to multiply and create a whole new UTI episode in the future.
- This is where D-Mannose comes in. D-Mannose, at a daily dosage of 500-1,000 mg per day helps to flush E. Coli out of the body before they can stick to the walls of the urinary tract and initiate another urinary tract infection.
- Thus, a combination supplement containing cranberry extract and D-Mannose, at effective dosages and standardized grades, is a potent one-two punch in the prevention of troublesome urinary tract infections.

Example of Supplement to Prevent Recurrent UT-Infections:

Ingredients: Each capsule contains:

1. Cranberry Extract – 150 mg (std to 30% total acids, including 10% quinic acid and 3% polyphenols)
2. D-Mannose – 500 mg

Dosage: Take one capsule twice per day between meals, or as directed by a healthcare professional (60 capsules per bottle)

During Infection UT-Infection (Synergistic with Antibiotic, but not a Replacement for Antibiotic:

- 1. Oil of Oregano** May Help Fight Existing Infection In Conjunction with Antibiotic (need mid-stream sample to identify pathogen)

The P73 research tested blend of wild oregano has been shown to kill numerous bacteria, viruses and fungi. It may be wise to include supplementation with this form of oregano to help fight acute and recurrent UTIs. A typical dosage would be 2 capsules, two or three times daily during an attack, and one capsule, twice per day for prevention in individuals prone to recurring urinary tract infections (assuming each capsule contains 250 mg of the P73 oregano blend).

2. Uva ursi

Uva ursi is a herb that has been used worldwide for centuries for its diuretic and antiseptic qualities.

The active constituent in uva ursi is arbutin. Within the urine arbutin is converted into another chemical, called hydroquinone, which kills bacteria.

As part of the complementary management of UTI s many practitioners recommend 700-1,000 mgs of a standardized extract tablet or capsule (containing 20% arbutin content), taken three times daily.

Family History

- Have any of your first-degree relatives developed colon cancer?
- Have any of your first-degree relatives developed prostate cancer? (men only)
- Have any of your first-degree relatives developed breast or ovarian cancer? (women only)
- Have any of your first-degree relatives developed dementia or Alzheimer's disease?
- Have any of your first-degree relatives developed Parkinson's disease?
- Have any of your first-degree relatives suffered a heart attack before age 60 ?

Preventing CVD: These lifestyle considerations include:

1. Low Saturated Fat Diet
2. Increase Intake of Soluble Fiber -Supplementing
3. High Potency Multiple Vitamin and Mineral – homocysteine, LDL-cholesterol oxidation, endothelial function)
4. Omega-3 fats
- 5 Avoid Smoking
6. Achieve Ideal Body Weight
7. Aerobic Fitness
8. Natural Cholesterol-Triglyceride Lowering Supplements –These two supplements include: Gum Guggul and Artichoke Leaf Extract
9. Coenzyme Q10 and Hawthorn – by age 45

Six Biggest Concerns with Drug-Nutrient Interactions:

1. Bleeding Disorders
2. Brain Chemistry Imbalances (serotonin and cholinergic syndromes)
3. Adverse Cardiovascular Effects: Heart muscle (myocardial) dysfunction and Hypertension
4. Internal Organ Damage and/or toxicity (Liver and Kidneys) and Related Effects
5. Adverse Immune Effects
6. Glucose Intolerance

Bleeding Disorders:

Potentiating Anticoagulant Effects:

1. Ginkgo biloba
2. Garlic Supplements
3. Angelica Species (Dong quai) – also photosensitivity dermatitis
4. Cranberry
5. Devil's claw – also may re-activate old peptic ulcers

Countering Anticoagulant Effects:

1. Ginseng
2. Coenzyme Q10
3. St John's wort

Other Popular Natural Health Products – potentially affecting prothrombin time (no human cases yet reported)

1. Ginger – gingerols exhibit anti-platelet clotting properties
2. Feverfew – parthenolide exhibits anti-clotting properties
3. White Willow Bark Extract – contains salicylic acid. At low concentration (15% std grade) studies do not demonstrate an anti-platelet clotting tendency
4. Turmeric – curcumin affects prostaglandin synthesis
5. Essential oils (Borage, Flaxseed, Fish oil) – Omega-3 fats decrease platelet clotting behavior via effects PG-3
6. Vitamin E - Safe up to 400 I.U. per day in conjunction with warfarin or aspirin. Testing at 800 I.U. and 1,200 I.U. per day yield equivocal results on safety with respect to altering the INR
7. Bromelain enzymes – may decrease platelet clotting tendency and increases fibrinolysis
8. Papain enzymes – these proteolytic enzymes may also potentiate the effect of warfarin]
9. Saw Palmetto
10. Red Clover – also photosensitivity dermatitis
11. Licorice root – can also raise blood pressure

Brain Chemistry Effects

1. Ginseng can trigger mania in patients on MAO-inhibitors
2. Valerian root and Kava can produce excess sedation in patients on any other sedative, sleep-aid medication, barbiturates, benzodiazepines or anti-histamines, opiates and not to be combined with alcohol
3. St. John's wort may produce serotonin syndrome in patients on antidepressant drugs (hyperthermia, rigidity, confusion, delirium, coma)
4. Huperzine A may cause cholinergic syndrome in patients taking Alzheimer's drugs (acetylcholinesterase inhibitors) – causing bradycardia, tearing, hypersalivation and increased GI motility symptoms from parasympathetic NS activity.
5. Ma Huang (Ephedra)- can lower seizure threshold in epileptics
6. California poppy not to be combined with night-time dose of any narcotic/opioid drug

Heart Muscle Dysfunction

1. Hawthorn and Ginseng should never be taken by a patient on digoxin or digitalis – potentiates their effect
2. Licorice root can elevate blood pressure (DGL tablets do not)
3. Ma Huang (Ephedra) – has caused sudden death heart attack even in young athletic individuals – and responsible for 17% of all reported adverse reactions to supplements
4. Glucosamine – may elevate blood pressure in small number of patients

Internal Organ Damage

1. Kava has caused liver failure and jaundice
2. Kelp and Iodine Supplements counter therapeutic effect of radioactive iodine in thyroid cancer and Grave's disease treatment
3. Vitamin A potentiates side effects of Accutane (liver damage, elevated lipids, headaches etc.)

Adverse Immune Effects

- Immune-modulating Supplements may counter immuno-suppressive drugs or exacerbate an autoimmune disease (Astragalus, Medicinal Mushrooms, Echinacea etc.)

Glucose Intolerance

- Glucosamine may elevate blood glucose in rare instances (monitor in early stages)

Other:

- Zinc – above 40 mg per day may cause increased risk of genitourinary problems, weaken immune system, induce copper deficiency and related anemia, and lower HDL-cholesterol
- White willow extract – not to be given to children under 12-14 years of age (Reye's syndrome risk)
- Cancer – be aware of specific drug-nutrient concerns and synergies in cancer patients (i.e. hypercalcemia of malignancy – 8-10% of CA patients – must be careful with Vitamin A and Vitamin D supplementation.

