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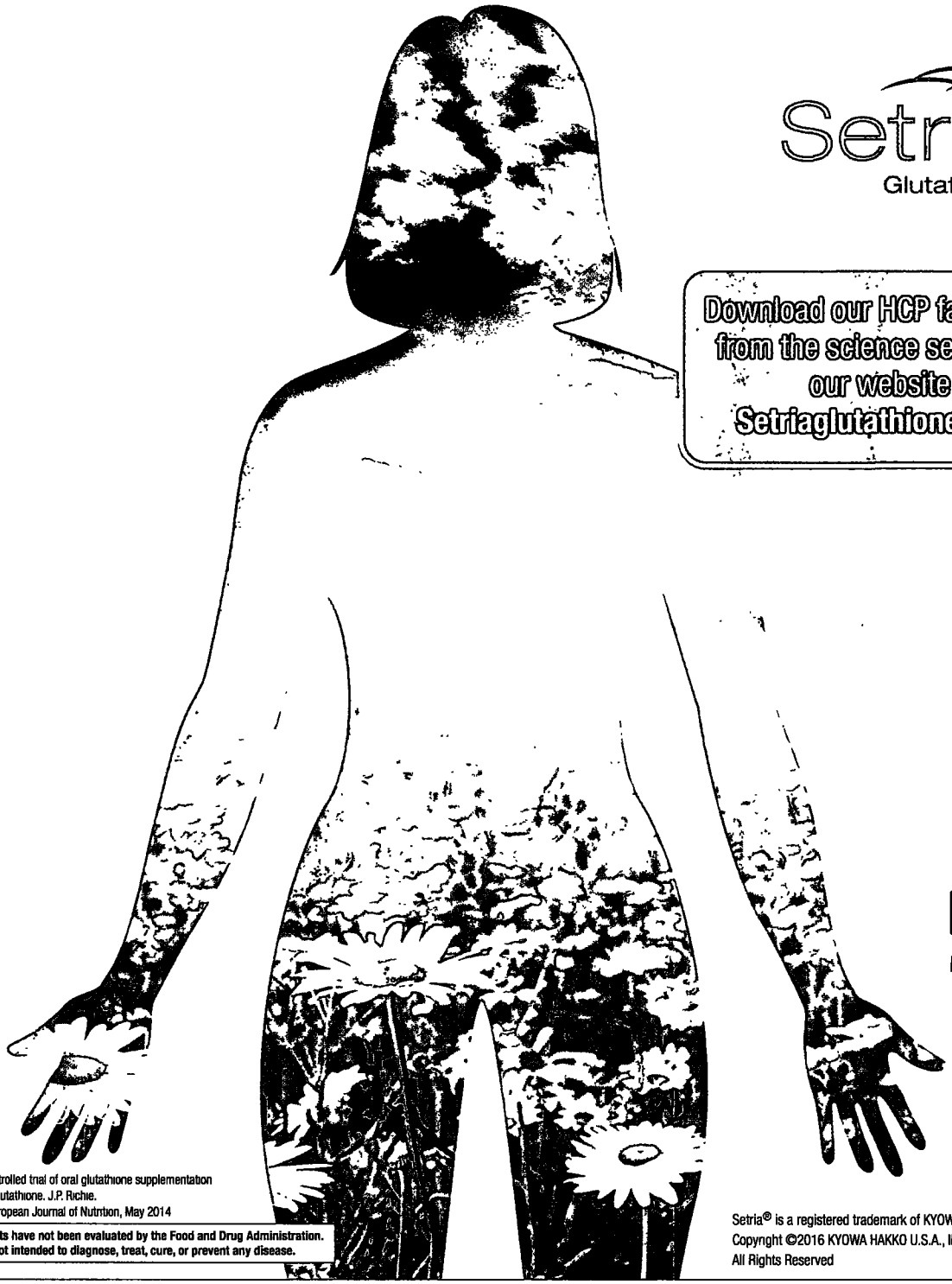

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1) Randomized controlled trial of oral glutathione supplementation on body stores of glutathione. J.P. Richie. Published in the European Journal of Nutrition, May 2014

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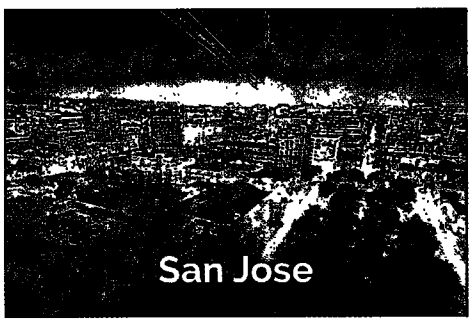

August 6
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August 7
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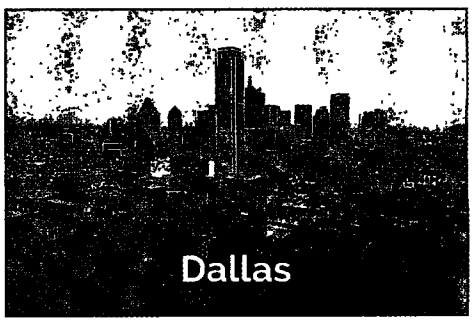

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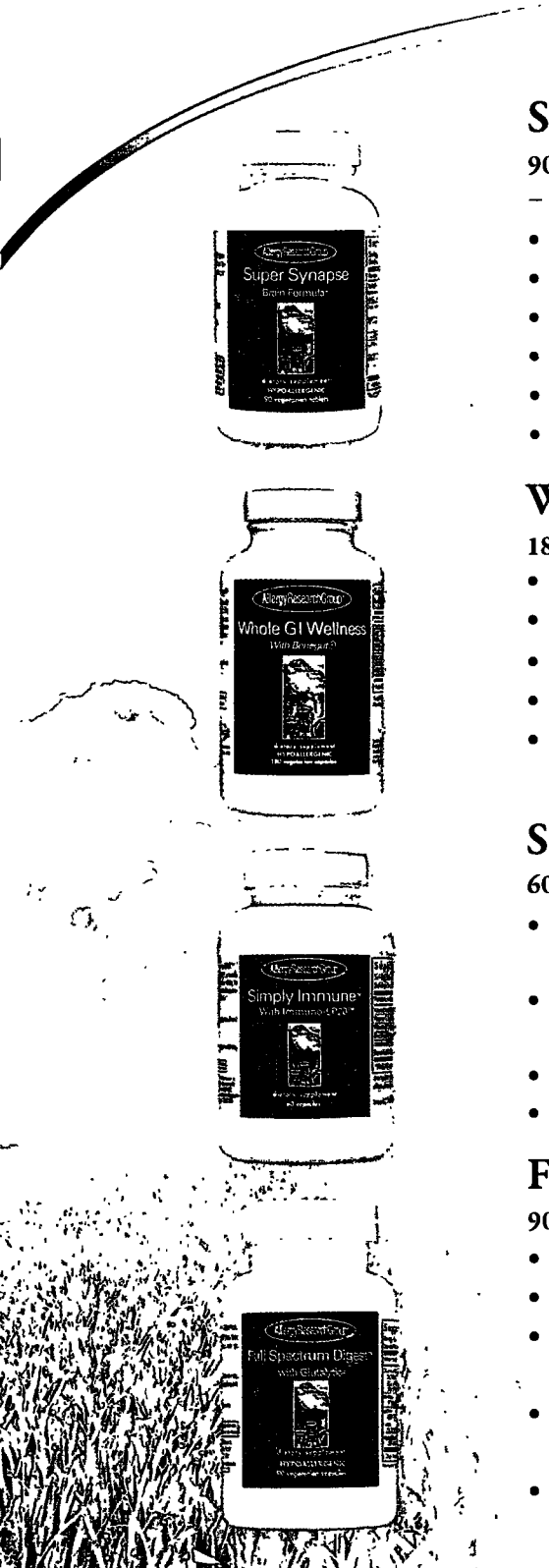

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From the Publisher

Broken

Like many of us, I have been dealing with a member of the family who has an addiction. Alcohol addiction has long been recognized as a major medical problem, and treatment for alcoholism has been in use for decades. However, drug addiction, an equally important medical problem, has not been addressed nearly so well. Unlike alcoholism, the medical profession has directly or indirectly instigated drug abuse. Excess alcohol use is viewed skeptically as an addictive condition – too many of us imbibe and consider drinking a safe outlet for stress and pent-up emotions. Where does one draw the line between heavy drinking and alcoholism? Drug addiction, on the other hand, generally started with a prescription from the doctor for a legitimate concern, but its usage became habitual and excessive. Of course, not all drug addiction starts in the doctor's office; too many younger individuals have used drugs "recreationally" and found that their illicit drug use became insatiable and beyond their control. Although marijuana has been blamed for being a gateway drug for further drug use, it has been less self-abusive.

Since the 1960s, drug experimentation and heavy alcohol use have been a rite of passage for college students. In the 1970s and 1980s, cocaine frequently turned users into addicts; more recently, opioids and methamphetamines have become the drugs of choice. When opioids became difficult to obtain in the past several years, heroin, a cheaper drug, has exploded in use. Heroin addiction is now overtaking our young in cities, suburbs, and rural areas. The addiction is so difficult to break that treatment for the poor is limited to medicating the craving with a drug substitute – necessitating daily early-morning lineups waiting to be seen at a methadone clinic.

PBS recently showed a documentary focusing on several individuals in the Seattle area who are addicted to heroin, and the Seattle Police Department's program to facilitate rather than incarcerate addicts. Heroin addiction is not just a problem for drug courts and methadone clinics – addicted patients are coming to our offices and looking for answers from integrative physicians.

Perhaps we should all take a closer look at addiction and the addicted individual. After all, this is not merely a patient in the office – it's also a family member or a friend. When addiction involves a close one, we are personally impacted. In the book *Broken*, by William Cope Moyers, the son of TV journalist Bill Moyers, the author tells his story of addiction and recovery. The younger Moyers' memoir details how he became addicted to alcohol and crack cocaine while in college. Moyers' binging with alcohol is typical college-age drinking, becoming drunk, and occasionally driving under the influence. He follows in his father's footsteps and becomes a journalist, performing brilliantly, despite

continued on page 8 ➤

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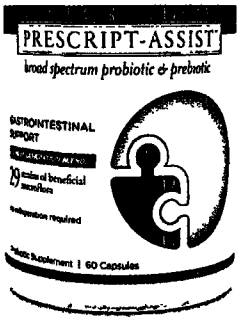

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[1] Pennisi, E. (2011) Body's Hardworking Microbes Get Some Overdue Respect. *Science, 330* (December 2010), 1619

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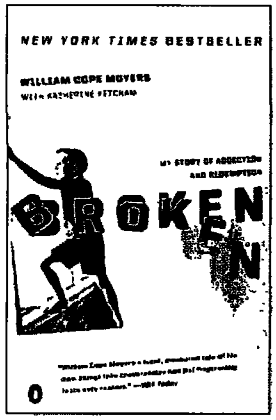
From the Publisher

➤ *continued from page 6*

his jealousy that he can never match his dad. However, the stress is too great, and William uses the drug that he is introduced to in the 1980s, cocaine. When snorting powder is not enough of a high, he upgrades to smoking "crack" cocaine. Moyers describes the exponential increase in pleasure that he experiences that first time on crack, and with that one use, he was hooked on smoking it, gradually abandoning his wife, his kid, and his job.



