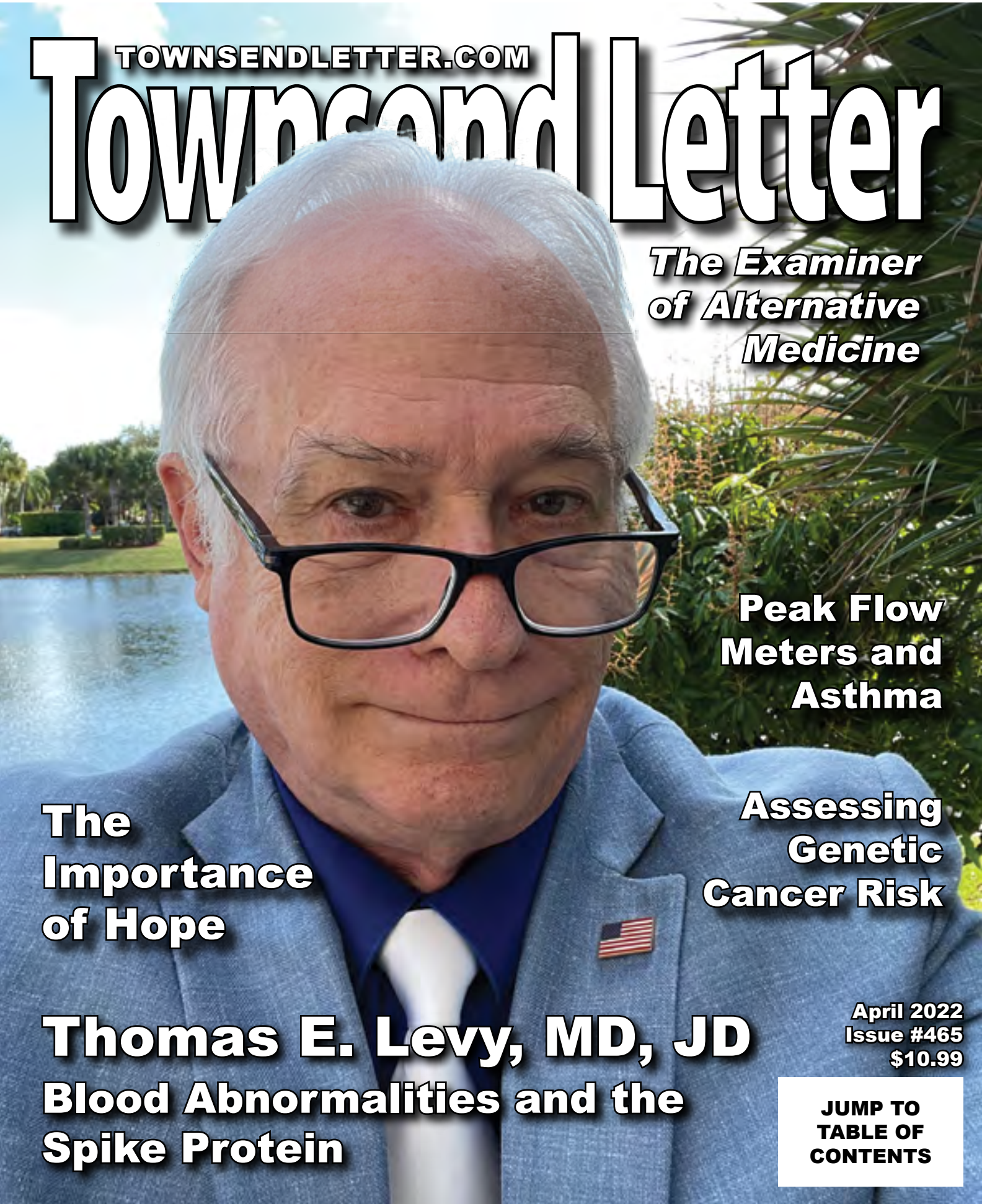
ALLERGY | SKIN DISORDERS | LUNG DISEASE | EYE DISORDERS



TOWNSENDLETTER.COM

Townsend Letter

The Examiner of Alternative Medicine

Peak Flow Meters and Asthma

Assessing Genetic Cancer Risk

The Importance of Hope

Thomas E. Levy, MD, JD
Blood Abnormalities and the Spike Protein

April 2022
Issue #465
$10.99

JUMP TO TABLE OF CONTENTS

Thank you for purchasing this issue of *TOWNSEND LETTER*

On the cover (previous page) you will find a button that will take you directly to the table of contents. Once there, you can click page numbers that take you directly to articles. Click on "return to table of contents" at the bottom of each page to take you back to the TOC.

Most web and email addresses are clickable within the articles and in the calendar. We do not guarantee the accuracy of each address/URL, or that it is clickable.

Please don't overlook our advertisers, without their support *Townsend Letter* would not exist. Take the time to discover companies you might not be familiar with, many of whom offer special pricing for *Townsend Letter* subscribers. An advertiser list is printed on page 77 with clickable page numbers that will take you directly to their ad(s).

Subscription Rates and Options

Prices valid through 7/1/2022

Name _____ Email/Phone _____

Address _____

City/State/Zip _____

Payment accepted in US funds, payable by check / money order / credit card / or billed via PayPal

Payment by: Visa/MC/AMEX/Discover # _____ Expiration date: _____

Signature _____

Click here to subscribe online

	Description	Print Version	E-Edition	Combined
US Addresses (except WA state)	1-year Domestic US	$76.99	$66.99	$91.99
	2-year Domestic US	136.99	116.99	166.99
	6-month Domestic US	45.99	41.99	–
	1-year Student Domestic US	56.99	41.99	66.99
Washington State Residents	1-year Washington state (w/tax)	86.99	74.99	99.99
	2-year Washington state (w/tax)	146.99	127.99	183.99
	6-month Washington state (w/tax)	33.99	46.99	–
	1-year Washington Student (w/tax)	56.99	46.99	66.99
1st Class	1-year First Class Domestic US	96.99	66.99	111.99
	2-year First Class Domestic US	176.99	116.99	206.99
International Rates	1-year International (US$)	105.99	66.99	120.99
	2-year International (US$)	202.99	116.99	232.99
	6-month International (US$)	63.99	41.99	–
	1-year International student (US$)	76.99	41.99	93.99

SPECIAL RECEPTION ROOM OFFER:
Purchase a 2nd subscription for your waiting room

$57.99 US addresses – $87.99 International
Offer valid with current existing subscription

E-Edition Single Issue: $15.00

E-Edition Single Issue WA State (includes tax): $16.00

Single Print Issues: cover cost (for each issue), plus shipping charges, applicable taxes, and $3 per-order handling fee.

Townsend Letter
911 Tyler Street | Port Townsend WA 98368
info@townsendletter.com
360.385.6021 | 360.385.0699 (fax)
www.townsendletter.com

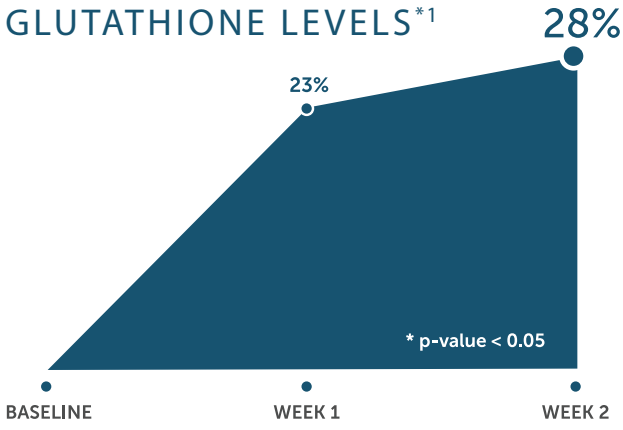
Tri-Fortify®

Liposomal Glutathione

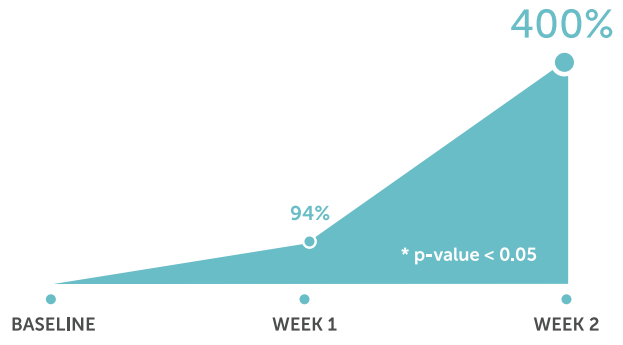
Researched Nutritionals®
solutions for life

Backed by *peer-reviewed, published* clinical research.[1]

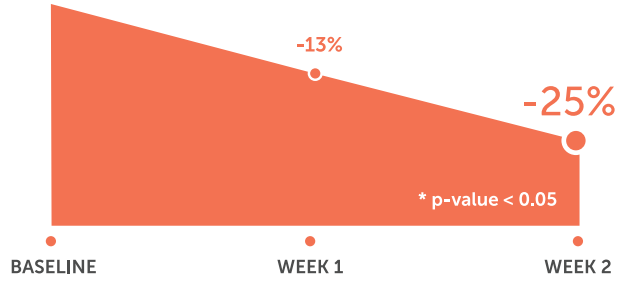
GLUTATHIONE LEVELS*[1]



NATURAL KILLER CELL FUNCTION*[1]



OXIDATIVE STRESS MARKERS*[1]



Learn more.

Tri-Fortify

[1]Sinha R, Sinha I, Calcagnotto A, et al. Oral supplementation with liposomal glutathione elevates body stores of glutathione and markers of immune function. Eur J Clin Nutr. 2018;72(1):105-111. doi:10.1038/ejcn.2017.132

800.755.3402 • Info@ResearchedNutritionals.com • ResearchedNutritionals.com | Available only through healthcare professionals.

Brush. Floss. OraMax™

A *vibrant oral microbiome* promotes healthy cardiovascular and systemic immune function.*

Dissolve in mouth

Supplement Facts

Serving Size: 1 Tablet
Servings Per Container: 60

Amount Per Serving	% Daily Value
OralBiome OM™ 43 mg | 1 Billion CFU	†
Lactobacillus reuteri (LRE-15), *Lactobacillus salivarius* (LS-33), *Bifidobacterium lactis* (HN019)	
Oral CarePlex™ 186 mg	†
Xylitol, Green tea leaf extract, Cinnamon bark powder, cinnamon bark 20:1 extract, Lysozyme	

† Daily Value not established.

Support your patients' oral health - learn more and order product: researchednutritionals.com/oramax

Researched Nutritionals® solutions for life

800.755.3402 • Info@ResearchedNutritionals.com • ResearchedNutritionals.com | Available only through healthcare professionals.

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

From the Publisher

U.S.P. Best Use Date Regulations Will Thwart Compounded Prescriptions

For years the pharmaceutical industry has complained about compounding pharmacies, questioning the safety and effectiveness of compounded medications. The Food and Drug Administration ratcheted up the requirements compounding pharmacies were obligated to follow, including special sterile manufacturing facilities and drug testing procedures. The standard for manufacturing a sterile injectable drug was so onerous that a majority of compounding pharmacies opted to no longer produce injections. Requirements for non-sterile drugs, oral medications as well as creams and gels, were not nearly as cumbersome. Compounding pharmacies agreed to abide by FDA regulations and remained productive in compounding bio-identical hormone creams as well as other drugs. Very few compounding pharmacies continue to manufacture sterile injectable drugs – however, since pharmaceutical manufacturers have declined to produce

continued on page 4 ➤

THE AUTOIMMUNE VIRAL TRIO

MAJOR CONTRIBUTORS TO AUTOIMMUNITY

Testing that shows a significant elevation in IgM or IgG antibodies against any of these viruses should be followed by our Autoimmune Panel, which comprises ANA, ENA, Mitochondrial Antibodies, Rheumatoid Factor, and C1Q Immune Complexes. IgG and IgM antibodies against this trio may help identify the major triggers of autoimmunity.

IMMUNOSEROLOGY OF LYME DISEASE

by Multi-Peptide ELISA is the most comprehensive method for the detection of Lyme disease and other tick-borne diseases (US Patent 7,390,626 B2).

THIS PANEL MEASURES

Lyme-Specific Antibodies (IgG, IgM)

- *B. burgdorferi* Antigens
- Outer Surface Protein A+C Peptides
- Outer Surface Protein E Peptide
- Leukocyte Function Associated Antigen + Cytokeratin 10
- Immunodominant Protein C6 Peptide
- Variable Major Protein E

Borrelia Subspecies Antibodies (IgG, IgM)

- *Borrelia burgdorferi sensu stricto*
- *Borrelia garinii*
- *Borrelia afzelii*
- *Borrelia miyamotoi*

Lyme Co-Infection (IgG, IgM)

- *Babesia*
- *Ehrlichia*
- *Bartonella*

Western Blot Assay (IgG, IgM)

IMMUNOSCIENCES LAB, INC.

Website: immunoscienceslab.com • E-mail: immunsci@gmail.com • Call us at (310) 657-1077

Immunoscience Lab., Inc. is CLIA-certified, CAP-accredited, and California-licensed.

CMS cap ACCREDITED CDPH

Letter from the Publisher

➤ *continued from page 2*

injectable chelation, B vitamins, certain minerals, and other drugs, compounding pharmacies have effectively become the only manufacturers of such injectables.

Over the course of the past few years the U.S. Pharmacopeia (U.S.P.) has decided to reset the standards for compounded drugs, both sterile and non-sterile. The U.S.P. believes that compounded medications have a limited shelf life and pose a safety risk. Because compounded prescriptions are not produced in the same manner as pharmaceuticals, it is believed that the compounded drug has a high likelihood of adulteration, bacterial/fungal contamination, and improper dosing. To ensure that the product has the least likelihood of microbial growth, the U.S.P. wants to limit product "best use date" (B.U.D.) to as little as 30 days and as long as 180 days. For much compounded prescriptions that will be produced with the least rigorous requirements, the 30-day B.U.D. would apply. Longer B.U.D. for compounded prescriptions will require unusual preserving techniques, including not just refrigeration, but freezing. The longest B.U.D. would be reserved for products that are "autoclaved" like surgical instruments. Such a process would disrupt the drug's chemical and physical properties as well as adulterate the drug via decomposition of the plastic vial. The U.S.P. does permit the compounding pharmacy to escape these sterility procedures if the compound were to undergo very specialized testing, a process that would be unrealistically expensive if required for every compounded prescription. It is ridiculous to think that a compounded prescription of limited production would need $30,000 of testing done to secure a longer B.U.D.

The U.S.P. is accepting comments regarding their new regulations. It behooves all practitioners who prescribe compounded prescriptions to submit their comments to the U.S.P. To learn more about the regulations go to compounding.com, the website of the Alliance for Pharmacy Compounding. If the U.S.P. regulations go into effect, there will be an immediate effect on your practice. Patients will face the need to get a new prescription monthly for their compounded prescription and the price for the prescription will increase dramatically. Doctors who provide injectables to patients or administer intravenous infusions will find their injectable supply will be much more limited and the pricing for injectables will skyrocket. With the compounding requirements being so onerous certain compounded prescriptions will become unavailable. Some pharmacies will not want to deal with the new regulations and may close shop. For compounding pharmacies to meet all the regulatory requirements, delivery of prescriptions will take longer or go unfulfilled.

Remember that the Food and Drug Administration is still unhappy with the prescribing of bio-identical hormones. The new regulatory apparatus that will be established by the U.S.P. will become additional fodder for the FDA to harass pharmacies, doctors, and patients. Nothing is more annoying than the FDA recalling a prescribed compounded prescription.

continued on page 6 ➤

YEAR-ROUND IMMUNE SUPPORT*

COMING SOON!

Buffered Cassava Vitamin C

with Calcium and Magnesium

High-purity non-GMO ascorbic acid from cassava root, buffered with carbonates of calcium and magnesium.

Mucolyxir®

Nanotech Nutrients®

Provides a small amount of DNA from salmon, which may help balance mucus.* Based on pre-clinical investigations and clinical trials, Mucolyxir® appears to support liquification and elimination of mucoid substances.*

Aller-Aid™ L-92®

with *L. acidophilus* L-92®

Contains *Lactobacillus acidophilus* L-92®, a sterilized immunobiotic dry cell powder which helps balance Th1/Th2 and other immune cytokines.* Enhanced with vitamin C, Boswellia, and Luteolin.*

L-92® is a trademark of Asahi Calpis Wellness Co., Ltd., Tokyo, Japan

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

INNOVATIVE, LEADING-EDGE SUPPLEMENTS **SOURCED FROM THE PUREST RAW MATERIALS SINCE 1979**

AllergyResearchGroup® Innovative Nutrition

NSF GMP Registered

Fullscript

Call or order online today.
800.545.9960
allergyresearchgroup.com

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Letter from the Publisher

➤ *continued from page 4*

Please act now. Ask your patients to write a story about how their injectable B12 or Bi-Est cream is being threatened, jeopardizing their health.

Make Comments to:

1. **"795" (Non-Sterile Compounded Prescriptions) https://usp.az1.qualtrics.com/jfe/form/SV_3OBK7VUbvver6zs**
2. **"797" (Sterile Compounded Prescriptions) https://usp.az1.qualtrics.com/jfe/form/SV_81VZpnzjwcQJlZA**

Cover Article: Thomas Levy, MD, JD, on Canceling the Spike Protein

Readers of the *Townsend Letter* are familiar with Dr. Thomas Levy's writings, which have focused on the powerful effect of ascorbic acid on controlling infectious disease. The author of 13 books, Levy is board certified in cardiology and is admitted to the bar in Colorado and Washington, DC. His most recent book, *Rapid Virus Recovery*, is an e-book available in English and in Spanish, at www.rvr.medfoxpub.com. Levy was honored by induction in the Orthomolecular Medicine Hall of Fame in 2016. Dr. Levy's work focuses on the role that focal scurvy plays in all disease states, causing intracellular oxidative stress, most of which is reversed by administration of ascorbic acid and other anti-oxidants. In particular, Levy's work has established a cause-and-effect relationship between infections in the mouth and the development of heart attacks.

In this month's cover article Levy demonstrates with dark field microscopy that individuals vaccinated with the mRNA COVID-19 vaccines and non-mRNA vaccines develop severe rouleaux formation present for days and weeks after vaccination. The dark field microscopy also demonstrates that the rouleaux formation of red blood cells reverses entirely after intravenous administration of ascorbic acid as well as autohemotherapy with ozone. Equally remarkable is the persistent presence of D-dimer in individuals post-vaccination. Remarkably D-dimer is often present when other inflammatory and coagulation markers, such as C-reactive protein as well as fibrinogen, are absent. Levy makes the case that the spike protein is probably responsible for the D-dimer persistence as well as the rouleaux formation. He argues that much of the damage that is possible by COVID-19 vaccination can be offset by administration of high doses of intravenous or oral ascorbic acid as well as the use of other antioxidants. In addition, Levy posits that long-haul COVID-19 is likely the result of ongoing spike protein activity, which can be assessed easily by measuring D-dimer and studying the dark field microscopy for rouleaux. He would argue that the same treatment to counter and prevent post-vaccination adverse effects would be effective for managing long-haul COVID-19.

Sarah Lobisco, ND, on How the Power of Belief and Hope Can Heal

When we examine a double-blind randomized trial we recognize the power associated with a treatment demonstrating a dramatic improvement compared to a control. The control, a placebo, is assumed to have no benefit composed of an inert substance if given by mouth, saline by injection. Yet, it is impressive, at least from my perspective, that placebos frequently yield therapeutic benefit in the study. When the placebo benefit matches the tested therapy, the treatment is considered to be inefficacious, and the conclusion is that the drug failed to prove itself. Still why should an innocuous bit of sugar or saline cause a therapeutic effect at all?

The answer lies in the belief that the treatment is effective. It is nearly impossible to be involved in a clinical trial and to remain emotionally and mentally impartial. One is expending time and energy, obligated to undergo testing and imaging, and hoping that there will be a symptomatic change. The expectation is that one will show improvement. That hope engendered while unknowingly using a placebo creates major cognitive and physiologic changes; the more one is invested in the belief that the tested treatment will bear fruit, the more likely the placebo is to cause symptomatic change. The opposite effect, a belief that a treatment will not work, the so-called nocebo effect, is also remarkable especially if the study is conducted to disprove the benefit of a treatment. In such studies there is the belief by the investigator that the treatment is ineffective, and that belief system is conveyed to the experimental cohort.

What does this have to do with our management of COVID-19? Lobisco who focuses much of her patient treatment using essential oils is concerned about the pervasive fear we are dealing with in the pandemic. She thinks that fear is so overwhelming that patients lack the hope that can heal. The fear is not only making it difficult for our immune system to fend off the virus, but it is causing undue anxiety, depression, and insomnia. Only by changing our patient's mindset can we prevent more illness and restore health.

Just for Fun: *My Brilliant Friend* by Elena Ferrante

Alright, this is not integrative or functional medicine, but I just wanted to give a shout-out to a particularly well written and delightful to read novel or rather four-part Neapolitan novel. Too many novels do not satisfy; this is not the case with Ferrante's story of Lila and Lenu, two youngsters in post-World War II Naples who not only grow up together but remain close friends through adulthood and then into old age. For those who think of Florence, Rome, and Venice when they talk about Italy, Naples remains the poorer, more dangerous part of the country, one that many opt not to visit. The community that Lila and Lenu inhabit is full of life that tourists rarely set eyes upon. Life is tough, work is difficult and pays poorly, but people still live a rich life eating as best they can, enduring the challenges scraping by even when the camorra takes what little one makes.

The story is a gem because it looks at life from Lenu's viewpoint. She's the daughter of a porter, quite smart, but timid, needing to follow in Lila's footsteps who is bold, cocky, willing to break the rules, and is even smarter. Lila says what she feels and is uninhibited with one and all. Their lives take different paths when they become old enough for middle school. Lila is needed to work with her father's shoe repair shop; Lenu stays in school despite her mom's resistance. The story is rich and keeps you glued in every chapter. For your next vacation, for your partner, this is well worth your while for taking your mind off of medicine. If you don't want to invest the time in novel reading, *My Brilliant Friend* is a 2-season TV series available now; a third season is in the works. Both the book and the TV show are translated from Italian and the translation is excellent.

Jonathan Collin, MD

MUSHROOM WISDOM®

1991 THIRTY YEARS LEADING THE WAY 2021

Bringing You Nature's Gifts for Over 30 Years

With more than three decades of expertise, the Mushroom Wisdom brand offers you well-researched and time-tested mushroom and mushroom extract products.

800-747-7418 • www.mushroomwisdom.com

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.

Shorts

briefed by Jule Klotter
jule@townsendletter.com

Macular Degeneration and Taurine

While anecdotal reports cannot have the weight of controlled research, those reports often provide clues for new avenues of treatment that are later confirmed in large studies. In Volume 2 of Dr. Zamm's Medical Mysteries Series, Alfred V. Zamm, MD, shares his own experience after being diagnosed with age-related macular degeneration (AMD). (Volume 1, *GERD: A Manganese Nutritional Deficiency,* was reviewed in *Townsend Letter,* November 2021.) Degeneration of the macula, the area on the retina where sharp vision occurs, leads to vision loss. It has no known cure, Zamm's ophthalmologist told him, although a combination of vitamins A, C, E, and a few other nutrients might help (See Grossman article, p. 41, for more on this).

Since he had already been taking vitamins for years, Dr. Zamm decided he was going to have to solve this mystery himself if he wanted to save his vision. He arbitrarily decided to take L-methionine (500 mg/twice a day), a sulfur-containing amino acid that he had researched and used before, and kept track of his vision using the Amsler grid. L-Methionine is the precursor to L-cystine, which is precursor to the amino acid taurine. With methionine, the AMD symptoms largely resolved for about a year. Then, whether it was because he had reduced his consumption of beef and pork (important sources of taurine) or because he was a year older, the symptoms began to return. Increasing the dosage of methionine did not help.

While searching for alternatives, Dr. Zamm came upon veterinary research about cats (whose bodies cannot make taurine) that developed retinal degeneration and, eventually, went blind when placed on a taurine-free diet. If they were given taurine before retinal cells died, the cats' vision would return. Dr. Zamm began taking 500 mg of taurine three times a day with meals. (He weighs about 170 lbs.) The taurine helped his "'sick' and dysfunction" retinal cells recover but could not totally restore his vision: "…taking taurine ***in time*** was fortuitous in saving enough of my rescuable macular cells to produce an excellent result – but not a 100% cure."

In *Macular Degeneration A Solution*, Dr. Zamm also explains that heavy metal poisoning from mercury and other toxic metals have a role in AMD; heavy metals "disable enzymes that are involved in the metabolic conversion of sulfur-containing amino acids that produce taurine." He includes information about selenium, which is needed for several enzymes, including glutathione peroxidase (detoxification). Other factors that can contribute to blurred vision include allergies, chemicals, hypoglycemia, and visual stressors such as reading small print on a computer. For those who like to dig deeper, Dr. Zamm has provided a list of research studies that he found useful. This little, lay-friendly book highlights an amino acid that may be key to preserving vision. It is available from Amazon.

Mercury Amalgams' Effects on Health

The neurotoxic effects of mercury have been known for decades; and after 20 years of reviewing scientific literature and holding public discussions, the US Food and Drug Administration (FDA) finally recommended that mercury amalgam fillings *not* be used in "certain high-risk populations." The agency's September 24, 2020, recommendation identifies pregnant women and their fetuses, women who plan to get pregnant, nursing women and their babies, children (especially under age six), and people with neurological disease, impaired kidneys, or with heightened sensitivity (allergy) to mercury or other components in amalgams as "high-risk." Based on the FDA statement, International Academy of Oral Medicine and Toxicology calculates that about 60% of the population falls into the high-risk category.

Mercury vapor (gas) is released in small amounts from amalgam fillings during chewing, brushing, teeth grinding, or when drinking hot liquids. Greater exposure occurs when mercury amalgams are placed into or removed from a tooth – which is why FDA does not recommend removing amalgams unless medically necessary (e.g., patient is allergic to filling components). The vapor is inhaled into the lungs and carried throughout the body by the bloodstream. Mercury blocks metabolic enzymes, binding thiol (sulfur; cysteine) and selenium, and causes oxidative stress. Signs of mercury toxicity include mood disorders, sleep difficulties, fatigue, memory problems, tremors, visual and/or hearing changes, impaired coordination, and kidney damage.

Despite issuing a recommendation that affects more than half of the population, FDA did not completely ban mercury fillings: "The weight of the existing evidence does not show that exposure to mercury from dental amalgam leads to adverse health effects

in the general population, and its longevity is better than that of alternatives…." But could it be that the correlation between health disorders and mercury toxicity has simply not been identified in the 40% that FDA considers the "general population"?

In 2021, the father-son team, Mark R. Geier, MD, PhD, and David A. Geier published two epidemiological studies that found a correlation between dental amalgams and two common health disorders: asthma and arthritis. The Geiers co-founded the non-profit Institute of Chronic Illnesses, Inc., which researches underlying causes and treatments of chronic disease, and CoMeD, Inc., a non-profit educational group. The Geiers were accredited participants in the United Nations meetings that developed the agreement to curtail mercury pollution, the Minimata Convention on Mercury. Both of their 2021 studies used data from the 2015-2016 National Health and Nutrition Examination Survey (NHANES), whose purpose is to "estimate the number and percentage of persons in the US population and in designated subgroups with selected diseases and risk factors," according to CDC.

The Geiers looked at asthma incidence among the NHANES adult participants (age 20-80 years) to test the hypothesis that damage from mercury vapor, which is inhaled, would show up as this common respiratory disorder. They compared those who had amalgam fillings to people who had other types of fillings and found, "As the number of dental amalgam filling surfaces increased, the incidence rate of reported asthma increased from 0 among those with 1 dental amalgam filling to a maximum of 3.76 among those with 6 dental amalgam filling surfaces." For those with >6 fillings, the incidence rate was 2.87; the incidence rate was 3.22 for those with >13 filling surfaces. This association remained statistically significant even after adjusting for covariates (race, gender, socioeconomic status, birth country, age, education level, and serum cotinine).

In the second epidemiological study, the Geiers found a statistically significant dose-dependent relationship between the number of amalgam filling surfaces and incidence of arthritis: "The arthritis rate was significantly increased in the exposed group compared to the unexposed group in the unadjusted (7.68-fold) and adjusted (4.89-fold) models." Interestingly, arthritis incidence peaked among persons with four to seven amalgam fillings but was significantly decreased among people with 13 or more. In addition to mercury's overt toxic effects, it is possible that the joint inflammation "may involve an immune-mediated allergic-type reaction to metals," and greater exposure may eventually suppress the immune response.

Both studies have several limitations, noted by the authors; and like all epidemiological studies, neither proves a cause-effect relationship. Still, the correlations in both papers are supported by case reports and clinical studies that describe remission of these conditions after amalgam removal in some patients. Mercury dental amalgams may be affecting the health of the general population in ways that FDA has not recognized – yet.

FDA. Recommendations About the Use of Dental Amalgam in Certain High-Risk Population: FDA Safety Communication. September 24, 2020.

Geier DA, Geier MR. Reported asthma and dental amalgam exposure among adults in the United States: An assessment of the National Health and Nutrition Examination Survey. *SAGE Open Medicine.* 2021;9:1-10.

Geier DA, Geier MR. Dental Amalgams and the Incidence Rate of Arthritis among American Adults. *Clinical Medicine Insights: Arthritis and Musculoskeletal Disorders.* 2021; 14:1-11.

IAOMT. FDA Populations to Avoid Dental Amalgam Mercury Fillings. https://iaomt.org/fda-populations-to-avoid-dental-amalgam-mercury-fillings/

Exclusion-Zone Water and Sulfur

About 20 years ago, Gerald Pollack, PhD, a professor of bioengineering at the University of Washington, and his colleagues identified a fourth phase of water to add to the three we already recognize (solid, liquid, gas). This fourth phase is a gel with a regularized crystalline hexamer structure and a negative charge that excludes colloidal and molecular solutes – hence, its name: exclusion-zone (EZ) water. EZ water is the primary form of water in the body; it forms next to hydrophilic structures such as biological membranes.

Interaction between the negatively charged EZ water and unstructured, bulk water, which has a positive charge, creates energy – like a battery – for cells and tissues in the body. Pollack and colleagues found that UV, radiant, and infrared light promote exclusion-zone growth: "Photons from ordinary sunlight…may have an unexpectedly powerful effect that goes beyond mere heating. It may be that solar energy builds order and separates charge between the near-surface exclusion zone and the bulk water beyond – the separation effectively creating a battery" (https://www.pollacklab.org/research).

In a 2019 paper, Stephanie Seneff and Greg Nigh hypothesize that "it is the sulfate molecule that plays a fundamental role in providing the interfacial negative charge that builds and maintains the EZ in biological systems." Sulfate promotes structured water (gel). Sulfates (e.g., heparan sulfate, chondroitin sulfate, keratan sulfate, dermatan sulfate) are important components of the extracellular matrix between cells that helps hold the cells together. Sulfate is also present to a lesser extent in the bloodstream where it is balanced by nitrate ions that destructure water to a liquid state, reducing viscosity and permitting good flow. In earlier papers, Seneff and colleagues hypothesized that endothelial nitric oxide synthase (eNOS), an enzyme that makes nitric oxide from arginine and is expressed by endothelial cells lining the blood vessels, "moonlights"; they suggest that eNOS bound to red blood cells synthesizes sulfur dioxide. According to their proposal, eNOS is responsible for maintaining $SO4^{-2}$ / $NO3^{-}$ balance, resulting in good blood flow and healthy tissue.

Seneff and Nigh propose that vitamin B12 (cobalamin) is necessary for sulfate synthesis. B12 deficiency can result from impaired absorption, from metformin use, and from a strict vegan diet (plants do not produce cobalamin). "In response to cobalamin deficiency, stored taurine [a sulfur-containing amino acid] in the brain can be mobilized as a resource to boost sulfate levels, systemically," they write. But that results in damage to the myelin sheath.

Sulfate is not often highlighted as an essential nutrient, but it deserves more attention, if it has a role in maintaining the exclusion zone, as Seneff and Nigh propose. In addition to B12, they say other nutrients that facilitate the production and/or utilization of sulfate include coenzyme Q10, vitamin D, vitamin C, curcumin, and resveratrol. "These are, perhaps not coincidentally, among the nutrients with the strongest health-supporting evidence," the authors state. "While their role in sulfur metabolism is virtually never mentioned in articles on their health benefits, we propose that it may be as significant as their antioxidant and other properties."

Seneff S, Nigh G. Sulfate's Critical Role for Maintaining Exclusion Zone Water: Dietary Factors Leading to Deficiencies. *WATER.* December 18, 2019.

◆

In Memory of James S. Turner

1940 – 2022

James S. Turner, an attorney and consumer advocate who was an original "Nader's Raider," passed away suddenly at his Washington, DC, home on January 25. He was 81.

While working with Ralph Nader, Mr. Turner wrote the 1970 book, *The Chemical Feast: Ralph Nader's Study Group Report on the Food and Drug Administration.*

Time Magazine commented at the time that Mr. Turner's book "may well be the most devastating critique of a U.S. Government agency ever issued."

Believing that private sector attorneys could energize the consumer movement, in 1973 Mr. Turner joined with David Swankin, a former aide to White House Consumer Advisor Esther Peterson, to create the law firm of Swankin & Turner, in which he remained an active principal for nearly five decades until his death.

From representing organizations such as the Consumer Federation of America as well as individual consumers, to consulting for major businesses on consumer policy, the firm of Swankin & Turner has fought for consumer interests and advocated consumer policies across a broad range of issues while influencing regulatory matters concerning food, drugs, health, the environment, and product safety.

Mr. Turner appeared before every major consumer regulatory agency, including the Food and Drug Administration, Environmental Protection Agency, Consumer Product Safety Commission, Federal Trade Commission, Department of Agriculture, and National Institutes of Health. Mr. Turner served stints as special counsel to the Senate Select Committee on Food, Nutrition, and Health, and to the Senate Government Operations Subcommittee on Government Research. He was also a policy consultant to major corporations in the food, pharmaceutical, and telecommunications industries, including Kraft Foods, The Quaker Oats Company, Hoffmann-LaRoche, and AT&T.

He vigorously advocated for emerging consumer health initiatives. He represented a coalition that successfully opposed an effort by the Federal Trade Commission to ban the words "organic," "natural," and "health food" from commerce by arguing that those terms are meaningful to protect consumer choice.

He was instrumental in winning passage of the Dietary Supplement Health and Education Act of 1994 (DSHEA), which defines and regulates dietary supplements as food rather than drugs, and the Organic Foods Production Act of 1990, which established uniform national standards for the production and handling of food labeled as "organic."

Mr. Turner also represented healthcare professionals fighting anticompetitive federal and state trade rules. He played a key role in mainstreaming the practice of acupuncture and served as lead attorney on a petition to the FDA that resulted in the classification of acupuncture needles as medical devices "safe for general use" by trained acupuncture practitioners, and in legalizing the importation and distribution of acupuncture needles in 1996.

He persuaded the Federal Trade Commission to cease its investigations targeting chiropractic care. He represented dentists ordered by state licensing boards to withhold information from their patients about the effects of mercury in dental amalgam fillings, including risks to patients, dental workers, and the environment. Mr. Turner's original advocacy was ultimately vindicated by a Food and Drug Administration Safety Communication on dental amalgam in 2020.

In 1978, Mr. Turner founded and became President of the not-for-profit National Institute for Science, Law and Public Policy (NISLAPP) in order "to bridge the gap between scientific uncertainties and the need for laws protecting public health and safety." In 1992 he began to take a leadership role in Citizens for Health, a consumer organization defending

individual choice and access in health matters and nutrition and served as Chairman and President for many years until the time of his death.

In 1996, he helped start Consumers for Dental Choice, which in turn led an international coalition of environmental, dental, and consumer groups to gain adoption of an anti-amalgam provision in the Minamata Convention on Mercury. Mr. Turner's recent advocacy included working with consumer groups advancing preservation of federally recognized homeopathic medicine, opposing dangerous exposure to radio-frequency radiation, and protecting access to innovative healthcare modalities, including energy medicine.

Mr. Turner served as a consumer consultant to and sat on advisory boards and committees of governmental agencies, including the US Department of State, the Food and Drug Administration, and the Federal Trade Commission, as well as business groups such as the Food Safety Council. He was also active on numerous boards of directors, boards of advisors, and legal and policy committees in nonprofit, educational, professional, and activist organizations; examples include Americans for Homeopathy Choice, the National Commission for the Certification of Acupuncture and Oriental Medicine, the American Herbal Products Association, and Voice for HOPE (Healers of Planet Earth).

He was a graduate of The Ohio State University, which he attended on a US Navy scholarship, and served in the OSU Student Senate for three years. He received his law degree from The Ohio State University College of Law (now Moritz College of Law), where he served as Chief Justice of the Moot Court. Between undergraduate school and law school, Mr. Turner was a lieutenant on active duty in the US Navy, where he graduated with distinction from Naval Justice School and served as a nuclear weapons handling officer and gunnery officer aboard the USS Purdy and the USS Austin.

In addition to *The Chemical Feast*, Mr. Turner was the co-author of *Making Your Own Baby Food* and produced numerous articles, book chapters, speeches, and lectures. In collaboration with A. Lawrence Chickering, author of *Beyond Left and Right: Breaking the Political Stalemate*, he co-authored *Voice of the People: The Transpartisan Imperative in American Life*, and co-founded and co-edited *The Transpartisan Review*, a journal dedicated to demonstrating how politics, culture, and society can be better understood as a matrix than as a continuum. Mr. Turner founded small-press Potomac Valley Press, which published *Healthy Harvest: A Directory of Sustainable Agriculture & Horticulture Organizations* (1985-1989), and hosted an organic community garden at his Washington, DC home for more than 30 years.

Mr. Turner is survived by his law partner and life partner of 45 years, Betsy E. Lehrfeld, Esq., his son Christopher B. Turner, Esq., and his daughter, Victoria M. Turner. The family is asking that in lieu of flowers, those wishing to honor Mr. Turner consider donations to the Citizens for Health Education Foundation, https://citizens.org/donate-citizens-health-education-foundation/.

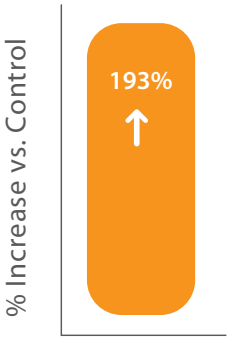
◆

Comprehensive Immune *Support**

Clinical research highlights:

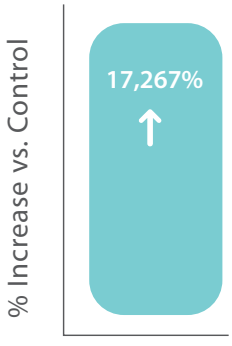
- 193% increase in NK cell function*
- Promotes healthy B & T cell lymphocyte activity*
- Supports healthy immune modulation*

NK CELL ACTIVATION*



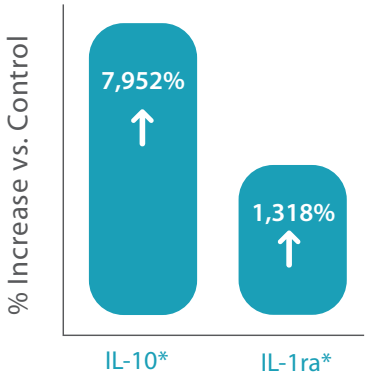
(*Mean fluorescent intensity for CD69 receptor on natural killer cells & CD69 / CD25 receptors for lymphocytes)

LYMPHOCYTE ACTIVATION*



(*Mean fluorescent intensity for CD69 receptor on natural killer cells & CD69 / CD25 receptors for B & T-cell lymphocytes)

IMMUNE MODULATION*



(* Mean fluorescent intensity on peripheral blood mononuclear cell cultures)

Researched Nutritionals®
solutions for life

800.755.3402 • Info@ResearchedNutritionals.com • ResearchedNutritionals.com | Available only through healthcare professionals.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

In this Issue

April 2022 | #465

ON THE COVER: Thomas E. Levy, MD, JD – Blood Abnormalities and the Spike Protein (pg. 2, 18); The Importance of Hope (pg. 2, 26); Peak Flow Meters and Asthma (pg. 35); Assessing Genetic Cancer Risk (pg. 50)

Literature Review & Commentary

by Alan R. Gaby, MD
drgaby@earthlink.net

Is Zinc Effective Against Molluscum Contagiosum?

Twenty-three Turkish children (mean age, 2.5 years) with molluscum contagiosum received oral zinc for two months. The dosage was 3 mg per day (as zinc sulfate) for ages three years or younger and 5 mg per day for older children. Three months after the start of zinc treatment the lesions had resolved in six children. At five months after the start of treatment, the lesions had resolved in 19 of the 23 children (83%). None of the children whose lesions resolved had a recurrence over the next 12 months. The mean serum zinc level prior to treatment did not differ between children with molluscum contagiosum and age-matched controls.

Comment: Molluscum contagiosum is viral skin infection that occurs most commonly in children. The condition usually resolves in six to 12 months, but in some cases it may last up to four years. Zinc has antiviral activity and plays a role in immune function, effects that might be useful in the treatment of molluscum contagiosum. Controlled trials are needed to determine to what extent the improvements seen in this study were due to zinc therapy, as opposed to spontaneous remission.

Vehapoglu A. Is molluscum contagiosum related to zinc deficiency in children? Effectiveness of oral zinc sulfate therapy in lesion regression. *Nutrition*. 2021;91-92:111418.

Niacinamide for Actinic Keratoses

A man in his mid-60s presented with extensive actinic keratoses on his forehead and scalp. He had male pattern baldness and a history of frequent sunburn of the scalp. He had undergone surgery on four separate occasions for invasive squamous cell carcinoma of the scalp. The patient had previously been treated with photodynamic therapy and with topical ingenol mebulate. Both of these treatments produced good results, but the lesions recurred. He was then tried on topical retinoids but developed erosive pustulosis of the scalp, and the treatment was stopped. In April 2019 the man was started on niacinamide (500 mg twice a day), and there was a dramatic decrease in the number of actinic keratoses. Niacinamide was continued and during the next eight months no new lesions appeared.

Comment: Previous studies have shown that oral niacinamide can decrease the number of actinic keratoses and prevent the progression of actinic keratoses to non-melanoma skin cancer.[1,2] Niacinamide may work in part by preventing ultraviolet light-induced immunosuppression. In the previous research, the beneficial effect of niacinamide wore off after treatment was discontinued. In the present case report, the benefits of niacinamide therapy persisted with continued treatment. Thus, ongoing treatment with niacinamide may be necessary to maintain the beneficial effects against actinic keratoses and non-melanoma skin cancer. A niacinamide dose of 500 mg twice a day is generally safe, although larger doses (such as 3,000 mg per day or more) has occasionally caused liver damage.