Patient Questions: Contra-indications and Precautions

- Have you ever had an allergic reaction to a vitamin supplement in the past?
- Do you suffer from sickle cell anemia? (Vitamin C) – although this is now changing (See Kyolic Review)
- Do you suffer from a hemolytic anemia due to glucose-6 phosphate dehydrogenase deficiency? (Vitamin C)
- Do you suffer from kidney failure or are you currently receiving dialysis treatment? (All supplements and dietary recommendations require physician approval)
- Have you ever had a kidney stone? (Keep Vitamin C supplementation at or below 750 mg per day)
- Do you have Wilson's disease? (Copper)
- Do you have hemochromatosis? (Iron)
- Have you received an organ transplant of any kind? (All supplements and dietary recommendations require physician approval, especially immune boosting agents)

- Are you taking an immuno-suppressive drug (i.e. Azathioprine, Cyclosporine, Methotrexate) (Any immune-boosting supplement may counter drug effects)
- Have you ever been diagnosed with Crohn's Disease or Ulcerative Colitis? (All supplements and dietary recommendations require physician approval)
- Are you an insulin-dependent diabetic? (Chromium can alter insulin need)
- Do you have only one functioning kidney (due to one kidney being removed or one kidney known to be non-functional)? (All supplements and dietary recommendations require physician approval)
- Are you taking the drug digitalis or digoxin? (Hawthorn and Ginseng contra-indicated)
- Do you have an active ulcer? (White willow extract, Garlic supplements, Devil's claw are contra-indicated)

- Are you under 12 years of age? (white willow extract)
- Are you taking a blood thinner drug (i.e., Coumadin, Warfarin, Clopidogrel (Plavix®), Heparin, etc.) and/or a non-steroidal anti-inflammatory drug (aspirin, ibuprofen)? Many anti-inflammatory herbs, garlic, ginkgo biloba, red clover, licorice root, omega-3 fats, Vitamin E above 400 IU per day, can increase anti-coagulant effect – requires INR monitoring)
- Do you have a pacemaker? (CoQ10, L-Taurine, L-Carnitine and Hawthorn require physician approval)
- Are you taking drugs to correct a heart arrhythmia problem? (CoQ10, L-Taurine, L-Carnitine, D-Ribose, and Hawthorn require physician approval)
- Are you taking any medications for Alzheimer's or dementia? (all mood altering supplements St John's Work, 5-hydroxytryptophan etc. require physician approval. Huperzine A is contra-indicated)
- Are you allergic to aspirin? (white willow extract)
- Do you suffer from hemophilia? (any supplement that decreases blood coagulation such as many anti-inflammatory herbs, garlic, ginkgo biloba, red clover, licorice root, omega-3 fats, Vitamin E above 400 IU per day)
- Are you presently experiencing a flare up of gout (gouty arthritis)? (High doses of niacin above 50 mg)
- Do you have advanced liver disease? (All supplements and dietary recommendations require physician approval)

- Do you suffer from hyperparathyroidism or sarcoidosis? (Vitamin D)
- Are you taking a drug called Methotrexate? (Folic acid above 400 mcg)
- Are you presently taking any chemotherapy drugs or undergoing radiation therapy for the treatment of cancer? (All supplements and dietary recommendations require physician approval)
- Are you currently taking any drugs for depression or to treat a psychological disorder of any kind (e.g., bipolar disease, schizophrenia, obsessive compulsive disorder, etc.)? (any mood altering supplement requires physician approval (i.e. 5-hydroxy tryptophan, choline, SAMe etc.) and St. John's wort should not be used)
- Are you taking the drug, Accutane (usually for acne)? (Vitamin A above 2500 IU) – See Next Slide
- Are you Pregnant? (only prenatal vitamin, plus essential fatty acids, maybe lecithin or choline)
- Are you Breast Feeding? (only prenatal vitamin, plus essential fatty acids, maybe lecithin or choline)
- Are you a woman who has had a history of breast or ovarian cancer? (do not recommend any phytoestrogen supplements without consent of physician)
- Do you have a shellfish allergy? (glucosamine)

Vitamin A toxicity

74 Hypervitaminosis A. Acute toxicity causes nausea, vomiting and headache due to raised intracranial pressure (pseudotumour cerebri) and peeling of the skin. Chronic poisoning results in loss of weight, low-grade fever, tenderness over the long bones and skull changes (see below) and a pruritic rash. Bright red marginal discolouration of the gingiva as shown here is characteristic.

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Ask Patient To Bring In Available Blood and Urine Lab Work From Physicians Office, Along With Any Other Relevant Test Results:

- Bone Density
- Imaging Results (X- Ray, MRI, CT scan)
- Stress Test etc.

Standard Blood Work

Hemoglobin

- Men: 136 – 175 g/L (13.6 – 17.5 g/dL)
- Women: 120 – 155 g/L (12.0 – 15.5 g/dL)
- Hemoglobin is the protein within red blood cells that binds to and carries oxygen from the lungs to the tissues of the body. A low hemoglobin level occurs in anemia and hemorrhage.

Hematocrit

- Men: 0.39 – 0.49 (39 – 49%)
- Women: 0.35 – 0.49 (35 – 45%)
- Hematocrit refers to the percentage of blood comprised of red blood cells. A low hematocrit occurs in anemia and hemorrhage.

Red Blood Cell Count (RBC)

- $4.2 - 5.6 \times 10^{12} /L$
- Red blood cells carry oxygen from the lungs to the tissues of the body. Low red blood cell counts occur in anemia, hemorrhage and various blood cell disorders. An abnormally high RBC count suggests an underlying genetic disorder of blood cell disorder problem.

Platelet Count (thrombocytes)

- $150-450 \times 10^9$ ($150 - 450 \times 10^3 \mu/L$)
- Platelet cells play a crucial role in the blood's clotting capacity. Platelet count is increased in leukemia and certain other blood disorders, and is decreased in certain anemias, acute leukemias, some chronic leukemias and some other conditions (idiopathic thrombocytopenia)

ESR (erythrocyte sedimentation rate)

- Men: less than 10 mm/hr
- Women: less than 15 mm/hr
- The ESR refers to the rate at which red blood cells settle in non-coagulated blood. The ESR is increased in rheumatoid inflammatory conditions, other inflammatory and infectious conditions, some cancers and several other conditions.

White Blood Cell Count (WBC) with differential

- $3.4 - 10 \times 10^9/L$ (3,400 – 10,000 per Cu. mm.)
- WBC levels usually rise with infection, as they comprise a significant part of the body's immune system. WBC levels also increase in leukemia and certain other blood disorders.

