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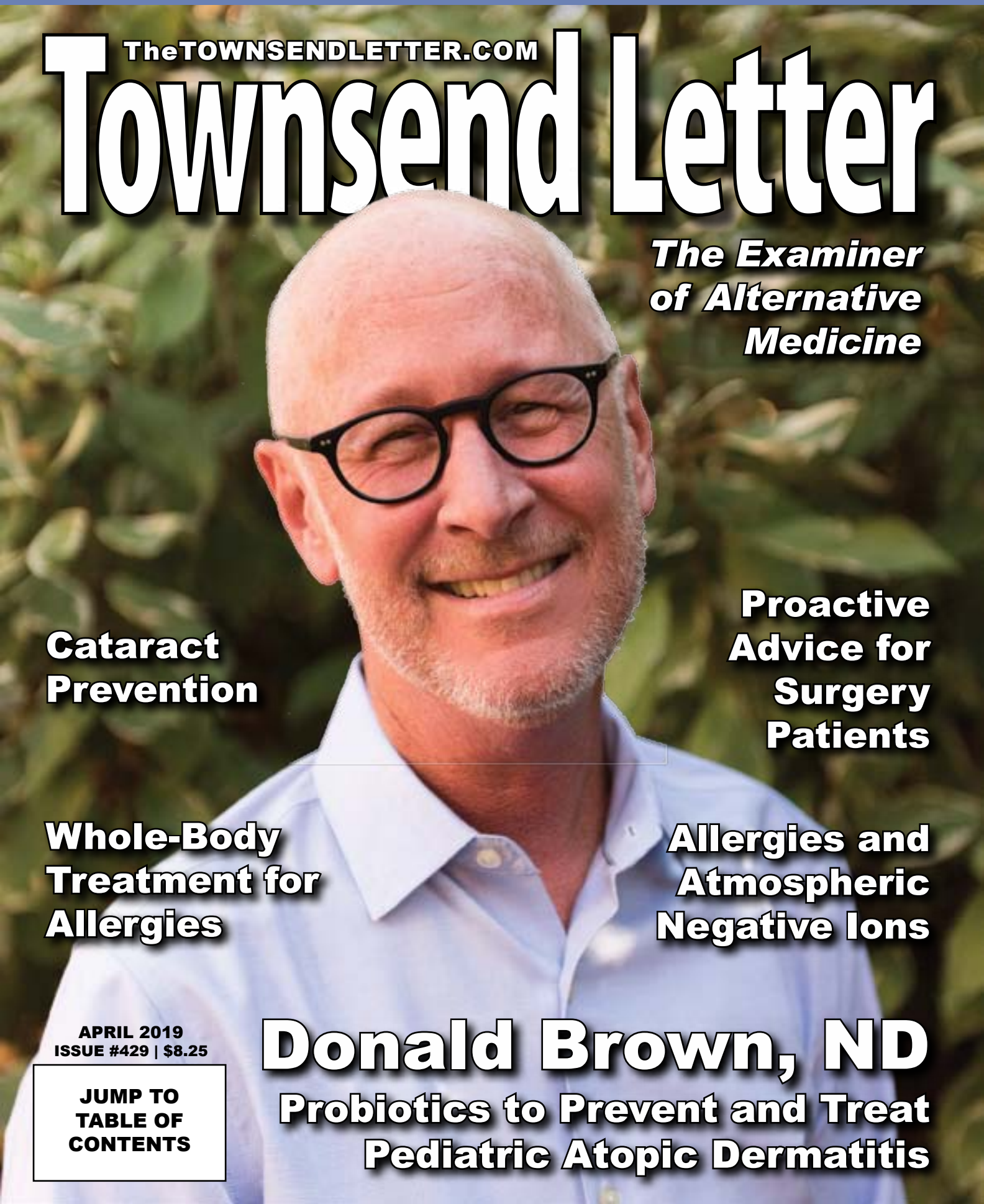

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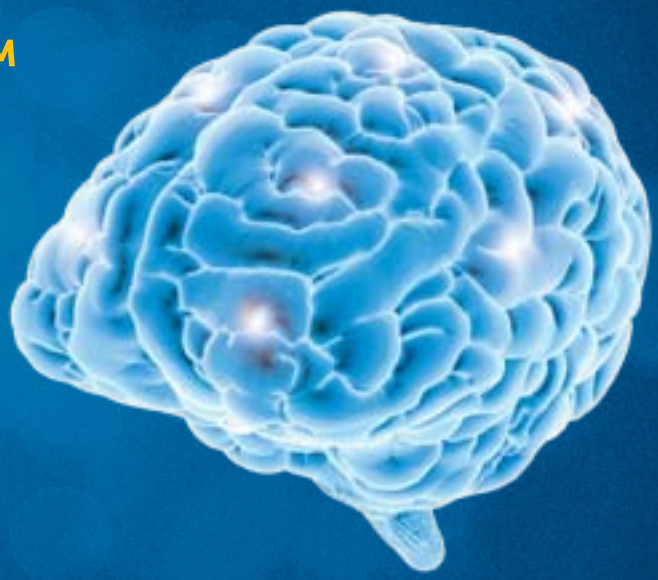

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From the Publisher

Has the *Townsend Letter* Become Too Allopathic?

A long-time subscriber from Spain, a doctor practicing naturopathic medicine, decided not to renew, commenting that the publication has become too allopathic. I was taken aback considering how our articles and editorials generally steer clear from pharmaceuticals and conventional medicine. However, I have become aware that standard of care has become a keystone in many naturopathic physician offices. Gone are the paper charts with handwritten notes – an electronic medical record similar to what appears in most MD offices is standard. The difference is whereas allopathic medical records report on supplement use to document what supplements are being used with concern about drug-

supplement interactions and adverse effects attributable to the supplements, the naturopathic EMR documents supplement and herbal prescriptions that the physician is using as a primary treatment program. It is one of those ironies that the ND will list the drugs the patient is using concerned with adverse effects and medication misuse, while the MD will list supplements for similar concerns. Of course, doctors practicing complementary medicine prescribe drugs and supplements concurrently, blurring the boundaries between allopathic and naturopathic medicine.

It is true that our authors cite references from the medical and scientific literature to document diagnostic and therapeutic protocols. The medical boards in the US and Canada have increasingly demanded that patients must be diagnosed and treated with evidence-based medicine. Case reports are useful but remain below the threshold for a treatment that is evidence-based. Naturopathic and integrative physicians understand that patients who fare poorly and/or die from inadequately proven treatments and misdiagnosis are not only subject to malpractice but board disciplinary action. Establishing that the patient received standard of care is vital when patient outcome is poor especially with non-understanding relatives. Hence, the practitioner advising alternative medical care with unproven therapies may face a day of reckoning when the medical record fails to establish evidence-based, standard of care medicine. Perhaps, this will be an abasement of remaining true to a natural healing philosophy; however, it may enable the physician to survive another day without legal or administrative difficulties.

The recent outbreaks of measles in Europe and North America have been decried by medical authorities here and abroad. Despite the assertion of vaccine critics that immunizations are useless and likely to yield long-term adverse effects and disabilities, most of the measles cases have occurred in individuals who have not been vaccinated. Practitioners need to reconsider strong anti-vaccination stances. If it should occur that it is documented, by audio/visual recording, that one recommends no vaccine for the infant, and the child were to later contract measles, the case may lead to malpractice and medical board investigation. The vast amount of writing on the internet and by anti-vaxxers will not stand up in the courtroom as evidence-based.

So I imagine our Spanish subscriber may be correct that the *Townsend Letter* has become more allopathic. Still much of the conventional medical world remains unconvinced that supplements, herbals, homeopathic medicine, chelation, colonic enemas, ozone therapy, and nutrition play an important role in preventive care and treatment for disease. To that degree, I would argue that we try to take what is best from natural and conventional medicine and provide the evidence to support such care.

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➤ *continued from page 5*

Preventing and Reversing Cataracts by Marc Grossman, OD

One thing that nearly half of my patients older than 70 years have in common is a history of cataract surgery. The other thing that they share is that the surgery was the greatest medical event of their lives because their vision improved dramatically following a quick and painless procedure. Still, there is something disconcerting in that we all face developing cataracts, which will progressively dim our vision until we undergo surgery. Might there be anything to alter this fate without resorting to drugs?

Co-author of the 2018 book, *Natural Eye Care: Your Guide to Healing and Health*, Dr. Marc Grossman, medical director of naturaleyecare.com would argue most certainly there is. What Grossman offers is not a casual change in diet, a recommendation to exercise a few times a week, some relaxation techniques, and a few vitamin supplements. No, he thinks we need to be very intensive in employing antioxidants including vitamin C and glutathione. Lutein and zeaxanthin, commercially touted in eye formulations, should be included as additional antioxidant support. Grossman advises supplementation of N-acetyl carnosine, bilberry, resveratrol, melatonin, and milk thistle in cataract treatment. Dietarily he suggests elimination of dairy products. Eyedrops should include n-acetyl carnosine. He also includes traditional Chinese medicine.

An integrative medicine approach to cataracts not only may prevent cataract progression but may also delay the development of atherosclerosis, diabetes, neurologic disease, and cancer. If our patient's family members have had cataract surgery, we should urge implementation of Grossman's program.

A Comprehensive Approach to Allergies by Clement Lee, NMD

For a growing number of individuals, early spring is a time of major misery. Seasonal allergies are not mere nuisances but torturing periods of sneezing, post-nasal drainage, itchy eyes, sore throats, headaches, fatigue, wheezing, digestive difficulties, headaches, brain fog, and overwhelming incapacity. Seeking relief is not a decision to debate but only a question of what drugs to use, how often, and how many. Dr. Clement Lee, founder of Optimal Health & Wellness in Pasadena, California,

➤

Letter from the Publisher

➤

thinks allergies need much more support than the prescription of pharmaceuticals. His whole-body approach for allergies is a useful model to employ in treating most chronic conditions.

Lee reminds us of the overflowing bucket model for allergy – that it is not one allergen, one food allergy, one nutrient deficiency, one bug, one organ weakness that causes allergy symptoms but the combination of all the allergenic and toxic-inducing factors that "overflow the bucket" and make us a symptomatic mess. Stopping the overflow with a drug is an easy solution but is only partially effective. Allergy shots are also helpful but are also temporary fixes. Lee tackles the problem as a whole, strategizing how to remove environmental exposures, eliminate toxins, address food allergies, evaluate mycotoxins, treat parasites, replenish micronutrients, support organs of detoxification, treat the nasal sinuses, and restore the gut microbiome. Clement also employs Low Dose Allergy Therapy (LDA) that has been reviewed extensively by Diego Saporta, MD, in previous issues of the *Townsend Letter*.

Probiotics for Atopic Dermatitis by Donald Brown, ND

Atopic dermatitis (AD), a condition associated with seasonal rhinitis and asthma, affects 10%-20% of children. If the skin disorder develops before two years of age, it is likely to persist through adulthood. Standard of care is the administration of corticosteroid creams, but like most dermatologic conditions, steroid treatment controls the rash without curing it. Probiotics and prebiotics strangely enough offer a different disease course. In particular, probiotics administered to mother prenatally and both mother and infant postnatally decrease the odds of developing AD. For the infant and toddler with AD, probiotics reduce the need for corticosteroids and diminish the intensity and extent of the dermatitis. Our cover story in this issue, by Don Brown, ND, reviews the role of probiotics in the prevention and treatment of pediatric atopic dermatitis.

Dr. Brown is the managing director of Natural Product Research Consultants (NPRC). NPRC consults with physicians, the supplement industry, and pharmaceutical industry on dietary supplements and phytomedicines. Previously Don has served as Vice President of Schwabe North America and Nature's Way. Earlier he was a physician in private practice as well as a lecturer and researcher at Bastyr University. He is author of *Herbal Prescriptions for Health Healing* and has been editor and contributor for numerous academic publications. Long-term readers will recall that Don Brown was a columnist for the *Townsend Letter* many moons ago. When he is not consulting or presenting lectures, Don enjoys music and the arts, admitting a passion for literary fiction. He has also volunteered as President of the Board for Real Change Homeless in Seattle.

Jonathan Collin, MD

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Clinical Study #1 (1999)

In a study of 319 women visiting three medical clinics, most women's normal vaginal bacterial residents included *L. crispatus* (32%), followed by *L. jensenii* (23%), *L.* 1086V (15%), *L. gasseri* (5%), *L. fermentum* (0.3%), *L. oris* (0.3%), *L. reuteri* (0.3%), *L. ruminis* (0.3%), and *L. vaginalis* (0.3%).*

Antonio MAD, *et al. Journal of Infectious Diseases* 1999;180:1950–6.

Clinical Study #2 (2007)

In another study involving 126 healthy pregnant women, *L. crispatus* and *L. gasseri* were the most dominant species found, followed by *L. jensenii* and *L. rhamnosus*.*

Kiss H, *et al. BJOG: An International Journal of Obstetrics & Gynaecology* 2007;114: 1402-1407.

Clinical Study #3 (2014)

In a double-blind, randomized placebo-controlled trial, 1-week of oral supplementation with the four Astarte strains significantly enriched *Lactobacilli* in the vaginal tract and reduced Nugent score in the neo-vagina of post-operative transsexual women, an environment typically resistant to colonization by *Lactobacilli.*

Kaufmann U, *et al. Eur J Obstet Gynecol Reprod Biol.* 2014 Jan;172:102-5.

Clinical Study #4 (2016)

In immunosuppressed pregnant women with herpes infection, oral supplementation with the four Astarte strains significantly reduced undesirable microbes in the intestines and vagina, and simultaneously increased vaginal *Lactobacilli* 3-fold compared to placebo.* This was accompanied by reduced incidence of placental insufficiency, pre-eclampsia and fetal distress in the probiotic supplemented women.

Anoshina TM, *et al. Perinatologiya I Pediatriya* 2016;4(68):22-25.

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Shorts

briefed by Jule Klotter
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"Displacing Foods" as Primary Cause of Age-Related Macular Degeneration?

In late 2013, ophthalmologist Chris A. Knobbe, MD, began investigating the connection between processed food consumption and age-related macular degeneration (AMD). His research resulted in an article for *Medical Hypotheses*, published November 2017 and co-authored with Marija Stojanoska, MSc, and a book, *Cure AMD – Ancestral Dietary Strategy to Prevent & Reverse Macular Degeneration*, published September 2016. Knobbe and Stojanoska gathered information about AMD prevalence and processed food consumption from 25 countries. They used sugar and 'harmful' vegetable oil as markers for processed food, defining 'harmful' oil as those with high polyunsaturated content, commonly used in processed foods (soybean, corn, canola, cottonseed, sunflower, safflower, rapeseed, grapeseed, and rice bran oils). They found that AMD was "a medical rarity worldwide" from 1851, when the first ophthalmoscopes permitted doctors to view the optic nerve, until the 1930s.

According to Knobbe's research, the first reports of patients with AMD characteristics appeared in an 1874 report concerning four English patients. Twenty-one years later, a German ophthalmologist "determined that macular degeneration was as rare as maculopathy and traumatic maculopathy" in his review of 50,000 patient medical records. Dr. Knobbe says maculopathy and traumatic maculopathy continue to be rare today, based on his 24 years of clinical practice, having "witnessed less than a handful of the latter two conditions combined." The incidence of AMD grew during the 1930s; it was acknowledged in the 1940 edition of Sir Stewart Duke-Elder's comprehensive textbook of ophthalmology to be "a common cause of failure in central vision in old people." By 1975, AMD had risen to "epidemic" proportions in the US and UK – but not in Japan and some other countries.

Dr. Knobbe points out that food quality changed in the 1880s. Refined white wheat flour became commonplace with the use of roller mill technology, instead of stone mill grinding. The new technology removed the most nutritious parts of the wheat grain (the bran and germ), which contain B vitamins, vitamin E, essential fatty acids, and minerals. In addition, 1880 saw the introduction of seed oils, aka vegetable oils, such as cottonseed oil. Food manufacturers used hydrogenation and partial hydrogenation to create cooking oils, like Crisco, as cheaper alternatives for traditionally used animal fats, like butter, lard, and beef tallow. While poverty or the consequences of war or drought could result in malnourishment, traditional diets consumed before widespread food processing in the late 1880s afforded protection against many diseases common today. "History is very clear that all of the chronic metabolic diseases, ie. 'Westernized' disease, such as heart disease, cancer, type 2 diabetes, and obesity, all of which are so prevalent today, were medical rarities at the turn of the 20th century," says Knobb.

The Japanese people were presumed to have 'genetic protection' against AMD. As late as 1979 at Japan's Nagoy University Hospital, about 0.2 percent of the eye patients had AMD. But as their diet became increasingly "Westernized," and the consumption of sugar and harmful oils rose, AMD incidence rose. The 2007 Hisayama study reported that 10% of Japanese residents age 50 and older had early AMD and 1.4% had late AMD.

Meanwhile, Pacific Island nations of Samoa, Solomon Islands, and Kiribati, which continue to maintain traditional diets (seafood, taro, yams, and other roots and tubers, and a variety of tropical fruits) with few processed foods, have AMD incidence of 0.2% or less – including populations age 60 and older. In looking at data from the Pacific Island nations, Knobbe and Stojanoska found that sugar consumption was extremely low in the Solomon Islands, moderately low in Samoa, and moderately high in Kiribati. All three countries, however, had extremely low consumption of 'harmful' vegetable oils ("essentially zero"), according to the Food and Agriculture Organization of the United Nations (FAO). "The correlative data … demonstrates that, when consumption of sugar is moderate, but 'harmful vegetable oil' consumption remains extremely low or absent, the prevalence of AMD remains rare," the authors conclude.

Interestingly, the harmful vegetable oils decrease absorption of eye-protective carotenoids, found in leafy greens like kale, collards, and spinach. Diets rich in these pro-vitamin A precursors were associated with low risk of developing AMD, according to the 1971-1972 National Health and Nutrition Examination Survey (NHANES). "These oils literally cause destruction of the

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Shorts

➤ *continued from page 10*

carotenoids, unless significant antioxidants are present, which is often not the case," says Knobbe.

Knobbe contends that nutrient supplements, such as those tested in the Age-Related Eye Disease Study (AREDS), do not make up for the inadequacies of the Western diet dominated by processed foods. He points out that the probability of progression to advanced AMD in people with intermediate AMD who took part in the AREDS placebo group was 28 percent over five years. In comparison, it was 20 percent for those who received vitamins E, C, beta-carotene, and zinc. Adding lutein, zeaxanthin, DHA, and EPA (AREDS 2) did not reduce the progression risk further. Recent studies by Carl Awh, MD, et al, and a 2016 study by Johanna M. Seddon and colleagues indicate that the effectiveness of supplementation may depend upon genetic make-up. Some genotypes of the CFH and ARMS2 genes (both implicated in genetic risk for AMD) were benefited by supplements while other genotypes actually showed increased progression.

For guidance on what constitutes a traditional diet, Knobbe refers to the findings of Weston A. Price, DDS, who traveled the world in the 1920s and 30s to observe the dietary habits and health of isolated populations. Price discovered that health declined as processed and canned foods became part of the diet. All healthy societies included nutrition from animal sources – even though that meant eating insects, instead of cows, chickens, or fish, in some cases. Other valued traditional foods include whole, raw milk, butter oil from pasture-raised animals, organ meats, seafood, and fish eggs. Fresh fruits and vegetables, nuts, and seeds are also part of nutrition-rich diets.

The Knobbe and Stojanoska study conclude "that macular degeneration is entirely preventable, through ancestral dietary strategy and avoidance of processed foods. Finally, this research has implications for patients with existing early and intermediate stages of AMD."

Knobbe CA. Is Age-Related Macular Degeneration (AMD) Preventable – and Treatable – with Diet? Introduction. Cure AMD Foundation. www.cureamd.org

Knobbe CA. What Are the Best 'Eye Vitamins' for Macular Degeneration? www.cureamd.org

Knobbe CA, Stojanoska M. The 'Displacing foods of Modern Commerce' Are the Primary and Proximate Cause of Age-Related Macular Degeneration: A Unifying singular Hypothesis (abstract). *Medical Hypotheses*. November 2017;109:184-196.

Seddon JM, Silver RE, Rosner B. Response to AREDS supplements according to genetic factors: survival analysis approach using the eye as the unit of analysis. *Brit J Ophthal.* 2016;100(12):1731-1737.

Blue Light and Retinal Damage

In 2018, researchers at University of Toledo (Ohio) reportedly discovered how blue light emitted by digital devices damages the retina and promotes age-related macular degeneration (AMD). Photoreceptor cells in the retina sense light, signaling the brain, but only in the presence of retinal molecules within the cells. Unlike red or yellow light, blue light "excites" retinal in a way that "irreversibly changes and distorts" the phospholipid (PIP2) bound to the cell's plasma membrane. This disruption leads to an increase in calcium within the cell, excessive cell shape change, and cell death. Interestingly, the combination of retinal and blue light proved to be toxic to non-photoreceptor cells (eg, HeLa cells) as well. Adding alpha-tocopherol, a lipid-soluble antioxidant, to incubated cells lessened damage to PIP2.

Blue light filters are being investigated as a way to lessen damage. Spanish researchers tested the protective effect of a filter using three groups of young albino mice (unexposed, exposed to filtered light, exposed to light without filter). The filter removed 94% of the blue component emitted by a cold light fluorescent emission lamp (400-820 nm). The mice, whose pupils were dilated with atropine, were exposed to continuous bright light (5000 lux) for seven days. Even though the filter removed this high percentage of blue light, the researchers found retinal damage in both groups exposed to the high-intensity light: "the number of photoreceptors in the unexposed groups of mice was significantly higher than in the unprotected or the protected groups." Among the light-exposed mice, photoreceptor cell survival was significantly better in the central areas of the retina in the filter group. The authors suggest that blue-blocking filters may be an effective way to decrease, albeit not totally prevent, retinal damage.

Chemists discover how blue light from digital devices speeds blindness. *Science Daily.* August 8, 2018.

Ratnayake K, et al. Blue light excited retinal intercepts cellular signaling. *Scientific Reports.* 2018;8:10207.

Vicente-Tejedor J, et al. Removal of the blue component of light significantly decreases retinal damage after high intensity exposure. *PLOS.* March 15, 2018.

Benefits of Solar Ultraviolet Radiation

Because of the association between ultraviolet radiation (UV) and skin cancers, people have been encouraged to use sunscreen and limit sun exposure. Yet, as Michael F. Holick explains in a 2016 article, sunlight exposure is associated with lower incidence of autoimmune illnesses such as multiple sclerosis and reduced mortality from a wide variety of disease, including cardiac disease, cancers, and infectious disease. Sunlight's health benefits have been primarily ascribed to vitamin D whose production is dependent upon ultraviolet B (UVB). The active form of vitamin D [1,25(OH)2D] is necessary to prevent skeletal deformity (rickets). Vitamin D also takes part in many metabolic processes, including DNA repair, antioxidant activity, and regulating cellular proliferation and differentiation – actions that provide protection against cancer. Holick points out that melanoma, the deadliest skin cancer, "is often found on the least sun-exposed areas" and that "occupational sun exposure has been associated with a reduced risk" for this disease. Vitamin D receptors are found in cells throughout the body.

Vitamin D is not the only beneficial result from UV exposure. UV radiation prompts melanocytes in the epidermal-dermal junction to produce melanin, a compound that absorbs UVB and ultraviolet A (UVA). Melanin acts like a protective shield for epidermal cells. In addition to its role as a natural sunscreen, melanin is an antioxidant and free radical scavenger.

UV radiation also stimulates nitric oxide production in the skin. Nitric oxide is a vasodilator, reducing blood pressure, and is cardioprotective. The compound also upregulates protein 53, which suppresses tumor formation.

And UV radiation increases expression of the proopiomelanocortin (POMC) gene, resulting in production of beta-endorphin (producing feelings of well-being) and production of ACTH (adrenocorticotropin hormone), which increases production of the immune modulator cortisol.

Both solar-derived and dietary/supplemental vitamin D are stored in fat cells until needed, says Holick. Sunlight, however, provides more benefits than vitamin D alone. The question is how to reap the benefits without causing skin cancers. The answer depends on many factors, including skin pigment, geographic location, time of day, and exposure time. Avoiding sunburn is the primary consideration. Information about sun exposure and

continued on page 14 ➤

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Shorts

➤ *continued from page 12*

vitamin D production is available at www.vitamindfoundation.org. A free app called dminder.info is another resource.

Holick MF. Biological Effects of Sunlight, Ultraviolet Radiation, Visible Light, Infrared Radiation and Vitamin D for Health. *Anticancer Research.* 2016;36:1345-1356.

Islam MT. Beneficial Aspects of Ultraviolet Rays in Protective and Sound Health. *EC Pharmacology and Toxicology.* December 18, 2017.

Yoga Practices and Glaucoma

Researchers in India want to investigate *Tratak kriya,* a yoga practice that includes eye exercises, as a way to lower intraocular pressure (IOP) in people with glaucoma. Glaucoma, the most common cause of blindness, affects over 65 million people worldwide. Above-normal IOP, characteristic of glaucoma, damages the optic nerve.

Tratak kriya is a technique for maintaining eye health, according to *Ayurveda,* India's ancient traditional medicine system. *Tratak* is simply the practice of gazing steadily at a small object without blinking for as long as possible or until the eyes fill with tears. In their 2018 article, the authors say that this exercise causes contraction and relaxation of ciliary muscles in the eyes. These same muscles are involved in the outflow of the aqueous humor. Increasing outflow reduces IOP. The Indian team hopes that restoring ciliary muscle movement will reduce IOP and, thereby, prevent the development of glaucoma in high-risk people or slow its progression. After testing *Traka kriya*'s effect on IOP, they propose clinical studies in people with glaucoma, using the technique as an 'add-on' to standard care, and other studies to investigate its use as a preventive measure in people without glaucoma.

Another yoga practice, forced unilateral nostril breathing, has already been shown to affect IOP in clinical studies. Back in 1990, an Israeli team found that breathing through the right nostril (the left was packed with cotton), for 20 minutes decreased IOP an average of 27% in the right eyes and 22.5% in the left in 46 patients with open and closed angle glaucoma, bringing the pressure to normal range. Previous studies found that forced *left* nostril breathing *increased* IOP. Not all participants in the 1990 study benefited from right nostril breathing; IOP increased significantly in three people with neovascular glaucoma, one with juvenile glaucoma, and one with closed angle glaucoma.

Yoga breathing exercises are known to affect the autonomic nervous system, which is a factor in regulating intraocular pressure. Although the effect of the breathing exercise was nearly immediate, the Israeli team did not view it as a potential clinical intervention because the effect lasted just two to three hours. However, the study's results suggest that chronic blockage in the right nostril, due to nasal polyps or septal deviation, may be a contributor to the development of high IOP and glaucoma.

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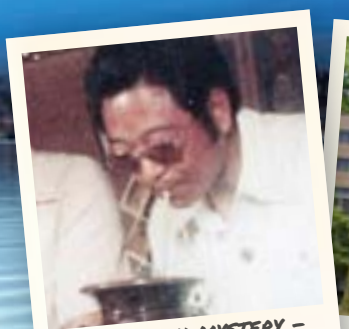
Dr. Iichiroh Ohhira: A Pioneering Genius in Probiotic Science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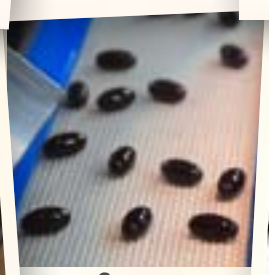
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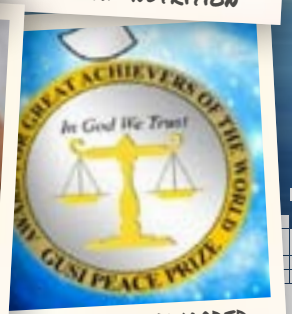

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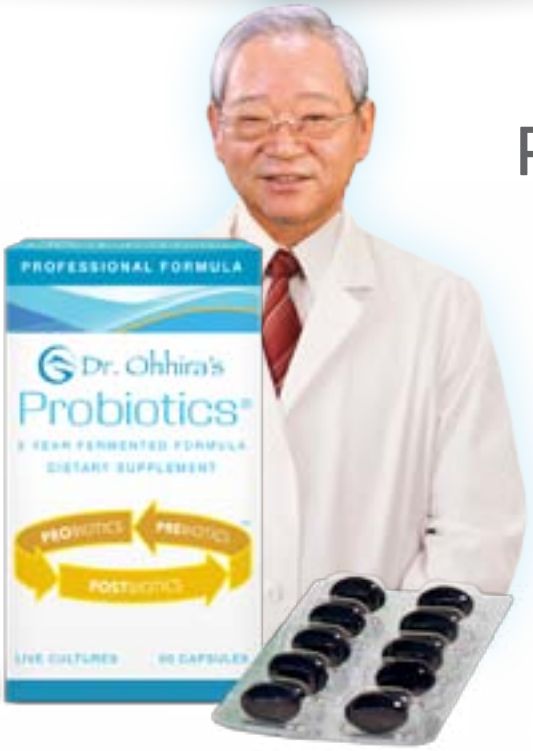

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Concerning Dr. Whitaker, Functional Medicine, and Related Issues

by Savely Yurkovsky, MD©

I wish to commend publisher Jonathan Collin's sound critique of some of Dr. Julian Whitaker's statements concerning dietary issues.[1] However, unlike his touching these with admirable gentleman's style ("I hesitated to agree with…."), I wish to offer a less tender touch to integrative medicine and functional medicine, which Dr. Whitaker supports, as per Dr. Collin's statement. Limiting my general assessment of the current state of integrative medicine to being one of integrated chaos, I will focus on, so called, functional medicine. This analysis has been long overdue, as many alternative practitioners have been misled over the years by the marketing activities of the functional medicine institute, which vows a certificate and training in The Gold Standard of Functional Medicine, leading to "expertise, clinical satisfaction and professional advancement." This all sounds good, except for being reminiscent of an appropriate remark, under the circumstances, of Mark Twain that "Wagner would have been a great composer had it not been for his music." The real music here is that while both certificates and expertise in something needless can be certainly attained, yet neither the great clinical satisfaction nor true professional advancement can be attained by any pharmaceutical approach in the majority of chronic diseases, simply because all of these approaches are born to be dead on arrival.

Here are a few confirmations to this. The 'top of the line,' to pharmaceutical minds, and gold standard of conventional pharmaceutical medicine – evidence based medicine – has just published its official eulogy in an elite medical journal.[2] This all followed a century long, tens of thousands of clinical trials that have tested synthetic pharmaceuticals for thousands of biochemical, morphological, gene related, and you-name-it targets. The main reason for this gold standard's funeral is that it hasn't made a dent in reversal of and, even, halting chronic diseases. Furthermore, its biochemical-pharmaceutical leader, cholesterol theory, has officially also given up the ghost and turned out to be a virtual, trillion dollar scam, where cholesterol lowering drugs have produced the only real evidence – side effects and harm.[3] While the 'natural' retailers partook in the feast too, FCT has been stating for decades that the only useful thing to know about cholesterol is to never bother checking it. True, too high or too low is not good, but it is only one of hundreds of symptoms, not the primary cause of disease, and once the cause is properly addressed the number will normalize automatically. The bottom line is that even conventional, pharmaceutically trained scientists have realized that their gold standard was built on sand where 'positive studies' of pharmaceuticals showed only that they did something better than just placebos or nothing. In other words, if an air balloon flies better than a kite it is still no rocket.

Certainly, as many scientists admit to human factor playing often a bigger role in under-the-table science than people think, don't expect either conventional or alternative pharmacists to curtail their businesses anytime soon. The murky waters of the biochemical-pharmaceutical field especially offers endless auspicious targets for business, in creative activities within the human biochemical ocean. The key here is to present itself as a new, better and real McCoy by using some catchy scientific verbiage, even if in the end, the patients get nowhere.

And this is what exactly functional medicine has done through its marketing for both its training and 'special' products. While its impressive terms – nutraceuticals, genomics, metabonomic, proteomics – capture imagination, in reality these all boil down to a "fashionable nonsense," "intelligent fooling," and "a magnificent building without a foundation," the terms used by knowledgeable scientists whenever they encounter empty scientific verbiage unsupported by substance. The 'big' mission behind the impressive verbiage and activities seems, on the surface, impressive too, to correct gone-awry bodily functions in disease, except that this brings us back to Wagner and his music. The problem here is that all functions in the body originate from the corresponding internal organs and tissues that functional medicine or any lab test cannot diagnostically penetrate in order to determine the primary causes of their pathologies. Since these remain a mystery, all of the treatments, pharmaceuticals, including nutraceuticals, energetic, and

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you-name-it become, at best, beating around the bush actions and, at worst, cause harm.

This inability to determine primary causes of disease have been deemed by conventional medical scientists as the main reason for failure of our entire healthcare and ultimate demise of the idea of evidence-based medicine. But at least they have honestly examined and admitted to the facts, as demanded by the rules of science, yet functional medicine company has not. So, let us do this and see what this medicine has concretely accomplished in real medical practice. A typical patient testimonial: "I spent the last three years with a doctor of functional medicine. After loads of supplements and bloodwork, he felt that there was not any more he could do with me to help the inflammation. I believe I need to find the root cause before anything will work. I am reaching out for your thoughts."

The typical doctors' testimonials. Integrative MD: "I've wasted tens of thousands of dollars and hours on functional medicine, muscle testing, many computerized machines and other things to get to the root cause, none pan out." A chiropractic doctor: "I am completely replacing my current method of treatment with FCT. I have been a student of 'functional medicine' for years and have never truly gotten the long-term results in patients that I expected. While watching the Basic FCT Seminar, I knew FCT is what I have been searching for. Thanks again!"

Looking further for concrete facts in successful reversals of chronic diseases in *The Textbook of Functional Medicine*, itself none could be found. The same zero number we see in the chapter, "Functional Medicine," in *Integrative Medicine*.[4] A chapter in the same book, "Detoxification," states that one of the powders engendered by functional medicine inventor, biochemist Dr. Jeffrey Bland, Ultra Clear, retails for $75 for just 21-day supply, exceeding a cost of even most of the drugs. There was no information concerning its actual benefit except for the analysis of only a short-term study, conducted by the company itself, **yielding some positive change in a marker.** Even while there is no law to preclude merchants from doing their own science, in inexact sciences such as **medicine,** which can easily manipulate **statistics,** such practices have been particularly exceeding in producing forged or low-quality science.

The official conventional medicine statistics have registered a drastic difference in false reporting and distortion of data when scientists were paid by the pharmaceutical industry to conduct studies on its products. These studies, as the one reported by functional medicine group, also have included some formally existing

Savely Yurkovsky, MD is internationally known as an author and teacher with an extensive background in the thorough study of scientific principles behind the numerous alternative and conventional approaches. Having realized that the primary source of health and disease, according to physics, stems from the corresponding cellular energy fields, he adopted a revolutionary new medical model, one that interfaces the theories of biology and physics established by his mentor, Professor Emeritus William A. Tiller, PhD, of Stanford University.

