

Nutritional Supplementation

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This presentation is for educational purposes, not to replace the services of a qualified health care professional. The health issues related to nutritional deficiencies are just to highlight the role of nutritional deficiencies in everyone's health. This powerpoint is by no means designed to be comprehensive and complete.

Overview

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- Reasons for nutritional supplementation
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Opening

- The argument has been going on in the United States on the need for nutritional supplements. On one hand, a number of medical authorities say that we do not need nutritional supplements to be healthy. We can get all the nutrients that we need from food.
- In the ideal world especially in this century, we should be able to obtain all the nutrients our bodies need for optimum health without the need for nutritional supplements.
- On the other hand, given the widespread incidence of illness and disability in the United States, nutritional deficiencies appear to be commonplace.
- The question that all of us need to ask ourselves is what is really needed to experience optimum health? It looks like more and more it is due to nutritional deficiencies and over-exposure to toxins.

What is Nutritional Supplementation?

- Nutritional supplement is the use of nutrients, either from food sources or synthetic sources, to supplement the nutrients obtained and eaten from food sources.
- During pregnancy, it is known that mothers' nutritional needs are higher and they are given pre-natal vitamins.
- People with biochemical imbalances, many of them benefit from nutritional supplementation. This is true of people with mental health issues. People who are experiencing ill health, their need for nutrition will be higher than normal.

Reasons for Nutritional Supplementation

- Nutritional supplementation is known for dealing with specific health conditions such as scurvy which is a vitamin C deficiency or rickets which is a vitamin D deficiency.
- In view of the declining levels of nutrients in our soil, our plant based foods have declined in nutritional quality. Organic food tend to be higher in nutritional quality and lower in toxins whereas conventional grown foods tend to be lower in nutritional quality and higher in toxins. Farmed raised animals have different levels of nutrition versus grass-fed and free range animals (this includes eggs).
- According to Dr. Mark Hyman, MD, over 92 percent of Americans are deficient in one or more vitamins. The next two slides indicate levels of nutritional deficiencies.

Nutritional Levels in Americans (One Source)

- Vitamin A 34% deficient
- Vitamin C 25% deficient
- Vitamin D 70% deficient
- Vitamin E 60% deficient
- Calcium 38% deficient
- Magnesium 45% deficient

Nutritional Levels in Americans (Second Source)

National Nutritional Survey

<u>Nutrient</u>	<u>% Below RDA</u>
• Vitamin B-6	80%
• Magnesium	75%
• Calcium	68%
• Vitamin A	50%
• Vitamin B-1	45%
• Vitamin C	41%
• Vitamin B-2, B-3, B-12	34%
• Pao EM, Mickle SJ. "Problem Nutrients in the United States."	
• Food Technology 35:58-62, 1981.	

Suggested Protocol for Nutritional Supplementation

- It is unfortunate that the current medical and health care system (allopathic medicine) and health insurance companies focuses on disease management in the United States, instead of true prevention, nutrition, and promoting optimum health. Our television shows show countless ads and commercials for prescription drugs.
- There is definitely a difference between preventing disease and promoting optimum health. It is not the same thing.
- What is suggested that testing be done to assess your nutritional status as well as your toxic exposure, before beginning a program of nutritional supplementation, detoxification, transitioning to a more clean and nutrient dense diet and an exercise program. In a number of instances, sensitivities to foods and environmental toxins need to be tested. For some people, emotional issues need to be addressed when there is a history of emotional and sexual trauma.
- After the testing has been completed, it is important to use quality supplements, generally ones recommended by your health care provider and supplements that follow GMP (good manufacturing practices) practices and contain quality ingredients.

Types of Nutritional Supplements

- One thing to keep in mind about nutritional supplements, some of them are fat based and others are water based.
- Nutritional supplements can be based from food sources or synthetic.
- Another consideration is whether or not the nutritional supplement is bioavailable, easily absorbed by the body's cells. Some nutrients need co-factors or additional nutrients for absorption.
- It helps to be aware of the source of the nutritional supplements. For example, if the vitamin C is made from corn and you are allergic to corn, it is better to use one not made from corn.
- Nutritional supplements come in different grades from pharmaceutical (highest) to lower levels. There is food grade (for human consumption) and feed grade (for animals).

Various Methods of Nutritional Supplementation

- There are a number of ways nutritional supplements can be taken.
 - Most common is the tablet (which is solid) or capsule (which is in powder form)
 - Available as gel tabs
 - Available as extracts
 - There are liquid forms
 - They can come in powder form
 - In some instances, it can come in via intravenous injections, like for mega dosage of vitamin C (which is done under medical supervision)

Herbal and Medicinal Mushrooms Supplements

- As the knowledge of the medicinal and beneficial benefits of herbs increases, there is a market of herbal as well as medicinal mushrooms supplements.
- It is important that these herbs and mushrooms be from organic sources and not grown with chemicals and pesticides. They need to be harvested at an optimum time.
- When using plant based supplements, it is recommended that the whole plant be used.