Creatinine

- 50 –100 $\mu\text{mol/L}$ (0.6 – 1.2 mg/dL)
- Creatinine is formed daily when old proteins are broken down by the liver. Blood creatinine levels are elevated in kidney disease. Blood creatinine is often used as an indicator of kidney function. An elevated value suggests poor kidney filtration ability. If the level drops too low then dialysis or kidney transplant is recommended

BUN (blood urea nitrogen)

- 2.9-7.1 mmol/L (8 – 20 mg/dL)
- Urea is produced exclusively in the liver as an end product of protein metabolism. The most common cause of elevated BUN is kidney disease, however, it is also elevated in uncontrolled diabetes, starvation, intestinal bleeding, congestive heart failure and in febrile states. A decrease in BUN occurs in advanced liver disease.

Uric Acid

- Men: 140 – 440 $\mu\text{mol/L}$ (2.4 – 7.4 mg/dL)
- Women: 80 – 350 $\mu\text{mol/L}$ (1.4 – 5.8 mg/dL)
- Uric acid is an end product of the breakdown of purines (found in DNA and in certain foods). High levels of uric acid occur in gout, but not all individuals with high uric acid have gout. High uric acid may also increase risk of vascular disease.

Albumin

- 34 – 47 g/L (3.4 – 4.7 g/dL)
- Albumin makes up the largest percentage of total blood proteins. A reduction in blood albumin usually reflects chronic liver disease. Other causes include advanced malignancy, protein mal-absorption, starvation, advanced kidney disease, congestive heart failure, eclampsia of pregnancy.
- An increase in albumin occurs in dehydration (a relative increase due reduced blood volume)

Total Protein

- 60.0 - 82.0 g/L (6.0 –8.0 g/dL)
- Like albumin, a reduction in total blood protein usually reflects chronic liver disease. Other causes include advanced malignancy, protein malabsorption, starvation, advanced kidney disease, congestive heart failure, eclampsia of pregnancy.
- An increase in total protein occurs in dehydration (a relative increase due reduced blood volume)

Globulin

- 14 - 45 g/L (1.4 – 4.5 g/dL)
- Globulin proteins are another type of protein found in the blood. Globulin proteins are often elevated in liver disease whereas a decrease signifies serious depletion of the body's immune defense mechanisms. Alpha globulins are often elevated in hepatitis, collagen diseases, advanced malignancies, chronic leukemia and lymphomas. The Bence-Jones globulin protein (an abnormal one) is frequently elevated in multiple myeloma (a type of bone cancer). It also spills into the urine and as is found there in high levels in approximately 50% of multiple myeloma cases.

A/G Ratio (albumin to globulin ratio)

- 1.30 – 2.60
- The A/G ratio is a useful evaluation to ensure that there is a healthy balance between albumin and globulin proteins in the blood.

Bilirubin (total)

- 2 – 21 $\mu\text{mol/L}$ (0.1 – 1.2 mg/dL)
- Bilirubin is the predominant pigment of human bile (yellow in color) and is formed from the breakdown of hemoglobin when worn out red blood cells are destroyed by the liver, spleen, bone marrow and other tissues. Bilirubin is often increased in liver cirrhosis, acute viral hepatitis, conditions that obstruct bile flow (liver tumors, obstructed bile duct from stones etc.), congestive heart failure, hemolytic diseases (red blood cells broken down at an unusually fast pace) and internal hemorrhage.

Alkaline Phosphatase

- 41-133 IU/L or 0.7-2.2 ukat/L
- Alkaline Phosphatase is an enzyme associated with bone metabolism and liver function. An increase in alkaline phosphatase often indicates bone cancer or metastasis of cancer to bone. It can also indicate liver disease, hyperparathyroidism or pulmonary infarct. It may also be elevated during healing of a broken bone.

C- Reactive Protein

- Less than 5 g/L (0.5 mg/L)
- Elevated levels of C-Reactive Protein indicate that inflammation is present somewhere in the body. This can be related to arthritis, inflammation of the blood vessel wall, which increases risk of heart disease and stroke, widespread cancer or lupus. Elevated C-Reactive Protein is now considered a risk factor for heart attack and related vascular diseases. Levels above 3 mg/L are associated with an increased risk of stroke and cardiovascular disease (approximately a 300% increase in risk of cardiovascular disease).
- Some natural anti-inflammatory agents such as curcumin, boswellia, white willow extract and ginger can help lower C-Reactive Protein in many cases. Reducing excess body fat, smoking cessation, endurance exercise and omega-3 fats (minimum of 1 gram per day), can also help to reduce C-Reactive Protein blood levels.

Fibrinogen

- Less than 30 g/L (300 mg/dL)
- Fibrinogen is a protein produced in the liver that is used in blood clotting. High levels of fibrinogen are associated with inflammation of blood vessel walls and, like C-Reactive Protein, is associated with increased risk of heart attack and related vascular diseases.

Prothrombin Time (PT of whole blood) or INR (International Normalized Ratio)

- INR = (International Normalized Ratio), which is the ratio of patient PT to control PT multiplied by the international sensitivity index. Patient PT (sec) divided by control PT (sec), times the ISI (which is determined by comparing each reagent (the specific thromboplastin used) with world health organization thromboplastin).
- 11-15 seconds (Emergency if at or over 30 seconds)
- Normal plasma should clot in about 12 seconds following the addition of calcium with a potent tissue thromboplastin. A short prothrombin time is associated with risk of thrombosis and embolism (e.g. deep vein thrombosis).
- The prothrombin time will be longer with deficiency of vitamin K, prothrombin factor V, factor VII, or factor X or a combination of these deficiencies, liver disease, disseminated intravascular coagulation, surreptitious or overdose of warfarin or coumadin and other prescription anti-coagulants, use of heparin, and use of certain non steroidal anti-inflammatory drugs (e.g. aspirin) and possibly supplementation with certain herbs (e.g. garlic, red clover, devil's claw, ginkgo biloba, dong quai, licorice).
- Prolonged prothrombin time increases the risk of bleeding disorders (internally) and possibly hemorrhagic stroke.
- The INR for normal individual should be between 0.9 and 1.3. For high risk CBD patients they usually use anticoagulants to boost the INR between 2.0-3.0 (thinning the blood and decreasing coagulation ability).

HIV 1 and 2

- No antibodies detected.
- This test is used to assess the presence of HIV infection.

Recall From Previous Subjects:

- Vitamin Levels (RBC Folate, Serum vitamin B12, Vitamin D, Serum Selenium-colon cancer association)
- Hormone Levels

Other Tests of Importance

- **Urinalysis:** this is a standard assessment of urine to screen for a variety of health and disease indicators.
- **Blood Pressure:** high blood pressure is a critical risk factor for heart disease and stroke (along with high cholesterol and smoking). Your blood pressure should remain below 130/90, more ideally 120/70/.
- **ECG/EKG:** the electrocardiogram provides details about the heart's performance. Abnormal electrocardiogram readings can indicate insufficient blood flow to the heart muscle, impaired conduction of nerve impulses throughout the heart, or asynchronous contraction patterns called fibrillations.
- **Stress ECG**

PSA (Prostate Specific Antigen) – this is a blood test that can screen for the presence of prostate cancer. Picking up prostate cancer in the early stages enables doctors to prevent it from spreading outside the prostate and becoming a lethal disease. Presently, one in eight men in most developed countries develop prostate cancer and it is the second leading cause of cancer death in men after lung cancer.