Paugam C, Dreno B. Is nicotinamide a sustainable therapy for resistant actinic keratoses? *J Eur Acad Dermatol Venereo*l. 2020;34:e624-e626.

Magnesium for Familial Benign Chronic Pemphigus

A 42-year-old woman with familial benign chronic pemphigus (Hailey-Hailey disease) had only a partial response to topical and systemic glucocorticoids and antibiotics, topical tacrolimus, dapsone, and botulinum toxin. Based on previous case reports, she was treated with 300 mg per day of magnesium, as a solution of magnesium chloride in water. The lesions completely resolved in four weeks. Subsequently there was a mild recurrence of some of the lesions, which resolved rapidly after the dosage of magnesium was doubled.

Comment: Hailey-Hailey disease is a rare autosomal dominant skin disease, occurring in about 1 in 50,000 individuals. It presents with eroded, macerated, vegetating, malodorous plaques in the intertriginous regions. Secondary infections are common. Although various medications may improve Hailey-Hailey disease, it is often difficult to control and in many cases is a debilitating condition. The patient described above had a dramatic improvement after taking a magnesium supplement. A similar dramatic response was observed in a previous case report.[3] Although the success of magnesium in patients with this difficult-to-treat genetic condition might seem too good to be true, there is nothing to be lost by trying this safe and inexpensive treatment. Several case reports suggest that low-dose naltrexone is also effective against Hailey-Hailey disease, and that the combination of magnesium and low-dose naltrexone is more effective than either treatment by itself.

Dos Santos Garcia MC, et al. Successful treatment of refractory Hailey-Hailey disease with oral magnesium chloride. *Dermatol Ther*. 2020;33:e14429.

Almonds for Facial Wrinkles

Fifty-six postmenopausal women (mean age, 63.4 years) with Fitzpatrick skin types I or II (light skin) were randomly assigned to consume 20% of their daily energy as almonds or a calorie-matched snack (pretzels, granola bars, and fig bars) for 24 weeks. Participants in both groups were advised to avoid all other nut-containing foods and nut oils. Facial photographs and an image analysis system were used to obtain standardized high-resolution photographs and information on wrinkle width and severity. Compared with baseline, mean wrinkle severity decreased in the almond group by 15% at week 16 ($p = 0.02$ vs. the control diet) and by 16% at week 24 ($p < 0.02$ vs. the control diet). Mean facial pigment intensity decreased by 20% at week 16 ($p = 0.02$ vs. the control diet) and this improvement was maintained at week 24.

Comment: The results of this study suggest that consumption of almonds can improve facial wrinkles and decrease skin pigmentation in postmenopausal women with Fitzpatrick skin types I and II. This study confirms a previous shorter-term study by the same research group. The authors suggested that the beneficial effect of almonds may be due to its fatty acid and antioxidant content. Other research has found that eating almonds may improve LDL-cholesterol levels and decrease insulin resistance.

Rybak I, et al. Prospective randomized controlled trial on the effects of almonds on facial wrinkles and pigmentation. *Nutrients*. 2021;13:785.

Magnesium for Migraines, or More Iranian Research Fraud?

Two hundred sixty Iranian adults with recurrent migraines were randomly assigned to receive, in double-blind fashion, sodium valproate (200 mg twice a day), magnesium oxide (250 mg twice a day), or both treatments for 12 weeks. A significant decrease in frequency, severity, and duration of migraine attacks was seen in each group. Mean headache severity, duration of headaches, and number of analgesics used were significantly lower in the group receiving combination therapy than in the group receiving sodium valproate alone. The authors concluded that magnesium enhanced the effect of sodium valproate as a prophylactic medication in patients with recurrent migraines.

Comment: There is ample evidence from previous studies that magnesium supplementation is beneficial for migraine prophylaxis. However, as *Townsend Letter* readers know, I have concerns that many of the research papers coming from Iran appear to be fraudulent. Several issues in the study described above raise questions about its credibility.

1. Dangerous treatment protocol: Sodium valproate is teratogenic and has been associated with severe birth defects, including neural tube defects. The neural tube forms during the second week of pregnancy, when many women do not yet know they are pregnant. For that reason, authorities advise against the use of sodium valproate by women who have the potential to become pregnant, unless the treatment is absolutely necessary. In the present study, 56% of the participants were female, and with a mean age of 35.5 years, more than half were of childbearing age. According to treatment guidelines, women of childbearing age who are taking sodium valproate should be advised of the risks, should use effective contraception, and should be supervised closely. There is no evidence that these actions were taken in this study. One wonders whether the risks of sodium valproate and the need for contraception were ➤

➤

discussed in the informed-consent document, considering that 9 of 125 women became pregnant during the 12-week trial. If the women in this study had been advised of the risks, it is unlikely that many of them would have agreed to participate, particularly since other medications for migraine prophylaxis are safe during pregnancy. It is also unlikely that the Ethics Committee of Qom University of Medical Sciences would have approved the study if they had been aware of the risks.

2. Implausible treatment protocol: At the beginning of the study, each participant underwent a one-month run-in period during which they were not given any medication for migraine prophylaxis. It is difficult to believe that anyone would have agreed to participate in such a study, let alone nearly 100% of the subjects who fulfilled the inclusion criteria. The people who enrolled in this study had been referred to a neurology clinic with a mean score of 21.85 on the Migraine Disability Assessment Test (scores of 21 or higher correspond to severe disability). Patients with severe migraines are looking for relief, not to participate in a study that requires them to wait a month before their treatment starts (and also to discontinue any prophylactic medication they were currently taking).
3. Discrepancy regarding funding: The paper stated that the study did not receive any funding. The Iranian Registry of Clinical Trials (IRCT) document that is associated with this study stated that the study was funded by Qom University of Medical Sciences.
4. Discrepancies regarding inclusion and exclusion criteria: One of the inclusion criteria in the paper was having at least four migraine attacks per month. In the IRCT document the inclusion criterion was having at least two migraine attacks per month. The paper stated that patients were excluded if they were taking supplements containing magnesium. The IRCT document stated that patients were excluded if they were taking supplements containing magnesium, calcium, or riboflavin.
5. Discrepancies regarding outcome measures: In the paper the primary outcome measure was migraine frequency. Secondary outcome measures were migraine severity, duration of attacks, and number of pain medicines used. In the IRCT document, all four of these outcome measures were listed as primary outcome measures.

Khani S, et al. Comparative study of magnesium, sodium valproate, and concurrent magnesium-sodium valproate therapy in the prevention of migraine headaches: a randomized controlled double-blind trial. *J Headache Pain*. 2021;22:21.

Calcifediol (25-hydroxyvitamin D) for COVID-19

An observational study was conducted from March to May 2020 among 838 patients admitted to COVID-19 wards of a hospital in Barcelona, Spain. Four hundred forty-seven patients received calcifediol (25-hydroxyvitamin D), whereas 391 patients (controls) did not receive calcifediol at the time of hospital admission. The dosage of calcifediol was 532 µg on day 1 and 266 µg on days 3, 7, 15, and 30. The proportion of patients who required admission to the intensive care unit (ICU) was significantly lower in patients treated with calcifediol than in the control group (4.5% vs. 21%; $p < 0.001$). After adjustment for age, sex, 25-hydroxyvitamin D levels at baseline, and comorbidities, patients given calcifediol had a reduced risk of requiring ICU treatment (odds ratio = 0.13; 95% confidence interval [CI], 0.07-0.23). The mortality rate was 4.7% in the calcifediol group and 15.9% in the control group ($p = 0.001$). After adjustment for potential confounding variables, the odds ratio for mortality was 0.21 (95% CI, 0.10-0.43).

Comment: In a previous randomized trial conducted in Cordoba, Spain, treatment of hospitalized COVID-19 patients with calcifediol (according to a protocol similar to that described above) decreased disease severity and markedly decreased the need for admission to the ICU. The results of the present observational study are consistent with the findings of the previous study.

Vitamin D is converted *in vivo* to calcifediol, so it would be reasonable to assume that vitamin D would also have some degree of efficacy against COVID-19. That assumption is supported by one previous study.[4] Widespread use of calcifediol in the United States for COVID-19 is not feasible because it is a prescription drug and because it is very expensive (more than $1,200 for a course of treatment). In contrast, vitamin D is inexpensive and can be obtained without a prescription. Vitamin D therefore seems to be a better candidate than calcifediol for routine use against COVID-19.

It is not clear what dosage of vitamin D would be equivalent to the dosages of calcifediol used in the study described above. A dose of 532 µg of vitamin D3 (the amount of calcifediol given on the first day) is equal to 21,200 IU. However, calcifediol is considered to be more potent than vitamin D because it produces greater increases in serum 25-hydroxyvitamin D concentrations.[5]

Nogues X, et al. Calcifediol treatment and COVID-19- related outcomes. *J Clin Endocrinol Metab*. 2021;106:e4017-e4027.

Modern Medicine Is Dangerous

The authors of this study estimated the number of visits from 2017 through 2019 to emergency departments (EDs) in the United States that were due to adverse reactions to medications. The estimate was based on visits to 60 EDs participating in the National Electronic Injury Surveillance System-Cooperative Adverse Drug Event Surveillance Project. Adverse reactions were based on clinicians' diagnoses and supporting data documented in the medical record. Based on 96,925 ED visits for adverse reactions to medication, there were an estimated 6.1 such visits per 1,000 population per year, and 38.6% of these visits resulted in hospitalization. Rates of ED visits were higher for patients aged 65 years or older than for those younger than 65 (12.1 vs 5.0 per 1,000 population per year). An estimated 69.1% of ED visits for adverse reactions to medication involved therapeutic use of the medication (defined as "use as directed or unintentional errors by adults or adolescents"). Among ED visits involving therapeutic use of medications, the proportion of visits due to certain drug classes were as follows: anticoagulants (21.5%), diabetes agents (13.7%), antibiotics (12.8%), antiplatelet drugs (7.8%), analgesics (6.6%), renin/angiotensin system inhibitors (3.8%), sedative/hypnotic agents (2.4%), beta-blockers (1.6%), and other cardiovascular agents (excluding renin/angiotensin system inhibitors and beta-blockers (3.9%).

Comment: This study demonstrates that around 2 million Americans visit an ED every year because of adverse effects of medications. That is a shockingly high number, especially considering that the medical profession purports to live by the adage, "Above all do no harm." No treatment is entirely safe, and it is inevitable that some patients will be injured by treatments that are designed to help them. However, practitioners can dramatically decrease the risk of harming their patients by

emphasizing safer treatments such as dietary modifications, exercise, stress reduction, and appropriate use of nutritional supplements, botanicals, and other natural substances. Many papers have been written about how dangerous conventional medical therapies can be. I store these papers in a filing cabinet in a file labeled "Iatrogenesis." This file has gotten rather thick over the years. Fortunately, more and more practitioners are offering approaches that can decrease the need for dangerous medications, and more and more patients are embracing that approach.

Budnitz DS, et al. US emergency department visits attributed to medication harms, 2017-2019. *JAMA*. 2021;326:1299-1309.

Dutch Doctors Are More "With It" Than American Doctors

A questionnaire was sent to pediatricians and pediatric residents in one academic hospital and six community teaching hospitals in the Netherlands, to examine the use of intravenous magnesium in children with acute asthma. Of 111 practitioners who responded, 96% reported regular use of this treatment. Ninety-three percent of practitioners who used intravenous magnesium for acute asthma were convinced that it was effective.

Comment: A large body of evidence has shown that intravenous magnesium is an effective treatment for acute asthma and may decrease hospitalizations by as much as 30%. Dutch treatment guidelines recommend that practitioners consider intravenous magnesium for children with acute asthma who fail to respond to first-line treatment. The results of this study indicate that Dutch practitioners are, for the most part, following these guidelines.

In the United States, guidelines from the National Heart, Lung and Blood Institute of the National Institutes of Health recommend intravenous magnesium as adjunctive treatment for asthma in the emergency department (ED). However, a study conducted in seven EDs in the United States found that, among 61,854 children presenting with acute asthma, intravenous magnesium was administered in only 10.5% of cases. During 22,495 visits resulting in hospitalization after ED treatment, intravenous magnesium was administered in only 25.7% of cases. Among children who did receive magnesium, the median time in the ED before they received it was slightly more than 2.5 hours.[6]

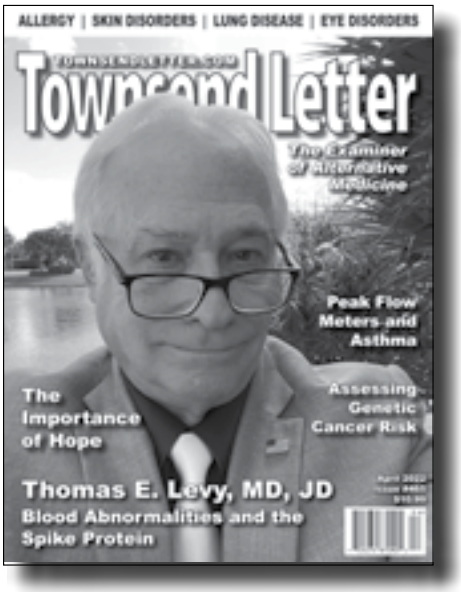
Thus, Dutch doctors are, for the most part, providing higher-quality care than their American counterparts with respect to treating acute asthma in children. I do not know why US doctors are failing to use this effective and inexpensive treatment. But I do know, based on this and other evidence, that we have no right to claim the US provides the best and most evidence-based healthcare in the world.

van Weelden M, et al. Intravenous magnesium sulphate in children with acute wheeze: a nationwide survey. *J Asthma*. 2021;58:1444-1450.

References

1. Surjana D, et al. Oral nicotinamide reduces actinic keratoses in phase II double-blinded randomized controlled trials. *J Invest Dermatol*. 2012;132:1497-500.
2. Chen AC, et al. A phase 3 randomized trial of nicotinamide for skin-cancer chemoprevention. *N Engl J Med*. 2015;373:1618-26.
3. Borghi A, et al. Efficacy of magnesium chloride in the treatment of Hailey-Hailey disease: from serendipity to evidence of its effect on intracellular Ca(2+) homeostasis. *Int J Dermatol*. 2015;54:543-548.
4. Annweiler C, et al. Vitamin D and survival in COVID-19 patients: A quasi-experimental study. *J Steroid Biochem Mol Biol*. 2020;204:105771.
5. Quesada-Gomez JM, Bouillon R. Is calcifediol better than cholecalciferol for vitamin D supplementation? *Osteoporos Int*. 2018;29:1697-1711.
6. Johnson MD, et al. Intravenous magnesium in asthma pharmacotherapy: variability in use in the PECARN registry. *J Pediatr*. 2020;220:165-174.e2.

◆



On the Cover

Canceling the Spike Protein – Striking Visual Evidence

by Thomas E. Levy, MD, JD

Orthomolecular Medicine News Service

No issue in the history of medicine has been as strident and polarized as that of the risk/benefit profiles of the various COVID vaccines being administered around the world. This article does not seek to clarify this issue to the satisfaction of either the pro-vaccine or the anti-vaccine advocates. However, all parties should realize that ***some*** toxicity does result in ***some*** vaccinated individuals ***some*** of the time, and that such toxicity can ***sometimes*** be unequivocally attributed to the preceding administration of the vaccine. Whether this toxicity occurs often enough and with great enough severity in vaccinated persons to be of greater concern than dealing with the contraction and evolution of COVID infections remains the question for many people.

Practically speaking, it does not matter whether an adverse event that occurs after a vaccination gets "blamed" on the vaccination. Such a matter may never get resolved. The issue of greatest concern is whether that adverse event can be clinically resolved if not effectively prevented, and whether any long-term damage to the body can be prevented once an adverse event is recognized. The remainder of this article will address the etiologies of such damage along with measures that can mitigate or even resolve such damage.

Toxins and Oxidative Stress

All toxins ultimately inflict their damage by directly oxidizing biomolecules, or by indirectly resulting in the oxidation of those biomolecules (proteins, sugars, fats, enzymes, etc.). When biomolecules become oxidized (lose electrons), they can no longer perform their normal chemical or metabolic functions. No toxin can cause any clinical toxicity unless biomolecules end up becoming oxidized. The unique array of biomolecules that become oxidized determines the nature of the clinical condition resulting from a given toxin exposure. There is no "disease" present in a cell involved in a given medical condition beyond the distribution and degree of biomolecules that are oxidized. Rather than "causing" disease, the state of oxidation in a grouping of biomolecules **IS** the disease.

When antioxidants can donate electrons back to oxidized biomolecules (reduction), the normal function of these biomolecules is restored (Levy, 2019). This is the reason why sufficient antioxidant therapy, such as can be achieved by highly-dosed intravenous vitamin C, has proven to be so profoundly effective in blocking and even reversing the negative clinical impact of any toxin or poison. There exists no toxin against which vitamin C has been tested that has not been effectively neutralized (Levy, 2002). There is no better way to save a patient clinically poisoned by any agent than by immediately administering a sizeable intravenous infusion of sodium ascorbate. The addition of magnesium chloride to the infusion is also important to protect against sudden life-threatening arrhythmias that can occur before a sufficient number of the newly oxidized biomolecules can be reduced and any remaining toxin is neutralized and excreted.

Abnormal Blood Clotting

Both the COVID vaccine and the COVID infection have been documented to provoke increased blood clotting [thrombosis] (Biswas et al., 2021; Lundstrom et al., 2021). Viral infections in general have been found to cause coagulopathies resulting in abnormal blood clotting (Subramaniam and Scharrer, 2018). Critically ill COVID ICU patients demonstrated elevated D-dimer levels roughly 60% of the time (Iba et al., 2020). An elevated D-dimer test result is almost an absolute confirmation of abnormal blood clotting taking place somewhere in the body. Such clots can be microscopic, at the capillary level, or much larger, even involving the thrombosis of large blood vessels. Higher D-dimer levels that persist in COVID patients appear to directly correlate with significantly increased morbidity and mortality (Naymagon et al., 2020; Paliogiannis et al., 2020; Rostami and Mansouritorghabeh, 2020).

Platelets, the elements of the blood that can get sticky and both initiate and help grow the size of blood clots, will generally demonstrate declining levels in the blood at the same time D-dimer levels are increasing, since their stores are being actively depleted. A post-vaccination syndrome known as vaccine-induced prothrombotic immune thrombocytopenia (VIPIT) with these very findings has been described (Favaloro, 2021; Iba et al., 2021; Scully et al., 2021; Thaler et al., 2021). Vaccinations have also been documented to cause bleeding syndromes due to autoimmune reactions resulting in low platelet levels (Perricone et al., 2014).

This can create some confusion clinically, as chronically low platelet levels by themselves can promote clinical syndromes of increased bleeding rather than increased blood clotting. As such, some primary low platelet disorders require pro-coagulation measures to stop bleeding, while other conditions featuring primary increased thrombosis with the secondary rapid consumption of platelet stores end up needing anticoagulation measures to stop that continued consumption of platelets (Perry et al., 2021). Significant thrombosis post-vaccination in the absence of an elevated D-dimer level or low platelet count has also been described (Carli et al., 2021). In platelets taken from COVID patients, platelet stickiness predisposing to thrombosis has been shown to result from spike protein binding to ACE2 receptors on the platelets (Zhang et al., 2021).

Of note, a D-dimer test that is elevated due to increased blood clotting will ***usually only stay elevated for a few days*** after the underlying pathology provoking the blood clotting has been resolved. Chronic, or "long-haul" COVID infections, often demonstrate ***persistent*** evidence of blood clotting pathology. In one study, 25% of convalescent COVID patients who were four months past their acute COVID infections demonstrated increased D-dimer levels. Interestingly, these D-dimer elevations were often present when the other common laboratory parameters of abnormal blood clotting had returned to normal. These other tests included prothrombin time, partial thromboplastin time, fibrinogen level, and platelet count. Inflammation parameters, including C-reactive protein and interleukin-6, typically also had returned to normal (Townsend et al., 2021).

Persistent evidence of blood clotting (increased D-dimer levels) in chronic COVID patients might be a reliable way to determine the persistent presence/production of the COVID spike protein. Another way, discussed below, might be dark field microscopy to look for rouleaux formation of the red blood cells (RBCs). At the time of the writing of this article, the correlation between an increased D-dimer level and rouleaux formation of the RBCs remains to be determined. Certainly, the presence of both should trigger the greatest of concern for the development of significant chronic COVID and post-COVID vaccination complications.

Is Persistent Spike Protein the Culprit?

Spike proteins are the spear-like appendages attached to and completely surrounding the central core of the COVID virus, giving the virion somewhat of a porcupine-like appearance. Upon binding to the angiotensin converting enzyme 2 (ACE2) receptors on the cell membranes of the target cells, dissolving enzymes are released that then permit entry of the complete COVID virus into the cytoplasm, where replication of the virus can ensue (Belouzard et al., 2012; Shang et al., 2020).

Concern has been raised regarding the dissemination of the spike protein throughout the body after vaccination. Rather than staying localized at the injection site in order to provoke the immune response and nothing more, spike protein presence has been detected throughout the body of some vaccinated individuals. Furthermore, it appears that some of the circulating spike proteins simply bind the ACE2 receptors without entering the cell, inducing an autoimmune response to the entire cell-spike protein entity. Depending on the cell type that binds the spike protein, any of a number of autoimmune medical conditions can result.

While the underlying pathology remains to be completely defined, one explanation for the problems with thrombotic tendencies and other symptomatology seen with chronic COVID and post-vaccination patients relates directly to the persistent presence of the spike protein part of the coronavirus.

Rouleaux formation is a reliable indicator of abnormal RBC stickiness and increased blood viscosity.

Some reports assert that the spike protein can continue to be produced after the initial binding to the ACE2 receptors and entry into some of the cells that it initially targets. The clinical pictures of chronic COVID and post-vaccine toxicity appear very similar, and both are likely due to this continued presence, and body-wide dissemination, of the spike protein (Mendelson et al., 2020; Aucott and Rebman, 2021; Levy, 2021; Raveendran, 2021).

Although they are found on many different types of cells throughout the body, the ACE2 receptors on the epithelial cells lining the airways are the first targets of the COVID virus upon initial encounter when inhaled (Hoffman et al., 2020). Furthermore, the concentration of these receptors is especially high on lung alveolar epithelial cells, further causing the lung tissue to be disproportionately targeted by the virus (Alifano et al., 2020). Unchecked, this avid receptor binding and subsequent viral replication inside the lung cells leads directly to low blood oxygen levels and the adult respiratory distress syndrome [ARDS] (Batah and Fabro, 2021). Eventually there is a surge of intracellular oxidation known as the cytokine storm, and death from respiratory failure results (Perrotta et al., 2020; Saponaro et al., 2020; Hu et al., 2021).

COVID, Vaccination, and Oxidative Stress

Although some people have prompt and clear-cut negative side effects after COVID vaccination, many appear to do well and feel completely fine after their vaccinations. Is this an assurance that no harm was done, or will be done, by the vaccine in such individuals? Some striking anecdotal evidence suggests otherwise, while also indicating that there exist good options for optimal protection against side effects in both the short- and long-term.

Under conditions of inflammation and systemically increased oxidative stress, RBCs can aggregate to varying degrees, sometimes sticking together like stacks of coins with branching of the stacks seen when the stickiness is maximal. This is known as rouleaux formation of the RBCs (Samsel and Perelson, 1984). When this rouleaux formation is pronounced, increased blood viscosity (thickness) is seen, and there is increased resistance to the normal, unimpeded flow of blood, especially in the microcirculation (Sevick and Jain, 1989; Kesmarky et al., 2008; Barshtein et al., 2020; Sloop et al., 2020).

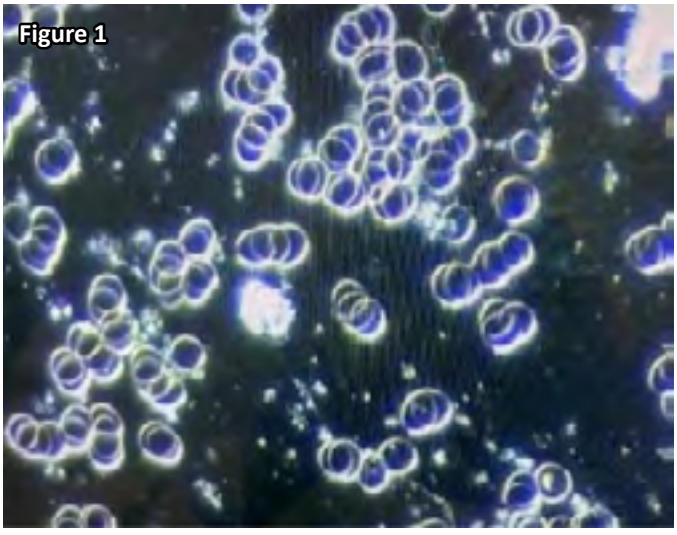
With regard to the smallest capillaries through which the blood must pass, it needs to be noted that individual RBCs literally need to fold slightly to pass from the arterial to the venous side, as the capillary diameter at its narrowest point is actually less than the diameter of a normal RBC, or erythrocyte.

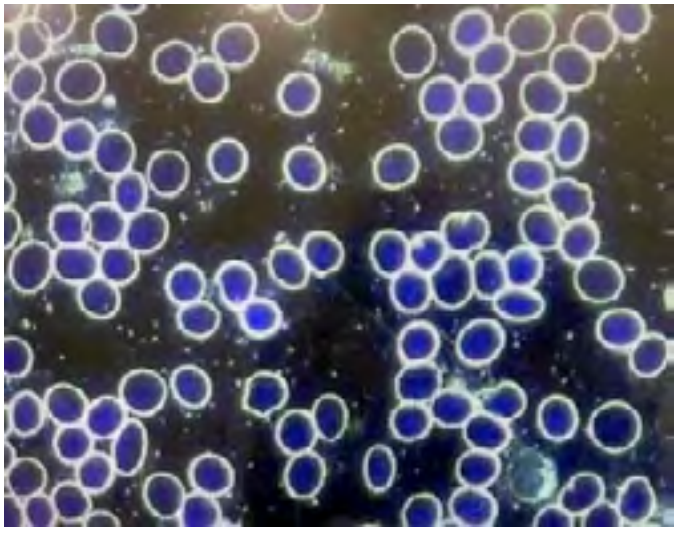
➤

➤

It is clear that any aggregation of the RBCs, as is seen with rouleaux formation, will increase resistance to normal blood flow, and it will be more pronounced as the caliber of the blood vessel decreases. Not surprisingly, rouleaux formation of the RBCs is also associated with an impaired ability of the blood to optimally transport oxygen, which notably is another feature of COVID spike protein impact (Cicco and Pirrelli, 1999). Increased RBC aggregation has been observed in a number of different microcirculatory disorders, and it appears to be linked to the pathophysiology in these disorders.

Rouleaux formation is easily visualized directly with dark field microscopy. When available, feedback is immediate, and there is no need to wait for a laboratory to process a test specimen. It is a reliable indicator of abnormal RBC stickiness and increased blood viscosity, typically elevating the erythrocyte sedimentation test (ESR), an acute phase reactant test that consistently elevates along with C-reactive protein in a setting of generalized increased oxidative stress throughout the body (Lewi and Clarke, 1954; Ramsay and Lerman, 2015). As such, it can never be dismissed as an incidental and insignificant finding, especially in the setting of a symptom-free individual post-vaccination appearing to be normal and presumably free of body-wide increased inflammation and oxidative stress. States of advanced degrees of increased systemic oxidative stress, as is often seen in cancer patients, can also display rouleaux formation among circulating neoplastic cells and not just the RBCs (Cho, 2011).



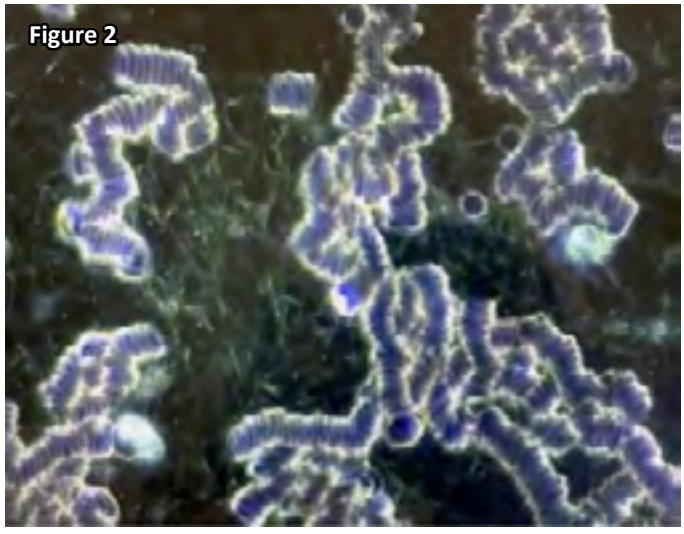


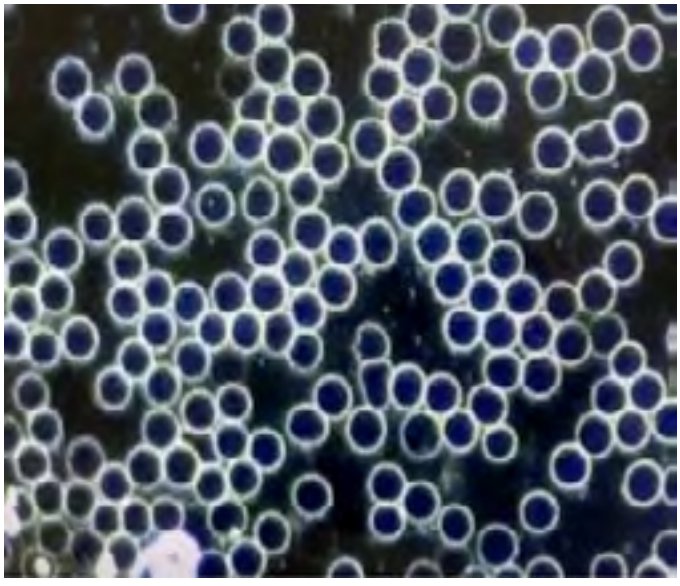
Rouleaux Formation Post-COVID Vaccination

The dark field blood examinations seen in Figure 1 come from a 62-year-old female who had received the COVID vaccination roughly 60 days earlier. The first picture reveals mild rouleaux formation of the blood. After a sequence of six autohemotherapy ozone passes, the picture below shows a completely normal appearance of the RBCs.

A second patient, a young adult male who received his vaccination 15 days earlier without any side effects noted and feeling completely well at the time, had the dark field examination of his blood performed. This first examination seen in Figure 2 revealed ***severe*** rouleaux formations of the RBCs with extensive branching, appearing to literally involve all of the RBCs visualized in an extensive review of multiple different microscopic fields. He then received one 400 ml ozonated saline infusion followed

continued on page 23 ➤





Exciting Study Results for Post Covid Symptoms

Firefly™ LIGHT THERAPY

Firefly Light Therapy™ Shows Positive Results for Post Covid Lung Symptoms

A single but promising case study revealed that in just two 5-minute anterior lung treatments with Firefly Light Therapy the patient, a 62 year old male struggling to recover from post-COVID lung symptoms, had remarkable results. Prior to treatment the patient noted 16 months of symptoms including shortness of breath, mild wheezing, and a feeling that he had to "push to breathe" and take a break after only 5 minutes of exertion.

5 days after his second treatment all symptoms subsided and improvement was verified with Spirometer Scores. After 3 more 5-minute Firefly sessions, the patient reported he can now exercise for 60 minutes before needing rest.

In my own personal COVID-19 experience I treated myself for loss of taste and smell and both returned after a series of treatments. This need is on the rise and as a fellow practitioner I'm very excited to share the possibilities with you.

Martin Bales
– Martin Bales L.Ac. DAOM

TYPE OF SCORE	BEFORE	AFTER	AMOUNT OF INCREASE
(PEF) Peak Expiratory Flow	77 L/min	138 L/min	**79.2%**
(FEV1) Forced Expiratory Volume	1.07 L	2.02 L	**88.8%**
(FVC) Forced Vital Capacity	2.21 L	3.04 L	**37.6%**

Bales™ Photonics

Bales Photonics, Inc. will be conducting a larger study (in the Orange County, CA area) your patients can be a part of.

CALL 619-847-0693 TO BE PART OF OUR STUDY, OR FOR PRICING & INFORMATION.

Relax Far Infrared Saunas & Lamps

The Relax Sauna can increase body temperature 3° in 25 minutes. Significantly more then any other sauna

Increasing core temperature will:

- Mobilize Lymphatic & Immune System
- Increase Circulation & Microcirculation
- Activate Parasympathetic Nervous System
- Help Mitochondria create ATP + nitric oxide

Detox: heavy metals, glyphosates, dioxins, plastics, metabolic waste. Lower Blood Pressure, Reduce inflammation, chronic pain, neuropathy. Reduce Stress, Anxiety, Sleep Disorders. Deep Profound Relaxation.

Only Sauna Company with Medical Lamps using a PATENTED ENERGY

Relax Sauna is Used in Cancer Clinics While Doing IV Therapy

A cancer clinic in Washington uses the Relax Sauna while doing IV therapy on many of their patients. They are able to increase the core temperature to 102.7° in 1 hour. Other clinics use the Relax Sauna for 5-7 minutes before doing IV therapy when they have trouble getting the needles into the veins. The Relax Sauna heats up in only 20 seconds making this very practical. No other infrared sauna has this capability.

Dr. Bill Akpinar - M.D., D.S., O.M.D. **Medical director - US Olympic karate team**
Author "No Sweat?, Know Sweat!" Definitive Guide to Reclaiming your Health"

"Every time I use the Relax Sauna, I cannot for the life of me see how people can live without it. I usually bring it with me when I travel. We recommend the relax sauna to many of our patients. ... We could not find this technology in any other sauna. The amount of Heat Shock Proteins produced with the Relax Sauna is phenomenal !"

See over 800 testimonials on YouTube relaxsaunas.com/youtube

phil@relaxsaunas.com **CALL 626.200.8454** **relaxsaunas.com**

Go to: relaxsaunas.com and use code relax4 to get $125 OFF the cost of a Relax Sauna until April 30, 2022

➤*continued from page 20*

by a 15,000 mg infusion of vitamin C. The second picture reveals a complete and immediate resolution of the rouleaux formation seen on the first examination. Furthermore, the normal appearance of the RBCs was ***still seen 15 days later***, giving some reassurance that the therapeutic infusions had some durability, and possibly permanency, in their positive impact.

A third adult who received the vaccination 30 days earlier also had severe rouleaux formation on her dark field examination, and this was also completely resolved after the ozonated saline infusion followed by the vitamin C infusion. Of note, similar abnormal dark field microscopy findings were found in other individuals following Pfizer, Moderna, or Johnson & Johnson COVID vaccinations.

Preventing and Treating Chronic COVID and COVID Vaccine Complications

In addition to the mechanisms already discussed by which the spike protein can inflict damage, it appears the spike protein itself is significantly toxic. Such intrinsic toxicity (ability to cause the oxidation of biomolecules) combined with the apparent ability of the spike protein to replicate itself like a complete virus greatly increases the amount of toxic damage that can potentially be inflicted. ***A potent toxin is bad enough, but one that can replicate and increase its quantity inside the body after the initial encounter represents a unique challenge among toxins.*** And if the mechanism of replication can be sustained indefinitely, the long-term challenge to staying healthy can eventually become insurmountable. Nevertheless, this toxicity also allows it to be effectively targeted by high enough doses of the ultimate antitoxin, vitamin C, as discussed above. And even the continued production of spike protein can be neutralized by a daily multi-gram dosing of vitamin C, which is an excellent way to support optimal long-term health, anyway.

As was noted in an earlier article (Levy, 2021), there appear to be multiple ways to deal with spike protein effectively. The approaches to preventing and treating chronic COVID and COVID vaccine complications are similar, except that it would appear that a completely normal D-dimer blood test combined with a completely normal dark field examination of the blood could give the reassurance that the therapeutic goal has been achieved.

Until more data is accumulated on these approaches, it is probably advisable, if possible, to periodically reconfirm the normalcy of both the D-dimer blood test and the dark field blood examination to help assure that no new spike protein synthesis has resumed. This is particularly important since some patients who are clinically normal and symptom-free following COVID infection have been found to have the COVID virus persist in the fecal matter for an extended period of time (Chen et al., 2020; Patel et al., 2020; Zuo et al., 2020). Any significant immune challenge or new pathogen exposure facilitating a renewed surge of COVID virus replication could result in a return of COVID symptoms in such persons if the virus cannot be completely eliminated from the body.

Suggested Protocol (to be coordinated with the guidance of your chosen health care provider):

1. For individuals who are post-vaccination or symptomatic with chronic COVID, vitamin C should be optimally dosed, and it should be kept at a high but lesser dose daily indefinitely.
    - Ideally, an initial intravenous administration of 25 to 75 grams of vitamin C should be given depending on body size. Although one infusion would likely resolve the symptoms and abnormal blood examination, several more infusions can be given if feasible over the next few days.
    - An option that would likely prove to be sufficient and would be much more readily available to larger numbers of patients would be one or more rounds of vitamin C given as a 7.5 gram IV push over roughly 10 minutes, avoiding the need for a complete intravenous infusion setup, a prolonged time in a clinic, and substantially greater expense (Riordan-Clinic-IVC-Push-Protocol, 10.16.14.pdf).
    - Additionally, or alternatively if IV is not available, 5 grams of liposome-encapsulated vitamin C (www.livonlabs.com) can be given daily for at least a week.
    - **When none of the above three options are readily available**, a comparable positive clinical impact will be seen with the proper supplementation of regular forms of oral vitamin C as sodium ascorbate or ascorbic acid. Either of these can be taken daily in three divided doses approaching bowel tolerance after the individual determines their own unique needs (additional information, see Levy, Vitamin C Guide in References; Cathcart, 1981).
    - An excellent way to support any or all of the above measures for improving vitamin C levels in the body is now available and very beneficial clinically. A supplemental polyphenol that appears to help many to overcome the epigenetic defect preventing the internal synthesis of vitamin C in the liver can be taken once daily. This supplement also appears to provide the individual with the ability to produce and release even greater amounts of vitamin C directly into the blood in the face of infection and other sources of oxidative stress (www.formula216.com).
2. Hydrogen peroxide (HP) nebulization (Levy, 2021, free eBook) is an antiviral and synergistic partner with vitamin C, and it is especially important in dealing with acute or chronic COVID, or with post-COVID vaccination issues. As noted above, the COVID virus can persist in the stool. In such cases, a chronic pathogen colonization (CPC) of COVID in the throat continually supplying virus that is swallowed into the gut is likely present as well, even when the patient seems to be clinically normal. This will commonly be the case when specific viral eradication measures were not taken during the clinical course of the COVID infection. HP nebulization will clear out this CPC, which will stop the continued seeding of the COVID virus in the gut and stool as well. Different nebulization approaches are discussed in the eBook.
3. When available, ozonated saline and/or ozone autohemotherapy infusions are excellent. Conceivably, this approach alone might suffice to knock out the spike protein presence, but the vitamin C and HP nebulization approaches will also improve and maintain health in general. Ultraviolet blood irradiation and hyperbaric oxygen therapy will likely achieve the same therapeutic effect if available.
4. Ivermectin, hydroxychloroquine, and chloroquine are especially important in preventing new binding of the spike protein to the ACE2 receptors that need to be bound in order

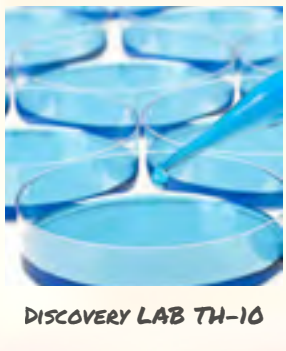
continued on page 25 ➤

Dr. Iichiroh Ohhira: A Pioneering Genius in Probiotic Science


MALAYSIAN MYSTERY – 'DRINKING FERMENTED ELIXIR'


ADVANCED RESEARCH – OKAYAMA UNIVERSITY

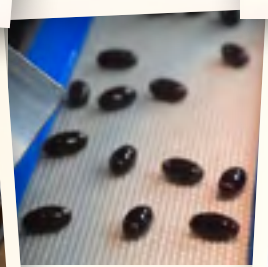
FOUNDED BIOBANK


DISCOVERY LAB TH-10


TESTING FOODS FOR PEAK NUTRITION

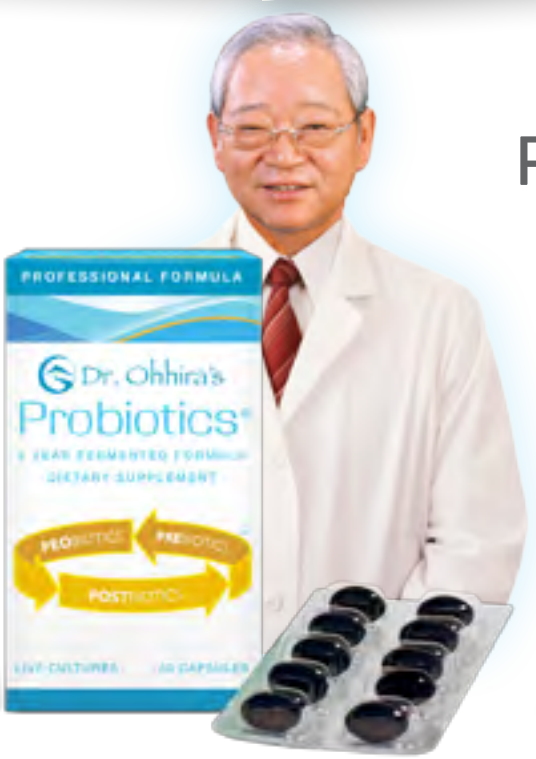

EXCLUSIVE 5-YEAR FERMENTATION


NATURE'S PERFECT PROBIOTIC W/POSTBIOTICS


PATENTED ENCAPSULATION


OFFERING "LONG LIFE AND GOOD HEALTH TO ALL!"

DR. OHHIRA AWARDED GUSI PEACE PRIZE



Developed Natures 'Perfect Probiotic' over 40 Years ago!

Dr. Ohhira has proven to be one of the world's most influential researchers in the history of probiotic science as his discoveries continue to be confirmed. He intrinsically understood restorative timeline when developing a 5-year natural temperature fermentation method that produces herculean strains of probiotics as well as therapeutic **Postbiotics Metabolites**, recently proven to be the most beneficial aspect of probiotic supplementation. Recent research on Dr. Ohhira's Probiotics revealed that his formula contains over 400 kinds of these health-promoting postbiotic metabolites!

Discover the Dr. Ohhira's Difference!™

ESSENTIAL FORMULAS®

www.EssentialFormulas.com • (972) 255-3918

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

➤*continued from page 23*

for either the spike protein alone or for the entire virus to gain entry into the target cells (Lehrer and Rheinstein, 2020; Wang et al., 2020; Eweas et al., 2021). These agents also appear to have the ability to directly bind up any circulating spike protein before it binds any ACE2 receptors (Fantini et al., 2020; Sehailia and Chemat, 2020; Saha and Raihan, 2021). When the ACE2 receptors are already bound, the COVID virus cannot enter the cell (Pillay, 2020). These three agents also serve as ionophores that promote intracellular accumulation of zinc that is needed to kill/inactivate any intact virus particles that might still be present.