Assessing Specific Products and Nutrient Supplements

- One, it is suggested that your health care provider suggest which supplements to use.
- Two, it is important that they be quality products. There are a number of grades for nutritional supplements. They need not to have fillers, harmful preservatives, binders, excipients, flow agents, shellacs, coloring agents, gluten, yeast, lactose, and other allergens.
- Three, use products whose manufacturers follow GMP (good manufacturing practices) and have third party analysis for independent verification of active ingredients and contaminants. These products need to be based upon basic science, clinical trials, or have a long history of use and safety.
- Four, nutritional supplements do have expiration dates.

Assessing Specific Products and Nutrient Supplements continued

- Fat soluble nutrients are best taken with food with fats.
- Vitamin D – the best form. Sunlight is a great source of vitamin D and the version that is good is vitamin D₃ or cholecalciferol.
- Vitamin B12 – the best form is methylcobalamin.

Addendum

- Bibliography
- Categories of Nutrients
- Nutritional Deficiencies
- Definitions/Glossary
- Ideal Multi-Vitamin and Mineral Supplement
- Grades of Chemicals/Reagents
- Fillers Found in Nutritional Supplements

Addendum: Bibliography (one of five)

- Adaptive dysfunction of selenoproteins from the perspective of the 'triage' theory: why modest selenium deficiency may increase risk of disease of aging by J. McCann and BM Ames. Published in Foundation of American Societies for Experimental Biology, 2011 June; 25(6): 1793-814.
- <http://blog.gettespo.com/do-your-vitamins-contain-unnecessary-fillers-and-additives>
- Cognitive and clinical outcomes of homocysteine-lowering B-vitamin treatment in mild cognitive impairment: a randomized controlled trial by CA d Jager, A Outhal, R Jacoby, H. Refsum, and AD Smith. Published in: International Journal of Geriatric Psychiatry, 2012 Jun; 27(6): 592-600.
- Drug-Induced Nutrient Depletion Handbook by Ross Pelton, James B. LaValle, and Ernest B. Hawkins (2001) Publisher: Hudson, OH : Lexi-Comp, Inc. ; Cincinnati, OH : Natural Health Resources ; [Washington, DC] : American Pharmaceutical Association, ©1999-
- Foods, fortificants, and supplements: Where do Americans get their nutrients? by VL Fulgoni et al. Nutr. 2011 Oct; 141(10):1847-54.

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- http://www.healingedge.net/store/article_supplement_facts.html
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- <https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/>
- <https://ods.od.nih.gov/factsheets/Zinc-HealthProfessional/>
- <https://www.healthline.com/nutrition/iodine-deficiency-symptoms#section12>
- <https://www.healthyandnaturalworld.com/>
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- <https://www.livestrong.com/article/474661-what-are-the-functions-of-iodine-in-the-body/>
- <https://www.maggiesholisticsny.com/category/home-remedies/>

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- Powerpoint: Optimized Aging With Nutritional & Weight Management Techniques presented for USI Mid-America Institute on Aging, August 15, 2014 by Louis B. Cady, MD, FAPA with Cady Wellness Institute, Newburgh, Indiana (Slideshare.net)
- Powerpoint: Primary Prevention and Medical Treatment with Nutritional Supplements in Primary Care A Brief Overview by William R. Rogers D.O., CCN (no date, obtained from slideshare.net).

Addendum: Bibliography continued (five of five)

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- Vitamins for Chronic Disease Prevention in Adults by Robert H. Fletcher, MD, MSc; Kathleen M. Fairfield, MD, DrPH. Published in JAMA, 2002, 287: 3127-3129
- www.healingedge.net/store/articles_supplement_facts.html
- <https://www.healthyandnaturalworld.com/common-diseases-caused-by-vitamin-d-deficiency/>

Addendum: Categories of Nutrients

- The next set of slides covers basic nutritional categories.
- They include:
 - Vitamins and minerals
 - Essential fatty acids (fats) and Amino Acids (protein)
 - Enzymes and Hormones
 - Minerals: Iodine
 - Miscellaneous and Herbs and Plant based supplements
 - Probiotics and Prebiotics

Addendum: Categories of Nutrients

Vitamins

- Two types of vitamins exist, the water soluble ones and fat soluble ones.
- Folate deficiency plays a major role in preterm labor (can be reduced by 70%)

Minerals

- There are different categories of minerals, starting with major, electrolytes, minor, and trace minerals.
- Major ones include:
 - Calcium
 - Iodine
 - Magnesium
 - Potassium
 - Selenium
 - Sulfur
 - Zinc

Addendum: Categories of Nutrients continued

Essential Fatty Acids

- The problem appears to be deficiencies in the omega 3 fats and over abundance of omega 6 fats. There needs to be a proper ratio between the omega 3 fats and the omega 6 fats.
- Also, trans fats are harmful and cannot be processed by the body.