- The 2007 National Comprehensive Cancer Network (NCCN) guideline recommends offering a baseline PSA test and digital rectal exam (DRE) at ages 40 and 45 and annual PSA testing and DRE beginning at age 50 through age 80, along with information on the risks and benefits of screening.
- However, annual PSA testing and DRE should begin at age 40 for African-American men, men with a family history of prostate cancer, and men with a PSA ≥ 6 ng/mL at age 40 or PSA > 6 ng/mL at age 45
- Biopsy is recommended if DRE is positive or PSA ≥ 4 ng/mL, and biopsy considered if PSA > 2.5 ng/mL or PSA velocity ≥ 0.35 ng/mL/year when PSA ≤ 2.5 ng/mL.
- Some U.S. radiation oncologists and medical oncologists who specialize in treating prostate cancer recommend obtaining a baseline PSA in all men at age 35 or beginning annual PSA testing in high risk men at age 35.
- As a rule, a PSA below 2.0 ng/mL is very low risk for prostate cancer, however, if the PSA rises by more than 0.75ng/mL within a 12-month period (although still within the ideal range between 0 – 2.0 ng/mL), then prostate cancer should be suspected and investigated.

Women

Pap Smear and Internal Exam— this is common testing used routinely to screen for cervical cancer and cervical dysplasia (precancerous condition) in women, as well as to screen for other uterine abnormalities.

Mammogram and Breast Thermography?

Colonoscopy/ Sigmoidoscopy – these procedures are recommended for individuals over fifty years of age to screen for early detection of colon cancer. Colon cancer affects one in 16 adults over their lifetime in most developed countries. As such, these procedures can catch it early, before it spreads and becomes a lethal disease.

If Negative- then repeat test every 5 years

Yearly - Occult Blood in Stool Test (some doctors substitute this for colonoscopy due to risk of bowel perforation)

See Next Slide for more details

High-sensitivity fecal occult blood tests (FOBT). Both polyps and colorectal cancers can bleed, and FOBT checks for tiny amounts of blood in feces that cannot be seen visually. (Blood in stool may also indicate the presence of conditions that are not cancer, such as hemorrhoids.)

Currently, two types of FOBT are approved by the Food and Drug Administration (FDA) to screen for colorectal cancer: guaiac FOBT (gFOBT) and the fecal immunochemical (or immunohistochemical) test (FIT, also known as iFOBT). With both types of FOBT, stool samples are collected by the patient using a kit, and the samples are returned to the doctor.

- Guaiac FOBT uses a chemical to detect heme, a component of the blood protein hemoglobin. Because the guaiac FOBT can also detect heme in some foods (for example, red meat), people have to avoid certain foods before having this test.
- FIT uses antibodies to detect human hemoglobin protein specifically. Dietary restrictions are typically not required for FIT.

Stool DNA test (FIT-DNA). The only stool DNA test approved by the FDA to date, Cologuard®, is a multitarget test that detects tiny amounts of blood in stool (with an immunochemical test similar to FIT) as well as nine DNA biomarkers in three genes that have been found in colorectal cancer and precancerous advanced adenomas.

The DNA comes from cells in the lining of the colon and rectum that are shed and collect in stool as it passes through the large intestine and rectum.

As with both types of FOBT, the stool sample for the FIT-DNA test is collected by the patient using a kit; the sample is mailed to a laboratory for testing. A computer program analyzes the results of the two tests (blood and DNA biomarkers) and provides a finding of negative or positive. People who have a positive finding with this test are advised to have a colonoscopy.

- In one study of people who were at average risk of developing colon cancer and had no symptoms of colon problems, this test detected more cancers and adenomas than the FIT test (that is, it was more sensitive). However, the FIT-DNA test also was more likely to identify an abnormality when none was actually present (that is, it had more false-positive results).

Reference:

www.cancer.gov/types/colorectal/screening-fact-sheet

Bone Mineral Density – This test is used to screen for osteoporosis, which is estimated to affect one in four women and one in eight men by age 50.

1. Are you a woman over the age of 50?
2. Are you a woman, who entered into early menopause (40-45), or premature menopause (before 40)?
3. Are you a woman who has had both ovaries surgically removed before normal menopause (45-55)?
4. Are you a woman under 45 years of age who routinely misses menstrual cycles or has greatly diminished menstrual flow due to estrogen and/or progesterone deficiency?
5. Have you ever suffered from anorexia nervosa or bulimia?
6. Are you a woman who at some time in your life exercised excessively or competitively to the point where your body fat was very low?
7. Have you undergone treatment with oral glucocorticosteroid (prednisone, cortisone etc.) drugs for more than 3 months at any time in your life?
8. Have you ever been diagnosed with hyperparathyroidism?
9. If you are a woman, did your mother or a sister develop osteoporosis?
10. Are you a man over 65 years of age?
11. Are you older than 45 and your doctor has told you that you are underweight?
12. In general, do you have poor muscular development and strength?
13. Have you ever taken anticonvulsant medication for more than 2 years?

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Overall Feedback To Patient

1. Anthropometric Findings – and relationship to disease risk
2. Ideal Body Weight to shoot for
3. Recommended Dietary Modifications
4. Signs, Symptoms and Risks of Nutrient Deficiencies – and recommendations
5. Exercise Protocol (aerobic, resistance training, flexibility)
6. Bone Density Testing Candidate (yes/no)
7. Contra-indications they should be aware of
8. Supplementation Recommendations – and how to access them (prescription pads, front desk, online, health food store, drug store etc)

In-Office Programs

1. Weight Management
2. Cholesterol/Triglycerides
3. Diabetes of Metabolic Syndrome
4. Gastro-intestinal conditions (IBS, Crohn's Ulcerative Colitis, Chronic Dyspepsia etc)
5. Gout
6. Adjunctive Nutritional Advice In Cancer
7. Sports Nutrition

See my Sample Nutritional Consulting Brochure in Additional Course Notes

Other Conditions Requiring Initial and Follow-up Visits To Your Office (See my Nutrition Consulting Brochure in Additional Course Notes)

- Acne
- Diabetes
- High Cholesterol or Triglycerides
- Arthritis (any type)
- Recurring Urinary Tract Infections
- Enlarged Prostate
- Eczema, Rosacea
- Cold Sores, Canker Sores or Herpetic Lesions
- PMS and Dysmenorrhea
- Menopausal Symptoms
- Osteoporosis/Osteopenia
- Acid Reflux (digestive complaints)
- High Blood Pressure
- Low Thyroid Function

