

FOOD AS MEDICINE
**Addressing Patient
Nutrition
Misconceptions With
Evidence-Based Data**

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A STEWARD FAMILY HOSPITAL



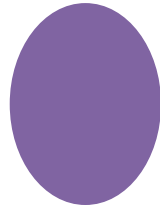
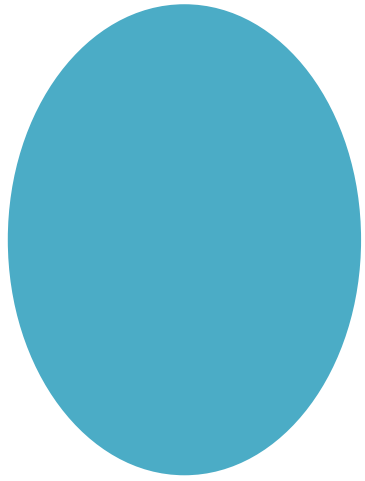


Disclosures/Affiliations

- I have no financial disclosures
- Clinical Nutrition Manager & Certified Diabetes Educator @ Davis Hospital & Medical Center
- 18 years experience
- Membership AND, AADE, ASPEN

Objectives

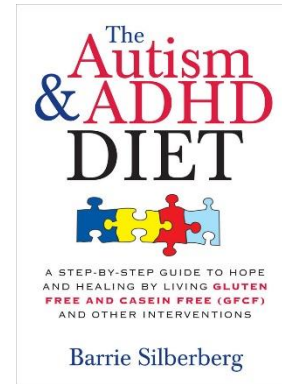
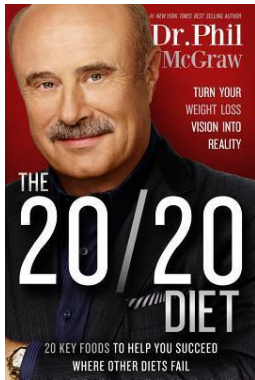
- **Define functional foods** and **list at least two examples of functional foods** that may interfere with prescribed medications
- **List two regulatory concerns** regarding dietary supplements (DS)
- **Identify at least three patient populations at risk** for nutritional misconceptions
- **List at least two resources** (digital or professional) to help you address patient nutrition misconceptions



MISCONCEPTIONS

WHERE are your patients getting their conflicting information?

Sources of Misconceptions

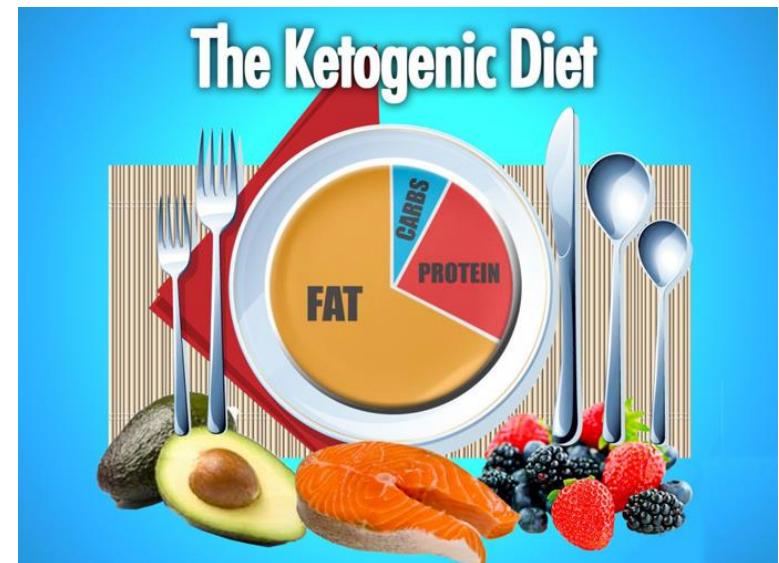


LEBRON JAMES' KETOGENIC DIET COULD BE YOUR TICKET TO BECOMING A SHREDDED BEAST... BUT AT WHAT COST?

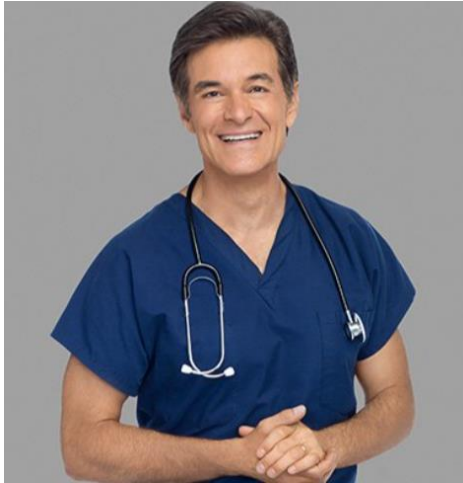
Is the food pyramid a lie?



James Booth | 28 Apr, 2018



Famous MDs – Integrative Medicine



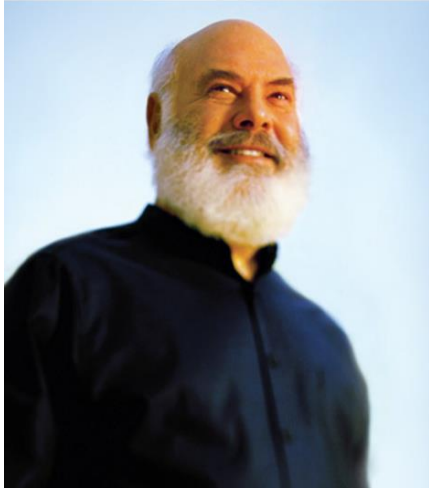
Mehmet Oz, MD –
Cardiothoracic surgeon.
After multiple appearance
on Oprah, launched his own
TV show in 2009.



Mark Hyman, MD – Director
of multiple medical centers,
still practicing physician,
complimentary and alternative
medicine advocate, testified to
Senate

<https://draxe.com/top-50-functional-integrative-medical-doctors/>

Famous MDs – Integrative Medicine



Andrew Weil, MD – Director Arizona Center for Integrative Medicine in Tucson, which trains health care providers from around the world in treating the whole patient.



David Perimutter, MD – Neurologist specializing in gut microbiome & the brain. Advocates gluten free & Mediterranean diet, probiotics

<https://draxe.com/top-50-functional-integrative-medical-doctors/>

Famous MDs – Integrative Medicine

Amy Myers, MD – Believes that inflammation is the root cause of most chronic disease. Created the Autoimmune Solution, a diet and lifestyle program to help reverse autoimmune disease.



Kelly Brogan, MD – Psychiatrist, diagnosed with Hashimoto's disease, became symptom-free naturally. Specializes in ADHD, anxiety, depression dietary treatments.

<https://draxe.com/top-50-functional-integrative-medical-doctors/>

Famous PhD – Integrative Medicine



Jeffrey Bland, PhD – Biochemist & Certified Nutrition Specialist. Founded the Institute for Functional Medicine in 1991, not-for-profit organization that educates health care practitioners on natural, effective approaches to treatment and prevention of chronic disease. Between lectures and medical education events, he has reached over 250,000 health care providers world-wide.

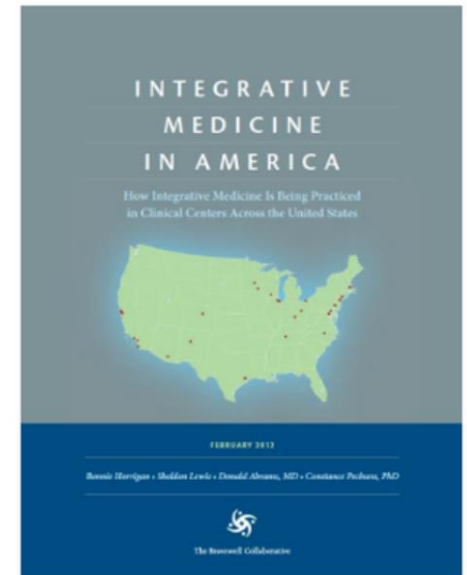
<https://draxe.com/top-50-functional-integrative-medical-doctors/>

Integrative Medicine is Popular!

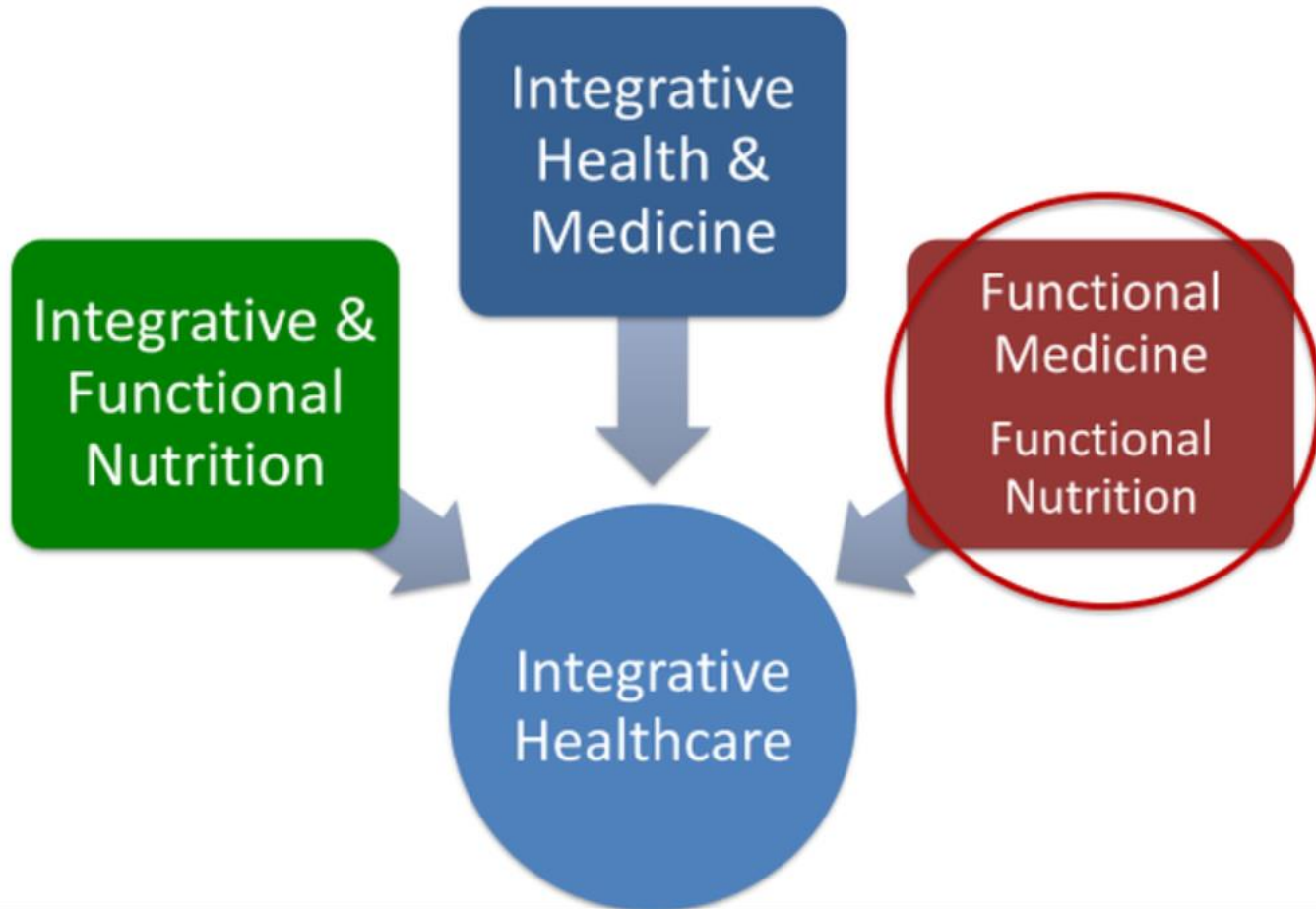
Integrative medicine (IM) is defined as the discipline concerned with using the combination of conventional allopathic medicine and alternative medicine to address the biological, psychological, social, and spiritual aspects of health and illness.