5. Many other positive nutrients, vitamins, and minerals are supportive of defeating the spike protein, but they should not be used to the exclusion of the above, especially the combination of highly-dosed vitamin C and HP nebulization.

Recap

As the pandemic continues, there is an increasing number of chronic COVID patients and patients post-COVID vaccination with a number of different symptoms. Furthermore, there is increasing number of vaccinated individuals who still end up contracting a COVID infection. This is resulting in a substantial amount of morbidity and mortality around the world. The presence and persistence of the COVID spike protein, along with the chronic colonization of the COVID virus itself in the aerodigestive tract as well as in the lower gut, appear to be major reasons for illness in this group of patients.

Persistent elevation of D-dimer protein in the blood and the presence of rouleaux formation of the RBCs, especially when advanced in degree, appear to be reliable markers of persistent spike protein-related illness. The measures noted above, particular the vitamin C and HP nebulization, should result in the disappearance of the D-dimer in the blood while normalizing the appearance of the RBCs examined with dark field microscopy. Even though new research is taking place daily that may modify therapeutic recommendations, it appears that taking the measures to eliminate D-dimer from the blood and to maintain a consistently normal morphological appearance of the blood is a very practical and efficient way to curtail the ongoing morbidity and mortality secondary to the persistent spike protein presence seen in chronic COVID and in post-COVID vaccination patients.

There are many vaccinated individuals who feel well yet remain cautious about potential future side effects, and who really have no easy access to D-dimer testing or dark field examination of their blood. Such persons can follow a broad-spectrum supplementation regimen featuring vitamin C, magnesium chloride, vitamin D, zinc, and a good multivitamin/multimineral supplement free of iron, copper, and calcium. Periodic but regular HP nebulization should be included as well. This regimen will offer good spike protein protection while optimizing long-term health. Furthermore, such a long-term supplementation regimen is advisable regardless of how much of the protocol discussed above is followed.

Dr. Levy is a board-certified cardiologist and a bar-certified attorney. After practicing adult cardiology for 15 years, he began to research the enormous toxicity associated with much dental work, as well as the pronounced ability of properly administered vitamin C to neutralize this toxicity. He has now written 13 books, with several addressing the wide-ranging properties of vitamin C in neutralizing all toxins and resolving most infections, as well as its vital role in the effective treatment of heart disease and cancer. Others address the important roles of dental toxicity and nutrition in disease and health.

Inducted into the Orthomolecular Medicine Hall of Fame in 2016, Dr. Levy continues to research the impact of the orthomolecular application of vitamin C and antioxidants in general on chronic degenerative diseases. His ongoing research involves documenting that all diseases are different forms and degrees of focal scurvy, arising from increased oxidative stress, especially intracellularly, and that they all benefit from protocols that optimize the antioxidant levels in the body. In particular, the ***cause-and-effect*** relationship between oral cavity infections and all heart attacks is now solidly established.

His latest book, *Rapid Virus Recovery*, addresses highly effective therapies for all respiratory viruses, including COVID and its variants. It is available for free, in English or Spanish, at www.rvr.medfoxpub.com.

Orthomolecular Medicine News Service free subscription link http://orthomolecular.org/subscribe.html and the OMNS archive link http://orthomolecular.org/resources/omns/index.shtml

◆

References are available online at www.townsendletter.com.

Mindset as Medicine: How the Power of Belief and Hope Can Heal

by Sarah LoBisco, ND, IFMCP

The Alarming Healthcare Crisis

The present state of our world has made it glaringly evident that our "sick care" system is dysfunctional and that it has been for a while.[1-7] The United States spends nearly twice as much on health care as the average Organisation for Economic Co-operation and Development (OECD) country, yet has the highest rates of suicide, chronic diseases, avoidable mortality, and hospitalizations for preventable deaths. It also has lowest rank in life expectancy compared to ten other high-income countries. Interesting, these statistics hold true even though America has the greatest number of preventative measures, such as breast cancer screening and flu vaccinations in those over 65 years old.[4] With some of the most expensive technologies, largest amounts of screening, highest medical costs, and resultant dismal results, the US medical care model was already struggling with a heavy load heading into the pandemic.[1-7]

Furthermore, the current crisis has magnified America's healthcare inadequacies and inequities. Older age, underlying medical and psychiatric conditions, racial and ethnic disparities, and socioeconomic status are the major risk factors for developing severe COVID-19 symptoms.[8-16] As if the traumatic events on the health system were not enough to handle, a disturbing and simultaneous spotlight on the issues of racial injustice, biases, and social determinants of health also have been brought to the forefront.[8-10,17-18]

All these events have pushed and strained our healthcare system to its limits. The unrelenting demands on health care providers have led to burn out, a rise in mental health issues, and disagreement with administration regarding resource allocation and management of the situation.[19-23]

Many physicians have taken this opportunity to raise their voices in frustration regarding the inadequacies of the current "sick care" model. The importance of nutritional, lifestyle, and personalized approaches to enhance wellness and resiliency have been exalted for years in the integrative community. Yet, they have often been brushed aside by conventional medicine as aggravations. No longer can they be dismissed.

It has never been more obvious that now is the time to transform our medical care approach. Health promotion and prevention should take precedent over disease management. Collectively, we should be aiming to enhance our health and boost our vitality. Sitting on the side lines helplessly and anxiously waiting for a disease to be contracted is not acceptable.

The current approach has not worked. Consumers are seeing this. Early in the crisis, when conventional wisdom didn't have much to offer as proactive measures, many took matters into their own hands and pocketbooks.[24-27]

The Emergence of Caring About Health

One "win" for natural medicine during the pandemic is that various holistic approaches and active patient involvement is being promoted by many physicians on a much larger scale, and with a growing audience. Suggestions for more comprehensive, inclusive, and integrative chronic disease management, public health measures, and treatment options have been brought to the table. Attention has shifted to integrative and alternative medicine as legitimate means to better one's health and support defense and repair processes.[28-32] According to the press release by Report Ocean on the Global Complementary And Alternative Medicine Market Report, "The global Complementary And Alternative Medicine Market is forecast to grow at a compound annual growth rate (CAGR) of 21.8% during the forecast period from 2021-2027."[30]

Purchases of nutritional supplements and investment in wellness are also on the rise.[24-27] In fact, in one small survey in May 2020, 36% of consumers reported using more supplements post-pandemic, and 39% said they expected to continue with this elevated use.[24-27] This exponential increase drew attention when supply chains got disrupted and backorders became a headache for many practitioners.[24-25]

Unfortunately, legal actions against practices for "unsubstantiated claims" on various supplements have been the modern day "dark side" for integrative healthcare. As with any specialty, money-making opportunities can sometimes cloud one's ability to effectively communicate objective data. On the flip side, those with pure intentions to spread helpful information have also found themselves in hot water.[33-35]

Leaving the regulations and legalities aside, it is now more recognized that various holistic health measures that optimize wellness and address the underlying risk factors can be complementary and provide benefit to the issue at hand.[28-29,31-32] As a result, integrative organizations have distributed research-backed recommendations and guidelines to their members for integrating herbal and nutraceutical interventions, lifestyle practices, stress management, and enhancing social connections into their practices. (All with the disclaimer that they are to be

used in conjunction with governmental recommendations, of course.)[31-3]

CDC (Centers for Disease Control and Prevention) and WHO (World Health Organization) preventive measures and vaccine promotion have been the mainstream. Still, edging into a lot of the conversation is the awareness that stress management techniques, healthy eating, and other lifestyle measures to support cellular health, inflammation, and immune modulation can help to promote health and provide one with a better chance of staying out of the hospital.[31-32]

The Big Losses for Natural and Integrative Medicine: The Divided States of America

Initially, there was a sense of hope in the integrative medicine sphere. The "wins" above were something to celebrate and the worldwide crisis seemed to be bringing together a sense of cohesiveness. Society joined together and convinced themselves that stopping their everyday lifestyles and staying home for a "two-week flattening of the curve" was something that made sense and was the responsible thing to do.[36] People joined together to do one of the hardest things in modern society … stop.

They stopped going to work, they stopped commuting, they stopped their everyday lives. With this, brought its own challenges, but regardless, in the beginning, gratitude prevailed and healthcare providers were deemed heroes.[37]

Then, things shifted.

Who knew that a few months and a few years later, a viral contagion would bloom into a divided and polarized world full of fear and sadness?[17] This division is not only preventing a full integration of the "best of both worlds" in medicine but is tearing apart families, friends, worsening mental health, and resulting in physical symptoms.[17,38-42]

What once was about health now has spread to become a political, moral, and ethical disagreement. People who once nurtured each other and shared freely are compelled to guard their stances or stay silent. Friendships have been disbanded over arguments on how to address things, what one considers the bounds of individual freedom are, and what side of "science" is the right one to follow.[17,38-42] The resulting social unrest, fear, and individual isolation has been profound.

It is heartbreaking.

How many doctors are seeing patients or clients whose families no longer speak to them or will let them see their grandchildren based on politics or a medical decision … on both sides? Am I alone in witnessing this?

Belief in the body's capacity to heal is sorely lacking in sick care, but it doesn't have to be this way.

Some could argue for or against these "necessary splits" and why it is appropriate for others to hold each other accountable. This is not what this article is about, nor would I pretend to be an expert in medical ethics or political science. However, I do wish the collective "we" was handling things in a way to create more community and unity.

A common problem that could have brought communion into the world and the United States is now one of the most polarized issues of our time. As one of my favorite 12-year-old clients succinctly puts it, we are living in the "Divided States of America, Dr. Sarah." She nailed it.

I don't think any leader can sweep in to save us at this point.

I think it must start with us.

As doctors and wellness advocates, I do feel that we may have a role in the solution that is bigger than we are aware of. People are looking to their physicians for guidance and support. We can either step out of the societal trance of fear provocation or add to the emotional and societal turmoil.

I believe the repercussions of how we handle and are handling this situation, if not done well, could end up being as much, if not more harmful, then the virus in the long-term.

Without a society that is supportive, without families that are loving, without people connecting and listening to other's reasoning, what world will be left to live in?

We must start sucking out this poison through one kind patient or interaction at a time. Along with all the environmental contaminants we are trained to deal with through avoidance and modulating detoxification, this toxin is one of the biggest polluters of life-sustaining properties that we have come up against in a long time.

The Right and Wrong Focus

As holistic and integrative medical professionals, we are taught to address the whole person, to seek out the cause of the dis-ease.

For COVID-19, many integrative doctors are focusing on the physical aspects of risk mitigation. This is important, but it shouldn't be the main narrative. The biggest predictors of overall mortality aren't exercise and diet, they are social connections and social determinants of health.[43-46]

Perhaps this narrowed focus is because it is much easier to control what patients put in their mouths and what exercise routine they should follow then it is to have the uncomfortable conversation of food accessibility or a home life of verbal abuse. It's way easier to get into the nitty gritty of a "perfect elimination" diet than to discuss a family division that is making someone so anxious that their IBS (irritable bowel syndrome) has become out of control. A FODMAPs diet can't fix that, my friends.

Thankfully, functional and naturopathic physicians are offering more group visits, community support, and stress management programs.[47-48] Yet accessibility and speaking about the "deep issues," beyond diet, lifestyle, and managing overwhelm within these groups is still sorely lacking in my opinion.

Missing almost completely in the mainstream and integrative medical communities is the promotion of patient empowerment and positive affect. There is not a narrative for promoting hope for a reason. In conventional medicine, it is taught that hope can be misleading and alter unfairly the patient's expectations, right?

I propose as a collective we may be doing more harm than good with this belief. In fact, we may be negating the benefits of lifestyle measures and group gatherings if we are literally scaring the health out of people, even with the best intentions.

➤

➤

The Feardemic – An Unseen and Major Risk Factor

It's an interesting chicken and egg scenario. We know that mental health disorders are on the rise and worsening because of the pandemic.[49-56] We also know that those with mental health issues are more at risk for severe COVID-19.[55-58] Even before the current crisis, psychiatric treatment results, similar to conventional medicine, were not in a good spot.[49-64]

Recently, Mental Health America (MHA) assessed fifteen psychiatric health measurements from national surveys, compiled the results, and compared their incidence across the states.[50-52] Prior to the traumas and uncertainties of the events of 2020-2021, approximately 20% of Americans experienced mental illness.[50] This equates to approximately 47 million people! The state prevalence ranged from 25.25% in Utah and 16.14% in New Jersey. Furthermore, many were avoiding treatment due to the associated stigma, accessibility, and/or shame of a mental health diagnosis.[51-52]

Sadly, access to current treatments have also been inadequate to meet sufferers' needs. About 11% of Americans who need mental health support are uninsured, and only about 27% of youth with severe depression receive constant care.[50]

Even more disturbing, the MHA reported on the alarming increase in depression and anxiety, meaning more people are suffering in silence: "From January to September 2020, 315,220 people took the anxiety screen, a 93 percent increase over the 2019 total number of anxiety screens. 534,784 people took the depression screen, a 62 percent increase over the 2019 total number of depression screens."[50]

On March 2021, the CDC echoed this troubling rise in mental health issues in their survey using a validated four-item Patient Health Questionnaire (PHQ-4):

> During August 2020 – February 2021, the percentage of adults with recent symptoms of an anxiety or a depressive disorder increased from 36.4% to 41.5%, and the percentage of those reporting an unmet mental health care need increased from 9.2% to 11.7%. Increases were largest among adults aged 18–29 years and those with less than a high school education.[53]

Interestingly, even if their emotions were not "validated" in the MHA reported screening, many people *felt* anxious and depressed. This is a concerning factor that may be perpetuating society's mood imbalances because the long-term, chronic stress of feeling "off" can literally rewire the brain.[65]

By downregulating neural pathways to the prefrontal cortex (PFC) and enhancing connections to the limbic, emotional brain (amygdala and hippocampus), stress can change one's ability to cope effectively and result in physical, mental, and relationship disorders. For those already with preexisting psychiatric conditions, this impact can be even more profound.[65]

Unfortunately, the emotional undertone of our society is hitting our young the hardest. Our children's mental health has been severely negatively affected.[50-52,54,56] On October 19, 2021, the American Academy of Pediatrics (AAP), the American Academy of Child and Adolescent Psychiatry (AACAP) and the Children's Hospital Association (CHA), which represents over 77,000 physicians and over 200 children's hospitals, "declared a national state of emergency in child and adolescent mental health." They are calling on policymakers to join forces with them:

"The COVID-19 pandemic has taken a serious toll on children›s mental health as young people continue to face physical isolation, ongoing uncertainty, fear and grief. Even before the pandemic, mental health challenges facing children were of great concern, and COVID-19 has only exacerbated them," stated the press release from the AACAP.[54]

Missing the Forest for the Trees: Treating the Truly Vulnerable

Many doctors are so laser focused on immune modulation, weight, and inflammation as the major risk factors to address to mitigate the repercussions of the virus that they are missing the fact that mental health, specifically anxiety and "fear-related" disorders, have also been highly associated with severe COVID-19 in both adults and children.[11-14]

A 2021 study published in *Preventing Chronic Disease* analyzed data from 800 US hospitals on patients 18 years or older with COVID-19 from March 2020 through March 2021. Data was taken from the Premier Healthcare Database Special COVID-19 Release (PHDR-SR). Multivariable generalized linear models were used to allow for adjusted risk of several factors, including admission to the intensive care unit, invasive mechanical ventilation, death linked to frequent conditions, and total number of conditions.[11]

The results and conclusion of the analysis validated that fear and anxiety disorders were a major risk factor for severe COVID-19, along with several other underlying conditions:

> Among 4,899,447 hospitalized adults in PHD-SR, 540,667 (11.0%) were patients with COVID-19, of whom 94.9% had at least 1 underlying medical condition. Essential hypertension (50.4%), disorders of lipid metabolism (49.4%), and obesity (33.0%) were the most common. The strongest risk factors for death were obesity (adjusted risk ratio [aRR] = 1.30; 95% CI, 1.27-1.33), anxiety and fear-related disorders (aRR = 1.28; 95% CI, 1.25-1.31), and diabetes with complication (aRR = 1.26; 95% CI, 1.24-1.28), as well as the total number of conditions, with aRRs of death ranging from 1.53 (95% CI, 1.41-1.67) for patients with 1 condition to 3.82 (95% CI, 3.45-4.23) for patients with more than 10 conditions (compared with patients with no conditions).[11]

Furthermore, there are other perpetuating factors: (1) Those who have had COVID are more likely to get a mental health issue following it[40,55-56] (2) A rise in deaths due to opioid overdose in context with the pandemic. In the article, *One Year In: COVID-19 and Mental Health*, published by NIH, Joshua Gordan writes:

> Emerging data also indicate that people with schizophrenia and other serious mental illnesses have also been hard hit by the pandemic. Individuals with schizophrenia, for instance, are nearly 10 times more likely to contract COVID-19 and are nearly three times more likely to die from it if they do fall ill, compared with individuals who do not have a mental illness. Finally, deaths due to opioid overdose rose substantially in the context of the pandemic. These

> data remind us that we need to work hard to address long-standing disparities and ensure access to life-saving medical and psychiatric care is available for all Americans.[56]

Mental Health Foundation.org also reported on this "bidirectional link" between the virus and mental health:

> In a study titled "Bidirectional Associations Between COVID-19 and Psychiatric Disorder" carried out by researchers at Oxford University in England and published in The Lancet Journal on 11/9/2020, their findings showed that 20% of COVID-19 survivors with no previous psychiatric history received a psychiatric diagnosis within 14 to 90 days after being diagnosed with COVID-19. Most commonly found in COVID-19 survivors were anxiety, depression, and insomnia.[66]

I strongly believe you cannot treat the physical without looking at the emotional. Furthermore, you cannot treat the emotional without peering into what physiologically and biochemically impacts brain health.[67]

What can we do? We can also start addressing mental and emotional health as mindfully as we do diet, lifestyle, and stress reduction. In fact, I believe our medicine can be agents for change and provide holistic solutions to the gaps in conventional psychiatric treatment that focus solely on cognition or emotional processing.

Another major area we can address is mindset. The stressful messages of how vulnerable we are, the relationship divisions based on political and personal viewpoints, and promoting diet culture messages and unintentional body shaming could be contributing to this feardemic. We can stop participating in this.

Rather, we can start offering belief and hope that we have more control over our body and health outcomes than is currently understood or promoted.

The Power of Belief, Hope, and Mindset as Medicine

Both great scientists and spiritual masters have paid respect for something that has a profound ability to ignite a healing response. It is not something that is based in form or even a substance that can alter your consciousness, but it does have the capacity to influence thought processes and shift brain function patterns and biochemical pathways in the body.

In religious and spiritual texts, thoughts and beliefs are believed to alter mental and physical states.[68-70] Those who work with biology, psychiatry, and biochemistry refer to the same phenomenon as the "placebo effect."[71-77] According to Harvard Medical School:

> Your mind can be a powerful healing tool when given the chance. The idea that your brain can convince your body a fake treatment is the real thing – the so-called placebo effect – and thus stimulate healing has been around for millennia. Now science has found that under the right circumstances, a placebo can be just as effective as traditional treatments.
>
> "The placebo effect is more than positive thinking – believing a treatment or procedure will work. It's about creating a stronger connection between the brain and body and how they work together," says Professor Ted Kaptchuk of Harvard-affiliated Beth Israel Deaconess Medical Center, whose research focuses on the placebo effect.[72]

There is also a concept known as "reverse placebo," the nocebo effect. This results in negative physical effects on the brain and body related to the belief that a placebo will be detrimental.[71,78-80]

The placebo effect is real and, depending on if one is a clinical trialist or neurologist, the significance of the change that occurs in one's physiology by the administration of an inert substance or sham intervention is either an obstacle to overcome or a fascinating biopsychological effect.[71-77] According to the 2011 article, "How Placebos Change the Patient's Brain," published in *Neuropsychopharmacology*:

> A real placebo effect is a psycho-biological phenomenon occurring in the patient's brain after the administration of an inert substance, or of a sham physical treatment such as sham surgery, along with verbal suggestions (or any other cue) of clinical benefit (Price et al, 2008). Therefore, the effect that follows the administration of a placebo cannot be attributable to the inert substance alone, for saline solutions or sugar pills will never acquire therapeutic properties. Instead, the effect is because of the psychosocial context that surrounds the inert substance and the patient. In this sense, to the clinical trialist and to the neurobiologist, the term 'placebo effect' has different meanings. Whereas the former is interested in any improvement that may occur in the group of patients who take the inert substance, regardless of its origin, the latter is only interested in the improvement that derives from active processes occurring in the patient's brain. In fact, the improvement in patients who are given a placebo can be ascribed to a vast array of factors, such as spontaneous remission of the disease (the so-called natural history), regression to the mean (a statistical phenomenon due to selection biases), patient's and doctor's biases, and unidentified effects of co-interventions (Figure 1). In pragmatic clinical trials, the trialists are interested in the improvement irrespective of its cause, because they only need to establish whether the patients who take the true treatment, be it pharmacological or not, are better off than those who take the placebo. This pragmatic approach yields fruitful results in clinical trials. However, if we are interested in understanding what a real placebo effect is and how it works, we need to separate it from spontaneous remissions, regression to the mean, biases, and so on (Benedetti, 2008a).[73]

In a review article on the neuroscience of placebo effects, this evolving field is explained as one that, "integrates diverse areas of human and animal neuroscience, and complements studies of placebo effects on peripheral physiology, clinical pharmacology and other outcomes."[74]

Scientists have explored the many mechanisms behind how the placebo and nocebo effects work. Several theories and clinical-based trials have suggested multiple pathways. These include the following:[71,73,76-77,79]

- Psychological theories (i.e., expectation model, conditioning model, social interactions, and personality traits)

➤

➤

- Biological effects (e.g., genetics, the opioid pathway, CCK, dopamine, neuroendocrine, and immune)
- Changes in brain patterns (e.g., changes in emotional center activity and other areas)

In one 2014 mini-review, the authors explored the various explanations of how our mental model of treatment influences our healing processes. The power of the belief that meeting a therapist or doctor will bring relief is profound:

> Expectation model explains how thoughts and beliefs can have strong influence on the health state and on the neurochemical reactions in the body and can lead to hormonal and immunological response of the patient, what seems to be the placebo reaction but is actually a true therapeutic response. On the other side, negative beliefs and expectations can lead to worsening of the health state or the nocebo effect (Moerman 1981, Guess et al. 2002, Manchikanti et al. 2011). The main role in this phenomena is our "belief system," an important part of our mental model and of our healing process, including feeling sick, seeking relief, meeting the therapist and receiving the therapy. (Jopling 2008, Benedetti 2013)[79]

Concerningly, the nocebo effect seems to be highly influenced by a physician's expectations and communication of the treatment. Several studies have shown that a patient who doesn't feel listened to and/or does not have a therapeutic bond with the doctor may experience worse outcomes with the intervention vs. someone in a healthy partnership with their provider.[71,78-79]

Are we creating a nocebo effect globally with our messages and mainstream media avalanche of doom and gloom?

True, this virus is deadly, and we need to know that. However, how do we balance that fact with nurturing of our patients' ability to be proactive, rather than just "scaring them into compliance?"

Mindset as Medicine

Through no fault or intention of many physicians, they often find themselves caught in a health care system that only manages disease or the damaged organ, not one that aims to heal the person.[1-7] Seeking to ensure they are following "standard of care" and not giving false hope to avoid legalities can ensure proper protocol, but where is the line in the sand?

Much of my job is supplementing my client's medical care with a whole-person program that incorporates the mind-body connection. I do not promise results or state untruths or non-scientific claims. I do, however, remind my clients that they are a miracle and that their body responds biochemically to their thoughts. I also invite them to rediscover their innate intelligence of how their body wants them to be well and it uses their symptoms as a form of gentle communication, not a scolding. This approach to merge medicine with mindset and belief in the body's capacity to heal is sorely lacking in sick care, but it doesn't have to be this way.[5-7]

We can help to shift mindset from a fixed state to a growth state. According to *Psychology Today*:

> A mindset is a belief that orients the way we handle situations – the way we sort out what is going on and what we should do. Our mindsets help us spot opportunities, but they can also trap us in self-defeating cycles.
>
> The Stanford University psychologist Carol Dweck (2006) popularized the idea of mindsets by contrasting different beliefs about where our abilities come from. If we have a fixed mindset and think that our ability is innate, then a failure can be unsettling because it makes us doubt how good we are. In contrast, if we have a growth mindset, then we expect that we can improve our ability – and a failure, therefore, shows us what we need to work on.[81]

As naturopathic and functional medicine practitioners, we can merge the biochemical with the psychological aspects of health. Tools such as essential oils and mind-body practices are some components I use to assist with the "emotional reset" and to help clients cope with chronic stressors. However, these modalities must rest upon the foundation of managing a clinician's and a patient's mindset to be truly effective and long-lasting.

We can't wave a magic wand and make the virus go away, but we do have the power to take back control of our minds. We can focus on our values to live our best lives. We can aim to honor our patients and clients and seek to positively influence their health span trajectory with, dare I say it, a little hope.

First, it may take a little "physician heal thyself."

We have to do something different. Fear doesn't work. It can literally be a major risk factor in the very thing we are supposed to be afraid of.

Ironic, isn't it?

◆

Sarah Lobisco, ND, IFMCP, is a graduate of the University of Bridgeport's College of Naturopathic Medicine (UBCNM). She is licensed in Vermont as a naturopathic doctor and has earned her certification in functional medicine through the Institute of Functional Medicine (IFM). Dr. LoBisco also holds a Bachelor of Psychology from State University of New York at Geneseo and an Applied Kinesiology certification.

She is a speaker on integrative health, has several publications, and does independent contracting or companies regarding supplements, nutraceuticals, essential oils, and medical foods. Dr. LoBisco currently incorporates her training as a naturopathic doctor and functional medicine practitioner through writing, teaching, private practice, and through her independent contracting work. She maintains her private wellness consultation practice through virtual consultations. Dr. LoBisco also enjoys continuing to educate and empower her readers through her blogs and social media. Her recent blog can be found at dr-lobisco.com.

References are available online at www.townsendletter.com.

Simply the Best

It's so good the FDA uses Boluoke® as the gold standard for lumbrokinase research!

Your Patients.
Your Reputation.
Trust Nothing Less!

Boluoke® (lumbrokinase)

- the original lumbrokinase used in trials
- highest fibrinolytic strength on the market
- over 25 years of clinical safety/efficacy records
- does not affect INR or aPTT testing

Hypercoagulation, a central issue in:

- conditions with a poor circulation
- growth and spread of malignant cells
- biofilm-associated chronic infections
- poor tissue healing due to hypoxia
- severe acute viral/bacterial infections

Dragon's www.dragonsmedicalbulletin.com
Medical Bulletin
Your Quick Stop for Integrated Clinical Research Updates

CRNA

1-866-287-4986
www.canadaRNA.com

Boluoke® is also available through:

Researched Nutritionals · Pro Health Network · return 2 health · antiaging-systems.com · MyP · NaturoDoc · BIORESOURCE

Integrative Approach to Inhalant Allergies

by Debby Hamilton, MD, MPH

Introduction

Everyone is familiar with the common symptoms of inhalant allergies such as rhinorrhea, congestion, and sneezing along with pruritis and irritated eyes.[1] These acute symptoms can greatly interfere with daily life depending on their severity. Inhalant allergies contribute to difficulty with sleep, leading to daytime fatigue and interference with work productivity.[2]

There is a wide range of environmental triggers leading to these symptoms. The primary ones are either from the natural environment such as trees, plants, dust, and molds or from man-made pollutants in the air.

Inhalant allergies have a prevalence of 10% to 40% depending on the geographical location.[3] There have been drastic changes in our environment over the last few decades contributing to the increasing prevalence. Climate change has contributed to an increase in air pollutants and a change in growing and pollination times. There has been an increase in chemicals added to our food and water contributing to new foreign chemicals contributing to an increase in potential allergens. These chemicals have altered our internal environment also with significant immune impacting changes to our microbiome. With these changes, inhalant allergies and other atopic diseases will continue to increase and have a negative impact on people's quality of life.

Acute Immune Mechanism

In allergic rhinitis, initial allergen exposure and sensitization involves multiple different immune cells. The antigen presenting cells, T and B lymphocytes lead to the development of allergen specific T cells and allergen specific IgE antibodies. Repeat exposure leads to the binding of IgE cross linked antibodies onto mast cells causing release of allergic chemical mediators such as histamine.[1,4] The release of histamine leads to the symptoms of allergic rhinitis such as rhinorrhea and sneezing. This is followed by a secondary allergic inflammatory response with Th2 lymphocytes, eosinophils, and basophils infiltrating the nasal mucosa and causing a late allergic response.[4]

Risk Factors

Chronic Immune Dysfunction. Long-term allergies, including allergic rhinitis, are associated with a chronically elevated T helper 2 cells (Th2) response. This ongoing elevated Th2 response is a common immune imbalance in chronic patients. With inflammation, especially inflammation arising in hollow organs such as the intestines and the lungs, there is an increase in T helper 17 cells (Th17) and a decrease in T regulatory cells.[5] A common example of this is dysbiosis or SIBO in the intestines leading to elevated Th17 and decreased T regulatory cells. An increase in Th17 cells with a concomitant lowering of Th1 cells leads to the development of autoimmune disease.[6]

Th17 and Th1 cells are antagonistic so if Th17 cells are elevated this leads to a decrease in Th1 cells. The decrease in Th1 cells results in a decrease in the ability to fight intracellular infections such as viruses. An increase in infections, then, causes an increase in inflammation leading to higher levels of Th17 cells, which creates an ongoing cycle of chronic immune imbalance.

When Th1 cells are low this leads to an increase in Th2 cells since these two groups of helper cells are antagonistic. Multiple chronic diseases, including autism, PANS, rheumatoid arthritis, and multiple sclerosis, have this immune imbalance with elevated Th17 and Th2 and decreased Th1 and Treg cells.[7-11] This imbalance leads to allergic diseases along with autoimmune propensity with an increased risk of chronic infections.

Hygiene Hypothesis. The hygiene hypothesis was proposed as one explanation to explain the increase in allergies. The idea was that there has been a decrease in infectious disease exposure in young children causing a decrease in Th1 immune responses needed to fight infections. This decrease in Th1 immune response leads to a shift toward an increase in Th2 immune responses associated with allergic diseases.[12] This decrease in exposure to infectious microbes is increased using hand sanitizers and decreased exposure to microbes from the dirt. Children raised on farms with increased exposure to dirt and animals with presumed increase in exposure to microbes have less allergic disease.[13]

Abnormal Microbiome. An abnormal microbiome in adults has been associated with an increase in all types of atopic diseases.[14] Multiple studies have looked at the types or bacteria in the intestinal microbiome and found decreased diversity. One study in adults with nut allergies and seasonal pollen showed a decreased microbial diversity with reduced Clostidium species and an increase in Bacteriodes.[15] Another research study aimed at allergic rhinitis specifically in adults also found decreased

diversity with similar imbalances as the previous study along with reduced Oxalbacter and Firmucutes microbial populations.[16] An altered microbiome is associated with multiple chronic illnesses and an immune system imbalance so it makes sense that it would be associated with an increase in allergic rhinitis and other atopic diseases.

Pregnancy and Postpartum Issues. The microbiome of the pregnant woman influences her immune system, which subsequently impacts her infant's risk of allergy. This influence begins early in gestation. The maternal microbiome influences the fetal immune system by aligning the maternal and infant regulatory immune balance.[13] In utero, there is passage of microbial metabolites and IgG antibodies across the placenta that also influence the development of an allergy-prone immune phenotype in the infant.[13]

Maternal allergy can impact an infant's allergy potential. In pregnancy, there is a natural down regulation of Th2 responses to allergens in later pregnancy.[17] Pregnant women with allergies have higher Th2 responses to begin with and do not exhibit the natural down regulation of these responses later in pregnancy.[17]

The mode of delivery can influence the microbiome of the infant. The newborn is naturally supposed to obtain the beneficial microbes for their microbiome during a normal vaginal delivery. A cesarean section bypasses this natural mechanism leading to an altered microbiome that is associated with increased allergies in the infant.[18] Breastfeeding is another natural mechanism of establishing the microbiome in the infant. Lack of breastfeeding is associated with increased risk of allergies due also to an altered microbiome.[18] A woman's diet during pregnancy and breastfeeding can also influence allergy potential in their child.[19]

Climate Change. Climate change has resulted in an increase in allergic pollens and air pollution both contributing to rising rates and severity of atopic disease.[14] The change in our climate has to do with an increase in atmospheric greenhouse gases such as carbon dioxide, nitrous oxide, and methane. Carbon dioxide is used by plants for photosynthesis, so an increase in carbon dioxide leads to growth of plant species such as ragweed that thrive at high carbon dioxide concentrations.[14] Increasing temperatures with less frost also leads to an increase in pollination times and longer seasons for trees.[20,21]

Air pollution such as ozone, nitric oxide, diesel exhaust, and other volatile chemicals have also been increased because of climate change. Inhaled air pollutants cause inflammation, oxidative stress, and increased permeability in the airways, which can increase the uptake of allergens.[22] These air pollutants can also bind to pollens and other allergens in the air, leading to an increase in their uptake in the body.[22] When children are exposed early in life to air pollutants, they are at increased risk for the development of asthma, allergic rhinitis, and eczema.[23]

Genetics. Allergic disease is considered primarily polygenic because the search for specific genes has only shown several specific single nucleotide polymorphisms (SNPs). Allelic variants or SNPs for increased risk of allergic rhinitis specifically are found in the IL1 genes and the TNF alpha genes.[24] For the IL-1B gene those homozygous for the T allele had an eight-fold increase in allergic rhinitis versus the C allele.[24]

Since there have not been multiple single genes associated with allergic rhinitis and other atopic diseases, epigenetic changes are thought to play a much greater role. Epigenetic changes from DNA methylation and histone modification modify the influence of environmental exposures such as air pollution contribute to the rising rates of allergic diseases.[25]

Treatment

Transfer Factors: Immune Balancing. One way to help balance the immune system away from the elevated Th17, Th2 and low Th1, Treg cell paradigm seen with allergies and many chronic diseases is by the use of transfer factors. Transfer factors are small proteins with DNA made by activated T helper cells that help boost cell mediated immunity needed to fight viruses.[26] They are smaller immune markers similar to antibodies, which are released from B cells. Because they help strengthen cell mediated immunity, they help support an increase in Th1 immunity. By increasing Th1 immunity both Th17 and Th2 levels are decreased. An elevation of Th2 is associated with an increase in allergic rhinitis and atopic disease. Lowering Th2 then helps balance the immune system away from allergies.

In allergic rhinitis, initial allergen exposure and sensitization involves multiple different immune cells.

Transfer factors can be supplemented as an individual ingredient and in multi-ingredient blends. Transfer Factor Multi-Immune™ from Researched Nutritionals is a multi-ingredient supplement with transfer factors, immune supporting mushrooms such as shitake and maitake, astragalus, zinc, selenium, arabinogalacatan, beta-glucan, and antioxidant herbs. Research with this formula has shown an increase in innate and adaptive immunity to help fight infections.[27] Levels of natural killer cells, B and T lymphocytes were increased significantly helping the body's infectious immune response.[27] Transfer Factor Multi-Immune™ was also shown to have modulating effects with an increase in Il-10 and IL-1ra.[27]

Probiotics: Improving the Microbiome. Probiotics are important for helping maintain and improve the microbiome. Research has shown that probiotics are immune modulating for allergic rhinitis with the potential to change disease severity and symptoms.[1] There appears to be multiple mechanisms of immune modulation. Animal studies have shown probiotics to increase the Th1 and T regulatory cells and to decrease the Th2 response associated with allergies by modifying the types of gut flora.[1,28] Research has also shown that probiotics can impact levels of specific IgE levels.[1]

There is much to be learned about the impact of supplemental probiotics on immune function and regulation of atopic disease. The question is also what specific species of probiotics and the dosage. Currently, probiotics are derived from soil (spore based) or derived from ➤

➤

food such as the Lactobacillus and Bifidobacteria strains. Many strains have been researched to elucidate immune modulation and clinical improvement. Certain strains of Lactobacillus and Bifidobacteria can increase histamine and others lower histamine, which can play a role in allergic diseases.

Since we know that probiotics help with decreasing allergies and modulating the immune system but there is inadequate research on individual strains, I recommend multi-species products that include both soil-based probiotics and histamine-lowering food-based Lactobacillus and Bifidobacteria strains. MultiBiome™ was formulated based on this principal of combining histamine-lowering probiotic strains of both soil-based and food-based researched strains.

Flavonoids. Flavonoids are phyto-nutrients found in fruits and vegetables. They are a type of polyphenol. These phytonutrients are known to have anti-allergenic, anti-oxidant, anti-inflammatory, and anti-cancer properties.[29] For allergic diseases, the general mechanism of action is to decrease the IgE mediated activation of mast cells, so they do not degranulate and release histamine and other mediators, including cytokines.[29] Flavonoids have been found to decrease pro-inflammatory cytokines such as Il- 4, IL-5, TNF-alpha, IL-6, IL-1B, and IL-8.[29-31]

There are multiple flavonoids that have been shown to inhibit mast cell activation resulting in a decreased release of histamine. Quercetin is one of the most well researched of the flavonoids. Compared to one of the prescription mast cell inhibitors, cromolyn sodium, it has been found to be better at blocking mast cell degranulation of histamine and cytokines.[32] Luteolin is another flavonoid that also inhibits mast cell activation with specific research inhibiting allergic rhinitis.[33] In addition, luteolin appears to be inhibiting microglial activation leading to neuroprotection.[34] A combination of quercetin and luteolin has been beneficial in decreasing allergies and inflammation in children with autism.[34]

Less well known but well-researched flavonoids include fisetin and perilla. They have both been shown to decrease activation of mast cells and therefore decrease allergic disease.

Each of them appears to have other immune modulating effects that help decrease atopic disease. Fisetin has been shown to decrease the interaction between mast cells and activated T cells, which is part of the immune response in the development of allergies.[35] Perilla has over 271 different chemical components, including rosmarinic acid and luteolin, thought to contribute to its supportive properties, including anti-allergenic effects.[36] It is also a flavonoid-like fisetin that impacts other immune cells in addition to mast cells. For allergic rhinitis, it decreases the migration of polymorphonuclear cells into the nasal tissue.[37] Fisetin and perilla have also been found to decrease asthma triggered by mast cells.[38,39]

Natural Histamine Receptor Blockers. One of the primary treatments for seasonal allergic rhinitis are histamine receptor one blockers such as Claritin or Benadryl. Stinging nettles (*Urtica dioca*) is an herb that can block histamine one receptors.[40] In addition, it has shown anti-inflammatory effects by decreasing cytokines and prostaglandins.[40]

Treatment Summary. My approach to allergic rhinitis is a combination treatment approach. I recommend inhibitors of mast cell activation along with a natural histamine one blocker. HistaQuel® is a product that combines multiple flavonoids along with stinging nettle for its histamine blocker mechanism. Since flavonoids inhibit release of mast cell histamine and cytokines, starting these as a supplement before seasonal allergies begins can be extremely helpful.

In addition, I use transfer factors and probiotics to help modulate the immune system away from an elevated Th2 allergic-promoting response. Low vitamin D has been associated with an increase in allergic rhinitis so measuring levels and supporting low vitamin D levels is beneficial.[41] Vitamin C is often found in combination with quercetin and is a good addition. Finally nasal irrigation is used to clean the nasal cavities from allergens such as air pollution and dust and can be helpful to people.

Seasonal allergies are increasing and, considering how our environment is heading, will continue to be an ongoing problem for patients. Understanding the underlying causes is helpful in terms of prevention and we have beneficial and natural safe options to help those suffering with chronic symptoms.

◆

References are available online at www.townsendletter.com.

Debby Hamilton, MD, MPH, is a pediatrician with experience in primary care, integrative medicine, research, speaking, and writing. Her education includes an undergraduate degree from Wesleyan University followed by a medical degree from Chicago Medical School, where she graduated with honors. She is board-certified in pediatrics, physician nutrition, and integrated/holistic medicine (AIHM), and has a master of science degree in public health (MPH).

Dr. Hamilton founded Holistic Pediatric Consulting in Colorado in 2005. Her practice focused on treating children with chronic diseases such as autism and ADHD, and preconception counseling based on her book, *Preventing Autism and ADHD: Controlling Risk Factors Before, During & After Pregnancy*. Her book led to her collaboration in the writing of *The Healthy Child Guide* through the Neurological Health Foundation. She has also contributed chapters for *Child Decoded: Unraveling Learning and Behavioral Disorders*.

In 2017, Dr. Hamilton joined Researched Nutritionals. She now splits her time between clinical work and expanding Researched Nutritional's clinical research on the efficacy of nutritional supplements, working on product development, and promoting the education of healthcare professionals.

The Role of the Peak Flow Meter in the Management of the Patient Receiving Allergy Immunotherapy

by Diego Saporta, MD

Peak flow meters are simple hand-held devices that measure the velocity of the expired air in liters per minute. This is a dynamic determination that gives an idea of how well the individual can forcefully empty the lungs. They are used as an aid for the management of asthmatic conditions.[1]

The peak flow (PF) value is best utilized when the value determined is compared to previously obtained values in the same individual. Changes in PF value can then suggest improvement or deterioration in lung function. The decrease in the PF value allows for early recognition and prompt treatment of asthma exacerbations.[2]

The device measures the peak expiratory flow (PEF) or peak expiratory flow rate (PEFR), commonly known as peak flow (PF). The normal values are influenced by age, height, weight, gender and race. The PF value increases with age and height but decreases with an increase in the Body Mass Index.[3]

The PF value is determined by the pressure exerted by the expiratory muscles in a forced expiration, so it is influenced by body build and the thoracic volume. The PF value rises to a maximum around age 30-35 which is consistent with increasing body size and muscular power. The PF value is strongly influenced by the voluntary effort,[4] so reliability can increase when subjects are properly trained and motivated to exert such maximum effort. The PF value is also influenced by the functional capability of the lung, so a healthy individual will be able to move more liters per minute than a person with a restricted or obstructed airway.[5]

Normative data helps to predict the normal value of an individual,[4,6] but because of the significant variations between individuals according to body structure, physical capability, lung conditions, sex, age or race, the normative values are only of relative usefulness.[7]

Changes in peak flow value can suggest improvement or deterioration in lung function.

PF Value in Asthma Management

The PF is reduced during the airway obstruction produced by asthma.[8,9] Pulmonary function starts to deteriorate before symptoms become clinically apparent.[10]

Personal Best

Because of the wide range of variation of the expected normal value, such determinations become useful when comparing the presently measured PF value with values previously obtained when the patient was asymptomatic, establishing a reference value called the Personal Best (PB).[11] In this way, a newly observed decrease will predict clinical deterioration before the patient becomes symptomatic. This PB is different for each individual but a decrease in the PF value below the pre-established PB for that patient acquires clinical relevance as a predictor of deterioration of lung function so that the PB sets a reference standard upon which future determinations will be compared.