At one point he drops out and disappears. His parents hire a detective to locate him; when William's car is spotted parked on a Harlem street, Moyers' mom canvasses the neighborhood before finding him crashed in his dealer's apartment. Moyers spends a few weeks in the psych ward in NYC detoxing and then is flown to Minnesota to the renowned Hazelden center for drug recovery. He details the recovery process, including counseling and the Alcoholics Anonymous Twelve Steps. Despite being sober for 6 months, Moyers returns to his home turf in New York and promptly relapses. He returns to Hazelden for another stint at addiction treatment and counseling. After he recovers, he is offered a plum journalist position in Atlanta. Despite a commitment to remain clean and continue AA meetings, after only a few months, he finds himself in a crack house. Moyers is given, yet again, another round of detox and drug counseling – and this time, his recovery work appears to achieve some spiritual epiphany that sinks in. He opts to give up the esteemed journalist position and returns to Hazelden, not as a patient, but as an employee. Moyers becomes a public relations advocate for drug treatment and rehabilitation, statewide and federally. He chooses to devote his life to advocacy work, lobbying for insurance company coverage for recovery treatment.

Perhaps the most important part of *Broken* is the discussion that Moyers provides of how his alcoholism and addiction affected his wife, his parents, his friends, and others. Addiction remains a very difficult problem, one that is heartbreaking for the addict and the family.

New CDC Guidelines Issued on Physician Prescription of Opioids

The medical prescribing of opioids is not exactly broken, but it isn't in good shape either. Over the past 3 years, the incidence of death from opioid overdose has mushroomed, as have resuscitations for such overdoses. Fortunately, efforts by public authorities to put injectable naloxone (Narcan) into the hands of police officers, EMTs, and related parties have dramatically prevented the death of unconscious, overdosed individuals. Still, the use of opioids by American is staggering: we are 5% of the world's population, yet use 80% of the world's opioid supply. Opioid use is now so rampant that it has become a major political issue in the 2016 election. While Moyers' story talks about the struggle of the addict using illicit drugs, patients experiencing pain are being prescribed opioids by their physicians, yet people in both situations are equally addicted. The difference begins to

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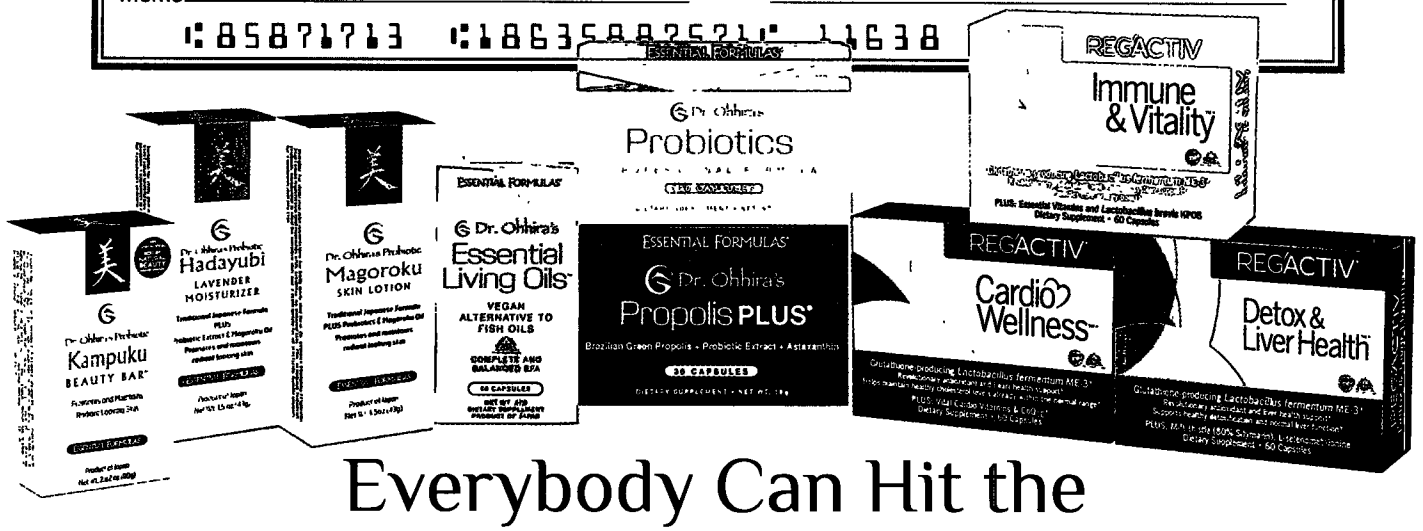

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From the Publisher

➤ *continued from page 8*

blur when the street addict is using Oxycontin or morphine. But how does a prescription drug make it onto the street? It had to start with the doctor writing a prescription for it and the "patient" selling the pills.

Of course, there is a black market supply for prescription painkillers that sidesteps the doctor's office, and is replenished directly from the corrupt pharmacist, drug company middleman, and pharmaceutical house. Still, the vast majority of the 10 to 15 million Americans who use opioids get their prescriptions legitimately in office visits with their primary doctors. The political answer is, as it always has been, to knock off the drug dealer. In this case, the physician is the drug dealer, and in mid-March the CDC issued a series of guidelines limiting opioid prescribing by the physician. Depending on one's viewpoint, the guidelines create red tape for the physician and endless grief dealing with the patient.

As before, the guidelines are not meant to stop the use of opioids in the terminally ill, particularly the cancer patient. The bugaboo is the patient with musculoskeletal pain. Many of these patients were given an initial prescription by the emergency room doctor following an acute injury. Others were given oxycodone prescriptions following surgery or a dental procedure. Even though severe pain is only present for several days, many patients have taken home 30 to 40 pills, sometimes even 60 to 100. Oddly, oxycodone and hydrocodone are inexpensive drugs (when bought at the drugstore, not on the street). Typically, a patient who sustained an acute injury will use a handful of pills and then put the rest in the bathroom cabinet. But more than a few individuals "like" the feeling that they experience on the drug, and continue to use it a week, 2 weeks, 3 weeks. By that point, they are hooked. In that short period, they have become opioid dependent. For others, the acute pain has never resolved. The pain stubbornly remains moderately severe and the opioid lessens the pain, dulls the interminable time of experiencing the pain, and enables one to persevere in doing chores and work. It's in these patients who have stubborn pain that the opioid is now a dependency – and the patient insists that the physician prescribe more. In the 1990s when doctors were encouraged to conquer the patient's pain, opioids were handed out like lollipops; now the pendulum has swung and physicians are shirking from any opioid prescriptions.

The CDC guidelines are outlined in a March 15 *JAMA* article.[1] Opioid prescriptions are initiated for pain only after determination that aspirin, acetaminophen, or a NSAID is not indicated or effective. Opioids should be prescribed for 2 to 3 days, certainly less than 1 week. Patients requiring refills of pain medication need to be reevaluated and only short prescriptions should be provided. Patients requiring lengthier prescriptions should be asked to do physical therapy, acupuncture, chiropractic (not part of guidelines), and other modalities supporting pain without medication. In addition to NSAIDs, patients needing long-term pain medication should be prescribed antidepressants, but not antianxiety medication (which should be avoided). Patients already using high-dose opioids should be required to taper their daily medication with the goal of lowering their dose to 50 mg/day of morphine equivalent. (Hydrocodone 5 mg is comparable to morphine 5 mg; oxycodone 10 mg is comparable to 15 mg morphine.) Patients requiring more than 50 mg morphine

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From the Publisher

➤ *continued from page 10*

equivalent of opioids should be considered for an addiction detoxification/recovery program using methadone maintenance or buprenorphine/naltrexone. Of course, patients should be screened with random urine drug analyses. Opioid prescriptions should be reevaluated every month to justify ongoing use and assess for drug dependency.

None of the above makes the business of prescribing pain medication easier, more straightforward, or less unpleasant. Furthermore, it is unclear how these guidelines will stem the flow of patients who have been denied opioids from seeking heroin. Integrative and naturopathic medicine should be implemented concomitantly with patients requiring ongoing drug prescriptions or detoxification programs.

ALS: An Infection of the Gut?

Although ALS (amyotrophic lateral sclerosis, or Lou Gehrig's disease) is relatively uncommon, it still affects nearly 20,000 individuals in the US and perhaps 10 times as many internationally. A progressive disease of the motor neurons of the brain and spinal cord, it has no effective therapy and most patients die in 2 years. While there is a familial variant of the disease, most patients develop ALS with no genetic predisposition. The disease is not only famous for taking Lou Gehrig's life at age 37 – it also claimed the lives of actor David Niven (73), historian Tony Judt (62), and soccer star Patrick Grange (29). Stephen Hawking, the astrophysicist, has a rare slow-progressing variation of ALS. The symptomatology of ALS dramatically weakening one's musculature is a grim way to die. If one could alter the course of this disease, it would be a boon for the patient and the patient's family and friends.

David Steenblock, DO, is a physician and medical researcher who is well known in the integrative medical community. David and I have had a collegial friendship for many years, first sharing our medical experiences at ACAM meetings focused on chelation therapy in the early 1980s. David has been very active in researching the medical literature, seeking information not limited to pharmacology but addressing biochemistry and physiology. In the late 1990s he became intrigued with the breakout of stem cell research and the early exploration of stem cell therapies. Steenblock's work had been focused on understanding the role of infection and inflammation in chronic, degenerative disease. His research in the 2000s examined the role that stem cell treatments would play in treating patient with neurologic disease, including ALS. Steenblock conjectured that while stem cells would be critical to repair of degenerative tissue, addressing inflammation, infection, and detoxification were all necessary to ensure stem cell efficacy. While treating patients with ALS, Steenblock uncovered a surprising pathophysiology for the disease.

In this issue, Bob Frost interviews Dr. Steenblock, who discusses the role that trauma to the neck plays in setting up the ALS process. Steenblock bases his hypothesis on his study of 54 ALS patients; he will submit his study to a journal later this year. Steenblock conjectures that it is the entry into the spinal cord of biofilms and other infections, monocytes, and toxins that sets in motion the death of motor neurons leading to the ALS process. Steenblock's clinical cases treated with stem cells and anti-infection, anti-inflammatory, and detoxification protocols have resulted in a number of individuals whose disease was "reversed."

Given that medicine's only treatment for ALS is life quality palliative care, Steenblock's work deserves close attention.