Introduced in MeSH® Database in 2009

In 2002, the Bravewell Collaborative was formed.
Goal: Shift the healthcare system to an integrative model & advancing many initiatives to include publication of the seminal report **Integrative Medicine in America - How Integrative Medicine Is Being Practiced in Clinical Centers Across the United States**. This survey established reference points for future surveys of 29 U.S. integrative medicine centers. **Food and nutrition and dietary supplements were used in the treatment of 19 of 20 conditions studied.**



Importance of Functional Foods



Functional Nutrition

- Emphasizes the **vital importance of food quality and adequate nutrition** in reversing disease and achieving optimal health.
- Uses **clinical data from a nutritional evaluation** to assess nutrition status and **personalize a dietary approach** that includes phytonutrient diversity and appropriate supplementation if needed.

Bravewell Mapping Survey Results

- Top 5 conditions treated (descending order):
 - Chronic Pain
 - GI conditions
 - Depression
 - Stress
 - Cancer

As a reminder, functional foods and dietary supplements were used in the treatment of 19 of 20 conditions studied.

- **As providers, patients want and need your guidance. They subcontract you to help them feel their best. If you cannot or will not help them, they will find other resources!**

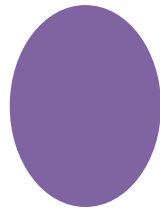
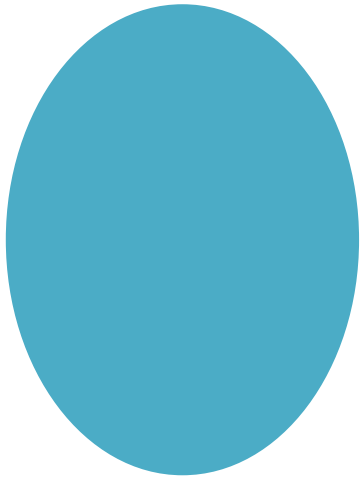


DIFM: Dietitian (RDN) Competency



Most integrative medicine clinics have a Registered Dietitian (RDN) on staff. There is an additional Certificate of Integrative & Functional Medicine that can be earned through the Academy of Nutrition and Dietetics.

What do integrative and functional dietitians do?
https://www.youtube.com/embed/GC_5zSJQi-o



FUNCTIONAL FOODS

WHAT is a functional food? **HOW** does it help prevent chronic disease?

Food As Medicine: Evidence

- **Functional foods** provide components necessary to fight inflammation. In Latin, inflammatio means “setting on fire”



- Claudio Franceschi, Judith Campisi; Chronic Inflammation (Inflammaging) and Its Potential Contribution to Age-Associated Diseases, *The Journals of Gerontology: Series A*, Volume 69, Issue Suppl_1, 1 June 2014, Pages S4–S9.
- u Haapakoski et al. Cumulative meta-analysis of interleukins 6 and 1 β , tumour necrosis factor α and C-reactive protein in patients with major depressive disorder. *Brain, Behavior, and Immunity*, Vol 49, October 2015, Pages 206-215
- u Danesh J, Whincup P, Walker M, et al. Low grade inflammation and coronary heart disease: prospective study and updated meta-analyses. *BMJ : British Medical Journal*. 2000;321(7255):199-204
- u Cefalu WT. Inflammation, Insulin Resistance, and Type 2 Diabetes: Back to the Future? *Diabetes*. 2009;58(2):307-308. doi:10.2337/db08-1656.

Functional Food Diet: Basics

- **REMOVE UNHEALTHY FOODS**

- Added sugar
- High gluten foods
- Unhealthy fats
- Processed foods with lots of sodium

- **INCLUDE HEALTHY FOODS**

- Colorful fruits & veggies
- Healthy fats, oils, nuts
- Low gluten grains

Deadly White Powder (SUGAR)



<https://healthylivinghowto.com/sugar-is-toxic/>

- In the amount we consume, it's toxic
- More addictive than cocaine in animal studies
- Highly inflammatory
- Major cause of obesity
- Hidden in most packaged and premade foods

Sugar Intake of Americans

- Average adult gets approximately 22 tsp (92 grams) per day.
- WHO recommends maximum of 6 tsp (25 grams) per/day.
- **Nearly 4X recommended amount!**

Beverage	Sugar (g)
20 oz. Classic Coke	65
15 oz Minute Maid Apple Juice	49
16 oz Red Bull	52
8 oz skim milk	11

Beverages Add Calories Fast!



<https://dinnertonight.tamu.edu/rethink-your-drink/>



5 Teaspoons
per 150g



3 Teaspoons
per half jar



4 Teaspoons
per 25g



4 Teaspoons
per bowl



6 Teaspoons
per pack



5 Teaspoons
per can



9 Teaspoons
per can



4 Teaspoons
per bottle

<https://www.zmescience.com/medicine/label-fda-added-sugar-percentage-0423423/>

BBB Affected by High Glucose

- Blood brain barrier disrupted
- High glucose promotes inflammation
- High glucose results in AGE metabolites leading to greater cognitive decline



<http://bipolarnews.org/?p=3401>

Kamada H, Yu F, Nito C, Chan PH. Influence of Hyperglycemia on Oxidative Stress and MMP-9 Activation After Focal Cerebral Ischemia/Reperfusion in Rats: Relationship to Blood-Brain Barrier Dysfunction. *Stroke; a journal of cerebral circulation*. 2007;38(3):1044-1049

Banks, William. The blood-brain barrier as a regulatory interface in the gut-brain axes. *Physiology & Behavior*, Vol 89, Issue 4, 30 November 2006, Pages 472-476.

Yaffe et al. Diabetes, Glucose Control, and 9-Year Cognitive Decline Among Older Adults Without Dementia. *Arch Neurol*. 2012.

C. Enzinger Risk factors for progression of brain atrophy in aging: six-year follow-up of normal subjects. *Neurology* May 2005

To Gluten or Not to Gluten



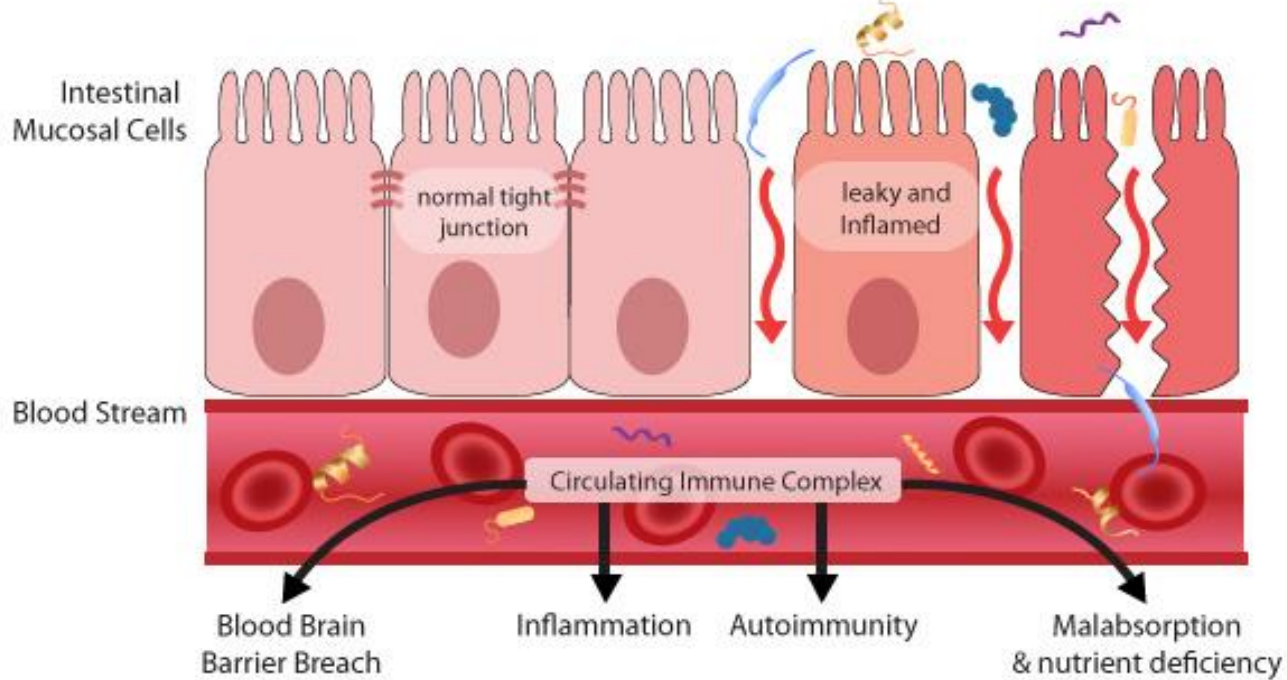
- Major 3 risk factors for gluten intolerance:
 - Environmental trigger
 - Genetic predisposition
 - Gut permeability, otherwise known as “leaky gut”



<https://www.healthline.com/nutrition/gluten-free-diet>

Leaky Gut Syndrome

Triggers Causing
Inestinal Damage



<http://haaswellnesscenters.com/wp-content/uploads/2017/08/Leaky-Gut1.jpg>

Foods Impacts **INFLAMMATION**

- **Inflammation** is an essential physiological process that supports healing.
- Acute inflammation is a short-lived, regenerative process. **Chronic inflammation** can cause imbalance and negatively impacted body systems.
- Inflammation **fuels** cytokine responses.

