Nutrition and Immunity

Randy Pendergrass LSN, CSCS, LMT
randycscs@gmail.com
Dig Deep

SYMPTOM

ROOT CAUSE
Nutrition and Immunity Topics

- Germ Theory, Immune System, and Metabolic Dysfunction
- Micronutrients: Vitamins, Minerals, Antioxidants, etc.
- Toxins:
  - Pesticides, medications, synthetic ingredients (food/skincare),
  - food toxins naturally occurring (gluten, oxalates, etc.) or produced during cooking (HCA’s, PAH’s)
  - Fats: Focus on Polyunsaturated fats and Immune Function
  - Sugar (refined carbohydrates) and Immune Function
- Digestion and Immune Function
- Healthy Eating to Optimize Immune Function
- Supplements
Mainstream Recommendations

- Masks
- Social Distancing
- Stay Indoors
- No Large Gatherings
- Wash Hands
- Get Tested
- Wait for a Vaccine
How About........

• Eat healthy
• Fresh air
• Sunlight (vitamin D)
• Activity
• Rest
Those at Highest Risk of Infection

- Age
- Existing Lung Conditions
- Heart disease
- Obesity
- Diabetes
- Cancer
- Weak Immune System (Meds)
- Liver and Kidney Disease
• Obesity is the result of a disruption of energy balance that leads to weight gain and metabolic disturbances that cause tissue stress and dysfunction.

• Metabolic disturbances lead to immune activation in tissues such as adipose tissue, liver, pancreas, and the vasculature, and individuals often present with elevated plasma markers of chronic low-grade inflammation.

• In addition to immune cells playing a role in the perpetuation of chronic disease, it has further been established that obesity negatively affects immunity, as evidenced by higher rates of vaccine failure and complications from infection.
The accumulation of fat tissue in lymphoid organs is not a novel phenomenon, as it is known to naturally occur with age. However, this change adversely affects immunity in older individuals. Interestingly, caloric restriction is known to impede this process and is associated with greater immunity and a longer lifespan in various animal models, including rodents and nonhuman primates. Therefore, obesity is thought to promote premature “aging” of the immune system.

Several studies have further demonstrated the complications of obesity after influenza exposure. Diet-induced obesity has been shown to impair memory CD8⁺ T cell responses to an influenza virus infection, resulting in increased mortality, viral titers in lung, and worsened lung pathology.

Accordingly, obesity has been shown to increase the risk of vaccine failure, including the vaccines for hepatitis B, tetanus, and influenza. Obesity is also associated with a greater risk of influenza-related complications and hospitalizations.
Germ or Terrain Theory
Germ Theory

• Louis Pasteur (1822-1895)
• Chemist
• “Father” of the germ theory
• Pasteurization
• Germs cause illness
• Believed the body to be sterile
Terrain Theory

• Claude Bernard (1813-1878)
• Physiologist
• Proposed “Milieu Interieur” (internal environment) which is the beginning of homeostasis coined by Walter Cannon
• Body is self regulating. If given optimal nutrition and a healthy environment it would function optimally
Terrain Theory

• Antoine Bechamp (1816-1908)
• Medical Doctor, Physicist, Chemist, Pharmacist
• “Father” of terrain theory
• Believed the body was not sterile and contained “mycrozymas” or little bodies
• The terrain (body) is everything
The Germ Filled Human

- Humans are composed of ~30-60 trillion cells (~20-30 trillion are immune related)
- Our microflora is part of our immune system
- Approximately 2-5 times more bacteria than human cells
- Microflora in our mouth, throat, intestine, skin, sinus, ears, stomach, lungs, etc.
- Yeast (Candida) is a normal part of our microflora
- 5-8% of the human genome is viral
- Microbes are nature’s recyclers
Germ or Terrain

• *Staphylococcus aureus* (staph infection) is a bacteria which is a normal part of our skin, sinuses, and other areas.

• *Streptococcus pyogenes* (strep throat) is a normal inhabitant of our throat, skin, and other areas

• *Candida albicans* (yeast infection) is a normal inhabitant of the colon, mouth and other areas

Bacteria, yeast, and viruses are a normal and important part of the human ecology. They provide various beneficial functions. Many scientists for over a century have shown that the PRIMARY cause of illnesses involving these microbes is an unhealthy body.

AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE
Immune System

- Recognize self from non-self
- Help in repairing the body
- Remove toxins - normal metabolic wastes, heavy metals, excess free radicals, synthetic chemicals, undigested food particles
- Fight and remove microbes that have translocated
- Search for and remove cancerous and damaged cells

*Skin and microflora are also organs of the immune system*
Immunology

- Most immune cells are made in the bone marrow
- 40-70% of immune system surrounds the gut
- Multiple types of immune cells with multiple functions
  1. White blood cells
  2. Macrophages
  3. T cells
  4. B cells
  5. Natural killer cells
  6. HDL and LDL
Plasma lipoproteins (VLDL, LDL, Lp[a] and HDL) function primarily in lipid transport among tissues and organs. However, cumulative evidence suggests that lipoproteins may also prevent bacterial, viral and parasitic infections and are therefore a component of innate immunity. Lipoproteins can also detoxify lipopolysaccharide and lipoteichoic acid. Infections can induce oxidation of LDL, and oxLDL in turn plays important anti-infective roles and protects against endotoxin-induced tissue damage. There is also evidence that apo(a) is protective against pathogens. Taken together, the evidence suggests that it might be valuable to introduce the concept that plasma lipoproteins belong in the realm of host immune response.
Metabolic Dysfunction

• All cells need to:
  1. Produce energy
     a. calories (carbohydrates, fat, protein) needed
     b. micronutrients (vitamins, minerals, etc.) needed to burn calories
  2. Reproduce and repair itself
     a. calories (fat and protein) and micronutrients needed
  3. Get rid of waste
     a. calories and micronutrients needed
Your Metabolism
Basic Cell Diagram

- nucleus
- mitochondria
- cytoplasm
- cell membrane
- vacuoles
Essential Metabolic Nutrients That Run Your Metabolism

<table>
<thead>
<tr>
<th>Vitamins</th>
<th>Minerals</th>
</tr>
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<tbody>
<tr>
<td>Biotin</td>
<td>Calcium</td>
</tr>
<tr>
<td>Vitamin B1-Thiamin</td>
<td>Chloride</td>
</tr>
<tr>
<td>Vitamin B2- Riboflavin</td>
<td>Chromium</td>
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<tr>
<td>Vitamin B3- Niacin</td>
<td>Cobalt</td>
</tr>
<tr>
<td>Vitamin B4- Choline</td>
<td>Copper</td>
</tr>
<tr>
<td>Vitamin B5- Pantothenate</td>
<td>Iodine</td>
</tr>
<tr>
<td>Vitamin B6- Pyrodoxine</td>
<td>Iron</td>
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<tr>
<td></td>
<td>Magnesium</td>
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<tr>
<td></td>
<td>Manganese</td>
</tr>
<tr>
<td>Vitamin B9- Folate</td>
<td>Molybdenum</td>
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<tr>
<td>Vitamin B12- Cobalamin</td>
<td>Phosphorus</td>
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<tr>
<td>Vitamin A</td>
<td>Potassium</td>
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<td>Vitamin D</td>
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<td>Sodium</td>
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<tr>
<td>Vitamin K</td>
<td>Zinc</td>
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<tr>
<td>Vitamin C</td>
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# Essential Metabolic Nutrients

## Amino Acids (Proteins)
- Leucine
- Isoleucine
- Valine
- Methionine
- Threonine
- Tryptophan
- Phenylalanine
- Lysine

## Fatty Acids
- Omega 3 fat - alpha linolenic acid
- Omega 6 fat - linoleic acid
<table>
<thead>
<tr>
<th>% Calories for 20-30 Year Olds</th>
<th>% Calories</th>
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</thead>
<tbody>
<tr>
<td>1. Non diet soft drinks</td>
<td>8.8</td>
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<tr>
<td>2. Pizza</td>
<td>5.1</td>
</tr>
<tr>
<td>3. Beer</td>
<td>3.9</td>
</tr>
<tr>
<td>4. Hamburgers/meatloaf</td>
<td>3.4</td>
</tr>
<tr>
<td>5. White bread</td>
<td>3.3</td>
</tr>
<tr>
<td>6. Cakes/pastries/doughnuts</td>
<td>3.3</td>
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<tr>
<td>7. French fries</td>
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<tr>
<td>8. Potato chips/popcorn/corn chips</td>
<td>2.7</td>
</tr>
<tr>
<td>9. Rice</td>
<td>2.6</td>
</tr>
<tr>
<td>10. Cheese/cheese spread</td>
<td>2.5</td>
</tr>
</tbody>
</table>

38.6