Having evolved a unique bio-energetic medical system that integrates a great deal of pertinent but, until now, underused knowledge from medical and non-medical sciences, Dr. Yurkovsky's system has been able to transform the often-vague nature of medical specialties from "hit and miss" paradigms into a far more effective, exact and predictable science. Dr. Yurkovsky has founded a teaching organization, "*SYY Integrated Health Systems, Ltd.*," which is dedicated to sharing his medical system under the concept of FCT – Field Control Therapy® or Guided Digital Medicine™. Since 1999, he has taught this curriculum to medical doctors and licensed health care professionals with special emphasis on energy-based diagnostic and therapeutic modalities aimed particularly at toxicological, biological or nuclear agents. These, as a rule, elude conventional and most of the alternative diagnostic methods yet represent the primary source of all chronic diseases. His book, ***Biological, Chemical, and Nuclear Warfare – Protecting Yourself and Your Loved Ones: The Power of Digital Medicine*** is an excellent illustration of both the scientific basis and effective practical means to combat the ravages of acute and chronic diseases in our toxic world. His system is the only alternative medical modality that has drawn attention from one of the departments of the Homeland Security Office. This year, along with several other doctors from premier medical schools in the US, he has been nominated for the prestigious Bravewell Leadership Award for "*significant contributions to the field of medicine*" and "*compelling vision for the future of medicine*."

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biochemical markers that showed some positive changes. Yet thousands of such pharmaceutical studies, covering also the trillion-dollar cholesterol hoax, justify the demand of science to produce independent verification and true significance of the obtained data. A good lesson, as taught by science, is that a statistical difference of an experiment can be positive and significant, yet its overall scientific value might be dismal, and vice a versa.

How much of a significance and practical use is a product that enhances an excretion of caffeine by the liver, as in this study, versus how effectively it detoxifies the liver from thousands of chemicals surrounding us, on a daily basis? Also, while the detoxification idea, whether through liver, or other tissues sounds good how do these tests and treatments determine its success when these lab tests cannot penetrate internal organs? Likewise, how can these treatments control releases of toxins from the liver or other organ and prevent these from shifting to the brain, heart, testicles or ovaries? Is this one of the reasons why major human trials on nutraceuticals have not only failed to prevent degenerative diseases but even demonstrated an association with increased incidence of these. One may only wonder why 'holistic heroes' such as Drs. Whitaker, Mercola and the rest ignore this important data and keep selling their 'scientific' pills? Another disturbing point is that functional medicine, like all pharmaceutical approaches, can't even plausibly explain, never mind correct, its failures, as required from a true science. All of these issues raise a question of this medicine being more dysfunctional than functional.

The only way to overcome these generic obstacles to reversing and/or halting of chronic diseases, depending on the stage of gravity and advancement of disease in each individual case, is only through skillful bio-resonance testing that can directly penetrate any internal organ and screen it for toxicological, infectious, electromagnetic and other important primary causes of diseases. It must be guided by a sound theory that leads the practitioners to only the most significant versus many secondary or red herring type of findings. And likewise, we need a treatment that is effective and administered with an optimal degree of safety. These issues will be examined in great detail, containing also real patients' examples, in part two of this commentary.

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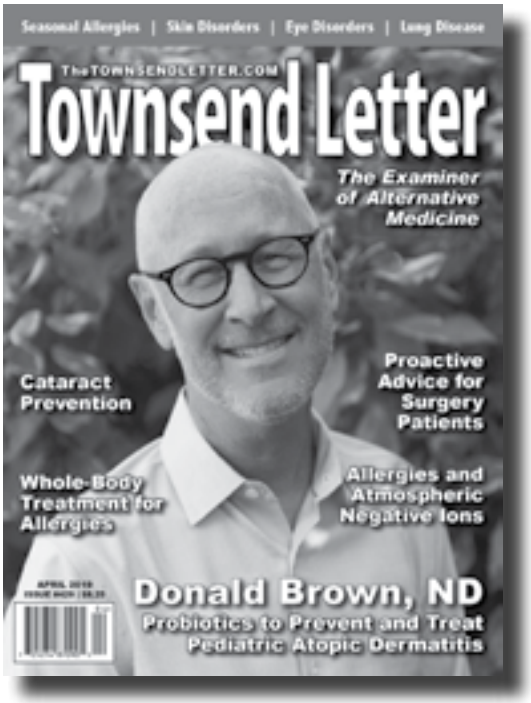

On the cover

Probiotics for the Prevention and Treatment of Pediatric Atopic Dermatitis

by Donald Brown, ND

Atopic dermatitis (AD) is a multifaceted, chronic, relapsing inflammatory skin disease that is commonly associated with other atopic conditions including food allergies, allergic rhinitis, and asthma.[1] It is the most common skin disease in children, affecting approximately 15% to 20% of children worldwide. Onset of the disease is most common by five years of age, with the highest incidence occurring between three and six months. Early diagnosis and treatment are essential to avoid complications of AD and improve quality of life. Incidence of AD has increase two- to three-fold in industrialized nations since the 1970s, and population-based studies in the United States estimate the prevalence at about 10.7% for children and 7.2% for adults. Twenty percent of children who develop AD before two years of age will have symptoms that persist into childhood and beyond, with 17% having intermittent symptoms by seven years of age.

Probiotics

Probiotics are living bacterial or yeast organisms that promote health when consumed. More specifically, a panel of experts convened in 2014 by the International Scientific Association for Probiotics and Prebiotics defined probiotics as "live microorganisms that, when administered in adequate amounts, confer a health benefit on the host."[2] Most of the scientific and clinical research on probiotics has focused on their oral use for GI and immune health. Oral supplementation and vaginal application of probiotics has also been studied for female genitourinary tract health. Emerging science is currently exploring the use of probiotics in areas such as AD, hypercholesterolemia, anxiety, depression, metabolic syndrome, and autism spectrum disorder.

The primary genera that have been used and studied as probiotics are *Lactobacillus* and *Bifidobacterium*.[2] Other bacterial and yeast species that have been used as probiotics include *Streptococcus thermophilus, Saccharomyces boulardii, Lactococcus lactis,* and the spore-forming anaerobes *Bacillus coagulans* and *Bacillus subtilis.*

Atopic Dermatitis Prevention

An area of clinical interest is the potential for probiotics to reduce the incidence of atopic disorders such as AD and asthma. A 2013 meta-analysis published in *Pediatrics* included 25 studies with a total of 4,031 children.[3] Conclusions included the following:

- Probiotics were effective in reducing total IgE and the reduction was more pronounced with longer follow-up.
- Probiotics significantly reduced risk of atopic sensitization when administered prenatally (to mothers) and postnatally (to mothers or infants).
- Probiotics did not significantly reduce the incidence of asthma or wheeze.

Prenatal and postnatal administration of probiotics has been shown in several randomized, double-blind, placebo-controlled trials (RDBPCT) to significantly reduce the risk of AD in at-risk infants (e.g. those with a parent or sibling with a history of atopy).

The first of these trials was published in 2001.[4] The study included 132 pregnant women (recruited with the at-risk profile above) who were randomized to receive either *Lactobacillus rhamnosus* GG (LGG) (1 billion colony forming units [cfu]/day) or placebo beginning at two to four weeks before delivery and continued through breastfeeding. When breast feeding ceased, infants were given LGG until six months of age. At a two-year follow-up, the incidence of AD was reduced by half in the probiotic group compared to the placebo group. Follow-up data at four years[5] and seven years[6] continued to show a reduced incidence of AD in the probiotic group.

continued on page 24 ➤

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Another RDBPCT included 474 mothers who were randomized to one of three groups at 35 weeks gestation and until six months if breastfeeding—*Lactobacillus rhamnosus* HN001 (6 billion cfu/day), *Bifidobacterium animalis* subsp. *lactis* HN019 (9 billion cfu/day), or placebo.[7] Infants were randomized to receive the same treatment from birth to two years. At two years, the incidence of AD was significantly reduced in the *L. rhamnosus* HN001 group but not the *B. lactis* group. The reduction in AD incidence in the *L. rhamnosus* HN001 group continued at four-year[8] and six-year[9] follow-ups. At the six-year follow-up, atopic sensitization was also significantly reduced in children that had taken *L. rhamnosus* HN001.

Atopic Dermatitis Treatment

Clinical trials on the use of probiotics for the treatment of AD have been somewhat more equivocal than those looking at prevention. Despite this, probiotics appear to be a practical addition to the management of pediatric AD as they have been shown to decrease IgE, decrease intestinal permeability in children with AD, and reduce systemic antigen exposure (e.g. food allergens).[10, 11]

A 2017 meta-analysis reviewed thirteen studies, and data from 1,070 children (intervention groups, 553; control groups, 517) were assessed.[12] The primary outcome in the majority of studies was the change in the Severity Scoring of Atopic Dermatitis (SCORAD) index. The SCORAD questionnaire includes an assessment of the extent and intensity of the rash, pruritis, and sleep disturbance. Results varied by population studied (European studies were largely negative and Asian studies largely positive) and by the strain or strain combination studied. While the authors conclude that the research to date has not robustly found probiotics beneficial for children with AD, they also suggest that clinical trials with larger samples and greater power are needed to identify species, dose, and treatment duration of probiotics that are most efficacious for treating pediatric AD.

A 12-week RDBPCT trial studied the effect of probiotics in children ages 4 to 17 years with moderate AD.[13] The primary outcome was changes in the SCORAD index score, and the secondary outcome was topical steroid use. Fifty-five children (mean age 9.2 years) were randomized to receive a probiotic combination of *Bifidobacterium lactis* CECT 8145, *Bifidobacterium longum* CECT 7347, and *Lactobacillus casei* 9104 (1 billion cfu/day) or placebo. After 12 weeks, the SCORAD index change was -83% compared to -24% in the placebo group ($p<0.001$). There was also a significant reduction in the use of topical steroids to treat AD flares in the probiotic group compared to the placebo group ($p<0.003$).

In another RDBPCT, 90 children ages one to three years old with moderate to severe AD were treated with either a mixture of *Bifidobacterium lactis* UABLA-12™ and *Lactobacillus acidophilus* DDS®-1 (5 billion cfu b.i.d.) or placebo for eight weeks.[14] The primary outcome measure was the percentage change in the Scoring of Atopic Dermatitis (SCORAD) value. Secondary outcome measures included changes in the Infant Dermatitis Quality of Life (IDQOL) and Dermatitis Family Impact (DFI) scores, and frequency of topical corticosteroid use. The IDQOL and DFI questionnaires each included ten questions specific to infant or family activity.

At eight weeks, children in the probiotic group showed a greater decrease in the mean [SD] SCORAD score compared to those in the placebo group (−14.2 [9.9] vs. −7.8 [7.7], respectively; $p=0.001$). IDQOL and DFI scores decreased significantly from baseline by 33% and 35.2% in the probiotic group compared to 19% and 23.8% in the placebo group ($p=0.013$ and $p=0.010$, respectively). Use of topical corticosteroids during the eight-week study period averaged 7.7 g less in the probiotic group ($p =0.006$).

Conclusions

Probiotic supplementation holds great promise for the prevention and treatment of AD in infants and children. While a somewhat complicated communication to mothers and parents of at-risk infants, the strongest data to date is prevention of AD with both prenatal and postnatal probiotic supplementation by both mother and infant. While the data to date on the use of probiotics to treat moderate to severe AD remains somewhat equivocal, positive trials to date have shown a significant reduction in SCORAD index as well as use of topical corticosteroids. Factoring in the increased intestinal permeability and food allergies/intolerance in children with AD, probiotics offer a practical addition to the management of pediatric AD.

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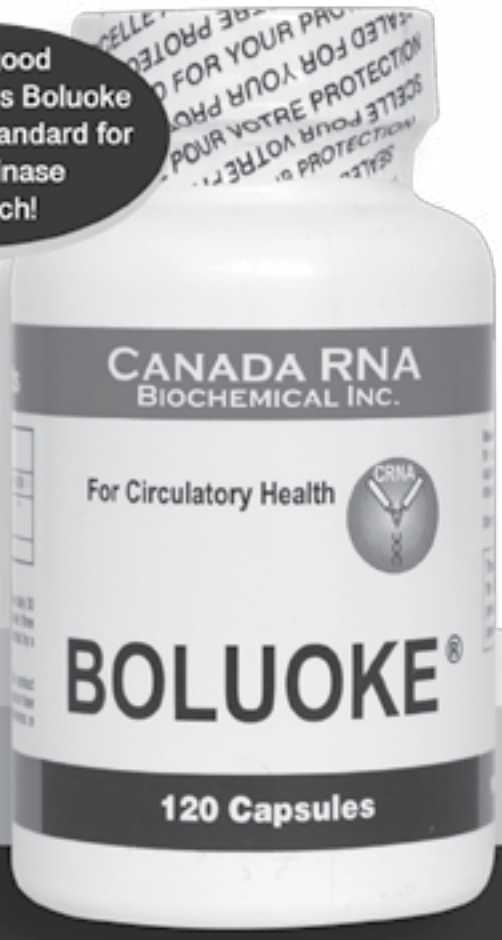

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Literature Review & Commentary

by Alan R. Gaby, MD
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Topical Vitamin C for Basal Cell Carcinoma

Seven patients (aged 72-81 years) with basal cell carcinoma (1 nodular, 6 superficial) applied topically 0.1-0.2 ml of a saturated solution of ascorbic acid (33 g per 100 ml of water) once a day to the affected area. A plastic applicator was also used to apply some of the precipitate. After each application, an occlusive bandage was placed for 12 hours. In six cases the treatment was continued for 22 weeks. In the other case, treatment was stopped after 13 weeks because of an excellent clinical response. Post-treatment biopsies showed tumor-free tissue in one nodular and four superficial basal cell carcinomas, whereas two superficial basal cell carcinomas showed residual tumor cells and were subsequently excised. During the treatment period, erythema with itching and burning was regularly noted at the application site by patients who later became cancer-free. In contrast, the two patients who did not become cancer-free experienced only a minimal reaction at the application site, which suggested noncompliance with the treatment. The five patients who became cancer-free were followed up for 18 months. One patient had a recurrence of a superficial basal cell carcinoma adjacent to the resolved lesion.

Comment: Conventional treatment options for basal cell carcinoma include surgery, radiation therapy, and pharmacologic treatments such as topical 5-fluorouracil. Vitamin C has been demonstrated to have a toxic effect on cancer cells but relatively little effect on normal cells. In the present report, topical application of vitamin C appeared to be an effective treatment for basal cell carcinoma. While this report should be confirmed in a larger study, it would seem reasonable to consider a trial of topical vitamin C as a first-line treatment for low-risk lesions.

Hollo P, et al. Topically applied ascorbic acid solution for the treatment of basal cell carcinoma (BCC). *J Am Acad Dermatol*. 2016;75:212-213.

Dietary Treatment of Hidradenitis Suppurativa

The author of this report has worked with 47 patients with hidradenitis suppurativa who followed his recommendation to eliminate dairy products from their diet. Eighty-three percent of the patients improved to varying degrees and none of them became worse.

Comment: Hidradenitis suppurativa is a chronic painful acneiform condition affecting the axillae, groin, and other areas that contain apocrine glands. It is caused by occlusion of follicles, which leads to inflammation and infection of the surrounding tissue. Results of conventional therapy, which may include antibiotics, glucocorticoids, retinoids, or surgery, are frequently disappointing. Lesions of hidradenitis suppurativa appear to result from a complex series of androgen-driven events that lead to obstruction of the follicular duct, rupture and destruction of the sebaceous glands, and the development of deep dermal sinuses that subsequently rupture to the surface. The author of the present report believes that consumption of dairy products contributes to these androgen-driven events. Although the mechanism underlying the observed clinical improvement is not clear, the results speak for themselves. A trial of avoiding dairy products should therefore be considered for patients with this difficult-to-treat condition.

Danby FW. Diet in the prevention of hidradenitis suppurativa (acne inversa). *J Am Acad Dermatol*. 2015;73(5 Suppl 1):S52-S54.

Does Eating Chocolate Make Acne Worse?

Fifty-four college students (mean age, 21.4 years) were randomly assigned to consume, in single-blind fashion, a 1.55 ounce (43 g) Hershey's milk chocolate bar or 15 g of jellybeans, each of which provided the same glycemic load. After a four-week washout period, each person consumed the other item (chocolate or jellybeans). Changes in acne were assessed blindly by a dermatologist 48 hours after each food challenge. The mean number of acne lesions increased by 4.8 lesions ($p < 0.0001$) after chocolate consumption and decreased by 0.7 lesions after jellybean consumption. Both men and women demonstrated an increase in acne lesions after chocolate consumption.

Comment: Many patients have observed that eating chocolate causes their acne to flare, although the conventional opinion is that the chocolate-acne connection is a myth. That opinion is based largely on a 1969 study in which 65 patients with acne ate a large chocolate bar daily for four weeks and a chocolate-free placebo bar for an additional four weeks. An exacerbation of acne occurred in 13.8% of patients during the chocolate period and in 10.8% of patients during the placebo period, a difference that was deemed to be clinically insignificant.[1] However, since the severity of the exacerbations was not assessed, one cannot rule out the possibility that chocolate ingestion makes acne markedly worse in a small proportion of cases, as some patients claim. In a 2011 study, 10 young men with mild facial acne were asked to eat as much unsweetened, 100% cacao chocolate as they could in a single sitting (i.e., a one-time bolus), to a maximum of 12 ounces. The mean total acneiform lesion count increased from 2.7 at baseline to 13.4 on day 4 and to 18.2 on day 7.[2] The present study supports the idea chocolate consumption exacerbates acne in some individuals.

Delost GR, et al. The impact of chocolate consumption on acne vulgaris in college students: A randomized crossover study. *J Am Acad Dermatol*. 2016;75:220-222.

Intravenous Magnesium for COPD Exacerbations

Thirty individuals in New Zealand who presented to the emergency department with an acute exacerbation of chronic obstructive pulmonary disease (COPD) were randomly assigned to receive, in double-blind fashion, 2 g of magnesium sulfate intravenously over 15 minutes or placebo (saline). All patients received standard bronchodilator therapy. The mean improvement in forced expiratory volume in one second (FEV_1) immediately after the infusion and at one and two hours after the infusion was significantly greater in the magnesium group than in the placebo group ($p = 0.01$). Forced vital capacity also improved significantly more with magnesium than with placebo. The proportion of patients hospitalized (85% vs. 94%) and the mean length of hospital stay (3.18 vs. 5.47 days; 42% reduction; $p = 0.11$) were nonsignificantly lower in the magnesium group than in the placebo group.

Comment: Magnesium deficiency is common in patients with COPD, particularly in those who are receiving diuretics that deplete potassium and magnesium (such as furosemide and hydrochlorothiazide). Correction of magnesium deficiency may improve the power of the skeletal muscles involved in breathing and may also exert a bronchodilator effect. The results of the present study demonstrate that parenteral administration of magnesium can improve outcomes in patients with an acute exacerbation of COPD.

Mukerji S, et al. Intravenous magnesium sulphate as an adjuvant therapy in acute exacerbations of chronic obstructive pulmonary disease: a single centre, randomised, double-blinded, parallel group, placebo-controlled trial: a pilot study. *N Z Med J*. 2015;128:34-42.

Coenzyme Q10 and Creatine for COPD

One hundred six Italian patients (mean age, 73 years) with chronic obstructive pulmonary disease (COPD) who were receiving long-term oxygen therapy were randomly assigned to receive, in double-blind fashion, 160 mg of coenzyme Q10 (CoQ10) and 170 mg of creatine twice a day or placebo for eight weeks. All patients were being treated with bronchodilators and continued them during the study. Ninety patients completed the trial. The primary endpoint was the change in the distance walked during the six-minute walk test. The mean improvement in the six-minute walk test was significantly greater in the active-treatment group than in the placebo group (51 m [from 214 m to 265 m] vs. 15 m [from 213 m to 228 m]; $p < 0.04$ for the difference in the change between groups).

Comment: The results of this study demonstrate that supplementation with CoQ10 and creatine can improve functional capacity in patients with COPD. The mechanism of action may be related in part to an increased availability of ATP, the body's main storage form of energy. CoQ10 and creatine both play a role in energy production or utilization: CoQ10 as a component of the electron-transport chain, and creatine by facilitating the recycling of ATP from ADP. In an earlier study, a much larger dose of creatine (5 g three times per day for two weeks followed by 5 g per day for 10 weeks) improved peripheral muscle strength and endurance, but not exercise capacity, in patients with COPD.[3] It is not clear to what extent the relatively low dose of creatine used in the present study contributed to the observed improvement.

De Benedetto F, et al. Supplementation with Qter® and creatine improves functional performance in COPD patients on long term oxygen therapy. *Respir Med*. 2018;142:86-93.

Gaby's Literature Review

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Omega-3 Fatty Acids and Dry Eyes

Thirty-six adults (mean age, 58 years) in the United States with moderate-to-severe dry eye disease for at least six months were randomly assigned to receive, in double-blind fashion, in a 2:1 ratio, omega-3 fatty acids (2,000 mg per day of eicosapentaenoic acid and 1,000 mg per day of docosahexaenoic acid) or placebo (5 g per day of refined olive oil) for 12 months. The mean score on the Ocular Surface Disease Index (the primary outcome measure) improved by 31.2% in the omega-3 group and by 28.3% in the placebo group ($p = 0.21$ for the difference in the change between groups). Secondary outcomes, including mean changes in the conjunctival staining score, corneal staining score, tear break-up time, and Schirmer's test, did not differ significantly between groups.

Comment: In several double-blind trials, oral administration of fish oil or the omega-3 fatty acids present in fish oil (eicosapentaenoic acid and docosahexaenoic acid) was moderately effective for relieving dry-eye symptoms, including in patients with dry eyes associated with the use of contact lenses. In most, but not all, of these studies, omega-3 fatty acids also increased tear secretion and decreased the rate of tear evaporation (as measured by tear film break-up time). In contrast, one study found that fish oil in combination with other nutrients was not more effective than placebo, although symptoms improved significantly in both groups.[4] It is not clear why the results of the present study differ from most of the previous research. One possibility is that both the active treatment and the olive oil placebo had beneficial effects. Omega-3 fatty acids are thought to improve dry-eye symptoms by an anti-inflammatory mechanism, and constituents in olive oil have also demonstrated anti-inflammatory activity.[5]

Asbell PA, et al. n-3 Fatty acid supplementation for the treatment of dry eye disease. *N Engl J Med*. 2018;378:1681-1690.

Does Arginine Cause Pancreatitis?

In a previous case report, a 16-year-old male developed acute pancreatitis after taking 500 mg per day of arginine (L-arginine) for five months. In the present case report, a 28-year-old man developed acute pancreatitis. For the previous 18 months he had been taking a protein powder every day for body-building. The powder provided about 1,200 mg per day of arginine (the arginine was apparently added to the protein powder). Other known causes of acute pancreatitis were ruled out, so the authors concluded that arginine was the likely cause.

Comment: In studies in mice, administration of a single large dose of arginine (500 mg per kg of body weight orally or 5 g per kg of body weight intraperitoneally) caused acute pancreatitis. The human equivalent of those doses (per 70 kg of body weight) would be 35 g and 350 g, respectively, which is much higher than what the young men were taking before they developed pancreatitis. For perspective, a typical American diet provides about 5.5 g per day of arginine. Arginine has been used in a number of studies in the dosage range of 1.5 g to 9.0 g per day to treat cardiovascular disease and erectile dysfunction. Acute pancreatitis was not reported as a side effect in any of those studies. Arginine is also widely used by body builders. If arginine in modest doses cause pancreatitis, it is likely that many more cases would have been reported by now among body builders.

It is possible that some people are unusually susceptible to the adverse effects of arginine. However, it seems more likely that arginine was not the cause of pancreatitis in the two case reports mentioned above.

Binet Q, et al. The second case of a young man with L-arginine-induced acute pancreatitis. *Clin J Gastroenterol*. 2018;11:424-427.

Does Bisphenol A Promote Premature Thelarche?

The median concentration of bisphenol A (BPA) was significantly higher in 25 non-obese Turkish girls (aged 4-8 years) with premature thelarche (i.e., premature breast development) than in non-obese age-matched healthy controls (3.2 vs. 1.62 µg/g of creatinine; $p < 0.05$).

Comment: BPA is widely used in the production of plastics. This compound is present in plastic food and beverage containers, and it is known to leach from these containers and from the resin lining of metal cans under conditions of normal use. BPA has estrogenic activity and has been shown to interfere with endocrine function in a number of different ways. Some of the biological effects of BPA occur at concentrations as low as parts per trillion.

The present study is observational in nature, so it cannot prove causation. However, the findings raise the possibility that BPA exposure plays a role in the pathogenesis of premature breast development. A previous observational study raised the possibility that phthalates – another group of chemicals used in the plastics industry – also contribute to premature breast development.[6]

Durmaz E, et al. Urinary bisphenol A levels in Turkish girls with premature thelarche. *Hum Exp Toxicol*. 2018;37:1007-1016.

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The Whole-Body Approach to Treating Allergies

by Clement Lee, NMD

Introduction

Allergy response can be a wide range of symptoms: sneezing, congestion, rhinitis (runny nose), post-nasal drainage, watery/itchy eyes, itchy/sore throat, hives, headache, fatigue/malaise, coughing, wheezing, shortness of breath, atopic dermatitis (eczema), digestive issues, and more. For some people, allergies can occur seasonally, or for some unlucky sufferers, constant year-long allergies. Some people's allergies can seemingly appear to occur out of nowhere at a later stage in life or can persist since childhood. It is a major inconvenience when dealing with allergy symptoms. Allergic reactions can range from minor problems to life-threatening. Allergies are the sixth leading cause of chronic illness in the US with an annual cost in excess of $18 billion. More than 50 million Americans suffer from allergies each year. 30% of adults in the US and 40% of children in the US have allergies.[1] Worldwide, the rise in prevalence of allergic diseases has continued in the industrialized world for more than 50 years.[2] There is an increased use of alternative medicine by allergy sufferers due to assumption of fewer side effects, avoiding the use of drugs, and unsatisfactory results with conventional medicine.[3, 4] This article will discuss using a personalized treatment approach while addressing the patient as a whole.

Looking for Underlying Causes

With allergies, there are numerous underlying causes to why a person develops symptoms. One can start with the most common approach through looking for environmental triggers like dust, pollen, dander, and foods.

Taking a step further is to look at food sensitivities or food intolerance. These are delayed hypersensitivities that can also present a burden on the patient and lead to the above symptoms.[5] Other underlying causes for allergies can be found within the gut. Elevated histamine is present in gastrointestinal conditions such as IBS and SIBO, which can exacerbate allergy response.[6,7] Also, exposure to parasites like giardia may lead to allergies, increases in food intolerance, and IBS symptoms.[8,9]

Other issues, such as mycotoxin exposure, can lead to allergy/asthma symptoms. Mold and mycotoxin exposure affect the immune system deeply and can be related to more complex illnesses beyond allergies.[10-12] Evaluating mold exposure may require a thorough workup and specialized treatments, but it is helpful to keep this as a possible consideration when dealing with chronic allergies.

Air pollution can exacerbate allergy/asthma symptoms.[13-16] Data suggests that living in an e-waste-exposed area may lead to increased levels of heavy metals and accelerated prevalence of respiratory symptoms and asthma.[17]

Taking a comprehensive environmental exposure intake is helpful, looking for previous and current exposures to potential allergens.

Treating the Whole Body

Before starting on specific symptom relief treatments, I try to address the whole body as a complete system. This process seems to give allergy sufferers great relief, as well as address any other concomitant symptoms. There still may be more specific individual components to address as the reasons for allergies are individualized.

I usually start my patients off with the bucket analogy when trying to address the total body burden. Keep in mind this is an overly simplistic view of the biochemistry and mechanisms but helps to paint the picture. The bucket analogy goes like this:

> Imagine your body is like a bucket. Everything that we are exposed to gets into the bucket: food, water, air, pollution, toxins, emotions, infections, etc. As all these exposures enter your body and start to fill up the bucket, your organs of detox and elimination have to go to work to break them down and process them. Your liver/gallbadder is responsible for the bulk of the initial processing and metabolism of all of those exposures and the broken-down exposures go to your bloodstream, then to your organs of elimination: lymph, lungs, skin, colon, and kidneys.
>
> Somewhere along the line, if your liver is overburdened or not efficient, then those exposures can overfill the bucket and spill over the brim, leading to an increase in allergy-related symptoms or other symptoms. Alternatively, if the liver/gallbladder is functioning satisfactorily, but the organs of elimination are compromised, then the bucket will still overfill or not drain properly leading to the same symptoms. If the system as a whole works well, then the bucket can eliminate these exposures, which helps keep the bucket from filling up too quickly. If the bucket never fills over the edge, you can tolerate these exposures with little to no symptoms.

First step is helping the patients limit the outside things coming into this bucket, such as exposures of irritating foods, drinks, chemicals, emotions, and known allergens if possible. We start

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with avoidance. We educate patients about possible contaminant exposures through air pollution, food, and drinking water, such as chemicals in the tap water, contaminants in plastic water bottles, glyphosate, or other herbicides in produce. Glyphosate has been linked to issues of celiac sprue and gluten intolerance.[18] We encourage patients to drink adequate amounts of filtered water. Exposure of chemicals through the skin is also another issue that is addressed. A good resource to look into popular skincare products and their possible contaminants is www.ewg.org/skindeep/. We talk about the possible effects of emotions such as stress and trauma and other repressed feelings that could lead to chemical hormones in the body that also have to be dealt with too. Unresolved emotions can have larger implications for overall health that go beyond the scope of allergies.[19]

Secondly, we work on the diet. We recommend an allergy elimination diet, which limits the most common reactive foods: wheat, dairy, soy, corn, sugar, and eggs. In addition, we limit the intake of processed foods and beverages and encourage to source organic foods if possible. We recommend whole foods with a variety of vegetables, good quality fats and protein. A good source for learning about organic fruits and vegetables is www.ewg.org/foodnews/.

The third step we address is the patient's micronutrient status. There are various nutrients that are important for supporting the basic liver detox pathways. I generally try to start with a medical food or broad-spectrum multivitamin that contains nutrients that support these detox pathways. I look for products that have methylated B vitamins, supportive amino acids, and herbs that can encourage healthy liver function. In addition, we may add vitamin C (3,000-5,000 mg), magnesium (400-1,000 mg), fish oils (1-3 g).[20]

Fourth, we focus on the other organs of detox and elimination.

For healthy gallbladder function, we may suggest gallbladder-supporting nutrients that include lipotropic agents, ox bile, taurine, beet extracts, or botanical choleretics.[21] Micronutrients from our second step also support this process.

For the blood and lymph, we encourage adequate exercise two to three times per week of at least 15 minutes. Simple things like jumping rope or using a rebounder can stimulate lymphatic movement. Additionally, hydrotherapy techniques such as alternating cold/hot water baths can help stimulate circulation. These same therapies help with skin and lung function.

For skin elimination, we suggest sweating through exercise, infrared sauna usage, dry brushing. Sweating is helpful for eliminating toxins, as the skin is the largest organ in the body.[22]

For lung function, practice deep breathing, or exercise, which can also help lower stress.[23] Look to getting a high-quality air filtration system for home and/or work use to minimize toxic air exposure.

For kidneys, the simple place to start is with adequate hydration. Aim to drink one-half of the body weight in ounces of filtered water to support adequate hydration. For example, if a patient weighs 160 pounds, they should aim for 80 ounces of water per day. There is some variability to this calculation, but it is a helpful rule of thumb.

For the GI system, focus on proper elimination and microbiome balance. Ensure patients have a minimum of one bowel movement per day. Adequate hydration can help with constipation.[24] Address microbiome balance with prebiotic fiber, probiotics, or antimicrobials if necessary. By changing the diet and limiting processed foods, it can help favorably alter the microbiome.[25]

There are a lot of steps for optimizing the emptying of this "bucket," but what I've found most helpful for patients are the pre-packaged-detoxification programs by several nutraceutical companies. I typically use kits like Designs for Health 14-day Paleo-cleanse and Thorne Mediclear 10-day program. They make it easier for the patient by supplying adequate amounts of micronutrients, herbs, and amino acids to support the majority of the biochemistry of detoxification. In addition, they serve as one-to-two meal replacements so patients will have less struggle with deciding which food options to choose from. Patients only need to focus on one major meal of the day, which will improve their compliance with the recommendations. There are similar programs and kits offered by other nutraceutical companies. The advantage to these programs is that they give patients a tangible and simplified process to start on while they get used to making the lifestyle changes.

Symptom-Relief Treatment Options

There are currently a wide range of treatment options available that I use in practice to help treat allergy symptoms. They range from temporary relief to more permanent lasting solutions. I will give examples of these options.

Nutrition. As mentioned above, start with foundational nutrition like a quality multivitamin.

Nettle leaf (*Urtica dioica*) has shown benefit for people suffering from allergic rhinitis.[26] Silymarin, a common herb used for liver support, has also shown benefit for alleviating the severity of allergic rhinitis symptoms.[27] Vitamins A, C, and E have shown some protective benefit on airway symptoms and may reduce wheezing symptoms.[28,29] Omega 3 oils from fatty fish show protection for childhood asthma risk and reducing atopic dermatitis.[30,31] There are supplements that have a combination of the above ingredients that we use in practice to give patients allergy symptom relief.

Quick relief. A newer supplement product containing an enzyme known as diamine oxidase (DAO) has been shown to give rapid symptom relief for allergic reactions. DAO helps to break down histamine in the body. Elevated histamine can lead to gastrointestinal upset, migraine, irritation of nasal mucosa, itching, or other forms of allergy. DAO, along with other enzymes, has the potential to break down and excrete histamine quickly thus helping to reduce the symptoms of allergy and food intolerance.[32,33] The only downside is that currently the products on the

market are relatively expensive when compared to other supplements. This should be used as temporary support while helping to address the underlying causes.

Nasal sinus relief. Nasal symptoms seem to be the most common presentation of allergies. Chronic runny nose or recurrent sinus infections are common conditions we see. Simple solutions, such as saline nasal rinse, can be helpful for chronic rhinosinusitis.[34] For tougher cases, addressing the underlying causes is helpful at eliminating chronic rhinitis. Some of the underlying causes could be naso-sinus fungal, polymicrobial, or multidrug resistant bacteria biofilm. This could be caused by mold exposure through water-damaged buildings or frequent use of antibiotics.[35, 36] Either way there are helpful agents that can be used for treatment and improvement of symptoms. Colloidal silver nasal spray has been shown to be effective against the biofilm activity and may be more superior than oral antibiotics.[36] Other agents such as N-acetyl cysteine and EDTA may assist in the biofilm disruption and enhance the effect of antifungal and antimicrobials.[37]

Treating the gut. Healthy microbiome balance is important. Proper prebiotics and probiotics have an effect on allergy development.[38] Specific probiotics like *Saccharomyces cerevisiae* and *Lactobacillus rhamnosus* have shown to reduce allergic rhinitis and nasal congestion and reduce food allergy.[39,40] Spore forming bacilli of the *Bacillus* species are showing promise for the treatment of gut dysbiosis, diarrhea, IBS, obesity, type 2 diabetes, cardiovascular conditions, and more.[41] In our practice, we use the product Mega Sporebiotic, which has shown benefit in patients dealing with inflammation and allergy symptoms.