Kiecolt-Glaser JK, Derry HM, Fagundes CP. Inflammation: depression fans the flames and feasts on the heat. *Am J Psychiatry*. 2015;172(11):1075-1091.

Evaluate Inflammatory Biomarkers

- C-reactive protein
- Homocysteine
- Tumor necrosis factor alpha
- Interleukin-6.
- **Uncovering the cause** of the inflammation is important so dietitians can **tailor appropriate treatment.**
- **Generally, start with GI.** Disruptions in the digestive microbiome can contribute to neuroinflammation.



Tabung FK, Smith-Warner SA, Chavarro JE, et al. Development and validation of an empirical dietary inflammatory index. *J Nutr.* 2016;146(8):1560-1570.

Tabung FK, Smith-Warner SA, Chavarro JE, et al. An empirical dietary inflammatory pattern score enhances prediction of circulating inflammatory biomarkers in adults. *J Nutr.* 2017;147(8):1567-1577

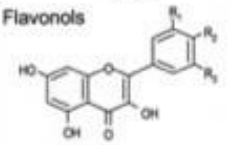

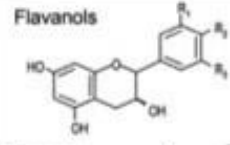

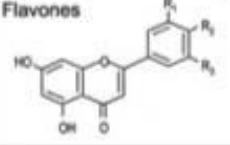

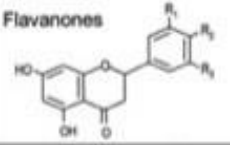

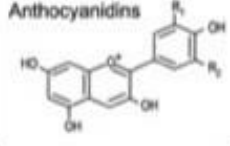

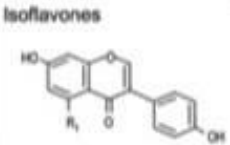

Functional Food Diets Have:

- Vibrant colors
- Plant-Based
- Minimal gluten
- Nature's packaging



What Science Says:

- Serum CRP concentrations are inversely associated with dietary flavonoid intake in U.S. adults (*Chun. J of Nutrition. 2008*)

Type	Food Sources
Flavonols 	Onions, Ginger, Broccoli, Asparagus & Leafy Greens 
Flavanols 	Red Wine, Chocolate, Black and Green Teas 
Flavones 	Celery, Parsley, and Oregano 
Flavanones 	Citrus Fruits and Juices 
Anthocyanidins 	Red and Purple Fruits and Vegetables Ex: Berries, Red Cabbage, Grapes, and Cherries 
Isoflavones 	Soy Foods Ex: Soy Milk, Tofu, Tempeh, Edamame 

What Science Says:



DASH Diet – the Key to Boost Women's Heart Health

<http://nursesknow.blogspot.com/2009/10/dash-diet-and-hypertension.html>

- A **DASH** diet (higher in fruits/vegetables, low in refined grains) compared a standard diabetic showed CRP decrease of 26.9% compared to 5.1% ($p=.02$) (*Azadbakht. J Nutr. 2011*)

What Science Says:

- Bing Cherry consumption decreased ($P < 0.05$) plasma concentrations of AGE products (29.0%), CRP (20.1%) (*Kelley. J Nutr. 2013*)



What Science Says:



- Strawberries and blueberries can decrease postprandial insulin secretion and CRP levels (*Torronen. J Nutr. Apr 2013; McDougall. Biofactors 23. 2005; Edirisinghe. Br J Nutr. 2011*)

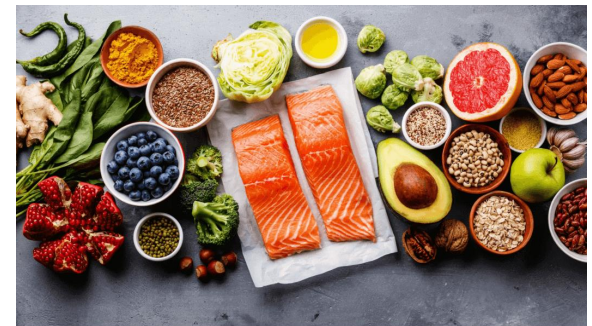
<https://www.globalhealingcenter.com/natural-health/healthy-berries/>

Mediterranean Diet Plan: Mood

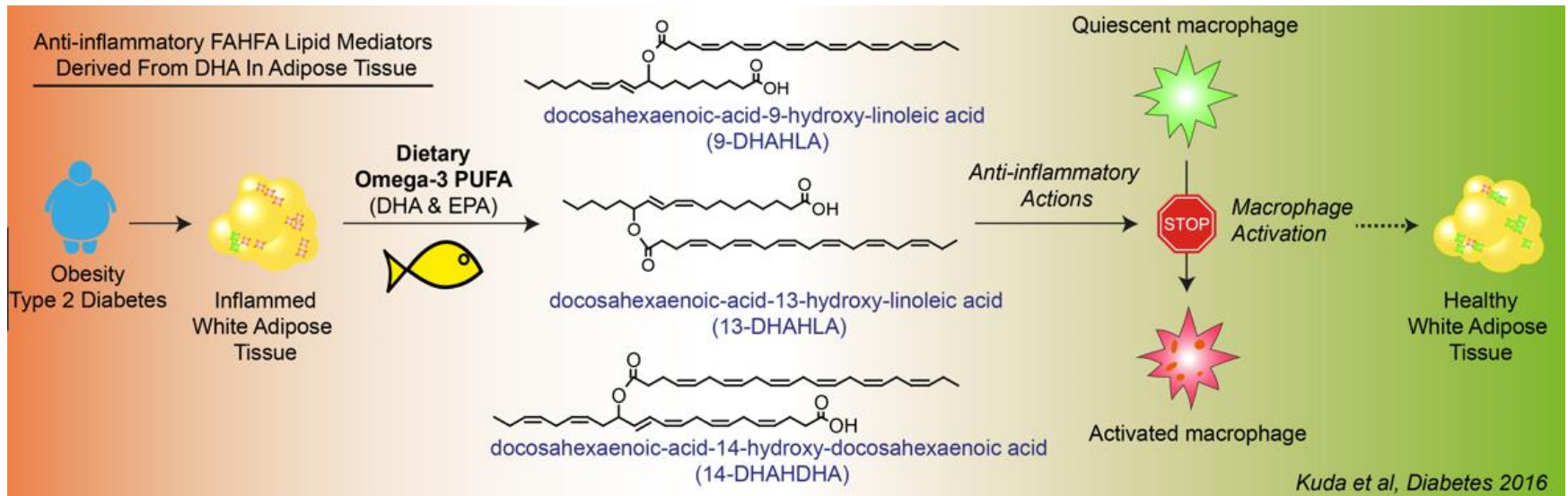
“Depressive disorders are associated with increased production of proinflammatory cytokines, such as interleukins 1 and 6 and C-reactive protein. These cytokines, whose levels are in part determined by dietary intake, may inhibit BDNF expression, interfere with neurotransmitter metabolism, and alter neurotransmitter messenger RNA. The Mediterranean Diet Plan (MDP) has been shown to reduce the levels of these cytokines and inflammatory modulators.”

Sanchez-Villegas et al.
Association of the Mediterranean dietary pattern with the incidence of depression. *Arch Gen Psychiatry* 2009

- +10,00 participants
- Followed 4+ years
- 42% decreased risk of depression



Omega-3s Fight Inflammation

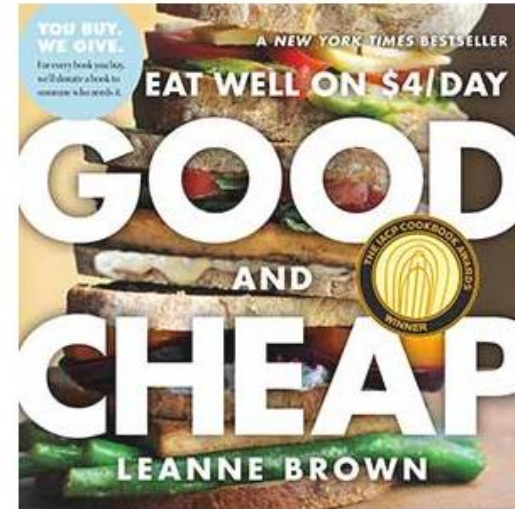
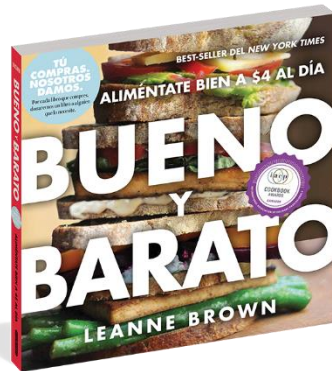


Docosahexaenoic acid-derived fatty acid esters of hydroxy fatty acids (FAHFAs) with anti-inflammatory properties. Ondrej Kuda, Marie Brezinova, Martina Rombaldova, Barbora Slavikova, Martin Posta, Petr Beier, Petra Janovska, Jiri Veleba, Jan Kopecky, Jr., Eva Kudova, Terezie Pelikanova and Jan Kopecky
Diabetes 2016 Jun; db160385. <https://doi.org/10.2337/db16-0385>

Food Affordability/Insecurity



<https://www.leannebrown.com/>



Good and Cheap is a gorgeous cookbook for people with limited income, particularly on a \$4/day food stamps budget. The PDF is free (ahora en Español!) and has been downloaded over 1,000,000 times. I have more cookbooks!