One way to determine the PB is by calculating the average of daily determinations obtained over a period of several days.[11] Once the PB is obtained, the 80% and the 50% of such value are calculated and recorded. A daily use of the PF meter allows the patient to be aware if the PF value is above the calculated 80% of the PB or not.

A significant decrease of the PF value is predictive of imminent deterioration of the lower airway, enabling the person to administer rescue medication prophylactically to stabilize the airway and to consult with the treating physician if there is no improvement. If the decrease of the PF value becomes critical (<50% of PB) the patient should seek immediate medical attention.

The American Academy of Allergy Asthma and Immunology,[11] the American Lung Association,[1] and similar organizations propose a "user friendly" method applying a concept similar to the traffic light:

- "Green" (the Peak Expiratory Flow is between 80% and 100% of the calculated PB): This person is stable and can continue with usual activities.
- "Yellow" (the Peak Expiratory Flow is between 50% and 80% of the calculated PB): This is a call for "Caution". This person should administer a short acting broncho-agonist (SABA) and be prepared for prompt consultation if there is no normalization of the PF value.

➤

➤

- "Red" (the Peak Expiratory Flow is lower than 50% of the calculated PB): This is a "Danger" situation. The possibility of a clinical deterioration of the lower airway is imminent. The person should administer inhaled bronchodilator medication immediately, continuing to administer up to three times in one hour. If the PF value does not reach a value at least between 50%-80% of the PB, the patient should contact the treating physician or even go to the nearest emergency room.

Lower Airway in Allergy Management

Administration of subcutaneous injectable immunotherapy usually known as "allergy shots," even though highly effective, carries a small risk of an anaphylactic reaction.

Even previously tolerated doses can trigger a reaction as the allergic individual can, at some point, be overwhelmed by different toxicants and stressors; and then, adding a parenteral dose of a mixture of allergens can be a triggering factor for the development of a systemic reaction.

While these reactions are infrequent, if they were to occur, they could progress into anaphylaxis and become life-threatening. It is documented that severe reactions and mortality are more prevalent in asthmatic patients.[12,13] Therefore, extra precautions need to be implemented when administering injectable immunotherapy to patients with an inflamed lower airway.

Precautions for the Administration of Injectable Immunotherapy

Because of the risk of treating a patient with involvement of the lower airway, it is important to identify such patients to maximize their pulmonary function. History plays a pivotal role and spirometry is a very useful tool to support such clinical impression. These patients are frequently placed on inhaled corticosteroids (ICS)[14] so that their symptoms abate and the functional parameters in the spirometry are maintained at their best value. With a stable lower airway as just described, intradermal testing is done; and injectable immunotherapy treatment is safe to be initiated.

Peak Flow Meters in Allergy Management

Patients with lower airway inflammation are prevalent in our practice. Because the PF meters were used since early in our practice as an aid in asthma management, we observed that when immunotherapy was successful, the value of the PF increased.

Following the concept of "one airway-one disease,"[15] it was assumed that the lower airway in allergic patients would be inflamed even if the patients were not asthmatic. Using PF meters in non-asthmatic patients showed that the PF value increased when allergy symptoms decreased during immunotherapy. This observation supported the idea that the inflammation present in the allergic condition may involve the entire respiratory tract. Soon after this observation, we incorporated PF meters to assess progress during immunotherapy treatment.

PF meters are used in all allergy patients, but they are used in a different way whether the patient is suspected of having a clinical involvement of the lower airway or not:

a) *PF meters are used in all allergy patients as a tool to monitor progress of the immunotherapy treatment.* All allergy patients have their symptoms scored every few months. At that time the value of the PF is determined, and the result recorded in the symptom scoring sheet, adding an objective determination to the assessment of patient-progression while subcutaneous injection immunotherapy is administered.
b) *PF meters used as an aid for the administration of allergy immunotherapy in patients with clinical evidence of inflammation of the lower airway.* For this type of patient, the PF value is determined before each injection and compared to a previously established Personal Best. The PF value in this case becomes an aid in the decision if shots are safe to be given at this encounter or not.

Use of the PF Meter as a Tool to Monitor Results of Allergy Immunotherapy

A chart review of 60 randomly selected patients receiving immunotherapy[16] demonstrated that the PF value increased in all patients who had successful immunotherapy treatment even if they did not have involvement of the lower airway. That finding suggests that the lower airway is inflamed in all allergy patients, which adds to the concept of "one airway-one disease."[15]

Evaluation of the PF value as above described can provide a rapid assessment of how a patient is responding to immunotherapy treatment. Evaluation of progress during immunotherapy is usually based on following changes in the symptoms scores and medication use, using a numerical scale. This subjective tool has been scientifically validated.[17] Using the PF value adds an objective determination of progress during treatment. It was found that the number of PF measurements was positively associated with the percentage improvement of the PF value ($P < 0.01$). Therefore, when more PF measurements were performed (longer treatment), greater increases in the PF value were obtained.

The PF meter device, when used repeatedly, does not always produce the same result. It has been reported that the coefficient of repeatability of the PEF can vary up or down by 10% to 17%.[18]

We observed[16] that when immunotherapy was successful, the PF value increased from 16.29% when two determinations were obtained to 28.95% when four or more determinations were done. In cases where the PF increased after each measurement, it had a 94% to 97% predictor value that the patient was improving. An increased PF value during immunotherapy administration was independent of the asthmatic condition, the presence of isolated asthma symptoms or the patient's age. Only length of treatment was related to an improved PF value. Therefore, when the PF value increases, it is likely that the patient is responding to the immunotherapy treatment.

The PF value in a child receiving immunotherapy needs to be interpretated with caution as height and weight can affect the PEF.[19] A child

grows, on average, 2.5 inches per year between the ages of 6 and 12,[20] and it can be expected that the PEF will increase a minimum of 20 points per inch of growth (20 liters/min).[21]

When evaluating immunotherapy results in children, frequent determinations of the PF value every two-to-three months will decrease the influence of growth in the final value of the PEF. Observing increases of the PF value every few months will suggest that the change is the result of the treatment rather than the growth.

Inflamed Lower Airway in the Patient on Injectable Allergy Immunotherapy

Symptoms suggestive of lower airway inflammation include cough triggered by exercise or responsive to bronchodilators, sensation of chest tightness, wheezing, shortness of breath, exertion-induced symptoms, waking up at night with any of the above symptoms, and also a history of inhaler or nebulizer use.

The concept that the lower airway is affected in an allergic patient is not new,[15] but this is not always clinically apparent and requires a concerted effort by the practitioner to specifically ask about this possibility.

From the clinical point of view, it appears that over the years, an increasing percentage of patients consult with symptoms suggestive of lower airway inflammation. The above referenced chart review[16] unexpectedly suggested that a significant number of patients that consult for "allergies" have symptoms indicative of inflammation of the lower airway. From the 60 non-selected charts, 13/60 or 21.7% of the patients stated that they had asthma; but from the 47/60 remaining patients that reported "no asthma," 30/47 had one or more asthma symptoms. Additionally, another 11/47 patients with "no asthma" had cough with no other asthma symptoms. These figures are staggering: not counting the patients with "only cough," a total of 43/60 patients (13/60 asthma + 30/60 no asthma) or 71.6% of this unselected sample included patients with clear evidence of inflammation of the lower airway. Stating that around 70% of the patients consulting for allergy have inflammation of the lower airway could be a conservative estimate, according to the results of this chart review, as at least some of the remaining 11 patients that had "cough only" could also be expected to have inflammation of the lower airway ("cough variant asthma").

The increasing prevalence of inflammatory conditions has been partially documented in other chart reviews from our patients on allergy immunotherapy.[22,23] This has also been reported by others,[24] a fact that suggests the role of the escalating rate of pollution in our environment.[25]

The prevalence of lower airway inflammation is so significant that we routinely ask all allergy patients that have denied having asthma if they have any of the symptoms suggestive of an inflamed airway, presently or during childhood, as this may have relevance for the safety of the administration of injectable allergy immunotherapy. Treatment of this inflammation by anti-inflammatory inhaled corticosteroids[14] and detoxifying interventions[25] may render the patient more tolerant to the injections, therefore increasing safety of this useful treatment modality.

Use of the PF Meter as a Tool to Increase Safety During Immunotherapy Administration

When a patient is diagnosed as potentially having an inflamed lower airway, the patient is trained in the use of the PF meter device and the patient is required to record the PF value over seven consecutive days before planning for intradermal testing. The average value of these determinations is considered as the "Personal Best" value (100%) using a similar system as above referenced.[1,11]

From this PB, the 80% and the 50% values are calculated. These three numbers (100%, 80% and 50%) are entered conspicuously into the allergy chart. Each time the patient comes to receive their allergy shots, besides the routine questions to establish safety to administer the shots, the PF value will also be obtained. **If the PF value is not higher than the 80% previously calculated, shots will not be given at this encounter.** The patient will be handled medically until the treating doctor determines stability.

If the determined value is so low that it reaches 50% or less, short acting bronchodilators are immediately administered and the treating physician

will evaluate and further manage the patient, deciding between discharge to home or evaluation at the ER.

Using the PF meter device in this fashion we were able to increase safety during administration of injectable immunotherapy for the patient with an inflamed lower airway.

The Conundrum for the Patient with Lower Airway Inflammation

Diagnosis of asthma is not always easy. It is our personal observation that there is a huge number of people that deny having asthma but develop, for example, mild shortness of breath on exertion (like when walking upstairs) or seasonal symptoms that require the use of inhalers. Even though triggering by exertion is often attributed to sedentary lifestyle and lack of training, the symptoms commonly respond to the administration of inhalers. This response is verified not only clinically (patient reports breathing better) but also by an improvement in the parameters of the spirometry. The inhalers that we most often use are inhaled cortico-steroids as we want to establish not only a diagnosis but also decrease the reactivity of the lower airway.[14]

Preparation for Intradermal Testing for the Patient with an Inflamed Lower Airway

We consider that any patient that has a symptom pertaining to the lower airway that is responsive to anti-inflammatory therapy has an inflamed airway. Knowing that the risk of a severe reaction to immunotherapy is higher in people with involvement of the lower airway [12,13] leads us to advocate extra precautions when treating these patients.

Here is where the "asthma conundrum" lies. The asthmatic patient has a small but definite risk of mortality.[26] Allergen specific immunotherapy is a treatment modality able to modify the immunological system so that the allergic condition resolves,[27] even preventing progression of the allergic disease into asthma.[28] Therefore, allergic patients with an inflamed lower airway should be considered for specific allergy

➤

➤

immunotherapy as a treatment of their underlying inflammatory condition, but these patients are more at risk of developing a severe complication, even mortality, from such treatment.

The solution to this conundrum is to maximize the stability of the airway. Inhaled corticosteroids play a significant role in stabilizing the lower airway.[14] Administration of ICS leads into clinical symptom-improvement as well as improvement in the functional parameters of the spirometry. With the help of medications, diet modifications and administration of vitamins and supplements, the lower airway can be stabilized, and its function maximized so that the patient can be tested and immunotherapy treatment can be administered. Still, treating such patients with immunotherapy requires extra precautions. Here is where the role of the PF meter, as explained above, comes into play, because a value <80% of the pre-established PB will prevent the practitioner giving shots on that day even if clinically there was no suspicion of airway deterioration.

The Child with Inflamed Airway

Children include a subset of patients whose management is sometimes challenging. Spirometry, a valuable tool in the diagnosis of a lower airway dysfunction is difficult to obtain in children younger than five years of age. The PF meter is easier to use but diagnosing asthma in children using a PF meter is difficult.[29] An increase of 20% in the PEF after the administration of a bronchodilator suggests a reversible airway obstruction.[30]

When a set of three consecutive determinations of the PEF with a subsequent administration of a SABA shows an increase in the three values, we suspect a reversible obstruction of the lower airway. If the clinical history also supports this impression, we will institute anti-inflammatory inhaler therapy[14] before proceeding with testing such a child, in order to increase safety during immunotherapy management.

Conclusions

PF meters are simple devices that help in the management of patients during the administration of injectable immunotherapy by adding an objective parameter to the evaluation of treatment outcomes.

PF meters add an important level of safety when injecting allergy immunotherapy into patients with lower airway inflammation, including asthma. In this case, using the model of the "traffic light" for asthma management, the patient receiving immunotherapy is required to forcibly blow 80% or more of a previously determined Personal Best. Avoiding administering shots on days of low performance adds to safety while enabling the practitioner to continue treating the patient, as the patient with an inflamed lower airway, while needing the treatment the most, is the one most at risk from such treatment.

PF meter devices can also be used to help establish a clinical diagnosis of lower airway obstruction in a child.

We encourage allergy practitioners to incorporate the use of PF meter devices into their practices.

Dr. Saporta completed his training in 1990 at Columbia Presbyterian Hospital in New York City. He is board certified in otolaryngology and has been a fellow of the American Academy of Otolaryngic Allergy (AAOA) since 2001. His private practice in Elizabeth, New Jersey, is heavily oriented to the management of allergic conditions. Interested in the use of oral vaccines since early in his practice, Dr. Saporta presented a protocol for sublingual immunotherapy at the 64th annual meeting of the AAOA that since then has been successfully used for the management of allergic rhinitis with or without asthma.

References

1. https://www.lung.org/lung-health-diseases/lung-disease-lookup/asthma/living-with-asthma/managing-asthma/measuring-your-peak-flow-rate#:~:text=A%20peak%20flow%20meter%20is,pushed%20out%20of%20your%20lungs.
2. To learn how to use a PF meter device see "How Do You Use a Peak Flow Meter?" in https://www.lung.org/lung-health-diseases/lung-disease-lookup/asthma/living-with-asthma/managing-asthma/measuring-your-peak-flow-rate#:~:text=A%20peak%20flow%20meter%20is,pushed%20out%20of%20your%20lungs.
3. Kaur, Harpreet et al. Variations in the peak expiratory flow rate with various factors in a population of healthy women of the malwa region of punjab, India. *Journal of clinical and diagnostic research : JCDR*. 2013;7(6): 1000-3.
4. Nunn AJ, Gregg I. New regression equations for predicting peak expiratory flow in adults. *BMJ*. 1989;298(6680):1068-1070.
5. Carson JW, Hoey H, Taylor MR. Growth and other factors affecting peak expiratory flow rate. *Arch Dis Child*. 1989;64(1):96-102.
6. Gregg I, Nunn AJ. Peak expiratory flow in normal subjects. *Br Med J.* 1973;iii:282-4.
7. Frischer T, Meinert R, Urbanek R, Kuehr J. Variability of peak expiratory flow rate in children: short and long term reproducibility. *Thorax*. 1995 Jan;50(1):35-9.
8. Nasreen S, et al. Changes of Peak Expiratory Flow Rate in Adult Asthmatic Patient. *Mymensingh Med J*. 2018 Apr;27(2):245-250.
9. Li JT. Home peak expiratory flow rate monitoring in patients with asthma. *Mayo Clin Proc.* 1995 Jul;70(7):649-56.
10. https://www.aafa.org/asthma/asthma-diagnosis/lung-function-tests/peak-flow-meters.aspx
11. https://www.aaaai.org/Tools-for-the-Public/Conditions-Library/Asthma/Peak-Flow-Meter
12. Borchers AT, Keen CL, Gershwin ME. Fatalities following allergen immunotherapy. *Clinical Reviews in Allergy & Immunology.* 2004 Oct;27(2):147-158.
13. Bernstein DI, Wanner M, Borish L, Liss GM; Immunotherapy Committee, American Academy of Allergy, Asthma and Immunology. Twelve-year survey of fatal reactions to allergen injections and skin testing: 1990-2001. *J Allergy Clin Immunol*. 2004;113(6):1129–36.
14. Reddel HK, et al. Should recommendations about starting inhaled corticosteroid treatment for mild asthma be based on symptom frequency: a post-hoc efficacy analysis of the START study. *Lancet* 2017; 389: 157–166.
15. Grossman J. One airway, one disease. *Chest*. 1997 Feb;111(2 Suppl):11S-16S
16. Saporta D. Changes in Peak Flow Value during Immunotherapy Administration. *Journal of Environmental and Public Health*; Volume 2012, Article ID 212867, 9 pages. doi:10.1155/2012/212867
17. Pynnonen MA, Kim HM, Terrell JE, Validation of the sino-nasal outcome test 20 (SNOT-20) domains in nonsurgical patients. *American Journal of Rhinology and Allergy.* 2009;23(1): 40–45.
18. Enright PL, Sherrill DL, Lebowitz MD. Ambulatory monitoring of peak expiratory flow. Reproducibility and quality control. *Chest.* 1995 Mar;107(3):657-61.
19. Kaur H, et al. Variations in the peak expiratory flow rate with various factors in a population of healthy women of the malwa region of punjab, India. *J Clin Diagn Res*. 2013;7(6):1000-1003.
20. https://www.beaumont.org/services/childrens/health-safety/your-growing-child-school-age#:~:text=While%20all%20children%20may%20grow,about%202.5%20inches%20per%20year
21. http://tvscn.nhs.uk/wp-content/uploads/2014/09/Paediatric-Normal-Values.pdf
22. Saporta, D. Changes in Skin Allergy Testing Reactivity observed after a Hurricane. Is the Environment Responsible? *SOJ Immunol*. 2015;3(3): 1-6.
23. Saporta D, Hurst D. Increased Sensitization to Mold Allergens Measured by Intradermal Skin Testing following Hurricanes. *Journal of Environmental and Public Health*. 2017, Article ID 2793820. https://doi.org/10.1155/2017/2793820
24. Toskala E, Kennedy DW. Asthma risk factors. *Int Forum Allergy Rhinol*. 2015;5 Suppl 1(Suppl 1):S11-S16.
25. Genuis SJ. Sensitivity-related illness: the escalating pandemic of allergy, food intolerance and chemical sensitivity. *Science of the Total Environment*. 2010; 408(24): 6047– 6061.
26. https://www.cdc.gov/asthma/asthma_stats/asthma_underlying_death.html
27. Malling HJ, Weeke B. Immunotherapy. Position Paper of the European Academy of Allergology and Clinical Immunology. Allergy 1993; 48(Suppl 14):9-35.
28. Jacobsen L, et al. Specific immunotherapy has long-term preventive effect of seasonal and perennial asthma: 10-year follow-up on the PAT study. *Allergy*. Aug 2007;62(8):943-948.
29. Murray C, et al. Diagnosis of asthma in symptomatic children based on measures of lung function: an analysis of data from a population-based birth cohort study. *Lancet Child Adolesc Health*. 2017;1(2):114-123.
30. Kirenga BJ, et al. Guidance on the diagnosis and management of asthma among adults in resource limited settings. *Afr Health Sci*. 2015;15(4):1189-1199.

◆

Diagnosis of the Pathophysiology of Chronic Mucosal Diseases of Allergic Rhinitis, Asthma, and Otitis Media as Seen by an Otolaryngologist

by David S. Hurst, MD, PhD,[1] and Alan B. McDaniel, MD[2]

Otolaryngologists, like pediatricians, often see patients with chronic rhino-sinusitis and draining ears. Surgeons can offer various procedures, from simple tympanostomy tubes to advanced sinus and turbinate operations, in which significant portions of bone and mucosa are removed. The rates of reinfection are often reduced[1] but failures occur.

All agree that surgery would rarely be necessary if early identification of the underlying pathophysiology could guide preventative treatment. Allergic reactions can affect any organ, including the eyes, nose and sinuses, middle ears and mastoids, pharynx and larynx, lower airway, skin and gut. The middle ear and sinuses are embryologically homologous.[2] The 2016 AAO-HNS guidelines[3] emphasize the "unified airway" of respiratory mucosa linking the mastoid sinuses, middle ears, Eustachian tubes, nose and sinuses with the pharynx, larynx and lower airway with similar cellular responses leading to inflammation. They state that the middle ear is part of the unified airway, and "like other parts of respiratory mucosa, the mucosa lining the middle ear cleft is capable of an allergic response."[3]

The answer to the question regarding recurrent eustachian tube dysfunction (ETD), sinusitis, and nasal polyps requires an understanding of the Th1 and Th2 helper cell pathophysiology of the mucous membrane itself. Allergy, a Th2 response, adds unique co-morbidity and is by far a greater risk for inflammation than any other identified factors.[4] The bacteria cultured are opportunists.

In the mucosa of allergic individuals, the sinuses and middle ear have all been shown to have degranulating mast cells and eosinophils,[4] which are genetically programmed to be *hyperreactive.* On exposure to an allergen, these cells activate and participate in a type I IgE-mediated Th-2 driven inflammatory reaction.[5] Atopy involves a Th2 response whose related symptoms are deemed "allergic.''[6] They release various inflammatory mediators that create an environment of mucostasis, bacterial overgrowth, and chronic inflammation.[7] This Th2 response uniquely adds co-morbidity and is a much greater risk for inflammation than any other identified factor.[4] Indeed, the pathophysiology of allergic rhinitis, chronic sinusitis, asthma, and ETD are associated with positive *in vivo* or *in vitro* tests for IgE mediated hypersensitivity.[7,8]

Atopy involves a Th2 response whose related symptoms are deemed "allergic.''

Atopy has been defined as ``the propensity of an individual to develop IgE antibodies.''[6] Indicators of a Th-2 driven, IgE-mediated inflammatory allergic response are mast cells[9] with their mediator tryptase and degranulating eosinophils.[10] Both are present in a majority of ears with chronic effusion[10] – as well as in the sinuses and lungs of allergic individuals. Their actions predispose allergic patients towards eustachian tube dysfunction (ETD), recurrent sinusitis, often asthma and nasal polyps. Data representing over 1.4 billion pediatric visits[1] and a meta-analysis link allergic rhinitis to ETD and otitis media with effusion.[11]

A Review of the Cells Involved in Allergic Middle Ear Disease

Some have questioned the causal linkage of atopy/allergic hypersensitivity and ETD/chronic otitis media with effusion. First, based on objective allergy testing, the majority of OME patients are atopic.[12] Secondly, the current best evidence supports this association: De Corso's systematic review of 3,010 papers provides an in-depth explanation of physiopathology factors linking allergy to increased risk of middle ear inflammation.[13]

Hurst and Venge studied 97 children with OME, of whom 81% were atopic.[10] In middle ear fluids, allergic children had significantly higher eosinophil cationic protein (ECP) and tryptase than non-atopic children ($P<0.001$), indicating Th-2 mediated eosinophil and mast cell activity. Tryptase was >2 mg/l in 64% (23/36) of atopic patients.[10] As a marker of atopy among patients with non-purulent effusion, ECP had a positive predictive value of 97.1% and a diagnostic sensitivity of 86%.[10] Cell kinetics would suggest that these elevated levels of ECP and tryptase produce an active inflammatory process.[14]

➤

[1] Tufts University, Dept. of Otolaryngology (retired Assistant Clinical Professor)
Correspondence: Tel: 01-207-578-0743
E-mail: oto72hurst@gmail.com

[2] University of Louisville, Kentucky
E-mail: abmcdaniel0621@gmail.com

➤

Testing and Therapy:

The optimal therapy for an allergic condition is successful hyposensitization immunotherapy.[15] Treatment success begins with accurate allergy tests that establish the correct diagnosis – but tests are imperfect. Clinicians see patients with typical symptoms and signs of allergy, who respond to allergy medications but are reportedly negative upon allergy testing.

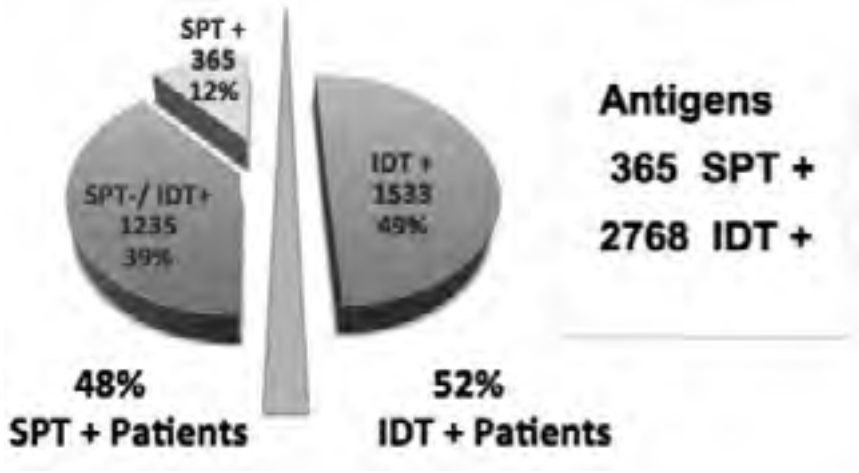
The basic question underlying this conundrum is: **What type of allergy testing was done?** Skin prick tests (SPT) introduce antigen at approximately 1:65,000 w/v. Intradermal dilution testing (IDT) injects antigens diluted five-fold, from 1:65,000 to 1:500 w/v. The stronger antigen concentrations used in IDT promise greater sensitivity than SPT.

Our recent report of 371 patients, comparing SPT and IDT test results and treatment outcomes provided evidence that IDT offers superior sensitivity, not false-positive results.[16] We found that of the 3133 *positive* IDT antigen tests, only 12% (365) were detectable by SPT. IDT identified an additional 6.9 allergens per patient (Figure 1). Adding IDT tests following negative SPT more than tripled the number of detected allergens, doubled the number of people successfully treated with immunotherapy and increased the number of children diagnosed as being allergic by 58%.[16] Treatment outcomes showed equal improvement in the "high-sensitivity" and the "low-sensitivity" (SPT-negative, suspected false-positive) groups. Importantly, there was no difference in the failure-rates between groups (5.1% vs. 5.7%). The results of this study support our hypothesis: The increased sensitivity of IDT compared to SPT is clinically relevant in patients with classic allergic diseases of chronic rhinitis, ETD, and asthma.

Reliance on the insensitive SPT may explain why many otolaryngologists find skin testing often does not support their clinical impression of allergy. Thus, their patients are termed "chronic, non-allergic," and they doubt their own diagnostic acumen. This can also explain why many otolaryngologists fail to include allergy in their differential diagnosis of ETD/OME, despite several authors having documented this association to be true.[7,11-13]

Importantly, as therapy is based on identification of specific positive antigens, patients found to be negative by SPT testing can never benefit from immunotherapy if they are *incorrectly* labeled as "non-allergic." Physicians need to insist on the best science in order to provide the best therapy.

Figure 1. Effect of adding IDT to SPT – Total of 3133 Allergens Discovered



IDT identified 1235 more treatable allergens among SPT+ patients (groups D&E) than did SPT alone (365) (Chi-Square p<0.001, 95% CI: -0.47, -0.36), (odds ratio 0.09; 95%CL: 0.05 to 0.15).

Abbreviations: ETD: Eustachian Tube Dysfunction; SPT: Skin Prick Test; ITD: Intradermal Skin Testing; ECP: Eosinophil Cationic Protein

Conflict of Interest: No financial disclosures or conflicts of interest for all authors.

References

1. Koivuniemi P. Secretory otitis media and mastoid pneumatization. A clinical study with long-term follow up.: Helsinki, Yliopistopaino, 1988.
2. Cappello ZJ, Minutello K, Dublin AB. Anatomy, Head and Neck, Nose Paranasal Sinuses. 2021 Oct 7. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2021 Jan–. PMID: 29763001.
3. Rosenfeld RM, Shin JJ, Schwartz SR; *et al*. Clinical Practice Guideline: Otitis Media with Effusion Executive Summary (Update). *Otolaryngol Head Neck Surg* 2016; 154:201-214.
4. Hurst DS, Deene CM. The Relation of Allergy to Eustachian Tube Dysfunction and the Subsequent Need for Insertion of Pressure Equalization Tubes. *Ear Nose Throat J*. 2020; 99:39S-47S. PMID: 32320297 DOI: 10.1177/0145561320918805.
5. Pauwels R. Future of anti-inflammatory therapy in asthma. *Allergy* 1995; 50 (suppl 22):27-31.
6. Pepys J. "Atopy": a study in definition. *Allergy* 1994; 49:397-399.
7. Cheng X, Sheng H, Ma R; *et al*. Allergic rhinitis and allergy are risk factors for otitis media with effusion: A meta-analysis. *Allergol Immunopathol (Madr)* 2017; 45:25-32.
8. Hurst DS. The role of allergy in otitis media with effusion. *Otolaryngol Clin North Am*. 2011; 44:637-654, viii-ix.
9. Hurst DS, Amin K, Sevéus L, Venge P. Evidence of mast cell activity in the middle ear of children with otitis media with effusion. *Laryngoscope* 1999; 109:471-477.
10. Hurst DS, Venge P. Evidence of eosinophil, neutrophil, and mast-cell mediators in the effusion of OME patients with and without atopy. *Allergy* 2000; 55:435-441.
11. Roditi RE, Veling M, Shin JJ. Age: An effect modifier of the association between allergic rhinitis and Otitis media with effusion. *Laryngoscope* 2016; 126:1687-1692.
12. Luong A, Roland PS. The link between allergic rhinitis and chronic otitis media with effusion in atopic patients. *Otolaryngol Clin North Am*. 2008; 41:311-323, vi.
13. De Corso E CE, Galli J, Seccia V et al. A. Otitis media in children: which phenotypes are most linked to allergy? A systematic review. *Authorea* 2020.
14. Demoly P, Crampette L, Mondain Met al. Assessment of inflammation in noninfectious chronic maxillary sinusitis. *J Allergy Clin Immunol* 1994; 94:95-108.
15. Jacobsen L, Wahn U, Bilo MB. Allergen-specific immunotherapy provides immediate, long-term and preventive clinical effects in children and adults: the effects of immunotherapy can be categorised by level of benefit -the centenary of allergen specific subcutaneous immunotherapy. *Clinical and translational Allergy* 2012; 2:8.
16. Hurst DS, McDaniel A. Clinical Relevance and Advantages of Intradermal Test Results in 371 Patients with Allergic Rhinitis, Asthma and/or Otitis Media with Effusion *Cells* 2021; 10:3224. https://www.mdpi.com/2073-4409/10/11/3224.

◆

Eye Disease, Integrative Vision Care, and Nutrition

by Marc Grossman, OD, LAc

Mind/Body medicine is based on the fact that our health and well-being depend on all the individual parts to work together effectively. So it should come as no surprise that healthy eyesight is also dependent upon our total well-being, which is affected by our genetic makeup, the food we eat, our work environment and exposure to airborne toxins, as well as our general belief systems about ourselves and the world we live in.

Each of us is unique and literally takes the world in through our senses, primarily through our vision. Many believe the way we take in the world is, to some degree, a reflection of who we are and which symptoms we might manifest. The integrative approach evaluates the person's lifestyle, habits, diet, exercise routine, and stress management, along with the family history, in determining a therapeutic approach. It attempts to bring in the patient as an active partner in the program to improve or maintain eye health. Specific habits have been identified in studies to be very damaging to eye health, including smoking, excessive alcohol, coffee, excess sugar and refined foods, and hydrogenated oils (like margarines).

Nutrition and nutritional supplementation could play a key role in helping to prevent vision loss and keeping our bodies strong. More and more peer review studies are identifying specific nutrients, by eye disease, that are lacking in patients with diseases such as the following.

Glaucoma

Oxidative stress and free radicals may play an important role in the onset of glaucoma by causing damage to the trabecular meshwork responsible for effective outflow of the aqueous fluid, and the retinal ganglion cells.[1,2] The optic nerve requires healthy circulation to the eyes and essential nutrients to maintain cell integrity and good vision. Research has shown that circulation to the optic nerve is poorer for those with glaucoma, particularly for normal or low-tension glaucoma. Glaucoma is not just a matter of normal IOP but also of keeping the optic nerve properly nourished. Antioxidants play many roles to help reduce oxidative stress and damage due to free radicals, protect the trabecular meshwork, and support healthy circulation to the optic nerve.

Healthy eyesight is dependent upon our total well-being.

Vitamin C. In parts of Europe and Asia, vitamin C is considered part of routine treatment for glaucoma. It lowers eye pressure through a combination of decreasing fluid production and improving the outflow of aqueous humor. It also improves collagen metabolism, which may be one of the underlying reasons for the development of glaucoma. Nutritional sources include citrus fruits, red peppers and tomatoes.

Vitamin C helps keep the trabecular meshwork from being blocked.[3]

Omega-3 fatty acids may help reduce the chronic inflammatory processes that are found in many patients with glaucoma. Fish and unrefined fish oils are rich in omega-3 fatty acids. Studies have shown that Eskimos, who have a high intake of omega 3, have a very low incidence of open-angle glaucoma. Some studies on animals further indicate that fish oil can reduce fluid pressure within the eyes. The best sources are the flesh of cold-water fish (example; salmon, mackerel, cod) as well as black currant seed oil and flax seed oil. Consider eating fish three times a week.

Coleus (Coleus forskohlii) is an herb in the mint family that is traditionally used in Ayurvedic medicine. Certain studies have shown that coleus will lower intraocular pressure by relaxing smooth muscles in the eye. There is no natural food source. It is derived directly from the coleus plant. Researchers find that the active ingredient in coleus, forskolin, can help lower intraocular pressure and support the health of the retinal nerve ganglions and the optic nerve.[4,5]

Ginkgo biloba can increase the circulation of blood to the eyes. It has been shown, in some cases, to help lower intraocular pressure in the eyes. There is no natural food source. It is directly derived from the ginkgo tree.

Magnesium is a mineral that relaxes smooth muscles, which regulate the

➤

➤

outflow of aqueous humor from the inner eye. Natural sources include most nuts, seeds, vegetables, seafood, and soy. Magnesium improves microcirculation in glaucoma patients and may protect the retinal ganglion cell against oxidative stress and cell death.

Amino acids. Important amino acids include taurine (concentrated in the eye and found in the optic nerve), glutathione (one of the most important antioxidants in the eye), and cysteine (taken as N-acetylcysteine). These nutrients assist the liver in producing glutathione.

Flavonols. Quercetin is a bioflavonoid that supports vision and the optic nerve.

B vitamins. Vitamin B12 supports the nervous system and nerve health. Vitamin B3 (niacin) may have a protective effect.[6] A combination of B6, B9, and B12 helps to lower homocysteine levels that are linked to higher risk of developing glaucoma.[7]

Green leafy vegetables. A diet rich in green leafy vegetables is one of the most important prevention methods for glaucoma. Researchers evaluating the diets of over 100,000 health professionals over a 26- to 28-year period found that those people who included the highest levels of green leafy vegetables in their diets had a 30% lowered risk of primary open angle glaucoma than subjects with lowest levels of leafy greens in their diets. These subjects also had a 40 to 50% lower risk of developing early paracentral visual field loss.[8]

Digestion and vitamins. Make sure to follow tips for taking vitamins and maintaining good digestion. Always take vitamins with food. Digestive enzymes are stimulated when eating and aid in nutrient absorption.

If you must take glaucoma medication, note that alpha lipoic acid has been found to help prevent the conjunctiva scarring caused by some glaucoma medications. Note that these drugs have been associated with causing or aggravating glaucoma.

Exercise. Regular exercise is tied to a lower risk of glaucoma. Exercise such as a regular brisk walk is about as helpful as using beta-blockers medication for glaucoma. A brisk 40-minute walk five days a week is a good target.[9] Research has shown that glaucoma patients who take a brisk, 40-minute walk five days a week for three months can reduce the pressure in their eyes by approximately 2.5 millimeters – similar to the reduction seen when using beta-blockers.[10]

Exercise decreasing pressure. Researchers have found that some forms of exercise reduce intraocular pressure – both mild forms of exercise such as tai chi, walking, dancing, yoga, and pilates and more obviously vigorous exercise such as jogging and aerobics. One study looking at student runners found that eye pressure was reduced by 4 mmHg after running.[9] Another concluded that including aerobic exercise in one's routine decreases intraocular pressure.[10] And a third study looked at exercise under several controlled circumstances and found that the amount of pressure decrease was associated with the degree of intensity of exercise.[11] Even in sedentary people who do not get sufficient exercise, walking and jogging both decrease intraocular pressure.[12]

Exercise increasing pressure. Researchers also found that eye pressure may increase due to some forms of exercise, such as doing bench presses (heavy weights), even more so if the subject inadvertently held their breath while lifting.[13]

Some yoga postures with a head down position increase intraocular pressure. One study looked specifically at four specific postures which were held for two minutes. Adho Mukha Svanasana (down dog), Uttanasana (forward bend), Halasana (plow), and Viparita Karani (legs-up-the-wall) all increased intraocular pressure measured at two minutes. Down dog yielded the highest increase in glaucoma patients (~11 mmHg) with a slighter greater increase in patients without glaucoma (~12mmHg). For glaucoma patients/non-glaucoma patients, forward bend resulted in ~10mmHg/~8mmHg; plow resulted in ~6mmHg/~4mmHg; and legs-up-the-wall resulted in ~3mmHg/~3mmHg. The IOPs returned to the baseline measurement within sitting for two minutes.[14]

Our recommendation is that if you do yoga and have a history of open-angle glaucoma where the eye pressure tends to be above normal (IOP), you either avoid these postures or do them for a shorter period of time such as 10-15 seconds. Of course always check with your eye doctor as well.

Macular Degeneration

Stop smoking. This is one of the most important things you can do to prevent damage to your vision. A 2005 review of research pointed out that 13 separate studies found that there was a statistically significant tie between the habit of smoking and the development of age-related macular degeneration (AMD). The risk in smokers was two to three times higher than in non-smokers.[15]

A 2015 study identified damage and inflammation caused by smoking to several layers of the macula: the pigmented layer, Bruch's membrane, the choroidal stroma.[16]

Protect against blue light. Wear sunglasses (wear wraparound sunglasses especially if you have been diagnosed with AMD) that are UV resistant to protect your eyes against damage from blue light.

Leafy greens. Make sure your diet includes plenty of fresh, preferably organic, dark leafy greens. These vegetables are rich in carotenoids, the colored pigments that your eye needs, especially lutein and zeaxanthin. Even if you don't like vegetables such as collards, kale, and spinach, you can add them to soups, puree them in green drinks, juice them with other fruits and vegetables, or add them to other greens in salads. Many studies report that the nutrients found in these healthy vegetables lower the risk of developing macular degeneration.

Low-fat diet. The Western diet, high in fats, is associated with a higher risk of macular degeneration. Researchers have found that a high-fat diet gives rise to weak gut microbiota resulting

in poor digestion and long-range, low-grade inflammation in the entire body. These factors appear to be the source of high rates of AMD in men who are overweight.[17]

Lutein/zeaxanthin. These two carotenoids have been shown to be low in people with macular degeneration. Increasing intake of them either by foods or by supplements has been found to prevent and even improve macular degeneration in many cases. Natural sources are green leafy vegetables, including spinach, kale, and collard greens. Other research has determined that astaxanthin[18] and meso-zeaxanthin, other potent antioxidants, are important. Vitamin C has been found to enhance the absorption of lutein.

Bilberry strengthens the structural integrity of blood vessels throughout the body and promotes healthy circulation, particularly to the small capillaries that deliver oxygen and nutrients to the eyes. Bilberry also helps prevent free radical damage to the delicate structures within the eye. Natural sources are blueberries and huckleberries.

Taurine. This amino acid is important for the regeneration of worn-out tissues of the retina. It helps protect the eyes from ultraviolet radiation. Natural sources include eggs, meats, and fish.

Vinpocetine improves the utilization of glucose and oxygen in the brain and retina.

Zinc. The macular can degenerate when zinc is deficient. It is found naturally in meats and oysters.

Resveratrol has been found to inhibit the growth of new blood vessels in the advanced form of macular degeneration, choroidal neovascularization.[19,20]

Omega-3 fatty acids. Many research studies have established that omega-3 fatty acids lower the risk of macular degeneration.[21] Omega-3s have the ability to regulate formation of extraneous blood vessels that distort vision.[22] Eating fish is a great way to increase omega-3 in your diet.

The standard western diet tends to be very high in omega-6 fatty acids, with a ratio of about 10-20:1 (omega-6:omega-3). The Mediterranean diet has a higher proportion of omega-3; the ratio is about 4-5:1. This ratio is associated with a protective effect against the severe neovascular form of AMD.[23]

Vitamin D3. Low levels of vitamin D3 in the body are associated with increases in macular degeneration symptoms. D3 has anti-inflammation and anti-angiogenic capacities and has the greatest benefit in patients where the genetic risk is greatest.[24] Because D3 has an important role in the immune system and aging process, it is important in age-related conditions such as macular degeneration where the retina suffers age-related damage.[25]

AREDS. The nutrients specified in the 2001 AREDS (which investigated vitamins C and E, beta-carotene and zinc) were found to reduce the risk of advanced AMD by about 25%. The AREDS formula includes 500 mg vitamin C; 400 IU vitamin E, 15 mg beta-carotene, 80 mg zinc, 2 mg copper.

AREDS2. The nutrients tested in 2006 (which added omega-3 fatty acids, lutein and zeaxanthin, and reduced zinc and beta-carotene in the AREDS formula) were found to further reduce the risk of advanced AMD. As a result of AREDS2 the formula was revised to 500 mg vitamin C; 400 IU vitamin E, 10 mg lutein, 2 mg zeaxanthin, 350 mg DHA, 650 mg EPA, 25 mg zinc, and no beta-carotene.

A note for vegetarians: The AREDs studies found that *zinc* is necessary for a healthy macula: 11 mg daily for men and 8 mg daily for women. Zinc is abundant in meat and seafood. It is also abundant in nuts, grains, and legumes, but not in a readily absorbable form. The body does not store zinc well, so zinc supplementation might be needed for vegetarians and vegans.

Cataracts

Though most conventional physicians attribute lens-related problems to general aging, we believe that they are often a symptom of an underlying condition due to a metabolic imbalance. They signal 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.

Even people preparing for cataract surgery should seek to improve their overall health before they go through this invasive procedure, as this may aid healing times and help protect the retina.

Diet is important. A 2011 study compared diets of nearly 28,000 people and found that those who ate the most meat had the highest incidence of lens problems.[26] This doesn't mean to stop eating meat, but it does demonstrate that a healthy diet with lots of fruit and vegetables is helpful in reducing risk.

A ten-year assessment of the diets of nearly 40,000 women found that those who consumed the most fruits and vegetables had a 10-15% lower risk of developing cataracts.[27]

Avoid nutritional deficiencies. Important nutrients include glutathione, (supported by lipoic acid, vitamins E and C, and selenium), vitamin A, lutein, zeaxanthin, vitamin B2 (riboflavin), pantethine, folic acid, bilberry, and melatonin.[28]

Vitamin C. The normal healthy lens of the eye contains a higher level of vitamin C that any other organ of the body except the adrenal glands. Studies have shown a decreased level of vitamin C in the aqueous humor as well as in the overall body when cataracts are forming. Vitamin C has also been shown to control sugar imbalances that often play a role in cataract formation. Natural sources include citrus fruits, red peppers, and tomatoes. Vitamins C and E act as antioxidants and are essential for enzyme formation and process.[29,30]

Glutathione could be 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 the amount of glutathione as compared to normal lenses. Glutathione is essential for forming enzymes in eye tissue and blocking damage by free radicals.[28,31]

Glutathione is produced by the body and is composed of three amino acids: cysteine, glycine and glutamic acid.