- Migraine Headaches
- Weak Immune System
- Chronic fatigue/Fibromyalgia
- Fibrocystic Breast Disease
- Constipation
- Inflammatory Bowel Disease (Ulcerative colitis/Crohn's)
- Peptic Ulcers
- Gout
- Autoimmune Disorder (e.g Lupus)
- Seasonal or Environmental Allergies
- ADD/Learning Disabilities
- Memory Loss and Preventing Memory Loss
- Parkinson's disease
- Cancer (adjunctive nutritional management or prevention of recurrence)

Popular Dietary Programs - Highlights

1. Metabolic Typing
2. Zone Diet
3. Atkins Diet
4. Eat Right for Your Blood Type
5. Macrobiotic Diet
6. Paleo Diet
7. Mediterranean Diet
8. Gerson Diet for Cancer Patients
9. Weight Watchers
10. Fasting and Intermittent Fasting

Metabolic Typing Diet

The Metabolic Typing Diet By Cathy Wong, ND Updated May 30, 2018. In the 1930s, dentist Weston Price began taking expeditions around the world and uncovered the link between modern eating habits and chronic degenerative diseases.

He also discovered that there wasn't a single diet that is ideal for everyone due to variation in climate, local produce, environmental conditions, heredity, genetics, and culture. Follow-up Researches believed that individual metabolism varied greatly due to two factors which were strongly influenced by heredity:

1. Autonomic nervous system dominance. One branch of the autonomic nervous system, the sympathetic nervous system, uses energy and is often referred to as the "fight or flight" response. The other branch, the parasympathetic nervous system, conserves energy and helps with the digestion of food. Proponents of the diet believe that one branch tends to be stronger or more dominant than the other.

2. Rate of cellular oxidation. This refers to the rate at which cells convert food into energy. According to proponents of the metabolic typing diet, some people are fast oxidizers, who can rapidly convert food into energy. In order to balance their systems, fast oxidizers need to eat heavier proteins and fats that burn slowly. In contrast, slow oxidizers convert food into energy at a slow rate. In order to balance their systems, proponents recommended that they eat mainly carbohydrates rather than protein and fat.

- **Protein types** -- Protein types are fast oxidizers or parasympathetic dominant. They tend to be frequently hungry, crave fatty, salty foods, fail with low-calorie diets, and tend towards fatigue, anxiety, and nervousness. They are often lethargic or feel "wired", "on edge", with superficial energy while being tired underneath.
- **Carbo types** -- Carbo types are slow oxidizers or sympathetic dominant. They generally have relatively weak appetites, a high tolerance for sweets, problems with weight management, "type A" personalities, and are often dependent on caffeine.

- **Mixed types** -- Mixed types are neither fast or slow oxidizers and are neither parasympathetic or sympathetic dominant. They generally have average appetites, cravings for sweets and starchy foods, relatively little trouble with weight control, and tend towards fatigue, anxiety, and nervousness.

According to proponents of the metabolic typing diet, the three metabolic types should eat the following foods:

- Protein types: Diets that are rich in protein, fats, and oils, and high-purine proteins such as organ meats, pate, beef liver, chicken liver, and beef. Carbohydrate intake should be low.
- Carbo types: Diets that are high in carbohydrates and low in protein, fats, and oils. They should eat light, low-purine proteins.
- Mixed types: Diets that are a mixture of high-fat, high-purine proteins and low-fat, low purine proteins such as cheese, eggs, yogurt, tofu, nuts. This type requires relatively equal ratios of proteins, fats, and carbohydrates.

- To Determine What Type the Patient is have them Complete the Metabolic Typing Questionnaire in Additional Course Notes
- Critics of the metabolic typing diet say that the diet isn't balanced. Also, a diet rich in organ meats, pate, and saturated animal fats is unhealthy. If you're considering trying the diet, make sure to consult your doctor first to discuss the potential risks and benefits.

To Learn More: <https://www.verywellfit.com/the-metabolic-typing-diet-89876>

Atkins Diet - High Protein, High Fat Diet (e.g. Atkins Diet, Hamptons Diet).

The Atkins diet was originally promoted by a physician named Dr. Robert C. Atkins, who wrote a best-selling book about the diet in 1972.

- The Atkins diet is a low-carbohydrate diet, usually recommended for weight loss.
- Proponents of this diet claim that you can lose weight eating as much protein and fat as you want, as long as you avoid foods high in carbs.
- The diet was originally considered unhealthy and demonized by the mainstream health authorities, mostly due to the high saturated fat content. However, new studies have shown that saturated fat is harmless ([1](#), [2](#)).
- Since then, the diet has been studied thoroughly and shown to lead to more weight loss than low-fat diets, and greater improvements in blood sugar, HDL (the "good" cholesterol), triglycerides and other health markers ([3](#), [4](#)).
- Despite being high in fat, it does not raise LDL (the "bad") cholesterol on average, although this does happen in a subset of individuals ([5](#)).
- The main reason low-carb diets are so effective for weight loss, is that when people reduce carbohydrate intake and eat more protein, their appetite goes down and they end up automatically eating fewer calories without having to think about it ([6](#), [7](#)).

Learn More: <https://www.healthline.com/nutrition/atkins-diet-101>

The Zone Diet: 40%-CHO; 30%-Protein; 30%- Fat Diet

The Zone Diet was developed by Dr. Barry Sears more than 30 years ago to reduce diet-induced inflammation.

HOW THE ZONE DIET WORKS

The Zone Diet requires that you simply balance your plate at every meal and snack with these nutrients:

- **Protein** – 1/3rd of your plate, add some lean protein, about the size and thickness of your palm. This could include egg whites, fish, poultry, lean beef or low-fat dairy.
- **Carbohydrates** – 2/3^{rds} of your plate, add a lot colorful vegetables and a little fruit. Fruits and vegetables to avoid are those that are high in sugar (e.g., bananas, carrots, grapes, raisins) or starchy (e.g., potatoes, corn).
- **Fat** – Add a little bit of monounsaturated fat. This could include olive oil, avocado, or almonds.

Benefits of being in the Zone include:

- Losing excess body fat at the fastest possible rate
- Maintaining wellness for a longer period of time
- Performing better
- Thinking faster
- Controlling diet-induced inflammation is a life-long effort. It is inflammation that disrupts the hormonal communication in our cells that prevents us from reaching peak performance.
- Learn More: <https://www.zonediet.com/the-zone-diet/>

Eat Right for Your Blood Type

The blood type diet was developed by Peter D'Adamo, a naturopathic physician who theorizes that people respond to various foods depending on their blood type. The theory behind the diet is the belief that eating foods with lectins (a type of protein) that are incompatible with a person's blood type can cause blood cell clumping, called agglutination, and result in health problems such as heart or kidney disease or cancer.