Amino Acids

- Essential and non-Essential amino acids
- The essential amino acids are needed from the diet.
- The non-essential amino acids can be created from the essential amino acids.

Addendum: Categories of Nutrients continued

Enzymes

- Digestive Enzymes
- Most food today is processed and enzymes have been deactivated. Irradiation of whole foods destroys some enzyme activity. Cooking destroys enzyme activity. Use of proton pump inhibitors blocks stomach acids. Removal of the gallbladder removes bile acids.

Hormones

- Melatonin

Note: There are other hormones, a number considered to be bioidentical hormones. This needs to be done under medical supervision. There are also herbals that can facilitate hormones in the body.

Addendum: Categories of Nutrients continued

Iodine (mineral)

- +
- Iodine is essential prior to conception. Inadequate iodine levels in the mother can cause low birth weight in the infant. Iodine levels also affect cognitive function, more means higher cognitive function. Iodine deficiency may be a role in ADD and ADHD in children.
- Every cell in the body needs iodine.
- Iodine is essential for energy.
- There seems to be research that high levels of iodine improves cognitive function
- Iodine is an essential component for the thyroid and thyroid hormones.
- Iodine helps with eliminating fluoride and bromide, and to a lesser extent, it helps to eliminate aluminum, lead, and mercury.

Addendum: Categories of Nutrients continued

Probiotics

- A healthy bacteria balance is needed in the intestinal tract or digestive track. Probiotics are a way to facilitate a healthy gut from a bacteria point of view.
- Probiotics comes in:
 - Families
 - Strains
 - Versions

Prebiotics

- Prebiotics are food for bacteria in the digestive tract, especially in the intestines.

Fermented foods such as sauerkraut and kimchi are a food source of probiotics.

Addendum: Categories of Nutrients continued

Miscellaneous

- Coenzyme Q10
- Fiber
- NAC
- Nitric Oxide

Herbs and Plant based supplements

- Garlic
- Ginger
- Grapefruit Seed
- Medicinal Mushrooms
- Tumeric

Note: This is just a partial listing. There are other nutrients and herbs with nutritional and medicinal benefits.

Addendum: Nutritional Deficiencies

- Inadequate dietary intake of vitamins and minerals are common.
- Deficiencies in micronutrients causes DNA damage in cultured or living human cells
- Partial Listing of Deficiencies in Health Issues
- Specific Nutrients:
 - Vitamin B12
 - Vitamin D
 - Magnesium
 - Selenium
 - Sulfur
 - Zinc
- This section of the powerpoint is just to highlight the importance of nutrition in health. It is not by all means comprehensive.

Addendum: Partial Listing of Nutritional Deficiencies in various health issues:

- Obvious Diseases
 - Goiter
 - Disorders of cell metabolism
 - Impaired immune system
 - Osteoporosis
 - Pernicious anemia
 - Premature aging
 - Poor psychological health
 - Some forms of cancer

Addendum: Nutritional Deficiencies (Vitamin B12)

Mental

- Anxiety
- Apathy
- Dementia
- Depression
- Hallucinations
- Irritability
- Memory loss
- Personality changes
- Violent behavior

Physical

- Chronic fatigue
- Clumsiness
- Diminished sense of touch and pain
- GI problems
- Pernicious anemia
- Tremors
- Weakness

Addendum: Nutritional Deficiencies (Vitamin D)

- Needed for the Immune System
- Can affect
 - Allergies
 - Asthma
 - Cancer
 - Cholesterol
 - Dementia
 - Depression
 - Heart Health
- Can affect continued
 - Inflammation
 - Influenza
 - Oral Health
 - Osteoporosis
 - Rheumatoid Arthritis
 - Type 2 Diabetes

Source: <https://www.healthyandnaturalworld.com/common-diseases-caused-by-vitamin-d-deficiency/>

Addendum: Nutritional Deficiencies (Iodine – Mineral)

- Changes in heart rate
- Dry, flaky skin
- Fatigue and weakness
- Feeling colder than usual
- Hair loss
- Heavy or irregular periods
- Problems during pregnancy (side effects for both mother and baby)
- Swelling in the neck
- Trouble learning and remembering
- Unexpected weight gain

Iodine is a major mineral and has been covered under categories of nutrients.