Parasitic infection. An often-overlooked source of underlying allergy symptoms are parasitic infections. Various protozoa and parasites such as *Plasmodium falciparum*, *Dientamoeba fragilis*, *Blastocystis*, *Cryptosporidium* spp., *Entamoeba histolytica*, *Entamoeba dispar*, and *Giardia intestinalis* can lead to symptoms of asthma, atopic dermatitis, food allergy/intolerance, mast cell activation, anaphylaxis, and other inflammatory conditions.[42-45] One of the most effective treatments for parasites I have seen in my practice is the use of nitazoxanide (Alinia). It has been shown effective for a wide variety of parasites, helminths, in addition to *H. pylori*, *Campylobacter jejuni*, and potentially *Clostridium difficile*, Rotavirus and other viruses.[46-48] It has an extremely low side effect profile. For those without infections, the medication effects are comparable to placebo. I use a higher than normal prescribed dose of 1 g BID for up to 15 days. Patients generally tolerate the treatment well. There are times when I need to start at a smaller dose 250 mg BID for the first few days depending on the initial effects of the drug. Common adverse effects are temporary increase in gastrointestinal effects, primarily diarrhea or abdominal

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discomfort. Rarer effects are temporary yellowing of the skin and eyes that clear up when discontinuing the medication. I have had success in clearing chronic eczema cases in which the previously mentioned treatments have failed.

Allergy Tolerance. One last treatment option I use in my practice has shown rapid and effective resolution of chronic and acute allergy symptoms, especially hay fever. Low dose allergy therapy (LDA) has been discussed in previous articles.[49] For patients dealing with simpler cases of seasonal allergies, one to two treatments of LDA were able to get a virtual elimination or significant reduction in their allergy symptoms. I typically use this therapy as a supportive treatment for building allergy tolerance. I have seen patients have significant reduction in food intolerances following this therapy. It is typically recommended for patients to have the LDA treatment once every two months for six to eight treatments.

Summary

Allergies can be treated effectively by addressing the whole person and their individual underlying conditions. Most patients can benefit with general detoxification support to help lower their total body burden. However, personalized treatment approaches can yield far superior results to eliminate allergy symptoms.

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Pulmonary Conditions – Breathing, the Highest Consideration in the Hierarchy of Health

by Chris D. Meletis, ND, and Kimberly Wilkes

Many of us are paying attention to the food we ingest, shopping for organic meat and produce items, or filtering our water to reduce our exposure to toxins. But how often do we pay attention to the air we're breathing? Yet, what we breathe in can have as important effect on our bodies as the food we're eating and the water we're drinking. To name one example, exposure to air pollution is associated with development and worsening of asthma and other allergic diseases.[1]

Whether caused by exposure to air pollution, genetic susceptibility, a viral or bacterial infection, exposure to cigarette smoke, or gastroesophageal reflux, impaired pulmonary health can have systemic effects. Therefore, it is critical to ensure the strength and health of our lungs. In this article, we'll discuss a number of lung diseases, their risk factors including the role that gastroesophageal reflux plays in several lung disorders, the role of the gut microbiota in cystic fibrosis, and natural solutions for optimal lung health.

Idiopathic Pulmonary Fibrosis

Idiopathic pulmonary fibrosis (IPF), a type of idiopathic interstitial pneumonia, is a chronic, debilitating lung disorder that results in a progressive worsening of lung capacity over time. It is characterized by scarring (fibrosis) and inflammation. The course of the disease can progress in varying ways, with some individuals undergoing periods of relative stability while others experience a steady reduction in lung function or periods of acute exacerbation. Rarely, some patients may remain symptom free for two to three years after diagnosis.[2]

In the United States, using narrow definitions, the prevalence is 14 to 27.9 cases of the disease per 100,000 population. Using a broader definition, the prevalence is 42.7 to 63 cases per 100,000 population.[3] IPF is slightly more common in males compared with females with a medium age of onset of 66 years.[4] Symptoms include shortness of breath and a cough, leading to marked declines in health-related quality of life. The survival rate is approximately two to five years.[3]

Conventional treatment for IPF usually includes corticosteroids or immunosuppressants, but this therapy does not markedly improve the survival of patients with IPF.[3] Balancing the benefits versus adverse effects of standard pharmaceutical therapies such as nintedanib, etanercept, warfarin (which is generally contraindicated), Gleevec, and bosentan is a very real clinical challenge.[5]

Cystic Fibrosis

Cystic fibrosis is a genetic disease involving chronic inflammation and oxidative stress impacting primarily the respiratory and digestive systems. Cystic fibrosis is the most common life-shortening autosomal recessive disorder, affecting 30,000 people in the US and 70,000 globally.[6,7] Although 75 percent of people with the disease are diagnosed by age 2,[7] Dr. Meletis recently had a 12-year-old boy in his clinical practice diagnosed that was quite athletically active whose sole presentation was frequent congestion and phlegm particularly in the morning. This reminds us as clinicians to test patients with unique presentations.

A mutation in the cystic fibrosis transmembrane conductance regulator (CFTR) gene, leading to expression of impaired Cl^-ion transport proteins in epithelial cells, is responsible for the development of cystic fibrosis.[6] This mutation results in insufficient hydration in the lungs and colon, leading to build up of viscous mucus on epithelial surfaces.[6,8] This accumulation of mucus leads to increased risk of infection in this group of individuals. Specifically, the lungs of cystic fibrosis patients are usually predisposed to colonization with *Pseudomonas aeruginosa* resistant to eradication by the immune system and medications.[9] The bacteria in the lungs of the cystic fibrosis patients often develops a biofilm to shield the microorganisms from host defenses and antibacterial drugs.[9] This biofilm combined with higher lung mucus viscosity and persistence in cystic fibrosis patients inhibits the effectiveness of antibiotics.[9]

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Airway inflammation plays an important role in poor clinical outcomes in cystic fibrosis patients.[10] Inflammation markers are higher in the sputum of people with cystic fibrosis while anti-inflammatory markers are decreased.[11,12] Impaired fatty acid metabolism, including low linoleic acid and docosahexaenoic acid levels, have been observed in patients with cystic fibrosis.[13] Human and animal studies indicate that impaired fatty acid metabolism in cystic fibrosis patients may be associated with greater inflammation via an elevation in prostaglandin synthesis.[14]

Dysbiosis of the gut microbiota is another contributing factor in cystic fibrosis. We will discuss this in more detail later in the article.

Asthma

Asthma is a chronic respiratory disease characterized by bronchial airway inflammation leading to increased generation of mucus and hyper-responsiveness of the airway to asthma triggers. Symptoms of asthma include wheezing, coughing, and shortness of breath. According to the Centers for Disease Control and Prevention, 18.4 million adults (7.6%) in the US have asthma.[15]

Genetic, allergic, environmental, infectious, emotional, and nutritional factors all play a role in asthma. Airway inflammation is a driving force behind the pathophysiology of the disease. The cause of this inflammation is thought to be an abnormal or poorly regulated CD4+ T-cell immune response.[16] The T-helper 2 (Th2) subset of immune cells generate proteins known as cytokines including interleukin-4 (IL-4), IL-5, IL-6, IL-9, IL-10, and IL-13. These cytokines enhance the growth, differentiation, and recruitment of mast cells, basophils, eosinophils, and B-cells. Each of these cells play an important role in humoral immunity, inflammation, and allergic response.

Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease (COPD) is comprised of two conditions: emphysema and/or chronic bronchitis. Chronic infections are common in COPD patients, who have heightened inflammatory responses and a progressive reduction in respiratory function. Chronic cough, respiratory secretions, and progressive difficult or labored breathing and fibrosis are all hallmarks of COPD. Nearly 15.7 million people in the US (6.4%) have COPD, although half of adults with low pulmonary function are unaware they have COPD so the actual number of people who have the disease may be higher.[17]

The primary cause of COPD is chronic exposure to cigarette smoke (CS), and the risk of disease is proportionally correlated to the number of cigarettes smoked daily.[18] However, other contributing factors to the disease include high exposure to dust laden with toxins, contact with chemicals, and mutations in the α_1-antitrypsin gene.[19,20]

Other Risk Factors for Development and Exacerbation of Lung Disorders

In addition to the other risk factors mentioned above, there are several important contributors to the development or worsening of lung diseases.

Viral and Bacterial Infections

An association exists between infections with certain viruses and lung diseases, especially IPF and asthma. Studies using lung samples have established a possible association between the hepatitis C (HCV) family of viruses and IPF, acute exacerbations of IPF, or patients at risk for familial IPF, indicating these viruses may be involved in the development and/or worsening of IPF.[21] In one of those studies, HCV antibodies were present in 28% of patients with IPF compared with only 3.6% of controls.[22] In another study, researchers found a greater incidence of IPF at 10 and 20 years after HCV infection compared with hepatitis B virus patients.[23] Other researchers observed a greater prevalence of HCV in many forms of lung disease, indicating the association may not be limited to IPF.[24]

Scientists have also found the presence of herpes simplex virus (HSV-1) in bronchoalveolar lavage fluid and lung tissue biopsy from patients with IPF and nonspecific idiopathic interstitial pneumonia.[25] Epstein-Barr virus (EBV), which belongs to the herpes virus family, is also common in patients with IPF and may be involved in the development of pulmonary hypertension in these patients.[26-29]

Other viruses are implicated in the development or exacerbation of IPF. There is a high prevalence of the Torque-Teno (Transfusion-Transmitted) virus (TTV) in patients with IPF.[30] Furthermore, in one study, the three-year survival rate of patients with IPF who were infected with TTV was markedly lower.[30] The same trial also found higher TTV levels in patients with IPF who develop lung cancer compared to patients who did not develop cancer.[30] Additionally, TTV was the most common virus in a group of individuals with IPF suffering from acute exacerbation.[31] Scientists have also observed this virus in people with lung cancer and acute lung injury.[21]

Viral infections acquired early in life are also triggers for the development of asthma. A newly discovered virus family known as *Anelloviridae* are contracted in childhood and replicate continuously without causing any symptoms.[32] This virus modifies the innate and adaptive immune systems and plays a role in the development of asthma.[32]

Asthma may be associated with other types of viral infections including EBV[33] and adenovirus.[34,35]

Bacterial infections may also play a role in lung diseases. Interestingly, reports have identified *Chlamydia pneumoniae* infection as a trigger for the development of asthma and improvement in asthma occurred after antibiotics eradicated the bacteria.[36] Chlamydia infections may also worsen smoking-associated inflammation in COPD patients.[36] Another study in adults found that higher levels of Chlamydia antibodies correlated with greater asthma severity.[37]

Pseudomonas aeruginosa is another bacterial infection implicated in lung

disease, specifically cystic fibrosis. Individuals with cystic fibrosis are vulnerable to *P. aeruginosa* infections of the lungs and these infections are often resistant to clearance by the immune system and antibiotics.[9]

Gastroesophageal Reflux Disease

Gastroesophageal reflux disease (GERD) is characterized by reflux and regurgitation leading to symptoms such as heartburn, pain in the upper abdomen, difficulty swallowing, and aerodigestive symptoms including asthma, chronic cough, or recurrent pneumonia. GERD often occurs together with IPF and may play a role in progression and worsening of the disease.[38] Some evidence suggests that treatment of GERD leads to lower IPF-related mortality but not overall mortality.[38] Researchers have also observed an increased incidence of GERD in asthma patients,[39] although it has not been firmly established whether these two disorders simply occur together, whether GERD causes asthma, or whether asthma causes GERD.[16] It is estimated that 75% of asthma patients have GERD symptoms, 80% have abnormal acid reflux, 60% have a hiatal hernia, and 40% have esophageal erosions or ulcerations.[39]

Increased bronchoconstriction occurs with esophageal acid infusion.[16] In a human study, this bronchoconstriction was eliminated after antacid treatment.[40] The mechanism of action linking GERD to asthma may involve the vagus nerve creating a reflex from the irritated esophagus to the lungs, leading to bronchoconstriction.[16] Another explanation is that gastric acid from the esophagus may seep into the lungs, causing injury, irritation, and increased production of mucus.[16]

There is some indication, as observed by Jonathan Wright, that asthma patients actually have a reduced gastric acid output, which results in impaired protein digestion and nutrient absorption as well as increased food allergies.[16]

Dysbiosis of the Gut Microbiota

An imbalance (dysbiosis) in the gut microbiota – the population of microbes residing in the intestinal tract – is associated with airway diseases such as cystic fibrosis and asthma. In cystic fibrosis, abnormal intestinal mucosa is associated with alterations in gut microbiota.[41] Patients with cystic fibrosis have a reduced overall bacterial abundance and lower species diversity compared with healthy people.[41] Researchers conducted one study of 43 individuals with cystic fibrosis and 69 controls without the disorder.[42] Although the greatest differences in diversity of the intestinal microbiota occurred between cystic fibrosis patients and healthy controls, alterations in the gut microbiota were also observed between individuals with cystic fibrosis when divided into groups based upon different parameters including the percent predicted FEV_1 (a measurement of lung dysfunction) and the amount of intravenous antibiotic courses received in the previous year. Patients with cystic fibrosis who had severe lung impairment had markedly lower gut microbiota diversity compared with patients who had mild or moderate impairment. Additionally, greater number of IV antibiotic courses was significantly associated with lower diversity of the gut microbiota.

There is also a relationship between the gut microbiota and asthma. Infants given antibiotics have an altered gut microbiota and immune development and an increased risk of childhood asthma.[43] However, in one study similar associations were found for maternal antibiotic use before and after pregnancy. This indicated the correlation is either not directly causal or it's not specific to pregnancy.[43] Furthermore, researchers have observed a difference in the microbiota profile of people with asthma compared with healthy controls.[44]

In mice with a predisposition to develop allergic airway diseases, oral administration of the live probiotic *Bifidobacterium adolescentis* ATCC 15703 alleviated allergic airway inflammation and decreased levels of eosinophils in the airway, hallmarks of allergic asthma.[45] In humans, supplementation with 10^8 CFU per day of the probiotic *L. reuterii* was effective in reducing bronchial inflammation in children with well-controlled asthma.[46]

The mechanism of action linking GERD to asthma may involve the vagus nerve creating a reflex from the irritated esophagus to the lungs, leading to bronchoconstriction.

Another study evaluated the effects of supplementation with the prebiotic Bimuno-galactooligosaccharide (B-GOS) on exercise-induced bronchoconstriction and airway inflammation.[47] Ten adults with asthma and bronchoconstriction caused by hyperpnea (increased depth and rate of breathing) and eight healthy controls randomly received either 5.5 grams/day of B-GOS or a placebo for three weeks separated by a two-week washout period. The prebiotic intervention resulted in reduced airway hyper-responsiveness along with reductions in markers of airway inflammation.

Air Pollution and Environmental Exposures

Epidemiological evidence indicates there is a significant association between air pollution and the development and worsening of asthma and COPD. The primary components of pollution responsible are ozone (O_3) and nitrogen dioxide (NO_2), as well as particulate matter (PM) derived from car exhaust and industry.[1,48] Diesel exhaust particulate (DEP) can bind proteins and may act as a carrier of allergens, allowing them to penetrate deep into the respiratory tract.[1,48] Furthermore, acute flare ups and worsening of idiopathic pulmonary fibrosis correlate with exposure to O_3, NO_2, and particulate matter.[49] In addition, chronic exposure to air pollution might actually cause the development of IPF.[49]

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Indoor pollution including secondhand cigarette smoke and emissions from wood-burning stoves can also exacerbate asthma symptoms.[16] Secondhand smoke up-regulates the Th2 immune response in animal studies.[50] Exposure to cigarette smoke is also responsible for most cases of COPD.[51] Gas appliances can increase the level of nitrogen dioxide breathed in, impairing lung function.[16] Offgasing of volatile organic compounds and formaldehyde emitted from paints, adhesives, furniture, carpet, and building materials are also associated with an increased risk of asthma attacks.[16]

Environmental exposure is also linked to IPF. A meta-analysis found that smoking at any time throughout life or exposure to agriculture/farming, livestock, wood dust, metal dust, and stone/sand were each considered significant risk factors for IPF.[19]

Natural Support for Lung Conditions

A number of nutritional and lifestyle options exist for patients with pulmonary concerns. Here are some suggestions based on both clinical practice and research.

Idiopathic Pulmonary Fibrosis. Animal studies have reported on the promising effects of a number of botanicals. In a rat model, rosemary extract, which contains rosmarinic and carnosic acids, reduced and cured pulmonary fibrosis even when it was administered after fibrosis occurred.[52] Similar results were achieved with rosemary extract in other animal studies.[53,54] Green tea is another botanical that has demonstrated anti-fibrotic activity in animal studies. In one of those studies, a rat model of pulmonary fibrosis, green tea extract reduced oxidative stress and suppressed endothelin-1 expression, a mediator of pulmonary fibrosis.[55] In another rodent model of pulmonary fibrosis, a combination of green tea extract and curcumin exhibited powerful, synergistic anti-inflammatory effects.[56]

Gingko biloba and carnitine were also studied in rats exposed to a substance that causes pulmonary fibrosis.[57] Researchers induced pulmonary fibrosis in the animals then administered ginkgo or carnitine. Ginkgo decreased the collagen content in the lungs of the rats and reduced inflammation and oxidative stress. Carnitine did not reduce the collagen content but did lower oxidative stress and inflammation.

Additionally, promising results were achieved using *Rhodiola rosea L*. in a rat model of pulmonary fibrosis.[58] Rhodiola protected against fibrotic lung damage through its anti-inflammatory, antioxidant, and anti-fibrotic actions.

Furthermore, a combination of the botanicals Astragali Radix, Angelicae Sinensis Radix, Paeoniae Radix Alba, Pheretima, Chuanxiong Rhizoma, Carthami Flos, and Persicae Semen (known as a Buyang Huanwu decoction) alleviated pulmonary fibrosis of rats by improving lung tissue morphology and reducing levels of serum collagen types I and III.[59]

Human studies of dietary supplements and IPF have focused on the use of N-acetylcysteine (NAC). A meta-analysis found that although NAC did not have a beneficial effect on changes in forced vital capacity, changes in predicted carbon monoxide diffusing capacity, rates of adverse events, or death rates, it did significantly improve decreases in percentage of predicted vital capacity and 6 minutes walking test distance.[60] Inhalation of NAC is a promising route of administration as noted in a study where patients with early stage IPF experienced enhanced forced vital capacity after exposed to NAC in an aerosol form.[61]

Cystic Fibrosis. In addition to supplementation with probiotics, as noted earlier in this article, there is also justification for support with other nutraceuticals in patients with cystic fibrosis. An imbalance in omega-6/omega-3 polyunsaturated fatty acids is common in cystic fibrosis (CF) patients.[62] Consequently, researchers have explored the effects of omega-3 fatty acid supplementation in these individuals. One randomized, placebo-controlled study found that compared to the previous year, cystic fibrosis patients given omega-3 fatty acids experienced a decline in pulmonary exacerbations at 12 months.[63] In addition, the subjects receiving the omega-3 fatty acids took antibiotics for a shorter period of time (26.5 days compared with 60 days in participants not receiving the fatty acids.)

NAC is another nutraceutical studied in patients with cystic fibrosis. When combined in an inhaled form together with an aerosol form of an antibiotic drug, it has synergistic effects against *P. aeruginosa* infections in this group of patients.[9] NAC is known for its ability to break down mucus. Therefore, combining it with the drug enhanced the ability of the antibiotic to diffuse into the mucus, compared to when the drug was used alone.

There's also indication that vitamin A may play a role in the health of cystic fibrosis patients. After excluding subjects with acute pulmonary exacerbations, researchers found that cystic fibrosis patients with a moderately high retinol level (up to 110 µg/dL) had the best respiratory function without any signs of toxicity.[64]

Asthma. Since oxygen radicals play a prominent role in the development of asthma, antioxidant supplementation is important. In one study, levels of the antioxidant vitamins C and E were low in the lung lining fluid of individuals with asthma, despite normal or increased plasma concentrations of the vitamins.[65] Furthermore, vitamins E and C may be able to prevent air pollution damage in patients with asthma. Four randomized, controlled trials found that vitamin E combined with vitamin C protected against bronchoconstriction caused by ozone in people with and without asthma.[66-69] Furthermore, the gamma tocopherol isoform of vitamin E suppressed markers of inflammation in subjects with asthma and reduced acute airway response.[70]

Vitamin D is another nutrient of interest to asthmatics. Although not all studies have found an association between vitamin D and asthma, enough evidence exists to warrant its use. Three population-based studies demonstrated a correlation between lower serum vitamin D concentrations and severe asthma exacerbations or core measures of exacerbations such as

hospitalizations.[71-73] For example, one of these studies observed that vitamin D insufficiency or deficiency in Puerto Rican children is linked to increased likelihood of having had one or more severe asthma exacerbation in the previous year.[71]

Other nutrients that may be important for individuals with asthma include pyridoxine (vitamin B6), magnesium, and omega-3 fatty acids.[74-76]

One botanical showing promise in supporting asthma patients is *Boswellia serrata*, which suppresses the formation of leukotrienes, inflammatory metabolites of arachidonic acid. One double-blind, placebo-controlled trial investigated the effects of 300 mg Boswellia extract three times daily for six weeks in 40 subjects with asthma.[77] Symptoms such as difficulty breathing, number of attacks, and wheezing improved in 70% of the participants given Boswellia compared to only 27% of the placebo group. Measurements of lung function also improved in the patients given Boswellia and eosinophilia was reduced.

Due to the connection between GERD and asthma and the finding that stomach acid is low in asthmatics, some clinicians have successfully used hydrochloric acid in asthma patients, indicating there may be justification for its use.[16] Moreover, in some people with asthma, aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs) can trigger an attack, so avoiding this class of drugs is important.[16] By blocking the cyclooxygenase enzyme, NSAIDs lead to production of leukotrienes, which in turn promote inflammation and bronchial constriction.[16] Dehydration may also play a role in asthma symptoms.[78] Cautioning asthma patients to stay well-hydrated is therefore important. Acupuncture, biofeedback, yoga breathing, and chiropractic care may offer other solutions.[16]

Chronic Obstructive Pulmonary Disease. Dietary supplements can offer support to COPD patients. Carotenoids and vitamins D and E help suppress lung injury after pollution exposure.[79] Furthermore, nitric oxide (NO) modulates lung function and low serum NO concentrations are associated with COPD severity.[80] This indicates that NO-balancing supplements such as L-citrulline and beetroot juice may be beneficial.

Additionally, NAC may be beneficial in COPD. In patients with COPD who were at high risk for exacerbations, a randomized, placebo-controlled trial showed that 600 mg twice per day of NAC was associated with a reduction in exacerbations and increased the time to the first exacerbation.[81] In another trial, Chinese patients with moderate-to-severe COPD given 600 mg of NAC twice daily for a year experienced a reduced number of exacerbations, especially in the patients with moderate disease severity.[82] ➤

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Conclusion

Our lungs are vulnerable to an onslaught of toxins including cigarette smoke and indoor and outdoor pollution. Lung disorders can seriously affect quality of life and in the case of idiopathic pulmonary fibrosis significantly increase mortality. Incorporating specific nutraceuticals into the regimens of patients with pulmonary concerns and in some cases implementing lifestyle solutions can have a beneficial impact on lung health.

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Why Food Allergy Occurs – An Electronic Mystery Story

by Alfred V. Zamm, MD

Abstract
Clinically, the gastrointestinal tract appears to act as an electronic device in its process of "deciding" which particle to let enter the body and which particle to prevent from entering the body, i.e., it functions as an electronic gatekeeper. This sorting process can be explained if one makes two assumptions: (1) that the central structure of the secretory IgA molecule is like the central structure in an electronic transistor and acts as an electronic one-way valve permitting electrons to flow only in one direction, thus resulting in the polarization of the secretory IgA molecule; and (2) that these polarized secretory IgA particles, when coalesced into a sheet and this sheet is spread over the gastrointestinal tract's absorptive surface, act as an electronic sieve with the ability to selectively accept or reject particles for absorption.

This article is anecdotal; it arose out of 50 years of personal experience as a board-certified dermatologist. My resources to produce this article were, however limited, those available to any physician in private practice: personal observation, patient anamnesis, the limited scientific resources and equipment herein described, and a reasonable education. When taken together, the ideas expressed in this article are essentially an opinion.

It all started when I moved to Kingston, New York, and opened my dermatology practice. (Kingston is a small city in the Hudson River Valley, 90 miles north of New York City. The Hudson River Valley region of New York State stretches northward along the Hudson River from Westchester County to Albany, the state capital.) Soon I began to notice that there was a group of patients with medically similar puzzling histories: Their allergic symptoms would mysteriously appear and disappear, in a manner for which I had no scientific explanation. The following examples are condensed versions of some of the many similar medical cases that helped me eventually arrive at an explanation for this curious phenomenon.

"The Roxbury Effect"

Roxbury is small town in New York 40 miles northwest of Kingston, New York (and *outside* the Hudson River Valley).

Case No. 1: The first patient that was my introduction to this puzzling group was a young woman who lived in Kingston and who came to my office because of eczema (atopic eczema) of her hands. I traced the cause of her eczema to an allergy that resulted from a hypersensitivity to fermented foods, i.e., foods containing the yeast-fungi group: Baker's yeast (bread), Brewer's yeast (alcoholic beverages, vinegar), fungi (cheese), and also mushrooms.

If she scrupulously avoided these foods, protected her hands from irritating contactants, and used topical treatment, her eczema would improve. If she had even a minor dietary transgression, she would experience a recurrence of her eczema – except when she visited her parents in Roxbury, where she could eat anything with impunity and come in contact with irritants ad lib and yet, despite this increased exposure to provocative agents, her hands would actually improve. Regarding a possible exposure to inhalant allergens confounding this observation, there was no relevant difference in the inhalant population between Roxbury and Kingston (and seasonal inhalant differences did not affect the eczema); the only variable was geographical location. Why did the gastrointestinal gatekeeper fail to work properly in Kingston but did work well in Roxbury? This is the essence of the story that I'm about to unfold for you.

I had no conventional medical explanation for this puzzling medical observation, and this led me to consider more generalized questions: How does the gastrointestinal absorptive process actually work? How does the gastrointestinal tract "decide" which particles to allow to be absorbed and which particles are to be rejected; and, by extension, how does food allergy occur? These were questions that I had never found answered in the scientific literature.

Cases No. 2 and 3 involved a husband and wife. The wife had asthma and the husband had atopic eczema. Their symptoms were both due to cow's milk allergy, and their symptoms would occur in Kingston but would not occur in

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Roxbury, despite their consuming cow's milk ad lib.

Cases No. 4 and 5 involved two brothers, both with asthma due to an allergy to cow's milk, and both of whom lived in Catskill, New York, a small town in the Hudson River Valley 20 miles north of Kingston. The brothers' asthma would occur in Catskill but not in Roxbury, despite their liberal consumption of cow's milk. For these four cases (2, 3, 4, and 5), the possibility of inhalant allergens being a factor was investigated and factored out.

Regarding Magnetism

From these cases, from my observations of additional similar cases, and from a study of the relevant scientific literature, I reached the following conclusions. These patients were always more resistant to allergenic insults if they were located in an area of the earth with higher geomagnetism. The amount of geomagnetism at a location is a function of the amount of iron deposits in the earth at that location (specifically the amount of magnetite, a form of iron oxide). Three types of investigations were done to see if magnetism was salubrious per se:

1. Experiments were done using iron bar magnets; the magnetism from these iron bars were without benefit and perhaps even deleterious in some cases;
2. Experiments were done using DC current to electrically generate magnetic fields of varying field strengths: these magnetic fields were without benefit or apparent harm;
3. Regarding geomagnetism: I was able to access existing information on the subject by using maps from the United States Geological Survey (USGS). I used two colorimetric geomagnetic maps in which the spectrum of colors of the rainbow ("ROYGBIV") was matched to the spectrum of geomagnetic intensity found throughout the United States. Obtaining these two maps from the USGS involves the following complicated identification nomenclature: Composite Magnetic Anomaly Map of the Conterminous United States, Geophysical Investigations Map GP-954-4. Sheet No. 1 Western United States Old Mati Number GGP0954A-1T (New Mati No. 22982). Sheet No. 2 Eastern United States Old Mati Number GGP0954A-2T (New Mati No. 22983). In addition to these two maps, I used a combination of other types of maps that I had transferred to transparent Mylar sheets after they were either enlarged or reduced in order to achieve a common map scale for use as transparent overlays in a composite arrangement.

These patients were always more resistant to allergenic insults if they were located in an area of the earth with higher geomagnetism. The amount of geomagnetism at a location is a function of the amount of iron deposits in the earth ….

"The Binghamton Effect"

This case involved a young woman with asthma due to an allergy to cow's milk. The woman was symptomatic in New Paltz (once more, allergic symptoms occurring *in* the Hudson Valley) and asymptomatic in Binghamton (symptoms disappearing *outside* the Hudson Valley), despite consuming cow's milk ad lib in Binghamton. Binghamton is a medium-sized city approximately 100 miles west of the Hudson River Valley. New Paltz is a town *in* the Hudson River Valley 20 miles south of Kingston. The possibility of a clinically significant allergenic difference in inhalants and seasonal pollens between the two locations was investigated and factored out. The patient volunteered that whenever she travelled west to east (from Binghamton to New Paltz), she noticed that at a specific site in the journey (when approaching the Hudson Valley) at the hamlet of Roscoe, New York, her asthma would always return. Her asthma would always disappear at the same location when travelling from east to west as she left the Hudson Valley on her return trip to Binghamton.

The combination of the colorimetric map of geomagnetic anomalies with the transparent overlays produced a revelation: The Hudson Valley, where these patients did not fare well, had a *lower* geomagnetic intensity than the towns and cities outside the Hudson Valley which were more salubrious.

In addition to observations concerning magnetism, I also collected medical histories concerning atmospheric negative ions:

1. Some patients reported that they were more resistant to an allergenic insult on a bright sunny day, that this benefit would be lessened on a cloudy day, and it would essentially disappear at sunset; they described it as "crashing at sunset" ("the sunset effect").
2. Some members of this puzzling group were more resistant to allergenic exposure if they were at the seashore and especially if they were exposed to a sea breeze ("the seashore effect").
3. I suspected that these patients did better at higher altitudes.

Scientific evidence by others verified that: (1) atmospheric negative ions are salubrious (a higher concentration of them is more salubrious); (2) there are more atmospheric negative ions present on sunny days, or with sea breezes, or at higher altitudes[1-6] (and, I suspected, at sites with higher geomagnetism).

Health benefits, for these patients, were *associated with* the presence of naturally occurring atmospheric

negative ions but not associated with negative ions that were artificially generated by a negative-ion-generating machine. In addition, I found that a negative-ion-generating machine made some patients worse, perhaps due to the harmful effect of toxic ozone gas that it generated. My conclusion was that any clinical benefit *associated with* naturally occurring atmospheric negative ions was due to more than just the presence of negative ions and that there was a mysterious additional factor.

These are the seemingly unconnected thoughts that were now swirling around in my head: patients who became ill and got well without a scientific explanation, magnetite in the earth, naturally occurring atmospheric negative ions, the salubrious effect of the sun and the seashore, and benefits which occurred at high altitudes.

Then one day the epiphany arrived: I remembered an educational toy, an electronics kit, that I had purchased for my son. One of the pieces in the kit had a schematic illustration printed on it, a diagrammatic representation of an electronic transistor: a "sandwich" consisting of a semiconductor central piece surrounded on two sides by two symmetrical conductive structures. It occurred to me that this configuration of an electronic transistor and the configuration of a molecule of secretory IgA were structurally (reductively) identical. Both had a single central piece, and both had two matching structures symmetrically arranged on either side of the central piece.

In the case of secretory IgA, and for convenience in this article, I will call this central piece "structure X" or simply "X." "X" actually consists of two substructures whose nomenclature is "the secretory component" and the "J-chain."

I conjectured that "X" in the secretory IgA molecule functions in the same way as the central structure of a transistor: as a semiconductor electronic one-way valve that permits electrons to flow in only one direction.[7] This conduction of electrons in one direction in an organic molecule would result in a polarized molecule.

The amount of electrons that flow through the one-way valve of the secretory IgA molecule *increases* in proportion to the amount of outside energy applied to it (in this case, the sun's energy – specifically the solar wind). This is how the secretory IgA molecule gets more polarized in areas of higher geomagnetism – the more salubrious state.

The coalescence of these polarized individual secretory IgA particles forms an electronic sheet over the absorptive surface of the gastrointestinal tract and this sheet serves as an electronic sieve (*vide infra*).

How could an electronic sieve work? The following narrative explains it to me:

1. If one assumes that each polarized secretory IgA molecule is somehow held in an immobile position on the gastrointestinal surface, then
2. The greater the polarization of the individual molecules of secretory IgA, the greater would be the field strength around each pole of this molecule, and
3. Thus the smaller would be the electronic "hole" between each of the secretory IgA molecules, and
4. The more "protective" would be this electronic sieve-gatekeeper, and
5. Hence, only smaller, *less allergenic* particles would be able to pass through the smaller electronic holes between each molecule of secretory IgA, and
6. The larger, *more allergenic* molecules would not be able to pass through an electronic sieve with finer "holes." This is the situation we find in areas of greater magnetism (Roxbury and Binghamton).

An outline of the reverse situation (lesser geomagnetism):

1. *Without* the greater input of the energy of the solar wind (the situation that was reversed in areas of *lower* geomagnetism in Kingston and New Paltz),
2. The resultant larger electronic "holes" would allow larger, more allergenic molecules to pass through this less effective electronic gatekeeper,
3. Thereby creating a less salubrious (more allergy, etc.) state.

The "size" of the electronic "holes" in the electronic sieve is *inversely* proportional to the amount of solar wind falling on "X." What would happen if "X" was shielded from all solar wind? I arranged an experiment to find out by acquiring access for my patients to a field-free room (a Faraday cage). Such a chamber consists of metal sheets or a metal grid that surrounds all sides of the chamber. The field-free room blocks the impingement of all outside radiation (particles and waves). When two patients from this mysterious group entered this chamber, they both became ill immediately and had to leave in less than five minutes. They were ill for the next five days in a lesser amount on each passing day.