D'Adamo also theorizes that a person's blood type affects their ability to digest various foods due to differences in digestive secretions associated with the different blood types. Blood type O, for example, are thought to digest meat well due to high levels of stomach acid. By eating according to a meal plan designed for your specific blood type, D'Adamo suggests, you can digest food with greater efficiency, avoid the negative effect of certain lectins, and—in turn—lose weight and enhance your overall health.

Here are the basic principles of the blood type diet:

- People with blood type A (which D'Adamo calls the "cultivator") should follow a dairy-free, primarily vegetarian diet with a high intake of fruits, vegetables, grains, beans, legumes, nuts, and seeds. People with blood type B ("the nomad") should eat a highly varied diet (including fruits, vegetables, grains, beans, legumes, meat, poultry, fish, eggs, and dairy) but avoid intake of nuts and seeds.
- People with blood type AB ("the enigma") can consume any food recommended for blood types A and B, although aiming for a mainly vegan diet is advised for this type.
- People with blood type O ("the hunter") should stick to a dairy-free and grain-free diet high in meat, low in grains, and with a moderate amount of vegetables, eggs, nuts, and seeds.

The validity of the Blood Type Diet **has not** been supported by two published studies:

1. Cusack L1, De Buck E, Compernelle V, Vandekerckhove P. "Blood type diets lack supporting evidence: a systematic review." Am J Clin Nutr. 2013 Jul;98(1):99-104.
2. Wang J, García-Bailo B, Nielsen DE, El-Sohemy A. "ABO genotype, 'blood-type' diet and cardiometabolic risk factors." PLoS One. 2014 Jan 15;9(1):e84749.

Learn More:

<https://www.verywellfit.com/the-blood-type-diet>

<https://www.verywellfit.com/the-blood-type-diet-89893>

Macrobiotic Diet

Macrobiotics is aimed at finding balance in life for health and vitality, and was the original counterculture diet back in the '60s. A macrobiotic diet isn't just about your weight -- it's about achieving balance in your life. It promises a healthier, more holistic long-term lifestyle

- About 40% to 60% percent of the daily diet should be organically grown whole grains, like brown rice, barley, millet, oats, and corn. Locally grown vegetables make up 20%-30% of your daily total. Five percent to 10% is reserved for beans and bean products like tofu, miso, and tempeh, and sea vegetables like seaweed, nori, and agar.
- You can also have fresh fish and seafood, locally grown fruit, pickles, and nuts several times a week. Rice syrup is one of the sweeteners you can have occasionally.
- You're discouraged from eating dairy, eggs, poultry, processed foods, refined sugars, and meats, along with tropical fruits, fruit juice, and certain vegetables like asparagus, eggplant, spinach, tomatoes, and zucchini.
- You're only supposed to drink when you feel thirsty. And spicy stuff is frowned on (no habaneros here!) along with strong alcoholic beverages, soda, coffee, and anything highly refined, processed, or chemically preserved.

Learn More: <http://www.webmd.com/diet/a-z/macrobiotic-diet>

Modern Paleo Diet (Hunter-Gatherer Diet stemming from Ancestors)

Avoid

- Wheat, corn, rice, or other grains.
- Sweets: avoid sugar, corn syrup, agave nectar, honey, maple syrup, and artificial sweeteners
- Modern oils derived from grains and seeds -- such as canola oil, corn oil, or soy oil.
- Soy. Some fermented soy might be okay
- Beans and other legumes.

Eat the Following:

- High-quality meat, preferably from pastured, animals. Grass-fed meats with higher omega-3 fats
- Organ Meats
- Eggs, preferably from pastured chickens. Eggs enriched with omega-3s are a good option too
- Fish and shellfish periodically, preferably caught wild rather than farm-raised.
- Vegetables
- Fruit, sparingly
- Fermented Dairy
- Other Fermented Foods (i.e. cabbage)
- Nuts

Other:

- Supplement with Vitamin D
- 10-minutes of working out really hard (high-intensity)- like a hunter
- Avoid environmental contaminants in food and drink
- Adequate Sleep
- Skip the odd meal

Learn More: <https://www.modernpaleo.com/principles.html>

Mediterranean Diet

The Mediterranean diet encompasses eating more fish than meat, lots of fruits and vegetables, whole grains, legumes (beans) and olive oil, while making some smart choices with your dairy.

Your main source of energy will be carbohydrate (about 55%) but a good chunk of the calories in the Mediterranean diet comes from fat, ranging from around 30-40%, but much of that is monounsaturated fat (olive oil, olives) and omega-3 fats (fish)

10 commandments of the Mediterranean diet:

- 1) Cook from scratch, avoid processed foods
- 2) Eat fresh, seasonal and where you can, local
- 3) Get most of your protein from fish and pulses, with eggs and chicken in moderation
- 4) Get most of your energy from whole grains and potatoes
- 5) Eat a bit of dairy every day, mostly cheese (sheep and goat is best)
- 6) Eat red meat occasionally (and mix it in with other ingredients)
- 7) Enjoy vegetables abundantly
- 8) Don't be shy with the olive oil
- 9) Fresh fruit for dessert every day, have cakes, sweets every now and again
- 10) Drink lots of water...and a little wine, if you want to.

Learn More: <https://www.belazu.com/story/key-principles-of-the-healthy-mediterranean-diet/>

Gerson Diet (For Cancer Patients)

Named after Dr. Max B. Gerson, goal is to restore health by removing toxins from the body while building the immune system.

Dr. Gerson believed that cancer is the result of changes in cell metabolism caused by the accumulation of toxic substances in the body that stress the liver.

He also believed that the excess sodium and insufficient potassium found in cancer patients causes damage to the tissues and weakens the organs.

As of 2015, the Gerson Therapy is not approved by the Food and Drug Administration for use in treating cancer.

The Gerson Therapy Treatment Plan:

- Individuals using the Gerson Therapy eat a diet primarily limited to organic fruits, vegetables and whole grains, take specific supplements to correct cell metabolism, and utilize detoxification treatments that include coffee and chamomile enemas
- In addition to eating only vegetarian meals and drinking organic juices, potassium, flaxseed oil, pancreatic enzymes, pepsin and vitamin A are ingested.
- Vitamins C and B3, or niacin, and Lugol's Solution, a mixture of potassium iodide, iodine and water, are also taken. Coenzyme Q10 injected with vitamin B12 is currently used in place of the original crude liver extract with vitamin B12.
- Food preparation must not be done using aluminum cookware or utensils, and oils, salt and spices are forbidden.

Learn More: See Additional Course Notes Gerson Diet for Cancer Patients Document

Weight Watchers

Weight Watchers uses a points system to track food intake. Every food has an assigned number of points, depending on its **calorie count** and how much saturated fat, sugar, and protein it contains.