➤

➤

All the following nutrients could help increase glutathione levels: N-acetyl cysteine, alpha lipoic acid, vitamin C, selenium, vitamin E, vitamin B2, vitamin B6, zinc, and other nutrients. Natural sources include eggs, broccoli, avocados, garlic, onions, and cauliflower.

Although the following nutrients are linked to reduced lens problems and/or reduced symptoms, other research has additionally noted that combinations of these nutrients are even more effective. For example, the combination of vitamins A, C, and antioxidants[32] and the combination vitamins B1, B2, B3, C, E, and carotene in the diet significantly lessened the risk of all cataract types.[33] Selenium is an essential trace element that supports antioxidants.

Lipoic acid and N-acetyl-carnosine act as antioxidants to support visual clarity through free-radical capacity and maintaining lens crystallins. The ability of the natural protein L-carnosine to pass through the liquid and fatty portions of the eye helps prevent damage to DNA by UV radiation. It contains sulphur, which supports certain bonds in the lens' crystalline structure and may be able to help repair lens transparency.[34]

Vitamin B2 behaves like an antioxidant and its deficiencies contribute to cataract development.

Vitamin B3 is related to metabolism, hence its use in lowering cholesterol and avoiding pellagra.[35] It is inversely related to the development of some types of lens opacities.

Vitamin B6 supports cell growth and help synthesize amino acids, as does folate. B6 is associated with lower risk of lens opacity.[35]

Vitamin B12 is needed for correct functioning of the brain and nerve cells and is also associated with lower risk of lens opacity.[35]

Lutein is a yellow carotenoid antioxidant that protects the eye from free radical damage through its ability to block blue and UV sunlight.

Astaxanthin also protects against free radical damage. It is ten times as powerful as beta-carotene and is able to cross the cell membrane, fighting free radicals both inside and outside human lens tissue

Cineraria, the homeopathic formulation for lens support, stimulates lymph flow in and around the eyes to remove toxins and maintain clarity.[36]

Make a habit of exercise. Long-term exercise, as opposed to a seasonal bout of exercise training, reduces cataract risk. For example, walking or bicycling an hour a day or a job that includes heavy manual exercise reduces cataract risk by 13%.

Prevention is the best medicine. Using complementary medicine to try to address the underlying cause, along with traditional medicine to try to prevent damage on an acute basis, is the best approach to preserving vision both short and long-term.

Dry Eyes

Supplement with research-proven nutrients that have been found to be helpful to manage dry eyes. Important nutrients include omega-3 fatty acids, and vitamin D.[37-39] Researchers have noted that high intakes of omega-3 fatty acids can significantly reduce dry eye syndrome symptoms,[40,41] including osmolarity, tear break-up time and inflammation.[42-44]

Dry eye homeopathic eye drops are very effective. We recommend the drops especially formulated for women and for men.

Make sure to eat lots of green leafy vegetables.

Avoid sugar and/or artificial sweeteners: It's thought that excess sugar in the diet results in too much un-utilizable glucose in the eyes (more than half of all diabetics suffer from dry eye syndrome).[45]

Consumption of more than 11 teaspoons of sugar a day has been linked to dry eye syndrome (a single can of soda contains approximately 9 teaspoons of sugar). Sugar is hidden throughout processed and refined foods, including cereals, ketchup, and salad dressings.

Avoid the toxic fats in commercial red meat, dairy products, fried foods, and man-made fats. These fats interfere with the proper metabolism of essential fatty acids in the body and are indirect causes of dry eye syndrome

Gut issues may contribute to dry eye. Try taking a high-quality probiotic to replenish the healthy flora in your gut, particularly if you have been on antibiotics. Gut issues are especially important if inflammation is a contributing factor.[43] Leaky gut can be the source of inflammation.

Drink 8-10 glasses of water a day.

Avoid any foods to which you may be allergic. Try cutting out categories of foods for a week at a time, and see how you feel, or visit an allergist for testing. Typical allergenic foods include nightshades (eggplant, peppers, tomatoes, white potatoes and cucumbers), milk, wheat, and corn (or products with corn in them).

Eyedrops that promise to "get the red out" may reduce circulation in the eye, limit moisture production, and may make your dry eyes worse.

Exercise such as a brisk daily walk is important for all eye conditions

Marc Grossman, OD, LAc, is one of the few holistic optometrists and licensed acupuncturist in the world and has been in practice since 1980. Internationally respected, he has taught many hundreds of practitioners and physicians in his methods. Dr. Grossman is co-author of *Natural Eye Care, Your Guide to Healthy Vision and Healing*, an 800-page landmark guide written to empower readers of every age to support and preserve healthy vision through the health of the whole body. He is also the author of *Magic Eye: Beyond 3D* and *Greater Vision.* He lectures widely on topics such as natural vision improvement, vision, and nutrition, as well as Chinese medicine and vision care and has been interviewed by the *New York Times, Wall Street Journal*, and many other magazines and has appeared on local and national network television. His respected https://naturaleyecare.com/ website is the world's largest holistic eye care website in the world and followed by many millions. Dr. Grossman has offices in Somers and New Paltz, New York.

and overall health. A Japanese study concluded that an increase in the level of physical activity can be an effective intervention for the prevention of and/or treatment of dry eye disease, as well as helping alleviate other disorders.[47]

Use a humidifier at home and/or at work to keep the air from drying out in the winter.

Remember to blink, especially while working at the computer. When you work at the computer your blink rate decreases sharply. Researchers have discovered that equally important with blinking is blinking completely. Making sure that when you blink you close the eyelids completely makes a large difference in reducing the symptoms of dry eye and computer eye syndrome.

Check your medications for any side effects that may cause dry eyes. Some drugs that can contribute to dry eyes include NSAIDS such as ibuprofen, synthetic penicillins, antihistamines, birth control pills, blood pressure medications, and antidepressants.

Gently massage your upper and lower lids, a couple of times a day to stimulate the tear glands. Better yet, do this while in a warm shower.

Eye Floaters

These are the nutrients that are most important in managing eye floaters. In general, by strengthening the health of the retina and vitreous, one reduces the risk of developing new floaters. These nutrients act together synergistically to help lessen the risk of floaters.

Vitamin C is a powerful antioxidant that is essential for overall eye health. Since floaters are often the result of vitreous tears/detachments and/or clumping of the vitreous due to aging, vitamin C plays a role in blood and lymph circulation, waste elimination and supporting connective tissue. Vitamin C is found in high concentrations in the eyes and helps neutralize the effect of oxygenation in the ocular fluids.[47-49]

Hyaluronic acid (hyaluronan) is a large molecule found in the vitreous gel which it is believed contributes to its gel-like quality[50] and may also support related connective tissue in the retina.[51] Elsewhere in the body it is found in the gel-like fluid that lubricates joints and it is a component of the tissue healing process. As we age, the amount of hyaluronan in the body decreases.

Liver Tonic. We recommend the classic Chinese liver formula *xiao yao san*, which contains rehmannia, milk thistle and dandelion. In Chinese medicine, the Liver "opens to the eyes" and stimulates energy and blood circulation throughout the eyes

However, nothing replaces a positive, healthy lifestyle that includes regular exercise, daily meditations or walks in nature, and a healthy diet. The rapid pace of our lives often interferes with us taking the time to really take care of ourselves. Caring for ourselves helps to keep our bodies healthy and maximizes the mind/body's inherent healing. ◆

References are available online at www.townsendletter.com.

A Surprising Menopause: A Case Study
Part 2

by Deborah McKay, ND

Originally published in *Naturopathic Doctor News & Review*

Review

In Part 1 of this case study (*Townsend Letter,* February/March 2022), I wrote about a 50-year-old woman who presented in January 2019 with a laundry list of health complaints. Some were chronic, such as recurrent sinus infections, GI disturbances, depression/anxiety, and symptoms of low thyroid function (she had untreated Hashimoto's). However, a year of severe stress and the onset of perimenopause had added to the pile, including weight gain, a foggy brain, and the feeling that her entire life was crumbling.

One week after our initial consultation, she would depart for Mexico for a two-week yoga retreat. Meanwhile, I educated her about blood sugar swings and small intestinal bacterial overgrowth (SIBO), recommended some dietary adjustments and supplements, referred her to Dr James Wilson's book (*Adrenal Fatigue: The 21st Century Stress Syndrome*), and asked her to get a blood draw for lab tests before leaving for Mexico.

First Follow-up

Dorothy returned to my office in February 2019, one month after her initial visit. She noted a "lack of joy" during her yoga retreat and also caught a Mexican "bug" that gave her debilitating diarrhea. The menu of vegan raw foods had made it worse. She put herself on the BRAT diet (ie, bananas, rice, applesauce, toast) at her first opportunity, which had eased the diarrhea, although a stomachache had persisted. Activated charcoal was easing her symptoms.

She had scored positive on 15 of 18 traits for adrenal fatigue, listed in Wilson's book.

Per my request, she had tracked her metabolism (via pulse, temp, mind) after starting on liothyronine (L-T3). Unfortunately, this was the same time that the "Mexican bug" was giving her fevers. Her dosing of L-T3 had been sporadic despite my recommendation of 3 tablets daily (15 mcg total). Instead, she had been taking four-to-six tablets per day, often loading up in the evening to make up for missed doses earlier in the day. She noted some sleep disturbance as a result, but no tachycardia or anxiety. There was palpable sadness in Dorothy's presence.

Laboratory Evaluation.

Prior to her Mexico trip, her labs indicated pretty good health overall, except for autoimmune thyroiditis (see Table 1). In contrast to her 2017 labs, her ovarian hormones measured normal despite the lack of menstrual periods for "many moons now." We planned to check FSH and LH at her next lab visit.

Impressions.

My diagnoses included functional hypothyroidism (ie, euthyroid sick syndrome), hypercholesterolemia, and acute gastroenteritis.

Although she still tended toward hyperglycemia, this was under better control now. In my experience, elevated LDL-cholesterol is mostly associated with high carbohydrate intake. The high-normal fibrinogen suggested systemic inflammation, which I often see along with fluctuating glucose; in Dorothy's case, it could also be related to Hashimoto's and GI imbalances.

She clearly still had functional hypothyroidism. I suspected that the Hashimoto's was impairing her thyroid gland's ability to respond to TSH, as indicated by low Free T4 in the presence of high-normal TSH. She also had an unfavorable ratio of Free T3 (FT3) to Reverse T3 (RT3). Thyroxine (T4) can convert to either active triiodothyronine (T3) or inactive Reverse T3. I look for an optimal FT3/RT3 ratio of 3.5-4.0. I suspected that Dorothy's emotional distress and the inflammation resulting from Hashimoto's and irritable bowel syndrome were contributing to an over-conversion of T4 to RT3. She was trending toward iron deficiency anemia, as evidenced by low-normal levels of Hbg, Hct, and ferritin. I commonly see this in SIBO, due to intestinal malabsorption and/or iron sequestration by dysbiotic organisms. An elevated DHEA-S suggested persistent stress.

Plan.

I suspected Dorothy's sporadic timing of her L-T3 prescription, especially the evening loading, was causing fluctuations in metabolism and sleep disturbances. I thus recommended that she spread out her dosing more evenly throughout the day, with a smaller dose of L-T3 in the evening to aid relaxation. I

suggested aiming for 30-40 mcg/day, but to self-monitor body, mind, and metabolism in order to stay comfortable.

For daytime focus and stress management, I prescribed a proprietary adrenal support supplement containing key nutrients and *Eleutherococcus senticosus*, *Glycyrrhiza glabra*, and *Coleus forskohlii*, to be taken early morning (along with thyroid) and at lunch.

It's always important to support the adrenals when starting a patient on thyroid hormones. This is because normalizing thyroid function will often speed up metabolism faster than the HPA axis is able to re-regulate itself. Not doing so has caused some people with adrenal insufficiency to land in the hospital (not on my watch!).

For the infectious diarrhea and chronic constipation, Dorothy agreed to treatment of probable SIBO/SIFO using two proprietary herbal formulations – one containing *Thymus vulgaris*, *Origanum vulgare*, and *Salvia officinalis*; and the other containing berberine HCl, *Berberis aquifolium*, *Coptis chinensis*, and other berberine-containing herbs, and a mixture of Chinese herbs to support detoxification and elimination. I suggested taking two tablets of each, twice daily, for four weeks. Although various herbal protocols are prescribed for SIBO/SIFO, I prefer to follow my classmate, Dr Allison Siebecker's, recommendations and list of published research.[1]

I coached her on managing Herxheimer symptoms and using charcoal to adsorb biotoxins (though away from thyroid dosing). I encouraged her to read about and follow a low-FODMAP diet. We would consider a definitive lactulose breath test for SIBO when she was ready.

I recommended she take a multivitamin/multimineral, including iron bisglycinate, with lunch. I cautioned her about magnesium's laxative effect.

Finally, I had Dorothy fill out a questionnaire designed by Julia Ross (see her books, *The Mood Cure* and *The Cravings Cure*). I hoped to start her soon on targeted amino acid therapy (TAAT).

After she left, I scored her TAAT questionnaire. According to Ross' guidelines, her #1 need was for catecholamines, in this case both thyroid and adrenal hormones. Not surprisingly, the questionnaire indicated that Dorothy's #2 need was blood glucose stabilization. I planned to mail her some free samples of a proprietary formulation containing chromium, vanadium, alpha-lipoic acid, *Gymnema sylvestre*, *Opuntia streptancantha*, and *Silybum marianum*. This was to be taken with each meal, along with glutamine, to reduce glucose and insulin surges. Her #3 need, according to the questionnaire, was for GABA, for calmness and relaxation. She was already using ashwagandha and L-theanine, but straight GABA is stronger and would likely give her greater benefit. I suggested taking it only in the evening to avoid daytime drowsiness, until she was accustomed to its effects. Theoretically, GABA shouldn't cross the blood-brain barrier (BBB). However, almost all of my patients with leaky gut appear to also have a leaky BBB.

In light of the emotional underpinnings of Dorothy's symptom profile, and to assist her in moving forward toward her goal of self-improvement, I was eager to teach her a proprietary technique of "tapping" in the very near future. This technique can help "erase" an unwanted emotion, and only requires about 30 minutes of an office visit.

In about three months, we would re-assess ovarian function and thyroid dosing via lab tests.

Second Follow-up, One Month Later

Dorothy was following a low-FODMAP diet and exercising positive internal self-talk. She was enjoying this approach to eating. Her menses had returned unexpectedly the previous month – the first time in five months – and it was a bad period with severe cramping and heavy bleeding.

Her symptom survey showed continued fatigue, insomnia, dry skin, and intolerance of both heat and cold, although there were very slight improvements across the board. She was currently taking a total of 35 mcg of L-T3 (three 5-mcg tablets early morning plus 4 tablets mid-day). Her heart rate was typically in the low 70s; her hands remained cold; and her mid-day temps were still in the 97º range (well below the optimal 98.6º F).

She seemed dejected. She was conversing better – not conspicuously slow any more.

➤

Table 1. Patient's Laboratory Results

(TSH = thyroid-stimulating hormone; T4 = thyroxine; T3 = triiodothyronine; TG = thyroglobulin; TPO = thyroid peroxidase; HbA1c = hemoglobin A1c)

Lab Marker	Result
TSH	Higher than optimal (2.18 mIU/mL); 1.0 µIU/L is my target "optimal"
Free T4	Low-normal (0.97 ng/dL)
Free T3	Low-normal (2.4 pg/mL)
Reverse T3	High-normal (17.1 ng/dL)
RT3/Free T3 ratio	High (7.1)
Anti-TG antibody	High (74.4 IU/mL)
Anti-TPO antibody	High (41 IU/mL)
LDL-cholesterol	High (145 mg/dL)
HDL-cholesterol	Good (94 mg/dL)
Fasting glucose	High-normal (96 mg/dL)
Fasting insulin	Normal, but poor effect (5.0 mIU/mL)
Glucose x Insulin	Borderline insulin resistance (480); insulin resistance = 507.6
HbA1c	High-normal (5.5%)
Fibrinogen	High-normal (315 mg/dL)
25-hydroxyvitamin D	Low-normal (39.8 ng/mL)
Ferritin	Low-normal (47 ng/mL)
Hemoglobin	Low-normal (13.1 g/dL)
Hematocrit	Low-normal (39.1%)
DHEA-S, serum	High-normal (225.5 µg/dL)
Progesterone, serum	Low-normal (0.3 ng/mL)
Testosterone, total, serum	High-normal (30.6 ng/dL)
Estradiol, serum	OK (75.0 pg/mL)
Cortisol, 9 AM, serum	Low-normal (11.9 µg/dL)

➤

Impressions.

Current diagnoses included IBS/SIBO, postmenopausal bleeding, and euthyroid sick syndrome. Today's issues were mostly psychosocial and emotional. Her TAAT for brain chemistry was going to be important for her well-being.

Plan.

I suggested continuing her low-FODMAP diet for now, to reduce SIBO/SIFO symptoms. In case of future dysmenorrhea, I recommended using *Viburnum opulus* (cramp bark) liquid extract, early and often, to prevent the "wind-up phenomenon" caused by prostaglandins.

We had a long, heartfelt discussion about SIBO and her dietary choices, and about self-compassion vs self-esteem. I referred her to Kristin Neff, PhD's book and TEDx talk on self-compassion.

For her thyroid, I encouraged a slow upward titration of L-T3 toward 50 mcg daily, while continuing to track metabolism and body-mind symptoms. Bothersome heart symptoms would be her sign to reduce the dose and call me.

I urged her to throw a party with other women when full menopause arrived, celebrating that she was now queen of her own life. I also suggested she plan on five years of well-balanced bioidentical hormonal replacement therapy (BHRT) regardless of menopausal symptoms, for lifetime protection of bone density and her cardiovascular system.

It is now internationally accepted that five years of BHRT, starting at the moment of menopause, yields lifetime benefits in these areas.[2] Recall the nationwide panic in 2002 when the Women's Health Initiative was abruptly cut short due to HRT-related deaths from cancers, heart attacks, and strokes.[3] Those deaths, we now know, were due to using oral (not transdermal) equine estrogens (not human bioidentical) in combination with synthetic progestins (also not bioidentical). I have been using BHRT since Day 1 of my practice, and until these recent findings were published, I had to calm down a lot of anxious women. It's now much easier to put their minds at ease.

Third Follow-up, One Month Later.

Dorothy was feeling good overall yet noted a strange sensation of "living in a cocoon and fighting to get out." This sounded to me like mild dissociation. She was going through deep and powerful emotional upheaval; in many ways this was her year of self-renewal.

She brought in questions about ionic silver, zinc, and liquid iodine, all self-prescribed. Her mid-day temps were still in the mid-97s; and her heart rate was often in the 60s, except when stressed.

Dorothy's posture and presence seemed worn down. At the same time, though, her eye contact, speech, and responsiveness were improved. She was feeling more like "her old self" these days.

She requested more dietary guidance, so I recommended the books *The Vegetarian Myth* by Lierre Keith, and *Primal Fat Burner* by Nora Gedgaudas.

Because of her elevated HbA1c and LDL-C and her history of hypoglycemic symptoms, I urged her to limit her fruit intake, favoring vegetables instead.

In terms of supplements, I shared my belief that the popularity of high-dose iodine supplementation is not scientifically based, and suggested she save her kelp drops in the event of nuclear fallout. I also urged restraint with ionic silver, saving it for when it's truly necessary, so that it wouldn't lose its effectiveness. I recommended that she start oral methylcobalamin and to hold the tablets in her mouth before swallowing, for better absorption. Dorothy tended toward anemia, and I suspected she also needed more methyl donors due to likely MTHFR genetic abnormalities. I also recommended 15 mg/day of zinc.

We further discussed the importance of optimizing thyroid and adrenal function. I suggested continuing L-T4 at 25 mcg each morning; I also suggested she continue the L-T3 at 25 mcg twice daily (early morning and lunchtime), but to try adding an additional 5 mcg at bedtime to "strengthen" her sleep cycles. Most of my patients report feeling feel more restored in the mornings by doing this. She would continue to self-monitor.

We both felt that she was ready for an emotional breakthrough, so we scheduled another visit for "tapping."

Fourth Follow-up, One Month Later.

In March 2019, one month later, Dorothy arrived at my office, ready to learn the technique of tapping. She had already connected the dots between childhood abandonment by her father with her adult inability to bond with a long-term mate. At this visit, Dorothy appeared brighter and more present than ever, and showed signs of improved physical and mental health.

"Tapping" involves a preliminary brisk tapping all 10 fingertips against each other, followed by tapping one's fingers on acupuncture meridians in a prescribed pattern while concentrating on a particular problem but with an imagined positive outcome. The goal is to clear unwanted emotions. A sentence stating a problem and its resolution is formulated before each tapping routine.

During the warm-up exercise, Dorothy could not perceive her own *Qi* (typically felt as tingling), which suggested an energetic blockage. When she tried to formulate her first sentence for the technique, she immediately felt distressed. During the tapping technique, Dorothy was unable to get traction until she directly acknowledged her childhood abandonment. Her sentence was, "Even though my father abandoned me, I still love and respect myself completely." At the start, her self-rated emotional distress was 10 out of 10, with tears flowing. On round 2, she scored 8 out of 10, feeling a tight throat. On round 3, she scored 5 out of 10, with palpable unhappiness. Then, on round 4, her energy shifted visibly, and her emotional distress dropped from 10 to 2, and she noted "practically just empty words." At this point she was smiling and her energy was radiant.

This is the kind of miracle I routinely witness when I am able to talk my patients into doing tapping with me. I love my work!

We ended by discussing the idea of taking drop-doses of *Oplopanax horridus* glycerite to help support healthy personal boundaries. She declined for now. We also discussed doing

Buteyko breathing down the line as another way to keep anxiety under control.

I gave Dorothy a lactulose breath test, to be collected at home ASAP. I suggested another blood draw for labs in a couple of months, or sooner if she was curious.

Email Exchange with Patient, Five Weeks Later.

Five weeks later, Dorothy emailed me to say that she had been having increased hot flashes several times daily for the past several weeks. I recommended *Cimicifuga racemosa* (black cohosh) twice daily, along with non-prescription estriol cream (0.75 mg per pump), to be taken anytime up to twice daily. I explained that progesterone cream (20 mg per pump) should be restricted to early morning, since transdermal progesterone can increase cortisol, which in turn can increase anxiety.

I also recommended she take additional doses of the stress management formula when needed, to reduce the likelihood of a hot flash.

I suggested we reevaluate her current symptoms and treatment plan at her next office visit. As of this writing, she has not scheduled another visit. She has also stopped requesting Rx refills. It is my hope that high-dose L-T3 did what it was meant to do: restore normal metabolism by chasing out Reverse T3, thereby healing and rebalancing bodily tissues. It is rare for folks to continue on high-dose L-T3 beyond a few months. When they feel like they no longer need it, that's typically an indication that healing has taken place.

Case Study: Menopause

In summary, it appears that Dorothy got what she came for… but it wasn't what either of us thought it would be. Her diminished mental functions, which she attributed to menopause, cleared in response to emotional healing and normalizing her thyroid function. Mostly, she was simply ready to heal an old childhood wound at a time when she was restructuring her life. My role here turned out to be a little bit of hormones and a lot of emotional leverage.

◆

References

1. SIBO – Small Intestine Bacterial Overgrowth. Site author: Dr Allison Siebecker. Available at: https://www.siboinfo.com/herbal-antibiotics.html. Accessed September 5, 2019.
2. L'Hermite M. HRT optimization, using transdermal estradiol plus micronized progesterone, a safer HRT. *Climacteric*. 2013;16 Suppl 1:44-53.
3. Rossouw JE, Anderson GL, Prentice RL, et al. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results From the Women's Health Initiative randomized controlled trial. *JAMA*. 2002;288(3):321-333.

Deborah McKay, ND, is a bio-identical hormone specialist in Portland, Oregon – the heartland of naturopathic medicine. Dr McKay is a 2005 graduate of NCNM, and now a solo practitioner. She's a founding member of EndoANP. She has personal experience with thyroid insufficiency, uterine cancer, surgical menopause, PTSD, and the blood glucose roller-coaster. She is passionate about hormone rebalancing, which she views as one possible approach to whole-person healing.

Decoding Cancer Genes

by Heather Hannon, MSN, RN, ANP-BC

This article is provided courtesy of Heather Hannon, MSN, author, and Judson Brandeis, MD, adapted from a chapter in *The 21st Century Man*, a comprehensive new men's health resource. (Dr. Brandeis is volume editor.)

Larry James was diagnosed with prostate cancer in his late fifties. His cancer had been detected at an early stage, and he underwent successful surgical treatment that rendered him "cancer free." Larry wasn't overly worried, but his physician expressed concern after reviewing the family history. Larry's mother and maternal grandmother had died of advanced breast cancer. He knew the disease was more common in the women in his family but wasn't sure how this applied to him. Still, he wanted to optimize his health and decided to opt for genetic testing, which involved collecting a small amount of saliva by having him spit into a test tube. Not the most refined approach to obtaining a sample, but it didn't hurt, and it got the job done.

Larry's test results revealed he had inherited a harmful genetic change (a mutation) in the BRCA2 gene, a gene responsible for protecting the body from cancer. His test results indicated he was at increased risk of developing several types of cancer, including male breast cancer, and his doctor immediately sent him for a screening mammogram. Larry was shocked when his mammogram showed early-stage male breast cancer. He credits genetic testing with saving his life because the test results played a role in detecting his risk and subsequently his breast cancer before it had reached a more advanced stage. That enabled him to escape the premature deaths of his mother and grandmother.

As a nurse practitioner who has provided genetic counseling and testing for more than eight years, I have witnessed firsthand the powerful impact this testing can make in the life of someone such as Mr. James. Genetic testing offers the opportunity to identify individuals who are at the highest risk, enabling them to lower that risk dramatically by detecting cancer at an earlier stage when outcomes are better.

Only about 1 in 400 individuals in the United States has an inherited BRCA gene mutation like Mr. James's. (The prevalence is higher, about 1 in 40, among individuals with Ashkenazi Jewish ancestry.) However, as with many things in life, genetic risk is not black and white; rather, it exists on a spectrum. The key to unlocking our health is in understanding where we fall on that spectrum and addressing the risks that matter most.

The Nature of Genetic Material

In a sense, DNA resembles sophisticated computer code that provides commands to make proteins. These proteins are the instructions for traits such as eye color and blood type as well as the information that enables our cells to carry out the functions that maintain life. DNA is made up of four different nucleic acids, referred to as base letters or bases, designated by four letters: A, T, C, and G. These nucleic acids combine in countless ways to form amino acids, the building blocks of protein. When scientists sequence a genome, they "read" the gene to determine the exact order of DNA letter bases (As, Ts, Cs, and Gs) contained in that individual's genetic code.

Genes are small snippets of DNA, comprised of letter bases that are passed down from our parents. We inherit two copies of every gene (one copy from our mother and one from our father) for every trait or function. Frequently a particular attribute or function will be defined by a number of different genes. There is usually not just one single gene for cancer or for allergies, for example, which might enable us to crack the code on these conditions.

Genetic Expression

Gene expression is the process by which the written code in DNA is translated by the body into biochemistry, such as a protein. Not all genes, or commands, are expressed at once. Gene expression is tightly regulated so that only specific genes are "turned on" in a cell while others are silenced or "turned off." This explains how heart cells are able to perform different tasks than the cells in our lungs and our brain, even though they share the same DNA. It appears that triggers from other cells (including hormones and neurotransmitters) can influence gene expression. Externally, exposure to environmental hazards, nutrition, social conditions, and the aging process itself can help determine which genes are turned on or off.

Although our DNA is around 3 billion bases long, only 1% is composed of genes that make proteins. Researchers used to think that the remaining 99% of our DNA was junk, but it appears these nonprotein-making regions help regulate the expression of the protein-making genes by turning them on and off.

If you lined up all of your DNA, it would form a strand 6000 miles long. To fit inside a tiny cell, DNA is tightly packaged inside chromosomes. Human beings have 46 chromosomes or 23 pairs, but chromosomes contain thousands of genes. We have approximately 25,000

genes. Our genes vary in size in terms of the amount of information they contain, from as small as a few hundred DNA base letters to more than a million DNA bases.

How Genes Affect Risk

Individuals do not inherit a disease – they inherit the risk for developing the disease. It has been suggested that changes in lifestyle can prevent at least four of every ten cancer cases. Research indicates that as high as 15% of men with metastatic prostate cancer have a hereditary mutation, so genetic testing is now recommended for all men with this cancer, regardless of age. Men with a Gleason score of 7 or higher should talk with their doctors about genetic testing, especially if members of their family have had breast and/or ovarian cancer. For these men, standard detection and treatment strategies may need to be adjusted due to their higher risk level.

The Impact of Genetic Changes

Understanding genetic changes helps identify a person's level of risk and focuses efforts to address that risk effectively.

Genetic mutations. Specific changes that alter the usual sequence of DNA letter bases that make up a gene are termed genetic mutations. Most gene mutations are not harmful but rather are an aspect of the evolutionary process. However, a small percentage of mutations alter how a gene functions, resulting in proteins that don't work correctly or are missing entirely. When a genetic mutation affects a protein that plays a critical role in maintaining our well-being, that mutation can increase the risk of a given disease. Sometimes the BRCA1 and BRCA2 genes are referred to as the "breast-cancer" genes. This is a misnomer because all of us have two copies of each of these genes. It is the presence of a mutation in a BRCA gene that raises the risk, not the genes themselves.

Acquired mutations. Acquired mutations can occur spontaneously when a mistake is made during cell division. These mutations are acquired over the course of a lifetime and are present only in specific cells in the body. Researchers estimate that individuals accumulate trillions of new mutations in a typical day, but most of these mutations are not located in areas of DNA that have significant consequences. However, the accumulation of multiple acquired mutations in a gene that protects against cancer or heart disease has the potential to disrupt normal gene function and contribute to disease risk. This helps explain why people with no known risk factors can be diagnosed with a severe illness even though they did "everything right."

Environmental factors can trigger acquired mutations, due to air pollution, exposure to radiation, and/or lifestyle factors (such as smoking, alcohol, an unhealthy diet, or a sedentary lifestyle). We can protect against certain diseases by addressing the lifestyle and environmental factors that trigger acquired mutations and contribute to developing these conditions. Almost 25% to 30% of cancer-related deaths are linked to tobacco use and 30% to 35% are linked to diet.

Hereditary mutations. Inherited mutations are passed down from one or both parents and, like other genes, remain throughout life. Inherited mutations are present in every cell in the body, including reproductive tissue. (Egg and sperm cells are called germ cells; hence reproductive mutations are also referred to as germline mutations.)

Hereditary diseases. Conditions associated with inherited mutations can cause significantly increased disease risk. Most hereditary diseases are inherited from just one parent. This has important implications. It means that an individual only has to inherit one copy of a mutant gene to be at increased risk for the associated hereditary disease. It is possible to inherit a gene for a particular risk from either parent.

Childhood risk. When the parent has a dominant hereditary mutation, each child has a 50% chance of inheriting the mutant gene from an affected parent. Many hereditary mutations raise risk substantially. Lifestyle and environment are still critical tools for lowering risk, but risk associated with hereditary mutations may require additional strategies. Individuals with the highest level of risk may benefit from specialized screening tools and more frequent screening, like an annual breast MRI for detecting breast cancer early or specific medications for controlling blood pressure and harmful cholesterol in the case of inherited cardiac disease.

SNPs – genetic glitches. Single nucleotide polymorphisms (SNPs) represent a change in a single DNA letter base and are found in stretches of DNA between protein-making genes. Both SNPs and hereditary mutations are inherited, but SNPs are much more common in the population.

Recent literature suggests that around 20% of us have an inherited mutation linked to a genetic condition.

- There are roughly 10 million SNPs in the human genome (and around 400 genetic mutations).
- Although SNPs have a minimal effect on raising disease risk, inheriting multiple SNPs may combine to increase disease risk to a significant level.
- SNPs may underlie genetic susceptibility to common diseases and have been linked to a range of disorders from addiction to mental illness, from high cholesterol to obesity, and from lactose intolerance to inflammatory bowel disease.

The presence of particular SNPs may cause the same level of risk as an inherited mutation would cause. Specific SNP profiles (such as polygenic risk scores) may warrant targeted screening and prevention tools similar to individuals with a known inherited mutation, such as BRCA genes.

Epigenetic changes. Epigenetic changes alter genetic expression, influencing biological development, in contrast to mutations that alter the sequence of DNA bases. Epigenetics reminds us that adopting healthy lifestyle choices can make a difference in optimizing health across our lifetime.

Protective behaviors. The following behaviors are believed to protect against adverse epigenetic changes:

➤

➤

- Maintaining a healthy weight
- Eating a healthy diet, one that is high in fiber and fresh fruits and vegetables with less processed food and meat
- Getting regular exercise
- Using sunscreen and covering up while out in the sun
- Avoiding smoking and tobacco products
- Limiting or avoiding alcohol
- Avoiding exposure to harmful chemicals in the workplace.

Evaluating Risk

Recent literature suggests that around 20% of us have an inherited mutation linked to a genetic condition.

Knowing family history. The health history of your family remains one of the most valuable tools we have for helping to predict risk. Individuals with several family members or relatives who have a particular condition are often at higher risk for that condition. For example, children of someone with an alcohol abuse disorder are four times more likely to develop problems with alcohol than people in the general population.

Red flags. Look for red flags in your family and personal history that might indicate an inherited genetic condition. Families are likely to share familiar environments and lifestyles, as well as genes. Don't forget to look at both sides of the family. (Holiday gatherings provide an excellent opportunity to connect with multiple relatives at once and learn more about what conditions "run" in the family.)

Checklists. A checklist can serve as a simple tool to help tease out genetic risk. Have you or anyone in your family:

- Been diagnosed with a disease at an earlier age than the condition typically occurs?
- Been diagnosed with a rare condition?
- Had multiple family members (on the same side of the family) diagnosed with the same disease?
- Been diagnosed with or had several family members with multiple types of the same disease (i.e., breast and ovarian cancer)?

Individuals who are adopted or unsure about family history may benefit from genetic testing and should also talk with their doctor about the results.

Myriad Genetics – myRisk test. This is a brief, easy-to-use quiz for evaluating hereditary cancer risk that is available online at https://www.hereditarycancerquiz.com/.

Cancer and heart disease checklists. Hereditary cancer and hereditary heart disease checklists are provided online at www.TheTwentyFirstCenturyMan.com.

Risk models. A person's probability of carrying a specific cancer-related gene mutation can be estimated using a risk model. For example, BOADACIEA, BRCAPRO, and PENNII are different models that estimate the probability that a woman carries a BRCA mutation. The PREMM5 model looks at the probability an individual carries a hereditary mutation associated with Lynch Syndrome (a condition that significantly raises the risk for multiple cancers). About 1 in 200 individuals has Lynch Syndrome, although many do not realize it. This particular model is appropriate for both females and males. Visit https://premm.dfci.harvard.edu/ for more information of the PREMM5 model.

Direct-to-Consumer Testing

Two common types of genetic testing utilized for health risk screening are direct-to-consumer tests (DTCs, such as 23andMe and AncestryDNA), as well as professional genetic testing that looks at genes associated with specific hereditary conditions that can cause harm.

The first sequencing of the human genome was completed in 2003 at a cost of $2.7 billion. Today, less than 20 years later, you can have your genome sequenced for $200.

What about 23andMe? 23andMe and AncestryDNA are examples of direct-to-consumer genetic tests that can be purchased online and in stores. DTCs have increased in popularity as the cost of testing has fallen. DTCs provide information on ancestry and health traits. Many DTCs are now expanding to provide information about a person's health risks as well, including (but not limited to) conditions such as:

- Parkinson's disease
- Alzheimer's
- Celiac disease
- Gaucher disease type 1
- Early-onset primary dystonia
- Alpha-1 antitrypsin deficiency
- Blood and blood clotting disorders (hereditary hemochromatosis, hereditary thrombophilia, Factor XI deficiency).

Benefits and limitations. Consumers should be cautioned that not all the genes identified in DTC testing are actionable. The consumer may be left with a result that indicates higher risk for developing a serious condition, such as Alzheimer's disease, and have no proven way to lower their risk or prevent the disease.

Results can sometimes be misleading. For example, 23andMe can screen for the three most common BRCA gene mutations, but the test is not FDA approved to look for the remaining 1,000 plus BRCA mutations that can raise cancer risks. An individual may believe they are not at risk when they really are.

- DTC tests usually do not involve a healthcare professional and do not provide guidance regarding whether you are testing for the appropriate genes. Also, DTC tests do not offer counseling concerning what the results mean and the implications of those results.
- Most DTCs use third-party interpretation (TPI) tools (such as Promethease, GED Match, and Livewello) to interpret raw DNA data and convert it into information about health risks. But TPIs don't fall under the same guidelines as other genetic testing types, and ensuring the quality and accuracy of the information obtained through a TPI is difficult.
- Different DTCs and TPIs have varying privacy policies. Remember to ask what steps the lab takes to protect your privacy and how long your sample is kept. However, this does not mean that DTCs don't have a useful role.

Benefits of direct-to-consumer testing include the following:

- A good starting point for talking with your doctor

- Results that can prompt individuals to make substantial lifestyle changes they otherwise might not have considered, had they not had the test
- Accessibility and affordability for most people
- Provision of health-related testing that is not offered through other genetic testing laboratories.

Professional Genetic Testing

Genetic testing ordered by physicians is typically comprised of actionable genes that are associated with defined, evidence-based medical recommendations. These tests focus on genetic expression, so the recommended lifestyle changes, when implemented, have been shown to improve outcomes, including reduced illness and mortality. Genetic testing currently available for conditions like heart disease and cancer offers "actionable results," providing information that doctors and nurses can act on in guiding the prevention, detection, and treatment of these conditions. Actionable genes are those with a harmful mutation that could potentially be addressed by medical intervention (some type of treatment supported by evidence of improved outcomes). By way of example, at least 1 in 200 individuals has an inherited form of heart disease that can result in sudden cardiac death. While all of us can benefit from adopting healthy behaviors to enhance heart health, individuals with an inherited form of heart disease most certainly want to consider specific lifestyle interventions, such as engaging in regular exercise and avoiding smoking, alcohol, caffeine, and high-fat foods.

Understanding gene-related risks. There are too many inherited genetic mutations and corresponding syndromes to list individually in this chapter. Your family and personal history serve as a guide to some degree for illuminating hereditary conditions and relevant inherited mutations that you might have and do not yet realize. Understanding your specific gene-related risks can help you create a personalized plan to optimize your health. Some hereditary mutations raise disease risk dramatically, while others have only a modest effect. For example, inheriting a mutation in the MSH2 gene is associated with a 52% to 82% lifetime risk of colorectal cancer, while inheriting a mutation in the PMS2 gene is associated with only a 15% to 20% lifetime risk of colorectal cancer. Depending on the degree of risk a gene mutation confers, we might recommend different or more frequent screening options (e.g., colonoscopy annually vs. every three years). Additionally, hereditary mutations can contribute to the development of multiple conditions. FH gene mutations, for example, can raise the risk for kidney cancer and uterine fibroids in women and managing risks means implementing strategies to address each condition.

- BRCA2 mutations have important implications for men and raise the risk for more than one cancer. Men with a BRCA2 mutation have a higher risk of prostate, male-breast, and pancreatic cancer, as well as melanoma.
- Men with a BRCA2 mutation will want to consider earlier, and more frequent screening for prostate cancer (starting in their early- to mid-40s), annual skin checks with a dermatologist, and annual clinical breast exams.
- Pancreatic cancer is a deadly malignancy because it rarely causes symptoms until it is in an advanced stage (and survival rates for advanced pancreatic cancer is in the single digits). But screening to catch pancreatic cancer early does exist, and research using this approach for those individuals with the highest-risk level is showing promising results. Early detection can mean the difference between a predicted 80% chance of survival at five years or a 5% survival rate.

Emerging science. Some genetic variants are linked to raising risk for serious conditions. The APOE gene is a good example of this, and it is important to discuss this in more detail.

- The APOE gene is responsible for packaging cholesterol and maintaining healthy levels within the body. There are three different versions of the gene: e2, e3, and e4. APOE e3 is the most common version of the gene found in the population.
- Inheriting the APOE e4 version is associated with raising a person's risk for developing Alzheimer's disease.
- People who inherit one copy of APOE e4 have approximately a 20% to 25% risk of Alzheimer's disease by age 85.
- A person who inherits two copies of APOE e4 has approximate a 30% to 35% risk of Alzheimer's or higher by the age of 85. There is speculation that being born with two copies of APOE e4 may also lead to slightly earlier onset of the disease.

Not everyone with two copies of the APOE e4 variant will develop Alzheimer's, and upwards of 50% of patients who develop Alzheimer's are negative for APOE e4. Additionally, there is no proven way to cure Alzheimer's disease, and sometimes finding out one carries the e4 version of the APOE gene can lead to more anxiety, not less. More importantly, this information could cause problems for people trying to obtain long-term care insurance.

However, researchers believe that changes in the brain occur several years before the first symptoms of Alzheimer's are evident. This indicates a potential window of time when one might be able to intervene to protect against the disease. The MIND diet (a combination of the DASH and Mediterranean diets) has been linked to cognitive benefits and is being studied as an effective intervention to prevent or delay Alzheimer's. Additionally, steps such as controlling blood pressure and engaging in regular exercise and certain types of "brain training" activities have shown promise in preventing and slowing the disease. Thus, test results can serve as a powerful motivator to change or enhance certain lifestyle choices. Anyone with a strong family history of Alzheimer's who is concerned about developing the disease may want to consider adopting a healthy lifestyle.

Working with a Genetics Professional

Understanding the risks and limitations of genetic testing can help you make thoughtful, informed decisions. Genetic testing can help you:

➤

➤

- Find out if you are at increased risk for a certain condition
- Create a personalized screening plan leading to early detection and better outcomes
- Adopt lifestyle strategies known to reduce risks
- Make informed decisions about medical and surgical options for reducing risks
- Protect family members by helping them identify and manage their risks
- Lower anxiety and fear about the risk of developing a specific health condition
- Guide decisions about biopsy, surgery, and medications
- Determine follow-up care for a specific disease
- Expand treatment options for advanced diseases, opening doors for targeted therapy, immunotherapy, and clinical trials.