The sun's energy (the solar wind's spray of particles and waves) does not flow uniformly upon the earth but flows with a greater amount to sites having greater geomagnetism (the most well-known example of this is the aurora borealis); the localized greater geomagnetism due to a greater deposit of magnetite "robs" the valuable solar energy from adjacent sites having

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lesser geomagnetism. This explains the difference in salubriousness between areas of different geomagnetism. For a more detailed explanation of these subjects, consult Pub Med ID 24068871.[8]

Epilogue

I wrote this article with the aim of attracting the attention of physicists with an interest in solving medical problems. My reasons for this can be summarized as follows:

1. The oxidative metabolism occurring in the underlying gastrointestinal structure on which the secretory IgA molecules rest is the source of the electrons necessary for the polarization of secretory IgA;
2. "X" is the critical "one-way valve";
3. If someone could figure out a wearable device that would artificially duplicate the effect of the solar wind on "X" (perhaps specifically tuned radio waves or some other form of harmless electromagnetic messaging);
4. Then, the secretory IgA molecule could be continuously artificially polarized independent of a lack of sufficient solar wind's energy or atmospheric ions.

What would be the salubrious consequences of such an invention that would artificially polarize secretory IgA?

1. Many deleterious molecules would not be absorbed from the gastrointestinal tract;
2. An allergic process that targets various organs (gastrointestinal, respiratory, genitourinary, et al) would be eliminated or reduced;
3. I suspect that some autoimmune diseases would be mitigated or eliminated (particularly autoimmune disease due to "molecular mimicry" of molecules that should not be absorbed from the gastrointestinal tract);
4. Allergy as a possible contributory factor to the development of cancer would be reduced or eliminated. In this regard, I bring to the attention of the reader the observation that allergy produces a depression of the leukocyte count (a reduction in a major defense against cancer) – sort of like having fewer policemen to defend against crime. This often-overlooked observation that the allergic process depresses the leukocyte count ("the leukopenic index") was made by Vaughan.[9,10]
5. Allergy is a possible contributory factor to cardiovascular disease would be reduced or eliminated. For example, the elimination or reduction of allergenic insult would reduce the incidence of myocardial infarction and other vascular diseases[11-14]

Just some thoughts on the subject – and ideas for some potential inventor.

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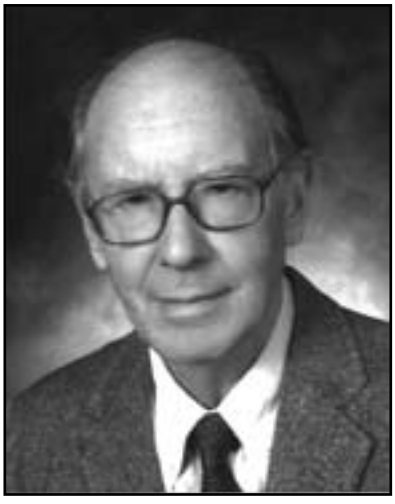

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Cataracts – An Integrative Medical Approach

by Marc Grossman, OD, LAc

The world is changing. Our concepts of Western medicine have shifted with new research coming out regularly supporting the benefit of lifestyle, diet, and targeted supplementation. The approach of a symptom-oriented treatment protocol isolates the person from the health condition, defining them in terms of diagnosis and specific medications for that diagnosis.

The holistic and Eastern medicine approach seeks to look at each person as a unique individual so treatment strategies can often vary from person to person even with the same diagnosis.

By combining the medical approaches of the East and West along with other alternative health modalities, we may be able to achieve better health with less cost and greater success in helping patients preserve vision.

Cataract Types and Prevalence

Cataracts are defined less by the age of onset than by the size and location. The age of onset does not determine the cause. Anyone with a genetic marker for cataracts could be more vulnerable to damage due to environmental toxins.[1]

Senile or age-related cataract occurs after age 45. Age-related cataracts are generally attributed to multiple environmental insults accumulated over a number of years, including ongoing exposure to sunlight, oxidation in the lens, as well as poor circulation and delivery of essential nutrients to the eyes.

Cataracts tend to worsen over time and are the major cause of blindness. Almost 40 million people in the US alone, suffer from cataracts. Only 10% of people are affected with cataracts by age 55, but the figure jumps to 50% by age 75, and 70% by age 80+.[2] Cataract removal is the most common surgical procedure covered by Medicare with almost 3,000,000 surgeries performed per year.

Location

Nuclear cataracts are those found in the central part of the eye lens. Due to the location of the cataract, these tend to impact vision to a greater degree than those located elsewhere on the eye lens, even in early stages of development.

Cortical cataracts are found on the outside part of the eye lens and are commonly found in people with diabetes. Given the location of this type of cataract, these may have little effect on vision, particularly in the early stage of development, but they can develop quickly in diabetics.

Posterior subcapsular cataracts appear on the back part of the eye lens. Symptoms can include sensitivity to bright light, seeing of halos, and/or difficulty in distance vision.

Secondary cataracts are not technically cataracts; however, they are called this in mainstream medicine. Secondary cataracts occur when old cells of the original lens remain in the eye and collect on the new artificial lens. They may occur in up to 50% of post-cataract surgery patients, and they can result in symptoms similar to the original cataract condition. Doctors use a YAG laser treatment to "burn" off the excess cells from the new lens. This procedure is typically fast, painless, and very effective, and usually done in the eye doctor's office.

About the Lens

The healthy eye lens is completely transparent, allowing the maximum amount of light to reach the retina. The lens is comprised of water and a highly concentrated mix of several proteins, including protective proteins that prevent the lens proteins from aggregating and clumping. A cataract results when the proteins start to clump up, clouding the lens, and reducing the amount of light that can pass through. If not treated, the color of the lens starts to change from being clear to yellowish and eventually brownish.

The lens has a microcirculation system which operates in lieu of blood vessels. It has been proposed that this system is a flow of ions that generates a flow of water through the lens. An extracellular flow of water moves nutrients into the lens; an intracellular flow of water removes wastes from the lens.[3]

Early Stages

Vision blurriness and sensitivity to glare, particularly at night, and/or seeing halos are signs of early stage cataract development. These symptoms can vary depending on the location of the cataract on the eye lens.

Moderate Stages

At this stage, the eye doctor will usually recommend surgery, particularly

if vision cannot be improved better than 20/40 with eyeglasses, due to the cataract. The location of the cataract on the lens also determines whether surgery is recommended at that time. Symptoms again include blurriness of vision, sensitivity to glare (particularly at night), and possibly less color clarity. Double vision, or seeing multiple images, is another common symptom at this stage.

Late Stages

As cataracts get harder and stiffer, they are more difficult to remove. They can also liquefy, and if not removed, can cause substantial inflammation, pain, and possibly infection. At this stage, people often can see shapes, but not detail. While an advanced cataract raises the risk of complications from surgery, unless there is a medical reason to avoid it, surgery should be performed. This is a crucial point in the development of cataracts, and if left unaddressed, further complications could result.

Causes and Risk Factors

Here are a few specific known causes of cataracts that most doctors acknowledge:

- Smoking,
- Increase in age,
- Excessive use of alcohol,
- Obesity,
- Genetics,
- High blood pressure,
- Use of pharmaceutical drugs, long term use of steroids,
- Diabetes, persistent blood sugar imbalances, even not diagnosed as diabetes,
- Long-term exposure to sunlight,
- Physical trauma, such as getting hit in the eye with a ball,
- Exposure to chemicals.

Less known to most doctors, but theorized by some researchers, is that radiation from cell phones can lead to early cataracts (in addition to causing other ocular problems).[4]

Conventional Treatment

Cataract surgery is performed when the cataract is considered "ripe enough." Typically, eye doctors begin to recommend surgery if one's vision cannot be refracted to 20/40 or better, due to the cataracts. Of all the eye diseases, cataracts are the most amenable to treatment with conventional medical methods. The standard treatment is an outpatient procedure to remove the lens using a technique called phacoemulsification. A surgeon uses an ultrasonic beam to break-up the hardened lens, and then vacuums up the pieces from the eye with a suction device. An artificial lens, called an intraocular lens or IOL, is inserted to replace the cataract lens.

Patients who may not be considered good candidates for cataract surgery include those with a history of heart conditions, retinal bleeding, or other health issues considered risky for surgery.

After Surgery

Vision improvement may be noticed immediately after surgery, but there can be initial blurriness due to inflammation, so that improvement is typically noticed within two to three days. One may feel itchiness and discomfort for a few days, which should disappear with the antibiotic and anti-inflammatory eye drops prescribed by the eye doctor. An eye patch can help temporarily protect the eye. Complete healing usually occurs within eight weeks after surgery.

Your eye doctor will recommend avoiding physical movements and activities for the first week after surgery. These include bending from the waist, and lifting heavy objects

Risks After Surgery

Although cataract surgery is typically very successful, it can cause trauma to the eye for a small percentage of people. Such trauma can include choroidal hemorrhage, macula edema, retina tears/detachment, vitreous tears/detachment, and/or flashes, and eye floaters.[1,5]

Overall, up to 20% of all cataract procedures are for diabetic patients.[6] High levels of sugar in the blood contribute to cataract formation; diabetics are two to five times at risk for getting cataracts.[6-8]

Blood sugar interferes with the lens's ability to pump out excess fluid from the eye and maintain its clarity. With too much dietary intake of sugar, this function can become difficult or impossible.

Diabetics with severe non-proliferative and proliferative diabetic retinopathy have a higher risk of progressive disease after surgery.

Complementary Approach

Though most conventional physicians attribute cataracts to general aging, we believe that a cataract is often a symptom of an underlying condition due to a metabolic imbalance. It signals that the natural processes of your body are breaking down on some level, and that the normal flow of nutrients into the eyes and waste products out of the eyes has been compromised.

While we do recommend cataract surgery for those with moderate to severe vision loss, we prefer to use complementary therapies, including nutritional intervention, where surgery is not considered essential. Through these and other complementary medical treatments, it is possible to slow and even reverse the growth of cataracts.

Even people preparing for cataract surgery should seek to improve their overall health before they go through this invasive procedure, as this will aid in healing times and help protect the retina. Because cataracts typically progress slowly over many years there is often time for preventive measures to work quite successfully.

Essential Nutrients

Studies have shown that rather than looking at vitamins and nutrients in isolation, combinations tend to decrease cataract risk significantly. For example, a combination of antioxidant group carotenes, vitamins A and C, and an omega-3 group were more effective than those nutrients in isolation.[9] Another study showed a combination of vitamins B1, B2, B3, C, E, and carotene in the diet significantly lessened the risk of all cataract types.[10]

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Cataracts

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Vitamin C (buffered and ascorbated), 2,000 mg per day, split up and taken with meals. The normal healthy lens of the eye contains a higher level of vitamin C than any other organ of the body, except the adrenals. When cataracts are forming, there is a decreased level of vitamin C in the aqueous humor as well as in the overall body. Vitamin C has been shown to control sugar imbalances that often play a role in cataract formation. Good sources are citrus fruits, red peppers, and tomatoes.[11-15]

Note. When supplementing with vitamin C, for better absorption make sure the formula you take is ascorbated and buffered (to slow the breakdown of vitamin C and extend absorption time in the body) with nutrients such as bioflavonoids, rutin, rosehips, calcium, magnesium, and/or potassium. Plain ascorbic acid flushes out of the body quickly.

Glutathione, 500 mg – 900 mg, if taken in capsule or pill form. The sub-lingual form has 5-10 times greater absorption so the dosage will be smaller. Follow label instructions. Referred to as the anti-aging antioxidant, glutathione is considered the most important antioxidant made by the body.

It is very effective in preventing cataract formation and is crucial in possibly altering free radical damage. Some studies have shown that many lenses with cataracts contain approximately one-fifth of the amount of glutathione as compared to normal lenses. Glutathione levels are even lower in nuclear cataract lenses compared to cortical cataract lenses.[16,17]

Food sources that help boost glutathione naturally include milk thistle extract, whey protein, and foods high in sulfur such as arugula, avocado, bok choy, Brazil nuts, broccoli, Brussels sprouts, cabbage, cauliflower, collard greens, dried apricots, eggs, garlic, kale, mustard greens, onions, radishes, roasted peanuts, turnips, and watercress.

The Perfect Pair: Glutathione and Vitamin C

The importance of vitamin C to eye health cannot be overstated; concentrations of vitamin C in the lens are 20–30 times higher than those in the plasma.[18] Vitamin C doesn't work alone: it needs glutathione to improve the use of ascorbic acid (the purist form of vitamin C) in the body.

Glutathione and vitamin C are thought to work together to promote proper water balance within the lens and prevent the protein clumping that can lead to cataracts.

Very Important Nutrients

Lutein, 6 mg–20 mg per day. This powerful antioxidant is found both in the lens of the eye and retina, and it helps protect the eyes from damage due to sunlight exposure by filtering out light.[19-23]

Zeaxanthin, 2 mg–12 mg per day. This powerful antioxidant is found in the lens of the eye and the retina, which helps protect the eyes from damage due to sunlight exposure by filtering out light.[21-24]

Alpha-lipoic acid, 120 mg–300 mg per day. Alpha-lipoic acid has been found to halt complications resulting from blood sugar imbalances and hardening of the lens. Oxidative damage results in cataract formation, and increasing antioxidants, particularly alpha-lipoic acid, can help prevent or stop cataract formation.[25-27]

Important Nutrients

An optimal potency multivitamin is an important foundation of any cataract prevention program. It should include flavonoids and carotenoids. Scientists found that the risk of cataract formation decreased in the regular users of multivitamin supplements (one-third risk decrease).

Flavonoids, 1,000 mg per day. Quercetin and rutin are important antioxidants that are synergistic with vitamin C, meaning they need each other to work efficiently. Of the two, quercetin seems to be one of the most effective flavonoids in the prevention of cataracts.[28,29]

Helpful Nutrients

Green tea extract, 500 mg–725 mg per day. High in antioxidants, this supplement helps protect the eyes against oxidative damage.[30]

Selenium, 200 mcg per day. Patients with senile cataracts were found to have significantly lower blood- and intraocular levels of the mineral selenium than controls.[31]

N-acetyl-carnosine (NAC), 500 mg per day. Statistical analysis revealed the significant differences over 6 and 24 months in cumulative positive changes of overall characteristics of cataracts in a group taking NAC.[32]

Bilberry, 180 mg–240 mg per day, taken along with vitamin E, 400 IU per day. Some studies suggest that bilberry may slow cataract formation. Bilberry combined with vitamin E stopped cataract formation in 48 of 50 patients with senile cortical cataracts.[33] In an animal model, supplementation with bilberry extract helped to protect DNA and improve enzyme activity in lens tissue.[34]

Resveratrol, 250 mg per day. Resveratrol activates an enzyme called sirtuin type 1 (SIRT1), which protects against oxidative stress in human lens epithelial cells.[35] This enzyme inhibits oxidation in the eye's lens and protects against cataract development.

Melatonin, 1 mg – 3 mg before bed-time. Melatonin can help increase levels of reduced glutathione in the body.[36]

Milk thistle, suggested dosage 480 mg–960 mg per day. Milk thistle contains silymarin (its main ingredient), which possesses both anti-inflammatory and antioxidant properties. Because of this, milk thistle may help boost glutathione by preventing glutathione depletion in the liver and helping to cleanse the liver, which is essential for lens health.

Vitamin E, suggested dosage 400 IU per day. In percentages that were statistically significant, studies have found that high levels of dietary vitamin E, supplemental vitamin E, and high levels of vitamin E in the bloodstream are all tied to a lower risk of cataract. As the levels of vitamin E dropped, the incidence of cataract increased.[32,37-39]

Saffron, suggested dosage 20 mg per day. An interesting and related study found that crocin, a saffron apocarotenoid, was helpful in reducing diabetic cataracts.

Diet

There is a strong correlation between the risk of cataract onset and the patient's diet. Subjects who ate the most meat had the highest rate of cataracts, and those who ate fish but not meat had a lower rate. Vegetarians had a lower rate and vegans had the lowest rate of cataract incidence.[41]

Whenever possible, a nutritional program should be maintained for at least three to four months to help with quicker recovery and retinal support, before considering cataract surgery.

Juicing is a great way to deliver nutrients to the body. Our juicing recipe for cataracts is some combination of the following. You can add your favorite fruits and vegetables.

- Fresh apple, endive, carrots, celery, parsley, blueberry, and fresh leafy-green vegetables.
- Not too many carrots because of their high natural sugar content.

This combination helps warm and detoxify the body and provide great nutrients for nourishing the eyes.

It is very important to reduce or eliminate all types of refined sugars (particularly white sugar, but also fructose, sucrose, fruit juice concentrates, maltose, dextrose, glucose, and refined carbohydrates). This includes "natural" drinks that contain a lot of sugar, including all fruit juices. Those people who are lactose intolerant are at higher risk for cataracts.[42]

Drink eight glasses of water per day (preferably filtered or purified). This is optimally taken as a four-ounce glass of water every half-hour, to equal 16 four-ounce glasses.

Our bloodstream can only effectively handle about four ounces at any one time. When you drink more at a time, this means more work for the kidneys to filter water that hasn't had a chance to travel through the lymph system and to clean body tissues. Adequate water intake helps to maintain the flow of nutrients to the lens and to release wastes and toxins from tissues.

Eat foods high in vitamin A or beta-carotene, vitamin C, and vitamin E. These substances are called antioxidants, and most of the nutritional components of cataract prevention and reversal are related to boosting antioxidant levels. Antioxidants are one of the most important combatants against free radicals, a major cause of cataract formation (and other eye disease). A good diet supplemented with antioxidant vitamins and minerals can help prevent the damage due to oxidation and free radicals.[43-48] Foods high in antioxidants include leafy-green vegetables, garlic, onions, beans, celery, sea vegetables, apples, carrots, tomatoes, turnips, and oranges.

Some foods, particularly dairy products, can exacerbate eye problems by creating mucus and causing sinus congestion, which can impair lymph and blood drainage from the area around the eyes.

It is also important to eliminate dairy products, at least temporarily. Some foods, particularly dairy products, can exacerbate eye problems by creating mucus and causing sinus congestion, which can impair lymph and blood drainage from the area around the eyes. When lymph and blood can't flow in and out of the eyes, nutrients don't reach the eyes effectively, and toxins and metabolic wastes aren't eliminated as efficiently. Try avoiding dairy for a month to see whether you become less congested and your eye issues clear up.

Note. Many people are lactose intolerant to some degree. Generally, reducing or eliminating dairy from one's diet has innumerable positive benefits on the eyes and the entire body.

Lifestyle Recommendations

While supplementation is important, nothing replaces a positive, healthy lifestyle that includes regular exercise, daily meditations or walks in nature, and a healthy diet.

The rapid pace of life often interferes with people taking time to care for themselves properly, and on all levels – mental, emotional, spiritual, and physical. However, proper care maximizes the mind/body connection and its inherent healing potential, which is essential for restoring and maintaining health.

Avoid smoking. Researchers have established that smoking cigarettes substantially increases the risk of developing age-related cataracts. Smoking accounts for about 20% of all cataract incidences.[49-51]

Eye Drop Recommendations

The following eyedrops have either a long history of safe usage for cataract management and/or have research studies showing related benefits to lens health. Take one eyedrop formula to start or any combination of the three. We recommend taking eyedrops for at least three to six months to start; this will help you determine their efficacy. Look for a reduction in common symptoms to cataracts, such as related reduction in blurriness and/or less sensitivity to glare, particularly at night.

Cineraria homeopathic eyedrops, one drop in each eye, two to three times per day, best taken at least 30 minutes apart from other eyedrops. This eyedrop has been listed in the Ophthalmology Physician's Desk Reference herbal section for over 38 years as a treatment for cataracts. They can be taken by themselves or with other eyedrops.[52]

N-acetyl-carnosine eyedrops 1%, two drops in each eye, two times per day, best to separate each eyedrop by approximately one minute. See Appendix Section 5 for product recommendations.[32]

Oclumed eyedrops, one drop in each eye, two times per day. These eyedrops contain a range of antioxidants including l-carnosine, n-acetyl-l-carnosine, l-glutathione, cysteine ascorbate (providing a source of vitamin C), l-cysteine, taurine and other nutrients to support the repair of the damaged lens tissues. ➤

Cataracts

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Exercise

Long-term regular exercise, as opposed to a burst of exercise training, reduces the risk of cataracts. High levels of inactivity increase cataract risk.[53]

Many therapies promote improved flow of energy and circulation throughout the body. The daily stress that we encounter due to a poor diet, emotional imbalances, lack of regular exercise, and more can cause areas within the body to tighten up, which restricts circulation. The eyes are the second most biologically active part of the body; only the brain is more active. So, they require a great deal of nutrition and the free flow of blood and energy to remain healthy. Eye exercises are helpful for maintaining good vision and promoting microcirculation in the eyes.

Inversion poses in yoga have been shown to aid blood flow to the heart and head. It may seem counter-intuitive, but the blood is more freely able to move to the upper extremities, these exercises can be very relaxing to the eyes and face. As such, they are particularly helpful in the prevention of eye conditions. One of the best and safest inversion poses is lying on the floor with your legs up a wall. Beginning, as well as advanced yoga practitioners equally enjoy this posture.

After cataract surgery, avoid inversions. This includes standing forward bends like Uttanasana and Prasarita Padottanasana (wide-leg forward bend), and even downward-facing dog. You can still include modified poses like half dog pose at the wall. If you apply the rule of not bending past 90 degrees from vertical, you will minimize the pressure increase to the head and subsequently to the eye. Other rather obvious poses that could have a similar effect are those that require strong, sustained contraction of the abdominal muscles, which would also increase blood pressure in the eyes.

Poses like boat pose (Navasana), deep held twists (even sitting versions), and arm balances like crow pose also fall into this category.

In a time of healing you want to keep the nervous system quiet, spending more time in the "rest and digest" part of the autonomic nervous system. So, spend the two-week healing period doing gentler practices, including lots of supported restoratives and guided meditations on health and healing.

Other Modalities

Traditional Chinese Medicine (TCM) views the development of cataracts as often being related to a chronic imbalance in the Kidney meridian, which is related to the emotions of fear and grief.

The Liver meridian "opens to the eyes" and is associated with overall eye health, and the Kidney meridian "opens to the lens" and provides blood and nourishment to the retina.

Since most of the major meridians (in terms of energy flow) pass through the eyes, the imbalance inherent in eye issues may be related to an imbalance in other meridians, that may affect the Kidney and Liver meridians. Where the imbalances lie is best determined through an intake evaluation by an acupuncturist.

Here are the common Chinese medicine patent formulas related to cataracts:

- Kidney yin tonic may be taken in a dosage as directed by your practitioner.
- *Shi hu ye guang wan* (dendrobium pill for night vision) nourishes Kidney yin and clears the Liver to improve vision. It is indicated for cataracts as well as red, irritated, or swollen eyes, poor or blurred vision, eye strain from reading or from computer use, excessive tearing, and pain around the eyes.
- *Ming mu di huang wan* (brighten the eyes) nourishes the Liver, enriches the Kidneys, and improves vision.
- *Zhu jing wan* (preserve vistas pill) tonifies and nourishes the Liver and Kidneys, enriches the yin, and improves vision. Symptoms related to deficiencies in these meridians include weak and aching lower back and knees, excessive thirst, poor memory, cough, asthma, shortness of breath, and wheezing.
- *Qi ju di huang wan* (rehmannia 6 plus chrysanthemum and lycii) nourishes Kidney, Liver blood,and yin. This formula is a classic adaptation of "*liu wei di huang wan*" (rehmannia 6), with a special emphasis on the eyes. In particular, the formula is helpful for dry eyes, redness, and heat caused by yin (fluid) deficiency.
- Celosia 10 was designed for disorders such as cataracts as the lens and cornea are exposed tissue easily subject to "wind" disorders.

Essential Oils

- Laurel leaf helps with lymph support.
- Clary sage helps balance the endocrine system.
- Saffron benefits include the following properties: antibacterial, blood purifier, antioxidant, decongestant, and memory enhancer.
- Frankincense helps relieve chronic stress and anxiety, reduces pain and inflammation, and boosts immunity.
- Carrot seed properties include antiseptic, disinfectant, detoxifier and antioxidant.

Keep essences away from the mouth, eyes, and mucous membranes; if a few drops get in one of these sensitive areas it may be uncomfortable for 15-30 minutes but not harmful. You can lessen discomfort by adding a pure oil, like olive or coconut oil, to neutralize the irritating effect. For the eye area, dab a few drops around the outside of the eye. Do not put the neutralizing oil in the eye.

Put 1⁄4 cup of avocado oil with 1⁄4 cup of calendula-infused oil. Slowly add 5 drops each of the essential oils. Then close the bottle and shake well; apply 4 drops of this mixture on your clean face. Massage in gentle circular motions. Leave overnight.

Other Therapies

Acupuncture supports the healthy flow of energy and circulation through the eye. There are eight acupressure points around the orbit of the eye, which can be massaged periodically throughout the day to help relax

the eyes and stimulate energy and circulation flow.

Eyedrops containing lanosterol showed reduced severity of cataracts in animal research. Future research needs to be done on humans to identify the effectiveness. The application of the molecule lanosterol was shown to dissolve the lens protein buildup that causes cataracts in animal subjects; it may provide a non-surgical treatment for humans in the future.[54]

Using lasers as a pretreatment to cataract surgery is showing potential for improvement in the safety and results of surgery.

Use of stem cells to regrow the eye lens after cataract surgery is another potential treatment of the future. Researchers at the University of California, San Diego School of Medicine, and Shiley Eye Institute, with colleagues in China, have developed a new, regenerative medicine approach to remove congenital cataracts in infants, which permits remaining stem cells to regrow functional lenses.[55]

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Since 1980 Dr. Marc Grossman has helped many people maintain healthy vision and even improve eyesight. He is best described as a holistic eye doctor, dedicated to helping people with such conditions ranging from myopia and dry eyes to potentially vision threatening diseases as macular degeneration and glaucoma. His combined multi-disciplinary approach using nutrition, eye exercises, lifestyle changes and Chinese medicine provides him with a wide array of tools and approaches to tackle difficult eye problems.

Dr. Grossman founded the Rye Learning Center in 1980, a multidisciplinary center for learning problems, in 1996 co-founded Integral Health Associates in New Paltz, New York, and in 1999 co-founded Natural Eye Care, Inc.

His background includes degrees in optometry, biology, physical education and learning disabilities, coupled with yoga, bioenergetics, nutrition, Chinese medicine and acupuncture, the Alexander technique and Feldenkrais. This orientation provides the foundation for an integrated approach to vision and its influence on the body, mind and spirit of each patient.

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Bastyr University San Diego Clinic: Student Case Reports

edited by Baljit Khamba, ND, MPH

Fourth-year interns at Bastyr University are actively developing their clinical skills through treating patients at the school's clinic. They engage their didactic skills in rigorous case taking, examinations, evaluation, and a naturopathic-focused treatment plan under the supervision of their attending doctor. The interns are able to gain experience in areas such as mental health, mind-body medicine, oncology, hydrotherapy, physical medicine, out-reach community care, IV treatment, biofeedback, and so on. Each one of these opportunities presents a prime opportunity for the students to enrich their knowledge about conditions and approaches to care. In efforts to fortify their understanding, the students write case reports under the supervision of Dr. Baljit Khamba in their course "Advanced Case Studies." By completing these reports, future practitioners gain a valuable skill that they can then utilize once they graduate.

A Case of Depression and Anxiety

by Katharine Chang

Abstract

This case report is written to demonstrate the importance of micronutrients and the fundamentals of health in mental disorders such as depression and anxiety. Through a well-balanced diet, proper nutrient supplementation, and healthy relational dynamics, human beings are able to not only step away from their diagnoses but also thrive and step into who they are meant to be. There are a handful of research articles already written on the benefits of omega-3 fatty acids on major depressive disorder.[1] Likewise, researchers have found a significant decrease in depressive symptoms measured by the Hamilton Rating Scale for Depression (HAM-D) in depressed subjects who had additional intervention in the form of a B12 injection.[2] Since the brain is mainly composed of fat through the form of myelin sheaths, it has been proven that consuming omega-3 fish oils modulate signal transduction and decrease the inflammatory state of the brain which occurs during depression.[3] Studies have demonstrated that the biochemical involvement of omega 3 polyunsaturated fatty acids decreases inflammatory cytokines such as IL-1 and TNF-α through the inhibition of nuclear factor-kB, a transcription factor involved in inflammatory signaling pathways.[3] Since certain nutrients and fatty acids are depleted in those suffering with depression, especially if they are not consuming a nutrient-dense diet, it is only logical that getting to the underlying cause of disease as well as replacing what is depleted will improve disease outcome. After a month-long follow up with a patient diagnosed with bipolar disorder and depression, there was significant improvement in mood stability and anxiety through dietary intervention and supplementation.

Introduction

Depression is a disease that many experience worldwide and impacts an estimated number of 350 million people.[3] Results from the World Mental Health survey show that about 1 in 20 people reported a depressive episode in the previous year. Moreover, it is one of the leading causes of disability on a global scale with high-income countries like the United States and Japan ranking highest, 17% and 3%, respectively.[3] According to the World Health Organization, 300 million people worldwide have depression with 16.2 million adults in the United States. Of those 16.2 million, 10.3 million adults experienced at least one episode resulting in severe impairment. Since depression is highly associated with suicide, it is of great importance to research interventions ranging from natural alternatives to conventional pharmaceuticals in order to improve the health outcomes of depression. As stated in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), five or more of the listed symptoms have to have been present in the same two-week time period and include a change from normal functioning with one of the symptoms being either loss of interest/pleasure or depressed mood. Some symptoms include depressed mood most of the day or almost every day, diminished pleasure or interest in all or most activities, notable unintentional weight loss or weight gain, insomnia, fatigue, feelings of worthlessness/guilt, inability to concentrate, psychomotor agitation or increasing thoughts of suicide or death. Before diagnosing, other substances

or medical conditions that may cause similar depressed symptoms must be ruled out.

Depression is a brain disorder that involves imbalanced neurotransmitters and overall systemic inflammation.[4] Those with depression may experience symptoms including lethargy, mood swings, irritability, difficulty concentrating, lack of motivation, suicidal thoughts, loss of interest, anxiety, insomnia, and sadness. There have been many interventions that have combined pharmaceutical drugs such as selective serotonin reuptake inhibitors (SSRIs), including sertraline, fluoxetine, citalopram, with alternative measures like cognitive behavioral therapy and counseling. SSRIs are known to come with side effects such as sexual dysfunction, weight gain, sleep disturbances, headache, and appetite changes; and studies have shown that the need for natural alternatives to treat depression and mood disorders has formally surfaced especially for those currently taking these drugs.[5,6] Omega-3 fatty acids have been shown to be beneficial in the treatment of depression.[7] It is already well known through several studies that those who consume a diet rich in omega-3 fatty acids are less susceptible to developing depression, which includes prenatal and bipolar depression.[4] Compared with the rest of the world, the Western diet is saturated with omega-6 fatty acids, which contribute to many inflammatory pathways in the body when consumed in excess.[3] In addition to fatty acids, B vitamins especially B6, folate (B9), and B12 have been well known to play an essential role in cell metabolism and biochemical processes in the human body.[8] These vitamins play a role in building neurotransmitters along with other nutrients such as protein and lipids.[9] Researchers have studied the effect of multivitamins on mood and neurocognitive function and found not only emotional improvement but also biochemical changes in the serum.[9] With natural interventions such as these, the trajectory of those dealing with depression is positive due to the ability of not only improving but sustaining long-term health. Thus, this all leads to the question: To what degree can appropriate supplementation of omega-3s and multivitamins improve depressive symptoms and mood disorders?

Case Description

A.P. is a 34-year-old Caucasian male that presented to our clinic with a chief concern of stabilizing mood and addressing depression. He has a history of bipolar disorder diagnosed in 2016, anxiety, insomnia, and drug and alcohol abuse. His main symptoms were low energy, wanting to sleep, and a decreased appetite. He works at a jet fuel company and has a very stressful relationship with his boss, mentioning multiple times that he feels anxious at work. He leaves work often wanting to sleep, not due to fatigue but because he does not like his job. The only medication he is on is lamotrigine (100 mg) to manage his bipolar disorder. He was prescribed and currently taking lithium orotate (5 mg 1-2 times/day), a ProOmega 2000 (2000 mg/day) and magnesium glycinate (20 mg/each, 3 caps at night). In office, review of systems came back negative except for the fact that he experiences mood swings every day; however, he stated that he is able to manage it well due to being on Lamictal and the lithium orotate. His previous in-office Patient Health Questionnaire-9 (PHQ-9) total scores came back none-mild and an in-office PHQ-9 during his most recent visit was a 5, which is mild. His most recent labs were done in January 2018 and all lab values were within normal limits (refer to Table 1).

Table 1: Patient Lab Values

Test	Result	Reference Range
HbA1c	5.2	< = 5.6%
lamotrigine level	3	2.5-15.0 ug/mL
Cholesterol	107	< = 199 mg/dL
Triglycerides	64	< = 149 mg/dL
HDL	43	> = 40 mg/dL
LDL	51	< = 99 mg/dL
ALT	18	< = 63 U/L
Creatinine	0.83	< = 1.30 mg/dL
GFR	116	> 89 mL/min/BSA (normal)
TSH	1.75	0.35-4.00 mcIU/mL

Future labs we have considered were salivary cortisol, vitamin D and vitamin B12 levels, a male hormone panel, and thyroid labs since many of his symptoms such as irregular mood, low energy, and insomnia can overlap with depression and bipolar disorder. We have considered checking his cortisol rhythms because he reported having a spurt of excitement around 8:30-9:00 pm. After considering the patient's entire symptom picture including social and past medical history, a working diagnosis of nutrient depletion was made. The patient is not on a multi-vitamin, his diet is sub-optimal, he works inside a warehouse with jet fuel exposure, and he does not take his omega-3 fatty acids consistently. We made sure to take into consideration his current work situation and life circumstances that could have also been perpetuating his mood instability and depression as well. We inquired every visit about his social support network, and he stated that he feels comfortable reaching out to his girlfriend and friends in times of need.

We prescribed D-Mulsion Citrus Vitamin D drops at 2000 IUs per day, a men's multivitamin by Vitamin Code at 2 capsules twice a day, and a recommendation to take his fish oils regularly at 2000 mg per day, especially since he has external stressors from his occupation and is anxious in preparation for an upcoming move.