The Bureaucratic Mind and Your Health

Kenneth Smith is the communications director of Beech Tree Labs, an early-stage biopharmaceutical company. He is also the executive director of Beech Tree's sister company, the Institute for Therapeutic Discovery, a nonprofit focused on bridging biochemistry and biophysics. In May 2014 his writing appeared in the *Townsend Letter* hypothesizing that we might need a "periodic table of allergens." His paper suggested that due to "molecular cross-reactivity," many allergies and hypersensitivities might be due one or more common denominator allergens. It would be very interesting indeed to have a periodic table of allergens.

In this issue, Smith examines the philosophic concept of "the bureaucratic mind," particularly its influence on our health. He states that the bureaucratic mind is a mindset that is quite "rigidly organized" so that "thinking is compartmentalized and passed on to others with minimal examination of value." The bureaucratic mind is not limited to organizations and governments. Our day-to-day personal mindset depends on our own bureaucratic mind to make decisions efficiently with little thought and evaluation. We want to come to a stop when we see a red light – we don't want this to be a decision open to interpretation or alternatives. But what about when we come to a fork in the road and there are no signs to direct us? Our first thought would be to confirm that there really is no sign; after all, why take a chance with a wrong decision? The problem in health is that the health bureaucracy wants to streamline medical diagnosis and treatment into a simple, codified process. What if the diagnosis and the treatment are open to different pathways, different options?

Hence the collision course that one faces opting for alternative medicine in a conventional medical setting.

Smith considers how the bureaucratic mind does not function well with genomics. How could chronic infection or toxicity contribute to a disease process? The bureaucratic mind falters when we approach health as a process of homeostasis or, as he terms it, homeodynamics. Smith is particular interested in psychologic homeodynamics, when the psychological state directly affects our physiological and immunological response.

Smith argues that we will always deal with the bureaucratic mind – the question is how we manage it.

Jonathan Collin, MD

Notes

1. Dowell D et al. CDC guideline for prescribing opioids for chronic pain – United States, 2016. *JAMA*. 2016:March 15.

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In Memoriam

Michael E. Rosenbaum, MD, MS

1942–2016

Michael Rosenbaum, MD, was a beloved friend, colleague, physician, and healer and a deep scientific thinker in the fields of integrative and orthomolecular medicine. He passed away unexpectedly on March 9, 2016, in Greenbrae, California, after a brief illness, surrounded by family, colleagues, and friends. He is survived by his daughters, Autumn and Crystal, and by a multitude of patients, many of whom credit him with saving their lives (literally or metaphorically).

Over the past 10 years, Michael and I became close friends and, in the truest sense, "brothers." One of the great eras in my life has been the decade I spent with this brilliant, impassioned soul, and I am honored to have collaborated with him on research and writing projects, including work on the reemergence of thallium in the food chain that appeared recently in the *Townsend Letter* (December 2015 and January 2016 issues).

Michael was born and raised in the Crown Heights section of Brooklyn and attended Yeshiva University High School, Brooklyn College, and the Albert Einstein College of Medicine, where he obtained his medical degree. He also earned a master's degree in biochemistry at the Hebrew University in Jerusalem, training that subsequently inspired and informed his practice of complementary and orthomolecular medicine.

Pursuing a career in psychiatry, he completed his residency at San Francisco General Hospital in the early 1970s. However, he concluded that the treatment of patients by standard allopathic medicine was not his calling. Instead, he became a pioneer in the practice of complementary medicine, founding the Wholistic Health & Nutrition Institute with Richard Shames, MD, in 1974, one of the first integrative medical centers in Northern California. Over the following decades, he also worked with Jeffry Anderson, MD, and Elson Haas, MD, innovators in integrative practice. Michael's clinical expertise included nutritional, environmental, and antiaging medicine, allergy and immunology, and the treatment of chronic health conditions such as Lyme and autoimmune disease. Both his colleagues and patients revered him for his medical insights, diagnostic skills, and compassionate care. A long-standing member of a number of professional medical societies, he served as president, vice president, and editor-in-chief for the Orthomolecular Medicine Society (later Orthomolecular Health Medicine) founded by Nobel Laureate Linus Pauling and Dr. Richard Kunin. He was a member of the American Academy of Environmental Medicine and the American Academy for Advancement in Medicine, and author of numerous publications, including two successful books, *Super Supplements* and *Solving the Puzzle of Chronic Fatigue Syndrome*.

Michael was noted not only for his medical skills, but his love of life. He enjoyed classical music and jazz, was an enthusiastic piano player and movie buff, and became a connoisseur of fine food and Japanese teas. A great sports fan, he was excited about the recent successes of the San Francisco Giants and the Oakland Warriors. Michael Eli Rosenbaum, MD, MS, had a great and meaningful life and will be missed by his family and his many friends and patients. He will be remembered with great love.

Ernest Hubbard
Mill Valley, California

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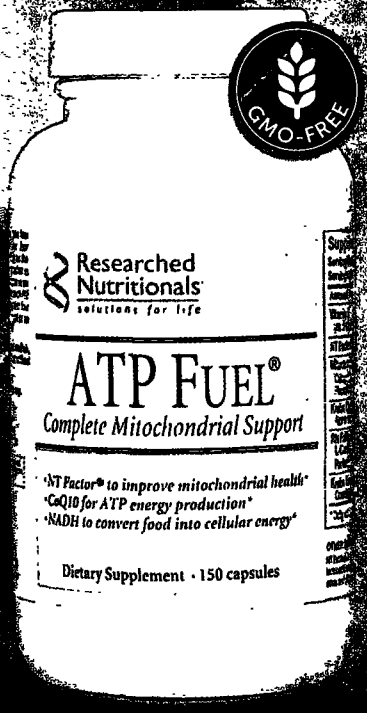

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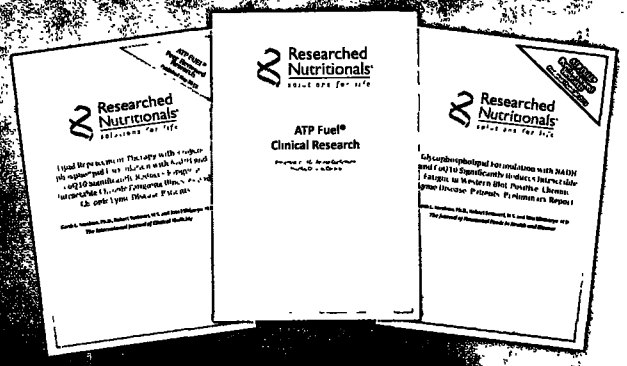

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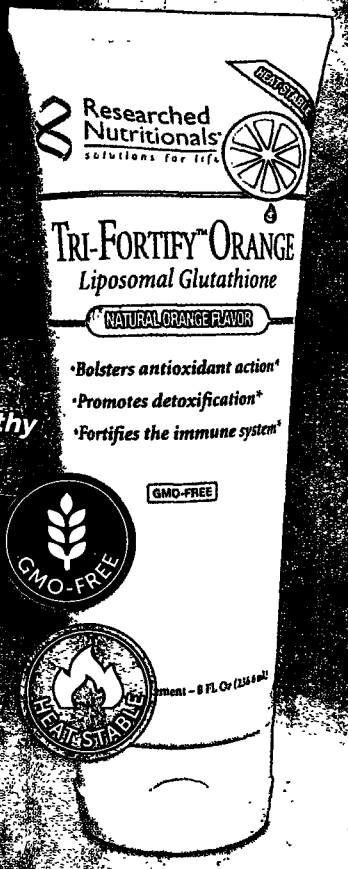

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In Memoriam

Iichiroh Ohhira, PhD

Developer of World-Renowned Natural Health Products

On March 1, 2016, Iichiroh Ohhira, PhD, developer of world-renowned Dr. Ohhira's Probiotic Formulations (known as OM-X in Japan), passed away after a brief illness. He was 80 years old.

"This is extremely sad news for everyone at Essential Formulas. I had the privilege of working with Dr. Ohhira for many years and considered him not only a brilliant scientist but also a friend. He was a visionary in the field of microbiology and biochemistry and his pioneering research developed the first clinically controlled natural fermentation process, thus setting the gold standard for probiotic supplementation worldwide," said Michael Schoor, CEO and president of Essential Formulas Incorporated. "Dr. Ohhira was a true humanitarian who made it his life's work to positively impact the health of millions of people, thus becoming a champion for a generation who were seeking naturally viable health alternatives."

In 1974, Dr. Ohhira founded Bio Activity Research & Development Center in Okayama, Japan, later known as BioBank. Through his research he discovered *Enterococcus faecalis* TH-10, a strain whose proteolytic power is 6.25 stronger than other lactic acid bacteria (LAB) known to science. This strain became the foundation of Dr. Ohhira's award-winning formulations. This discovery, along with his research in lactic acid bacteria, earned Dr. Ohhira a series of prestigious awards. He received the Presidential Citation from Philippine Medical Association and was named a GUSI Peace Prize winner, often referred to as the Philippines' version of the Nobel Peace Prize. Dr. Ohhira once stated, "Each capsule is filled with our passion and hope for bringing health and long life to all 7 billion people on the earth. We make our product with not only proven scientific protocol but tender care through the power of fermentation, inspired through nature's blessings and the mighty lactic acid bacteria."

Continuing to lead the company is Chief Executive Officer Masumi Ohhira; lead research scientist and Dr. Ohhira protégé Dr. Muneaki Takahata, PhD, and his team of researchers; and Hiroaki Takahata, who oversees marketing operations in Japan and other regions. For the time being, we would like to reflect upon Dr. Ohhira's life and express our gratitude to an exceptional man who gave everything to his company and his passion. According to his utmost wishes, the company will continue to pursue and expand the exciting adventure that he initiated in 1974. For a full list of Dr. Ohhira's accomplishments, visit http://www.essentialformulas.com/efi.cgim?template=beta-dr._ohhira.

Essential Formulas Incorporated (EFI) was established in 2000 as the sole US distributor of world-renowned microbiologist Dr. Iichiroh Ohhira's award-winning probiotic dietary supplements and skin care products. Always an innovator, EFI introduced Reg'Activ in 2015. Containing ME-3, a probiotic catalyst that produces the "master'" oxidant glutathione inside the body's own cells. A family-owned and operated business, EFI was founded on the philosophy of providing high-quality preventative, supportive and comprehensive prohealth products for the entire family.

Pledging to provide premium all natural supplements and exceptional customer care, EFI continually strives to lead the industry in customer and retailer education in the use and efficacy of its innovative products, which include Dr. Ohhira's Probiotics, Dr. Ohhira's Propolis PLUS, Dr. Ohhira's Essential Living Oils (Vegan Certified), Dr. Ohhira's Probiotic Kampuku Beauty Bar, and Magoroku Skin Lotion. Essential Formulas supplements continue to garner consumer, health-care professional and industry accolades for its convenient packaging and powerful health-promoting benefits. EFI continues to flourish and grow through strong company and product integrity and the knowledge that it is providing scientifically proven products that positively affect the health and well-being of its customers. For more information, visit: www.essentialformulas.com, or call 972-255-3918.