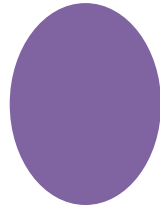
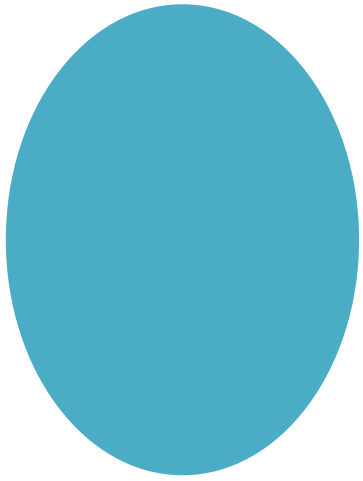
AMAZON

FREE PDF

PDF (ESPAÑOL)

AMAZON.CA

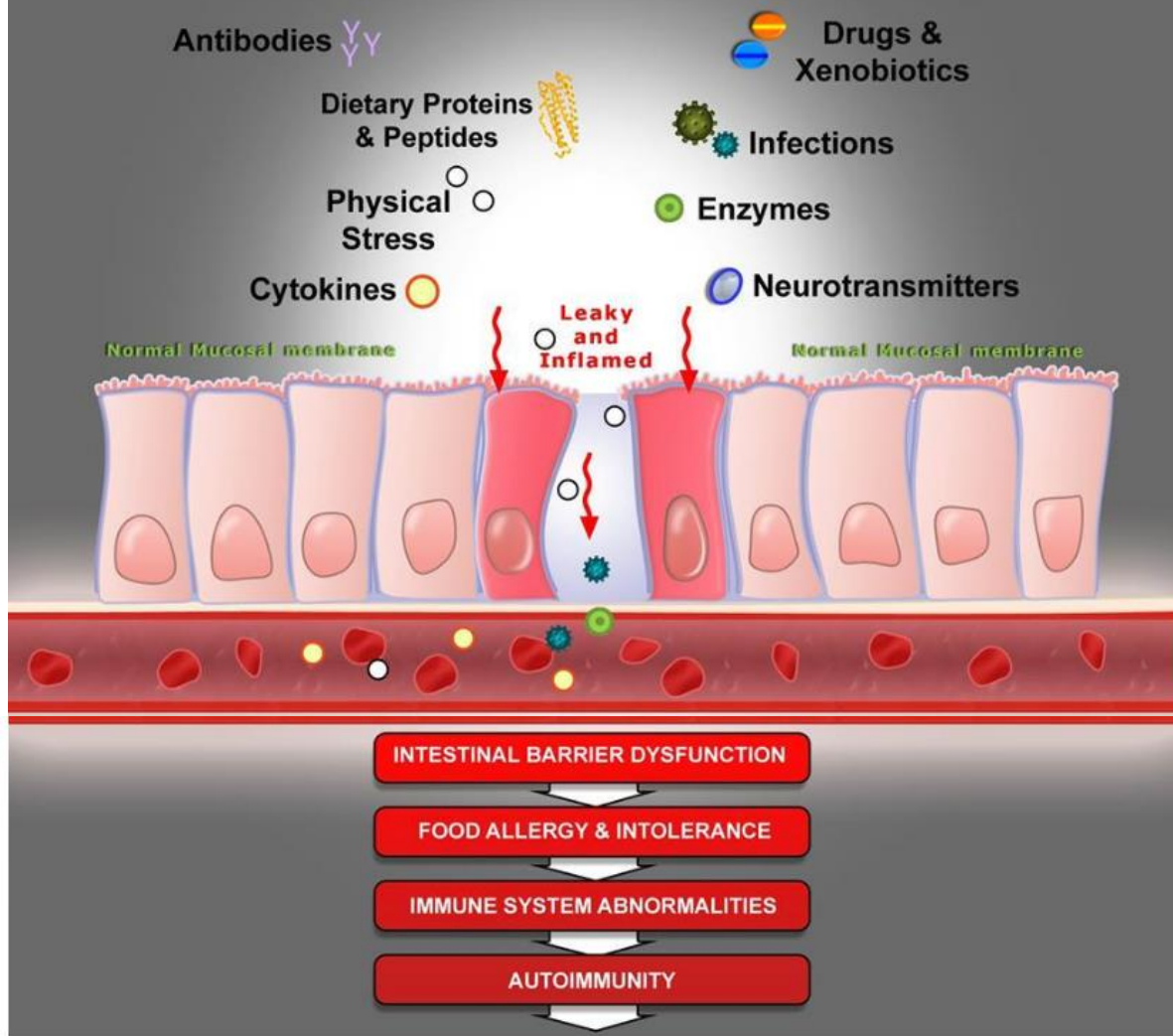
IN BULK: \$5.19/COPY!



IMPACT THE GI TRACT

HOW does GI
function impact
overall health?

Leaky Gut Syndrome



Gut microbiota participates in whole-body metabolism by affecting energy balance, glucose metabolism, and low-grade inflammation associated with obesity and related metabolic disorders.

Gut Microbes 3:4, 1-10, July/August 2012; © Landes Bioscience

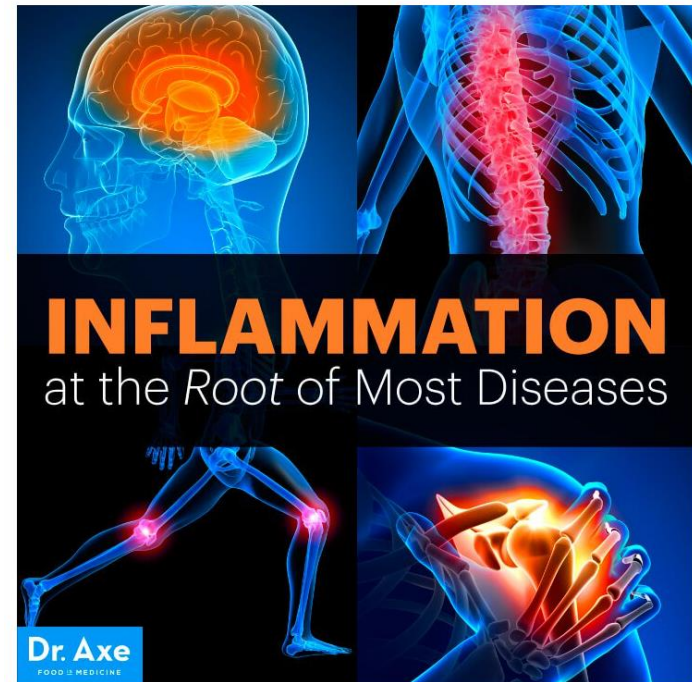
<https://rothwellness.com/alternative-therapies/leaky-gut-syndrome/>

Intestinal Permeability (IP)

Location	Diseases for which GI barrier function plays a crucial role in pathogenesis	Diseases associated with an altered composition/function of GI microbiota
Intestinal	<ul style="list-style-type: none">•Infectious diarrhea•Inflammatory bowel disease•Celiac disease•Irritable bowel syndrome	<ul style="list-style-type: none">•Inflammatory bowel disease•Celiac disease•Irritable bowel syndrome
Extraintestinal	<ul style="list-style-type: none">•Allergic diseases•Autoimmune diseases/arthritis•Obesity, fatty liver and non-alcoholic steatohepatitis•Systemic inflammatory response syndrome and sepsis in ICU patients•Malnutrition	<ul style="list-style-type: none">•Allergic diseases•Arthritis•Obesity

Causes of Chronic Inflammation

- Stress & childhood trauma
- **Low fiber, high glycemic, processed food diet**
- Sedentary lifestyle
- **Obesity**
- **Gut permeability**
- Smoking
- Atopic disorders

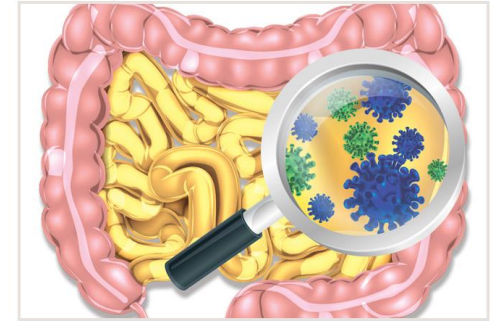


<https://draxe.com/inflammation-at-the-root-of-most-diseases/>

Berk et al. So depression is an inflammatory disease, but where does the inflammation come from? *BMC Medicine*201311