A conversation regarding transitions was brought up to make space for his thoughts in regards to moving away. The patient reported he would feel relief due to leaving his current job but does not know how smoothly he will transition into another environment with the pressure of finding a new job and making new friends. In office, we reminded him about the excitement, challenges, and possible discomfort of transitioning into an entirely different community, which the ➤

patient was open to discussing. He was aware and reported feeling a little more comfort knowing his girlfriend will be going alongside him. We also educated him on consuming a variety of nutrients including proteins and healthy fats and suggested that he substitute his morning coffee with Teecino herbal blends since caffeine can inhibit tryptophan conversion into serotonin. The patient moved out of state shortly after the appointment and quit his job, which was a major source of his stress and a trigger to his depressive symptoms. We followed up with him after a month and the patient reported experiencing increased stability of mood and less anxiety, although he was experiencing more stress from looking for a new job.

It is warranted to investigate deeper into the cause of mood instability and assess if certain underlying factors can be removed; this can range from unhealthy relational dynamics to true micronutrient depletion from an inadequate diet.

Discussion

The differential diagnosis list for the patient included stressful relational dynamics at work, nutrient deficiencies of B vitamins (B6, folate, B12), vitamin C, and omega-3 fatty acids, which are all nutrients commonly depleted in depression. The patient did report negative changes in mood and stress when he was around his old boss; therefore, it was important to take external stressors such as work environment into consideration. Through a more biochemical lens, B vitamins are heavily involved in cellular functioning and serve as essential cofactors that ultimately lead to production of neurotransmitters like serotonin, GABA, and dopamine.[9] In depression, even minor deficiencies of B vitamins like B6 downregulate serotonin and GABA production, which contribute to symptoms such as irregular sleep patterns and behavioral changes.[8] Furthermore, the study performed by White et al., demonstrated that supplementation with multivitamins including 500 mg/day of vitamin C showed mood benefits and specifically reductions in depressed mood.[9] The patient's diet does not consist of foods that are particularly high in vitamin C, which can potentially be contributing to his low mood. Likewise, foods he frequently eats such as quinoa, black beans and rice do not possess high levels of healthy fats such as omega-3 fatty acids. An imbalanced diet was also on the differentials list since he eats very carbohydrate heavy meals, though mostly vegan (quinoa, rice, black beans, pasta, and granola). Furthermore, he is not consuming enough protein (at least 56g/day based on body his weight) and healthy fats which are essential in the production of neurotransmitters.[9] Other differentials of lower priority were male hormone imbalance and hypothyroidism since symptoms of depressed mood and low energy can be seen in these processes as well.

In a study performed by Mocking et al in 2016, it was found that supplementation with omega-3 fatty acids has a positive effect in those suffering with major depressive disorder (MDD).[7] Researchers also found that higher EPA doses were associated with a better response whereas DHA did not have a significant effect on MDD symptoms.[7] In another study performed in Rotterdam, researchers found that individuals who had lower concentrations of omega-3 fatty acids experienced severe symptoms of depression; therefore, supplementing or increasing dietary omega-3 fatty acids has been and is increasingly being studied for benefiting depression.[10]

The formation of neurotransmitters and prostaglandins is affected by omega-3 and omega-6 fatty acid proportion, which is very important in the maintenance and regulation of normal functioning of the brain. Thus, ensuring that an individual has optimal omega-3 levels is crucial, especially for those dealing with depression. In addition to supplementing with these fatty acids, many foods such as salmon and mackerel are often recommended due to their rich source of omega-3 fatty acids. Ever since omega-3 oils have been shown to improve depressive symptoms, there have been more studies done that show the effect of omega-3 oils in other mental health disorders such as bipolar disorder, schizophrenia, and dementia.[4] Likewise, other studies assessing the military diet have demonstrated the possibility of reducing psychiatric disorders like suicide and impulsive aggression by increasing omega-3 fatty acids.[4]

The role of multivitamins, including B vitamins, has also been in the spotlight for not only improving depressive symptoms but also inflammatory lab biomarkers. In a randomized, double-blinded study performed by White et al, supplementing with a multivitamin significantly improved mood in a matter of four weeks. This was concluded by reduced scores according to the depression-dejection scale of the Profile of Mood State. Researchers also found that increasing B vitamins decreased homocysteine levels in young healthy adults. Other research has undoubtedly shown the role of multivitamins, especially B vitamins, in improving stress and mood and decreasing risk for neurodegenerative diseases like Alzheimer's disease. Another randomized controlled trial that specifically studied vitamin B12 and its effect on treating major depressive disorder demonstrated that having a B12 injection along with taking antidepressant medication had significant impact on depressive symptoms.[2] Researchers screened 199 depressed patients in total and out of that, 73 patients had a low to normal B12 level. They randomized 34 patients to the treatment group and 39 to the control group. After three months, 100% of the treatment group taking antidepressants along with receiving B12 injections showed a 20% decrease in their HAM-D rating score, whereas only 69% of the control group taking only antidepressants showed 20% reduction in their scores.

The research studies up to date, although convincing, still reveal much conflicting evidence. Since the therapeutic dose of omega-3 fatty acids in supplement form, usually 9 grams, is sometimes hard to achieve due to the concern of causing gastric pain, it is difficult to truly understand the potency and efficacy of it. Also, the different forms of supplemental fish oils used in the studies are not specifically stated since the synthetic ethyl ester (EE) form differs in efficacy and safety compared with the natural triglyceride (TG) form. Likewise, the source of these fish oils is hard to control between studies as well. Furthermore, there is also a need to take the genetic variability among different participants into account. More research needs to be done to support the claim of fish oils on depression and a greater population size needs to be obtained. It would be beneficial to study the specific interaction between antidepressants and the EPA component of fish oils and the possibility of enhancing drug effect. There should be more consistency across the studies in regards to taking into account participant dietary status, health history, sex, age, and lifestyle habits, including smoking, and drug and alcohol use.

Conclusion

The beneficial effects of omega-3s and natural interventions have been researched and shown to have substantial effects on human mood; however, a more universal claim needs to be made on its efficacy. There is a lot of variability seen in clinical trials involving the testing of omega-3s; but since depression can have many causes other than a lack of omega-3s in the diet, more targeted and comprehensive trials need to be undertaken. Supplementation and implementing food as medicine to support the patient is warranted especially in cases when social and environmental factors are not under the patient's control and cannot be removed within a certain time period. Depression involves the increased presence of pro-inflammatory cytokines and higher omega-6 to omega-3 ratios thus, increasing omega-3 fatty acids not only enhances cognitive function but also decreases symptoms of depression.[4,10] The balance of neurotransmitters, essential fatty acids, and B vitamins is essential and heavily involved in maintaining normal brain function and stability of mood.[2,4] It can be inferred that including more foods that contain B vitamins (organ meats, eggs, beans, lentils, sunflower seeds, broccoli, spinach) and omega-3 fatty acids (sardines, chia seeds, walnuts, Brussels sprouts) could be a simple, preventive measure against mood instability, especially for those dealing with mental health concerns like depression, anxiety, and bipolar disorder. It is warranted to investigate deeper into the cause of mood instability and assess if certain underlying factors can be removed; this can range from unhealthy relational dynamics to true micronutrient depletion from an inadequate diet.

Although many biochemical factors can contribute to symptoms of depression, meeting the patient where they are in their health journey and helping them establish strong foundations of health, which includes exploring topics such as their sense of well-being and past traumas, takes priority. It is critical to give equal opportunity and weight to mind, body, and spirit and not end treatment after addressing a lab value that is out of range, especially when working with mental health disorders. Each individual has unique genetic profiles, social and medical history, and determinants of health; thus, individualized, personalized treatment is of utmost importance when it comes to patient care.

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Katherine Chang is a fourth-year naturopathic medical student at Bastyr University in San Diego, California. She obtained her bachelor's degree in Hispanic studies while studying pre-medicine and always possessed a desire to help people. Growing up, she experienced the power of nutrition and natural medicines firsthand and wholeheartedly believes she was divinely called to this profession. Her clinical interests include mental health, oncology, autoimmunity, and pain management. After graduating in spring 2019, she looks forward to joining a naturopathic medical practice and promoting naturopathic medicine within the greater Los Angeles community. She has received advanced training in regenerative joint injections, nutraceutical formulation, IV therapy, and PRP aesthetics. Her long-term aspirations are to do a lot of community work with school-aged children in low-income neighborhoods to prevent childhood obesity and mental health disorders. Besides medicine, she enjoys gardening, nature walks, family time, and practicing Chinese calligraphy.

Adrenal Fatigue: Myth or Metaphor?

by Dr. Douglas Lobay, BSc, ND

"Hi Mrs. Jones, your four-point salivary cortisol test showed a normal but blunted response. Your 24-hour urine hormone tests showed that your allo-tetrahydrocortisol and your tetrahydrocortisone were low, tetrahydrocortisol was high, and your cortisone was average. Ragland's test for postural hypotension and Rogoff's sign of back tenderness were positive. Oh, and by the way, your serum morning cortisol was normal." I scratched my head and furrowed my eyebrow like I was deep in thought. She looked at me with bewildered eyes. We both appeared to be confused. I paused for a moment and then stammered, "I think you have adrenal fatigue." I then continued, "Here take these supplements to help build up and nourish your adrenal glands. I think they will improve your energy, make you feel better and improve your response to stress." She asked, "What is adrenal fatigue?" I then went into a long ardent and zealous lecture of what the adrenal glands are, what they do, how they modulate the stress response, why they appear to get run down and how I think we can improve them. My impassioned narrative was full of medical metaphors, similes and hyperboles. We both then nodded, smiled at each other and shook hands. She left with her supplements, and I reflected back in my chair.

According to my old physiology book and Wikipedia, the adrenal glands are a pair of small acorn-shaped organs located on the top of each kidney. They measure 3 by 5 and 1 centimeter in size and weigh a combined weight of 7 to 10 grams. Histologically, they consist of two different and distinct tissues: an outer cortex and inner medulla. The outer cortex consists of three layers: the zona glomerulosa, zona fasciculata, and zona reticularis. The zona glomerulosa secretes mineralocorticoids, mainly as aldosterone, that regulate blood pressure and fluid volume. The zona fasciculata secretes glucocorticoids, mainly as cortisol, that regulate immunologic, inflammatory, metabolic and homeostatic mechanisms. The zona reticularis secretes sex hormones, including dehydroepiandrosterone. The zona fasciculata accounts for 80% of the size of the adrenal cortex. The inner medulla consists of chromaffin cells that produce adrenaline (epinephrine) and noradrenaline (norepinephrine) that regulate the "flight or fight" response to stress. The adrenal glands, along with the sympathetic part of the nervous system, are the considered to be the main part of the body that deals with stress.

The function of the adrenal glands, particularly the outer cortex, is under the control of the pituitary gland and hypothalamus in the brain. The HPA axis refers to inter-relationship and feedback mechanisms of these three regions. The hypothalamus secretes corticotrophin releasing hormone (CRH) that stimulates the pituitary gland to secrete adrenocorticotropin hormone (ACTH). The ACTH in turn stimulates the adrenal glands to produce cortisol and other hormones. The HPA axis helps to maintain a homeostatic balance of adrenal hormones in response to everyday life and response to acute and chronic stress.

Addison's disease is a condition marked by adrenal hormone insufficiency. It was first described in 1849 by the English physician Dr. Thomas Addison. Early symptoms of Addison's disease include fatigue, weakness, depression, increase thirst, frequent urination and craving for salt. The most common cause of Addison's disease is an autoimmune condition. The incidence of Addison's disease is reported to be about 1/100,000 people. Conversely, Cushing's disease is a condition marked by adrenal hormone excess. It is most commonly caused by a pituitary adenoma. The incidence of Cushing's disease is reported to 2-3/1,000,000 people. Both diseases are relatively rare.

The American physician Dr. John W. Tintera first described hypo-adrenocortical syndrome in 1949. I read his book called *Hypoadrenocorticism*, a collection of papers in which he describes a constellation of symptoms that are a result of a hypo-functioning adrenal gland system. Interestingly, he strongly associated hypo-adrenalism with hypoglycemic symptoms. Hypo-adrenia, subclinical Addison's disease, adrenal neurasthenia, adrenal exhaustion and adrenal fatigue are colloquial terms used to describe low-functioning adrenal glands. I learned that adrenal exhaustion was a syndrome marked by undiagnosed fatigue, malaise, unusual tiredness, depression, anxiety, muscle and body aches, low or high blood pressure, dizziness and lightheadedness, inability to concentrate, hair loss, headaches,

allergies, shortness of breath, heart palpitations, poor digestion, hypoglycemia, weight gain, weight loss, urinary irritation and many other symptoms too numerous to list here.[1] I further learned that hypo-adrenia was caused by heavy acute stress and/or chronic stress on the body. The term adrenal fatigue was popularized by the American chiropractor Dr. James L. Wilson who wrote a book called *Adrenal Fatigue: The 21st Century Stress Syndrome* in 2001.

Fatigue is a subjective feeling of lack of energy, unusual tiredness, weakness, and poor vitality. It is one of the most common complaints encountered in family practice. The causes of fatigue can be many, including infection, anemia (including iron and vitamin B12 deficiency), endocrine dysfunction (including diabetes), hypothyroidism, sleep disturbance, medication side effects, asthma and chronic obstructive lung disease, anxiety, depression and other neurological issues and prolonged periods of excessive stress. Other illnesses associated with fatigue include cancer and Lyme's disease, malignancy, fibromyalgia, and chronic fatigue syndrome.[2,3] Often the causes of unexplained fatigue are rooted in diet, lifestyle, and stress-related consequences. The diagnosis of fatigue can be complex and almost always involves blood and other lab tests. Routine lab tests are used to evaluate fatigue and rule out certain relatively common diseases that may cause this symptom. Common lab tests routinely done for evaluation of unusual fatigue include CBC or complete blood count, blood chemistry including ferritin, vitamin B12, liver enzymes and bilirubin, electrolytes including sodium, potassium, calcium and magnesium, kidney function including BUN and creatinine, protein including albumin and globulin, uric acid, thyroid hormone levels and possibly inflammatory markers including CRP or c-reactive protein and ESR or erythrocyte sedimentation rate, possibly autoimmune markers and other markers of inflection and inflammation. It is important to note there are many other causes and many other lab tests that are further used to evaluate fatigue that are too numerous to list here.[2,3]

Is adrenal fatigue a real disease or a symptom of other disease and illness? Modern medicine uses diagnostic tests to evaluate and diagnose disease. Serum levels of cortisol are used to evaluate adrenal function. Morning levels of cortisol are considerably higher than at any time during the day or night. The diurnal pattern of cortisol reflects a normal pattern that is highest in the morning from about 6 to 8 am. From there levels normally decrease through the day and are at their lowest levels usually at night. Low levels of cortisol would possibly indicate Addison's disease and high levels of cortisol could possibly indicate Cushing's disease. I have noticed that the lab values of morning cortisol are quite broad and they only very rarely show abnormal levels. I still order baseline cortisol levels in individuals with suspected adrenal disease.

I have also used other tests to evaluate adrenal function including urine hormone and salivary cortisol tests. Urine tests evaluate levels of cortisol, cortisone, precursor pregnanetriol, dehydroepiandosterone, sex hormones including estrogens, progesterone and testosterone and various cortisol metabolites including tetrahydrocortisone, all-tetrahydrocortisol, tetrahydrocortisol and other byproducts. Four point salivary cortisol levels are measured first thing in the morning upon awakening between 6 and 8 am, lunch time at 12 pm, late afternoon between 4 and 6 pm and at bedtime between 10 to 12 pm. A graphic representation of the diurnal rhythm of salivary cortisol is then produced and compared to a normal rhythm in healthy individuals. I find that both urine and saliva tests are useful and interesting, but they can also be complicated, confusing and expensive for some patients.

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I then searched out adrenal fatigue and allied synonyms on medical databases. I looked at various published studies and found different studies on the same topic to be contradictory and inconclusive. I came across a systematic review of adrenal fatigue published in 2016 that looked at 3470 studies found on PubMed, Medline and Cochrane databases.[4] The researchers concluded that most of these studies had poor study design, poor quality assessment, unsubstantiated methodology, false premises, and inappropriate and/or invalid conclusions. Fifty-eight/3470 studies were selected and met the inclusion criteria for this review. Thirty-three studies were on healthy individuals and 25 studies were symptomatic individuals. Methods used to evaluate adrenal fatigue included salivary cortisol rhythm, direct awakening cortisol, cortisol awakening response, morning serum cortisol, night salivary cortisol, area under curve measurement, dexamethasone suppression test, dehydroepiandosterone sulfate or DHEA-S, adrenocorticotropic hormone or ACTH, mental stress test, 24-hour urinary free cortisol, cosyntrophin stimulation test, morning area under curve, corticotrophin releasing hormone, total urinary cortisol metabolites and oral glucose tolerance test.[4]

Twenty-six studies utilized the salivary cortisol rhythm (SCR) to evaluate adrenal fatigue: 16/26 studies (61.5%) showed no difference between fatigued and controlled patients,[4] 7/26 studies (26.9%) showed impaired circadian rhythm, and 3/26 studies (11.6%) showed a pronounced decrease in cortisol levels. Twenty-nine studies utilized direct awakening cortisol (DAC) to evaluate adrenal fatigue: 19/29 studies (65.5%) showed normal DAC, 6/29 studies (20.7%) showed a decrease in (CAR) and 4/29 studies (13.8%) showed an increase in DAC.[4] Nine studies utilized the dexamethasone suppression test (DST) to evaluate adrenal fatigue[4]: 6/9 studies (66.6%) showed no significant difference between fatigued and non-fatigued individuals, and 3/9 studies (33.3%) showed a decreased cortisol response from the DST. Six studies (10.3%) utilized adrenocorticotropic hormone or ACTH levels to evaluate adrenal fatigue[4]: 5/6 studies (83.3%) showed no significant difference between fatigued and non-fatigued individuals in terms of ACTH levels, and 1/6 studies (16.7%) showed an increase in ACTH levels in burnout patients. Three studies (5.2%) utilized 24-hour urinary free cortisol (UFC) levels to evaluate adrenal fatigue[4]: 1/3 study (33.3%) showed no correlation between UFC with fatigue and energy status. 2/3 studies (66.6%) showed a decrease in UFC in fatigued patients. Thirteen studies (22.4%) utilized area under the curve (AUC) in diurnal salivary cortisol levels to evaluate adrenal fatigue[4]: 8/13 studies (61.5%) showed a normal AUC, 2/13 studies (15.4%) showed an increased AUC, and 3/13 studies (23.1%) showed decreased AUC in fatigued individuals. Twenty-two studies (37.9%) utilized morning serum cortisol (MSC) to evaluate adrenal fatigue[4]: 14/22 studies (63.6%) showed no difference in MSC between fatigued and non-fatigued individuals, 3/22 studies (23.1%) showed a decrease in MSC, and 2/22 studies (15.4%) showed an increase in MSC. Twenty-two studies (37.9%) utilized late night cortisol (LNC) levels to evaluate adrenal fatigue[4]: 13/22 studies (59.1%) showed no difference in LNC in fatigued individuals, 3/22 studies (13.6%) showed a decrease in LNC, and 6/22 studies (27.3%) showed an increase in LNC levels. Six studies (10.3%) utilized dehydroepiandrosterone sulfate or DHEA-S levels to evaluate adrenal fatigue[4]: 4/6 studies (66.7%) showed no correlation between fatigued and non-fatigued individuals while 2/6 studies (33.3%) showed a decrease in DHEA-S levels in fatigued individuals. Four studies (6.9%) utilized the morning total cortisol release or morning area under the curve or MAUC to evaluate adrenal fatigue[4]: 2/4 studies (50%) showed a decrease MAUC, while 1/4 studies (25%) showed an increase in MAUC, and 1/4 studies (25%) showed no difference in MAUC in fatigued versus non-fatigued patients. Five studies (8.7%) utilized Mental Stress Tests to evaluate adrenal fatigue[4]: 4/5 studies (80%) showed no difference between fatigued and non-fatigued individuals while 1/5 studies (20%) showed a correlation between burnout status and cortisol and ACTH responses. This paper also pointed out that none of the 58 studies utilized the insulin tolerance test (ITT) which is considered by specialists to be the gold standard test to evaluate the hypothalamic-pituitary-adrenal or HPA axis.[4] The researchers concluded in this review that there is "no substantiation that adrenal fatigue is an actual medical condition" and is "not recognized by endocrine societies."[4]

The clinical diagnosis of adrenal fatigue through objective testing is unclear and disputable.[5,6] Lab tests used to diagnosis this condition are not straightforward and still controversial.[7,8] Urine and saliva tests may still be useful and may reveal some results that are important with regards to adrenal function. However, their clinical relevance may be overstated for practical purposes. These tests can be helpful, but I feel that they only help to confirm the physician's intuition of what is wrong with the patient. The evidence of the effects of stress on the body leading to fatigue and burnout is fairly well documented.[9] Symptoms of burnout are eerily similar to the symptoms of adrenal fatigue.[10] These include unexplained fatigue, malaise, listlessness, anxiety, depression, inability to cope, and many other symptoms too numerous to list here. It doesn't take a rocket scientist to see that adrenal fatigue could be easily diagnosed as clinical burnout.

Here is a classic example of that old adage that you may be smart, but you still can't see what is right under your nose. Mainstream medicine admonishes many alternative practitioners for their belief in the concept of adrenal fatigue. While I agree the objective lab testing of this condition is controversial, clearly something is going on.[11,12] Adrenal fatigue may be a synonym for stress-induced burnout. Burnout is a fairly well documented clinical disorder. There are no objective lab tests that clearly diagnose burnout, but

subjective symptoms are revealing[13,14] Few would dispute that physicians have one of the highest rates of work-related burnout. Many mainstream physicians are overworked, highly stressed, and burned out.[15] Therefore, it is fair to say that many physicians suffer with adrenal fatigue or something similar to that.

I feel that naturopathic medicine has much to offer to help the body effectively deal with the deleterious effects of stress and burnout. Dietary and lifestyle factors are fundamental and important for optimal health and vitality. Few would dispute a healthy diet rich in good quality protein, whole grains and ample fruits and vegetables is important for proper energy production. Daily exercise and good quality sleep are also vitally important. Also there are many nutritional supplements that can help improve energy and help the body deal with stress. All vitamins and minerals are probably important for proper biochemical reactions and energy production in the human body. B-vitamins play an especially important role in energy production and have been used to help improve symptoms of burnout.[16] Iron may be important especially when diagnosed as low and anemic. Substances that help improve mitochondrial function can help improve energy production including co-enzyme Q10, l-carnitine, l-cysteine, alpha-lipoic acid and other nutrients.[17]

Adaptogenic botanical medicines may be beneficial in treating fatigue and burnout. An adaptogen is a substance, primarily used in natural medicine, that helps the body adapt and deal with stress. It helps to nourish and balance the parts of the body that respond to stress. It helps to promote balance and homeostasis. Popular examples of adaptogenic herbs include Korean ginseng, Eleuthero or Siberian ginseng, American ginseng, maca, rhodiola, ashwaghanda, holy basil, cordyceps, astragalus, licorice, and other herbs. Adrenal cortex glandular extracts usually derived from bovine and porcine animal sources have been used to treat stress-induced fatigue and exhaustion. And although the medical databases seem to have only scant information on these substances, they are quite popular and widely used. Also liver extracts have been used for fatigue and exhaustion especially as a nutritional source of iron and B-vitamins. Relaxing and sedating botanical medicines can useful in treating nervous exhaustion, anxiety, insomnia and some the neurological signs of burnout. Examples of nervines and relaxants include kava kava, passionflower, valerian, hops, scullcap, magnolia, chamomile and other herbs. Hormones such as melatonin and amino acids such as 5-hydroxy tryptophan, L-theanine, and gamma aminobutyric acid can be useful in treating insomnia, depression, and anxiety associated with stress and burnout. Other possibly beneficial tools would include acupuncture and counseling.

I believe that adrenal fatigue is an example of a medical metaphor. A metaphor is a figure of speech used to describe and explain something. A medical metaphor is used to explain and conceptualize something that is complicated and abstract.[18,19] It helps to make something easier for the patient to understand. The adrenal glands, along with the sympathetic nervous system, are the main part of the body that deals with stress. The cumulative effects of stress and burnout can cause depleting fatigue. Whether the adrenal glands are really fatigued or not is controversial and debatable. Current objective lab testing of adrenal fatigue is still not clear and straightforward. However, awareness of the effects of stress and fatigue on the body is important to help alleviate suffering, promote homeostasis, and facilitate healing. Naturopathic medicine can offer some useful, practical and effective treatments that can help treat adrenal fatigue, burnout, or whatever stress-induced illness you call it.

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Chinese Botanical Medicine: Wikipedia Claims It Is Fake, We Are Certain It Is Real.

by Richard Gale and Gary Null

Progressive Radio Network

Modern conventional medicine has increasingly become a culture of scientific and historical denialism. Although portending to be an objective discipline of consistent progress, the medical establishment more often than not denies the insights, discoveries, medical systems, and methodologies of the distant past and non-Western cultures. Rather, Western medicine is racing more rapidly towards a retro-future with a blind faith in the promises of new engineered, synthetic drugs. Sadly, this pursuit is misconstrued as synonymous with important medical breakthroughs and the evolution of scientific medicine in general. Yet as the statistics show, modern medicine is on a collision course with itself. This is most evident in the increasing failures conventional medicine faces in fighting life-threatening diseases and the annual increases in iatrogenic injuries and deaths.

The majority of clinical research into Chinese botanicals and medical preparations are only found in Chinese databases. Therefore, Western analytical reviews, including the Cochrane reports, are extremely limited, inconclusive and biased.

Upon graduation, every new physician repeats "I will not give a lethal drug to anyone if I am asked, nor will I advise such a plan." The Oath composed by the wise Greek medical sage, Hippocrates, goes on to say "I will use those dietary regimens which will benefit my patients according to my greatest ability and judgement, and I will do no harm or injustice to them." Hippocrates was a naturalist. Unlike physicians today, he was expert in the healing powers found in the natural world and was a keen observer about the health benefits of different foods, plants and herbs. However, modern allopathic doctors are not only largely ignorant about the natural world but also the epigenetic, environmental and behavior causes of diseases and the means to prevent them. They have also removed themselves from honoring the Hippocratic Oath.

How well has modern medicine lived up to its Oath? Adverse drug events (ADEs) are rising. They have become a plague upon public health and our healthcare system. As of 2014, prescription drug injuries totaled 1.6 million events annually. Every day, over 4,000 Americans experience a serious drug reaction requiring hospitalization. And over 770,000 people have ADEs during hospital stays.[1] The most common ADEs are hypertension, congestive heart failure, atrial fibrillation, volume depletion disorders, and atherosclerotic heart disease.[2] According to the Centers for Disease Control, in 2016 there were 64,070 deaths directly associated with prescription overdoses; this is greater than the number of American soldiers killed during the entire Vietnam War.[3] For 2017, the CDC reported over 42,000 deaths from prescription opioid drugs alone.[4] Yet this figure is probably much higher due to the CDC's practice of reporting statistics very conservatively and many cases not getting properly reported. So, when we consider that there were over 860,000 physicians in the US practicing in 2016, potentially most physicians in America have contributed to ADEs.

No legitimate and highly developed alternative or natural medical practice has such a dismal track record of illness and death. Nevertheless, when a rare ADE, poisoning or death occurs Skeptics in the radical fringe Science-Based Medicine (SBM) movement, who rabidly oppose complementary and alternative medicine (CAM) and Traditional Chinese Medicine (TCM), are quick to report the incident as a national crisis and condemn the use of traditional natural medicine altogether. Yet if we look at the potential number of iatrogenic injuries and deaths over the last four decades since the start of the pharmaceutical and biotechnology boom in the late 1980s, we are looking at over 60 million ADE incidences caused by conventional Western medicine alone. This is nothing to celebrate, and no concerted national effort within the medical establishment nor among the followers of SBM is

being made to challenge the dominant medical paradigm responsible for this crisis.

According to the World Health Organization, 80% of the world's population uses herbal medicine. And this trend is increasing exponentially.[5] Skeptics have few viable and rational explanations to account for this trend. Since they regard traditional herbal medical systems as quackery, everyone experiencing relief or having a successful treatment from botanicals is simply having a placebo effect conversion experience.

Fortunately, in the US and other Western nations, the public is rapidly losing its trust and satisfaction with conventional Western medical practice and is seeking safer alternatives. With healthcare costs escalating annually and prescription ADE's on the increase as more and more drugs are fast-tracked through federal regulatory hurdles, relying solely upon allopathic medicine is a dangerous bargain. Dr. Dominic Lu at the University of Pennsylvania and president of the American Society for the Advancement of Anesthesia and Sedation recommends that Chinese herbal and Western medicine might complement each other if we make the effort to investigate their synergistic therapeutic effects. Lu believes oriental concepts of human anatomy should be further included in higher educational health science curriculums.[6] In addition, we would also note that with conventional medicine in a crisis people are accessing the numerous resources on the internet to educate themselves about the medicinal properties of plants, herbs, supplements, and foods as part of their personal therapeutic protocols.

Wikipedia has a noteworthy amount to say about traditional Chinese herbal medicine. However, its major criticisms rely heavily upon five-plus-year-old reviews of the peer-reviewed research. Some references, in fact, have nothing to do with Chinese herbology. The majority of clinical research into Chinese botanicals and medical preparations are only found in Chinese databases. Therefore, Western analytical reviews, including the Cochrane reports, are extremely limited, inconclusive and biased.

Critics of TCM frequently criticize published Chinese research as "incomplete, some containing errors or were misleading."[7] These are the same Skeptic criticisms Wikipedia levels against traditional herbal medical systems in general. With over 181,000 peer-reviewed research papers and reviews listed in the National Institutes of Health PubMed database referring to TCM, it is ridiculous and disingenuous to assume Wikipedia's editors have scoured this massive body of science to make any sound judgement about TCM's efficacy.

Under the heading "Chinese Herbology," Wikipedia states,

> A *Nature* editorial described TCM as 'fraught with pseudoscience,' and said that the most obvious reason why it has not delivered many cures is that the majority of its treatments have no logical mechanism of action... Research into the effectiveness of traditional Chinese herbal therapy is of poor quality and often tainted by bias, with little or no rigorous evidence of efficacy.[8]

Nature's editorial, which reflects the same ill-informed opinions frequent in Skeptical criticisms about natural health, does not cite any research to support its sweeping prejudiced opinion. The editorial is primarily a diatribe against the growing popularity of traditional medicine in the Chinese domestic market, estimated by the Boston Consulting Group to be worth $13 billion in 2006.[9] In addition, as noted above, Wikipedia's sources include a review of herbal medicine published in the *South African Medical Journal* that only looked at six African botanicals, none which are part of the Chinese pharmacopoeia.[10]

We would be negligent to not state a serious concern that readers should be aware of regarding Chinese medicinal herbs and preparations. This has been rightly noted by the SBM writers and Wikipedia: that is the high levels of toxic contaminants, notably arsenic, lead, and other toxic chemicals found in Chinese herbs and formulas being exported. However, Wikipedia fails to note the real reasons for this warning. Rather it frames caution as a means to discredit Chinese botanical medicine altogether. The export of toxic herbs is largely due to the enormous and out-of-control environmental problem including toxic atmospheric particulate matter from over-pollution, toxic dumping and waste spills in water supplies and poor agricultural practices. However, in some countries such as Japan and Taiwan, federal regulations for the import and export of medical botanicals are stricter and clean, non-toxic botanical herbs and preparations are readily available. There remain very reliable sources for getting high-quality-grown Chinese herbs.

One of SBM's leading spokespersons, David Gorski, would like us to believe that Mao Tse-tung should be condemned for restoring traditional Chinese medicine in mainland China.[11] But this is a blatant half-truth. In fact, Gorski and his colleagues have far more in common with Chairman Mao based upon the historical facts. It was during Mao's reign that classical Chinese medicine took an enormous leap backwards. The ancient system was originally banned during the Chinese Nationalist movement in the early 20th century because its leaders believed the old ways were preventing the nation from modernizing. Mao initially made a small effort to restore the practice when he came to power. However, it was after the Communist Revolution when Mao turned against traditional medicine. The Cultural Revolution again outlawed the practice. Traditional doctors who retained the most extensive knowledge and wisdom about classical Chinese anatomical theory and knowledge of medicinal herbs were systematically gathered for Communist conversion programs, imprisoned and/or killed. TCM nearly died out altogether from the mainland.

Years later, when the Communists attempted to resurrect the ancient ➤

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medical wisdom, only a few hundred doctors could be found throughout the country with sufficient knowledge to start TCM anew. Yet, Mao remained ambiguous. He wrote, "Even though I believe we should promote Chinese medicine... I personally do not believe in it. I don't take Chinese medicine."[12]

Unfortunately, what is commonly called Traditional Chinese Medicine (TCM) today is a partial reconstruction of the original ancient system that had developed over thousands of years. Much has been lost. The government's effort failed. According to Dr. Brigetta Shea, "once the government decided to reinstate some form of China's traditional medicine, they did it with an emphasis on combining it with Western medical theory. This shifted even acupuncture theory, as Western anatomical teaching was adopted and esoteric subtle anatomy was discarded."[13] The result has been that TCM today is a mere shadow of what it was in the past and is little more than a watered-down system contaminated with Western reductionist medical theories. Fortunately, growing interest in TCM is inspiring young researchers and practitioners to travel to China, Taiwan, Japan, and Korea to try to recover the more ancient classical medical teachings that were not included in the standardized TCM curriculums.

SBM founder Stephen Novella remarks,

> TCM is a pre-scientific superstitious view of biology and illness, similar to the humoral theory of Galen, or the notions of any pre-scientific culture. It is strange and unscientific to treat TCM as anything else. Any individual diagnostic or treatment method within TCM should be evaluated according to standard principles of science and science-based medicine, and not given special treatment.[14]

The remainder of Novella's argument is an example of taking TCM terms literally and not penetrating their deeper functions to discover their correlations with scientifically identified biomolecular substances and events. Novella also believes that the Chinese medical theories of qi and the acupuncture meridians share the same magical thinking as "ether, flogistum, Bigfoot, and unicorns."[14]

The master physicians and pioneers of the advanced traditional medical systems of Greece, India, China and Tibet, were very skilled and astute in identifying metabolic disturbances in their patients. Although on the surface, the humors may appear to be outdated or primitive mythological terms, a deep study of the traditional medical texts reveals they have direct correspondences to biochemical and biological processes that are well known in modern medicine. For example, according to the recent translators of the enormous medical corpus composed by one of the world's greatest medical doctors Avicenna in the 11th century, who revived the medical theories of Galen at the height of Islamic civilization's golden age, Dr. Hakima Amri, professor of molecular biology at Georgetown University and Dr. Mones Abu-Asab, a senior scientist and expert in phylogenetic systematics at the National Institutes of Health, discovered the ancient descriptions of the humors have a direct correlation to properties of fats, proteins and organic acids – the cornerstones of metabolic changes.