The WW Freestyle program, which was introduced in December 2017, expanded the number of zero-point foods. The list now includes 200-plus options, such as fruits, vegetables, eggs, and seafood.

On Weight Watchers, there are no “must-eat” foods — participants put together their own menu based on the point total given when they enroll, which is based on height, weight, age, and gender.

1-Day Weight Watchers Diet Sample Menu

Based on a SmartPoints Budget of 23:

Breakfast: Tomato, egg, and avocado breakfast sandwich

Lunch: Bacon and sharp cheddar macaroni and cheese

Snack: Veggies and Greek artichoke dip with capers and dill

Dinner: Slow cooker winter vegetable farro stew

Dessert: 1 slice lemon buttermilk bundt cake

Learn More: www.everydayhealth.com/diet-nutrition/weight-watchers.aspx

Fasting and Intermittent Fasting

Review of Research Paper: Fasting: Molecular Mechanisms and Clinical Applications. Cell Metabolism (Review) – Longo V.D. and Mattson M.P. (2013) – see pdf copy of this paper in additional course notes for this subject

Fasting is achieved by ingesting no or minimal amounts of food and caloric beverages for periods that typically range from 12 hr to 3 weeks.

In many clinics, patients are now monitored by physicians while undergoing water only or very low calorie (less than 200 kcal/day) fasting periods lasting from 1 week or longer for weight management and for disease prevention and treatment.

- Fasting results in ketogenesis, which promotes potent changes in metabolic pathways and cellular processes such as stress resistance, lipolysis, and autophagy; and can have medical applications that, in some cases, are as effective as those of approved drugs such as the **dampening of seizures and seizure-associated brain damage and the amelioration of rheumatoid arthritis** (Bruce-Keller et al., 1999; Hartman et al., 2012; Müller et al., 2001).
- Findings from well-controlled investigations in experimental animals, and emerging human studies, indicate that fasting may provide effective strategies to **reduce weight, delay aging, and optimize health**

Cancer Prevention

- In both mice and humans, fasting for 2 or 5 days, respectively, causes an over 50% decrease in IGF-I, a 30% or more decrease in glucose, and a 5–10-fold increase in the IGF-1 binding protein and inhibitor IGFBP1 (Cahill, 2006; Lee et al., 2012; Raffaghello et al., 2008; Thissen et al., 1994a, 1994b).
- These and other endocrinological alterations affect the expression of hundreds of genes in many cell types and the consequent reduction or halting of growth and elevation in stress resistance, which may be dependent in part on FOXO and other stress resistance transcription factors. (see next slides for FOXO genes)
- During Chemotherapy, ketogenic diet improves treatment outcomes

- The extreme changes caused by fasting, and particularly the very low IGF-1 and glucose levels and high IGFBP1, also generate a tumor prevention environment that promotes cancer cell death, since transformed cells have acquired a number of mutations that progressively decrease their ability to adapt to extreme environments (differential stress sensitization [DSS]) (Guevara-Aguirre et al., 2011; Lee et al., 2010, 2012).
- Thus, periodic fasting (intermittent fasting) may help the body rid itself of tumor-initiated cells or emerging cancer cells

- **FOXO Gene Expression** - Studies have consistently revealed FOXO (Forkhead box O) transcription factors as important determinants in aging and longevity.
- FOXO proteins represent a subfamily of transcription factors that act as key regulators of longevity downstream of insulin and insulin-like growth factor signaling. Mammals have four FOXO genes: FOXO1, FOXO3, FOXO4, and FOXO6.
- In mammals, this subfamily is involved in a wide range of crucial cellular processes **regulating stress resistance, metabolism, cell cycle arrest, and apoptosis.**
- Their role in longevity determination is complex and remains to be fully elucidated.

Reference: Aging Cell (2016): <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4783344/>

Fasting and Neurodegeneration

- Fasting and Neurodegeneration Compared to ad-libitum-fed controls, rats and mice maintained on an IF diet exhibit less neuronal dysfunction and degeneration and fewer clinical symptoms in models of Alzheimer's disease (AD), Parkinson's disease (PD), and Huntington's disease (HD).
- These models include transgenic mice expressing mutant human genes that cause dominantly inherited AD (amyloid precursor protein and presenilin-1) and frontotemporal lobe dementia (t) (Halagappa et al., 2007), PD (a-synuclein) (Griffioen et al., 2012), and HD (huntingtin) (Duan et al., 2003), as well as neurotoxin-based models pertinent to AD, PD, and HD (Bruce-Keller et al., 1999; Duan and Mattson, 1999).
- Animals on an IF diet also fare better than ad-libitum-fed controls after acute injury, including severe epileptic seizures, stroke, and traumatic brain and spinal cord injuries (Arumugam et al., 2010; BruceKeller et al., 1999; Plunet et al., 2008).

- IF may also promote restoration of damaged nerve cell circuits by stimulating synapse formation and the production of new neurons from neural stem cells (neurogenesis) (Lee et al., 2002).
- Interestingly, while beneficial in models of most neurodegenerative conditions, there is evidence that fasting can hasten neurodegeneration in some models of inherited amyotrophic lateral sclerosis, perhaps because the motor neurons affected in those models are unable to respond adaptively to the moderate stress imposed by fasting (Mattson et al., 2007; Pedersen and Mattson, 1999)

Metabolic Syndrome (MS)

Fasting results in a lowering of insulin and leptin levels and an elevation of adiponectin and ghrelin levels. By increasing insulin and leptin sensitivity, suppressing inflammation, and stimulating autophagy, fasting reverses all the major abnormalities of the MS in rodents (Singh et al., 2009; Wan et al., 2010).

Finally, in addition to its many effects on cells throughout the body and brain, IF may elicit changes in the gut microbiota that protect against MS (Tremaroc and Backhed, 2012).

Naturally, the challenge of applying fasting based interventions to treat MS in humans is a major one, as some obese individuals may have difficulties in following IF for long periods.

- Overweight subjects maintained for 6 months on a twice weekly IF diet in which they consumed only 500–600 calories on the fasting days, lost abdominal fat, displayed improved insulin sensitivity, and reduced blood pressure (Harvie et al., 2011).
- Three weeks of alternate day fasting resulted in reductions in body fat and insulin levels in normal weight men and women (Heilbronn et al., 2005), and Ramadan fasting (two meals/day separated by approximately 12 hr) in subjects with MS resulted in decreased daily energy intake, decreased plasma glucose levels, and increased insulin sensitivity (Shariatpanahi et al., 2008).
- Subjects undergoing coronary angiography who reported that they fasted regularly exhibited a lower prevalence of diabetes compared to nonfasters (Horne et al., 2012).