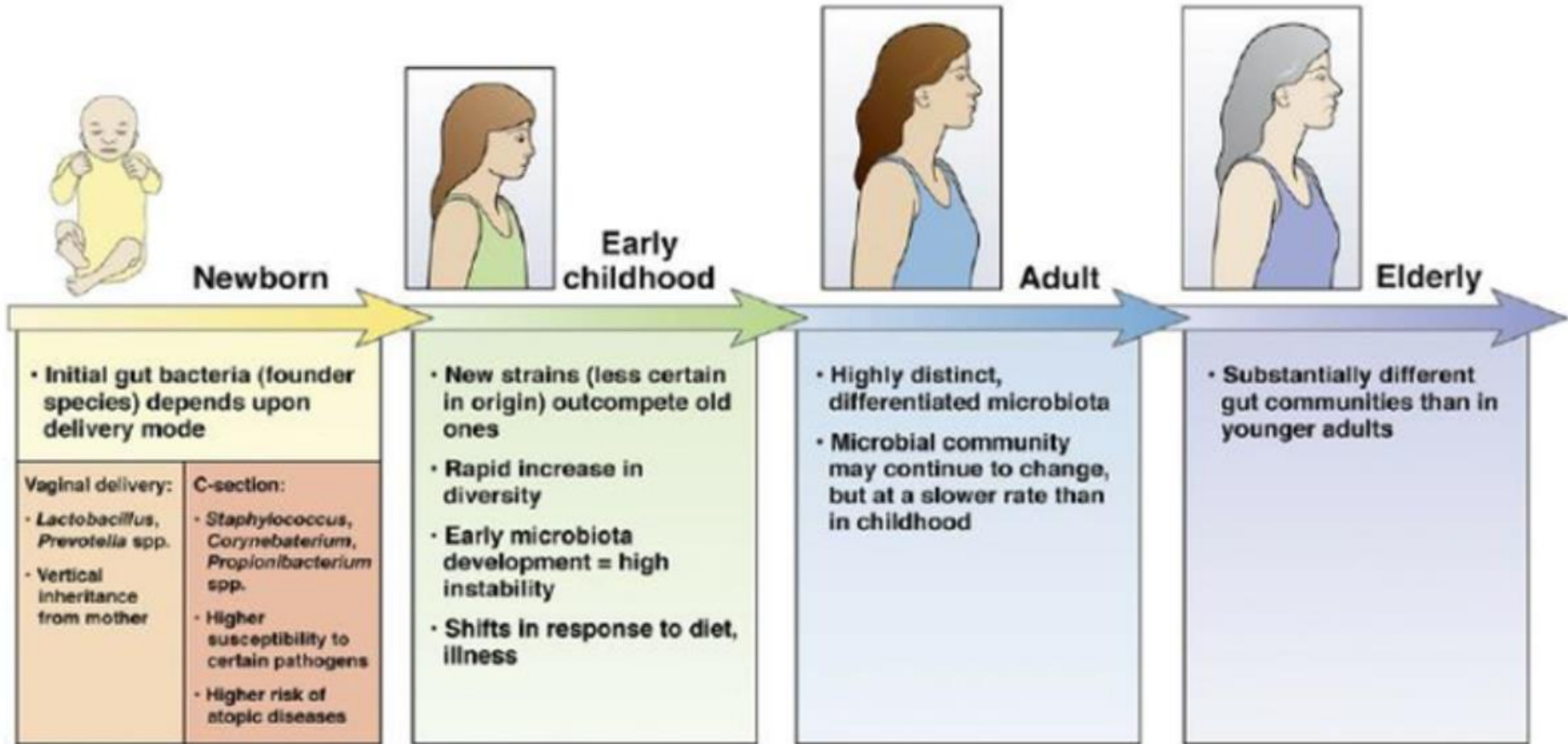
Developing A Good Gut Microbiome

- Majority of microbes in the colon & are part of genome
- Gut microbiome established from birth-first few years
- Gut bacteria, which create a 30 μm “biofilm” barrier, decrease as inflammation increases. This inflammation increases gut permeability. *Gut* 2007; 56:343-350



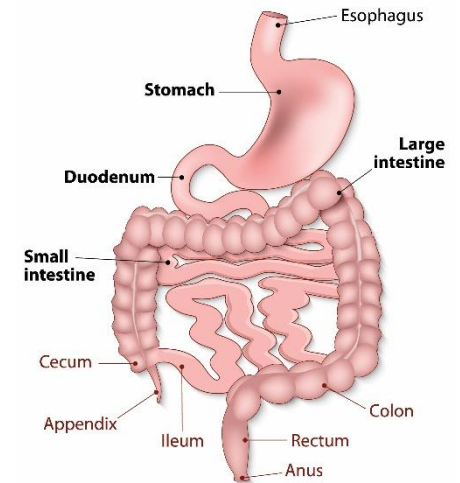
<https://vector.childrenshospital.org/2017/12/gut-microbiome-which-bacteria-really-influence-disease/>

Gut Microbiota Development



GI System is Amazing!

- Small intestines have surface area of tennis court
- More neurons than spinal cord or peripheral nervous system
- Produces 75% of neurotransmitters and 95% of body's serotonin
- Contains 70-80% of body's immune system
- Houses a genome 100-150X larger than the human genome:
 - 100 trillion bacteria
 - 500+ different species



Digestive Disease Increasing

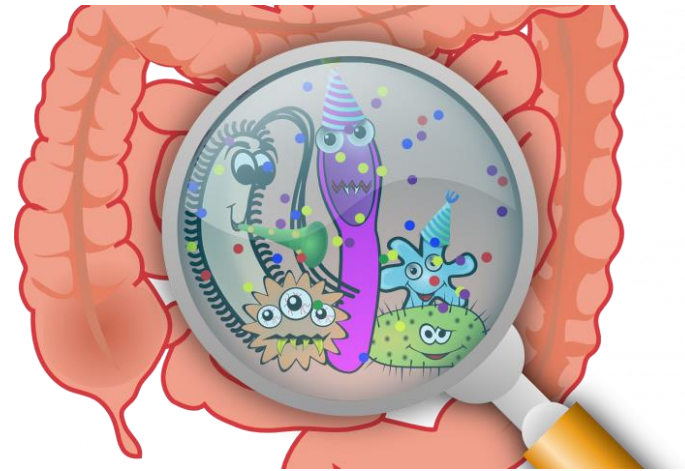


- **Prevalence:** 60-70 million Americans
- **Ambulatory care visits:** 48.3 million (2010)
- **Hospitalizations:** 21.7 million (2010)
- **Mortality:** 245,921 deaths (2009)
- **Diagnostic/therapeutic inpatient procedures:** 5.4 million (12% of all inpatient procedures in 2007)
- **Ambulatory surgical procedures:** 20.4 million (2010)
- **Costs:** \$141.8 billion (2004)

NIH: National Institute of Diabetes and Digestive and Kidney Diseases
<http://www.niddk.nih.gov/health-information/health-statistics/Pages/digestive-diseases-statistics-for-the-united-states.aspx>

Terminology

- Gut Microbiome – the collective genomes of the microbes that live within the GI tract from mouth to anus
- Dysbiosis – disruption of microbial balance



ATMs: ID & Treat GI Issues

- **Antecedents** – Predisposing factors of illness
 - Gender, age, poor nutrition, environmental exposure, and psychologic influences
- **Triggers** – Discrete events that provoke illness or symptoms (e.g. microbes)
 - Major exposure, emotional trauma, social or cultural factors
- **Mediators** – Intermediaries that contribute to the manifestation of disease
 - Keep a person from healing (allergens, poor nutrition, toxins, medications)

5R Protocol

- **Remove** stressors (elimination diet)
- **Replace** digestive secretions required for proper breakdown and absorption of nutrients
- **Repopulate** beneficial microbes (probiotics) and fiber (prebiotics) to support rebalance of the gut microbiome.
- **Repair** the gut with key nutrients
- **Rebalance** the GI tract/overall body with lifestyle changes

GERD Case Study: **ATMs**

ATMs that Contribute to GERD	Examples
Foods/Beverages	Alcohol, caffeine, chocolate, milk, fried foods, OJ, spicy foods, tea, tomato juice, acidic or citrus foods
Dietary Supplements	Herbs, high doses of essential oils, food triggers
Lifestyle	Smoking
Medications that weaken lower esophageal sphincter (LES)	Calcium channel blockers and beta blockers, anticholinergic drugs, iron, NSAIDs, potassium, dopamine, sedatives, bisphosphates
Physical	Positioning, hiatal hernia, overeating before bed, stricture or blockage
Psychological	Stress

GERD 5R Protocol Example

5 R Protocol	Examples
Remove	Remove any ATM that you can identify
Replace	Betaine HCL PPI
Repopulate/reinoculate	Probiotic (Lactobacillus acidophilus)
Repair	Antioxidant-rich foods (berries, cherries, squash, peppers); can also try fish oil, Chamomile tea
Rebalance	Exercise, meditation, acupuncture, cognitive behavioral therapy (CBT), deep breathing

IBD (UC/Crohns) Case Study 5Rs

5 R Protocol	Examples
Remove	Food triggers (elimination diet) <ul style="list-style-type: none">-Most common food intolerances: cereal, milk, eggs, veggies, citrus-Elemental diet-Low FODMAP diet-Specific Carbohydrate Diet (SCD)
Replace	Digestive enzymes
Repopulate/reinoculate	VSL #3 (UC) S. Boulardii shows promise Lactobacillus rhamnosus var GG 10-20 billion CFUs/day
Repair	Aloe vera, vitamin A, zinc
Rebalance	Meditation, deep breathing, yoga, acupuncture

IBS Case Study 5Rs




5 R Protocol	Examples
Remove	Remove trigger foods – elimination diet -Low FODMAP diet -Personalized elimination diet
Replace	Digestive enzymes
Repopulate/reinoculate	-Bifidobacterium infantis 35624 -Lactobacillus GG -VSL#3 -Fermented dairy improves symptoms
Repair	-Peppermint oil – enteric coated -Fiber (psyllium and ground flax seed) -L-glutamine
Rebalance	Acupuncture, mind-body practices to relieve stress

Probiotics – Live Microorganisms

- Name
 - Genus: Lactobacillus
 - Species: acidophilus
 - Strain: ATCC 4356
- Colony forming units (CFUs)
 - Dosage based on CFUs



Review of Six Popular Probiotics

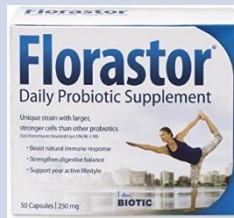
Probiotic	
<p>Align https://www.alinggi.com</p> 	<p>Bifidobacterium infantis 35624 Reduces symptoms of bloating, cramping, stool frequency in IBS. Recommended dose is 1 capsule/day.</p>
<p>Bio-K+ https://www.biokplus.com/en_us</p> 	<p>Lactobacillus acidophilus CL 1285 and L casei. Lowers incidence of antibiotic-associated diarrhea (AAD). Probiotic should be taken at different time than antibiotic. Dosage is 1-2 capsules/day.</p>
<p>Culturelle https://www.culturelle.com</p> 	<p>Lactobacillus rhamnosus GG ATCC 53103. Reduces severity and duration of acute infectious diarrhea and AAD in children and adults. Dosage 1-2 capsules/day.</p>

Review of Six Popular Probiotics

Probiotic

Florastor

<https://florastor.com/>



Saccharomyces boulardii. Prevents ADD and traveler's diarrhea in children/adults. Often used to treat chronic C. difficile. Dosage 2-3 capsules or powder packets/day.