Due to its linear and non-systematic way of analyzing health and disease, modern medicine focuses upon single metabolic pathways and fails to consider that these pathways work in concert and are co-dependent with others. For example, a patient with high LDL cholesterol will be prescribed a statin without fully understanding the biological imbalances that increased LDL. But traditional herbal systems, including Chinese botanical medicine, provide more parameters such as a tissue's hydration and energy production in the case of abnormal cholesterol levels. Western medicine does not take into account hydration and energy production in making an accurate diagnostic assessment of the reasons for a patient's cholesterol imbalance. This is where the ancient theory of humors, or the fundamental "fluids" in the body – traditionally defined as blood, phlegm and yellow and black bile – provides clues.

Western medicine has no equivalent to what traditional systems refer to as "dystemperament" in a biological system or organ. Dystemperament was understood as an imbalance in a person's unique personalized physical, genetic and psychological disposition. Today the rapidly growing discipline of functional medicine finds agreement with this principle for diagnosing and treating an illness. In fact, conventional medicine still endeavors to define the causes of many diseases at a singular cellular or molecular level. It also faces a serious predicament in being based upon a one-drug-one-target paradigm in drug research and development. Traditional systems, including Chinese herbology, being far more complete and efficient medical systems, don't struggle with this dilemma. For half a century we have spent hundreds of billions of dollars on reductionist biomedical research to identify genes, proteins and metabolic biochemical changes that contribute to disease. But despite the enormous body of knowledge and data we have gathered from astronomic costly projects there have been few practical and meaningful results to find safe and effective treatments outside of prescribing potentially lethal drugs.

Most evidence-based medical reviews of research conducted on the efficacy of specific Chinese herbs fail to take into account that Chinese herbology is a complete system. It is unrealistic to research a single traditional Chinese herb and draw a definitive conclusion. An herbal concoction can include up

to 18 or more ingredients, and these may be fermented or simmered for hours to produce pharma-therapeutic properties useful for the treatment of disease. This was noted in a Cochrane review of Chinese medical herbs for treating acute pancreatitis.[8] It is estimated that there are over 13,000 different medicinal ingredients found in the annals of Chinese medical texts and well over 100,000 unique decoctions and recipes. While the vast majority of substances used in Chinese medicinal preparations are plant-based, parts of animals and specific minerals may also be included.[15,16]

Regardless of the Skeptics' and Wikipedia's invective to diminish Chinese medicine's efficacy and successes, TCM is booming; and extraordinary research continues to pump out positive discoveries. Even Bayer Pharmaceutical purchased the Chinese herbal company Dihon Pharmaceutical Group in 2014 because of the huge potential for discovering powerful phytochemicals to treat a wide variety of diseases. Helmut Kaiser Consultancy in Germany predicts that annual revenues in Chinese botanicals will triple by 2025 from 2015 revenues of $17 billion.[17] A Morgan Stanley 2012 review found that even among Chinese physicians trained in Western medical schools, TCM is being used as the first line of defense against disease in 30% of medical cases.[18]

Curiously Skeptics and Wikipedia fail to acknowledge that the 2015 Nobel Prize in Medicine was awarded to China's scientist Tu You-you for her use of the Chinese medical remedy *artemisia* to develop an anti-malarial drug.[13] In 2015, researchers at the Texas Biomedical Research Institute and the Center for Integrative Protein Science in Munich published their findings in *Science* of an alkaloid in an ingredient of the Chinese formula *Han Fang Ji* that protected human white blood cells from the Ebola virus.[19] And in 2006, the FDA gave its first drug approval to an ointment based upon Chinese botanicals, including green tea leaves, for the treatment of genital warts caused by human papillomavirus.[20] In a bioinformatics database analysis comparing phytochemicals in Chinese plants with the modern Comprehensive Medical Chemistry database of pharmaceutical drug ingredients, over 100 Chinese herbal phytochemicals had direct correlates with ingredients used in approved pharmaceutical drugs on the market.[21]

Taking one excellent example of the synergistic effects of herbal combinations in TCM is the duo *Rhizoma* ➤

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coptidis and *Evodia rutaecarpa*. In classical Chinese medical practice, this formula has been given for centuries to treat gastric conditions including rapid healing of ulcers. Modern research has shown that together these herbs inhibit the bacterium *Helicobacter pylori*, which frequently accompanies ulcers. In the US approximately 20% of people under 40 years and over 50% of those above 60 years are estimated to have an *H. pylori* infection which can be responsible for gastritis, stomach and duodenal ulcers, gastric lymphoma and stomach cancer. The herbs were also found to contain limonene used in drugs as an antineoplastic molecule and gamolenic acid used as an ingredient in pharmaceutical anti-tumor drugs.[21]

Finally, we might take a look at the 2017-2018 flu season. In fact, the influenza vaccine for this past season was a dud and failed to protect most recipients from infection. According to the CDC, the vaccine was 36% effective.[22] Almost 100 pediatric flu deaths were reported. However, later research at Rice University determined the vaccine was at best only 20% efficacy.[23] With conventional medicine and our federal health agencies failing to protect the public, tens of thousands of people experiencing the onset of flu-like symptoms rushed to purchase the Chinese herbal cold formula *Nin Jiom Pei Pa Koa*. The formula costs as little as $6 in New York City's Chinatown. *Pei Pa Koa* is one of the most popular cold, flu and cough remedies across East Asia and Singapore. It was first formulated during the Qing dynasty in the 17th century. The results are often immediate. When we desire relief from a health condition that is all that matters.

Therefore, we have absolutely no need for Skeptics preaching from their bully pulpits. There is no need to read the vitriol of Science-Based Medicine's priesthood. And we certainly have no need to refer to Wikipedia's encyclopedia of biased misinformation parroting Skepticism's paranoia and deceptive efforts to censor natural health. We don't need any of them to tell us that the relief we experience after taking a medicinal herb or natural formula is only a placebo effect or a figment of our imagination because the scientific research doesn't meet their standards. The fact of the matter is that the science will never meet their standards because fundamentalists, either religious or science-based, cannot be persuaded by factual evidence that conflicts with their ingrained psychological ideologies and fears. And this is the fundamental fallacy and blatant hypocrisy that runs throughout SBM Skepticism and Wikipedia. It is not "science-based" because it is impoverished of the necessary inquisitive open-mindedness that defines those who are authentic scientists. SBM is faith-based, and holds fealty with a grossly reductionist, petulant and brattish mentality incapable of seeing the forest from the trees.

In his criticism of TCM, Novella brings the absurdity of Skepticism to a climax: "I maintain that there are many good reasons to conclude that any system [i.e. TCM] which derives from everyday experience is likely to be seriously flawed and almost entirely cut off from reality."[14] However, for thousands of years there have been countless people who experienced and claimed the benefits from Chinese botanical medicine. We have no need for Skepticism's scientific reductionist validation to prove the reality of natural medicine.

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Surviving and Preventing Medical Errors!*

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The purpose of this article is to share what I have learned from a cascade of medical errors that happen much more commonly than surgeons, hospitals, or health care providers acknowledge. My goal here is to provide a few simple recommendations to reduce these errors.

Medical error is the third leading cause of death in the United States.

It is now two years since my own surgery – double hernia repair by laparoscopy. The recovery predicted by my surgeon, "In a week you can go swimming again," turned out to be totally incorrect.

Six weeks after the surgery, I was still lugging a Foley catheter with a leg collection bag that drained my bladder. I had swelling due to blood clots in the abdominal area around my belly button, severe abdominal cramping, and at times, overwhelming spasms. For six weeks my throat was hoarse following the intubation. Instead of swimming, hiking, walking, working, and making love with my wife, I was totally incapacitated, unable to work, travel, or exercise. I had to lie down every few hours to reduce the pain and the spasms. Instead of going to Japan for a research project, I had to cancel my trip. Rather than teaching my class at the university, I had another faculty member teach for me. I am a fairly athletic guy – I swim several times a week, bike the Berkeley hills, and hike. Yet after the surgery, I avoided even walking in order to minimize the pain. I moved about as if I were crippled. Now two years later, I finally feel healthy again.

How come my experiences were not what the surgeon promised? All those who cared for me during this journey were compassionate individuals, committed to doing their best, including the emergency staff, the nurses, my two primary physicians, my surgeon, and my urologist. However, given the personal, professional, and economic cost to me and my family, I feel it is important to assess where things went wrong. The research literature makes it clear that my experience was by no means unique, so I have summarized some of the most important factors that contributed to these unexpected complications, following "simple arthroscopic surgery."

• **Underestimating the risk.** Although the surgeon suggested that the operation would be very low risk with no complications, statistically, the published research data does not support his optimistic statement. Complications for laparoscopic surgery range from 15% to as high as 38% or higher, depending on the age of the patient and how well they do with general anesthesia (Vigneswaran et al, 2015; Neumayer et al, 2004; Perugini & Callery, 2001). Experienced surgeons who have done more than 250 laparoscopic surgeries have a lower complication rate. However, a 2011 Cochrane review points out that there is theoretically a higher risk that intra-abdominal organs will be injured during a laparoscopic procedure (Sauerland, 2011). My experience is not an outlier– it is more common.

• **Inappropriate post-operative procedures**. In my case I was released directly after waking up from general anesthesia without checking to determine whether I could urinate or not. The medical staff and facility should never have released me, since older males have a 30% or higher probability that urinary retention will occur after general anesthesia. However, it was a Friday afternoon and the staff probably wanted to go home since the facility closes at 5:30 pm. This landed me that evening in the emergency room.

• **Medical negligence.** In my case the surgeon recommended that I have my bladder emptied in the emergency room and then go home. That was not sufficient, and my body still was not working properly and still could not urinate, requiring a second visit to the ER and the insertion of a Foley catheter. Following the second ER visit, the surgeon removed the catheter in his office in the late afternoon and did not check to determine whether I could urinate or not. This resulted in a third ER visit.

• **Medical error.** On my third visit to the emergency room, the nurse made the error of inflating the Foley catheter balloon when it was in the urethra (rather than the bladder) which caused tearing and bleeding of the urethra and possible irritation to the prostate.

• **Drawbacks of the ER as the primary resource for post-surgical care.** Care is not scheduled for the ➤

* Adapted from the blog, Surgery: Hope for the best and plan for the worst. https://peperperspective.com/2018/03/18/surgery-hope-for-the-best-but-plan-for-the-worst/

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patient's needs, but rather based on a triage system. In my case I had to wait sometimes two hours or more until a catheter could be inserted. The wait kept increasing the urine volume which expanded and irritated the bladder further.

• **A medical system that does not track treatment outcomes.** Without good follow-up and long-term data, no one is accountable or responsible.

• **A reimbursement system that rewards lower up-front costs.** The system favors quick outpatient surgeries without factoring in the long-term costs and harm of the type I experienced.

• **Assuming the best and not planning for the worst.**

Can I trust the health care provider's statement that the procedure is low risk and that the recovery will go smoothly? The typical outcome of a medical procedure or surgery may be significantly worse than generally reported by hospitals or medical staff. In many cases there is no systematic follow-up nor data on outcomes and complications, thus no one knows the actual risks.

In the United States medical error results in at least 98,000 unnecessary deaths each year and 1,000,000 excess injuries (Weingart et al, 2000; Kohn et al, 2000). The Institute of Medicine reported in 2012 that one-third of hospitalized patients are harmed during their stay (Ferguson, 2012; Institute of Medicine, 2012).

One should also be intelligently skeptical about positive claims for any specific study: it is important to know whether the study has been replicated with other populations and not just a particular highly selected group of patients. To quote Dr. Marcia Angell (2009), the first woman editor of the highly respected *New England Journal of Medicine:*

> It is simply no longer possible to believe much of the clinical research that is published, or to rely on the judgment of trusted physicians or authoritative medical guidelines. I take no pleasure in this conclusion, which I reached slowly and reluctantly over my two decades as an editor of *The New England Journal of Medicine*.

The evidence for many procedures and medications is surprisingly limited:

• Research studies frequently select specific subsets of patients. They may exclude many patients who have other co-morbidities.

• Clinical trials may demonstrate statistical significance without providing clinically meaningful results. For example, between 2009 and 2013 almost all cancer drugs that were approved for treatment in Europe showed upon follow-up no clear evidence that they improved survival or quality of life for patients (Davis et al, 2017; Kim & Prasad, 2015).

• Pharmaceuticals are tested only against a passive placebo. In some cases, the patient's positive response may actually be the placebo effect, due to physical sensations induced by the medication or its side effects, thus inspiring hope that the drug is working (Peper and Harvey, 2017).

• Negative side effects are significantly underreported. The data depend on self-report by both the patient and the health care provider.

Many published studies on the positive clinical outcome of pharmaceuticals are suspect. As Dr. Richard Horton (2015), Editor-in-Chief of *The Lancet*, wrote in 2015:

> A lot of what is published is incorrect … much of the scientific literature, perhaps half, may simply be untrue. Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness.

Most studies, including those on surgery, lack long-term follow-up. The apparent short-term benefits may not be beneficial in the long term or may even be harmful. For example, doctors and patients are convinced that SSRIs (serotonin re-uptake inhibitors – antidepressants such as Paxil and Prozac) are beneficial, with resulting global sales in 2011 of $11.9 billion. However, when all the research data were pooled, meta-analysis showed that these drugs are no more effective than placebo for the treatment of mild to moderate depression and increase suicides significantly among young adults (Fournier et all, 2010; Kirsch, 2014).

Consider long-term follow-up in my case: the surgeon will report a successful surgery, despite the fact that it took me almost two years to recover fully. (I did not die during surgery and left in seemingly good shape.). Although I called him numerous times for medical guidance during my complications, the outpatient surgical facility will report no complications since I was not transferred from that facility during the surgery to a hospital for continuing care. My insurance carrier that paid the majority of the medical bills only recorded the invoices as separate unrelated events: one surgery/one bill, but three separate bills for the emergency room, an additional visit to my primary care physician to check my abdomen when my surgeon did not return my call, and the ongoing invoices from the urologist. They all reported success because the iatrogenic events were not linked to the initial procedure in the data base.

In my case, following surgery, I had to go to the emergency room on three separate occasions due to post-operative urinary retention, placing me at risk of permanent detrusor damage. For more than a year, I was under the care of a urologist.

Over the past two years, my symptoms have included gastro-intestinal inflammation, spasms, and abdominal bulging, which are only now disappearing. Even my posture has changed. I am now working to reverse the automatic flexing at the hips and leaning forward which I covertly learned to reduce the abdominal discomfort. This level of discomfort and dysfunction are new to me. Reading the research on laparoscopy, I realized that excessive internal bruising, large hematomas, and internal adhesions are fairly common with this type of surgery. However, soft tissue injuries are difficult to confirm with imaging techniques.

My complications were also a direct result of inappropriate post-surgical recommendations and treatment. The symptoms were further compounded by faulty patient discharge procedures performed by the outpatient surgical facility. Since this was my first general anesthesia, I had no idea that I would be one of the people whose outcome were not what the surgeon had predicted. Thus, hope for the best, but plan for the worst.

Scheduling Medical Procedures

The following recommendations may help reduce post-surgical or medical procedure complications.

1. Schedule elective medical procedures or surgery early morning and in the middle of the week. Do not schedule procedures on Mondays, Fridays, or in the afternoon. Procedures performed in the afternoon have significant increase in complications and errors. Anesthesia complications, for example, are four times higher in the afternoon than in the morning (Wright et al, 2006). Our biological rhythms affect our (medical staff) ability to attend and focus. In the morning most people are able to concentrate better than in the afternoon (Pink, 2018).

2. Avoid weekends. Procedures performed on weekends (as compared to those done in the middle of the week) increase the risk of complications or dying. For example, babies born on the weekend have a 9.2% higher infant mortality than those born during the week, while those born on Tuesdays have the lowest death rate (Palmer et al, 2015).

It is possible that on Mondays medical staff are recovering from weekend binging, while on Fridays they are tired and looking forward to the weekend. If elective procedures are done on a Friday and complications arise, the emergency room is the only option, as the medical staff may not be available over the weekend. In my case the procedure was done on a Friday, and I left the surgical outpatient facility at 2 pm. When complications occurred, it was after 5:30 pm – phone support from the advice nurse and the surgeon on call were my only option until the following Monday. Thus, I had to go to the emergency room late Friday evening and again the next evening because of urinary retention, with a long delay in a busy waiting room. Since, I wasn't bleeding or having a heart attack, that meant I had to wait, wait and wait, which significantly aggravated my specific problem and hyper-extended the bladder.

Don't *assume* the worst but be *prepared* for the worst. Ask your health care provider about the various side effects of surgery, including the worst things that could happen, and then develop a pre-emptive plan.

3. Schedule medical procedures at least one or two weeks before any holiday. Do not schedule surgery just before or during holidays. Medical staff also take holidays and may not be available. In my case, I scheduled the procedure the Friday before Thanksgiving because I thought I would have a week of recovery during my Thanksgiving break from teaching. This meant that medical staff were less available and more involved in their holiday planning.

4. Schedule procedures so that you are released early in the day. This can allow you to return to the facility in case complications arise. I was released at 2 pm and the complications did not occur until early evening. The facility was closed, so the only option was the ER. When possible, schedule medical procedures or surgery in a facility that is able to provide post-operative care after 5:30 pm.

5. Do not schedule elective procedures during the month of July in an academic teaching hospital. During this month mortality increases and efficiency of care decreases because of the end of the academic year and subsequent changeover to new personnel (Young et al, 2011). Medical school graduates with limited clinical experience begin their residencies and experienced house staff are replaced with new trainees. This is known as the *July effect* in the US and *Killing season* in the United Kingdom. During the month of July in any given year, fatal medication errors, for example, increase by 10% at teaching hospitals, but not at neighboring hospitals which do not experience this turnover in medical personnel (Phillips & Barker, 2010).

6. Have procedures performed at a medical facility in which the health care professional has no financial interest – take economics out of the equation. When health care practitioners have financial interest in a facility, they tend to order more tests and procedures than health care providers who have no financial interests (Bishop et al, 2010). In my case the surgeon had a financial interest in the outpatient surgical facility where I received surgery. Had I had the operation across the street in the hospital where the surgeon also operates, I probably would not have been released early, avoiding the problems in follow-up care.

Strategies to Optimize Outcomes and Health

Organize your support system. Assume that recovery could be more difficult then promised.

Before your procedure, ask family members, friends, and neighbors to be prepared to help. If you did not need them, thank them for their willingness to help. In my case I did not plan for complications, thus my wife was my entire support system, especially for the first three weeks when I was unable to do anything except rest and cope. I was very fortunate to have numerous family members, friends, and colleagues who offered their expertise to help me understand what was going on and who assumed my responsibilities when needed.[1]

1. Bring an advocate to your appointments. Have your advocate/friend keep notes and ask questions, especially if the health care provider ➤

1. I thank my family, friends and colleagues (Karen Peper, Norihiro Muramatsu, Richard Harvey, David Wise, Annette Booiman, Lance Nagel and many others) who generously supported me during this journey.

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is a respected authority and you are suffering, exhausted, and/or anxious. Record any detailed instructions you must follow at home as a video or audio file on your cell phone or write them down (be sure to ask the health provider for permission). Under stress one may not be able to fully process instructions from the health care provider.

2. Make a list of questions and concerns before seeing your health care provider. Talk to your partner and close friends and ask them if there are questions or concerns that you should raise with your provider.

3. Ask for more information when tests or procedures are proposed (Robin, 1984).

- o Why do you recommend this particular test/procedure/intervention for me and what are the major benefits?
- o What are the risks and how often do they occur, in your experience and in the research literature?
- o What will you do if the treatment is not successful?

4. Ask your provider if there is anything that you should or should not do to promote healing. As much as possible, ask for advice on specific efforts you can make. General statements without instructions such as, "Relax" or "Don't worry," are not helpful unless the practitioner teaches you specific skills to relax or to interrupt worrisome thoughts. Many health professionals do not have the time to teach you these types of skills. In many cases the provider may not be able to recommend documented peer-reviewed self-care strategies. Often they imply – and they can be correct – that the specific medical treatment is the only thing that will make you better. In my case I did not find any alternative procedures that would reverse a hernia, although there may be habitual postural and movement patterns that could possibly prevent the occurrence of a hernia (Bowman, 2016). Being totally dependent upon the medical procedure may leave you feeling powerless, helpless, and prone to worry. In most cases there are things you can do to optimize self- healing.

5. Think outside the box. Explore other forms of self-care that could enhance your healing. Initiate self-care action instead of waiting passively. By taking the initiative, you gain a sense of control, which tends to enhance your immune system and healing potential. Do anything that may be helpful, as long as it is not harmful. In my case, future medical options to resolve urinary retention could include additional medications or even surgery. Researching the medical literature, there were a number of studies showing that certain herbs in traditional Chinese medicine and Ayurveda medicine could help to reduce bladder irritation, prostate inflammation and possibly promote healing. Thus, I began taking three different herbal substances for which there was documented scientific literature. I also was prescribed herbal tea to sooth the bladder. Additionally, I reduced my sugar and caffeine intake to lower the risk of bladder irritation and infection.

6. Collaborate with your health care provider. Let your provider know the other approaches you are using. Report any interventions such as vitamins, herbs, Chinese medicine. Ask if they know of any harm that could occur. In most cases there is no harm. The health care professional may just think it is a waste of time and money. However, if you find it helpful, if it gives you control, if it makes you less anxious, and if it is not harmful, it may be beneficial. What do you have to lose?

7. Assume that every health care professional is committed to improving your health to the best of their ability. Yet at times professionals are now so specialized that they focus only on their own discipline and not the whole person. In their quest to treat the specific problem, they may lose sight of the whole person and other important aspects of care. Thus, hope for the best, but plan for the worst.

Preparing for Surgery

Assume that the clinical staff will predict a more positive outcome than that reported in the medical literature. In most cases, especially in the United States, there is no systematic follow-up data since many post-surgical complications are resolved at another location. In addition, many studies are funded by medical companies which have a vested interest and report only the positive outcomes. The companies tend not to investigate for negative side-affects, especially if the iatrogenic effects occur weeks, months, or years after the procedure. This has also been observed in the pharmaceutical companies sponsoring studies for new medications.

Generally, when independent researchers investigated medical procedures they found the complication rate three-fold higher than the medical staff reported. For example, for endoscopic procedures such as colonoscopies, doctors reported only 31 complications from 6,383 outpatient upper endoscopies and 11,632 outpatient colonoscopies. The actual rate was 134 trips to the emergency room and 76 hospitalizations. This discrepancy occurred because the only incidents reported involved patients who went back to their own doctors. It did not capture those patients who sought help at other locations or hospitals (Leffler et al, 2010).

The data are even worse for patients who are hospitalized; in the US 20% of patients who leave the hospital return within a month; while in England, 7% of those leaving the hospital return within a month (Krumholz, 2013).

1. Ask about possible complications that could arise, the symptoms, and what the physician would do if they occurred. Do not assume the health professional will have the time to explain or know all the possible complications. In my case when the surgeon removed the catheter at 4 pm two days after my second emergency room visit in which a catheter was inserted. I had to ask, "What would happen if I still cannot urinate?" Again, the emergency room was the only answer. However, I know that he should never have allowed me to leave without checking if I could urinate. He should have referred me to an urologist and/or taught me simple self-catherization

which would have eliminated the long waiting in the emergency room, the excessive stretching of the bladder and the subsequent emergency room medical error on my third visit to the ER. It would also have reduced the medical costs by a thousand-fold.

2. Get a second opinion. In my case, the surgeon came highly recommended, is very experienced, and has done many hernia repairs. I trusted his judgement that I needed a bilateral hernia repair although I only felt the bulging in the right inguinal area and did not feel bulging or sensations in the left inguinal area. Despite my feeling of trust, I should have asked for a second independent opinion just to be sure. In many moments of despair when suffering the significant complications, I even started to wonder if the bilateral laparoscopic surgical repair was really necessary or just done to increase the income of the surgeon and the outpatient surgical facility in which he had a financial interest. My surgery resulted in large hematomas, irritation of internal organs, and possible damage to the GI track. This type of complication did not occur for a close friend who had a single-sided hernia repair by the same surgeon in a hospital where the surgeon had no financial interests.

3. Request medical personnel who are highly experienced in the intervention. Mortality and complications rates are significantly lower for practitioners who have done the procedure at least 250 times.

4. Don't *assume* the worst but be *prepared* for the worst. Ask your health care provider about the various side effects of surgery, including the worst things that could happen, and then develop a pre-emptive plan.

The most common problems associated with surgery and general anesthesia include the following:

Urinary retention. Following general anesthesia, neural enervation to the bladder and gastrointestinal tract are often affected. The general risk for postoperative urinary retention (POUR) for all types of surgeries ranges from 7% to 52% (Tammela et al, 1986; Petros et al, 1990; Petros et al, 1991; Gonullu et al, 1993; Tammela, 1994). For patients who have surgery for hernia repair 24.4% will experience postoperative urinary retention (Keita et al, 2005) – one in four. The risk for older males is even higher. Do not leave the medical unit until you have urinated or have a Foley catheter inserted with a leg bag and appropriate follow-up managed by a urologist. In my case, neither the surgeon nor the outpatient hospital checked to determine whether I could urinate – they just discharged me the moment I was conscious. Discharging a patient who has had general anesthesia without checking to determine whether they can urinate goes against all medical guidelines and standard hospital policies and constitutes malpractice. As this was my first surgery, I had no idea that urinary retention could occur. ➤

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Thus, I did not recognize the symptoms nor did the advice nurse or the surgeon when I called for advice before checking into the emergency room.

Constipation. Plan to eat a high roughage diet that supports bowel movements. In case bowel function is slow in resuming, you may want to have on hand simple over-the-counter supplements such as magnesium capsules, psyllium husks, and aloe vera juice or gel, all available at any health food store. Liquid magnesium citrate (GoLytely® solution available at drug stores), can be useful, but tends to be a little stressful to take. Check these over-the-counter supplements with your provider to avoid supplement-drug interaction.

Infection. Many patients pick up hospital-induced infections (nosocomial infections). In my case after four weeks with a Foley catheter, I got a mild bladder infection and had to control it with antibiotics. While in the hospital, avoid direct physical contact with other patients and staff, wash and rewash your hands. Remember medical staff tend are less attentive and wash their hands 10% less in the afternoons than in morning. Ask the medical staff to thoroughly wash their hands before they examine you. If you do get an infection, contact your medical provider immediately.

Action Steps

Pace yourself. Assume that recovery could be slower than promised. Although your body may appear to be healed, in many cases your vitality could be significantly reduced for a number of months, and you will probably feel much more fatigued in the evening. The recovery from general anesthesia has been compared to recovery from a head-on car collision.

Identify your support system in case you cannot take care of yourself initially. Organize family and friends to help you. In my case, for the first two weeks I did not have the energy or mental ability to do anything for myself – the overwhelming abdominal spasms and the three episodes in the ER had drained my energy. I was very lucky that I had my family and friends to help me. For the first few weeks, I was so distracted by the pain and discomfort that I did not drive or take care of myself.

Assume that recovery could be slower than promised. **Although your body may appear to be healed, in many cases your vitality could be significantly reduced for a number of months, and you will probably feel much more fatigued in the evening.**

Have a plan in case you need to go to the emergency room in the evening. Know its location and have someone who can take you.

Assume that you will probably have an extensive wait in the ER unless you are desperately ill. Do not try to "tough it out." Be totally honest about your level of pain, so you can get the best possible care. In my case, I had terrible abdominal pain and spasms with urinary retention, but still acted as if I were okay. When the admitting nurse asked me how I felt, I rated my discomfort as a 5 on a scale from 0 to 10. In my mind I compared the pain with that I had experienced after a skiing accident, which was much worse. What I had forgotten was that the ER is triage system, so I had to wait and wait and wait, which was phenomenally uncomfortable and increased bladder hyper expansion.

In the ER, ask which medical specialist can follow up with you if further issues develop. A general hospital usually has specialists on call. In my case, if I had requested care from a specialist, I would have been treated directly by a urologist. I would not have had to follow the advice of the surgeon who said, "When you go to emergency room, have them empty the bladder and then go home." Almost all urologists would have recommended keeping the Foley catheter in for a few days to allow the side effects of the anesthesia and the trauma caused by the bladder expansion to ameliorate and then test whether urination was possible.

Have a medical advocate with you at all times who can observe that the procedures are done correctly. There is a four-fold increase in errors during the evenings and nights as compared to the morning. The more medical staff is multi-tasking, the more likely they will make errors. Have the medical personnel explain any procedure before they perform it – why and how they will do the procedure and what you will experience. In my case I had to interrupt the nurse because she was unfamiliar with how to use the Foley catherer. You also need to know if they are experienced in that particular procedure. If the answers do not make sense, stop them and ask for another staff member.

In the ER, record the instructions on your phone. Have medical staff explain and demonstrate to you and your support person what you will need to do at home. Then repeat the instructions back to them to be certain you have it right.

Remind yourself that errors can occur. In my case, during the third ER visit for urinary retention, the nurse delayed the anchoring of the catheter and it had slipped down out of the bladder into the urethra. As she began to pump, I could feel my urethra tearing and I told her to stop. This was immediately followed by another procedural error on her part, so I had to again alert her to stop, which she finally did and then left the room. All this occurred at 1 am in the morning. As the patient, I had to take charge at a time when I was totally exhausted. As the nurse retreated, I was left sitting on the gurney waiting for someone to come and follow-up. I waited and waited and when I finally stood up, the catheter dropped out and I began bleeding from the urethral opening and dripping blood on the floor.

Lesson learned: hope for the best but prepare for the worst. In my situation, after eight weeks and numerous visits to the urologist, the urologist removed the catheter. He did this at 8:30 in the morning. This way I could go home, and I could go back to his office for further care if I could not urinate. Before

leaving the office, I planned for the worst. I asked what would happen if I could not urinate later in the evening and requested that he give me a few catheters, so if problems developed, I could catheterize myself.

The urologist gave me the catheters and explained how to use them, although I did not actually practice on myself. Still, I felt better prepared. During the day, I become more and more optimistic because I had no problems; however, at 2 am I woke up unable to urinate. For the next hour, I felt very anxious about inserting the catheter, since I had never done it myself. Finally, my discomfort overcame my anxiety. To my surprise, it was easy. After waiting a few minutes, I removed the catheter and went to bed feeling much more comfortable. The next morning after breakfast and a cup of coffee, I found that my body was working fine without the catheter.

Had I not planned for the worst, I would have once again gone to the emergency room and probably waited for hours, risking a repeat of tremendous discomfort and irritation. This simple planning reduced my medical cost more than a thousand-fold from $1700 for the emergency room to $2 for some single-use catheters.

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Monsanto Wants to Disguise Its Genetically Engineered Foods as "Biofortified" But NHF Is Standing in Its Way ...

by Scott C. Tips

In the same way that deadly aspartame is being secretly slipped into all kinds of foods and drinks that we eat, plans have been hatched to disguise genetically engineered food ingredients under the label "Biofortified." After all, consumers are catching on to the deadly health consequences of the increasingly fake foods that they eat, so the corporate monsters behind aspartame and GE ingredients are stooping to subterfuge. Like crocodiles, they lay their eggs in hidden terrain.

Its Immaculate Conception

It all started out innocently enough several Codex Nutrition committee meetings ago when an international nongovernmental organization (INGO) named the International Food Policy Research Institute (IFPRI) (and sponsored by Harvest Plus[1]) had one of its country contacts introduce a proposed new work at Codex. (Only member countries may introduce new work at Codex, not INGOs.) Harvest Plus' method of increasing certain vitamin and mineral content of basic food crops consists of the time-honored, conventional way of cross-breeding, not genetic engineering. Harvest Plus, for example, will increase the vitamin or iron content of sweet potatoes so that malnourished populations in developing nations will receive better nutrition.

The new work at the Codex Alimentarius Commission's Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU) was simple: Craft a definition for *biofortification*. That definition could then be used uniformly around the world to apply to those foods conventionally fortified with higher levels of nutrients and everyone would be on the same page whenever the term "biofortified" was used. Indeed, the National Health Federation (NHF) was an early supporter at Codex of ***this*** definition.

Poisoned in the Womb

This year's CCNFSDU meeting – hosted by the German Health Ministry in Berlin, Germany, the first full week of December 2017 – witnessed a lively debate about not only how to define biofortification but also whether or not the very word "biofortification" should be used at all. However, this was not the beginning of the debate. The NHF had two delegates there.[2]

At the 2016 CCNFSDU meeting, Chairwoman Pia Noble (married to a former Bayer executive) had started off the biofortification-definition discussion by giving her incorrect personal opinion that the definition should be as broad as possible and that recombinant technology should be included. Her statement, though, directly contradicted Australia's admission at the *2015* meeting that if the Committee were to refer to the original 2012 document on the scope of biofortification, we would see that biofortification only refers to conventional breeding and so we should clearly exclude GM techniques. At last year's CCNFSDU meeting, however, Australia was silent on the issue.

In other words, the original mandate for creating the biofortification definition was that it was to be defined as a process by which the nutritional quality of food crops is improved through conventional plant breeding with the aim of making the nutrients bioavailable after digestion. Not surprisingly, though, soon enough, the Monsanto minions got their grubby little hands on the definition through influence peddling with Codex delegates and the chairwoman, and the definition began changing into one that would include genetically modified "biofortified" foods. So, the battle is on at Codex as to whether or not GM foods will be included within the definition of biofortification. I am sure that Monsanto would be thrilled to be able to market its synthetic products under a name that began with the word "Bio."

So, by the 2017 meeting, the proposed biofortification definition had morphed into the following, which includes genetically engineered foods:

Editor Note: No decision was made at the November 2018 meeting. The battle continues at the May 2019 meeting in Canada.

> Biofortification is the process whereby any nutrients or related substances of all potential source organisms (e.g. animal, plant, fungi, yeasts, bacteria) of/[and] foods are increased by a measurable level [and/or] become more bioavailable for the intended purposes. The process applies to any method of production [and excludes conventional fortification]. [footnotes excluded][3]

Deceptive Marketing Par Excellence

The EU raised a valid objection that the very name "biofortification" would cause confusion in many European countries due to the widespread use of the word "bio" as synonymous with "organic." Other countries within the EU have been very vocal and support the EU's position here, arguing that the definition needs to be restrictive, not broad. Once again, the NHF agreed with the EU position here. The term "biofortification," at least within European countries, risks consumer confusion as to whether they are purchasing organic products or something else entirely. This kind of market confusion cannot be allowed. We have used fortified products such as cereal and milk without any additional descriptor. Monsanto seeks to cash in on the organic market with the loaded word "bio."

Biofortification – Part of a Broader Push

Monsanto's herbicide glyphosate, a worldwide bestseller, was up against a wall earlier this year. The European permit for its sale was set to expire in December 2017. Blind as a bat, and despite massive consumer protests, the EU Commission suggested that the permit be renewed for an additional fifteen years, a proposal that was unsurprisingly supported by both the European Food Safety Authority (EFSA) and the German Federal Institute for Risk Assessment (BfR). BfR's most influential scientific advisor, for example, is Dr. Georg F. Backhaus, head of the Julius Kühn Institute, who last year gave an introductory speech at a scientific colloquium lauding crop genetic improvement technologies.[4] Influence-peddling is rife amongst these "scientific" bodies.