Fasting, Aging, and Disease in Humans:

Clinical and epidemiological data are consistent with an ability of fasting to retard the aging process and associated diseases. Major factors implicated in aging whose generation are accelerated by gluttonous lifestyles and slowed by energy restriction in humans include the following:

1. Oxidative damage to proteins, DNA, and lipids
2. Inflammation
3. Accumulation of dysfunctional proteins and organelles
4. Elevated glucose, insulin, and IGF-I, although IGF-1 decreases with aging and its severe deficiency can be associated with certain pathologies (Bishop et al., 2010; Fontana and Klein, 2007).

- Serum markers of oxidative damage and inflammation, as well as clinical symptoms, are reduced over a period of 2–4 weeks in asthma patients maintained on an alternate day fasting diet (Johnson et al., 2007).
- Similarly, when on a 2 days/week fasting diet, overweight women at risk for breast cancer exhibited reduced oxidative stress and inflammation (Harvie et al., 2011), and elderly men exhibited reductions in body weight and body fat and improved mood (Teng et al., 2011).
- Additional effects of fasting in human cells that can be considered as potentially “antiaging” are inhibition the mTOR pathway, stimulation of autophagy , and ketogenesis (Harvie et al., 2011; Sengupta et al., 2010).

- Among the major effects of fasting relevant to aging and diseases are changes in the levels of IGF-1, IGFBP1, glucose, and insulin.
- Fasting for 3 or more days causes a 30% or more decrease in circulating insulin and glucose, as well as rapid decline in the levels of IGF-1, the major growth factor in mammals, which together with insulin is associated with accelerated aging and cancer (Fontana et al., 2010).

- In humans, 5 days of fasting causes an over 50% decrease in IGF-1 and a 5-fold or higher increase in one of the principal IGF-1-inhibiting proteins, IGFBP1 (Thissen et al., 1994a). This effect of fasting on IGF-1 is mostly due to protein restriction, and particularly to the restriction of essential amino acids, but is also supported by calorie restriction since the decrease in insulin levels during fasting promotes reduction in IGF-1 (Thissen et al., 1994a).
- Notably, in humans, chronic calorie restriction does not lead to a decrease in IGF-1 unless combined with protein restriction (Fontana et al., 2008)
- In fact, subjects who are moderately overweight (BMI of 25–30) in later life can have reduced overall mortality risk compared to subjects of normal weight (Flegal et al., 2013)

- Fasting, Inflammation, and Hypertension In humans, one of the best demonstrations of the beneficial effects of long-term fasting lasting 1 to 3 weeks is in the treatment of rheumatoid arthritis (RA). In agreement with the results in rodents, there is little doubt that during the period of fasting both inflammation and pain are reduced in RA patients (Müller et al., 2001).
- However, after the normal diet is resumed, inflammation returns unless the fasting period is followed by a vegetarian diet (Kjeldsen-Kragh et al., 1991), a combination therapy that has beneficial effects lasting for 2 years or longer (Kjeldsen-Kragh et al., 1994). The validity of this approach is supported by four differently controlled studies, including two randomized trials (Müller et al., 2001).

- Therefore, fasting combined with a vegetarian diet and possibly with other modified diets provides beneficial effects in the treatment of RA. Alternate day IF also resulted in significant reductions in serum TNF- α and ceramides in asthma patients during a 2 month period (Johnson et al., 2007).
- The latter study further showed that markers of oxidative stress often associated with inflammation (protein and lipid oxidation) are significantly reduced in response to IF.
- Thus, for many patients able and willing to endure long-term fasting and to permanently modify their diet, fasting cycles would have the potential not only to augment but also to replace existing medical treatments.

- Water-only and other forms of long-term fasting have also been documented to have potent effects on hypertension. An average of 13 days of water-only fasting resulted in the achievement of a systolic blood pressure (BP) below 120 in 82% of subjects with borderline hypertension with a mean 20 mm Hg reduction in BP (Goldhamer et al., 2002).
- BP remained significantly lower compared to baseline even after subjects resumed the normal diet for an average of 6 days (Goldhamer et al., 2002).

- A small pilot study of patients with hypertension (140 mm and above systolic BP) also showed that 10–11 days of fasting caused a 37–60 mm decrease in systolic BP (Goldhamer et al., 2001).
- These preliminary studies are promising but underscore the need for larger controlled and randomized clinical studies that focus on PF strategies that are feasible for a larger portion of the population.
- For both hypertension and RA, it will be important to develop PF-mimicking diets that are as effective as the fasting regimens described above but that are also tolerable by the great majority of patients.

Summary (Fasting)

- One general mechanism of action of fasting is that it triggers adaptive cellular stress responses, which result in an enhanced ability to cope with more severe stress and counteract disease processes.
- In addition, by protecting cells from DNA damage, suppressing cell growth, and enhancing apoptosis of damaged cells, fasting could retard and/or prevent the formation and growth of cancers.

Online Link to Research Paper (Fasting): https://ac.els-cdn.com/S1550413113005032/1-s2.0-S1550413113005032-main.pdf?_tid=79211811-178d-44d4-a22e-78d59fa5e9d9&acdnat=1528823865_6828ef0f3bb225da41d9ade3d9184117

*Pdf of this article is additional course notes for this subject

Intake and Other Forms Provided in Course Notes

- **Dietary Assessment** – Food Frequency Questionnaire (20 Multiple Choice Questions)
 - **Confidential Nutrition Screening Questionnaire:** *In addition to standard medical treatment, specific nutrition and supplementation practices have been shown to enhance the management of many health conditions, and help prevent health problems from developing that may run in your family. This questionnaire is designed to help identify the specific dietary modifications and supplements that are best suited to your individual health profile.*
- A. Large Number of Health Conditions we have covered in Course Program
 - B. Female Only Section (PMS, Menopausal Symptoms, etc.)
 - C. Family Health Section – based on conditions where genetics and lifestyle both influence manifestation of disease in many cases (Prevention is key)
 - D. Bone Density Testing Inclusion Criteria
 - E. Signs of Nutrient Deficiencies – we have covered them in this section
 - F. Drug-Nutrient Interactions and other Precautionary Concerns to factor in before recommending supplements

- Initial Appointment: Nutrition/Weight Loss Assessment Form
- Neuro-Musculo-Skeletal and Health Screening Questionnaire, Plus Surgeries, Medications, Supplements
- Perceived Stress Scale – is Cortisol a Factor and Sympathetic NS overdrive (Blood Pressure, GI problems, Sleep, Immune etc.)
- Sleep Questionnaire – sleep is major health determinant (offer advice for sleep hygiene if score poorly)
- 7-Day Diet History Log (with exercise and supplements documentation as well)
- Nutrition/Weight Loss Weekly Follow-up Note Taking by Practitioner Form
- Anthropometric Assessment and Conversion Table

Additional Course Notes

- Intake, Monitoring and Practitioner Note-taking Forms
- Recommended Annual Blood Tests
- Sample Promotion Brochure
- Oil of Oregano Research – Georgetown University
- Other Research related to Subject Materials
- More Details on Various Popular Dietary Plans (including Rotation Diet and Wheat Belly Diet)