Seeking out a genetics professional. As you can see, there are several essential factors to consider when exploring genetic testing. We recommend seeking a healthcare professional with expertise in genetic counseling and testing to ensure the appropriate test is selected and to understand your results and how they affect you. Licensed genetic counselors (LGCs) as well as doctors and advanced practice providers (nurse practitioners and physicians' assistants) with additional training in genetics are all excellent options.

Limitations of testing. Remember, genetic testing cannot tell us if someone will develop a condition: it can only tell us about risk. Even with the best interventions, we cannot entirely eliminate the risk of developing a disease. Sometimes test results are inconclusive, and that can lead to increased anxiety. Learning that one does have a higher risk for a disease can also cause worry. In addition, parents can experience guilt if they have passed a harmful mutation on to their child.

What to expect. Genetic testing is typically separated into two counseling visits. At the pre-test visit, the genetics professional will review the history in detail and discuss critical considerations about testing (benefits, limitations, results, insurance issues, etc.) so that an informed decision can be made. Test results can impact entire families, and it is not uncommon for close family members to attend these visits as well. Sometimes people worry that they will lose their health insurance if they test positive for genes that carry high risk. The Genetic Information Non-Discrimination Act (GINA) is a federal law that protects individuals undergoing genetic testing from health insurance discrimination and employment discrimination. GINA does not address long-term disability and life insurance, so speaking to a genetics professional can provide helpful information. If genetic testing is a good fit, a DNA sample can be obtained the same day using saliva or blood. Results take two to four weeks and can be rushed in situations in which the findings might alter treatment decisions. During the post-test visit, the genetics professional will review the results and discuss their impact with the patient and their family members. Learning the results can trigger a range of emotions. Genetics professionals can clarify misconceptions, connect patients with resources, and provide support.

Cost. Most insurance carriers, including Medicare and Medicaid, cover genetic testing, especially if the test results will help guide a person's medical care and/or if there is a reasonable chance that the individual has a hereditary mutation. As science has advanced, the price of testing has come down significantly. The majority of individuals pay approximately $100 or less, out of pocket, for genetic testing. Most labs will also verify the cost before testing, and some offer self-pay options for around $250. A genetics professional will review payment options at the first visit. Multiple safeguards are in place to make sure the bill is not exorbitant.

Laboratories and Testing

A genetic test is valid only if it provides accurate results, and all laboratories and tests are not the same. Federal regulatory standards (CLIA standards) exist to help control the quality of laboratories and ensure the accuracy of the tests offered. Most genetic tests are over 90% accurate, and some are 99% accurate. A genetics professional can make sure that the appropriate laboratory and test are selected. For the purpose of this chapter, we have highlighted some standard testing options for inherited mutations for adults.

*Myriad Genetics – myRisk test***.** This test is a solid, multigene panel for hereditary cancers. It offers a full selection of genes, covering the important basics without being too broad. Test reports are easy to understand and include helpful educational information and resources. Myriad provides counselors who can answer questions and explain results. The test is limited in that it does not cover genes associated with some of the rarer hereditary cancer syndromes, such as HLRCC.

*Ambry Genetics***.** A variety of multigene panels for cancer, heart disease, and neurological conditions are available from this laboratory. The OvaNext, BreastNext, ProstateNext, etc., provide the option of ordering testing based on cancer type. Their larger panel test, CancerNext Expanded, is a good option when you need to look beyond the usual risks.

Ambry recently launched RNAinsight to provide even greater accuracy for re-classifying inconclusive results (which are a natural aspect of all tests). Ambry offers self-pay options for around $250 for most tests, and also has genetic counselors available.

Invitae. This laboratory offers an impressive selection of multigene panel tests as well as single-gene tests, including options for cancer, heart disease, neurological disorders, and rare genetic conditions (such as Ehlers-Danlos Syndrome). Invitae's patient portal is user-friendly and provides patients with updates. The lab offers self-pay options for most tests for around $250 to $300. Invitae communicates with patients through email and text messaging and is not the best fit for patients who do not use the internet or a cell phone.

LabCorp and Quest Diagnostics. Both of these CLIA-certified labs offer a wide array of laboratory testing, including hereditary cancer panels and several tailored panels for inherited forms of heart disease. LabCorp and Quest

also offer testing for APOE variants, although Quest offers it under testing for cardiovascular health (remember APOE is involved in packaging cholesterol). Both labs have contracts with numerous insurance companies, and many physicians are familiar with ordering through these labs.

Interpreting the Results

A positive result. This means that an inherited genetic mutation was found. The genetics professional will review with you the specific gene-related risks associated with your results.

A negative result. When no genetic mutation is found, the negative result tends to be more complicated than it appears. A negative result does not mean you won't develop a particular condition. Most diseases are not caused by inherited mutations or by single genes. Also, we can only test for what we currently know about. You might be carrying a mutated gene that isn't being tested for currently or has yet to be identified. Those with a strong family history of a disease or a personal medical history with red flags might still be at risk and would benefit from personalized, risk-reducing strategies.

Sometimes there is conflicting evidence about whether a particular gene or set of genes raises risk. Although this is uncommon, a genetics professional can help make sense of inconclusive test results.

Managing Risks

Whether one is at risk because of a positive test result, a strong family history, or a personal history of a health condition, there are multiple options for managing risk.

*Personalized screening***.** When risk is identified, it is important to follow up with earlier, more frequent screening and specialized types of testing (for example, PSA test starting in the early to mid-40s as opposed to 50 years of age).

Lifestyle changes. Knowing one is at higher risk can motivate healthier choices regarding diet, exercise, etc. It can be helpful to consider the insight on genetic risk a call to action.

Seek out support. For example, optimize your diet by working with a nutritionist, joining a weight loss program, or seeking a support group. A few medical centers have support groups specifically for individuals with inherited mutations, and online forums such as FORCE (Facing Our Risk of Cancer Empowered) are a great option as well. Sharing one's experience with others who understand the emotions and decisions that come from being at higher risk can also be empowering.

Future Options

Genetics is transforming healthcare, and the future potential of using information about our genetic makeup to improve our well-being are endless. There are several exciting options on the horizon.

First, SNPs will likely become essential markers for predicting the risk of common but debilitating disorders, such as addiction, diabetes, and mental illness. In terms of breast cancer, polygenic risk scores (using SNPs) are already being investigated for predicting breast cancer risk.

Second, future research will illuminate why specific genes are turned on or off and why certain people with a specific genetic makeup develop a disease while others don't.

Third, clinical trials for cancer now include studies of treatment based on the individual patient's genetic makeup and on the genetic makeup of the tumor, rather than by cancer type. In the future, doctors will sequence genes to determine the type of treatment that is likely to work best for a specific condition.

Down the road, we hope to use gene therapy to introduce a missing gene or fix a mutated one. CRISPR is a scissor-like gene-editing tool that cuts up strands of DNA, altering the sequence of base pairs, and modifying gene function with the potential to someday cure disease. This technology is being applied to sickle cell disease, for example. However, technologies that allow us to modify a person's genetic makeup also raise ethical questions about how to use these technologies.

In the era of personalized medicine, genetic testing is one of the most critical interventions available for protecting your health. There are many test options, and results are not always straightforward. Talking with your doctor or a genetics professional could help you decode your options and focus your efforts on the path to wellness.

Credit

Hannon H. Decoding your cancer genes. In: Brandeis J, ed. *The 21st Century Man.* San Ramon, CA: AFFIRM Science, Dec 2021.

For additional information on the book, the 60 contributors, and the topics covered, please see www.TheTwentyFirstCenturyMan.com.

Resources

Nessa Carey. The Epigenetics Revolution: How Modern Biology is Rewriting our Understanding of Genetics, Disease, and Inheritance. New York, NY: Columbia University Press, 2013.

Clarissa Foster. Understanding BRCA: Living with the Breast Cancer Gene. London, UK: Hammersmith Health Books, 2017.

Siddhartha Mukherjee, MD. The Gene: An Intimate History. New York, NY: Scribner, 2017.

James Watson, PhD. The Double Helix: A Personal Account of the Discovery of the Structure of DNA. New York, NY: Touchstone, 2001.

◆

Heather Hannon, MSN, is a board-certified adult nurse practitioner specializing in oncology and advanced clinical genetics. She holds degrees from Tufts University in Boston and the Massachusetts General Hospital Institute of Health Professions and is currently pursuing her doctorate in nursing at Marymount University in Arlington, Virginia. Ms. Hannon has worked at multiple top-ten medical centers in medical and surgical oncology, cancer genetics, palliative care, and oncology nurse navigation. As an oncology nurse navigator and genetics nurse at Bon Secours Cancer Institute in Richmond, Virginia, Ms. Hannon provides support and education to individuals and families across the cancer care continuum. She is a member of the Oncology Nursing Society, International Society of Nurses in Genetics, American Society of Clinical Oncology, and the Academy of Oncology Nurse and Patient Navigators.

Applied Kinesiology Management of Whiplash Associated Disorder (WAD): A Case Report

by Scott Cuthbert, DC

Research shows that whiplash injuries are a remarkably complex condition, which may explain the modest effects of typical medical, physical therapy and chiropractic interventions investigated to date. Contemporary management options for both the acute and chronic stages of WAD are not straight forward and, while offering some improvements in pain and disability, are far from being a panacea. Trials of medical and physical therapy management of acute whiplash have not demonstrated efficacy in terms of decreasing the incidence for those who develop persistent symptoms.[1-3]

The existing evidence-base does, however, support a shift in care to de-medicalize these conditions,[1-4] and de-emphasize pharmacological and surgical approaches that carry high-risk profiles with no commensurate improvement in outcomes.[5]

With up to 50% of those sustaining a whiplash injury reporting ongoing pain and disability worldwide, it is essential to identify both the reasons for those at risk of poor recovery and to better understand the reasons in those who recover well.[6-7]

The following report describes the multi-modal management necessary (as well as the sequence of previous therapeutic attempts by numerous physicians from many disciplines) for the ultimate recovery of a patient who experienced WAD. This patient had been previously evaluated and treated by three chiropractors, one osteopath, and three traditional medical doctors who performed many evaluations and treatments as well as performing facet and trigger point injections, along with multiple medications. Despite this, the patient showed increased symptoms in the year following her motor vehicle accident (MVA) and failed to reach maximum medical improvement (MMI).

This paper and a recent textbook by its author detail the background of muscular dysfunction in WAD and explain why muscular inhibition is a primary feature of the structural, biochemical, and mental-emotional disturbances accompanying and often perpetuating the symptoms following whiplash injuries.[1]

Motor Vehicle Accident (MVA) History

On October 21, 2017, this patient was the restrained driver of a 2015 Audi four-door sedan. She was decelerating for a red light in Pueblo, Colorado. The car in front of her stopped very quickly, and she swerved to the left to avoid hitting that car. Her car was hit on the rear-end passenger side by a Jeep Cherokee. The road condition was dry.

She immediately felt pain in her lower back, neck, and upper thoracic spine and acquired an immediate headache. She was taken restrained to a hospital by ambulance. An examination was done, and x-rays taken as well as a CT scan of the brain. She was dismissed with a prescription for medication. Examination ruled out cerebral concussion.

Pictures of her vehicle supplied to me show damage to the right taillight, fender, and bumper. The estimate from a mechanic showed a gross total of $3,665.62 for repair.

In the next several days however, her headache became much more severe, and the low back pain also became more severe.

One week after the accident the patient was advised by a friend to see the first of four chiropractors. She began with three visits per week of chiropractic treatment.

After six months of treatment, one of her three chiropractors asked her to complete the Neck Disability Index Questionnaire, with 9 of the 10 sections completed. On section 7 an answer is not checked, but she notes, "I have to work to pay bills but it causes extra pain." The raw score of the 9 completed sections was 33, which is a severe level of disability. At this time a Revised Oswestry Low Back Pain Disability Questionnaire was completed, with a raw score of 37. This is considered as complete low back disability.

At six-months post-MVA, the pain drawing now showed pain radiating into the right leg, which was not present on her initial visits, and there is indication of right leg pain with provocative tests. There is further complaint of poor sleeping, dizziness, occasional decreased coordination, and poor memory only during times of headaches. The patient describes feelings of depression and anxiety related with frustration over

her persistent pain. Treatment plan continued to be 2x/week for four more weeks. It appears that there was a plan or consideration to make consultation or referral to another medical doctor in the city.

A medical examination after the initial examination in the emergency room was given by her insurance company's PPO doctor at six months post-MVA. He prescribed anti-inflammatory, muscle relaxer, pain relievers, and physical therapy treatments. Additionally, positive Waddell signs were present that included hypersensitivity to even light skin touch, axial compression as noted above, diffuse and generalized pain complaints, significant over-reaction, multiple bizarre symptom reports with simulated movements that should not cause pain, and profound and diffuse breakaway weakness in the lower extremities. The doctor's impression was that the patient did indeed have significant pain, but he noted that the Waddell signs were suggestive of symptom magnification versus exaggeration. Relpax® was given for abortive migraine treatment. Subsequent medical treatment involved injections of the bilateral L4-5, and L5-S1 facets with fluoroscopic guidance and trigger point injections. Ten trigger points in the neck and shoulders were injected and only slightly improved her neck and midscapular pain.

A subsequent MRI of the lumbar spine was performed six months after the initial MVA. Findings were (1) Mild degenerative changes of L5-S1 disc space noted with comparable posterior desiccated disc bulge/protrusion causing mild neural canal stenosis without evidence of cauda equina compression. Bilateral neural foramina are patent. There is no evidence of foraminal nerve root encroachment. No posterior disc bulge or herniation is seen. (2) The remainder of the examination was within normal limits.

Professional Applied Kinesiology (PAK) Examination

This long-suffering patient was referred to the author by her dentist, who had been treating her for TMJ imbalances that were thought to underlie her chronic headaches subsequent to the MVA. A thorough orthopedic assessment followed by a thorough manual muscle test (MMT) evaluation were employed in order to demonstrate the fundamental etiologies underlying the symptoms in this patient's case.[8]

On my first examination (10 months after her MVA) she indicates that her headache has become much more severe, and the low back had also become more severe during the course of the past year. During my consultation she sat leaning to the right for relief. She stated that she has to sit that way most of the time to take strain off the lower back.

The severe headache is accompanied by visual problems and nausea. She takes medication prescribed by her medical doctor for the severe headache, which is ameliorative. She has difficulty sleeping because of pain. She states that her energy level has decreased since the accident.

In my systems review there are no contributing factors other than the MVA found. The patient remarked that she was in good health prior to the MVA. She had never had chiropractic care prior to the accident and was on no medication before the accident.

Upon measuring the cervical rotation, I mention that there is much better movement in rotation; and she states, "Yes, I can move my neck much better when lying down." This is confirmed by me visually. Rotation cannot be measured weight-bearing with an inclinometer, and I did not have a goniometer available.

Sitting blood pressure was 103/72; standing b/p 99/73, pulse rate 86. Normally the blood pressure rises around 6 mm when standing to accommodate against gravity so adequate blood is supplied to the brain. She acknowledges that she gets lightheaded when she stands, and also bright lights bother her eyes. This was not present prior to the accident, and are physical signs of adrenal gland stress and dysfunction, called Ragland's sign.[9]

Orthopedic tests persisting despite 10 months of therapy for a MVA. Romberg, finger-to-finger, and finger-to-nose tests are passed. Right heel-to-shin test is done easily; the left is done with difficulty. Trendelenburg test is positive on the left. As she moves into Adam's position there is pain in the low back area, and she stops at about only 20 degrees. Lumbar lateral bending is limited by pain in the left sacroiliac area. Extension is not as painful as forward flexion. Kemp test bilaterally causes discomfort in the left sacroiliac. She states that when she goes into the Kemp position to the left it feels like her back is going to pop. Left Bechterew test causes discomfort in the left sacroiliac; right Bechterew test is negative. Lindner's seated test causes pain down the entire length of the spine, and she feels it in the back of her left leg. FABERE Patrick test on the left has very limited range of motion and discomfort in the left sacroiliac. There is also very limited range of motion in the right FABERE Patrick test, but it does not cause pain. Left straight leg raise is positive at 45 degrees for pain in the left sacroiliac

➤

➤

area. Right straight leg raise is limited at 80 degrees by tight hamstrings. Left Bragard test is positive. Quadriceps and Achilles reflexes are 2+ bilaterally.

Mennell's sacroiliac test is positive bilaterally. Hip extension is positive for pain bilaterally in the sacroiliac area, worse on the left. Ely's heel-to-buttocks is negative. Left Leguerre test is positive for pain in the sacroiliac and no pain in the hip; right is negative. Hibb's test is positive for sacroiliac pain on the left and negative on the right.

Shoulder depression and Jackson foramina compression tests cause discomfort in the cervical spine but there's no radiation to the arms. Right JayMar dynamometer test is 45/40/40 lbs; left is 20/24/20 lbs.

AK manual muscle test findings. The purpose of specific manual muscle tests in the examination is to determine if there is objective evidence to substantiate the continuing subjective complaints. If so, then the examination design continued to determine the cause of the dysfunction and whether it can be improved. To accomplish this, various sensory receptor stimuli were applied to determine if the muscle dysfunction was improved, indicating the weakness was functional in nature and had potential for improvement. If there was improved muscle function the type of sensory stimulus that causes the improvement separates the problem from a peripheral neuropathy, receptor, spinal cord, brainstem, cerebellum, thalamus, or cortical lesion. Unless otherwise noted the muscle tests listed in this examination as strong are equivalent to 5 and weak as 4 as graded in the *Guides to the Evaluation of Permanent Impairment, 5th edition*, by the American Medical Association.[10]

The psoas and tensor fascia lata muscles test weak bilaterally and do not strengthen to suboccipital stimulation. The left psoas strength is grade 3/5. Extensor hallucis muscles are weak bilaterally. Piriformis muscles are weak bilaterally. Tibialis posterior and tibialis anterior muscles are weak bilaterally. Peroneus longus and brevis muscles are weak bilaterally. Hamstring muscles tested as a group are weak bilaterally. Support ("therapy localization") to the bilateral sacroiliac articulations strengthens the hamstring muscles. Gluteus maximus testing position cannot be maintained (2/5). Bilateral lower trapezius muscles are weak.

McMurray's test is negative. There is no pain in the knee external ligaments, Patella gliding is smooth. Sartorius and gracilis muscles, however, test weak bilaterally. Passive knee movement is smooth; active knee movement of the right knee produces crepitation.

Pectoralis muscles (clavicular and sternal divisions) test weak bilaterally. Deep neck flexor, anterior scalene, and sternocleidomastoid muscles are weak to the point she cannot hold the testing position (2/5). Abdominal muscles test weak. Deltoid, serratus anterior, infraspinatus, supraspinatus, subscapularis, teres minor, rhomboid, levator scapula, opponens pollicis and flexor digiti minimi brevis muscles are weak bilaterally. Biceps, triceps, and brachioradialis reflexes are 1+ bilaterally.

Glossary of Applied Kinesiology's Integrative and Revolutionary Diagnostic System

Manual muscle test

The actual testing of the muscle had been firmly established by Kendall and Kendall,[15] who held that a muscle from a contracted position against increasing applied pressure could either maintain its position (rated as "facilitated" or "strong") or break away and thus be rated as "inhibited" or "weak." The testing of muscle strength itself has been widely practiced in manual medicine for decades and the use of the MMT for functional conditions continues today with the work of Goodheart (and nearly 1 million 'kinesiologists' around the world),[16] and many others like Janda, Lewit, and Liebenson.[17-25] *The American Medical Association* has accepted that the standard method of MMT used in AK is a reliable tool and advocates its use for the evaluation of disability impairments.[10]

Challenge

Challenge is a diagnostic procedure unique to AK that is used to determine the body's ability to cope with external stimuli, which can be physical, chemical, or mental-emotional. Cranial and vertebral challenge as used in this case report have been described in the literature previously.[1] After an external stimulus is applied, muscle-testing procedures are done to determine a change in the muscle strength as a result of the stimulus. Through this approach, ineffective therapies that produced no improvements in muscle strength were rejected, and only those that elicited a positive muscle response were used. This guided the treatments given to the patient.

Therapy localization

Therapy localization is a diagnostic procedure unique to AK that consists of placing the patient's hand over areas of suspected involvement and observing for a change in the MMT. This method assists the doctor in rapidly finding areas that are involved with the muscle dysfunction found on MMT and has been used around the world clinically for over 50 years.[1] Rosner et al in two consecutive, blinded, controlled clinical trials and literature reviews clearly supports the AK concept of therapy localization.[26-28] Collectively these data suggest that stimulating or stabilizing the muscles, joints, ligaments, and skin -- and their associated cutaneomotor reflexes -- can produce measurable changes in muscle function.

"Weak" muscle

A muscle that may or may not develop full power, but on MMT it does not neurologically function at its full capacity. Preferable terms for muscles that test weak or strong are termed conditionally inhibited and conditionally facilitated, respectively. According to the majority of leading researchers in the field of chiropractic and manual medicine today, the combination of muscular inhibition, joint dysfunction and trigger point activity are the key peripheral components leading to functional pathology of the motor system. In AK, the presence of each of these factors are differentially diagnosed using the 'challenge' procedure cited above.

Indicator muscle

A muscle tested to determine if there is a change in its strength as a result of some testing mechanism (challenge or therapy localization, for instance) applied to the body. Generally an indicator muscle is strong prior to the test and weakens as a result of the specific testing procedure.

Impression. All muscle tests done in this examination were graded at 4/5 with the exception of the left psoas, gluteus maximus, and neck flexors which are 2/5 (full movement only when gravity is eliminated).

When there is 4/5 diffuse weakness as in this patient's case there is often one central cause. If a central cause can be located and corrected, there will be an immediate and dramatically improved 5/5 function of many of the dysfunctioning muscles.

A common cause of diffuse 4/5 weakness is dural tension as described by the neurosurgeon Alf Brieg. Brieg stated that the primary source of adverse mechanical spinal cord tension is "set up directly by virtue of its anchorage at its two extremities, namely the brain and cauda equina."[11] A clue in this patient's case was the increased pain down her entire spine when Lindner's seated orthopedic test was done. The dura mater has a firm attachment at the foramen magnum and upper cervical vertebrae, and then does not have a firm attachment again until the sacrum. Lindner's seated test stretches the spinal cord around the forwardly flexed spinal column, placing tension on the dura and increasing her pain.

Applied Kinesiology Chiropractic Treatment

The first step in this patient's recovery was being able to observe immediate improvements in objective tests as a result of treatment, i.e., changing muscle function to 5/5 following the manipulative effort. This was accomplished within the first two weeks (6 sessions) of examination and treatment during each and every treatment session.

The next step was to determine if the improved function was still present on the next office visit. Any of the corrections that were not stable were recorrected, or further causes of the positive MMT finding were discovered and treated. The AK examination looks for the reason for recidivism and appropriate corrections are made. This was a two-week-long continuing investigation as levels of injury from the MVA were found and corrected. It must be understood that the body is a self-correcting and self-maintaining mechanism. When the body cannot correct dysfunction, it will often make adaptation to return function to as close to normal as possible. Often when there has been a long period of dysfunction, one may find on examination many adaptations that the body has made attempting to manage the condition.

In this patient's case, there were several layers of dysfunction that were worked through involving the TMJ, the cranium, the lumbar spine and pelvis, and even the feet, and their associated muscle attachments. Besides the feet, these areas are where the dura mater attaches to the rest of the body, and correction of dural tensions led to improvements in her symptom and functional patterns since the onset of her MVA symptoms one year before.

To test whether spinal dysfunction might be a cause of her dural tension, I evaluated the upper cervical area and found that when static digital pressure was applied to the left side of the axis spinous process in a very specific vector the sternocleidomastoid and right pectoralis (sternal division) and right psoas muscles tested 5/5. As soon as the spinous process digital pressure was released the muscles returned to a 4/5 function. This indicated that a spinal adjustment applied to the axis vertebra in the same vector that produced muscle strength would release tension on the dura and improve function in the motor neurons.

There was poor function and organization of the cervical flexors and extensors that I diagnosed as secondary to subtle entrapment of cranial nerve XI supplying the sternocleidomastoid and upper trapezius muscles. This was supported by the improved muscle function after the AK cranial treatment. Although the deep neck flexors (scalene and others) are not supplied by cranial nerve XI, their function also improved after the cranial corrections. This probably occurred because of improved cervical function affecting the spinal nerves.

Figure 1.
How Chiropractic Adjustments Improve Muscle Tone

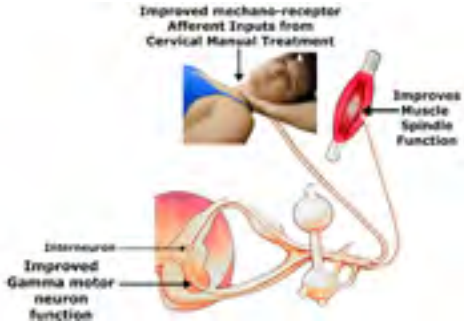
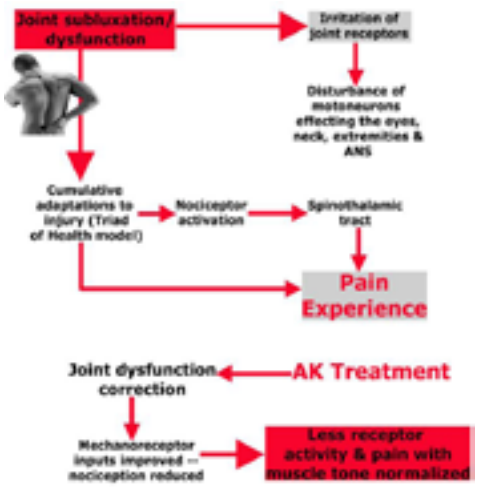


Figure 2.
How Chiropractic Adjustments Improve Muscle Tone



I believe that correction of the cranial-sacral primary respiratory system produced a wide range of objective improvement throughout her body. This correction addresses cranial nerve dysfunction and reduces dural tension, producing a positive effect on many aspects of her nervous system. Follow-up spinal examination found considerable improvement after the cranial-sacral function was improved.[12]

➤

➤

Treatment to the factors producing her dural tension was effective in relieving her headaches and cervical spine pain and limitations in range of motion over the course of two weeks (6 visits). After the first upper cervical correction, there was profound strengthening of the cervical flexor and sternocleidomastoid and scalene muscles. However, these immediately re-weakened upon opening and then clenching her mouth shut. Once AK TMJ treatment to the muscles of mastication and the temporal bone were given, this no longer occurred. After stabilization of these factors with two weeks of treatment, the improvement in her clinical picture and return to MMI pre-accident status has been maintained for nearly one year.

After two weeks on adrenal nutritional supports (Drenamin (SP) and Ashwagandha), her sleep and adrenal signs as well as her depression and anxiety were improved.[13-14]

No modalities such as electric muscle stimulation, trigger point injections, etc. were employed during this AK chiropractic treatment period so that the effects of the functional neurologic treatment could be observed. Subjective (symptomatic) improvement was recorded by the steady disappearance of the positive MMT and orthopedic tests noted above as well as by rating her symptoms using visual analog scales.

The impression given by her second medical doctor that multiple Waddell signs were suggestive of symptom magnification vs exaggeration was incorrect. Bizarre symptoms, hypersensitivity, and other unusual findings are compatible with the subtle functional impairments taking place in this patient's condition. Correction of these physiological imbalances and dural tension post-MVA improved her Waddell signs significantly.

References

1. Cuthbert SC, Walther DS. *Whiplash Dynamics and Manual Muscle Testing*. Amazon Kindle, 2018.
2. McGee, S, et al. Systematic review of the measurement properties of performance-based functional tests in patients with neck disorders. *BMJ Open*. 2019 Nov 24;9(11):e031242.
3. Rosenfeld M, et al. Early intervention in whiplash-associated disorders: a comparison of two treatment protocols. *Spine* (Phila Pa 1976). 2000 Jul 15;25(14):1782-7.).
4. NE Foster, JR Anema, D Cherkin, et al. Prevention and treatment of low back pain: evidence, challenges, and promising directions. *Lance*t (London, England), 391 (2018), pp. 2368-2383.
5. Traeger AC, et al. Care for low back pain: can health systems deliver? *Bull World Health Organ*, 97 (2019), pp. 423-433.
6. Sterling M. Physiotherapy management of whiplash-associated disorders (WAD). *J Physiother*. 2014 Mar;60(1):5-12.
7. Jull et al. Chap. 4: Alterations in Cervical Muscle Function in Neck Pain. In: *Whiplash, Headache and Neck Pain: Research-based directions for physical therapists*. Elsevier: Edinburgh; 2008:41-58.
8. Cuthbert S. Manual Muscle Testing for Tension-Type and Cervicogenic Headaches. *Townsend Letter*. June, 2018.
9. Cuthbert S, et al. Correlation of Manual Muscle Tests and Salivary Hormone Tests in Adrenal Stress Disorder: a Retrospective Case Series Report. *Townsend Letter*. Jan. 2015.
10. *American Medical Association: Guides to the Evaluation of Permanent Impairment*, 5th Edition, Chicago, IL, 2001:510.
11. Brieg A. *Adverse Mechanical Tension in the Central Nervous System*. New York: John Wiley & Sons, 1978.
12. Cuthbert S, et al. The Association of Manual Muscle Tests and Treatment Outcomes With Headache and Cranial Dysfunctions: A Retrospective Case Series Report. *Altern Ther Health Med*. 2018 Nov;24(6):8-21.
13. Standard Process Labs, Drenamin. https://www.standardprocess.com/products/drenamin.
14. Supreme Nutrition Products, Ashwagandha Supreme. https://shop.supremenutritionproducts.com/ashwagandha-supreme/.
15. Kendall HO, Kendall FP, Boynton, DA. *Posture and Pain*. Baltimore, MD: Williams & Wilkins; 1952:77-94.
16. Jensen AM. Estimating the prevalence of use of kinesiology-style manual muscle testing: A survey of educators. *Adv Integr Med* (2015).
17. Cuthbert SC, Goodheart GJ Jr. On the reliability and validity of manual muscle testing: a literature review, *Chiropr Osteopat*. 2007; 15(1): 4
18. Schmitt WH Jr, Cuthbert SC. Common errors and clinical guidelines for manual muscle testing: "the arm test" and other inaccurate procedures. *Chiropr Osteopat*. 2008 ;16(1): 16.
19. Janda V. *Muscle Function Testing.* London, UK: Butterworths; 1983:150-222.
20. Lewit K. *Manipulative Therapy in Rehabilitation of the Locomotor System*, 2nd edition. Oxford, UK: Butterworth-Heinemann; 1991:120-124.
21. Liebenson C. Ed: *Rehabilitation of the Spine: A Practitioner's Manual*, 2nd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2007:203-225.
22. Motyka TM, Yanuck SF. Expanding the Neurological Examination Using Functional Neurologic Assessment, Part 1: Methodological Considerations. *Int J Neurosci* 1999;97(1-2):61-76.
23. Green GN, Gin RH. George Goodheart, Jr., D.C., and a history of applied kinesiology. *J Manipulative Physiol Ther* 1997: 20(5): 331-337.
24. Schmitt WH, Yanuck SF. Expanding the neurological examination using functional neurological assessment part II: Neurologic basis of applied kinesiology. *Int J Neuroscience* 1999; 97: 77-108.
25. Goodheart GJ: Applied Kinesiology Research Manuals. Detroit, MI: Privately published; 1964-1998.
26. Rosner AL, Leisman G, et al. Reliability and validity of therapy localization as determined from multiple examiners and instrumentation. *Funct Neurol Rehabil Ergon.* 2015;5(3):365.
27. Rosner AL, Charles E. Therapy Localization in Applied Kinesiology: Validation by Means of Blinding in a Cohort Study. *Funct Neurol Rehabil Ergon* 2016;6(2):85-96.
28. Cuthbert S. *Applied Kinesiology Essentials: The Missing Link in Health Care*. Amazon: Kindle. Chapter 3: Applied Kinesiology's Diagnostic Advantages: Challenge and Therapy Localization. 2014: 25-38. ◆

Dr. Scott Cuthbert practices AK at Intercare Chiropractic Clinics in Makati Manila. Dr. Cuthbert is the author of *Applied Kinesiology Essentials: The Missing Link in Health Care* (2014), and *Applied Kinesiology: Clinical Techniques for Lower Body Dysfunctions* (2013), and *Whiplash Dynamics and Manual Muscle Testing* (2019), all of which are available at Amazon Kindle. He has published 15 Index Medicus clinical outcome studies and literature reviews, and over 50 peer-reviewed articles on AK.

Energy Medicine, the New Paradigm to Displace the Medical Establishment

by Richard Gale and Gary Null

Progressive Radio Network

During the past several decades, complementary and alternative medicine (CAM) is shaping rapidly into a new medical paradigm to displace our now failing and defunct science-based medical (SBM) model, which supports the ultra-orthodox and conservative drug-based theory started with the Rockefeller-funded Flexner report in the early 20th century. Among the many non-conventional therapies available, the science emerging in energy medicine or "biofield" therapies, and its partner energy psychology, is proving to be the greatest challenge to skeptical medical materialism. Underpinning the biomolecular properties of human anatomy and biology, energy medicine seeks scientific explanations for the cause and treatment of disease that occur at an atomic level. Briefly, energy medicine is "the application of extremely low level signals to the body, including energy healer interventions and bioelectromagnetic device-based therapies."[1] Therefore energy medicine shares more common ground with concepts derived from electromagnetic science and quantum physics, which govern the underlying physical laws of matter, including the anatomy and biology of our bodies and the essence of life.

The consequence has been that energy medicine is a direct challenge to the limited dominant medical paradigm, primarily pharmaceutical drug-based therapies, which rely upon the means to chemically affect genes, proteins and molecules synthesized by genetically coded proteins. Unlike conventional medicine, which parcels the human body into various organs and distinct biological systems in order to measure the level of a person's health, energy medicine and integrative medicine in general, according to Dr. Robert Heffron, the former director of Brown University's medical school department on integrative medicine, emphasizes the treatment of a disease by targeting its energetic cause. Heffron states, "a person's overall wellness cannot be measured simply by looking at the health of various organs."[2] Evidence-based alternative medicine, on the other hand, begins with the premise that the complexity of human biology cannot be predicated upon its parts alone but needs to be viewed in the wholeness of the body's complexity as a living system.

A large percentage of energy medicine techniques are employed for stress reduction and pain relief.

Today, energy medicine has developed into a broad discipline that includes energy healing, acupuncture, homeopathy, bioelectromagnetic and magnet therapies, light therapy, electrodermal therapy, psycho-neuroimmunology, applied kinesiology, mind-body techniques such as meditation, and traditional hands-on healing techniques.[3] The latter can include traditional chiropractic, therapeutic touch and massage, reflexology, cranial-sacral and polarity therapies, external qigong, and intentional faith healing. Notably, Hippocrates, the originator of the physician's oath that every new medical school student takes upon graduation, described healing energy as "the force which flows from many people's hands."[4]

A large percentage of energy medicine techniques are employed for stress reduction and pain relief. Numerous peer-reviewed studies reveal a direct correlation between a variety of health conditions and illnesses with elevated stress levels, including heart disease, asthma, obesity, diabetes, gastrointestinal problems, Alzheimer's, accelerated aging and premature death.[5] A University of Wisconsin review of clinical studies utilizing biofield therapies in cardiac patients found efficacy in reducing anxiety and stress, improved muscle relaxation, heightened sense of well-being, and a reduction in pain.[6]

If it is correct that a new theoretical paradigm is emerging that is evidence-based upon the role energy and its transmission plays to facilitate healing of the body and mind, then it is expected that its denunciation from factions within the existing medical establishment would be fierce. At present the most savage criticism is coming from the followers of skeptical materialism and SBM.

As we described in earlier articles in this series, SBM is deeply rooted in the radical reductionist Newtonian worldview of the skeptic movement, which now controls Wikipedia's content on medicine and healthcare. Wikipedia has kept the gates open for skeptics and their trolls, such as Guerrilla Skeptics on Wikipedia and the Center of Inquiry, to dominate the editorial discourse about CAM theories and medical and psychological interventions. It is a mystery how skeptics and the proponents of SBM repeatedly

➤

➤

fail to understand that our body is much greater than the mere sum of its parts, the central premise for all of the emerging discoveries in modern systems theory now being adopted into multiple disciplines, including economics, ecology and nature conservation, climate science, etc. Consequently, SBM has been floundering one hundred years in the past while denigrating the integrity of legitimate scientific inquiry and persistent discovery.

SBM skeptics and the pharmaceutical industry have every reason to worry about the rapid advancements being made in alternative medicine, and most important energy medicine. Their paradigmatic dominance and profits are under rising stress due to the popular demand for safer alternatives to the trail of iatrogenic injuries, illnesses and deaths resulting from prescription drugs and often unnecessary surgical procedures. Until recently the medical establishment has always held hegemony over determining what is and what is not approved medical protocol. It seems likely that for the allopathic regime to maintain its dominance, it will require the full support of the federal government to institute a legislative totalitarian police state over national healthcare.

In 2012, Americans spent $14.7 billion on CAM practitioners, such as chiropractors, massage therapies, acupuncturists, and energy medical practitioners and healers. This is almost a third of what is personally spent on conventional medical services. In addition, $12.8 billion was spent on natural supplements, approximately 25% of what Americans spend on pharmaceutical drugs. The US National Center for Complementary and Integrative Health, a division of the National Institutes of Health, calculates that 9% of out-of-pocket healthcare costs are spent on alternative medicine and, as of June 2016, the Center estimated that 38% of adults are using CAM, including energy medical modalities, and 44% in the 50-59 age bracket.[7] Moreover, this increase is not limited to the well-educated but has been found occurring in various degrees across all income levels and racial groups.[8]

Skepticism's fundamentalist perspective adamantly rejects the value of the CAM practices being adopted into mainstream medicine. Its lack of self-reflection and its stubborn inability to objectively question why they are losing ground is baffling. The skeptics' refutation of energy medicine's empirical evidence is equivalent to scientifically illiterate bureaucrats who categorically deny anthropogenic-induced climate change regardless of the numerous evidence to the contrary. Wikipedia has thrown its support with the losing side, a dying paradigm, while also committing a great disservice by preventing valuable information about safe and effective alternative therapies from reaching the public.

According to the skeptics' Wikipedia entry:

> Energy medicine, energy therapy, energy healing, psychic healing, spiritual medicine or spiritual healing are branches of alternative medicine based on a pseudo-scientific belief that healers can channel healing energy into a patient and effect positive results.... While early reviews of the scientific literature on energy healing were equivocal and recommended further research, more recent reviews have concluded that there is no evidence supporting clinical efficiency. The theoretical basis of healing has been criticized as implausible, research and reviews supportive of energy medicine have been faulted for containing methodological flaws and selection bias, and positive therapeutic results have been dismissed as resulting from known psychological mechanisms.[9]

"Implausible" is a common skeptic catch-term to deny and degrade any scientific premise that challenges skepticism's self-cherished truths. Yet, objectively the term is meaningless. For this reason, SBM skepticism is anti-science at its core.

Since the start of the scientific method's modern era, the ethos of legitimate science has always been open to change. It is experimental, fluid and non-dogmatic. The essence of the scientific worldview that most frightens SBM skeptics is that it is always hypothetical. Any certainty is in fact tentative until a new discovery and theory debunks it. Real science is an organic quest for knowledge and not certainty. When medicine becomes doctrinal, which appears to be skepticism's goal, it becomes exceptionally corrosive to the public good. It undermines the alternative worldviews it confronts solely on irrational arguments. For this reason, the skeptics' often treat their scientific materialism as an idol, and SBM skepticism now warrants a warning label for being dangerous to public's health.

Skeptics have their own strategies to demonize CAM and non-conventional medical therapies they disapprove of. But there are notable patterns they hold in common and that pervade the language on Wikipedia pages. Dr. Phil Mollon at the British Psychological Society notes that skeptics commonly misrepresent their target in order to create a negative impression on the reader. This includes the use of subtle distortion of cited research and only cherry-picking research to support the skeptical narrative. We find the frequent use of disparaging words, ridicule, prejudice and false indictments. In the absence of sound argument and an attention to details of the peer-reviewed literature of their target, they rely upon broad sweeping and unsubstantiated generalizations. And finally, skeptics embrace "a dogmatic assertion of what is and what is not to be termed 'science'."[10] We would also include their harboring a delusional paranoia about the motives of CAM practitioners. For this reason, SBM skeptics frequently refer to CAM therapies as "scams."

Likewise, Wikipedia skeptics sharply criticize energy medicine's scientific theoretical rationale, which is based upon the physics of bioelectrical and biomagnetic activity: Wikipedia states, "Physicists and sceptics roundly criticize these explanations as pseudophysics – a branch of pseudoscience which explains magical thinking by using irrelevant jargon from modern physics to exploit scientific illiteracy and to impress the unsophisticated."[9] The encyclopedia also denounces bioresonance therapy as "pseudoscientific," which incorporates devices using electromagnetic waves to diagnose and treat illnesses. Relying upon SBM's preeminent source of healthcare misinformation, Quackwatch, it states, "the therapy is completely senseless and the proposed mechanism of action impossible."[9] The good news is that the general public increasingly disagrees with Wikipedia's skepticism.

Wikipedia's war against energy medicine and energy psychology is best exemplified in an online confrontation between Jimmy Wales and Debby Vajda, President of the Association for Comprehensive Energy Psychology (ACEP). In 2014, the ACEP posted a petition on the grassroots activist site Change.org requesting Wikipedia users to refrain from donating to the encyclopedia because of the preferential treatment given to skeptics to ridicule and viciously condemn energy medicine and psychology. The petition gained over 11,200 signatures.[11] In response, Wales wrote:

> No, you have to be kidding me. Every single person who signed this petition needs to go back and check their premises and think harder about what it means to be honest, factual and truthful. Wikipedia's policies around this kind of thing are exactly spot-on and correct. If you can get your work published in respectable journals, that is to say, if you can produce evidence through replicable scientific experiments, then Wikipedia will cover it appropriately. What we won't do is pretend that the work of lunatic charlatans is equivalent of 'true scientific discourse.' It isn't.[12]

"Lunatic charlatans?" A word taken directly out of skepticisms' lexicon.