Curiously enough, some of the EU's text in its permit-renewal proposal was reportedly extracted word-for-word from the so-called "Glyphosate Task Force," a Monsanto lobby group. Equally curious was that EFSA's assessment of scientific studies excluded all independent studies (some 106 studies in all) as failing to meet EFSA "standards." So, EFSA has zero problem basing its advice on secret industry studies that cannot be independently verified; but, as the International Monsanto Tribunal puts it, when "it comes down to Monsanto 'proving' that glyphosate is safe … all studies that say otherwise are 'not scientific.'"[5]

In early November, the EU was divided in its support and opposition to the glyphosate permit renewal; but Germany broke the deadlock by supporting a five-year extension that was steadfastly opposed by Belgium, France, Italy, Austria, Malta, Greece, and Croatia, amongst others.[6] Germany does not have a great history of protecting European citizens' interests, as shown once again here.

The furor over the decision to renew the glyphosate permit for an additional five years was such that over 1.3 million Europeans have signed a citizens' initiative asking for a total glyphosate ban. Sadly, though, neither EFSA nor BfR seem to realize that their already suspect credibility has been seriously eroded by this incident, perhaps beyond repair.

Above all, this permit-renewal fiasco reveals that most government agencies that are supposed to protect the public are really nothing more than regional field offices for Monsanto and other industry players. Far from protecting the public, these governmental agencies have betrayed the public trust and should be thoroughly cleaned out or even disbanded. Otherwise, they are simply part of the broader push to poison us and the rest of our planet.

The Chairwoman Violates Codex Procedure

Dr. Noble, the CCNFSDU Chairwoman, actually should be spoken of in the past tense since she reigned over her last CCNFSDU meeting this December 2017 in Berlin. She is retiring now and not a moment too soon. Following a typical pattern of ignoring INGOs such as NHF, not to mention the Codex Procedural Manual itself,[7] Her Imperial Highness would allow the country delegates to rattle on for literally hours, letting them make whatever comments they wanted to make and that had popped into their heads, ***twenty or more times***, on an issue without ever calling even once upon the patiently waiting INGOs. This resulted in the INGOs not being heard at all or only briefly and oftentimes after the timeliness of the issue had long since passed and been decided upon!

Above all, this permit-renewal fiasco reveals that most government agencies that are supposed to protect the public are really nothing more than regional field offices for Monsanto and other industry players. Far from protecting the public, these governmental agencies have betrayed the public trust and should be thoroughly cleaned out or even disbanded.

When I confronted Her Majesty about this at the meeting, she demurred, saying that she had to call on all of the countries first; but the truth was that even during lags in the discussion when she could have called upon an INGO who was waiting to speak, she would deliberately wait until a country pushed a button and then promptly call upon that country instead, ignoring the INGOs who were still waiting to speak.

When finally forced to call upon the INGOs due to my angry denunciation of her tactics at the head table, she prefaced it all with a flimsy lie of blaming "technical problems with the microphones." This lie was so blatantly false that it hardly deserved refutation.

So, When We Finally Got to Speak …

The morning after the main debate about the biofortification definition, the chairwoman finally began calling upon the INGOs to speak on this issue, ➤

"Biofortified"

➤

starting with NHF. What follows are my words to the some 300 delegates in the room:

> Yesterday, NHF was not given the timely opportunity to speak on this important topic, so I appreciate that we can at last finally speak now. In the future, I would suggest that more value can be gained from the INGOs' unique consumer and industry perspectives if their verbal comments are heard at the same time as the specific issues discussed rather than waiting to the very end of an Agenda item and even then only to be heard if time permits. IPFRI, e.g., could have offered us much insight on this issue and we would have liked to have heard IPFRI speak. We ourselves had to wait 2 hours and 20 minutes, all flagged up, and never got to speak.
>
> Having said that, on this issue of the wording for the biofortification issue, let me first say that NHF has nothing but the utmost respect for IPFRI and its sponsor. These are good people – trying to do good things.
>
> But we do have concerns. Although NHF was an early supporter of biofortification, we have since come to see that the biofortification concept is in the process of being hijacked and being converted from something good into something bad.
>
> If Codex is to allow 'any method of production' and 'any source' to be part of the biofortification definition, then Codex will be engaging in ***marketing deception*** of the worst sort.
>
> Most consumers want GM foods labelled. Consumer polls across the World have shown this to be true. In the United States alone, some 90% of consumers want such labelling and yet here, this proposed definition will seek to disguise GM foods under the term 'Biofortification.'
>
> That is **dishonest**, it is **disgraceful**, and for all of those sincerely concerned with the credibility and transparency of Codex, you should absolutely and positively ***oppose*** this definition.
>
> So, the National Health Federation is opposed to adding in the following wording:
>
> (1) 'all potential source organisms'
>
> (2) 'The process applies to any method of production' and
>
> (3) Footnote 4 ('Method of production should be determined by National/regional authority')
>
> On the last wording, NHF feels that letting the National Authorities determine whether GM foods are included within the definition is simply a **backdoor way** to include GM foods within the biofortification definition.
>
> I thought we were trying to harmonize the standard here. It makes much more sense for us to have a **solid, non-misleading definition** or else, as the Russian Federation has said, have no definition at all.
>
> And for the reasons already expressed by the European Union, we have a problem with the term itself as the word "bio" is almost universally recognized as being synonymous with 'organic.'
>
> We also note in passing that it is a very sad state of affairs where we have come to the point in our history where we must manipulate our natural foods to provide better nutrition all because we have engaged in very poor agricultural practices that have seen a 50% decline in the vitamins and minerals in our foods over the last 50 years. NHF mentioned this problem back at the 2005 CCNFSDU meeting.
>
> Regardless of where we find ourselves now, however, we will not remedy poor nutrition by engaging in ***deceptive marketing*** practices and sleight of hand with this definition. NHF urges this Committee to have a clear and non-misleading definition as was originally envisioned at the 2015 meeting, where the Australian delegation correctly stated that the original 2012 document on the scope of biofortification excluded GM techniques.

In the end, after all of the INGOs had finally been able to speak, including NHF and IFPRI, the latter conceded that it would probably not be successful in holding onto the "biofortification" name for its products and proposed alternatives such as "agro-fortification" and "nutria-fortification." The chair-woman, though, brought the discussion to a quick halt and it was left for her successor to untangle this mess at next year's meeting in Berlin.

But That Was Not All

Follow-up formula (FUF) for young children, a nutrient reference value (NRV) for EPA and DHA (eicosapentaenoic acid and docosahexaenoic acid, respectively), ready-to-use therapeutic foods (RUTFs), and trans-fatty acid claims were four other agenda items discussed at

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the Berlin meeting, sometimes with passion. But, after the contentious 2016 committee meeting, the discussion on follow-up formula was mostly wordsmithing. Both sides seemed content – the formula manufacturers because the FUF standard was still progressing, which when adopted will give international legitimacy to this product, and the infant-formula consumer groups because CCNFSDU will include a reference to WHO's recommendations for strict controls on the marketing and labeling of formulas for babies over six months.

Ironically, the proposed Codex standard for Ready-To-Use Therapeutic Foods allowed glucose syrup to be used as a sweetener but forbade the use of corn syrup, until NHF pointed out that these were practically identical sweeteners and very dangerous GMO-derived ones at that. A change was made.[8]

On the trans-fatty-acid claims and the proposed NRV for EPA and DHA, the Codex Nutrition Committee postponed any action until the next meeting, but not before both Malaysia and NHF could lambast Canada and those others who so ignorantly continue to buy into the long-discredited myth that saturated fats have any connection with heart disease.[9]

In Short

Heavy-handed tactics on the part of the outgoing chairwoman resulted in an unnecessarily prolonged discussion about the biofortification definition, which itself has been hijacked by Monsanto and others to disguise within its consumer-friendly name something very ugly and deceptive. Monsanto's attempt was recognized by many delegates for what it was and denounced in the meeting. The fight, however, will carry over to next year's meeting to be held in Berlin in November 2018. And that meeting will be chaired by the committee's new chairwoman, Ms. Marie-Luise Trebes.

EDITOR NOTE: NO DECISION WAS MADE AT THE NOVEMBER 2018 MEETING. THE BATTLE CONTINUES AT THE MAY 2019 MEETING IN CANADA.

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1. *See* www.harvestplus.org.
2. The NHF delegation consisted of Scott Tips (NHF President and head of NHF Codex delegation) and Katherine Carroll (NHF Executive Director).
3. Report of the Thirty-Ninth Session of the Codex Committee On Nutrition And Foods For Special Dietary Uses Berlin, Germany, held December 4-8, 2017. The approximately 300 participants on Government, Observer, and UN delegations are listed in Appendix 1, on pages 19-48. A further 60 or so people (including Danone's Policy and Intelligence Manager from its Global Affairs Unit) wore public badges and do not appear on the list.
4. Agricultural Biotechnology Scientific Colloquium, sponsored by JKI, and held in Quedlinburg, Germany from 22-24 June 2016; *see* http://www.grace-fp7.eu/sites/default/files/Scientific%20Colloquium%20final4.pdf.
5. Foundation Monsanto Tribunal website, accessed on December 21, 2017, at http://en.monsantotribunal.org/main.php?name=main&obj_id=384283593.

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6. Tani C. German Vote Swings EU Decision on 5-Year Glyphosate Renewal. *EU Observer*. Nov 27, 2017, at https://euobserver.com/environment/140042.
7. *Codex Procedural Manual*, 24th Edition, Section III, pp. 99-105. *See also ibid*, Section I, Rule IX, par. 3, at p. 15. It has traditionally been the practice at Codex meetings to allow the countries to all speak first ***once*** and then the INGOs ***once*** and then back to the countries again for second comments, and so on. Her Imperial Highness routinely violated these rules with impunity, making her unfit for the position.
8. Report, *supra*, at p.14, para. 117, last bullet point.
9. Dehghan M, *et al*. Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study. *Health Sciences and Medicine, Aga Khan University, Karachi, Pakistan*, PGIMER, Aug 29, 2017, at http://dx.doi.org/10.1016/S0140-6736(17)32252-3.

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Non-Exercise Activity Thermogenesis, "Effortless" Fat Loss, and Pantothenic Acid

by Owen Fonorow©2019

Ari Whitten's book *Red Light Therapy* contains the revelation that the well-researched, yet relatively little known, Red/Near Infrared (NIR) light therapy reduces oxidized ubiquinone (aka CoQ10) in the mitochondria to ubiquinol. The referenced experiments found that CoQ10 can only be regenerated by light at specific wavelengths in the presence of "chlorophyll" metabolites. (Now we know why Mom always told us to eat our greens.)

The Red/NIR light effect on CoQ10 may explain most of the myriad of reported health benefits from more than 3000 studies. The studied benefits include anti-aging, reduced chronic inflammation, increased strength and endurance, fat loss, and improved cognitive function. The therapy also helps overcome chronic fatigue. The research was spurred by NASA after it was discovered diabetic foot sores heal normally when exposed to RED/NIR light.

Keep in mind that for the CoQ10-effect, we not only need to eat greens and apply the light properly, but we also need ample supplies of ubiquinone – CoQ10. As we age, our own bodies make less, and drugs like the popular statin cholesterol-lowering drugs lower circulating CoQ10 levels.

Ari's book contains a fascinating discussion of the research showing that Red/NIR light causes fat cells to disgorge their contents! Ari explains why stubborn fat is so hard to lose, and why exercise is not the answer. He then explains how and why Red/NIR light can be used for "spot" fat reduction.

Our company Immortal Cell Sciences has become interested in efficient fat burning and weight loss. In 1996, Hong Kong doctor L.H. Leung developed a theory regarding coenzyme A and efficient lipid metabolism. Pantothenic acid (Vitamin B5) is a direct precursor to coenzyme A. Leung's theory is that very high dosages of B5, after it turns into coenzyme A, optimize fat burning, avoiding a secondary, less efficient evolutionary-backup method, which produces ketones.

Leung studied high doses of vitamin B5 for weight reduction and fat loss to test his hypothesis. For one year, 100 patients were able to achieve "effortless" and steady fat loss by taking 10,000 mg of vitamin B5 as pantothenic acid daily. Hunger was averted on a 1000 calorie diet and there was no weakness – or ketosis. Surprisingly, the only side effect reported at these "mega" doses of vitamin B5 was a feeling of well-being.

Leung reported that 10,000 mg vitamin B5 daily worked for most subjects, but a few cases required up to 20,000 mg of vitamin B5 to avoid ketosis on a 1000 calorie per day diet.

Another book by Whitten, *Forever Fat Loss*, promises "effortless" fat loss, without counting calories, or reducing carbs, etc. Reminded of Leung, we read Whitten, who explains why and how all diets fail, almost of necessity given our evolutionary biology which slows down our metabolisms when calories are scarce. Whitten also advises eating whole foods, thus avoiding all processed food which may contain additives affecting "pleasure areas" in the brain, creating food addictions.

The other major point in Whitten's book is to avoid our normal lack of movement. We sit too much. The advice is not exercising *per se*, but to strive to be constantly moving, at least once per hour. Not too long ago, our forefathers, just living their lives, generated on average about 2300 calories during the day. Today our sedentary jobs has lowered our thermogenesis to only 400 to 800 calories, leaving 1500 less calories to burn the food we now eat.

Whitten's ideas on movement stem from Mayo Clinic obesity researcher James Levine's work on non-exercise activity thermogenesis (NEAT). Levine wondered whether it was true that some people could seemingly "eat a horse" and not gain weight, while others seemed to gain weight eating a potato chip. It turns out that after meticulous experiments with people who didn't exercise regularly, this anecdotal observation was true. Different people eating the exact same number of calories gained between 3 to 30 pounds.

The difference between the people turned out to be their non-exercise activity or NEAT. Levine reports that as societies have adopted the automobile, eg, China, and thus decreased their NEAT, the rate of obesity closely matches the percentage of the population that drives cars.

As far as we know, neither Whitten nor Levine is aware of Leung's vitamin B5 findings. In our opinion, combining the Whitten/Levine blueprint with a Leung-size dose of vitamin B5 wouldn't be harmful, would likely lead to better health, and may very well be an infallible means to burn fat and lose weight.

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The editors of the *Townsend Letter* recommend that all patients (and physicians) review further reports provided in the article's references and investigate the practitioner's techniques before undertaking an alternative diagnosis, examination, or treatment. Please discuss such treatments and examinations with a reputable health practitioner in your community. If you do use an alternative treatment discussed in the *Townsend Letter*, we would appreciate your report of the outcome, any side effects, and costs.

Bioregulatory Medicine

review by Heather Tallman Ruhm, MD, Medical Director, The Biomed Center NE

Bioregulatory Medicine by Dickson Thom, James Paul Maffitt Odell, Jeoffrey Drobot, Frank Pleus, and Jess Higgins Kelley
Chelsea Green Publishing, www.chelseagreencom.
2018; 240 pp; $20

Bioregulatory Medicine is a primer (for those who need re-priming), a refreshing look at what matters in medicine and how we can work *with* the human body, not against it, without fear, to heal ourselves and others. It shows as where we left our roots – roots deeply embedded in an understanding of our amazing human physiology, its intricate biochemistry, and its awe-inspiring anatomy – and how to return to this scaffolding, to the miracle of life.

It is a book of hope. It captures important messages about the path to sustainable, biologically based medicine. It shows us where and how we have gotten off course by tracing the history of allopathic medicine. It tells us what we should know, that we are beautifully made yet somehow broken, that health is more than the absence of disease. The human body is a complex network of connected and interdependent systems. Their harmony and ability to self-regulate depends on their milieu – the environment in which each organ, cell and structure is immersed.

Our bodies carry a toxic burden, unlike any throughout history. It is the source of their dysregulation and disease. Yet, when we work *with* nature our bodies have an amazing capacity to heal – to repair, restore, and regenerate. This book tells us how Bioregulatory Medicine uses modern technology to assess which systems are most burdened, acknowledge the wisdom of ancient traditions (e.g., supporting elimination), and embrace new approaches to help bodies gently detoxify, rebuild and self-regulate, indeed to heal. ◆

Industrial Food and Our Children's Health

review by Katherine Duff

What's Making Our Children Sick? How Industrial Food is Causing an Epidemic of Chronic Illness, and What Parents (and Doctors) Can Do About It by Michelle Perro, MD, and Vincanne Adams, PhD
Chelsea Green Publishing, 85 North Main Street, Suite 120, White River Junction, VT 05001, ©2017, 272 pp., Softcover, $24.95

Food is information for the cells in the human body. It is long past time that we analyze and research how that information has changed through industrial food production practices and its effect on the human body. So warns Michelle Perro, MD, a practicing pediatrician for the last 35 years, in the enlightening book, *What's Making Our Children Sick? How Industrial Food is Causing an Epidemic of Chronic Illness, and What Parents (and Doctors) Can Do About It.* Co-written with Vincanne Adams, PhD, this book is a call to action to not just consider the health of children but do something about it.

In her practice, Dr. Perro treated children for acute conditions but began to see patterns of underlying chronic illnesses. Children were presenting with such conditions as, gastroesophageal reflux disease, irritable bowel syndrome, type 2 diabetes, and mental disorders. The statistics for these and other chronic conditions show they are increasing among children. Conventional medicine offers what she calls the "Pill for Ill" approach that is intended to treat symptoms but not really resolve the underlying illness. Her desire to discover what was causing the chronic illnesses led her to the field of integrative medicine and food-focused medicine.

How she treats these children is told in case studies that can be instructional for parents and practitioners alike. In these cases, the children had been to other doctors and had tried the prescribed medications such as antacids, prednisone, and antibiotics, without success. Dr. Perro would usually start with diet changes that call for organic foods only and elimination of wheat, dairy, soy, and other potential inflammatory offenders as necessary. This may even mean such diet changes for the mother if she is nursing because babies are among those with chronic illnesses. Sometimes taking the child off a prescribed pharmaceutical helped relieve symptoms. What her treatments consider are the sources of toxic exposures our children are experiencing from birth, whether through the exogenous environment and especially through the foods they ingest. She is not offering a cure-all but a measured approach to healing the gut for improvement or relief from these disorders.

"As a society that values and depends on the well-being of our future generations to thrive, we need to rethink the causes, complexities, and treatments for many of the chronic diseases on the rise today among our kids."

Industrial food production has changed our foods from what they were a few decades ago. Though they will not be found on nutritional labels, pesticides, antibiotics, and hormones that have been used in production are now in our foods. Even mother's milk will pass these substances to nursing babies. Dr. Perro asserts these products are playing a role in the increasing incidence of chronic illnesses in children. She demonstrates this by bridging the chasm between environmental research and conventional medicine. She is not making the case for direct causation but rather using existing research to demonstrate the connection.

A great leap forward in understanding many health conditions has been the research into the microbiome. This collection of micro-organisms in and outside the gut, as we now know, has an impact on our health and well-being. These able assistants process the information we ingest to supply us with nutrients as well as signaling them to multiply or die off, among other functions. A course of antibiotics to treat infection will change the microbiome, but it goes

without notice we are ingesting antibiotics in our food that could possibly have the same consequences. Especially vulnerable to the whole array of toxins in the food supply are the children, whose bodies are still developing.

One cannot address the role of pesticides in our food without examining the all-pervasive product, Roundup and its active ingredient glyphosate. Not only is this product used in food production but also neighborhoods and anywhere weeds are a problem. Glyphosate first hit the market in 1974. It was lauded for its safety for humans because it utilized the *shikimate* pathway, which is a metabolic route that blocks synthesis of proteins, causing weeds to die. It was thought humans and animals did not have this pathway. We now know that bacteria and fungi in our microbiome do have this pathway.

Monsanto's development of genetically modified seeds demonstrates how pesticide use is increasing. Called Roundup Ready seeds, they first offered it as a reduction in the use of glyphosate to control weeds. After years of glyphosate use though, the weeds have developed resistance. The solution to this problem has been to use mixtures of herbicides and more glyphosate. If that were not enough, it is now being used to spray before harvest to prevent sprouting. It leaves a residue.

Another example of questionable genetically modified plants can be found in the Bt (*Bacillus thuringiensis*) toxin which turns plants into insecticides. This is a naturally occurring bacterium that is found in soil. Scientists have inserted the Bt genes into the food plant so they require less external spraying to kill insects. It is not known or even been studied what effect this may have on humans and especially children.

Dr. Perro is not averse to all genetic modification especially as it has been used for medicine. In this case the product must be tested to show it is safe for humans. For genetically modified plants, such testing is not required. The testing is limited to demonstrate its nutritional equivalency to non-genetically modified plants. She does note that there has been independent research that has shown damaging health effects in lab animals. Studies with such findings have been shown to have damaging effects on the lives of researchers though, as in the case of Arpad Pusztai of the Rowett Institute in Scotland. The ill effects seen in his testing on genetically modified potatoes resulted in him being attacked, his thirty-six year career destroyed, and his work buried. Interesting to note: the potatoes in question never entered the market.

When we talk about health effects from pesticides, antibiotics, and hormones in our food, we come up against the wall of powerful corporations and enabling government agencies. The authors explain how the industry-generated studies, which are used to accept products into the marketplace, are stacked in favor of the corporation's interests. Their critique of the studies used for support of genetically modified foods is a brilliant examination of the manipulation of science to achieve preset goals.

This is such an important book for many reasons. First of all, as a society we should be alarmed that children are being burdened with chronic illnesses in increasing numbers. Beyond practitioners of integrative medicine, no one is addressing the problem with anything other than pharmaceutical management of symptoms. That is shameful. Secondly is the authors' utilization of environmental health studies, which have been bureaucratically separated from standard medical care for far too long. And finally, these authors have brought logic to a fallacy that has passed as fact: Agrochemical foods are the same as food has always been. That meme can only survive as long as studies are not done. These keen authors have caught and enumerated how the industrial scientific community is experimenting with children's lives. That should not be acceptable to anyone.

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New Edition of *Metabolic Therapies in Orthopedics*

"35 Expert doctors from diverse fields help patients get pain-free and recover faster from surgery" says Ingrid Kohlstadt MD, MPH, Associate, Johns Hopkins University's Center for Human Nutrition.

"Fork and knife," expresses how food, dietary supplements, and emerging metabolic therapies improve recovery from orthopedic surgery. The medical approach now celebrates two firsts.

An orthopedics textbook snagged Amazon's #1 New Release in Nutrition and Alternative Medicine. Entitled *Metabolic Therapies in Orthopedics*, this CRC Press book's 35 authors reveal new-found consensus across the table – internists and surgeons.

The unprecedented collaboration started with the book's editors, Ingrid Kohlstadt, MD, MPH, who is an associate at Johns Hopkins University's Center for Human Nutrition, and Kenneth Cintron MD, MBA, who is Chief of Orthopedics at the Veterans Administration Hospital in San Juan. Chapters include personalizing nutrition with genetics, enhancing results of regenerative orthopedic procedures with nutrition, interpreting metabolic labs in the age of artificial intelligence, activating metabolism with laser therapy, treating sleep apnea with orthodontics, using ultrasound to guide joint injections, avoiding recent unlabeled food technologies, identifying common drug-nutrient interactions, bringing advances from veterinary medicine to human medicine, mobilizing fascial connective tissue, and using US military medicine to prevent sports injuries.

Ethan Kellum, MD, is a sports medicine trained orthopedic surgeon in Nashville and says, "I am ecstatically overwhelmed by the knowledge that is found within its pages. Whether you are a patient and especially if you are a caregiver for musculoskeletal injuries and condition, this book is a must read! I believe wholeheartedly that as we follow the information given in this book we will revolutionize how we treat patients with musculoskeletal conditions."

As a family physician Melissa Gamponia, MD, MPH, explains, "Living in a state where the opioid crisis has reached epidemic proportions, I certainly have high recommendations for this textbook."

Dr. Kohlstadt was inspired to lead the team because the evidence for using both the fork and the knife is in. This book empowers health care providers to readily distinguish hope from hype and engenders forward-thinking healers and adherers to "first-do-no-harm." In her opinion, baseball catcher Yogi Berra summed it up. "When you come to a fork in the road [to health], take it!"

To view chapter authors bios, reviews, and more visit http://www.BetterOrthopedics.com. Clinicians who purchase and read *Metabolic Therapies in Orthopedics* are invited to ask the authors questions at BetterOrthopedics.com's first-of-its-kind "Ask the Author" page. For Dr. Kohlstadt's LinkedIn profile, see https://www.linkedin.com/in/ingridkohlstadtmd/.

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Functional Gastroenterology Bolus

by Steven Sandberg-Lewis, ND, DHANP

The Sterolbiome – The Essential, But Overlooked Enterohepatic Endocrine System

The human ecosystem consists mostly of microorganisms. The genetic contribution of the microbiome dwarfs the 23,000 genes in the human genome. These organisms and their genes control much of the human endocrine system through their interactions with bile (and vice versa). Decades of research attest to the hormonal effects of bile acids on energy (glucose, lipids, and lipoproteins) and inflammation – the sterolbiome.

A Quick Review of the Biliary System

The liver synthesizes and secretes hydrophilic primary bile acids, which are converted in the gut by Clostridia into numerous secondary hydrophobic bile acids. With gastric emptying after a meal, gradual gallbladder emptying occurs. Gallbladder contraction and Sphincter of Oddi relaxation is mediated by the enteric hormone cholecystokinin, which delivers bile to the small intestinal lumen. Bile acids (BA) are absorbed by active and passive mechanisms, returned to the liver via the portal vein, processed by hepatocytes and re-secreted into the bile ducts. During overnight fasting, bile accumulates in the gallbladder where it is concentrated and stored.[1]

Primary bile acids (synthesized from cholesterol in hepatocytes) include cholic and chenodeoxycholic acid. About 16 enzymes are needed to convert cholesterol to bile salts. Hepatocytes also conjugate bile salts with glycine or taurine**.** Bile salts may also be sulfated or glucuronidated or – in the case of ursodeoxycholic acid (UDCA) – undergo N-acetylglucosamination. UDCA makes up only 2% of the biliary pool but has unique beneficial properties.[2]

Primary bile acids have both a hydrophobic and a hydrophilic side. The anions associate to form micelles with phosphatidylcholine and lipids. Mixed micelles increase absorption of fatty acids, monoglycerides and fat-soluble vitamins.

The secondary bile acids are deoxycholic acid (DCA) and lithocholic acid (LCA). Secondary bile acid metabolites influence nuclear receptors. This is the mechanism for most of the endocrine effects of the sterolbiome.

Elevated colonic concentrations of the primary bile acid chenodeoxycholic acid (CDCA) or the secondary bile acid deoxycholic acid (DCA) are known to induce water secretion, causing diarrhea. A decrease in these may be a cause of childhood functional constipation.[3]

The major mechanism for removal of cholesterol is through bile excretion either by direct transport of intact cholesterol to the bile or by conversion into bile acids in the liver, mediated by the enzymes CYP7A1, CYP8B1 and CYP27A1.

The biliary system is a major route of detoxification and bile acids can be used as therapeutic agents.

Bile also has a major influence over the balance of intestinal flora. In the colon, primary bile acids regulate growth of *Clostridium difficile***.** Secondary bile acids (formed by bacterial action) suppress the growth of *C. diff.* By killing bacteria, most antibiotics are risk factors for C. difficile enterocolitis. Antibiotics inhibit production of secondary bile acids by altering intestinal flora.

Bile Acids…Are They Hormones?

"The gut microbial community through their capacity to produce bile acid metabolites distinct from the liver can be thought of as an ***endocrine organ*** with potential to alter host physiology, perhaps to their own favor."[4]

The gut microbiome (sterolbiome) produces endocrine molecules from endogenous and exogenous steroids in the gut. BAs are also known to fundamentally shape the gut microbiome and vice versa.

Bile Acids Activate Nuclear Receptors

As stated above, secondary bile acids influence nuclear receptors. Bile acids are hormones that regulate their own synthesis and transport, glucose and lipid homeostasis, energy balance, inflammation and microbial growth. These nuclear receptors include the Farnesoid X receptor (FXR), the Pregnane X receptor (PXR), G-protein coupled receptors (GPCR) and the Vitamin D receptor (VDR).

Farnesoid X receptor (FXR): "FXR is the bridge between the liver and the small intestine to control BA levels and regulate BA synthesis."[4] By doing so it regulates glucose, lipoproteins, lipid metabolism, inflammation, tumor suppression, drug metabolism, hepatic regeneration, fibrosis, cell differentiation and neoplasia.

Pregnane X receptor (PXR): PXR turns on sulfation in phase 2 detoxification, regulating the processing of xenobiotic and endogenous compounds. It is especially important in the detoxification of carcinogenic lithocholic acid (LCA). LCA can induce double stranded breaks in DNA!

Rifaximin, the SIBO drug, also increases PXR-mediated inhibition of angiogenic factors in colorectal cell lines and may be a promising anticancer tool. Treatment with rifaximin also causes "significant and concentration-dependent reduction of cell proliferation, cell migration, VEGF secretion, NO and MMP release."[5] This activation of PXR (by rifaximin) can enhance intestinal epithelial repair and down-regulate gut microbe inflammatory responses. The specifics include inhibiting the activation of the nuclear factor-κB *via* the pregnane X receptor (PXR) as well as reduced interleukin-1B and tumor necrosis factor-alpha.[6] Rifaximin is uniquely bile soluble.

G protein coupled receptors (GPCR): GPCR are found in the gallbladder, spleen, intestinal neuroendocrine cells, macrophages, cholangiocytes and brown adipose cells. Secondary bile acids (and primary BA to a lesser degree) are potent stimuli for GPCR. This leads to enhanced glucose regulation by modulation of incretin hormones, glucagon and insulin.[7] One might hypothesize that chronic low-grade inflammation which is associated with insulin resistance, may inhibit bile acid signaling and disrupt lipid metabolism. The disruption of these signaling pathways may increase the risk of fatty liver and non-alcoholic fatty liver disease.[8]

Vitamin D receptor (VDR): Lithocholic acid metabolites are agonists for the vitamin D receptor, enhancing the myriad effects of this essential fat-soluble vitamin/hormone.

In addition to the nuclear receptor activity discussed above gut bacteria secrete β-glucuronidase, an enzyme that deconjugates estrogens. The deconjugated forms of estrogen are more active, so in this way, estrogen is more efficiently absorbed into the blood and is therefore able to bind to receptors and induce physiological activities. *Clostridium scindens*, one of the major species involved in the bio-transformation of BA, also converts glucocorticoids to androgens.[9]

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Healing with Homeopathy

by Judyth Reichenberg-Ullman, ND, MSW, and Robert Ullman, ND

www.healthyhomeopathy.com

Eczema from Birth: Why Homeopathy Is the Best Solution

Why Breastfeeding Can Prevent Most Childhood Allergies

I am forever indebted to the legendary naturopathic doctor, John Bastyr, as are, indirectly, many of my patients over the past 35 years. As a child I remember being allergic to chocolate. At that time my mother did the best she knew at the time – to give me white chocolate instead. I don't know if there's a connection, but I absolutely love dark chocolate and have an aversion to the white substitute!

Many children, sometimes from infancy, suffer from much more extreme allergies. That is true of the patient I will present in this article. In naturopathic medical school, Dr. Bastyr gave us a protocol for introducing foods into an infant's diet, which I will include as an addendum to this article (see Sidebar). And he taught us that any nursing mom who, for whatever reason could not breastfeed sufficiently to satisfy her baby should supplement with goat's milk. That is advice that I never forgot and that I have given to countless pregnant and breastfeeding moms. I was not breastfed either (along with most of my contemporaries), but I was, fortunately, not allergic to milk. And now, at seventy, I find myself here in Chile making yummy yogurt from dairy sheep. But that is another story! I am also, of course, indebted to Dr. B, as he was lovingly called, for curing my bronchitis when I first arrived in Seattle from New Mexico in 1973, and for his legacy of Bastyr University which led to my career!

Cow's milk allergies in newborns, be it formula or the milk, can, in an infant predisposed to allergies, lead to life-long problems. If one or both of the baby's parents have allergies, this is even more likely. The allergic reaction typically begins superficially with the skin in the form of eczema. This is the attempt of the vital force to deal with the allergen on an external level. Depending on the sensitivity of the baby, whether or not formula or cow's milk is continued, and, as happens so often now, topical steroids are used, the allergic disposition can be driven to a deeper level. The eczema can progress from mild to severe, to the point of the poor baby being covered from head to toe with an unbearable raw, scaly, itchy skin. From this point, if the milk is not removed and the topical medications continue to be given, the *same allergic imbalance* often progresses to ear infections. Of course, this depends on the nature of the particular child – the more sensitive overall, the more likely this progression. Then, commonly, a series of antibiotics ensues, none of which ultimately eliminate the tendency to the otitis. Then ear tubes, which involve a minor surgical procedure and do not address the underlying cause of the problem. In many cases, this very same allergic predisposition will progress to a potentially life-threatening condition: asthma.

This is a far too common and unnecessary pattern. If the mom had breastfed initially *or,* if that were not possible, she had given the baby goat's milk instead of cow's milk or formula, *or* she had sought out homeopathic treatment for the infant, this unfortunate progression could have been prevented. Thank you, Dr. Bastyr, for having taught me this while I was still a naturopathic medical student! In 35 years of practice, I remember only one infant who was allergic to goat's milk as recommended in this protocol. And Dr. Bastyr's advice pre-dated the era of extensive allergy testing and allergy-elimination diets that were so prevalent in the first 10-15 years of my practice.

A Young Man with Eczema from Birth

Felipe, a young minister, came to see me two and a half years ago for lifelong eczema, mainly on his hands and arms: "*My eczema is looking a lot better after using steroid cream during the past week. It's mainly on my hands and arms. Last week they were so inflamed that it was difficult to even bend my wrist. It burns a lot. And itches. I often scratch in my sleep and wake up with a new cut from the scratching. My skin can get purplish. When I scratch, it will bleed and discharge pus. Even if I scratch lightly. The worst, though, is my hands. My right elbow gets so bad that I can't bend my arm. It becomes dark red, purple. Occasionally my skin will be dry behind my ears. Same with my neck and shoulders. I usually apply Cetaphil moisturizer and often use a topical steroid cream.*

"*The eczema started when I was a week old. It used to be all over my entire body. It was better during my teenage years except when I had a reaction to something. Like dust. I scratch, then I can get an infection. For a while I reacted to dust and my skin was black from the knee to the ankle.*

"I was not breastfed. My mom gave me formula. I might have had ear infections when I was teething. At its worst the eczema is so paralyzing that I feel like I can't move. It's exhausting physically and mentally. Every time I move, it pulls the skin and burns. I sit by a fan to cool off and that provides a little comfort.