Barcelona to Host Naturopathic Medicine World Congress

3rd International Congress on Naturopathic Medicine

Theme: Global Patient Care

Preventing Chronicity Naturopathically

www.icnm.naturopathy.eu

The third International Congress on Naturopathic Medicine ICNM 2016 will take place in Barcelona, Spain, July 1–3, 2016, at the prestigious Barcelona Plaza Hotel. The Global Annual Conference will have a strong focus on the future of natural health care in the wake of increased consumer demand for access to natural medicine.

ICNM 2016 is the world's major annual natural medicine congress attended by the most influential and inspiring health-care experts dedicated to improving patient care. Participants have the opportunity to network with the finest practitioners from over 50 countries and update their knowledge and skills, learning from more than 40 internationally recognized keynote speakers and lectures.

"We believe it is a good thing for natural health-care professionals from around the world to connect and share ideas on health-care challenges from a different perspective. We are excited to propose an outstanding program that will play a pivotal role in helping to shape the future of the natural medicine profession. Over 40 internationally renowned naturopathic medicine professors and doctors will present exceptional lectures to 500-plus delegates from 50 countries. The congress is endorsed by more than 160 organizations and universities worldwide," says Anne Marie Narboni, BA Com, ND, executive congress chair.

Natural health-care professionals and participants are invited to join us for this unique opportunity to remain at the cutting edge of natural medicine practice, and to share in the mutual exchange of knowledge and friendship.

For further information please visit our website: www.icnm.naturopathy.eu.

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The Institute for Functional Medicine Unveils Results of Landmark Survey at Corporate Roundtable Meeting

The Institute for Functional Medicine (IFM) shared results of its recent survey of functional medicine practitioners with a group of its corporate leaders on March 16, 2016, in Phoenix, Arizona. Many of IFM's corporate leaders attended the roundtable, including Cleveland HeartLab, Doctor's Data Inc., Genova, Metabolic Maintenance, Metagenics, Nordic Naturals, Ortho Molecular, Power2Practice, Pure Encapsulations, Thorne Research, Vital Nutrients, Wellness Pharmacy, XYMOGEN, and ZRT.

IFM leadership presented on the functional medicine practitioner landscape from data that were collected in a landmark survey deployed in November 2015 to 7000 clinicians, more than 1000 of whom responded. The survey was designed to explore the experiences, implementation methods, technology platforms, and business insights of practitioners in the field, with the goal of identifying and publishing current and best practices in functional medicine.

The corporate leaders were also presented with IFM's key initiatives and strategic priorities for 2016–2020 and invited to participate in opportunities that will broaden their involvement with IFM and the functional medicine ecosystem.

"This inaugural convening of our corporate partners was an important milestone for functional medicine," according to Laurie Hofmann, CEO of IFM. "The deeper engagement of these key industry leaders in finding new and innovative ways to support functional medicine practices will help to scale the functional medicine movement."

Hofmann added that several corporate leaders are eager to participate in IFM's Frontier Project, which focuses on practice implementation resources, training, and patient education for functional medicine practitioners.

The Institute for Functional Medicine (IFM) is the global leader in functional medicine. The mission of IFM is to serve the highest expression of individual health through the widespread adoption of functional medicine as the standard of care.

Functional medicine is a personalized, systems-oriented model that empowers patients and practitioners to achieve the highest expression of health by working in collaboration to address the underlying causes of disease. The primary drivers of the chronic disease epidemic are the daily interactions among an individual's genetics, environment, and lifestyle choices. Functional medicine addresses these underlying causes of disease and equips health-care practitioners to help their patients manage this complex, interconnected web. For more information about IFM, please visit www.functionalmedicine.org.

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Disclosure: The *Townsend Letter for Doctors & Patients* 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 required to submit their reports to other professionals for review and include proof of peer-review with article submission.

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 5th Annual Low-Dose Naltrexone Conference: A Review

by Emily Kane, ND

As daily opioid overdose surpasses motor vehicle accidents as a cause of premature death in the US, interest in naloxone and naltrexone has spiked. Training primary-acare providers, pharmacists, friends and relatives of addicts, and legislators in the judicious use of the various forms of naloxone (Narcan, Vivitrol) will save many lives. Naloxone is an opioid antagonist that binds to the mu opioid receptors found on most cells, preventing activation of the opioid response, and mostly used in emergency settings to prevent opioid (e.g., heroin) overdose death. Naltrexone is a similar opioid antagonist but with a shorter half-life and slower uptake than naloxone. Unlike naloxone, naltrexone is well absorbed orally and transdermally. My purpose in reviewing the 5th Annual LDN conference in Orlando, Florida (February 29–21, 2016), is to increase awareness of the broad-spectrum efficacy of naltrexone, used in very low doses, in alleviating human suffering.

The conference organizer, energetic LDN patient and advocate Linda Elsegood, along with many volunteer members of her family and staff, runs the LDN Research Trust, based in England. A summary fact sheet for everything LDN, including the 176 disease indications, per published research, is available on its website.[1] Another available resource is a video of Dr. Alex Vasquez interviewing a seasoned LDN prescriber.[2]

The trust has, hot off the press, an informative and fascinating book about the mechanism and uses of LDN that would be a good investment for anyone interested in the topic: *The LDN Book*.[3] One of my favorite chapters in the book is a delightful romp through LDN history, starting with early humans' fascination with narcotics, by Scottish pharmacist and pharmacy owner Stephen Dickson.

The more recent backstory for LDN starts with the late researcher and neurologist Bernard Bihari. Bihari considered himself a primary-care physician and was living in New York City during the height of the AIDS epidemic in the 1980s. The city commissioned him to study the disease and gave him a large budget, because new victims were dropping like flies. Bihari noted that many of the advanced AIDS patients were also heroin addicts, and he became interested in measuring endorphin levels. This was an expensive undertaking, but Bihari had the funds and knew that helping addicts get off heroin could only improve their health. Bihari was able to show in an AIDS patient group that taking naltrexone regularly slowed or even halted the gradual destruction of CD4 cells. His trial group death rate was vastly lower than controls. This effect was not from LDN alone, but synergistic with the newer (at the time) antiretroviral drugs. Bihari also noted, almost incidentally, that when lower doses of naltrexone were given, there was a positive endorphin response compared with the endorphin suppression found when doses more typical for opioid addition were given. Opioid addiction is treated by blocking the effect of the opiate with 50 to 200 mg of naltrexone or naloxone daily, which inhibits any desired effect of the opioid for 24 hours. Bihari was assessing different dosing schedules and saw that giving very low doses of naltrexone actually stimulated endorphin production, rather than blocking it. At first he didn't believe these results, so he repeated them. A colleague in Milan (Dr. Maria Garoni) verified this finding. Bihari's work triggered a flurry of research assessing the importance of endorphins in the regulation of the immune system. A few years later, Dr. Ian Zagon speculated that low doses of naltrexone, producing rebound uptick in endogenous endorphins, could be used therapeutically. In 1986 Zagon demonstrated that opiate receptors were present inside multiple types of immune cells, and published nearly 300 research papers on LDN and endorphins. Quoting directly from *The LDN Book*, per Zagon, the basic mechanism of action for LDN is as follows:

1. Many outward diseases are expressions of a malfunctioning immune system.
2. The immune system is regulated by endorphins, which have a primary action on opiate receptors.
3. Blocking opiate receptors briefly using naltrexone causes an upregulation in the production of endorphins, which can act in an immunomodulatory way to correct immune system malfunction.
4. Cell proliferation is also mediated by a subtype of endorphins and can be suppressed by endorphins, which is applicable to some forms of cancer.

Endorphins and inflammation are not the whole picture, however. Naltrexone also binds to the group of receptors called *toll-like* (TLRs), first demonstrated by Christiane Nüsslein-Volhard in 1985 to recognize a wide range of antigens and initiate signaling pathways that trigger the appropriate immune response.

Now, in 2016, we also know that the broad mechanism of action of LDN is at least in part due to racemic isomers which have different and

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complementary functions. Mostly humans only have receptors for one isomer of a given molecule. However, in the case of naltrexone, the levorotating molecule fits into mu opiate receptors and causes a brief suppression, then rebound proliferation of endorphins, mostly beta-endorphin and met-enkephalin. The dextro isomer fits into receptors for various mediators of inflammation (cytokines, NF kappa-b) and suppresses them, via TLR antagonist mechanism.

The 2½-day conference featured 25 speakers, mostly physicians and pharmacists. The conference attendees were a mix of health-care providers, pharmacists, and patients – a format recognized as salutary at least a decade ago by this publication. It is beneficial for all to have a variety of stakeholders on site when expanding consciousness about health and well-being.

Learning of the breadth of LDN's therapeutic potential was a highlight of the conference, and this feature cannot be adequately elucidated here. Lecturers gave clinical evidence (some with patient numbers in the 100s) of benefit in chronic pain disorders, Crohn's, ulcerative colitis, IBS, SIBO, rheumatoid arthritis, sarcoidosis, psoriasis, polymyalgia rheumatica, FM, CFS, RLS, asthma, fertility, many autoimmune disorders, and many cancer types (endorphins boost apoptosis). This review will focus on the neurodegenerative disorders presented, since these are increasingly prevalent and conventional remedies are largely unsatisfactory. The brain disorder case studies helped by LDN presented over the weekend include autism, alcoholism, ALS, depression, dissociative disorder, MS, and PTSD.

Let's start with alcohol addiction disorder, a condition from which 1 person dies every 10 seconds in the US, wherein addiction is moralized ("why can't you just stop?") and monetized (detox and dry-out facilities are big business). Treatment is often punitive or court mandated. We learned about a revolutionary method for curing alcohol addiction via the Sinclair Method, which uses naltrexone in slightly higher doses than LDN, immediately before drinking, to neutralize the desire to continue to drink. This method has been used successfully in Finland to cure over 70,000 alcoholics. For more info visit www.cthreefoundation.org or www.onelittlepillmovie.com. The Sinclair Method claims a 78% long-term success rate, which is unheard of with detox or Twelve-Step programs. Over 120 clinical trials document this success. Check it out and spread the work.