Mutaflor

<http://www.mutaflor.com>



Can purchase in Canada, but not US. E coli Nissle 1917, may help in sustaining remission of ulcerative colitis. Takes 2-3 months for full effect. Titrating dosage.

VSL #3

<http://vsl3.com/>



Eight different strains of bacteria. Alleviates symptoms of IBS and UC. Safe for adults/children. Regular and double strength.

Terminology

- Prebiotics – nondigestible parts of food that support beneficial microbes



- Symbiotics – mix of probiotics, prebiotics, enzymes
 - <https://enzymedica.com/>



Participate in Research!

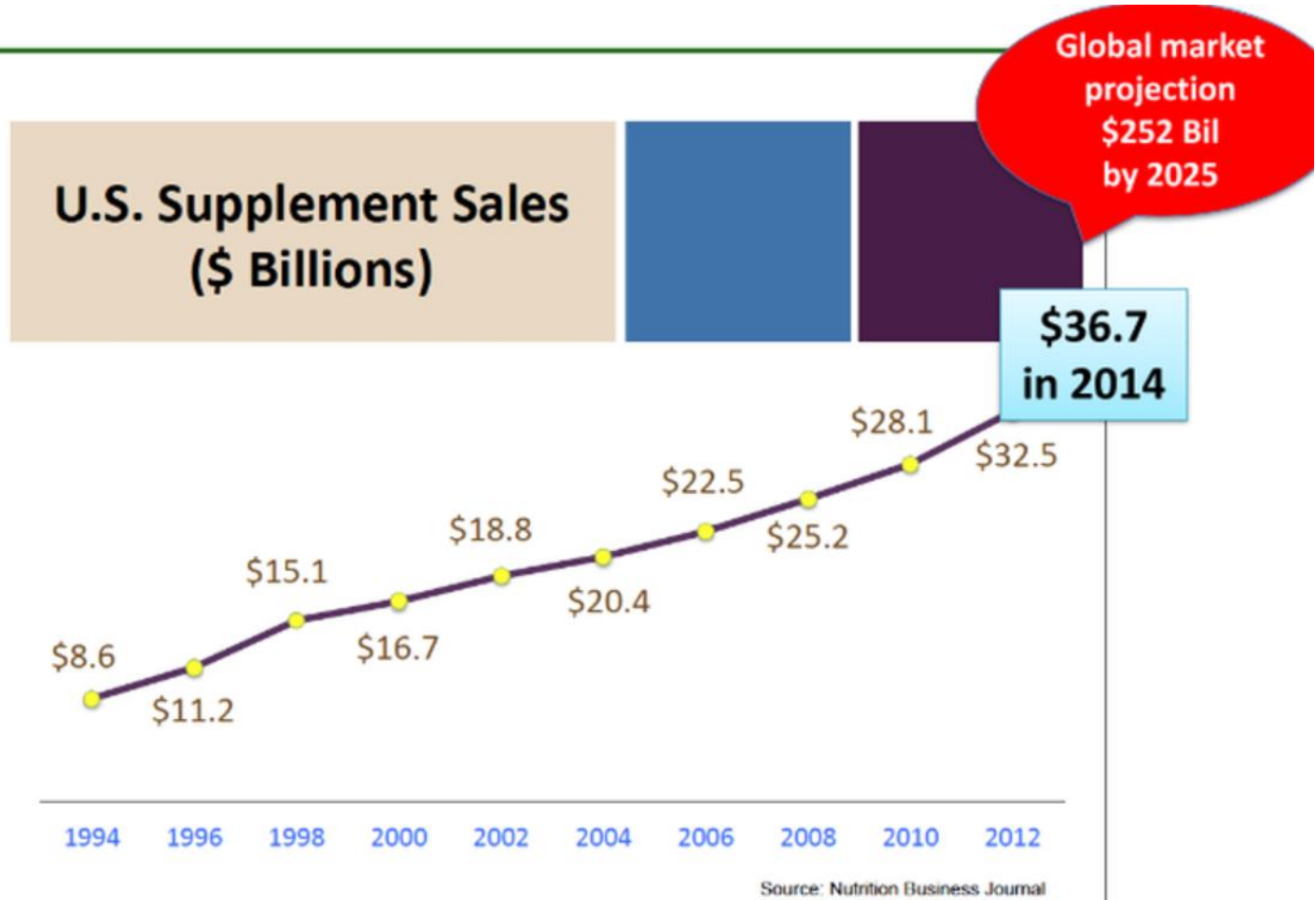
- <http://humanfoodproject.com/american Gut/>
- American Gut, supported through the Human Food Project
- Open access research project. Participants provide stool samples that are collected and entered into a database for research on the human microbiome.
- Personal report on the composition of your microbiome and how it compares to others involved in the research study.



PATIENT POPULATIONS

IDENTIFY at least
three patient
populations at risk
for nutritional
misconceptions.

DS are BIG BUSINESS!



Complementary Vs. Alternative Therapy

- **Complementary:** The use of a non-mainstream approach **together** with conventional medicine
- **Alternative:** The use of a non-mainstream approach **in place of** conventional medicine

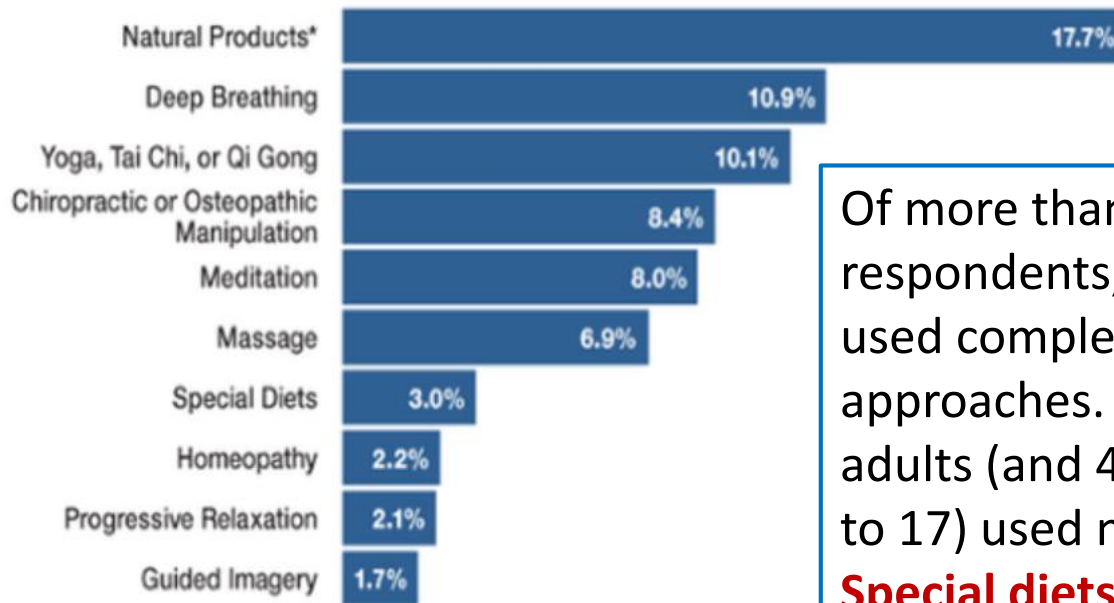
Dietary Supplements



- **Taken by mouth**
- Contains a dietary ingredient intended to supplement the diet.
 - Extract or concentrate
 - Tablet, capsule, softgel, gel caps, liquid, or powders
 - Can be in a bar, but label information cannot represent the supplements as a food
 - Can be a vitamin, mineral, herb, botanical, amino acid (protein), etc.

2012 National Health Interview Study

10 most common complementary health approaches among adults—2012



Of more than 34,000 civilian U.S. respondents, 33.2% of U.S. adults used complementary health approaches. A total of 17.7% of adults (and 4.9% of children age 4 to 17) used natural products.

Special diets were in the top 10 commonly used approaches by consumers seeking food-based solutions to their health issues.

NCCIH Goals:

- Study **complementary health** approaches
- **Encourage self care methods** that support healthy lifestyles
- Uncover potential usefulness and safety issues related to the use of **natural products**

DS Use in Children

- Improve overall health (41%)
- Maintain health (37%)
- Supplement diet (23%)
- Preventative health (20%)
- “Boost” immunity (14%)
- Most frequently used DS: MVI, MVM, vitamin C, calcium-containing (in combination w/ Vitamin D or other nutrients) and botanicals
- Only 15% of children DS users used DS at the recommendation of a provider

DS Use for Sports Performance & Body Shaping in Children & Adolescents

- Monitoring the Future (MTF) yearly surveys of grades 8, 10, and 12 reveal increasing use of performance-enhancing DS. The most common include:
 - Creatine
 - Caffeine & energy drinks
 - Protein supplements
 - Amino acids
 - Nitric oxide boosters
 - Metabolic acidosis boosters
 - Anabolic prohormones (DHEA)



DS Sales to Under 18 Crowd

- Just because it is not recommended for use for those under 18, there is no law regulating sale or distribution.

Testosterone
Booster



Warning: Not Intended
for Use Under Age 18

Warnings

Not intended to treat low testosterone or sexual dysfunction.
Not intended for use by persons under 18. Do not use if pregnant or nursing. Discontinue use and consult a medical doctor if you experience unusual symptoms. Consult a medical doctor if you have diabetes and/or blood deficiency. Consult a medical doctor before use if you have been treated for or diagnosed with, or have a family history of any medical condition, or if you are using any prescription or over-the-counter drug(s) including blood thinners. Consult a medical doctor before starting a diet or exercise program. Do not exceed recommended serving. Improper use of this product will not improve results and is not advised. Use only as directed. Do not use if packaging has been tampered with. Store in a cool, dry place (60°F to 80°F). Keep out of reach of children.