Every attempt ACEP and practitioners of energy psychology made to correct the Skeptics' litany of misinformation and questionable citations were rejected. References supporting their attacks on energy-based healing are grossly cherry-picked to validate their disdain towards anything outside their orthodoxy. Vajda provided 51 peer-reviewed articles and studies, 18 which were randomized controlled studies, appearing in professional journals, including the *Journal of Clinical Psychology*, the *Journal of Nervous and Mental Diseases*, *Psychotherapy Theory Research and Practice*, and others showing positive statistical results outside the range of chance. In fact, the volume of published scientific literature she could have provided is vastly larger. Vajda replied:

> Every edit to the energy psychology Wikipedia page that attempts to reference findings from these well-respected, scientific journals is summarily deleted… The American Psychological Association does not think we are 'lunatic charlatans.' Neither does the Association of Social Work Boards, the National Board of Certified Counselors, or the National Association of Alcohol and Drug Abuse Counselors, all of which approve ACEP to provide continuing education to their professional members for the study of energy psychology. The Wikipedia page is out of step with existing peer-reviewed research on this topic, and opinionated, self-described "skeptic" editors are resisting any change.[12]

Apparently, the scientific evidence was insufficient to pass Wikipedia's litmus test for scientific credibility. The page still defines energy medicine as a "pseudo-scientific belief."[9]

As we noted earlier, skeptics spearheading the SBM clique are vocally ➤

condemnatory towards the assimilation of CAM therapies, energy medicine and other healing modalities into medical and nursing school curriculums, hospitals and clinics, and the federal healthcare system. Writing on the SBM blog, Scott Guvara has ridiculed medical schools creating integrative medicine departments and offering courses in alternative medicine. Displaying a frequent skeptic jealousy and mistrust, he calls CAM practices "Trojan horses." He goes on to argue that "medicine is based upon a "rigorous foundation of science."[13] If this were true, we would expect much safer and effective drugs reaching the market; however, the opposite has been the case. Our pharmaceutical culture continues to pump out poorly researched drugs that pose serious health risks. For this reason, the number of people turning their back on conventional medicine continues to rise. Other SBM skeptics such as Mark Crislip and David Gorski equate CAM medicine with religious belief.[14]

One major hurdle energy medicine confronts has been reaching a scientific consensus for a theory of "biofields." Energy medical modalities, also known as biofield therapies, are perhaps the most mysterious and controversial CAM therapies. Although many of these approaches have existed for millennia, scientific investigation into these techniques is still pre-paradigmatic; much remains to be learned about the deeper physical mechanisms to account for these therapeutic activities and efficacy.[15] The empirical evidence is already cataloged regardless of the skeptics' attempts to deny it or attribute it to psychological suggestion or the placebo effect. However, a true paradigmatic shift cannot occur until a sound theory becomes grounded in science. Skeptics outright reject empirical evidence without the confirmation of a scientific theory to support it. As an analogy, there is scientific consensus among astrophysicists for the existence of dark matter in the universe. Although it is neither visible by current telescopes nor measurable by modern technology, its existence is inferred and agreed upon because of its effects observed on visible matter.[16]

Wikipedia doesn't provide any useful information about biofields. Despite almost a hundred years of scientific research and peer-review scientific research to identify what is now known as biofields, which previously took on a variety names over the centuries, including vital energy and chi, the encyclopedia simply states that "Biofield therapies are intended to affect energy fields that purportedly surround and penetrate the human body. The existence of such fields has not been scientifically proven."

Rather than acknowledge peer-reviewed literature supporting biofield activity, or the fact the term emerged from a committee funded by the federal government's National Institutes of Health, Wikipedia simply associates biofields with "esoteric" medicine and the paranormal. On the other hand, the encyclopedia's entries about electrophysiology (electrical properties of cells and tissue), electroreception (sensory electric fields of organisms) and bioelectromagnetics (organisms' sensor magnetic fields) – all which form a scientific basis for research and further inquiry to understand energy medicine's empirical successes – are isolated from the context of CAM.[17]

In the mid-1980s, Dr. Bjorn Nordenström observed bizarre coronas and halos around tumors in routine x-rays. His further investigations led him to discover that cancer tissue had distinct electrical characteristics. Later Nordenström treated two women cancer patients, one with ovarian cancer and another with breast adenocarcinoma. Following a single day's treatment of electrochemical stimulation, the cancers vanished and eight years later both women were healthy with no clinical evidence of cancer. Nordenström claimed to have identified an entire system of electrical activity and communication pulsating throughout the human body, which *Discover* magazine reported might be the "most profound biomedical discovery of the century." He defined this electrical circulatory system as a network of "biologically closed electric currents," which has since given rise to the electromagnetic treatment of cancer.[18] Although Nordenström's results have now been replicated in many clinical studies involving thousands of patients, largely outside of the US, the full significance of his revelations for energy medicine's enormous potential is still in its infancy.

Notably, Nordenström was not a crazed doctor. Rather he had impeccable credentials as the chairman of the prestigious Karolinska Institute's Department of Radiology in Sweden and served as chair of the scientific assembly that awards the Nobel Prize for Medicine. A true scientist, he was a staunch adherent of the scientific method.[18] Later in his life he began to explore ancient medical systems, particularly Chinese medicine and its concept of chi, and discovered these ancient theories shared much in common with his own laboratory and clinical observations. Ancient healers were already recognizing a mysterious and subtle force of energy enveloping our bodies that could only be technologically and clinically monitored thousands of years later.

As expected, Nordenström confronted fierce criticism from the medical establishment's close-minded bureaucracy. A September 1986 *Los Angeles Times* article discussing the debate quoted his opponents calling his theory "wild-eyed." A director at the National Cancer Institute said, "The theory sounds flawed... Based on what we know about cancer biology, there is no evidence that changing electrical fields have any impact on a tumor." Nordenström's reply was simple and applicable to skeptics and SBM proponents today. "It's not my fault it's complex. It's not my fault that people don't understand. This is not the first time in history that this situation has occurred. People say it's controversial because it's another way to say they don't understand."[19] Similarly, when skeptics and SBM advocates fail to understand something or a phenomenon are unable to find agreement within its narrowly defined parameters, Dr. David Hufford at Pennsylvania State University writes that it is then shrugged off as psychological suggestion, a placebo or fraud.[16]

Perhaps this is a reason why skepticism's editorial control of Wikipedia does not include an entry for Bjorn Nordenström. Scientific geniuses, such as Nordenström, who challenge SBM's narrow belief system, are its greatest threat.

Professor William Tiller at the Department of Materials Science and Engineering at Stanford University has made it his career to study electromagnetic, bioelectromagnetic and even more allusive subtle energies.

Using the dark matter analogy, subtle energy, according to Tiller, is different than electromagnetic forces, and in human biology their processes are elusive because they cannot be measured directly but its effects can be observed. Tiller believes subtle energy holds a role in human consciousness based upon research he performed on participants' intentionality to increase or decrease the pH in aqueous solutions and increase the ATP-ADP ratio in fruit fly larvae.[18]

Dr. Beverly Rubik is an internationally recognized biophysicist and a pioneer in advancing evidence-based research to promote energy medicine and biofield science. As federal agencies recognized there was growing empirical evidence supporting energy medicine and a public demand for CAM therapies, she received a Congressional appointment to chair panels at the NIH's Office of Alternative Medicine to arrive at a scientific consensus for defining biofields. The committee eventually arrived at a definition. A biofield is "a massless field, not necessarily electromagnetic, that surrounds and permeates living bodies and affects the body."[20] The term "biofield" was subsequently entered in the National Library of Medicine. Nevertheless, this is a preliminary working definition. Future research and discoveries will eventually substantiate and better define biofield theory. At such time, modern medicine will undergo a profound revolution.

In addition to the emerging science of biofield therapy, and empirical evidence stimulating these fields through energy medicine and psychology (such as tapping), the new medical paradigm is based upon the physics of electromagnetic frequency. Every cell in the body acts at certain frequencies. Cells function in a collective network to sustain harmony. Emotional stress or stress generated from pain, on the other hand, produces erratic electrical vibrations that lead to cellular imbalance and in turn lead to illness and disease. There are numerous biochemical processes constantly occurring within the body with electrical stimuli. Cell membranes have electrical charges. There are amps, volts, and both static and magnetic energies within the electrical currents of our body's organs, systems and biofields; and these can be observed, measured and monitored with modern medical devices and technologies. Aside from skeptic denialism, conventional medicine already employs the principles of energy medicine daily, such as electrocardiogram (ECG) to monitor cardiac functions, the electroencephalogram (EEG), and functional magnetic resonance imaging (fMRI) to measure brain wave activity, and electromyography (EMG) to evaluate the electrical activity produced by skeletal muscles.

As stated above, the emerging theory to support energy medical modalities and biofields shares more in common with physics. Recent research applying quantum theory to non-conventional therapies, such as meditation and mental stress reduction techniques, suggests the body-mind relationship is a macroscopic quantum system. Furthermore, the empirical evidence suggests the biofield plays an important role in these processes, including biophoton-mediated regulatory processes, such as ultraviolet light emission when cells replicate. Cell-to-cell communication, secretion of regulatory neurotransmitters, respiratory modulation in white blood cells, and seed germination are additional cellular activities where bio-photons seem to function. According to Dr. Van Wijk at the International Institute of Biophysics in Neuss, Germany, "bio-photon research [as well as bio-photons' capacity to carry bio-information across distance due to cellular radiation] is hardly recognized in mainstream science so far."[21] Yet this is all part of the new developing biophysical sciences that continue to reinforce energy medicine's fundamental principles.

Most of us have had the personal experience of feeling an exchange of energy between ourselves and another person. We have all experienced moments of calm or fear in the presence of someone. These experiences do not require scientific evaluation or a stamp of approval by an authoritative committee to be ruled as authentic. One of the important strengths of CAM and the emerging confirmation of energy medicine and energy psychology has been the swelling of popular demand. People do something because it works for them. And when millions of people turn to CAM therapies, they cannot all be written off as victims of psychological suggestion, the placebo effect, or skeptics' censuring of alternative modes of healing as mere scams and hoaxes. This is the rhetoric of a paradigm in decline.

The great MIT historian of science and developer of a theory to explain paradigm changes within dominant scientific models notes that the dominant conventional science at the time is one that is deeply rooted in past achievements that generate a stalwart foundation for future discovery.[22] On the other hand, dominance is accompanied by scientific rigidity and in the case of the pharmaceutical-based medical paradigm ruling American medicine today, it is unable to accept competition from theories threatening its control. Therefore, skepticism's inability to comprehend the fundamental principles that define scientific and legitimate medical inquiry and discovery should relegate Wikipedia's treatment of medicine and health to the dustbin of history.

References

1. Rubik B, et al. Biofield science and healing: history, terminology and concepts. *Glob Adv Health Med*. 2015 Nov;4 (Suppl): 8-14.
2. Kowarski I. Med schools adding integrative medicine courses. *US News and World Report*. September 5, 2017.
3. Rubik B, et al. Biofield science and healing: history, terminology and concepts. *Glob Adv Health Med*. 2015 Nov;4 (Suppl): 8-14
4. Schiegl H. *Healing Magnetism*. Freiburg: Herman Verlag KG; 1983.
5. Griffin RM. Ten health problems related to stress that you can fix. WebMD.
6. Rindfleisch JA. Biofield therapies: energy medicine and primary care. *Primary Care*. 2010;37(1):165–179.
7. Thompson, Dennis. Alternative medicine taking hold among Americans: Report. Healthday. June 22, 2016.
8. The use of complementary and alternative medicine in the United States. National Center for Complementary and Integrative Health. https://nccih.nih.gov/research/statistics/2007/camsurvey_fs1.htm
9. Energy Medicine. https://en.wikipedia.org/wiki/Energy_medicine
10. Mollon P. Debunking the pseudoscience debunkers. *British Psychological Society*. June 2007;174: 13-16.
11. Change. org. https://www.change.org/p/jimmy-wales-founder-of-wikipedia-create-and-enforce-new-policies-that-allow-for-true-scientific-discourse-about-holistic-approaches-to-healing
12. Newman LH. Jimmy Wales Gets Real, and Sassy, About Wikipedia's Holistic Healing Coverage. *Slate*. March 27, 2014.
13. Gavura S. The trojan horse called integrative medicine arrives at another medical school. https://sciencebasedmedicine.org. August 29, 2013.
14. Gorski D. The difference between science-based medicine and CAM. SBM blog. July 29, 2013.
15. Rindfleisch JA. Biofield therapies: energy medicine and primary care. *Primary Care*. 2010 March; 37(1): 165-79.
16. Hufford DJ, Sprengel M, Ives JA. Barriers to the entry of biofield healing into mainstream medicine. *Global Advances in Health and Medicine*. 2015 Nov; 4 (Suppl): 79-88.
17. Biofield. https://en.wikipedia.org/wiki/Biofield
18. Rosch PJ. Bioelectromagnetic and subtle energy medicine. *Annals New York Academy of Science*. 2009;1177: 297-311.
19. Parachini A. Cancer-Treatment Theory an Enigma to Scientific World. *Los Angeles Times*. September 30, 1986.
20. Rubik B et al. "Manual healing methods." *Alternative Medicine: a report to the National Institutes of Health on alternative medicine systems and practices in the United States*. NIH Publications: US Government Printing Office, 1995: 113-57.
21. Van Wijk J. Bio-photons and Bio-information. *J Scientific Exploration*. 2001;15(2): 183–197.
22. Kuhn T. *The Structure of Scientific Revolutions*. University of Chicago Press, 1962: p. 10.

◆

Ask Dr. J

by Jim Cross, ND, LAc
thias1020@yahoo.com

Animal, Vegetable, Junk

Do I even have to ask? Would any *Townsend* reader buy a junk car or a junk computer? If our readers wish to ascertain cogent reasons why people choose to ingest junk food, please read Mark Bittman's highly entertaining, educational, and historical book, *Animal, Vegetable, Junk: A History of Food, from Sustainable to Suicidal* (Harvest, 2021). He lays out in substantially considerable detail how humans progressed from eating food, as it is found in nature, to consuming a hyper-processed, adulterated non-food item.

Mark is also extremely adept at making connections between food and every aspect of human life on earth plus our relationship to the earth itself. Here is an incredible, direct quote:

> You can't talk about reforming a toxic diet without talking about reforming the land and labor laws that determine that diet. You can't talk about agriculture without talking about the environment, about clean sources of energy, and about water supply. You can't talk about animal welfare without talking about the welfare of food workers. You can't talk about food workers without talking about income inequality, racism, and immigration. In fact, you can't have a serious conversation about food without talking about human rights, climate change, and justice. Food not only affects everything; it represents everything.

Wow, it's okay to take a few moments to ponder the absolute wisdom incorporated into those words. At the beginning of Obama's first term, people were floating Michael Pollan's name as Secretary of Agriculture. I'm going to vote for Mark Bittman.

His essential point is that food has driven history. Unfortunately, the vast majority of humans forget that soil also drives food. Over the centuries, humans built entire civilizations and industries around their ability to bend the land and its fruits to their will. Land became the foundation of wealth. Sadly though, because of this manipulation of the earth, agriculture has gotten away literally with murder over the course of our history. With each passing century this non-altruistic manipulation of the earth has become better organized and has done more damage to the earth than strip mining, urbanization, and even fossil fuel extraction combined. Alas, it remains not only underregulated but subsidized by most governments.

Now back to the title of his book. Humans had, for the most part, two types of food until about a century ago: plants and animals. Plants mostly create biomass, and animals mostly consume that biomass. As agriculture and food processing became industries, they developed a third type of food, which is more akin to poison: junk.

Part I of his book is entitled "The Birth of Growing." He makes an interesting point that I happen to agree with: facts about early human ancestors' diets are mostly deductions and interpretations based on indirect evidence and influenced by current prejudices. He generates another very interesting detail in that women had a more varied role in hunting and roles based on gender were less fixed than we were led to believe. Essentially women provided more overall calories because they collected plants/birds/eggs/shellfish/insects, hunted small game, and even took part in large game hunts. He estimates they accounted for approximately 70% of total calories gathered.

Another interesting point he makes about pre-agricultural humans is that there was originally no ownership of the land. Everyone needed food, and it was best to share. Equality, cooperation, and generosity were more advantageous than conflict. This also led to social networks being formed.

Bittman then shifts to early agriculture, which varied from place to place and occurred over millennia. Each region would have different approaches to farming based on the type and availability of land, water sources, growing seasons, and amount of labor.

Another important point he makes is that making plants grow where you wanted them to grow and forcing animals to stay around so you could fatten, milk, and breed them was easier than constantly moving from a nomadic existence. A problematic result of this new way of life predestined that doing the work meant owning the results and enacting laws to protect the owners of the land, which bred injustice, poverty, disease, slavery, and war. Agriculture then had brought inequality and class distinctions into play. Diets also became monotonous and less variable, which caused undernourishment and vulnerability to disease.

Bittman also writes a chapter entitled "Agriculture Goes Global" where he shows the initiation of food being produced not outside your door but far afield by exploited labor overseen by strangers and shipped in unimaginable quantities to supply huge markets. Sustainable agriculture had protected locals from starvation and sustained their cultures, but now invaders began to grow their food and bring their animals into indigenous areas. A good example of this is de Soto brought 13 pigs to Florida in 1530. In the New World, Europeans were taking the most productive land, fencing it off, and selling it to other Europeans. They worked the indigenous people to death and then brought in slaves. The old, local ways then gave birth to market economies and unrestrained capitalism.

As a result of this indigenous land grab, they also created famine for the local populations. A great example of this is one of the most eaten foods on the planet, the potato. In the Andes, farmers grow 4,000 various types, which make it extremely difficult for insects and microbiological diseases to have a major impact. At the end of the 1800s in Ireland, the most prized agricultural land was used to grow corn or raise animals for meat, both of which were shipped to England. The Irish were growing one type of potato, which succumbed to a microscopic fungus called *Phytophthora infestans*. The Irish were written off as justifiable victims of natural law.

Mark also makes an interesting claim that the British East India Corporation was the first multinational corporation because of the widespread colonization of the world by the United Kingdom. Great Britain was only interested in colonies that could supply it with raw materials for their burgeoning tastes, such as tea and sugar. For example, the Brits forced India to deindustrialize, levied crushing taxes, and caused multiple famines. In West Africa, locals had eaten dozens of life-sustaining grains, which were hardy and tolerant of temperature change, drought, and infertile soil. These were destroyed in favor of cocoa and coffee. Agriculture then had become a global commodity, which caused and enhanced famines in local countries by eroding traditional farmers' ability to farm.

An interesting side point: There was an agricultural depression in the 1800s in Europe due to insufficient manure. After the Battle of Waterloo and other major battles, the remains of soldiers were sold, ground, and resold as bone meal for plant growth. Maybe that explains some of the unnecessary wars of the 1800s!

Next, he delves into the American way of farming where yield and volume are more important than sustainability. In the USA, science has emerged as a framework for contorting nature into shapes that squeezed the most profit out of the land but didn't lead to a profitable ecosystem. Americans are superior at reorganizing nature into deceptively simple components—in other words reductionism, which unfortunately ignores complicated ways parts interact with one another. It can explain how a bird flies but not what causes the supreme uniformity of a flock of birds flying in pinpoint unison.

The US was best at producing meat, wheat, soybeans, and corn. We grew excess grain that could be consumed and transported without spoiling. Animals, especially pigs, were a great way to convert grain into profit. The advent of refrigerated transport made meat easier to process and ship. Since Cincinnati was located on the Ohio River, meat could be transported to all ports east. It became known as Porkopolis. With Mississippi closed to traffic during the Civil War, Chicago/Mud City replaced Cincinnati. In 1870, approximately 3 million hogs and cattle/year were slaughtered in Chicago. The Great Plains, with its 500,000 square miles was transformed into the world's greatest experiment in grain production and cattle breeding and raising.

I'm not even a fourth of the way through reviewing the book. Hopefully I have whetted your whistle enough to desire to read this true magnus opus. Let me end with yet another Bittman piece of logic: If terrorists stole or poisoned a large share of our land, water, and other natural resources, underfed as much as a quarter of the population and seeded disease among half, threatened our ability to feed ourselves in the future, deceived/lied to/poisoned us, and ruthlessly exploited many of our citizens**,** we'd consider that a threat to national security and act accordingly. So, faithful *Townsend* readers, hopefully you agree that this modern manipulation of food and the earth is a threat to national security. Please use your initiative and highly active brains to figure creative ways to throw multiple wrenches into the present system and begin to transform this dysfunctional methodology into a sustainable, sensible, and equitable model that benefits all life on earth and our earth mother herself.

◆

Healing with Homeopathy

by Judyth Reichenberg-Ullman, ND, MSW
www.healthyhomeopathy.com

Is Homeopathy Too Good to Be True?

A Godsend or a Hoax?

There are few forms of medicine as controversial as homeopathy. If you were new to homeopathy and you searched, as we all do, for online sources such as Wikipedia (whose founder has always thought homeopathy was ineffective, unscientific, and has made no effort whatsoever to be unbiased), you might reject it out of hand as implausible and impossible. Check it out further, and you will find that there are over 200,000 registered homeopathic physicians in India, for example, and 12,000 more being added each year—and that homeopathy is the treatment of choice, before conventional medicine, for many individuals and parents worldwide. If you were to dig beyond the "Where is homeopathy banned" sensationalism and investigated further, you would find homeopathy was popular and widespread throughout Western Europe until the past few years, when it received a tremendous backlash in the UK and Spain and that it was extremely popular and widespread in the US until 1910 when the Flexner Report, funded by the Carnegie Foundation, led nearly to its demise in the US until the 1970s, when it was revived. You would also find a number of articles in the medical literature legitimizing homeopathy. And, if you would like to better understand the controversy and ubiquitous bias, watch *Just One Drop: The Story Behind the Homeopathy Controversy* (https://justonedropfilm.com/). I will not spend my time in this article trying to defend homeopathy scientifically because, as you may know already or will learn in the film, the deck is stacked against us. Many minds are made up, regardless of the facts.

Since homeopathy uses micro-doses beyond what is considered material, you may wonder how it is possible that they are criticized as having nothing in them, yet, at the same time, are blamed for being toxic and dangerous? Given that homeopathic remedies are astoundingly dilute, why would they pose a threat to anyone? Why would the FDA, which has had a very positive relationship with homeopathic pharmacists for decades, feel a need to threaten to make illegal, remedies that are safe even for infants and pregnant moms? And why would a devoted (rather than misguided) homeopathic practitioner, such as Dr. John Bastyr (1912-1995), devote 50 years of his life to the practice of naturopathic medicine, including homeopathy (https://bastyr.edu/news/general-news/2012/09/7-things-you-may-not-know-about-john-bastyr and https://bastyr.edu/about/overview/history#Namesake-Dr-Bastyr)? Why would so many of us homeopaths practice into our 70s and 80s? Are we fooling ourselves and our patients? And making up the thousands of before-and-after videotaped teaching videos from which many of us have studied avidly over the years. I hope to dispel some myths and answer some basic common questions, from nearly 40 years of homeopathic practice, some important and real questions that are asked commonly.

How is it possible that there is one single homeopathic medicine for ALL of my symptoms? This, along with the principle of "the minimum dose," is what makes homeopathy unique among medical approaches. Just as there is one, single substance in nature that *causes* a particular constellation of symptoms, that very same substance, when potentized (prepared homeopathically), can *relieve* that same set of symptoms. If you stop and think about this, it is astounding. It flies in the face of much of modern medicine. Think of the patients, such as geriatric individuals, who are prescribed four, five, ten *different* prescription medications. Each of these come with its own (often extensive) insert listing its potential side effects. Not to mention how it interacts with all the other meds the individual is supposed to take.

It is only possible after a 90-minute or more extensive case-taking to understand the individual well enough to

find the specific homeopathic remedy that corresponds. We listen carefully, hopefully free of assumptions and prejudice, assess all the current symptoms, past symptoms (physical, mental, and emotional), life and family history from birth to childhood through adulthood). We observe whatever we can about the patient's appearance, demeanor, gestures. All of this leads us, hopefully, to find the one remedy that will relieve *all* of the patient's symptoms. This is where it is legitimate to ask: "How is this possible?" "Is it too good to be true." Hopefully not. Ideally, the one correct remedy, out of 8000+, can be found, resulting in the patient feeling better all around. But this requires a patient who can communicate and a homeopath who has the expertise to recognize what (s)he is seeing, hearing, witnessing. Even with nearly forty years of experience, I cannot always find the remedy to help someone, though usually I can. And, when I do, that remedy should help *all*, not only some, of the patient's symptoms.

How can homeopathic remedies/medicines NOT have side effects? The only *reactions* that a patient is likely to see are 1) an *aggravation* (worsening of already existing symptoms occurring right after taking a remedy, which is why we carefully assess which potency of a remedy to give to each patient and when); 2) a *return of old symptoms* (replay of symptoms from the past, often in the reverse order from which they appeared; a confirmation that the remedy is correct); or 3) no response at all (what typically happens after the wrong homeopathic remedy is prescribed). But, it is true; homeopathic remedies do not have side effects and drug reactions like conventional pharmaceuticals. Drug interactions, such as typically occur, are not an issue because only one remedy is administered at a time and will not *interact* with medications.

How can homeopathic remedies not have expiration dates? This is true, unlikely as it may seem, with homeopathic remedies. The remedies in the acute self-care kits that we sold for decades are just as effective now as 20 years ago, though common remedies such as *Arnica montana* (Leopard's bane) may need to be refilled. How do homeopaths and homeopathic pharmacies make money? Certainly not by selling individual remedies or self-care kits!

How is it that the more dilute the homeopathic remedy, the stronger it is? This is unique to homeopathy. A 200C remedy, which has been diluted 1 part of the original substance to 99 parts water or alcohol and succussed (shaken) successively 200 times, is much stronger than a 6X remedy that you might find in your health food store. But not as strong as a 1M dilution (1 to 99 but diluted and shaken successively 1000 times). You can see why these remedies are made by homeopathic pharmacies with machines. Preparing a remedy by hand could take weeks or months!

How can a homeopath begin to find the one remedy that fits me the best out of over 8000? If you are trying to find the best remedy for a first-aid or acute condition, it is easy. There are many wonderful resources to have at your fingertips, such as our tried-and-true *Homeopathic Self Care: The Quick & Easy Guide for the Whole Family*. The possibilities are limited, But, when you are talking about finding the one best remedy for a complex, chronic combination of complaints, an effective system is needed. And a computerized method of compiling and analyzing symptoms. This is the art of homeopathic prescribing and there have been many teachers and methods over the past 200+ years. I have used a variety of approaches but, since 1993 when I began studying with my mentor, Dr. Rajan Sankaran of Mumbai, India, I find his Sensation Method to be a godsend. There are newer systems, such as those of Jan Scholten and Michal Yakir, and others, as well as a wealth of previous homeopathic literature.

What does my hereditary predisposition have to do with my remedy? Dr. Samuel Hahnemann, the founder of homeopathy, found that homeopathic remedies could remove symptoms, but there was an underlying layer of predisposition (literally *miasma* or swamp) that needed to be addressed to maintain health. For example, my mother suffered from TB for a number of years before my birth. I inherited the *tubercular miasm*, characterized by lung symptoms, a burning desire to travel and to burn the candle at both ends, and a love of bacon and smoked meat! Now this is an oversimplification, but it is true, and very relevant to healing patients. And the *cancer miasm*, recognized by perfectionism, moles, and a family history of cancer. Certain remedies correspond to certain miasms, narrowing the possible choices for a constitutional (whole person) remedy.

Why would a homeopath, when treating my child, want to know so much about me and the pregnancy? Especially when treating children, the mother's "state" during the pregnancy can be very relevant to narrowing down the remedy choices – so can the patient's childhood history, even if (s)he doesn't begin homeopathic treatment well into adulthood.

How likely is it that you *can be helped by homeopathy?* If your symptoms can be communicated to a homeopath clearly enough that that individual can find the right remedy for you (be it sulfur or butterfly or daisy or whatever), it is highly likely that you will be happy with the results.

Is homeopathy too good to be true? Back to the original question and the title of this article! Millions of individuals have been helped by this unique medical science and art. I have experienced and witnessed amazing results over the past four decades. So, I would unqualifiedly say, "No, homeopathy is not too good to be true!"

Dr. Judyth Reichenberg-Ullman is the author of *Whole Woman Homeopathy*, and co-author, with Dr. Robert Ullman, of eight books on homeopathy: *Ritalin-Free Kids, Homeopathic Self Care, The Savvy Traveler's Guide to Homeopathy and Natural Medicine, Whole Woman Homeopathy, A Drug-Free Approach to Asperger Syndrome and Autism, The Homeopathic Treatment of Depression, Anxiety, and Bipolar Disorder*, and *Rage-Free Kids*, as well as *Mystics, Masters, Saints and Sages – Stories of Enlightenment*. She has been a columnist for the *Townsend Letter* since the early 90s, and has taught internationally. Judyth and Bob live on Whidbey Island Washington, with their golden retriever, Rosie Posie, and in Pucón, Chile with a menagerie of farm animals.

Please visit www.healthyhomeopathy.com (where you will find a wealth of articles, blogs, and more) and Facebook at Healthy Homeopathy. Dr. Reichenberg-Ullman can be reached at drreichenberg@gmail.com.

◆

Still the Best

A Must Have for Kidney Function Support!

CORDIMMUNE ™

The only cordyceps product that is standardized for and declares its cordycepin content

- Supports mitochondrial function and ATP production
- Modulates immune system
- Enhances athletic performance safely
- An excellent adaptogen and adrenal support
- Supports hematopoiesis
- 0.2% Cordycepin (worth over $100 per bottle)
- 0.3% Adenosine • 22% Polysaccharides

Immune Support Beyond Just Polysaccharides!

CORIO PSP ™

The most clinically researched mushroom in Japan and China

- Unmatched 38% polysaccharides
- Lessens the side effects of toxic treatments
- Raises the quality of life
- Raises the activities of NK cells and macrophages
- Increases thymus weight

The statements herein have not been evaluated by the FDA. This product is not intended to diagnose, treat, or prevent any disease.

CRNA

CANADA RNA BIOCHEMICAL INC.
Tel: (604) 273-2233 • **www.canadaRNA.com**

1-866-287-4986

Curmudgeon's Corner

by Jacob Schor, ND, FABNO
drjacobschor1@msn.com

No Citation Allowed

I tend to be near fastidious in citing references to support any statement of fact made in my writing. Thus, I'm not sure what to do now where a document declares itself off limits and asks the reader not to cite it.

Let me back up. I've been following air pollution studies closely, especially those on the fine particulates that are less than 2.5 micrograms in diameter referred to as PM2.5. This is really just very fine soot. Numerous studies link exposure to PM2.5 to higher risk of disease, in particular heart disease. I've recently reviewed one of these studies for the *Natural Medicine Journal*, a study by Ward-Caviness that looked at chronic PM2.5 exposure and outcomes for people suffering from heart failure. This study was published in the *Journal of the American Heart Association* in May 2021. These researchers used some fancy statistical tests to compare chronic exposure to PM2.5 in heart failure patients and their risk of ending up readmitted to the hospital after an initial cardiac event.

To do this the researchers accessed population data from the Environmental Protection Agency Clinical and Archived Records Research for Environmental Studies (EPA CARES). This is a treasure trove of electronic health records merged with environmental exposure data gathered to facilitate environmental health studies such as this one. The researchers analyzed data from a total of 20,920 heart failure patients using sophisticated regression models to associate annual average fine particulate matter at the date of heart failure (HF) diagnosis with the number of hospital visits and 30-day readmissions. They first had to individually geocode each patient's address and estimate their daily exposure to PM2.5. A total of 442,244 hospital visits were counted for these patients over an average follow-up of 2.79 years.[1]

To no one's great surprise, the greater the exposure to air pollution, the worse the patients did. A 1-$\mu g/m^3$ increase in fine particulate matter (PM2.5) was associated with a 9.31% increase in total hospital visits, a 4.35% increase in inpatient admissions, and a 14.2% increase in 30-day readmissions.

This is one of several studies that I've reviewed in the past year. About a year ago I wrote about Hayes et al, and their study published in February 2020, that calculated that each 10 µg/m3 increase in PM2.5 exposure was associated with a 16% increase in mortality from ischemic heart disease and a 14% increase in mortality from stroke.

Hayes had analyzed data from a large cohort, the 565,477 men and women in the National Institutes of Health-AARP Diet and Health Study. Multivariate Cox regression models were used to estimate relative risks. This large cohort yielded data from 7,500,000 person-years of follow up, which included 41,286 cardiovascular disease deaths, including 23,328 ischemic heart disease and 5,894 stroke deaths. So much data added up to robust conclusions.[2]

Recently I started looking about hoping to find broader statistics. I hoped to find some way to more easily equate changing levels of PM2.5 with shifting mortality rates. How much does PM2.5 pollution cost us each year in lives lost? Can we equate changes in µg/m3 to lives? I did find that factor but let me tell you first where it is and why I'm not allowed to cite this source.

The US Environmental Protection Agency (EPA) is required by law to review the latest science and update air pollution standards every five years. Last winter, in December 2020, the EPA declined to lower the standards on PM2.5 and left the 12 µg/m3 standard, put in place in 2012, despite the fact that newer science suggests even small reductions from this level would save lives.

During the Trump years, EPA scientists did conduct this mandated review of the new science and concluded that reducing the standard from 12 to 9 µg/m3 would save more than 12,000 lives per year in our country. This calculation was in a draft 457-page assessment that analyzed the benefits of revising the standard. These scientists estimated that the current 12 mcg standard is associated with 45,000 deaths per year. They predicted that dropping the standard to 9 µg/m3 would drop

➤

➤

annual deaths by 27% or specifically 12,150 lives. But it appears that this draft report was not published.

You can view the entire draft report here: https://www.epa.gov/sites/production/files/2019-09/documents/draft_policy_assessment_for_pm_naaqs_09-05-2019.pdf.

Notice that on the bottom of each page of text is the statement, "Do Not Quote or Cite." Thus, we are not going to quote or cite these data.

Heart Disease Is a Big Deal.

Heart failure rates are increasing every year. By 2030, an estimated 8 million individuals in the US will have HF, a 46% increase from 2012. The total cost of HF in the US in 2012 was estimated at $30.7 billion but by 2030, it is estimated that HF cost will grow to $69.8 billion.[3] Tracking hospital readmission rates has become important because the Affordable Care Act imposes financial fines on hospitals for poor performance. Hospitals with elevated 30-day readmission rates may have 3% of Medicare and Medicaid fee for service payments for heart failure withheld. This small fine on hospitals added up to hundreds of millions of dollars in 2020. Those costs don't change profit; they are passed on to consumers. While we may not feel much sympathy for the financial concerns of hospitals, we do care about human suffering and these statistics provide a way to measure it closely

The Debate Is Over

There is no need to debate whether increasing PM2.5 raises risk of being admitted to the hospital. A 2019 study by Danesh Yazdi, reported long-term exposure to PM2.5 was associated with an increased inpatient admission among Medicare recipients, even in areas where PM2.5 concentrations were below the National Ambient Air Quality Standard of 12 μg/m.[4] The new Ward-Caviness study looked at only patients with existing heart failure and suggests a similar association.

The biological mechanisms behind these associations are by now well understood and include systemic inflammation, increased activation of the autonomic nervous system, and oxidative stress induced by penetration of PM2.5 particles into the respiratory tract.[5-7]

Racial Health Disparities and PM2.5 Exposure

In the Ward-Caviness data, Black patients had the strongest association between total hospital visits and long-term air pollution exposure; their risk was 40% higher than in whites. This racial disparity was even larger for 30-day readmissions. Minority populations are more likely to live in urban areas and are often exposed to higher-than-average levels of air pollution. It is possible that some of the well documented racial health disparities seen in HF patients are driven by exposure to air pollution.[8]

A similar explanation may underlie the disparities in breast cancer among Black women. High PM2.5 exposure is associated with greater risk for more aggressive forms of breast cancer.[9]

It is past time for us to encourage heart failure patients to lower their PM2.5 exposure as much as possible. Admittedly at this time we do not yet have interventional trials to confirm the idea that heart failure patients will do better with clean air post diagnosis. While it may seem obvious that if bad air causes a disease, clean air may improve it, that is just our assumption, being the naturopathic practitioners that we are. Remember that old mantra "Association does not prove causation."

The only way to tell if an association is causational is a clinical trial to see if an intervention will prevent a disease. And on top of that, once the disease is present, we still don't know whether a strategy of intervention will reverse the disease process.

What to Tell Patients

In my mind, any patient with heart problems should be told that fine particulate air pollution may worsen their prognosis, though admittedly without evidence from interventional clinical trials. Ethical considerations will limit us from exposing people randomly to different levels of pollution, some of which we assume would be harmful.

The majority of the PM2.5 originates 'outdoors' from combustion, yet the majority of exposure happens indoors. The US mortality burden associated with PM2.5 exposure in one 2012 estimate was thought to be between ~230,000 to ~300,000 deaths. Indoor exposure may account for as much as 60% of this total.[10] Various studies have reported that indoor air filtration can be highly effective at reducing exposure. One Beijing study reported that average indoor PM2.5 dropped from 60 to 24 μg/m^3.[11] A Shanghai trial reported a drop from 96.2 to 41.3 μg/m^3, a drop of 57%.[12] Obviously these cities start out with dirty air. In a Danish study conducted in Copenhagen where the air is relatively clean, filtration still reduced PM2.5 by half, from 8 to 4 μg/ m^3.[13] A similar 40% decrease in PM2.5 levels was seen in a Canadian study.[14] A trial conducted in Detroit, Michigan, reported that air filters reduced PM2.5 exposure by more than 50%.[15] Assume if someone uses a HEPA filter they can decrease the PM2.5 levels from whatever it starts at by about half. A little effort can make a significant difference in air quality

Rough Calculations of Benefit

We should all be actively encouraging patients to try to reduce their own PM2.5 exposure. This means air filters at home and in cars. The data regarding heart failure and PM2.5 should be used specifically to encourage patients with cardiovascular disease to reduce their exposures.

According to the World Bank's database average exposure to PM2.5 has fallen in the United States from 9.741 μg/m^3 in 2011 down to 7.41 μg/m^3 in 2017.[16] Thus in many parts of the country revising the EPA standards won't change things much. But not everywhere has air this clean. The EPA provides up-to-date information on pollution levels by zip code at https://www.

airnow.gov/.[17] Here in Denver, Colorado where I'm writing this in mid-June, this EPA website tells me that PM2.5 levels in the air here are 'moderate' at 88 μg/m^3.

Let's ignore reality for the moment and use the World Bank's estimate of about 7 μg/m^3. If the approximation is true that home filters drop exposure level by half, a further 3.5 μg/m^3, then a home air filter might reduce hospital visits for those suffering from heart failure by a third (3.5 μg/m^3 decrease in PM2.5 x 9.3% change in hospital visits/ μg/m^3 = 32.6% decrease in hospital visits). For us, and our patients, it's not about reducing health care costs or fines to hospitals, it is about reducing suffering and improving quality of life; these numbers suggest effort spent at reducing exposure to air pollutants might do both to a significant degree.

Side Note: Modern cars have replaceable air filters hidden in their dashboards usually tucked behind the 'glove compartment'. They should be replaced at yearly intervals, though most people are unaware that they even exist. HEPA versions of these filters are available. One 2018 study reported that PM2.5 levels they had measured inside cars on driving on the highway averaged 133.9 μg/m^3.[18] Given the potential benefit, get your patients to replace their cars' air filters and recirculate the cabin air. It will be cleaner than the fresh air from outside.

References

1. Ward-Caviness CK, et al. Long-Term Exposure to Particulate Air Pollution Is Associated With 30-Day Readmissions and Hospital Visits Among Patients With Heart Failure. *J Am Heart Assoc*. 2021 May 18;10(10):e019430.
2. Hayes RB, et al. PM2.5 air pollution and cause-specific cardiovascular disease mortality. *Int J Epidemiol*. 2020 Feb 1;49(1):25-35.
3. Virani SS, et al. Heart disease and stroke statistics-2020 update: a report from the American Heart Association. *Circulation*. 2020;141:e139–e596
4. Danesh Yazdi M, et al. Long-term exposure to PM2.5 and ozone and hospital admissions of Medicare participants in the Southeast USA. *Environ Int*. 2019;130:104879.
5. Fiordelisi A, et al. The mechanisms of air pollution and particulate matter in cardiovascular diseases. *Heart Fail Rev*. 2017 May;22(3):337-347
6. Simkhovich BZ, Kleinman MT, Kloner RA. Air pollution and cardiovascular injury. *Epidemiol Toxicol Mech*. 2008;52:719–726.
7. Brook RD, et al. American Heart Association Council on Epidemiology and Prevention, Council on the Kidney in Cardiovascular Disease, and Council on Nutrition, Physical Activity and Metabolism. Particulate matter air pollution and cardiovascular disease: An update to the scientific statement from the American Heart Association. *Circulation*. 2010 Jun 1;121(21):2331-78.
8. Yitshak-Sade M, et al. Race or racial segregation? Modification of the PM2.5 and cardiovascular mortality association. *PLoS One*. 2020 Jul 27;15(7):e0236479.
9. Prada D, et al. Long-term PM2.5 exposure before diagnosis is associated with worse outcome in breast cancer. *Breast Cancer Res Treat*. 2021 Mar 8.
10. Azimi P, Stephens B. A framework for estimating the US mortality burden of fine particulate matter exposure attributable to indoor and outdoor microenvironments. *J Expo Sci Environ Epidemiol*. 2020 Mar;30(2):271-284.
11. Shao D, et al. Cardiorespiratory responses of air filtration: A randomized crossover intervention trial in seniors living in Beijing: Beijing Indoor Air Purifier StudY, BIAPSY. *Sci Total Environ*. 2017 Dec 15;603-604:541-549.
12. Chen R, et al. Cardiopulmonary benefits of reducing indoor particles of outdoor origin: a randomized, double-blind crossover trial of air purifiers. *J Am Coll Cardiol*. 2015 Jun 2;65(21):2279-87.
13. Karottki DG, et al. An indoor air filtration study in homes of elderly: cardiovascular and respiratory effects of exposure to particulate matter. *Environ Health*. 2013 Dec 28;12:116.
14. Kajbafzadeh M, et al. The impacts of traffic-related and woodsmoke particulate matter on measures of cardiovascular health: a HEPA filter intervention study. *Occup Environ Med*. 2015 Jun;72(6):394-400.
15. Maestas MM, et al. Reduction of personal PM2.5 exposure via indoor air filtration systems in Detroit: an intervention study. *J Expo Sci Environ Epidemiol*. 2019 Jun;29(4):484-490.
16. https://data.worldbank.org/indicator/EN.ATM.PM25.MC.M3?locations=US
17. https://www.epa.gov/air-trends/particulate-matter-pm25-trends
18. Dröge J, et al. Mobile Measurements of Particulate Matter in a Car Cabin: Local Variations, Contrasting Data from Mobile versus Stationary Measurements and the Effect of an Opened versus a Closed Window. *Int J Environ Res Public Health*. 2018 Nov 26;15(12):2642.

◆

Curmudgeon's Corner

Townsend Letter

ISSN 1940-5434

Subscriptions • Editorial • Advertising

360/385-6021

24 Hr. Fax – 360/385-0699

911 Tyler Street | Pt. Townsend, Washington 98368 USA
http://www.townsendletter.com | info@townsendletter.com

Editor-in-Chief Jonathan Collin, MD
Publisher Jonathan Collin, MD
Editor Jule Klotter
Contributing Medical Editor Alan Gaby, MD
Managing Editor Barbara Smith
Circulation Manager Joy Reuther-Costa
Managing Assistant Julie Reuther
Advertising Projects & Accounts Barbara Smith, Joy Reuther-Costa, Jonathan Collin

Published by
Townsend Letter for Doctors & Patients, Inc.
Jonathan Collin, President
Deborah Nissen-Collin, Vice-President

Disclosure: The *Townsend Letter* publishes information about alternative medicine written by researchers, health practitioners, and patients. As a forum for the entire alternative medicine community, we present information discussing a wide variety of alternative and integrative medicine practices. In addition to publishing original research and literature abstracts and reviews, we encourage case studies and anecdotal reports. Detailed anecdotal reports are not viewed as proof but as possibilities that need further investigation. All authors are requested to submit their reports to other professionals for review.