Source: <https://www.healthline.com/nutrition/iodine-deficiency-symptoms#section12>

Addendum: Nutritional Deficiencies (Magnesium - Mineral)

Factors that decreases intake of Magnesium

- Not in Processed Food
- Stress depletes magnesium
- The following decreases magnesium levels:
 - ETOH (Ethyl Alcohol), caffeine, sodas, and medications

Role of Magnesium

- Decreases cortisol levels (stress hormone)
- Relaxes muscles and prevents cramps

Addendum: Nutritional Deficiencies (Magnesium - Mineral) continued

Psychiatric Issues

- Difficulty with memory and concentration
- Depression and apathy
- Emotional lability
- Irritability, nervousness, and anxiety
- Insomnia
- Autism
- ADHD

Physical Health Conditions

- Migraine headaches
- PMS
- Dysmenorrhea
- Fibromyalgia
- Fatigue
- Constipation

Addendum: Nutritional Deficiencies (Selenium – Mineral)

Benefits of Selenium

- Protects all membranes
- Reduces risk of cancer
- Enhances immune system
- Anti-oxidant

Symptoms of *Selenium Deficiency*

- Cancer
- Heart disease and heart attacks
- Immune dysfunction
 - Muscular dystrophy
 - Cystic fibrosis

Addendum: Nutritional Deficiencies (Sulfur - Mineral)

- Sulfur is the third most abundant mineral in the body
- Needed for insulin production
- Sulfur detoxifies at the cellular level and relieves pain
- Sulfur builds flexible cells in the arteries and veins
- Considered a beauty mineral because it helps with skin and hair health
- Has anti-parasitic action
- Has anti-allergenic properties
- Needed in conjunction with vitamin C

Addendum: Nutritional Deficiencies (Zinc – Mineral)

Zinc levels in Food

- Fast Food low in micronutrients especially zinc

- **Role of Zinc**

- Antioxidant processes are dependent on zinc
- Correlates to inflammation in testicular tissue and decreased testosterone levels

- Low levels of zinc can be a factor in:
 - Growth retardation
 - Loss of appetite and weight loss
 - Impaired immune function and chronic infections
 - Delayed healing of wounds
 - Birth defects
 - Infertility
- More severe deficiency results in:
 - Hair loss
 - Diarrhea
 - Delayed sexual maturation and impotence
 - Hypogonadism in males
 - Eye and skin lesions

Addendum: Definitions and Glossary (one of three)

- Co-factors – supplementary ingredients needed for the optimum absorption of the primary nutrient
- Dietary supplement - A dietary supplement is defined under the Dietary Supplement Health and Education Act of 1994 (DSHEA) as a product that is intended to supplement the diet and contains any of the following dietary ingredients: ☐ a vitamin, mineral, herb or other botanical, or amino acid ☐ a dietary substance for use by people to supplement the diet by increasing the total dietary intake ☐ a concentrate, metabolite, constituent, extract, or combination of any of the above ☐ Furthermore, it must also conform to the following criteria: ☐ intended for ingestion in pill, capsule, tablet, powder or liquid form ☐ not represented for use as a conventional food or as the sole item of a meal or diet ☐ labeled as a "dietary supplement" ☐ The hormones DHEA , pregnenolone (also a steroid) and the pineal hormone melatonin are marketed as dietary supplements in the US
- GMP – General Manufacturing Practices
 - meets required specifications for quality and purity ☐ is evaluated and monitored for potential contaminants such as filth, heavy metals, pesticides, and microbiological organisms (Designs for Health packaging is also monitored to ensure against contamination) ☐ is analyzed to confirm the quantity of all dietary ingredients, thereby ensuring the consistency and accuracy of label claims

Addendum: Definitions and Glossary continued (two of three)

- Independent and third party testing – a third source that tests the validity and quality of the nutritional supplement without financial ties and conflict of interest to the company
- Pharmaceutical Grade – highest quality of nutritional supplement
- Nutraceutical Supplements – nutritional supplements that have medicinal and therapeutic properties
- Nutrigenomics – The positive and negative relationship between diet/nutrients and genetics

Addendum: Definitions and Glossary continued (three of three)

- **ORAC** stands for Oxygen Radical Absorbance Capacity. Scientists have developed at a lab test that aims to quantify the “total antioxidant capacity” (TAC) of a fruit, vegetable, or other food taking a sample and placing it in a test tube with chemicals that cause free radical activity, along with select molecules that are vulnerable to oxidation. After a specific span of time, the scientists measure how well the food sample protected the vulnerable molecules from free radical damage. A higher ORAC value is assigned to foods that provided more protection. Source: <https://vibranthealth.com/info-hq/whats-an-orac-unit/>
- **Orchestra theory of nutrients** — In order for the body to perform on an optimum basis, it needs all of the nutrients in the right range to function. In other words, it is not just a single nutrient that is essential. All of the nutritional are essential to experience optimum health and behave like an orchestra. Roger Williams, a biochemist, developed this theory.