National Social Life, Health & Aging Project (2010-2011) Age range: 65-82

- 1 or more medications: 88%
- 1 or more DS use: 64%
- 5 or more medications: 36%
- 2 or more DS 47%
- **Risk of DNI: 15%**
- Most common DS use: MV/MM, Calcium, Omega-3, Vitamin D, CoQ10, Vitamin E, folic acid
- **Adverse events: Choking hazard common**

DS Among Prescription Medication Users

- **NHANES III:** 34% of all U.S. adults reported both prescription medication and DS use.
 - **DS use highest by users with:** osteoporosis, thyroid, cancer, arthritis, cardiovascular, kidney, diabetes, respiratory and liver diseases
 - **Most common DS used:** MV/MM, MV + botanical, single vitamin, standard MV, fish oil and Omega-3, multi-ingredient botanical, single mineral and joint.
 - **Most common medications used with DS:** cardiovascular, followed by CNS, hormones, metabolic, psychiatric, anti-infection, GI, respiratory, miscellaneous, anticoagulants, topicals, antineoplastics, and immunologic

DS Use in Hospitalized Patients

- Studies find 60-80% of hospitalized patients use DS.
- “Don’t ask, don’t tell” common scenario
- Hospital policies and best practice are needed for DS use as part of medical reconciliation upon admission, during hospital stay and for discharge planning.



DS - Military Personnel



- 60-70% use DS
- 31% use 5 or more DS
- Most common DS: MV/MM, protein/amino acids, combination products (weight loss, energy), single vitamins or minerals, sports drinks, bars, gels, caffeine/energy drinks
- DS is more common among females, higher education levels, higher BMI, greater amount of resistance training, and elite military men.
- 22% reported one or more adverse events, more common with combination products.

<https://www.hprc-online.org/>



CHAMP
Consortium for Health and Military Performance

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Mental Fitness



Environment



Dietary Supplements

Davis Hospital and Medical Center





DRUG NUTRIENT INTERACTIONS

WHAT functional foods can interfere with prescription medications?

Foods that Interfere w/ Meds

Category	Food Interaction
Cholesterol-lowering agents Atorvastatin (Lipitor®) Fluvastatin (Lescol®) Lovastatin (Mevacor®, Altoprev™) Pravastatin (Pravachol®) Rosuvastatin Calcium (Crestor®) Simvastatin (Zocor®)	Grapefruit and pomegranate can interfere with efficacy
Anticoagulant Warfarin (Coumadin®)	High Vitamin K+ foods (dark green leaf)
MAO inhibitors Nardil (phenelzine) Parnate (tranylcypromine)	Avoid chocolate
Lanoxin (digoxin)	Licorice increases risk for Lanoxin toxicity



DIETARY SUPPLEMENTS (DS)

LIST two regulatory concerns regarding dietary supplements.
WHAT labeling can help your patients in selecting a DS?

Regulations State:

- **Compounding pharmacies may dispense** (by prescription only in most states) products with dietary ingredients with directions for **non-oral routes of administration** (transdermals, enemas, nebulized and inhaled, injectables or IV)
- There are **NO practice guidelines** that address non-oral routes of administration.



DSHEA – October 1994

- **D**ietary **S**upplement **H**ealth and **E**ducation **A**ct
- Manufacturers & distributors are responsible to make sure DS are:
 - Safe
 - Claims have evidence
 - Claims not false or misleading
- FDA's Current Good Manufacturing Practice (GMP) Guidelines
- Industry-wide
 - Well-maintained physical facilities
 - Quality control & proper manufacturing
 - Testing of materials in all aspects of processing as well as the final supplement
 - Handling customer complaints
 - Maintaining records (for recall, tracking, etc.)

FDA will exercise enforcement of DS CGMP if practitioners:

1. Prepare batches of DS and sell them to consumers without determining whether the DS is appropriate for each consumer's needs in a one-on-one personal consultation.
2. Prepare batches of DS for which there is a known or suspected safety concern.

According to FDA:

"We exercise enforcement discretion in the case of a one-on-one consultation by a practitioner who is adequately trained in his or her profession."

<https://www.fda.gov/Food/GuidanceRegulation/default.htm>

NLEA: Nutrition Labeling & Education Act

Allowed on DS Label

- NLEA Authorized Health Claims*
- Nutrient Content Claims*
- Nutrient Content Percent* Claims
- Structure and Function Claims**
- Claim of General Well-Being **
- Claim Related to Nutrient** Deficiency Diseases

NOT allowed on DS Label

- Health Claim Based on Authoritative Statements
- **Disease Claims***

*FDA review and approval required

** FDA preview or approval is **NOT** required

Food and nutrition practitioners using DS in practice should avoid the use of disease claims, both verbal and written.

USDA Interactive DRI



Compare DRIs and ULs to DS Amounts Per Serving

Activity: USDA's Food and Nutrition Information Center Interactive DRI for Healthcare Professionals
<https://www.nal.usda.gov/fnic/interactiveDRI/>

Vitamins

Each reference value refers to average daily nutrient intakes. Day-to-day nutrient intakes may vary.

Vitamin	Recommended Intake per day	Tolerable UL Intake per day
Vitamin A	700 mcg	3,000 mcg ⁶
Vitamin C	75 mg	2,000 mg
Vitamin D	15 mcg	100 mcg
Vitamin E	1 mg	100 mg
Vitamin K	120 mcg	1,000 mcg ⁷
Thiamin	1.2 mg	ND
Vitamin B ₁₂	2.4 mcg	ND
Riboflavin	1.3 mg	ND
Niacin	16 mg	1,000 mcg ⁸
Choline	425 mg	3,500 mg
Pantothenic Acid	5 mg	ND
Biotin	30 mcg	ND
Carotenoids	NA	ND ⁹

Click individual vitamins for fact sheet.
 Click on numbered footnote for more information.

Minerals (Elements)

Each reference value refers to average daily nutrient intakes. Day-to-day nutrient intakes may vary.

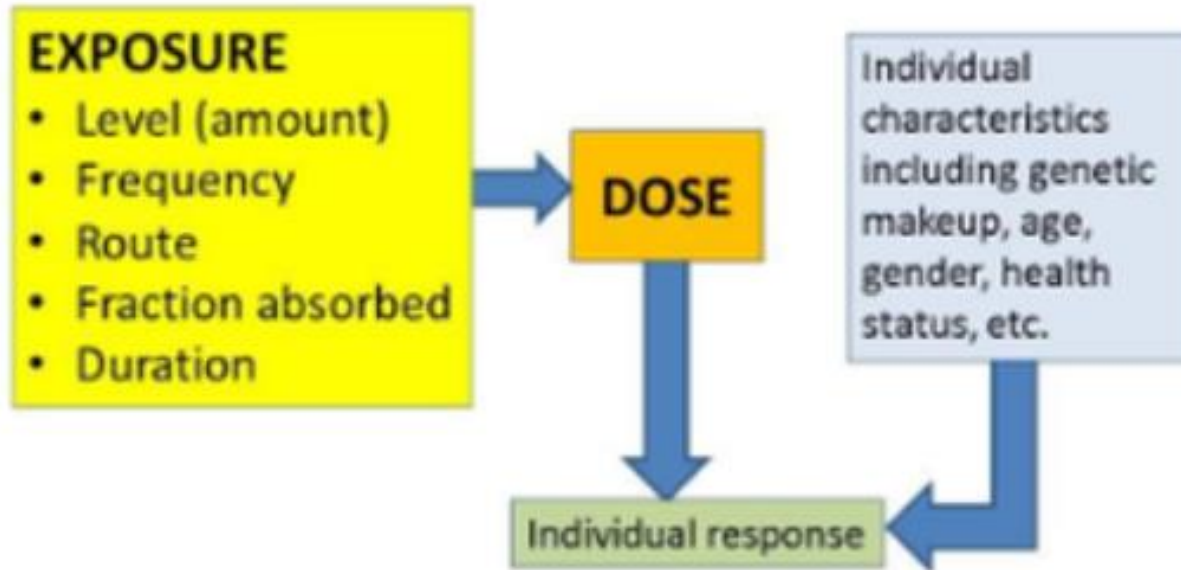
Mineral	Recommended Intake per day	Tolerable UL Intake per day
Essential		
Calcium	1,000 mg	2,500 mg
Chloride	2.3 g	8 g
Cromium	25 mcg	ND
Copper	900 mcg	10,000 mcg
Fluoride	3 mg	10 mg
Iodine	150 mcg	1,100 mcg
Iron	8 mg	45 mg
Magnesium	400 mg	350 mg ¹⁰
Manganese	2.3 mg	11 mg
Molybdenum	45 mcg	700 mcg
Phosphorus	700 mg	3,000 mg
Potassium	4.7 g	ND
Selenium	55 mcg	400 mcg
Sodium	2.3 g	2.3 g
Zinc	8 mg	40 mg
Non-Essential		
Aluminum	NA	50 mg ¹¹
Barium	NA	20 mg
Boron	NA	1 mg
Silicon	NA	50 mg ¹²
Sulfur	NA	ND
Vanadium	NA	1.6 mg ¹³

Click individual minerals for fact sheet.
 Click on numbered footnote for more information.

Best Available Evidence



Risk/Benefit Assessment



Consider dose, frequency, duration (have stop and start dates), variability in individuals

ER Visits Related to DS (2004-2013)

- 23,000 ER visits annually
 - Herbals 66%
 - Nutrient 32%
- Most common events:

Tachycardia, chest pain or palpitations (energy, body building or sexual performance products), allergic reactions (24%), abdominal pain, choking on pills by elderly, accidental ingestion by children (21%)



- Patient outcomes: 91% discharged from ER, 9% hospitalized.

Serious Adverse Event Vs. Side Effects

- **A Serious Adverse Event is** “Any health-related event that results in, for example, a death, a life-threatening experience, inpatient hospitalization, birth defect, or that require, based upon reasonable medical judgment, a medical or surgical intervention to prevent serious outcomes.”
- **Side effects** would include mild to moderate or **short-lived and self-resolving symptoms** like: GI distress (N, V, D or C), reflux, headache, drowsiness, or **Potentially foreseeable symptoms** (like bloating or gas with the use of probiotics)

Report Adverse Events to DS

FDA Safety Reporting Portal

Safety Reporting Portal

[ABOUT THE PORTAL](#) [SAFETY REPORT DIRECTORY](#) [FAQS](#) [RELATED LINKS](#) [CONTACT US](#)

The Safety Reporting Portal

The Safety Reporting Portal (SRP) streamlines the process of reporting product safety issues to the Food & Drug Administration (FDA) and the National Institutes of Health (NIH).