"It's a burning sensation. Like my skin is peeling away. It gets really hot. If I scratch a lot, it gets bumpy then it turns into cuts. Particularly by my elbows and neck. It looks like hives. Hot and inflamed. Burning. Like somebody is taking a hot iron and peeling my skin away. It's like sitting in an oven. Any water that touches it really stings. Even an oatmeal bath. It's an uncontrollable itch. I can't stop myself from scratching. I try to rub it with my clothes to not scratch. The scratching feels really good. When I stop scratching, it compounds. Sweating makes it worse. Eczema runs in my mother's family. Doctors told her formula was the best thing to give me at birth. This is my only health problem."

I inquired about Felipe's nature: *"I'm mild and calm. If I get angry, it doesn't come out. Being a priest, a lot of my stress is from others coming to me with their problems. When I was training to be a priest, the scratching could keep me awake and I would go 22 hours without sleeping. People turn to me to help with their spiritual issues. That can stress me out and my eczema will flare up. My nature is to let people have their way. I try to avoid conflict. It impacts me emotionally. If I feel angry, I get a little shaky. I try to keep it under control. I shut down, get quiet, and walk out of the room to mull things over. Retreat inside myself. Take a step back. I'm pretty sensitive in general. I enjoy going away from the city into the forest. It gives me serenity."*

An Easy Remedy Choice But Potency Is Very Important

I am sharing this case because I think the information about starting babies off on the right track to prevent allergies is so important AND because I have found homeopathic care to be a safe, effective, wonderful alternative for allergies at *any time* of life.

Before I share the remedy with you, I want to share another tip that was given to me early on in my practice. Be VERY CAREFUL of aggravations in cases like this. One homeopath, decades ago, taught never to go higher than a 12C potency when prescribing *Graphites* for eczema cases (keynotes: dry, itchy eczema with a honey-like discharge, especially in the bends of the elbows and behind the ears). That is an overstatement, and not remedy specific. But the point is that the last thing we want to do in a case of severe eczema, *especially* with an infant, is to aggravate the condition. And that is definitely a possibility. I was quite aware of that in Felipe's case, especially given his highly sensitive nature. So I was very cautious regarding potency selection in this case.

What stands out most prominently in this case? Why is it not a *Sulphur* case, the remedy that is most frequently, and most incorrectly, prescribed for cases of eczema? What is the *one* word that best describes this young man? Certainly not lazy, disorganized, untidy! I say this because many would give *Sulphur* simply because of the degree of itching, scratching, heat, and discomfort. But, NO! The single word that best fits this young man is *sensitive*. He does not need a mineral remedy, but a plant. And what stands out most about his sensitivity? That he is mild-mannered, kind, caring, responsible, and keeps his anger within. There is a nobility about him. A serenity. Yet the discomfort and suffering due to the eczema is terrible.

The characteristic sensation of the *Ranunculaceae* (buttercup) family is vexed, easily excited, raw nerves, morbidly sensitive, sharp, stitching, stabbing, stinging, sticking pain. The active reaction of those needing remedies from this family is nervous tension and suppression. The specific member of this family that Felipe needed was *Staphysagria* (stavesacre.) From the *Substance of Homeopathy* by Dr. Rajan Sankaran:

> They are morbidly sensitive. The effect of this sensitivity is very deep and long lasting. They set for themselves a task which is nearly impossible. That task is to maintain their dignity.... The main feeling of *Staphysagria* is one of dignity and honor, like a person of noble birth. He feels that he should live up to his sense of dignity and honour (which is often more than needed

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How to Introduce Foods to Infants for Allergy Prevention

It is very important to start off your baby's diet right from the beginning in order to prevent allergies such as eczema, ear infections, and asthma, especially important if there is a family history of allergies. This program is meant to supplement breast milk as the primary source of nutrition for your infant. If it is not possible for you to breastfeed, the recommended naturopathic alternative is goat's milk.

Allergic reactions to look for: rash around mouth or anus, swollen or red lips, red face, cheeks; darkness under eyes; runny nose; sudden infection, particularly ear infection skin eruptions: rash, hives, eczema; diarrhea; mucus in stool; discomfort, irritability, behavioral changes

At age **six months**, introduce applesauce (made raw in blender); banana; blackberry; broccoli; raw and blended or cooked carrot; cooked and mashed cherries; pitted and smashed grapes; seeded and mashed prunes; sprouts, blended in water.

At age **nine months**, introduce apples, artichoke, Basmati rice, blueberries, cabbage, lima beans, Millet (cooked and mashed), nectarines, oatmeal, papaya, peas, mashed potato, split peas, string beans, and sweet potato.

At age **12 months**, introduce asparagus, avocado, barley, blackstrap molasses, brown rice, garlic, goat's milk (fresh), honey (not raw), onions, parsnips, squash, Swiss chard, tofu, and yogurt.

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in a man in his position. He should never lose his control, since it would be very much below his honour and dignity to do so. If somebody insults him, he has to keep control as befits his noble birth.

The skin symptoms of the remedy include eruptions, chronic; eruptions, crusts, scabs after scratching; eruptions, eruptions, bleeding after scratching; eruptions, eczema, in children.

Response to the Remedy

I treaded lightly in choosing the potency for Felipe. The only remedy I have ever prescribed for him is *Staphysagria.* I began with an LM1 potency using a 2-glass method. LM remedies are made from 1 in 50,000 dilutions (rather than 1 part mother tincture to 9 parts water for X potencies and 1 to 99 for C potencies). They were developed by Dr. Samuel Hahnemann, the founder of homeopath, later in his lifetime, and are typically used for highly sensitive individuals. Below are the instructions that we have given for years to those patients taking LM remedies:

LM Medicines:

- You will receive a 1-oz dropper bottle containing your remedy. You will be making a new dilution each day you are instructed to take the medicine.
- Shake the bottle against your hand or a book 10 times.
- Place 5 drops in 4 oz. water in a paper cup.
- Stir this solution for 15 seconds vigorously with a spoon.
- Take ½ tsp. of the stirred solution.
- Throw away the remaining solution.

LM Medicines Multiple-Glass Method for Sensitive Individuals:

- Follow the instructions above to prepare the first glass of the LM medicine.
- Instead of taking the ½ tsp. of the liquid, put it in a second 4-oz glass of water. Stir that glass and take ½ tsp. of it.
- You may be asked to repeat this process a specific number of additional times if you are very sensitive.

Six Weeks: *I'm doing better. Pretty much immediately I noticed that I went ten days without using any cortisone cream. I got a little itchy after the one-glass method the first night, so I went to the two-glass method. There's been no horrible flareup. I've had an easier time going to sleep.*

Five Months: *I'm doing better. I am using a one-glass method and it has been improving. I raised the potency from* Staphysagria *LM1 to LM2.*

Eight Months: *I am still using a very small amount of steroid cream every couple of weeks. My digestion has been better since first starting the remedy.* Staphysagria *LM3, 1-glass method.*

Ten Months: *I have not used the cortisone cream.* Staphysagria *30C dry pellets as needed.*

Twelve Months: *Still much better but I tried a dose of* Staphysagria *30C dry pellets.* Felipe had a slight flare-up on day five and did use a small amount of the cortisone cream. He experienced a great deal of family stress during this time. I prescribed *Staphysagria* 12C dry pellets.

Twenty Months: *Overall well. I've been resisting the cortisone.* Having just attended a seminar with our teacher, Dr. Rajan Sankaran, I changed the potency to *Staphysagria* 12C in water two doses.

Twenty-Two and a Half Months: *The best reaction ever. 85%-95% improvement after the two doses, then again a month later after repeating the dry doses in water.*

Twenty-Three Months: *The most stressful three months of my life, but I'm doing okay. It's been a year since using steroid cream.*

Two Years Three Months: Same potency. I continue to talk briefly with Felipe, by phone or in person, every two to three months. He continues to do well with very slight flareups occasionally, but he is very pleased with the results from the homeopathy.

Conclusion

I think this case teaches a lot: 1) the importance of encouraging breastfeeding whenever possible; 2) supplementation with goat's milk, if needed, rather than cow's milk or formula; 3) homeopathic care as early in life as possible (the parent(s) may also benefit from homeopathy as well) to treat the symptoms of eczema, chronic ear infections, asthma, and other allergic symptoms; 4) selecting, as always, the one best homeopathic remedy for the patient and, as long as results are positive, sticking with that remedy over time; 5) cautious and flexible potency selection and careful and long-term follow-up care .

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APRIL 6: THE WUNDER HEALTH FUNCTIONAL MEDICINE SUMMIT & EXPO – Gut Check in Fort Collins, Colorado. CONTACT: https://wunderhealth.com/

APRIL 6: MATRIX REFLEX TESTING BASIC COURSE, MODULE 1 with Louisa Williams, ND, in Austin, Texas. CONTACT: http://www.cecruncher.com/search_res.cfm

APRIL 12-14: ENVIRONMENTAL HEALTH SYMPOSIUM (EHS) – Endocrine Disruption: The Solution in Scottsdale, Arizona. Endocrine disruption correlation to chronic disease and solutions. CMEs available. CONTACT: 855-347-477; http://environmentalhealthsymposium.com

APRIL 13-14: INTEGRATIVE SIBO CONFERENCE – The Microbiome in Seattle, Washington. CEUs/CMEs available. CONTACT: https://www.synergycmegroup.com/?tap_a=38767-f8ebd9&tap_s=211965-be9aff

APRIL 22-23: TRADITIONAL MEDICINE 2019 – Exploring New Horizons in Traditional & Alternative Medicine in Rome, Italy. CONTACT: https://www.meetingsint.com/conferences/traditional-medicine

APRIL 25-28: ACUPUNCTURE MERIDIAN ASSESSMENT (AMA) TRAINING For Doctors, Dentists & Health Professionals: Detecting Parasites, Dental & Fungal with Simon, Yu, MD, in St. Louis, Missouri. **CONTACT:** 314-432-7802; http://www.preventionandhealing.com/pah-training.php

APRIL 26-27: THE GREAT PLAINS LABORATORY, INC. presents GPL ACADEMY PRACTITIONER WORKSHOPS in San Francisco, California. Organic acids testing, toxic chemical testing, and mycotoxin testing, among others. CONTACT: http://www.GPLWorkshops.com

APRIL 26-28: MENOPAUSE MANAGEMENT: ADVANCING YOUR EXPERTISE – Hormone Boot Camp Research Update in Portland, Oregon. CEUs available. CONTACT: http://instituteofwomenshealth.com/

APRIL 27-28: PEDIATRIC UPDATE FOR NATUROPATHIC DOCTORS in Toronto, Ontario, Canada. On-line & in person registration. Earn up to 12 CE Credits. CONTACT: info@collaborativeeducation.ca; http://www.collaborativeeducation.ca/toronto-naturopathic-conference/

APRIL 27-30: WALSH RESEARCH INSTITUTE presents MASTERING BRAIN CHEMISTRY PHYSICIAN EDUCATION WORKSHOP in Evanston, Illinois. CONTACT: https://www.walshinstitute.org/

MAY 2-4: AMERICAN ACADEMY OF OZONOTHERAPY 8th ANNUAL MEETING in Denver, Colorado. Pre-conference on May 1. CONTACT: https://aaot.us/page/2019MeetingSchedule

MAY 3-4: 1st ANNUAL EPIC FUNCTIONAL MEDICINE CONFERENCE in Houston, Texas. Precision and personalized cardiovascular medicine with Mark Houston, MD. CONTACT: https://epicfmconference.com/

MAY 3-5: INTERNATIONAL SOCIETY FOR ENVIRONMENTALLY ACQUIRED ILLNESS CONFERENCE – Healing Complex Patients in a Toxic World near Phoenix, Arizona. CONTACT: https://iseai.org/2019-conference/

MAY 3-5: KLINGHARDT BRAIN MASTERS – Science and Solutions in Morristown, New Jersey. Neuro Lyme, Autism, MS, ALS, Parkinson's, Retrovirus with Dr. Judy Mikovits, Boyd Haley PhD, Dietrich Klinghardt, MD, PhD. CONTACT: 908-414-0769; info@klinghardtacademy.com; www.klinghardtacademy.com

MAY 11: MATRIX REFLEX TESTING BASIC COURSE, MODULE 2 with Louisa Williams, ND, in Austin, Texas. CONTACT: http://www.cecruncher.com/search_res.cfm

MAY 16-19: NATIONAL ASSOCIATION OF NUTRITION PROFESSIONALS (NANP) 13th ANNUAL CONFERENCE AND EXPO – Ancestral Path to Modern Healing in Tucson, Arizona. CONTACT: https://www.nanpconference.com/

MAY 17-19: A4M ANNUAL SPRING CONGRESS in Orlando, Florida. CONTACT: https://www.a4m.com/

MAY 17-19: ADVANCED APPLICATIONS IN MEDICAL PRACTICE (AAMP) SPRING EVENT in Scottsdale, Arizona. CONTACT: 954 540 1896; https://aampconferences.com/

MAY 31-JUNE 2: 48th ANNUAL INTERNATIONAL ORTHOMOLECULAR MEDICINE TODAY CONFERENCE in Vancouver, Canada. Sessions on orthomolecular oncology, immunology, and general medicine. CONTACT: https://isom.ca/event/omt2019/

MAY 31 – JUNE 3: MEDICINES FROM THE EARTH HERB SYMPOSIUM in Black Mountain, North Carolina. CEs available. CONTACT: 541-482-3016 or www.botanicalmedicine.org.

JUNE 7-9: LDN 2019 CONFERENCE in Portland, Oregon. CONTACT: https://www.ldnresearchtrust.org/conference-2019

JUNE 7-9: COLLEGE OF NATUROPATHIC DOCTORS OF SASKATCHEWAN HEALING SKIES CONFERENCE in Saskatoon, Saskatchewan, Canada. CONTACT: http://sanp.ca/healing-skies-conference.html

JUNE 14-16: 4th HRI INTERNATIONAL HOMEOPATHY RESEARCH CONFERENCE in London, United Kingdom. CONTACT: https://www.hrilondon2019.org/

JUNE 21-22: THE GREAT PLAINS LABORATORY, INC. presents GPL ACADEMY PRACTITIONER WORKSHOPS in Minneapolis, Minnesota. Organic acids testing, toxic chemical testing, and mycotoxin testing, among others. CONTACT: http://www.GPLWorkshops.com

JUNE 22-29: ALLEN COLLEGE OF HOMOEOPATHY SUMMER SCHOOL in Chelmsford, Essex, United Kingdom and online. CONTACT: https://homoeopathy-course.com/images/pdf/reasons-to-join-summerschool.pdf

JUNE 28-30: THEORETICAL AND PRACTICAL COURSE IN NEURAL THERAPY in New York, New York with David Vinves Catalonia, MD (Spain). Organized by Dr. Gurevich. CONTACT: www.HolisticMD.org; 516-674-9489.

JUNE 28-30: 14th ANNUAL JOINT HOMEOPATHIC CONFERENCE – Homeopathy and Brain Health in Baltimore, Maryland. CONTACT: https://www.homeopathycenter.org/2019-joint-american-homeopathic-conference

AUGUST 15-17: AMERICAN ASSOCIATION OF NATUROPATHIC PHYSICIANS 2019 ANNUAL CONVENTION in Portland, Oregon. CONTACT: https://www.naturopathic.org/

AUGUST 22-25: ACUPUNCTURE MERIDIAN ASSESSMENT (AMA) TRAINING For Doctors, Dentists & Health Professionals: Detecting Parasites, Dental & Fungal with Simon, Yu, MD, in St. Louis, Missouri. **CONTACT:** 314-432-7802; http://www.preventionandhealing.com/pah-training.php

SEPTEMBER 20-22: NEURAL THERAPY HANDS ON in New York, New York with David Vinves Catalonia, MD (Spain). Fascia, ANS, palpation, autonomic ganglia. Organizer Dr. Gurevich. CONTACT: www.HolisticMD.org; 516-674-9489.

SEPTEMBER 20-29: KLINGHARDT IMMERSION WEEK – Injection Techniques, Neural Therapy, and Autonomic Response Testing Workshops in Kenmore, Washington. CONTACT: 908-414-0769; info@klinghardtacademy.com; www.klinghardtacademy.com

OCTOBER 23-27: INTERNATIONAL COLLEGE OF INTEGRATIVE MEDICINE (ICIM) – Healthy Parents, Healthy Children in Toronto, Ontario. CONTACT: https://icimed.com/

OCTOBER 25-26: ANNUAL MICROCURRENT CONFERENCE in Scottsdale, Arizona. CONTACT: http://microcurrentconference.org/ ◆

Classified Ads

Curmudgeon's Corner

by Jacob Schor, ND, FABNO
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Probiotics: Why Do They Work So Well?

A study published last year has been nagging at the back of my mind. In it, Faith Dickerson and colleagues report that probiotics appear useful to control mania. They had enrolled a group of 66 patients who were hospitalized for acute mania and gave half of them probiotic supplements and the others placebos to take at home after they were discharged for the following 24 weeks. The researchers tracked which of these patients ended up being readmitted. Of the 33 patients who took the placebo, 24 came back to the hospital. Of those receiving the real thing (a combination of *Lactobacillus rhamnosus* strain GG and *Bifidobacterium animalis* subsp. lactis strain Bb12) only eight returned. These numbers made the relative hazard ratio for rehospitalization in the experimental group a mere 0.26, [95% confidence interval [CI] 0.10, .69; P=0.007] a 74% decline in risk of rehospitalization. Additionally, those patients who received probiotics and were admitted back in the hospital, stayed there for fewer days than those who received placebo, 2.8 vs. 8.3 days. In other words, taking probiotics appears to have provided a solid benefit to these patients.[1]

I am glad that these patients found such benefit. We should all make a point of remembering this study next time we have a bipolar patient.

What's nagging me is that I have no idea why these worked so well, or for that matter why probiotics work in any clinical trial. Given the gazillions of bacteria in the human gut, why do a handful of capsules make such a big difference or for that matter any difference?

We should not doubt that probiotics are helpful. A recent PubMed search for probiotics or lactobacillus yields citations for over 2,100 published clinical trials. Probiotics have been tested in clinical trials for all sorts of health problems including gastroenteritis, vaginitis, urethritis, arthritis, radiation side effects, cancer of all sorts, fatty liver disease, heart disease, and so on. More recently studies have begun to identify specific species of bacteria that are helpful for specific situations and conditions. Somewhere or other I've got a list of what species are associated with greater benefit from the immunotherapy drug pembrolizumab. We know which bacteria increase GABA in the brain and reduce seizures; which bacteria increase insulin sensitivity and control DM-2, and so on. The list gets longer with every webinar. What is not clear to me is why plain old *Lactobacillus acidophilus* does anything useful.

Three decades ago at National College of Naturopathic Medicine all this seemed to make sense. Biology was simpler then. We had yet to hear of dark biology. The gut was inhabited by *E coli,* lactobacilli*,* bifidobacteria, and maybe a few yeast. Any other living thing found on a stool test was probably a pathogen that ought to be eliminated.

Our notion that lactobacilli are important to human health goes back more than a century to Élie Metchnikoff and his 1907 book, *The Prolongation of Life*. He theorized that the gut microbiota produce toxic substances that damage the nervous and vascular systems, leading to aging.[2] Metchnikoff suggested that eating fermented milk products would "implant" beneficial, lactic acid-producing bacteria in the intestinal tract and would "arrest intestinal putrefaction and must at the same time postpone and ameliorate old age." Metchnikoff based his thinking on two observations. First, that Bulgarian peasants, who were believed to live to very old age, ate large amounts of fermented milk products. Second, the natural fermentation of food by lactic acid-producing microbes inhibited the growth of putrefactive organisms. Metchnikoff concluded, "… as lactic fermentation serves so well to arrest putrefaction in general, why should it not be used for the same purpose within the digestive tube?"

Metchnikoff's "Bulgarian bacillus" theory became popular and still remains widely believed to be fact.

This notion that the long life spans in isolated populations could be attributed to specific foods took quite a beating a decade back with the publication of the Akea study. This study investigated longevity on Sardinia, an area then referred to as a "blue zone." The term 'blue zone' had been popularized by Dan Buettner in *National Geographic* in 2005 and was applied to parts of the world where people lived the longest.[3-5] Buettner identified Okinawa, Sardinia (Italy), Loma Linda (California), Nicoya (Costa Rica), and Ikaria (Greece) as blue zones. He created a list of common lifestyle and diet traits these people shared in common and popularized them as ways to live longer.[6]

In the Akea Study, Michel Poulaina and colleagues looked carefully at the people who lived in an area of Sardinia that had an unusually high number of centenarians. These researchers conducted a more methodical and exhaustive examination than Buettner had but were not able to identify any specific mechanism or dietary traits to explain why people living in their study area lived so long.

Instead, Poulaina et al suggested an "… interesting hypothesis … that the high rate of inbreeding determined by frequent marriages between consanguineous individuals and low immigration rates have progressively decreased the variability of the genetic pool and facilitated the emergence of genetic characteristics that protect individuals from diseases that are major causes of mortality particularly in older individuals."[7]

In other words, the secret to long life in these 'blue zones' may not be yogurt, dried apricots or any other specific foods, nor good living or any of the traits Buettner would have us aspire to but instead, inbreeding. The lifestyle trait that sets the people in these areas apart is a cultural acceptance of older men taking younger second and third wives. Thus, genes for longevity and protection from disease were amplified in the population.

In fact, the term 'blue zone' might be appropriate to describe areas of high consanguinity, which means frequent inbreeding, rather than lifestyle traits that we would wish to emulate. Metchnikoff's assumption that fermented milk would increase lifespan may have been like these blue zone areas, a misinterpretation of the facts.

Lactobacilli bacteria are the most common bacteria found in fermented foods. They are among the easiest of any bacteria to grow. As I write this article, I have a loaf of sourdough bread rising in my kitchen. Despite my repeated neglect, the lactobacilli and yeast in the 'starter' continues to produce delicious bread. In the old days, when we isolated gut bacteria on agar plates, it also looked as if lactobacilli bacteria dominated the gut. If there weren't 'enough lactobacilli in there', it made sense for patients to supplement with lactobacilli.

There are certainly a lot of microorganisms living in the gut; early estimates suggest the population exceeds 10^{14}. It has often been repeated that there are about 10 times more bacteria than human cells in the body. However, this estimate has been revised downward and currently the ratio of human-to-bacteria cells is believed to be closer to 1:1. It turns out that these "… ubiquitous statements regarding … bacteria residing in our body trace back to an old back-of-the-envelope calculation" from 1972.[8,9]

The idea that most of these bacteria were either *E. coli* or *Lactobacilli* species has also proven to be incorrect: "… there has been a general and persistent assumption that a large number of *Lactobacillus* form stable and numerically significant populations in the human intestinal tract, especially in the small intestine, where they are presumed to form epithelial associations. Considering how widespread and accepted this perception is, there is surprisingly little experimental evidence that supports it."[10,11]

In fact, lactobacilli make up only a teeny-tiny portion of the total bacterial population in the human gut. When we first learned about intestinal bacteria, the only way to identify them was to culture colonies on differing growth media, a method that has proven to be inaccurate in comparison to the newer techniques that:

> … have revealed that the diversity of the gut microbiota has been greatly underestimated. Although a complete catalogue of the members of the collective human gut microbiome is not yet available, more then 10,000 different species are estimated to be present, among which a large majority of these microbes are resilient to cultivation by currently available methodologies.[12]

These newer technologies suggest lactobacilli are in the distinct minority, far outnumbered by a multitude of other bacteria species. The old school techniques have given way to "culture-independent molecular measuring" techniques, the most objective being direct sequencing of the 16SrRNA genes.[13] Such technology has also revealed a greater diversity in the gut biome than we ever dreamed possible. ➤

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This shouldn't surprise us that much as, "… the vast majority of experimental studies conducted after 1960 clearly showed that they [lactobacilli] form marginal populations in the human gut. When total anaerobic culturing techniques are used, lactobacilli form a very small proportion of the cultivable human fecal microbiota and can rarely be cultured at population levels exceeding 108 CFU per gram…."[14]

This should remind us how far off popular belief may be from actual fact.

Let's do the math. If gut lactobacilli account for only about 0.01% of the bacteria that can be grown, then only one in every 10,000 bacteria is lactobacilli. This doesn't include the bacteria that scientists still haven't figured out how to grow.[15] While there may be 10,000 different possible species of bacteria in the gut, it is generally accepted that any one individual will have about 160 distinct species.[16] It is difficult to imagine how so few lactobacilli will make any difference in a person's health. It is not just this mania study that begs explanation. We could pose this same question after any positive probiotics study; how can so few bacteria make such a significant difference?

Not having a decent answer for this question led me to reach out to Mark Davis, ND, to see if he could offer an explanation. Dr. Davis practices in Maryland these days at the IBD Specialty Center (http://ibdspecialty.com/) in Bethesda, Maryland. He pointed out that there are a growing number of published clinical trials that report positive effects from taking dead probiotics, that is studies that used heat processed lactobacilli that could not grow in the gut.[17-22] In most, though not all studies, these dead bacteria retained their therapeutic effects. Lactobacilli do not need to grow, to have an effect. This is not how we have been describing how this works.

That bears repeating: Lactobacilli need not be alive to work. They need not colonize the patient's gut. If they don't have to be alive to work, there must be some factor within their 'bodies' or within their fragments, some factor X that triggers a response. Think of all the effort you and your patients have put into keeping those products refrigerated over the years; it may not have mattered.

Dr. Davis provided me a useful analogy in an email:

> …so if its abundance is so tiny, how does *Lactobacillus* help? First of all, it doesn't seem implausible at all. Ultra-wealthy people are an inordinately small part of our population but they have a lot of influence on how society works. Politicians too, and doctors. There are all sorts of categories of humans that make up a tiny part of the population but influence the whole population for the better. So what's the mechanism of action?... I've thought that the way that other microbes in the gut and our own immune system are reacting to (probably proteins in) probiotic bacteria may be more important than the actual work the probiotic bacteria themselves are doing.

Maybe Dr. Davis is correct; maybe he's not. The thing is that we take it for granted that these probiotics help a wide range of conditions and yet if we stop and look carefully, we really do not understand how or why lactobacilli do what they do.

For many years I used a simple analogy with patients to explain why lactic acid-producing bacteria were so beneficial: it's like preserving vegetables by canning – the whole Mason jar, pressure cooker production:

> All foods can be divided into one of two categories when canning. They are either 'acid-safe' or 'non acid-safe'. Foods that are acidic, say tomato products, whole tomatoes, puree or sauce, have a low pH and are acid-safe. You cook them up, pour the stuff in clean jars and put a lid on it. Period, done. Dangerous bacteria cannot grow in an acid environment. Foods with a higher pH are not so safe. With non-acid foods you pack the food into sterile jars, then heat process it in a pressure cooker in the hope of sterilizing it and once done, throw the contents in the compost out of fear of botulism. The difference is pH. Pathogens don't survive long in acid. Same thing happens in your gut. Probiotics lower the gut pH and keep out unwanted bacteria.

It sounds good but is obviously not accurate. If dead bacteria still have effect, this whole image we have of the tiny amounts of lactobacilli that we take as probiotics supplements repopulating the gut with their offspring is not what happens. Instead some surviving constituent of these bacteria drastically shift populations of other bacteria as they pass through the gut. What is this 'factor'?

When Columbus reached the New World, he thought he had reached India. He was totally wrong of course. I suspect that our understanding of gut microbiology may be as accurate as any map Columbus might have drawn of the world. He was missing a few key facts, there was that whole North America business. Lactobacilli may be our equivalent of Columbus and the East Indies. We may be more certain of where we are than we should be….

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➤ *continued from page 88*

Oral magnesium supplementation has also been shown to reduce migraine recurrences, although not all studies have been positive.[5] Comparisons with the abovementioned trials are difficult, because the data were not reported as the proportion of patients who experienced at least a 50% reduction in headache frequency. In clinical practice, however, I have seen many migraine patients who reported positive experiences with magnesium supplementation. A year's supply of magnesium (at a daily dose of 400 mg) can cost as little as $30.

For migraine sufferers willing to take on the sometimes arduous task of identifying and avoiding hidden food allergens, the results can be even more pronounced than those achievable with any of the pharmaceutical or nutritional treatments discussed above. In one clinical trial, 60 patients with a long history of recurrent migraines underwent an elimination diet followed by individual food challenges. On average, patients discovered reactions to 10 different foods. When the symptom-evoking foods were removed from the diet, the mean number of migraines in the group as a whole fell by 98%, and 85% of the patients became headache-free.[6]

Modern Medicine's "Wrong Turn"

Thus, we have another example of how the pharmaceutical industry spends hundreds of millions of dollars to obtain monopolies on drugs that can then extract billions of additional dollars from a healthcare system on the brink of financial collapse. These overpriced drugs do not necessarily work better than low-cost alternatives that are already available. In the case of migraines, the new drugs appear to be less effective than some dietary interventions and nutritional supplements, and may also be no more effective than some of the older drugs used for migraine prophylaxis.

The ongoing political debate regarding healthcare in the United States centers primarily on how it should be paid for. Not enough attention is given to the reasons it is so expensive and how we might lower the cost. Two simple changes could make healthcare much more affordable. First, insurance companies should agree to pay for evidence-based low-cost natural remedies, even if they have not been officially "approved" by the FDA. Second, the FDA should stop prohibiting distributers of nutritional supplements and herbs from truthfully disseminating scientific evidence that supports the efficacy of their products. If people were armed with the facts, and if insurance companies were to cover various low-cost evidence-based natural remedies, I believe there would be a serious change in the market for overpriced, marginally beneficial, and potentially toxic medications.

Alan R. Gaby, MD

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Lynne Shinto, ND, Becomes Full Professor at OHSU

On July 1, 2018, Lynne Shinto, ND, MPH, was promoted to full professor in the departments of neurology and of OB/Gyn at Oregon Health & Science University's School of Medicine. This milestone in collaboration may be a first for a naturopathic doctor in a conventional medical institution in the US or Canada.

A graduate of Bastyr University's naturopathic program, she was the first naturopathic doctor credentialed to practice at OHSU in 2012. Her research focus at OHSU has been primarily on clinical trials in complementary and integrative medicine, and she has led studies in multiple sclerosis, Alzheimer's disease, and in mental health in adolescents funded by the NIH, National MS Society, and the OHSU Foundation. Her research experience began in her undergraduate years in the basic sciences at University of Massachusetts, Boston. Her degree in naturopathic medicine created an opportunity to help bridge the gap between conventional and naturopathic medicine by strengthening the evidence base for complementary practice.

Dr. Shinto has a particular interest in evaluating complex, multimodal interventions which are very common in integrative medicine practice yet are methodologically challenging in research. In addition to her research, clinical practice, teaching, and international speaking, Dr. Shinto has collaborated to manifest credentialing pathways for NDs at OHSU and mentors NDs, MDs, and PhDs at the beginning of their research and clinical careers in integrative medicine. She is currently on sabbatical, traveling around the world with her husband, Carlo Calabrese, ND, MPH, and their daughter, Poppy, while working on a book about Alzheimer's disease.

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The New Migraine Drugs: Expensive and Less Effective Than Nutritional Therapy

You may have noticed the recent ad blitz for Aimovig (erenumab), a new drug for migraine prevention that was approved by the US Food and Drug Administration (FDA) in May 2018. A new TV commercial depicts emotional scenes such as hugging a child, gazing in awe at the stars, and tearfully embracing one's significant-other, as the voice in the background declares, "The awe-inspiring. The heart-racing. The heartbreaking. That's what life is all about – showing up. Unless migraine steals your chance to say, 'I am here.'" In launching this new ad campaign, Amgen and Novartis (which jointly market Aimovig) are hoping to gain a competitive advantage over two similar drugs that achieved FDA approval four months later: Ajovy (fremanezumab-vfrm; Teva Pharmaceuticals) and Emgality (galcanezumab; Eli Lilly).

Each of these newly approved migraine drugs functions as a calcitonin gene-related peptide (CGRP) antagonist by binding to the peptide itself or to its receptor. CGRP is a 37-amino acid neuropeptide produced in the peripheral and central nervous system that has been shown to play a role in the pathogenesis of migraine. All three drugs are administered once a month by injection. And surprisingly (or perhaps not surprisingly), all three drugs carry the identical price tag of $575 per dose, or $6,900 per year. That price is well beyond the budget of the average person. Therefore, each of the drug companies is offering a program where patients with insurance can receive the drug for little or no out-of-pocket cost for up to 12 months, while the companies continue their negotiations with insurers over prices. Those tactics seem eerily reminiscent of a street dealer handing out free samples in order to get his clientele hooked on his drug.

So, what benefit could a migraine sufferer expect to obtain from taking one of these $6,900-per-year drugs? In several industry-sponsored randomized controlled trials, the improvements were modest or, at best, moderate. In a double-blind trial published in the *New England Journal of Medicine*, 43.3% of patients receiving erenumab, as compared with 26.6% of those receiving placebo, achieved at least a 50% reduction in the number of migraine days per month.[1] This absolute difference in response rate of 16.6% means that for every six patients treated with the drug, only one would achieve at least a 50% decrease in migraine days (i.e., the number-needed-to-treat is 6). In a similar trial, 39.7% of patients receiving erenumab, as compared with 29.5% of those receiving placebo, achieved at least a 50% reduction in the number of migraine days per month.[2] This absolute difference of 10.2% corresponds to a number-needed-to-treat of 10. Similar results were seen in clinical trials of fremanezumab-vfrm and galcanezumab.

Comparison with Low-Cost Nutritional Therapies

How do those results compare with the results of evidenced-based, but underutilized natural approaches to migraine prophylaxis? In a double-blind trial, 59% of patients receiving 400 mg per day of riboflavin, as compared with 15% of those given placebo, had at least a 50% decrease in the number of migraine days ($p = 0.002$).[3] This absolute difference of 44% corresponds to a number-needed-to-treat of only 2.3. The retail cost of a year's supply of riboflavin is approximately $40.

In another double-blind trial, migraine patients received 100 mg of coenzyme Q10 (CoQ10) three times per day or placebo for four months. The proportion of patients who had a 50%-or-greater reduction in attack frequency in month four compared with baseline was 47.6% with CoQ10 and 14.3% with placebo ($p = 0.02$), corresponding to a number-needed-to-treat of 3.0.[4] The price (and apparently the quality) of CoQ10 varies among different commercial products, but a year's supply of high-quality CoQ10 at the dosage used in this study can be obtained for less than $500 per year.

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DNA CONNEXIONS

DNA Connexions is a sophisticated laboratory specializing in the detection of microbial DNA. Polymerase chain reaction technology (PCR), with its high specificity and sensitivity, is the cornerstone of our testing methodology.

The Lyme Panel tests for four unique gene sequences found in *Borrelia burgdorferi*, in addition to 10 common tickborne co-infectors.

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