There was not a lot of discussion of ALS, a currently incurable condition, but it was mentioned several times during the conference, and these patients may benefit from LDN, though no clinical trials exist. As an older, generic, drug, no return on investment exists for Big Pharma to develop LDN. One of the overarching purposes of the LDN Research Trust is to stimulate interest in deep research without need for financial motive. As an aside, this problem in research is one of the many compelling reasons to have a single-payer health-care system – wherein it actually becomes financially interesting to prevent and cure, rather than "manage" disease. The neuropathology of ALS is characterized by pathologic inclusions within both upper and lower motor neurons and glia. The conference's opening lecturer, Dr. Pradeep Chopra (MD from Harvard Medical School and now instructor at Brown Medical School), emphasized that focusing on glial cells, as opposed to solely on neurons, was an important shift in thinking about treating pain and neurodegenerative diseases. Glial cells are so named because they were previously thought to be merely a "glue" for holding neurons in place. Now we know that glial cells play a critical house-cleaning role by modulating inflammation. When activated, they can release many pro-inflammatory chemicals including cytokines and chemokines, and increase TLRs on nearby cells. LDN blocks TLR4 signaling and upregulates the opioid growth factor-OGF receptor axis, which blocks the release of cytokines, including IL6, IL12, TNF-alpha, and NF-kappa-beta. This dual actual of LDN (analgesic and anti-inflammatory) was revisited numerous times over the weekend, and is presumably the mechanism of benefit for ALS.

Depression and anxiety are extremely common clinical presentations, and over time these emotional conditions can create physical problems as well. Several presenters praised the benefits of LDN in "mind-body" problems, with a focus on the critical importance of addressing the mental well-being of the patient when treating any disease. Hypnotist Lachlan Cox presented compelling evidence that emotions drive our pain. As an example, the mechanism of phantom limb pain is that the memory of the injury is stored in the limbic system. Ignoring physical sensations can amplify them. Find more about his work at www.focusperformance.pt.

Dr. Ulrich Lanius, a psychologist, presented on "Traumatic Stress, Dissociative Smptoms and Consciousness." Dissociative symptoms include amnesia, depresonalization, inability to feel emotions, flashbacks, identity confusion, and somaticization.

Common links for autism diagnosis include problems in these categories:

- Genetic: fragile X, Rett syndrome, trisomy, copy number variations.
- GI: very common. If person acts as if they have "ants in their pants," sometimes they do. Check for parasites.
- Immunologic: asthma, eczema, food sensitivities, frequent ear infections, vaccination reactions and microbiota alterations.
- Birth complications: CP, "mental retardation," preemies.
- Metabolic and nutritional: rampant vitamin deficiency, lipid abnormalities, picky eaters, MTHFR deficit.
- Boy (75%) versus girl prevalence.
- Early presentation (at birth) versus "converts" after vaccine or other noxious exposure.

He talked about how, years ago, he came to an impasse with his usual method (EMDR) and recognized a similar "blankness" in patients with severe PTSD and those with high blood opioid levels. An Internet search brought him to naltrexone and he worked with a prescriber, using 50 mg at first. It worked; blocked patients opened up and therapy interventions became useful. Later, he found Bihari's work and switched dosing to 3 mg, which worked even better and remains Lanius's preferred dose. Pape and Woller have a paper on LDN and PTSD from 2015 available on PubMed; 11 of 15 subjects had positive and lasting effects.

Day 2 started with a presentation of LDN for MS by Dr. Jarred Younger, "Calming the Microglia: A Future Method for Treating MS." Well, the future is here and a 2015 chart review of 215 MS patients using 3.5 mg LDN daily, for average duration of 804 days, showed 60% improvement in fatigue, 60% improvement in overall disease severity, and with minimal side effects. Early treatment is key. Another presenter, Dr. Patrick Crowley, who has treated over 150 MS patients with only LDN (no other therapy), states that LDN is more effective than interferon. The pathophysiology of MS is demyelination due to deficits in microglial and oligodendrocyte function, triggered by many potential pathogens including hydrocarbon or heavy metal exposure, obesity, microbial infection, and so on, all of which cause inflammatory chemicals such as NO to be overexpressed. These noxious chemicals make their way through the lymphatic system deep into the body, creating "autoreactive" T cells. Ultimately these antigenic T cells leak into the brain and attack axons, leading to relentless neuroinflammation. We have many anti-inflammatory remedies, but most do not cross the blood–brain barrier. LDN does. LDN reduces the inflammatory response to toxic T cells in the CNS. It is best used immediately after the first MS "attack," because then it has potential to put the patient into permanent remission. Younger is raising funds to create an MS/LDN trial. He's looking at a medium-sized pilot trial with about 60 patients; his budget is around $300,000. He is hoping that this will stimulate interest in a more comprehensive 4-year trial that can include labs and radiologic follow-up; this would cost $2 to $3 million. Any interested researcher or donor may contact him at Younger@uab.edu.

Day 3 began and ended with spectacular information on autism spectrum disorder. Lecturer Brian Udell, MD, has had other subspecialties during his medical career but asserts that the autism spectrum population has more savants than any other patient population he has worked with. After the lectures wrapped up, we were treated to a 20-minute virtuosic piano recital by one of Udell's young patients, age 10, who is clearly a musical genius. Udell started working with Jacob Velazquez when the boy was 4. His parents brought him in due to extremely violent and aggressive behavior that crescendoed after the birth of his sister, who also is autistic and much improved on LDN. Check out Jacob's many inspiring piano concerts available on youtube.com.

I asked Udell in the lobby after the concert if he speculated on why autistic people were more likely to display creative or mathematical genius. He shared a theory given to him by a colleague, which is that for some reason, during embryological development, the brains of autistic children do not "self-prune" and they ultimately have access to a lot more information. I was not familiar with neural pruning in utero, but it makes sense that as we develop, we respond to stimuli, noxious or beneficial, and grow new cells accordingly. The multitude of noxious stimuli in our environment today (gluten, GMO soy, Roundup, endless plastic) is undoubtedly why autism is so much more prevalent. It's not only the mercury in the vaccines – mercury, fortunately, has largely been removed from children's vaccines. In opening his lecture, Udell quipped that this week he got 6 or 7 bulletins about Zika virus, which has maybe 2 cases in Florida, whereas 1 in 4 boys are now being born autistic. Autism is the pandemic, not Zika!

Conventional medicine uses heavy-duty drugs designed for adults on toddlers with brain problems. This is overkill and inappropriate. In 2006 Dr. Jaquelyn McCandless developed a protocol for administering topical LDN at 9 p.m. when the child is asleep. Udell has used this protocol very successfully in hundreds of cases.

The *Physicians' Desk Reference* actually lists LDN (along with Abilify and Risperdal, speedy antipsychotics which cause eating disorders, diabetes, and tics, and antiseizure meds Trileptal or Depakote) for treating autism. Most pediatricians prescribe stimulants (methamphetamine) for autistic people. Since amphetamines retard growth, they really should not be given before age 8, not to speak of their high addictive potential. Straterra never works, says Udell. He sees lots of children on Zoloft and Prozac and claims that these are horrible approaches – the kids are stoned out their minds, drooling.

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The key defining features in autism spectrum are speech apraxia and disruptive behavior. A child with a low IQ probably is *not* autistic. Most truly autistic children have higher IQ. Autistic children do not have OCD. OCD is washing your hands over and over or counting cracks in the sidewalk. All autistic children have GI problems – abnormal flora, including yeast. You can fix the gut. This is more effective than trying to put a big drug Band-Aid over repetitive behavior. Autistic kids are strong (climb walls) but have low tone (can't do pull-ups or pedal big wheels). They don't make eye contact. Check Udell's weekly blog: theautismdoctor.com.

Autistic children can't communicate properly. The voicebox doesn't work normally, depriving them of the most fundamental form of communication. The most upstream problem linking these gut, immune, skin, CNS, and metabolic issues is genetics. Udell asserts that genetic mutation is the major cause of autism: it's a combination of genetic susceptibility plus a toxic environment. He says that the DSM criteria are not helpful for autism spectrum. They were developed in the 1940s by someone who thought that psychiatric issues were caused by emotionally distant mothers. DSM parameters are not helpful when sorting out therapies for autism.

Check food allergies. High IgG represents inflammation. 10% to 15% of autistic children have very low cholesterol. The conduction system in the brain (Schwann cells) requires cholesterol. Raising lipid profiles can restore eye contact.

The most difficult children have the aggressive, self-injurious behaviors. The beta-endorphin aspect of LDN mostly helps with these. LDN does not work so well for speech apraxia, but it immensely helps immune vulnerability. Parents will say, "Since starting LDN, he isn't sick all the time anymore." Udell says that once various parameters of the autism spectrum are addressed, prodigies can emerge. He has a high level of extremely talented musical, artistic, and creative children in his autistic population.

During the conference, many of the LDN prescribers mentioned being shunned or derided by certain colleagues. You have to be brave to be on the frontier. One approach is to ask your skeptical colleague, "Do you really just want to use steroids again?" And then of course refer them to www.LDNresearchtrust.org.

Notes

1. Low-dose Naltrexone (LDN) fact sheet 2015 [Web page]. LDN Research Trust. http://www.ldnresearchtrust.org/sites/default/files/LDN%20Information%20Pack(1)_0.pdf.
2. LDN (low-dose naltrexone) conversation with Drs Carnahan and Vasquez with application for multiple sclerosis, rheumatoid arthritis, fibromyalgia, complex regional pain syndrome, irritable bowel syndrome. International College of Human Nutrition and Functional Medicine [online video interview]. http://www.ichnfm.org/#!blank/ezga0.
3. Elsegood L. *The LDN Book: How a Little-Known Generic Drug (Low Dose Naltrexone) Could Revolutionize Treatment for Autoimmune Diseases, Cancer, Autism, Depression, and More* White River Junction, VT: Chelsea Green Publishing; 2016.

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Pathways to Healing

by Elaine Zablocki

Reimagining Our Lives with Resilience and Verve

If you listen to National Public Radio, you already know Barbara Bradley Hagerty. Over the past 20 years, she's broadcast more than 500 stories, including a series on human spiritual experience throughout the world. She discussed recent research on human consciousness and the brain, near-death experiences, meditation training and its relationship to physical and emotional health. I used to check the NPR website every few weeks to be sure I hadn't missed any of her work.

At age 49, she lost her voice. That would be a problem for anyone, but especially for a radio reporter. Over the next three years, under various treatments, her voice went away and came back and went away again. Then she began experiencing pain in her vocal cords. "The pain was not excruciating, but it was relentless," she writes. "It was also boring ... and it narrowed my world to a pinprick."

Hagerty faced a midlife problem, a severe chronic illness. For many of us, early adulthood is a time of increasing skills, good health, new social relationships. "Troubles start to cluster at midlife," Hagerty writes. "You are more likely to lose a parent or spouse after 40, more likely to be diagnosed with cancer after 45, and much more likely to be replaced by a younger, cheaper, more tech-savvy employee after 50."

She found ways to cope with her changing vocal cords, and she also started interviewing people to learn about the best ways to cope with midlife challenges. Now she shares what she's learned in a just-published book, *Life Reimagined: The Science, Art, and Opportunity of Midlife*.

Hagerty was diagnosed with a partially paralyzed vocal cord, and worked with a speech therapist for several months. "When I went to vocal cord boot camp at the University of Wisconsin, they conducted thorough tests and found that in fact my vocal cords had healed," she recalls.