Whether your role, (manufacturer, health care professional, researcher, public health official, or concerned citizen), when you submit a safety report through this Portal, you make a vital contribution to the safety of America's food supply, medicines, and other products that touch us all.

Begin Reporting Here

1. Login
EMAIL:
PASSWORD:
Forgot your password?
 Remember me

2. Report As Guest
Not ready to create an account but would like to submit a report?
You can do that here.

Account Benefits

- Save a draft
- Email follow up
- View submissions
- Faster case entry

Who Should Submit a Safety Report?

Organizations and people in certain professional roles, such as the following, may be required by law to submit safety reports under some circumstances.

- Food Manufacturers, Processors, Packers, and Holders
- Researchers
- An applicant of an approved drug product or a manufacturer, distributor or packer listed on the label of any drug product
- Drug Manufacturers
- Dietary supplement manufacturers, packers, and distributors

Others, including health care providers, public health officials, and other professionals, as well as consumers and concerned citizens, may voluntarily submit reports if they encounter safety issues with a product and/or unanticipated harmful effects that they believe are related to a product.

Reports You Can Submit Through this Portal

FDA safety issues involving:

- Marketed human drug and therapeutic biologics
- Human or animal reportable foods
- Animal drugs
- Animal feeds
- Tobacco products
- Dietary supplements

NIH safety issues involving:

- NIH gene transfer research

For other issues, [find out where to submit your report.](#)

<http://naturaldatabase.therapeuticresearch.com/>

Consumer and Professional Versions by Subscription

NATURAL MEDICINES
COMPREHENSIVE DATABASE

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PROFESSOR'S LETTER
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PROFESSOR'S LETTER
IDENT A DRUG REFERENCE

Search Natural Medicines Comprehensive Database

- **Search** - enter any natural product name, disease or condition, or drug name... gives you objective product information, Effectiveness Ratings, or potential interactions with drugs, etc.
- **Natural Product Effectiveness Checker** - tells you the level of effectiveness for natural products used for various medical conditions.
- **Natural Product / Drug Interaction Checker** - tells you potential interactions between any natural product and any drug. Automatically checks for interactions with EACH INGREDIENT of each product.
- **Nutrient Depletion Checker** - identifies potential nutrient depletion issues caused by medications and provides a rating of the clinical significance.
- **Disease / Medical Conditions Search** - shows you medical conditions, and shows you to see which natural products might be effective.
- **Search Colleagues Interact** - shows you questions, answers, and comments posted by other health professionals.
- **Advanced Search** - helps you find specific information or keywords anywhere in the Database.

Clinical Management Series

Featured: Menopausal Symptoms

- ADHD
- Allergic Rhinitis
- Anxiety
- BPH
- Colds and Flu
- Depression
- Diabetes
- Drug Supplement Interaction
- Headache
- Heart Failure
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- Osteoarthritis
- Pain Management
- Urinary Tract Infections

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- Start a Discussion

Manage My Account

- View My Account
- eUPDATE

Charts

- Nutrient Depletion
- Caffeine Content of Energy Drinks

Now Mobile Version

- Mobile Version

Now you can take Natural!

WebMD Vitamins & Supplements Center

- Find a Vitamin or Supplement search
- Find by Condition search

Informed Consent – Be Proactive

- The process of securing agreement from patient or decision maker for nutrition intervention.
- **Informed consent must be obtained before stating or modifying the intervention, plan of care, or provision of services.**



USP Resource

USP U.S. Pharmacopeial Convention

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Dietary Supplements Compendium Development Process Reference Standards Verification Services Resources

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Dietary Supplement Resources

Dietary Supplement Quality: How the Top Manufacturers Do It

WATCH Dietary Supplement Quality: How the Top Manufacturers Do It

Newsletters
USP sends out via email periodic news about dietary supplement standards, Executive Committee activities, and industry hot topics with links to upcoming meetings and events. Sign up to receive:

- August 2016
- March 2016
- November 2015
- June 2015
- March 2015

Press Releases

- USP joins to publicly available resources designed to address dietary supplement quality challenges in a special issue of "Drug Testing and Analysis" devoted to the topic.

News Coverage

- Indian Ministry of AYUSH and USP sign Memorandum of Understanding to improve understanding and quality of traditional and herbal medicines.
- USP's Christine Feaster discusses on ABC7 how USP and the USP-verified seal can help consumers find the right supplements for cold and flu season.
- U.S. Pharmacopeial Convention (USP) The Science Behind Ingredient Integrity
- Dietary Supplements in Tablet Form
- The State of Purify: Industry Leaders Discuss Botanical Authentication in the Supplement Industry

Multimedia

- "How to Read a Dietary Supplement Label"
- "Choosing a Dietary Supplement" video: High Bandwidth or Low Bandwidth
- Follow USP-Verified on Facebook.

Guestbook Information:

- Scientific & Technical Support
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The Science of Dietary Supplement Verification

NEW CE COURSE

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USP General Chapters & Reference Materials Best Research Environment

**FREE Webinar
DS Quality:
How the Top
Manufacturers
Do It**

NSF Certification

The screenshot shows the NSF website's page for 'Dietary, Nutritional and Sports Supplements Certification'. The NSF logo is at the top left, with the tagline 'The Public Health and Safety Organization'. Navigation tabs include 'SERVICES', 'REGULATORY RESOURCES', 'CONSUMER RESOURCES', and 'TRAINING & EDUCATION'. The main heading is 'Dietary, Nutritional and Sports Supplements Certification'. Below the heading, there is a sub-heading 'Are you concerned about what's in your vitamins, minerals, herbs, botanicals, protein-bars or other supplement? It's NSF.' and a search bar. The page contains several sections: 'Search for Certified Products', 'Have Questions?' with contact information for the Consumer Information Office, 'How Supplements Become NSF Certified' which lists three components: Label claim review, Toxicology review, and Contaminant review; 'Special Requirements for Sports Supplements' which mentions NSF's role in protecting athletes; and 'A Truly Independent Program' which describes NSF's testing process. A red speech bubble on the right side of the page contains the text: 'FREE Search NSF Certified Products; NSF Certified for Sport app'.

FREE
Search NSF Certified
Products;
NSF Certified for
Sport app

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Warnings

Chocolate Hazelnut Butter CLIF Nut Butter Filled Energy Bars Recalled

Male Enhancement Supplement Recalled

In the News

Bloomberg

- The article "No Evidence of Aloe Vera Found in the Aloe Vera at Wal-Mart, CVS" on Bloomberg cites findings from ConsumerLab.com's Aloe Review and tests by Bloomberg.

ConsumerReports

- An article from Consumer Reports about "Supplement Seeds" shows that ConsumerLab.com is the only certifying organization that purchases its initial test samples in stores, while others obtain samples from the manufacturer.

Clinical Updates: Fish Oil for Psychosis?

Recent ConsumerLab.com Reviews

50% of Aloe Products Fail Testing [Full Review](#)

Find the Best Lipolic Acid Supplement at the Right Price

Choose Aloe Pills, Gels, and Drinks Carefully!

See Tests of 21 Turmeric/Curcumin Supplements and Spices

Most Popular Reviews | **Other Recent Reviews** | **Brands**

How to Get the Right Omega-3s from Fish, Krill & Other Oil Supplements: Best Fish Oil? See Our New Tests and Comparisons

43 Probiotic Supplements and Kefirs Tested: Surprising Findings for Probiotics and Kefirs

Too Much or Too Little Vitamin D Found in Some Supplements: Not All Vitamin D Supplements Contain What's On the Label!

Defects Found in 32% of Multis: New Findings for Women's, Men's, Children's & Pets' Multis

CoQ10 and Ubiquinol Differ in Quality, Absorption & Cost: Choose the Best CoQ10 & Ubiquinol -- and Save Money

Most Garcinia (HCA) Supplements Fail CL's Tests: Garcinia Weight Loss Supplements Found Lacking

See Tests of 21 Turmeric/Curcumin Supplements and Spices: 33% of Turmeric/Curcumin Supplements Fail, Filthy Spices

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Jennifer Syge, M.Sc., RD., Director of Nutrition - Cleveland Clinic, Canada

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Nutrition is a HUGE area of
research and it's difficult to keep
up! Consult RDNs for help.
When in doubt, refer out!**

**Gina R. Ward, MS, RDN, CDE
(801) 807-7184
Gina.Ward@Steward.org**



MORE PROVIDER RESOURCES

**LIST AT LEAST TWO
RESOURCES** to help
you address nutrition
misconceptions.

Get Educated!

Academic Programs in Integrative and Functional Nutrition

Bastyr University <http://www.bastyr.edu/>



Kansas University <http://www.kumc.edu/school-of-medicine/integrative-medicine.html>

Maryland University of Integrative Health <http://www.muih.edu/area-of-study/nutrition>

Saybrook University <http://saybrook.edu>



University of Bridgeport <http://www.bridgeport.edu/academics/graduate/nutrition-ms/>

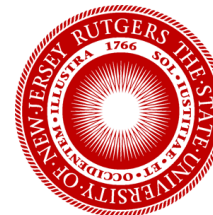
Rutgers - University of Medicine & Dentistry New Jersey

http://shrp.rutgers.edu/dept/primary_care/ICAM/Wellness/index.html



UNIVERSITY OF
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University of Western Sciences <http://uws.edu>



Western
Science

Online
Education/Training:

Center for Mind-Body Medicine

<http://cmbm.org/fam>



Duke University [http:](http://www.dukeintegrative)

www.dukeintegrative

medicine.org/professional-
training/integrative-health-coach-
professional-training



Integrative & Functional Nutrition
Academy <http://IFNAcademy.com>



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THE UNIVERSITY OF ARIZONA.



**Resources for
Health Care
Professionals:
Check Dietary
Supplements Vs.
Medications for
Interactions**

Dietitians in Integrative and Functional Medicine (DIFM) practice group through the Academy of Nutrition <http://integrativerd.org>

Institute for Functional Medicine
<http://www.functionalmedicine.org>

National Center for Complementary and Integrative Health <https://nccih.nih.gov/>

Natural Medicines Comprehensive Database
<http://naturaldatabase.com>

American Botanical Council
<http://abc/herbalgram.org>

International Society of Nutrigenetics and Nutrigenomics
<http://www.nutritionandgenetics.org>