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.

The Lobay Viewpoint

by Douglas Lobay, BSc, ND
douglobay@gmail.com

Licorice: An Enigma Wrapped in a Riddle?

For some, licorice can be a pleasant mixture of sweet, salty, bitter, and sour tastes. For others, licorice is an acquired taste. It can tantalize the taste buds as a confectionary candy, and it can be a strong and effective herbal medicine. I have been reacquainting myself with the medicinal uses of licorice. While reintroducing myself to the active ingredients and their many beneficial physiologic effects, I beg to ask the question, how much licorice is too much? I soon discovered licorice is, to use the vernacular, an enigma wrapped in a riddle.

Dr. M. was a popular pundit and respected teacher at Bastyr College in the late 1980s who introduced me to the world of botanical medicine. He wrote about the scientific validation of medicinal herbs. He was largely responsible for introducing the form of DGL or deglycyrrhizinated licorice to North America. Dr. G. was also one of my favorite teachers in naturopathic school in Seattle. She was equitable, honest, and open-minded. She said licorice was one of her favorite herbs. She said it was one of the most useful, practical, and versatile botanical medicines available. I liked licorice, after all it was a candy that tasted good. However, I also learned that licorice had a dark and potentially forbidding underside.

Rosemary was a pleasant 78-year-old female who came to our clinic wanting intravenous chelation therapy. Her real-estate-agent brother was an avid chelation afficionado who suggested that it would be beneficial for her. She and her husband were retired missionaries who spent time in small villages in Ecuador and Peru. She was hardened and well-seasoned and told interesting and exciting stories of her experiences abroad. During one non-descript chelation session she complained that her hands and feet were swelling. I matter-of-factly inspected her fingers and to my surprise discovered they were indeed swollen. And to add to matters, her blood pressure had risen sharply. After a serendipitous discovery that she was eating her favorite black licorice candy and I was serving licorice tea to my clients on that particular day, I made the fortuitous connection between her licorice consumption and her swelling and rising pressure. I told her to stop consuming licorice products and the next day her fingers and blood pressure returned to normal. This was one of my first exposures to the possibility of acute licorice toxicity.

Licorice has a broad therapeutic utility in natural medicine. According to the *Textbook of Natural Medicine*, licorice has phyto-estrogenic, aldosterone-like activity, anti-inflammatory, anti-allergic, anti-bacterial, anti-viral, immune stimulatory, anti-hepatotoxic, choleretic, anti-nephritic, anti-cancer, anti-convulsive, and potential memory enhancing effects.[1]

Licorice is one of my top ten favorite herbs that I have used in clinical practice. I have used licorice topically with great success as an alternative and adjunct to topical cortisone creams for a wide variety of skin conditions not limited to atopic dermatitis or eczema, contact dermatitis and psoriasis. I have used licorice and DGL alone or in combination with other herbs and over-the-counter or OTC medicines for gastritis, heartburn, and GERD. I have also used licorice for lower digestive irritations and inflammations and as a mild laxative. I have also incorporated licorice in throat, bronchi, and lung formulas as a soothing expectorant. I have used licorice as a phytoestrogen in the management of hot flushes and other hormone-related issues. And I also recommend licorice as a nutritive support for adrenal gland issues such as adrenal fatigue and exhaustion.

Licorice (*Glycyrrhiza glabra*) is a member of the Fabaceae or Leguminosae family comprising beans, legumes, and peas. It is native to western Asia, the Mediterranean and southern Europe, and parts of north Africa. Licorice is a perennial plant that grows up to 1 meter in height. It has a pleasant aroma primarily due to its content of volatile oils. Its root has a sweet taste and is believed to be 30 to 50 times sweeter than sucrose. Licorice contains an estimated 300 different compounds including glycosides, flavonoids, chalcones, coumarins, lignans, amines, amino acids, sterols, gums and volatile oils. Dried licorice root has a light orange to yellow or brown appearance. Licorice is literally translated from Latin meaning "sweet root."[1-3]

Glycyrrhizin is the main glycoside found in the plant, primarily the root. It is classified as a triterpenoid glycoside

because it contains a characteristic ringed carbon backbone that resembles steroid molecule precursors. Glycyrrhizin contains the triterpenoid molecule also known as glycyrrhizic or glycyrrhizinic acid bound to two glycone or simple sugar molecules. Glycyrrhizin has a molecular weight of 822.9 grams per mole. The glycyrrhizin content of the root has been found to vary from 2 to 25% weight to weight of dried root. Another estimate suggests that the glycyrrhizin content of licorice root is usually between 10 and 20%. A more conservative estimate suggests the root of this species contains an average of 6 to 10% glycyrrhizin content.[1-3]

Upon oral ingestion glycyrrhizin is hydrolyzed to glycyrrhetinic acid and two sugar molecules primarily as glucuronic acid by intestinal gut bacteria. Glycyrrhetinic acid has a molecular weight of 470.7 grams per mole. Glycyrrhetinic acid is the aglycone form of glycyrrhizin and is also known as glycyrrhetic acid. Glycyrrhetinic acid is highly water soluble and is easily absorbed in the small and large intestine. Upon absorption the glycyrrhetinic acid circulates in the blood stream. Some of the glycyrrhetinic acid is converted in the liver to a monoglucuronyl form. Both glycyrrhetinic acid and this monoglucuronyl form are considered to be the active forms of glycyrrhizin. Glycyrrhetinic acid is further degraded in the liver via glucuronidation and sulphation pathways. Glycyrrhetinic acid reaches a peak concentration in the blood 1.5 to 4 hours after oral ingestion. It can be detected in the serum up to 39 hours after following consumption. It can be further detected in urine for two to four days after initial consumption. Ninety-nine percent of glycyrrhetinic acid is eliminated through the liver in bile and only 1% eliminated through urine.[2,3]

Glycyrrhetinic acid has been shown to inhibit the enzyme 11-b-hsd or 11-beta-hydroxysteroid dehydrogenase. This enzyme is found throughout the body and converts the steroid molecule cortisol into cortisone. Cortisol is the main steroid molecule produced in the adrenal glands. It has many physiologic effects throughout the human body, including decreasing inflammation, affecting the immune system, and helping the body deal with stress. Hydrocortisone occurs when a hydroxyl group is substituted for a carbonyl group or double bond oxygen molecule at the 11-carbon position of the cortisol steroid molecule. Hydrocortisone has weaker biological activity and is rapidly converted back to cortisol in peripheral tissues throughout the body. Glycyrrhetinic acid reversibly binds to the 11-b-hsd enzyme and thereby prevents conversion of cortisol to cortisone. As a consequence, cortisol levels can rise. Glycyrrhetinic acid has been found to specifically bind to 11-b-hsd type 2 enzyme found in the distal collecting tubules of the kidney glomeruli. The increased cortisol binds to mineralocorticoid receptors on the distal tubules and causes sodium and water reabsorption and potassium loss.[2,3]

Other mechanisms of glycyrrhizin toxicity have been suggested, including direct mineralocorticoid effects with glycyrrhizin binding to specific receptors and inhibition of an enzyme called 5-alpha reductase, which catalyzes the conversion of cortisol to dihydrocortisol. While these effects occur, there is only weak support for these mechanisms being the primary driver of licorice toxicity. Again, it is the inhibition of the 11-b-hsd enzyme that catalyzes the conversion of cortisol to cortisone that is affected by excessive amounts of glycyrrhizin. This leads to a higher amount of cortisol, which directly affects sodium resorption, water reabsorption and potassium loss in the distal tubules and collecting ducts of the kidneys.[2,3]

Pseudo-aldosteronism is the condition that occurs when excess doses of glycyrrhetinic acid overwhelms the 11-b-hsd enzyme in the kidneys and causes sodium and water reabsorption and potassium loss. If severe enough, hypernatremia (high blood sodium levels) and hypokalemia (low blood potassium levels) can occur. This can directly lead to edema, fluid retention, weight gain, and hypertension. Furthermore, potassium loss can lead to cardiac arrhythmias, both ventricular and supraventricular tachycardia, prolonged QT interval, and lead to the development of torsades de pointes ventricular arrhythmias. And potassium loss in muscle, primarily the distal long muscles of the body, can lead to tetra paresis, muscular fasciculations, and spasms. In severe cases rhabdomyolysis or severe muscle damage can occur. In addition to low potassium levels, CPK or creatine phosphokinase can be elevated. Other potential side effects include headaches, encephalopathy, metabolic alkalosis, ocular deficits, pulmonary edema, and gastrointestinal effects such as diarrhea. Excessive amounts of glycyrrhizin can affect drug metabolism via interference with the cytochrome 3A4 pathway. Glycyrrhizin can also interfere with the cytochrome 3PA activity. It is believed that up to half of all drugs used can utilize this pathway and can be potentially affected.[2-4]

The European Scientific Committee of Foods stated that the total glycyrrhizin content should be less than 100 milligrams per day. The Dutch Information Bureau suggested that glycyrrhizin content should be less than 200 milligrams per day. The WHO or World Health Organization suggests an upper limit of 100 milligrams of glycyrrhizin per day. In Japan the daily recommended glycyrrhizin content is 200 milligrams per day. Dr. Murray in the *Textbook of Natural Medicine* suggests a dose of 100 to 200 milligrams of glycyrrhizin per day is safe. Doses of 300 milligrams and above have been seen to cause hypernatremia, hypokalemia and hypertension.[1,2,3]

It should be noted that the inhibition of the 11-b-hsd is reversible and self-limiting. Discontinuing excessive consumption of the licorice product causing the toxicity results in a resolution of symptoms and stabilization of lab values. Depending on the amount consumed, the duration and the sensitivity of inhibition, a resolution within two weeks of discontinuing consumption is normal. For extreme excessive dosage the time period can be much longer. It is also worth mentioning that most of the cases requiring hospitalization were due to quite large doses of licorice candy, licorice tea and medicinal licorice products. There is even a case report of an individual consuming 20 or more DGL tablets per day ending up in hospital with hypertension and hypokalemia. This obviously suggests that it is not just the glycyrrhizin in licorice that is a bioactive ingredient. Caution of excessive DGL consumption should also not be thrown to the wind.[4-6]

➤

Lobay Viewpoint

➤

Licorice is not recommended during pregnancy because of the risk of toxicity and potential efects to the developing fetus. However, a modest amount might be considered safe in small doses. Licorice is not recommended for individuals with high blood pressure and congestive heart failure above the recommended daily intake. Licorice is not recommended in patients with reduced kidney function and renal failure. It has also been observed that women appear to be somewhat more sensitive to the effects of glycyrrhizin than men.[2,3,7]

If the average glycyrrhizin content is estimated to be 10% of the dried weight of the root, then a consumption of 1000 milligram of crude herb would yield 100 milligrams of glycyrrhizin. This would suggest that a daily dose of somewhere between 1000 and 2000 milligrams would be safe and limit potential intake of glycyrrhizin above 200 milligrams. Conversely, the upper limit would be somewhere around 1000 milligrams per day in licorice containing 20% glycyrrhizin content.

Licorice is a wonderful botanical medicine. It is a practical, popular, and an effective treatment for a variety of health problems. It is also an enigmatic herb with a multiplicity of interesting effects in the human body. However, large doses of licorice above and beyond an excessive dose of glycyrrhizin should be discouraged. Practitioners should be prescient with a working knowledge of dosing values and ranges of licorice consumption. With respect to the old adage about excesses, it once again rings true, "too much of a good thing is never good."

References

1. Murray MT. Glycyrrhiza glabra. *Textbook of Natural Medicine*. 2020: 641–647.e3.
2. Omar HR et al. Licorice abuse: time to send a warning message. *There Adv Endocrin Metab*. 2012 Aug; 3(4): 125–138.
3. Deutch MR et al. Bioactive Candy: Effects of Licorice on the Cardiovascular System. *Foods*. 2019 Oct; 8(10): 495.
4. Isbrucker RA and Burdock GA. Risk and safety assessment on the consumption of Licorice root (Glycyrrhiza sp.), its extract and powder as a food ingredient, with emphasis on the pharmacology and toxicology of glycyrrisin. *Regul Toxicol Pharmacol*. 2006 Dec;46(3): 167-92.
5. Patel P et al. How Much is Too Much? Exploring Pseudohyperaldosteronism in Glycyrrhic Toxicity From Chronic Licorice Root Consumption. *Cureus*. 2021 Jul 18: 13(7).
6. Kaczor T. Deglycyrrhizinated Licorice for Gastrointestinal Ulcers. How can something so good be so poorly proven. 2009 November; volume 1 issue 11.
7. Nazari S et al. Toxicological Effects of Glycyrrhiza glabra (Licorice) A Review. *Phytother Res*. 2017 Nov;31(11): 1635-1650.

◆

CALENDAR

MARCH 25-27: GPL ENVIRONMENTAL TOXIN SUMMIT live online. CONTACT: https://www.gplworkshops.com/

APRIL 3-10: ANTHROPOSOPHIC THERAPEUTIC FOUNDATIONS TRAINING CONFERENCE – Physical, Functional, Emotional, Spiritual in Watsonville, California. CONTACT: https://www.anthroposophicmedicine.org/annual-training-week

APRIL 6-10: INTERNATIONAL COLLEGE OF INTEGRATIVE MEDICINE SPRING MEETING – Advances in Cancer Prevention and in Post-Cancer Care in Detroit, Michigan. CONTACT: https://icimed.com/

APRIL 7-10: 32nd CLINICAL APPLICATIONS FOR AGE MANAGEMENT MEDICINE CONFERENCE in Miami, Florida. CMEs. CONTACT: https://agemed.org/cme-conferences/florida-april-2022/

APRIL 8-10: CARDIOMETABOLIC HEALTH CONGRESS – Great Debates in Cardiometabolic Medicine in Scottsdale, Arizona. CONTACT: https://www.cardiometabolichealth.org/cmhc-spring-2022/

APRIL 8-10: ENVIRONMENTAL HEALTH SYMPOSIUM (EHS) ANNUAL CONFERENCE – Clinical Applications in Environmental Medicine in Tucson, Arizona. CMEs available. CONTACT: 855-347-4477; www.environmentalhealthsymposium.com / email Info@environmentalhealthsymposium.com

APRIL 21-24: ACUPUNCTURE MERIDIAN ASSESSMENT (AMA) TRAINING for Doctors, Dentists, & Health Professionals with Simon Yu, MD, in St. Louis, Missouri. Detecting parasites, Dental and Fungal. CONTACT: 314-432-7802; https://preventionandhealing.com/training/

APRIL 22-24: JOINT AMERICAN HOMEOPATHIC CONFERENCE in Reston, Virginia and virtual online. CONTACT: https://www.homeopathycenter.org/

APRIL 23-24: 2022 TORONTO NATUROPATHIC CONFERENCE – Frontiers in Naturopathic Medicine online. CONTACT: http://www.collaborativeeducation.ca/toronto-naturopathic-conference/

APRIL 28-30: A4M SPRING CONGRESS – Eat, Fuel, Health: Nurturing the Second Brain in Hollywood, Florida. CONTACT: https://www.a4m.com/

APRIL 28-30: A4M/MMI MODULE – Advanced Endocrinology: The Hormonal Symphony in Hollywood, Florida. CONTACT: https://www.a4m.com/module-i-a4m-2022.html

APRIL 28-30: A4M/MMI MODULE – Triads: A Systems Biology Approach in Hollywood, Florida. CONTACT: https://www.a4m.com/module-v-a4m-2022.html

APRIL 29-30: CONNECTING THE DOTS IN CARDIOMETABOLIC MEDICINE – Integrative Approaches to Improve Patient Care in Hollywood, Florida. CONTACT: https://www.cardiometabolichealth.org/

APRIL 29-30: 12th WORLD CONGRESS ON DRUG ADDICTION AND REHABILITATION THERAPY in Las Vegas, Nevada. CONTACT: https://addiction.healthconferences.org/

MAY 6-8: INTERNATIONAL CONSORTIUM ON MANUAL THERAPIES CONFERENCE 2022 in Phoenix, Arizona and online. https://www.icmtconference.org/

MAY 12-14: ASSOCIATION FOR THE ADVANCEMENT OF RESTORATIVE MEDICINE SPRING HERB SEMINAR online. CONTACT: https://restorativemedicine.org/conferences/2022-spring-herb-seminar/

MAY 13-14: 51st ANNUAL INTERNATIONAL ORTHOMOLECULAR MEDICINE TODAY CONFERENCE online. Leading orthomolecular clinicians and researchers on the topics of detoxification, immunology, pain medicine, and nutritional intervention. CONTACT: https://isom.ca/event/51st-conference/

MAY 20-22: 11th INTERNATIONAL ADVANCED APPLICATIONS IN MEDICAL PRACTICE (AAMP) CONFERENCE -Advanced Chronic Neurological Disorders in Scottsdale, Arizona, and online. Topics: Neurological Autoimmunity, Addiction, Trauma, TBI and Neurotransmitter balance. CMEs. CONTACT: https://aampconferences.com/spring-conference-2022/

MAY 21-22: 2nd ANNUAL EPIC FUNCTIONAL MEDICINE CONFERENCE in Charlotte, North Carolina. CONTACT: https://epicfmconference.com/

MAY 23-26: INTERNATIONAL CONGRESS ON INTEGRATIVE MEDICINE AND HEALTH in Phoenix, Arizona. CONTACT: https://www.consortiumcongress.org/

JUNE 2-4: IFM ANNUAL INTERNATIONAL CONFERENCE in Dallas, Texas. CONTACT: https://www.ifm.org/learning-center/

JUNE 3-6: MEDICINES FROM THE EARTH HERB SYMPOSIUM in Black Mountain, North Carolina. Botanicals for resetting circadian rhythm, targeting VEGF in cancer treatment, geriatric mental health, long-term drug use, and more. CEUs. CONTACT: www.botanicalmedicine.org

JUNE 10-12: GPL MASTER PRACTITIONER WORKSHOPS live online. CONTACT: https://www.gplworkshops.com/

JUNE 25: KEY COLLABORATIONS IN HOMEOPATHY RESEARCH online. CONTACT: https://www.hri2022.org/

JULY 21-23: AANP 2022 CONFERENCE in Spokane, Washington. CONTACT: https://naturopathic.org/

AUGUST 25-28: ACUPUNCTURE MERIDIAN ASSESSMENT (AMA) TRAINING for Doctors, Dentists, & Health Professionals with Simon Yu, MD, in St. Louis, Missouri. Detecting Parasites, Dental & Fungal. CONTACT: 314-432-7802; https://preventionandhealing.com/training

OCTOBER 14-16: 12th INTERNATIONAL ADVANCED APPLICATIONS IN MEDICAL PRACTICE (AAMP) CONFERENCE – Endocrine Assessment and Treatment in Scottsdale, Arizona, and online. CMEs available. CONTACT: https://aampconferences.com/spring-conference-2022/

OCTOBER 28-29: INTERNATIONAL CONFERENCE ON PREVENTIVE MEDICINE AND INTEGRATIVE MEDICINE in Los Angeles, California. CONTACT: https://waset.org/preventive-medicine-and-integrative-medicine-conference-in-october-2022-in-los-angeles

◆

Leader in Molecular Medicine Wants Nitric Oxide in the Hands of Every Person

Today, Dr. Nathan S. Bryan, world-renowned molecular medicine and nitric oxide expert and founder of Pneuma Nitric Oxide, LLC and Bryan Nitriceuticals, LLC, announced a partnership with Berkeley Life Professional, a practitioner-exclusive nitric oxide nutraceutical brand. Dr. Bryan and Berkeley Life Professional share a mission to provide health care practitioners with an exclusive and efficacious nitric oxide product portfolio for use in patient protocols.

Dr. Bryan has been involved in nitric oxide research for the past 22 years. Nitric oxide, often called the "miracle molecule," is a vasodilator and a signaling molecule made naturally in the body. In 1998, three US scientists whose research for nitric oxide's role in cardiovascular function through optimized circulation won the Nobel Prize in Medicine. However, research suggests that over time, the body's ability to naturally create nitric oxide diminishes – a problem that Dr. Bryan has dedicated his career to solving. Dr. Bryan was the first to demonstrate and discover an endocrine function of nitric oxide via the formation of S-nitrosoglutathione and inorganic nitrite. His discoveries have changed the way health care practitioners assess patients and manage patient care.

Dr. Bryan has maintained a continued focus on leading research and the development of safe and efficacious nitric oxide product technology. When Dr. Bryan was introduced to Berkeley Life Professional, a brand aligned to the same mission, he saw natural synergies.

"It quickly became evident that Berkeley Life Professional shared the vision I had for nitric oxide and its ability to improve patient care when properly understood and taken on the guidance of a practitioner. Their focused mission of providing safe and effective nitric oxide product technology exclusive to the practitioner channel aligned with my personal and professional objectives over the past 20 years. Together our innovations will bring additional nitric oxide-centric product technology to market so that practitioners can provide their patients safe and effective nitric oxide products," says Dr. Bryan.

Dr. Bryan's topical formulation, N1O1 Nitric Oxide Activating Skin Serum by Pneuma Nitric Oxide, LLC, is the first to join the Berkeley Life Professional brand, offering a complement pairing to Berkeley Life Professional's current supplement. N1O1, sold through the health care practitioner channel, will be re-branded under Berkeley Life Professional in the spring. This will expand Berkeley Life Professional's product offering into the skin care and beauty space. Providing nitric oxide inside and out is a new and innovative approach to supporting nitric oxide in the body.

"Nitric oxide is rapidly coming into the focus of the healthcare community," Dr. Bryan says. "It should be part of every discussion with every patient. In the early 1980s, we lauded fish oils. Now, we need to be talking about nitric oxide and doing whatever we can to get nitric oxide in the hands of every person on Earth."

Dr. Bryan earned his undergraduate Bachelor of Science degree in Biochemistry from the University of Texas at Austin and his doctoral degree from Louisiana State University School of Medicine. He pursued his post-doctoral training as a Kirschstein Fellow at Boston University School of Medicine in the Whitaker Cardiovascular Institute. In 2006, Dr. Bryan joined faculty at the University of Texas Health Science Center at Houston. His nine years at UT led to several discoveries, which have resulted in over a dozen issued US and international patents and many more pending worldwide. Dr. Bryan has published a number of highly cited papers and authored or edited five books. He is regarded as an international leader in molecular medicine and nitric oxide biochemistry. He lives outside of Caldwell, Texas. Dr. Bryan is represented by Alan Morell, CEO of Creative Management Partners LLC (CMP), Beverly Hills, California. www.drnathansbryan.com

Berkeley Life was launched in early 2017 as a direct to consumer offering with the intention of building consumer awareness of nitric oxide's ability to maintain healthy blood pressure levels.

Deeper research into the potential applications of nitric oxide led to the strategic decision to make Berkeley Life available through the 1-on-1, trusted conversations of a practitioner and their patient, and was re-branded to Berkeley Life Professional. The Berkeley Life Professional supplement line is now used successfully by top practitioners around the country, along with a proprietary test strip. Used together, this system provides a tool for assessing nitric oxide levels and facilitating patient conversations and has transitioned to practitioner protocols. Transparent practitioner relationships continue to inspire product improvements. Now with the partnership of Dr. Nathan S. Bryan, Berkeley Life Professional is positioned to be the leading name in practitioner-recommended nitric oxide support products. www.Berkeleylife.com

◆

Please Support the Advertisers in this Issue

Women's Health Update

by Tori Hudson, ND
womanstime@aol.com

Perimenstrual Asthma

The prevalence of asthma is almost twice the rate in women as in men and ranges from 9.1 to 9.7% in adult women and 5.1 to 5.5% in men.[1,2] Women have an increased vulnerability to inflammatory and autoimmune disease after puberty, and sex hormones have an effect on the inflammatory defense system, specifically on mast-cells[3,4] (MC) and eosinophils cells. The normal fluctuations of estrogens trigger the mast-cell degranulation, while testosterone and other androgens have a more stabilizing effect. The normal perimenstrual fluctuations of sex hormones in women are thought to be responsible for the worsening of many different perimenstrual symptoms, including inflammatory,[5] autoimmune,[6,7] and pain-related conditions, including headaches and pelvic pain.[8-11]

A review of asthma as influenced by a woman's key hormonal events can be helpful in understanding the times of vulnerability and thus provide insight as to prevention and treatment strategies:

- Puberty: asthma is more common and severe in women during and after puberty. The prevalence is higher in women with early menarche.[12]
- Ovulation: asthma exacerbations begin more often during the preovulatory (28%) period in women with this chronic asthma.[12-15]
- Menstruation: asthma can worsen during the perimenstrual phase, known as perimenstrual asthma (PMA) and is usually significantly more severe and bothersome than the periovulatory exacerbation.[16]
- Pregnancy: asthma is inconsistent during pregnancy. It may worsen in about one-third of pregnant women, which is more likely in more severe forms of asthma, and may improve in about one-quarter, which is more likely in mild asthma.[17-20] Asthma generally improves during the last four weeks of pregnancy, and fortunately, attacks are very infrequent during labor and delivery.[17,20]
- Postpartum: any changes experienced in asthma during pregnancy generally last up to three months postpartum.[17,20]
- Menopause: postmenopausal women have a significantly lower risk of developing asthma than premenopausal women.[17, 21]
- Menopausal Hormone Therapy: results of the effect of menopausal hormone therapy (MHT) on asthma are controversial and lack clarity. In one study, having ever used MHT was associated with increased risk of hospital admission for asthma and was highest the longer it had been used and was increased for all types of MHT regimens evaluated.[22] In other studies MHT had no effect on airway obstruction in women with asthma.[21,23]

There is no clear definition of perimenstrual asthma (PMA) in the literature. The definition appears to vary by whether it is self-reported by the patient, an increase in symptoms, increased medication use, decreased pulmonary function testing or combinations of any of these.[24] As you can imagine, this variability of the definition of PMA affects a better understanding of the condition. One thing is generally clear: the worsening of asthma symptoms during the luteal phase and/or during the first days of menstruation, is captured by deterioration in lung function tests.[25] Women with PMA have less atopy (less IgE level), and lower forced vital capacity, which is different than traditional allergic asthma.[26]

The incidence of PMA is as high as 40% of asthmatic women.[27] Rates of acute asthma hospitalizations are similar between early teenage boys and girls.[13,28,29] In women and men aged 20-50 years, it is three times higher in women but after menopause the incidence of asthma becomes similar with men.[13,28,29]

These findings and the growing body of evidence for sex differences in asthma[12,13] support the hypothesis that hormonal status may influence asthma in women – more specifically the impact of normal physiological fluctuations in estrogens at ovulation and before periods.[13]

The physiology of the menstrual cycle is not only characterized by fluctuating levels estrogen, but also of

luteinizing hormone (LH), follicle-stimulating hormone (FSH), progesterone and testosterone. The perimenstrual phase is characterized by a decline in progesterone and estradiol levels.[30] This triggers mast cell degranulation at the basal layer of the endometrium, which induces endometrial tissue breakdown and subsequent menstruation as well as systemic inflammation with mast cell and eosinophil degranulation leading to increased inflammatory markers in lung and bronchial tissues of asthmatic women where hyperactive mast cells are already present.[3] In addition, the presence of sex steroid receptors on mast cells indicates that sex hormones may exert their effects by binding to these receptors.[31]

Treatment Considerations

It should not be surprising that several studies have demonstrated a role for both exogenous estrogen and progesterone in the management of PMA.[25,32-34] In one prospective study on asthma in post-pubertal women, the women using oral contraception (OC) had reduced asthma symptoms and better control of their asthma along with improved pulmonary function compared with those women not using OC.[33] Stabilizing estradiol and progesterone levels and using hormonal management to alter the normal rise and fall of these hormones offers a therapeutic option for preventing hormonal exacerbations. High quality, controlled studies would solidify this hypothesis.

References

1. Centers for Disease Control and Prevention (CDC). Vital signs: asthma prevalence, disease characteristics, and self-management education: United States, 2001--2009. *MMWR Morb Mortal Wkly Rep*. 2011;60:547–52.
2. Kim S, Camargo Jr CA. Sex-race differences in the relationship between obesity and asthma: the behavioral risk factor surveillance system, 2000. *Ann Epidemiol*. 2003;13:666–73.
3. Graziottin A, Zanello PP. Menstruation, inflammation and comorbidities: implications for women's health. *Minerva Ginecol*. 2015;67:21–34.
4. Graziottin A. The shorter, the better: A review of the evidence for a shorter contraceptive hormone-free interval. *Eur J Contracept Reprod Health Care*. 2015;21(2):1–13.
5. Heitkemper MM, Cain KC, Jarrett ME, Burr RL, Hertig V, Bond EF. Symptoms across the menstrual cycle in women with irritable bowel syndrome. *Am J Gastroenterol*. 2003;98:420–30.
6. Rubtsova K, Marrack P, Rubtsov AV. Sexual dimorphism in autoimmunity. *J Clin Invest*. 2015;125:2187–93.
7. Zandman-Goddard G, Peeva E, Shoenfeld Y. Gender and autoimmunity. *Autoimmun Rev*. 2007;6:366–72.
8. Graziottin A, Skaper SD, Fusco M. Inflammation and Chronic Pelvic Pain: A Biological Trigger for Depression in women? *J Depress Anxiety*. 2013;3:142–50.
9. Graziottin A, Skaper SD, Fusco M. Mast cells in chronic inflammation, pelvic pain and depression in women. *Gynecol Endocrinol.* 2014;30:472–7
10. Martin VT, Lipton RB. Epidemiology and biology of menstrual migraine. *Headache*. 2008;48 Suppl 3:S124–30.
11. Hassan S, Muere A, Einstein G. Ovarian hormones and chronic pain: A comprehensive review. *Pain*. 2014;155:2448–60.
12. Zein JG, Erzurum SC. Asthma is Different in Women. *Curr Allergy Asthma Rep*. 2015;15:28.
13. Brenner BE, et al. Relation between phase of the menstrual cycle and asthma presentations in the emergency department. *Thorax*. 2005;60:806–9.
14. Pereira Vega A, et al. Variability in the prevalence of premenstrual asthma. *Eur Respir J*. 2010;35:980–6.
15. Macsali F, et al. Menstrual cycle and respiratory symptoms in a general Nordic-Baltic population. *Am J Respir Crit Care Med*. 2013;187:366–73.
16. Skoczyński S, Semik-Orzech A, et al. Perimenstrual asthma as a gynecological and pulmonological clinical problem. *Adv Clin Exp Med*. 2014;23:665–8.
17. Balzano G, Fuschillo S, Melillo G, Bonini S. Asthma and sex hormones. *Allergy*. 2001;56:13–20.
18. Gluck JC, Gluck P. The effects of pregnancy on asthma: a prospective study. *Ann Allergy*. 1976;37:164–8.
19. Schatz M. Asthma and pregnancy. *J Asthma*. 1990;27:335–9.
20. Schatz M, et al. The course of asthma during pregnancy, post partum, and with successive pregnancies: a prospective analysis. *J Allergy Clin Immunol*. 1988;81:509–17.
21. Troisi RJ, Speizer FE, Willett WC, Trichopoulos D, Rosner B. Menopause, postmenopausal estrogen preparations, and the risk of adult-onset asthma. A prospective cohort study. *Am J Respir Crit Care Med*. 1995;152:1183–8.
22. Bønnelykke K, et al. Postmenopausal hormone therapy and asthma-related hospital admission. *J Allergy Clin Immunol*. 2015;135:813–6. e5.
23. Hepburn MJ, Dooley DP, Morris MJ. The effects of estrogen replacement therapy on airway function in postmenopausal, asthmatic women. *Arch Intern Med*. 2001;161:2717–20.
24. Murphy VE1, Gibson PG. Premenstrual asthma: prevalence, cycle-to-cycle variability and relationship to oral contraceptive use and menstrual symptoms. *J Asthma*. 2008;45:696–704.
25. Dratva J, et al. Perimenstrual increase in bronchial hyperreactivity in premenopausal women: results from the population-based SAPALDIA 2 cohort. *J Allergy Clin Immunol*. 2010;125:823–9.
26. Rao CK, et al. Characteristics of Perimenstrual Asthma and Its Relation to Asthma Severity and Control: data from the Severe Asthma Research Program. *Ches*t. 2013;143:984–92.
27. Gibbs CJ, et al. Premenstrual exacerbation of asthma. *Thorax*. 1984;39:833–6.
28. Skobeloff EM1, Spivey WH, St Clair SS, Schoffstall JM. The influence of age and sex on asthma admissions. *JAMA*. 1992;268:3437–40.
29. Becklake MR, Kauffmann F. Gender difference in airway behaviour over the human life span. *Thorax*. 1999;54:1119–38.
30. Owen Jr JA. Physiology of the menstrual cycle. *Am J Clin Nutr*. 1975;28:333–8.
31. Zhao XJ, et al. Expression of oestrogen and progesterone receptors by mast cells alone, but not lymphocytes, macrophages or other immune cells in human upper airways. *Thorax*. 2001;56:205–11.
32. Chandler MH, Schuldheisz S, Phillips BA, Muse KN. Premenstrual asthma: the effect of estrogen on symptoms, pulmonary function, and beta 2-receptors. *Pharmacotherapy*. 1997;17(2):224–34.
33. Salam MT, Wenten M, Gilliland FD. Endogenous and exogenous sex steroid hormones and asthma and wheeze in young women. *J Allergy Clin Immunol*. 2006;117:1001–7.
34. Tan KS, McFarlane LC, Lipworth BJ. Modulation of airway reactivity and peak flow variability in asthmatics receiving the oral contraceptive pill. *Am J Respir Crit Care Med*. 1997;155:1273–7.

◆

GMB Enterprises, Inc. Acquires Mountain Peak Nutritionals

GMB Enterprises, Inc., a supplement company, announced it has acquired Mountain Peak Nutritionals® (MPN), producer of more than 30 condition-specific nutritional formulas, including multivitamin, mineral, and botanical products in the MPN brand.

"This acquisition ensures that the MPN brand and products will live on and continue to be enhanced. We believe there are more consumers who can benefit from MPN's top-shelf condition-specific products, and we intend to make that happen," said R. Grant Bergstrom, CEO of GMB Enterprises and MPN. "I have deep respect for the company's past and look forward to building on the solid foundation to provide more offerings to healthcare practitioners and their patients."

MPN markets Condition Specific Formulas® that combine the most pure, bioavailable, and clinically studied ingredients into formulas that address specific health conditions, including boosting energy, providing support for the body structure/functions, gender health, gastrointestinal issues, sleep and stress.

"We're proud of the work we've done at MPN and look forward to watching the next stage of growth and development," said Dr. Jim Massey, former CEO and owner of MPN. "We know that Grant has the ability and vision to accomplish new and inventive plans for MPN that will offer additional benefits to practitioners and patients."

About Mountain Peak Nutritionals

Mountain Peak Nutritionals was founded in 1996 with the introduction of the Ultra High™ multivitamin, mineral and antioxidant formula. Today, Mountain Peak Nutritionals offers more than 30 different nutritional supplements blended in Condition Specific Formulas®. MPN supplements afford healthcare practitioners and their patients an easy way to integrate nutritional supplementation into the foundation of their healthcare programs.

For more information, visit www.mountainpeaknutritionals.com

COVID-19: The Silver Lining That Could Have Been

Mainstream medicine and medical academia have historically been biased against natural therapies such as nutritional supplements and herbal remedies. This bias manifests in various ways, such as ignoring evidence of efficacy, exaggerating or overemphasizing adverse effects, misrepresenting the data, and referring to natural medicine in disparaging terms such as, "massive, carelessness, indefensible, useless, indiscriminate, false, unnecessary, deplored, and poor medical practice."[1] I have documented many examples of this bias in the nearly 40 years I have been writing for the *Townsend Letter*.

When the COVID-19 pandemic came along, I thought that there could be a silver lining to all the sickness and death and fear that was gripping the world; something positive that might arise from it. After all, natural medicine has been pretty successful at treating a wide range of viral illnesses. For example, there have been reports over the years that high-dose intravenous vitamin C can knock out most viruses, and that oral vitamin C or zinc lozenges can shorten the duration of the common cold (which is caused in some cases by coronaviruses). Might these and other natural treatments also be effective against COVID-19?

With the entire world focusing on this disease, and with everyone hoping and praying for a treatment to emerge that would decrease disease severity and save lives, I thought the pandemic presented an ideal opportunity for natural medicine to shine. I really thought that. It would be like when the American music industry was ignoring the Beatles, who had been scoring big hits in England with songs like "Love Me Do" and "Please Please Me." When "I Want to Hold Your Hand" was released in England, it was impossible for the American music industry to ignore the Beatles any longer.

Initially there were some encouraging signs. Anecdotal reports were coming from doctors in New York hospitals that intravenous vitamin C enhanced recovery from COVID-19. A double-blind trial from China found that intravenous administration of vitamin C to critically ill COVID-19 patients decreased mortality by about one-third. However, because the sample size was small, this decrease was not statistically significant. Studies from Europe found that treatment with vitamin D or calcifediol (25-hydroxyvitamin D) decreased COVID-19 disease severity and decreased the number of patients who had to be transferred to the intensive care unit. A randomized open-label trial conducted in Florida and Ohio found that oral administration of vitamin C and zinc to outpatients with COVID-19 accelerated recovery. However, again the sample size was too small and the improvement was not statistically significant.

As these encouraging reports were appearing, the government was spending hundreds of billions of dollars dealing with the medical and economic consequences of the pandemic. Star-Trekky phrases like "operation warp speed" were being tossed around to indicate the urgency of the crisis and the spare-no-expense attitude about getting the pandemic under control as fast as possible. One might have thought that the Centers for Disease Control and the National Institutes of Health would have jumped at the chance to warp-speed some well-designed, large scale clinical trials to determine whether safe, inexpensive nutrients like vitamin C, zinc, and vitamin D could decrease mortality and lower hospital costs. And one might have thought that these agencies would seek the counsel of experts in the field of natural medicine, in order to create research designs that would be most likely to demonstrate beneficial effects. But those things did not happen. A few studies were conducted by various research groups, but those studies were typically not large enough to produce definitive results and/or they did not use treatment protocols that would have produced the best results.

Consequently, we are left with an all-too-familiar conclusion regarding natural therapies: that there is reason to believe they may be helpful against COVID-19, but the evidence is not strong enough to be considered definitive or to convince practitioners in mainstream medicine. What a lost opportunity!

In retrospect, I overestimated the probability that a worldwide crisis would force the powers that be to take a more serious look at natural therapies. In retrospect, I understand there was too much inertia to overcome: too many financial conflicts of interest among the pharmaceutical companies and the academicians and politicians who depend on pharmaceutical money; too many years of biased reporting about natural therapies; and too strong a need by the medical establishment to cling to its less-than-optimal methods.

But, perhaps we can be comforted by the knowledge that progress regarding the acceptance of natural medicine has historically been evolutionary (as opposed to revolutionary). Interest in natural medicine has grown gradually over the years, and that growth continues today. If we keep telling the truth, more and more people will hear it, and healthcare will continue to evolve to a better place.

Which brings me back to the Beatles. George Harrison wrote a verse for the song "Hurdy Gurdy Man," which was written by his friend Donovan. Although Donovan never used George's verse (it made the song too long for the radio), it is a verse I often think of when progress seems painfully slow.

> When truth gets buried deep
> Beneath a thousand years of sleep
> Time demands a turn-around
> And once again the truth is found.

Alan R. Gaby, MD

Reference

1. Goodwin JS, Tangum MR. Battling quackery: attitudes about micronutrient supplements in American academic medicine. *Arch Intern Med*. 1998;158:2187-2191.

◆

When water isn't enough.

A lozenge for temporary relief from DRY MOUTH.

- Naturally increases saliva production
- Fresh citrus taste
- Helps prevent tooth decay
- No interaction with medications
- Safe for diabetics
- Available in convenient flip-top container

Improved Formula with **XYLITOL**

Ingredients: • Xylitol • Citric Acid • Apple Acid • Sodium Citrate Dihydrate • Sodium Carboxy Methyl Cellulose • Dibasic Calcium Phosphate • Silica Colloidal • Magnesium Stearate • Stearate Acid.

Available from major distributors such as Threshold Enterprises, Emerson Ecologics, SuperNatural Dist., McKesson, Cardinal/Kinray

Safe. Effective. Convenient.

Scandinavian Formulas

Sellersville, PA 18960 • P: 215-453-2507 800-688-2276
F: 215-257-9781 • scandinavianformulas.com

Truly the Best CBD: Now Two Proven Formulas!

TruEase®: today's best-in-class CBD product, produced under the highest ethical and quality standards, now validated as the truly superior CBD product in a newly published **Clinical Trial Study: "A Novel Self-Emulsifying Drug Delivery System (SEDDS) Based on VESIsorb® Formulation Technology Improving the Oral Bioavailability of Cannabidiol in Healthy Subjects"†**.

TruEase® + Curcumin: a patented, synergistic formulation with unmatched therapeutic benefits of Curcumin, Cannabidiol (CBD), Beta-caryophyllene, & Vitamin D3 powered by the VESIsorb® delivery system for maximum absorption and bioavailability and validated by the recent TruEase® Clinical Trial Study†. The active constituents in Curcumin can act as effective antioxidants against excessive free radical damage, along with support for joints, brain, and overall good health*.

TruGen3® continues the Lioon family legacy of three generations and more than a half-century of nutraceutical experience, with products produced under the highest ethical standards, available exclusively through Health Professionals. Contact us to find out how you can put our highly innovative products to work for your patients, and your practice, today.

Contact us today for FREE SAMPLES and to find out how you can put our innovative, one-of-a-kind products to work for your patients, and your practice, today.

† For a complete copy of the TruEase® Clinical Trial Study, visit trugen3.com/truease.

Get More with TruGen3®

Direct access to **Chief Clinical Advisor Dr. Chris D. Meletis** for answers to all your CBD questions

- **VESIsorb® Technology for up to 440% more** bioavailability than ordinary CBD products†. Many Turmeric components' (including curcuminoids) fat-soluble nature can make gastronomical absorption a challenge. The VESIsorb® delivery system minimizes these challenges, better supporting the body's natural inflammatory response, as well as joint, brain and immune health.*
- **Proprietary Super Critical CO^2 extraction process** eliminates solvents and impurities with non-detectible THC content at < 10pm.†
- Cannabinoid profile confirmed by 3rd party Certificate of Analysis

TruGen3®

Three Generations of Truth in Nutrition

www.trugen3.com 1-844-387-8436