However, she was still experiencing daily, hourly pain. Based on interviews with neuroscientists and others who're working on chronic pain, she realized that her brain now had a habit of reporting pain, even after the physical problem had resolved. "I had a brain wiring issue. My brain was telling me there was something wrong with my vocal cords, and that created the perception of pain," Hagerty says. "There are two types of pain. There's the acute pain you feel when you put your hand on the hot stovetop, and then there's the emotional reaction that increases pain and also leads to chronic pain."

Barbara Bradley Hagerty

She developed tools to retrain her brain. She reorganized her life so that she faced fewer stressful situations. She did meditation exercises. When the pain began, she'd remind herself it was just a false alarm, take some deep breaths, and find something interesting to distract herself and give her brain something else to work on.

At one point Hagerty was taking 24 pain pills a day. Now, she's down to 3. She plans to keep them as a safety net during her current book tour. "The pain used to dominate my life, literally – I could think of nothing else," Hagerty recalls. "Now, I may think about my throat three times a day, usually when I've been talking a lot. Now, it has become a minor issue."

Life Reimagined, Midlife Opportunities

Hagerty's interest in midlife opportunities was sparked by her own specific health problem, but she's written a book that

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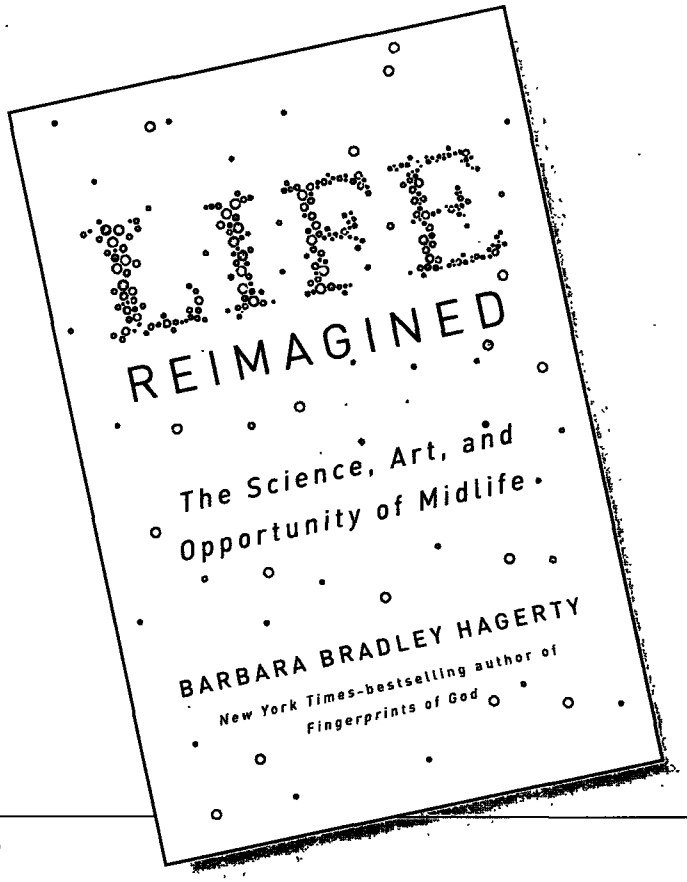
touches on a wide range of challenges that people are likely to face in midlife. "Can a midlife brain remember new tricks?" one chapter asks, and goes on to describe the ways that aging brains can compensate by using more brain regions and neural circuits, and by taking on challenging mental activities. Another chapter asks whether midlife marriages will be deserts or oases. Hagerty interviewed a dozen researchers with various ways of analyzing intimate relationships. "The research reveals countless ways for midlife couples to be happy, and just as many paths for unhappy midlife couples to navigate back to a vibrant partnership," she writes.

Throughout the book, there's an emphasis on engaging with the inevitable challenges of midlife – whatever they may be. "The people who do midlife really well, who thrive, are people who engage life with verve. They consciously invest in the parts of their lives that are most important to them," Hagerty says.

At any moment, each of us could find ourselves coping with an unexpected catastrophe. We all need to develop the skill of resilience, of recovering after a setback. "We are more resilient than we think we are," Hagerty says. "Studies show that even people who go through terrible trauma do return to their happiness set point. It takes an effort, but they do recover."

It's also possible to increase resilience. Hagerty mentions two useful tools that she's learned from personal experience. First, don't catastrophize. It's so easy, when something goes wrong, to focus on all the terrible results that might happen next ... until those exaggerated worries just become an additional problem. "Handle one thing at a time," Hagerty says. "In addition, if you're in a situation where you need help, that's all right. Researchers say those who're able to let other people in their lives and accept help recover faster and have a richer experience."



"Midlife invites second chances," Hagerty reflects. "As you grow older, you find that relationships are so important – your family, your friends, the causes that you think are worthy." She encourages readers to rethink their priorities, and to make choices that support a full engagement with life. "Just running on autopilot is death," she says. "Midlife is a time to engage. Flipping the switch from autopilot to engagement demands intention, energy, and effort every single day."

Health-Care Practitioners Play a Key Role

Townsend Letter readers include many health-care professionals, and many people with personal experience as patients. I asked Hagerty what she's learned about our health-care environment, what she wants to say to those who work directly with people who are experiencing illness.

"You know, research shows that doctors in a hurry, who don't take time to listen to their patients or look them in the eye, actually have much poorer outcomes," she says. "These days some medical schools even include training in empathy, because they recognize it is such an important part of the relationship between practitioners and patients."

During her own experience with injured vocal cords, Hagerty found that the physicians who helped her most dealt with her illness on all levels: physical, emotional, and spiritual. "The best doctors try to help you think through the situation in a way that will promote healing," she says. "My speech therapist, who helped with my vocal cords, also encouraged me to try meditating out of the pain. I encourage health-care practitioners to use every arrow in their quiver, and that includes not just their medical skills, but also their empathy and encouragement for spiritual and emotional practices that help people heal."

Resources

http://www.barbarabradleyhagerty.com

http://www.barbarabradleyhagerty.com/life-reimagined: a short description of the new book, with comments from people who've read it.

http://www.barbarabradleyhagerty.com/fingerprints-of-god: information about Hagerty's previous book, *Fingerprints of God: What Science Is Learning About the Brain and Spiritual Experience*

http://www.barbarabradleyhagerty.com/contact: Sign up to receive news about book readings, Facebook posts, and additions to Hagerty's blog. "I am quite attentive to friends and correspondents," she says. "If you write me, I will try to respond within a couple of days."

Elaine Zablocki has been a freelance health-care journalist for more than 20 years. She was the editor of *Alternative Medicine Business News* and *CHRF News Files*. She writes regularly for many health-care publications.

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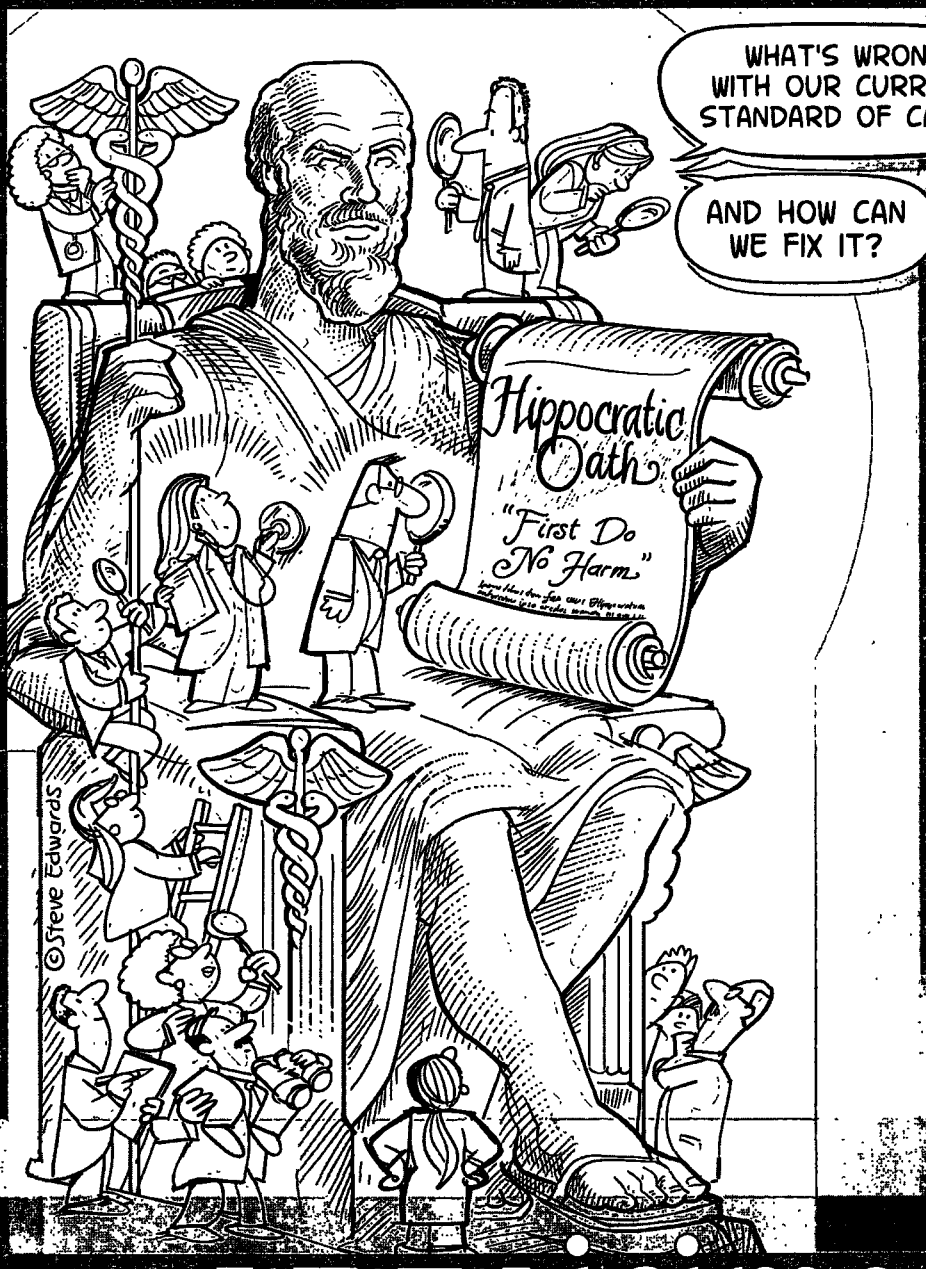

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Shorts

briefed by Jule Klotter
jule@townsendletter.com

A1 Beta-Casein, Inflammation, and Type 1 Diabetes

A1 beta-casein, a protein found in milk from European cows, produces inflammation and symptoms of milk intolerance. Unlike A2 beta-casein, found in the milk of genetically pure Asian and African cattle, A1 beta-casein releases the bioactive opioid peptide BCM-7 during digestion. BCM-7 activates μ-opioid receptors in the digestive tract, slowing GI transit time, stimulating inflammatory responses, and increasing mucin production, according to a 2015 review by Sebely Pal and colleagues. Excessive mucus can disrupt GI function and hamper the activities of commensal gut bacteria. Because BCM-7 has several documented negative GI effects, Pal et al. and other research teams hypothesize that A1 beta-casein, not lactose, is the primary cause of milk intolerance.