Addendum: Ideal Multi-Vitamin and Mineral Supplement

- Complete. Based on the latest nutritional science, women need at least 30 vitamins and minerals, plus a rich essential fatty acid formula (i.e., EPA and DHA).
- Bioavailable. The nutrient forms must be the most bioavailable. There are six patented chelated formulas we recommend be included. And of course it must meet USP standards for solubility.
- Natural. No artificial preservatives, dyes, allergens or other contaminants. The fatty acid formula (derived from marine lipids) must be certified to be free of mercury and lead. See the next slide for a brief listing of fillers found in supplements.
- Reliable. NSF and GMP labeled. Laboratory tested. As is true for pharmaceutical drugs, every production batch of a nutritional supplement must be tested in a laboratory (i.e., “standardized”) to ensure that it contains exactly what is on its label.
- Makes a difference. You are the final test. If the nutritional supplement doesn’t make you feel better within the first 30 days, try another formula. It may not resolve all your symptoms in that time, but you should feel a real improvement.

Addendum: Grades for Chemicals and Reagents

- There are different grades of chemicals and uses.
- 1. ACS grade meets the American Chemical Society (ACS)
- 2. Reagent grade is generally equal to the ACS grade, and suitable for food, drug, or medicinal use.
- 3. USP grade is for the United States Pharmacopeia (USP) , and acceptable for food, drug, or medicinal use.
- 4. NF grade is the National Formulary (NF).
- 5. Laboratory grade is for educational use, not pure enough for food, drug, or medicinal use.
- 6. Purified grade is not pure for food, drug, or medicinal use.
- 7. Technical grade is not pure enough for food, drug, or medicinal use, but can be used for commercial and industrial purposes.

Addendum: Fillers Found in Nutritional Supplements

- Artificial Colors
 - Hydrogenated Oils
 - Magnesium stearate
 - Microcrystalline cellulose
 - Silicon dioxide
 - Simethicone
 - Starch
 - Stearic acid
 - Talc and propylene glycol.
 - Titanium dioxide
 - Vegetable gum
- Note: It is important to be aware of fillers found in nutritional supplements. For those gluten sensitive, you may need to avoid products that include grains, including rice. Another ingredient to look out for is fructose or anything that you are sensitive to.
 - The source below explains in more detail what these ingredients do.

Source: <http://blog.gettespo.com/do-your-vitamins-contain-unnecessary-fillers-and-additives>

Conclusion

- What is important for everyone to keep in mind is that nutritional supplements are not really designed to substitute diet. It is only there to supplement nutrients that are not available in the diet and deficiencies found in the body.
- At this point in time, we do not have U.S. government regulation oversight on nutritional supplements. Whether this is a good thing or not, it is important to work with a health care practitioner who is knowledgeable about nutrient supplements and which ones will work for you.
- Ideally, our health care system needs to systematically assess people's nutritional status as well as their exposure to toxins, and facilitate a plan to address these issues in implementing optimum health objectives.

Conclusion continued

- Our country is overdue for a true universal health care system found in 27 other industrialized countries. One of the other shortcomings of existing health care system, that coverage is obtained through employers and coverage varies from employer to employer and from state to state.
- Employers who arrange health insurance policies with the health insurance companies, they can request coverage for nutritional assessment and nutritional testing. This may result in healthier employees and reduce the need for surgeries and hospitalization.
- If someone because too ill to be gainfully employed, this results in loss of health insurance coverage from the employer. This is another reason to implement universal health care.
- What we have in the United States is an epidemic of ill health and disability. There is no reason why we can have a health care system (including dental health, vision, and hearing) designed to bring optimum and functional health to all of us.

Information about the authors

- Tamar Clarke has a master's degree in library science from the University of Pittsburgh and a master's degree in public administration from American University.
- April Huckabay has studied integrative health at Allegany College of Maryland with an AA degree, a Reiki master, Aroma Touch technician, and undertaken a number of classes on nutrition, yoga, and other independent classes. She does yoga classes, as well.

Note: One Source from Slideshare.net