A1 beta-casein's effect on people with self-reported lactose intolerance was tested in a 2016 double-blind, placebo-controlled, randomized crossover study led by Sun Jianqin. The researchers enrolled 45 Han Chinese subjects, a population with a high incidence of self-reported lactose intolerance. About half of the volunteers tested positive for lactose intolerance with urinary galactose testing. After a 14-day dairy-free washout period (baseline), each subject drank 250 ml (8 oz.) of milk after two meals per day of A2 beta-casein or normal commercial milk (a mix of A1 and A2 beta-casein) for 14 days. After a second 14-day washout period, the subject drank the opposite milk for 14 days. The researchers assessed gastrointestinal function using serum and fecal tests, patient symptom reports, and a smart pill (OMOM Capsule, Chongqing, China) to measure GI transit time and inflammation. They also assessed patients' cognitive processing with the Subtle Cognitive Impairment Test (SCIT).

Reports of delayed GI transit time and milk intolerance symptoms (bloating, abdominal pain, flatulence, heavy stomach, stomach rumbling) were significantly higher when participants consumed the A1 milk compared with baseline. The changes were more pronounced in those who tested lactose intolerant even though both types of milk contained the same percentage of lactose. Drinking A2 milk did not worsen symptoms in either the lactose tolerant or intolerant participants compared with baseline measures. In addition to GI symptoms, cognitive processing speed and accuracy were slower when subjects consumed A1-containing milk. μ-opioid receptors are also present in the neurological system.

The researchers observed increased small bowel inflammation using the smart pill as well as corresponding changes in inflammation-related biomarkers when some participants drank A1-containing milk ($p = 0.042$). "It is possible that the intervention period was too short to elicit inflammation in many subjects. Therefore, these findings warrant further examination in a larger cohort or with a longer intervention time," the authors state.

This study focused on GI effects, but it important to remember that the opioid peptide BCM-7 activates receptors in other systems and tissues as well. Although A2 cow's milk is sold in New Zealand, the most available A2 source in the US is milk from goats.

Jianqin S, Leiming X, Lu X, Yelland GW, Ni J, Clarke AJ Effects of milk containing only A2 beta casein versus milk containing both A1 and A2 beta casein proteins on gastrointestinal physiology, symptoms of discomfort, and cognitive behavior of people with self-reported intolerance to traditional cows' milk. *Nutr J.* 2 April 2016; 15:35.

Pal S, Woodford K, Kukuljan S, Ho S. Milk Intolerance, Beta-casein and lactose. *Nutrients.* 2015;7(9):7285–7297.

Berberine and Diabetes

Over the past decade, berberine has emerged as an effective, plant-based treatment for controlling blood sugar and lipids. The compound is found in the roots and stem of *Coptis chinensis* (coptis or goldthread), *Hydrastis canadensis* (goldenseal), *Berberis aquifolium* (Oregon grape), and *Berberis vulgaris* (barberry). Plants containing berberine have been used in Ayurvedic and Chinese medicine to treat bacterial, viral, and protozoal infections for over 3000 years. Pharmacological research shows that berberine also has antioxidant, immunomodulation, neurotransmitter, and enzyme modulation effects, according to a 2015 review by Anil Kumar and colleagues.

Bing Pang and Chinese colleagues performed a 2015 literature review of English and Chinese studies on the use of berberine in the treatment of type 2 diabetes. Most of the research consists of laboratory studies that identify berberine's

positive effects on insulin resistance, insulin secretion, lipid metabolism regulation, and the gut microbiota. Animal research has shown that berberine significantly reduced the number of Firmicutes, which is associated with low-grade inflammation and obesity, and increased the number of Bacteroidetes and other bacteria that produce short-chain fatty acids (SCFAs). SCFAs improve gut barrier function and reduce inflammation, "which may also help to improve obesity and insulin resistance-related metabolic abnormalities," write Pang et al.

The Chinese reviewers also found a number of small, placebo-controlled studies that lasted between 2 and 6 months. These studies indicate that berberine is as effective as conventional hypoglycemic drugs such as metformin. Unlike metformin, berberine has the additional benefit of reducing triglycerides and cholesterol. Berberine has also been safely used in combination with metformin and/or glipizide. The combination was more effective in controlling blood glucose than the drugs alone in these studies. In addition to its positive effect on glucose metabolism, berberine's antioxidant and anti-inflammatory properties have made it useful in the treatment of diabetic nephropathy, diabetic neuropathy, and diabetic cardiomyopathy. Pang et al. say that larger, multicenter, long-term, controlled studies are needed to confirm berberine's therapeutic use in treating diabetes.

In addition to clinical studies, empirical evidence from a respected source is also available. In February 2013, Jonathan V. Wright, MD, reported that berberine "has lived up to its research reputation in clinical observations at Tahoma Clinic, In fact, it turns out that in most of the cases where type-2 diabetes *didn't* respond to berberine the patients were misdiagnosed before they came to us ... they were actually type-1 diabetics."

Berberine is nontoxic; it does not produce death when given orally (no LD50). Mild gastrointestinal effects are the primary adverse response. Kumar and colleagues caution against its use in pregnant women because berberine has uterine-stimulatory effects. In addition, two berberine-containing herbs have been withdrawn in Singapore because of the possibility that berberine might worsen jaundice and kernicterus in newborns with glucose-6-phosphate dehydrogenase deficiency.

Practitioners and patients also need to be aware that berberine interacts with several pharmaceuticals, including L-DOPA, cisplatin, fluconazole, warfarin, and cyclosporin A – a list that will probably continue to grow as more information arises. Kumar et al. state, "More studies with a clinical background need to be initiated to evaluate and detect the rare adverse effects of berberine. This is essential to draw a complete safety profile of berberine and to strengthen its applicability."

Kumar A, Ekavali, Chopra K, Mukherjee, M, Pattabathini R, Dhull DK. Current knowledge and pharmacological profile of berberine: an update. *Eur J Pharmacol.* 16 June 2015;761.288–297.

Pang B, Zhao L-H, Zhou Q, et al. Application of berberine on treating type 2 diabetes mellitus. *Int J Endocrinol* 2015.

Wright JV. Superstar botanical could be your drug-free solution to tackling health complaints from type-2 diabetes to cancer prevention. *Nutr Healing.* February 2013:19(11)

Shorts

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Bone Broth and Arthritis

"Conventional medical opinion holds that joint problems are inevitable with aging and that damage is irreparable and irreversible. But it appears the human body can revert to the "young" type of cartilage and regenerate young healthy cartilage if provided with the right tools," write Sally Fallon Morell and Kaayla T. Daniel, PhD, CCN, in *Nourishing Broth* (New York: Grand Central Life & Style; 2014). "And it's undoubtedly even easier to prevent the damage to begin with. That means providing the right constituents of cartilage—glycine, proline, glutamine, proteoglycans, and other nutrients found in cartilage-rich bone broth." Simmering bone, cartilage, and skin from chicken, beef, fish, and other animals in water breaks down collagenous protein into amino-acid-rich gelatin and provides minerals and other nutrients vital for healthy connective tissue.

Although bone broth's benefits have not been tested in scientific studies, its use in traditional medicine has a long history. Back in the 12th century, Abbess Hildegard von Bingen recommended frequent consumption of broth made from collagen-rich ox feet to prevent and cure joint pain. When Weston A. Price, DDS, visited isolated villages of people who adhered to their traditional whole-food diets instead of processed Western foods in the 1930s, he was astonished at the lack of dental cavities, osteoarthritis, and other degenerative diseases in people of all ages. These people ate "nose to tail," finding ways to ingest all parts of the animal, including connective tissue.

While bone broth has not been studied, therapeutic use of cartilage and its components has. *Nourishing Broth* provides information on the formation of cartilage, collagen, and bone and on the extensive research by John F. Prudden, MD, Dsci, and others who investigated cartilage's anti-inflammatory, immune-enhancing, and wound-healing effects. Cartilage supplementation activates macrophages, killer T-cells, and other parts of the immune system, making it useful for diverse conditions. Researchers have reported that cartilage injections and oral supplements benefit people with osteoarthritis, rheumatoid arthritis, scleroderma, psoriasis, wound healing, infectious disease, digestive disorders, cancer, and mental health issues. Anecdotal reports that Morell and Daniel include throughout the book indicate that bone broth has healing power as well.

Nourishing Broth offers practical tips for making bone broth and recipes for broth-rich soups, stews, aspics, and sauces. Although bone broth is not a complete protein, it is a "protein sparer," increasing the body's ability to digest the protein in wheat, oats, and barley. It also improves the digestibility of beans and meat protein, providing a proline- and glycine-rich balance to the methionine in meat. Morell and Daniel recommend a daily cup of bone broth from pastured chickens and/or cows for health maintenance and 3 cups per day when dealing with a health challenge. Their web site www.nourishingbroth.com provides sources for collagen-rich bone broth for those who cannot make their own.

Nourishing Broth attests to the adage "Let food be your medicine."

The Need for Supplements

Many commonly used prescription and over-the-counter drugs deplete vital nutrients. Tieraona Low Dog, MD, explains how the resulting deficiencies seriously compromise health in her book *Fortify Your Life* (Washington, DC: National Geographic Society; 2016). Low Dog, fellowship director for the Academy of Integrative Health and Medicine (www.aihm.org), is an internationally recognized expert on dietary supplements, herbal medicine, women's health, and integrative medicine. She wrote the book after her father, who had taken a proton pump inhibitor (PPI) for several years on his oncologist's advice, was hospitalized twice with dangerously low magnesium and potassium levels. PPIs are known to produce deficient levels of several nutrients including magnesium, calcium, B12, and vitamin D. Prior to hospitalization, her father's doctors had not tested his red blood cell magnesium level. Rather, they assured him that all was well as long as he ate a good diet.

PPIs are not the only nutrient robbers. Insulin, for example, increases urinary excretion of magnesium. Magnesium is needed for carbohydrate and fat metabolism, cell signaling, nerve impulses, muscle contractions, normal heart rhythm, cardiovascular health, bone health, and more. Yet, how many people with insulin-dependent diabetes get tested for magnesium deficiency or take magnesium supplements? The diabetes drug metformin depletes thiamine, a vitamin that inhibits the development of diabetes-related cardiovascular, kidney, and eye diseases. Metformin also depletes folate, vitamin B12, and possibly CoQ10. People with arthritis often turn to regular use of nonsteroidal anti-inflammatory drugs (NSAIDs) to relieve pain. NSAIDs deplete vitamins B9 (folate) and C, iron, zinc, and melatonin.

Drugs are not the only threats to nutrient deficiency. Years ago, the US government mandated that bread be fortified with B1, B2, B3, B9, and iron to prevent deficiency illnesses such as beriberi and pellagra. Avoidance of breads and cereals because of gluten or GMO/pesticide concerns puts people at risk for B vitamin deficiency. Consumption of iodized salt, the primary source of iodine to prevent goiter, has also declined. Nowadays, people follow recommendations to reduce their salt intake, eat fast food and processed food that does not contain iodized salt, and use noniodized specialty salts. "It's almost impossible for you to become depleted in one nutrient," writes Low Dog, "without that deficiency affecting other nutrients and bodily processes." Consequently, she urges readers to identify their risks for nutrient deficiency and to supplement a nutritious whole food diet with well-chosen dietary supplements.

Fortify Your Life is a wonderful reference about foundational nutrients (vitamins, minerals, and some important nutraceuticals such as CoQ10, probiotics, and omega-3s), their food sources, and the signs and risk factors of their deficiency. Low Dog also gives readers information about evaluating supplements, the use of lab tests to check for deficiencies,

helpful nutrients for common ailments, and information about drug–nutrient interactions and depletions. *Fortify Your Life* is a practical and very helpful book that explains why supplements are absolutely necessary in Western life.

Electromagnetic Hypersensitivity Metabolic/Genetic Markers

In 2014, an international group of researchers identified metabolic and genetic biomarkers specific to people with electromagnetic hypersensitivity (EHS). Although EHS has received little recognition in the US, an increasing number of people, especially in Europe, report negative – at times disabling – effects due to electromagnetic pollution. Any type of exposure can trigger symptoms in a sensitive person, but video display units, radio, television, and electrical installations are the most commonly blamed sources, according to Chiara De Luca and colleagues. EHS has clinical similarities with other puzzling, multisystem conditions such as multiple chemical sensitivity (MCS), fibromyalgia (FM), chronic fatigue syndrome (CFS), sick building syndrome, and Gulf War syndrome. De Luca et al., like other researchers, have hypothesized that people with these hypersensitive conditions "may share common genetic and/or metabolic molecular determinants connected with an impaired capability to detoxify xenobiotics."

Their 2014 study involved 153 Italians who self-reported having EHS, 147 Italians diagnosed with MCS using Cullen's criteria and QEESI (Quick Environmental Exposure and Sensitivity Inventory), and 132 healthy age- and sex-matched volunteers who served as the control. The researchers measured 12 metabolic enzymatic (i.e., CuZn superoxide dismutase, catalase, glutathione S-transferase, and glutathione peroxidase) and nonenzymatic redox (e.g., reduced and oxidized CoQ10, plasmatic total antioxidant capacity, and plasma alpha-tocopherol levels) parameters in blood samples taken from all participants. The researchers found that metabolic profiles in EHS participants were comparable to the MCS group, "though generally less pronounced."

Three factors, however, differentiated EHS sufferers from those with MCS. The authors found elevated oxidation of plasma CoQ10 in the EHS group; "only in electrosensitive subjects, the oxidized/total CoQ10 ratio reached statistical significance versus normal values." The authors linked this finding to lipophilic antioxidant depletion, which might account for the higher incidence of acute or chronic inflammatory skin conditions among people with EHS. Secondly, the researchers found a significant difference in the omega-6/omega-3 ratio in erythrocyte membranes of EHS and MCS subjects: "The ratio showed a remarkable elevation versus [control] in favor of the more proinflammatory omega-6 PUFA in the MCS group, while EHS values were instead nearly overlapping [control] values. ..." Thirdly, the researchers found a genetic difference between people in the EHS and MCS groups. The EHS group showed a significantly higher frequency of the CYP2C19 homozygous mutated *1 allele. The researchers also found "a mutated (null) allele combination of GSTT1 and SGTM1 variants able to predict risk of developing EHS by a 9.7 fold versus [control]." The authors state that their research is by no means conclusive; it is just a beginning in their search for a way to clinically identify electromagnetic sensitivity.

De Luca C, Thai JCS, Raskovic D, et al. Metabolic and genetic screening of electromagnetic hypersensitive subjects as a feasible tool for diagnostics and intervention. *Mediat Inflamm.* 9 April 2014.

Undenatured Type II Collagen and Osteoarthritis

An undenatured type II collagen (UC-II) supplement, made from chicken sternum cartilage, reduced pain and stiffness in people with knee osteoarthritis more effectively than placebo or glucosamine hydrochloride-chondroitin sulfate supplementation in a 2016 study. The research, led by James P. Lugo of InterHealth Nutraceuticals (Benicia, CA), took place at 13 clinical centers in southern India. An independent statistician performed the data analyses.

The study involved 191 volunteers, aged 40 to 75 years, with moderate-to-severe osteoarthritis (OA) in one or both knees. The volunteers were randomized into three groups. Group 1 received a daily dose of UC-II (40 mg) for 180 days. Group 2 received glucosamine hydrochloride (1500 mg) and chondroitin sulfate (1200 mg), and the third group received a placebo. Every 30 days, clinic staff assessed the volunteers' pain, stiffness, and physical function of the more compromised knee using the Western Ontario McMaster University Osteoarthritis Index (WOMAC) as well as the Visual Analog Scale (pain) and Lequesne Functional Index. Participants were also asked to record their use of the study product and other medications. Blood and urine samples were taken at the initial screening and on day 180.

After 6 months of treatment, WOMAC scores showed significant reductions in pain and stiffness and improved physical function in the UC-II group compared with the placebo group: pain (24.0 [UC-II] vs. 17.0 [placebo]); 95% CI −11.1 to −2:8; p = 0.0003, stiffness (23.8 vs. 17.8; 95% CI −10.4 to −1.6; p = 0.004), and physical function (22.5 vs. 17.3; 95% CI −9.3 to −1.3; p = 0.007). WOMAC pain and stiffness scores were also significantly improved in the UC-II group compared with the glucosamine-chondroitin group at day 180. Although the glucosamine-chondroitin group showed improved WOMAC scores compared with the placebo group, the improvement was not statistically significant. The researchers found no changes in range of motion or distance walked in any group.

"The etiology behind UC-II's impact on OA symptoms is not known," the authors write. "However, undenatured type II collagen has been shown to protect animals against the onset of joint damage in both OA and [rheumatoid arthritis] experimentally induced arthritis models." Denatured (e.g., hydrolyzed) collagen is not protective against arthritis, according to animal studies. Although UC-II supplementation reduced arthritic pain in this 6-month trial, the researchers say that longer studies are needed to see whether UC-II can actually reverse knee damage and improve range of motion.

Lugo JP, Saiyed ZM, Lane NE. Efficacy and tolerability of an undenatured type II collagen supplement in modulating knee osteoarthritis symptoms: a multicenter randomized, double-blind, placebo-controlled study. *Nutr J.* 2016;15:14.

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Literature Review & Commentary

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

Vitamin D for Juvenile Onset Systemic Lupus Erythematosus

Forty-five patients (mean age, 19 years) with juvenile-onset systemic lupus erythematosus (SLE) were randomly assigned to receive, in double-blind fashion, 50,000 IU of vitamin D3 or placebo once a week for 24 weeks. Medications remained stable throughout the study. At the end of the treatment period, compared with placebo, vitamin D significantly decreased disease activity, as determined by the SLE Disease Activity Index ($p = 0.01$) and by the European Consensus Lupus Activity Measurement ($p = 0.006$).

Comment: Serum concentrations of 25-hydroxyvitamin D (25[OH]D) have been found to be low in a high proportion of SLE patients. However, 25(OH)D levels decline in response to inflammation, and low 25(OH)D levels in patients with inflammatory diseases such as SLE may not necessarily indicate vitamin D deficiency. Nevertheless, the results of this study suggest that vitamin D supplementation is beneficial. In another double-blind trial, the proportion of SLE patients who had a disease flare was significantly lower among those who received 2000 IU per day of vitamin D for 12 months than among those who received placebo (10% vs. 24%; $p < 0.005$). Vitamin D also significantly decreased the mean erythrocyte sedimentation rate compared with placebo. In that study, 2% of the patients receiving vitamin D developed hypercalcemia and 2% developed hypercalciuria; these side effects were not seen in the placebo group (Abou-Raya A et al. The effect of vitamin D supplementation on inflammatory and hemostatic markers and disease activity in patients with systemic lupus erythematosus: a randomized placebo-controlled trial. *J Rheumatol.* 2013;40:265–272.) Therefore, it would be prudent to monitor serum and urinary calcium levels periodically in SLE patients who are being treated with 2000 IU per day or more of vitamin D.

Lima GL et al. A randomized double-blind placebo-controlled trial of vitamin D supplementation in adolescents and young adults with juvenile-onset SLE: improvement in disease activity and fatigue scores. *Arthritis Care Res.* 2016;68:91–98

Magnesium for Insomnia

Forty-six individuals (mean age, 65 years) with moderate or severe insomnia and a mean dietary magnesium intake of 194 mg per day were randomly assigned to receive, in double-blind fashion, 250 mg of magnesium (as magnesium oxide) twice a day or placebo for 8 weeks. Compared with placebo, magnesium significantly increased mean sleep time ($p = 0.002$) and sleep efficiency ($p = 0.03$) and significantly improved the mean score on the Insomnia Severity Index ($p = 0.006$). Compared with baseline, magnesium supplementation improved the mean Insomnia Severity Index by 14.4% ($p < 0.001$).

Comment: Insomnia is one of the symptoms of magnesium deficiency. Dietary intake of magnesium is frequently less than the Recommended Dietary Allowance of 420 mg per day for men and 320 mg per day for women. For many people, dietary magnesium intake is less than the mean amount consumed in this study. Dietary magnesium tends to be particularly low in African Americans and young women. I have seen many patients with nonspecific symptoms such as fatigue, anxiety, and insomnia who experienced marked improvement simply by taking a magnesium supplement (usually 400 mg per day). Good food sources of magnesium include nuts, whole grains, legumes, leafy green vegetables, fish, meat, and dairy products. More than 80% of the magnesium is lost in the refining of whole wheat flour to white flour and brown rice to white rice. Some 50% to 75% of the magnesium is lost in the water when vegetables are boiled.

Abbasi B et al. The effect of magnesium supplementation on primary insomnia in elderly: a double-blind placebo-controlled clinical trial. *J Res Med Sci.* 2012;17:1161–1169.

Topical Vitamin B12 for Aphthous Ulcers

Forty-two patients with aphthous ulcers were randomly assigned to receive, in double-blind fashion, a topical ointment containing a glucocorticoid and vitamin B12 (250 µg/g according to a personal communication from the author) or placebo (topical glucocorticoid alone) 4 times per day for 2 days. After 2

continued on page 38 ➤

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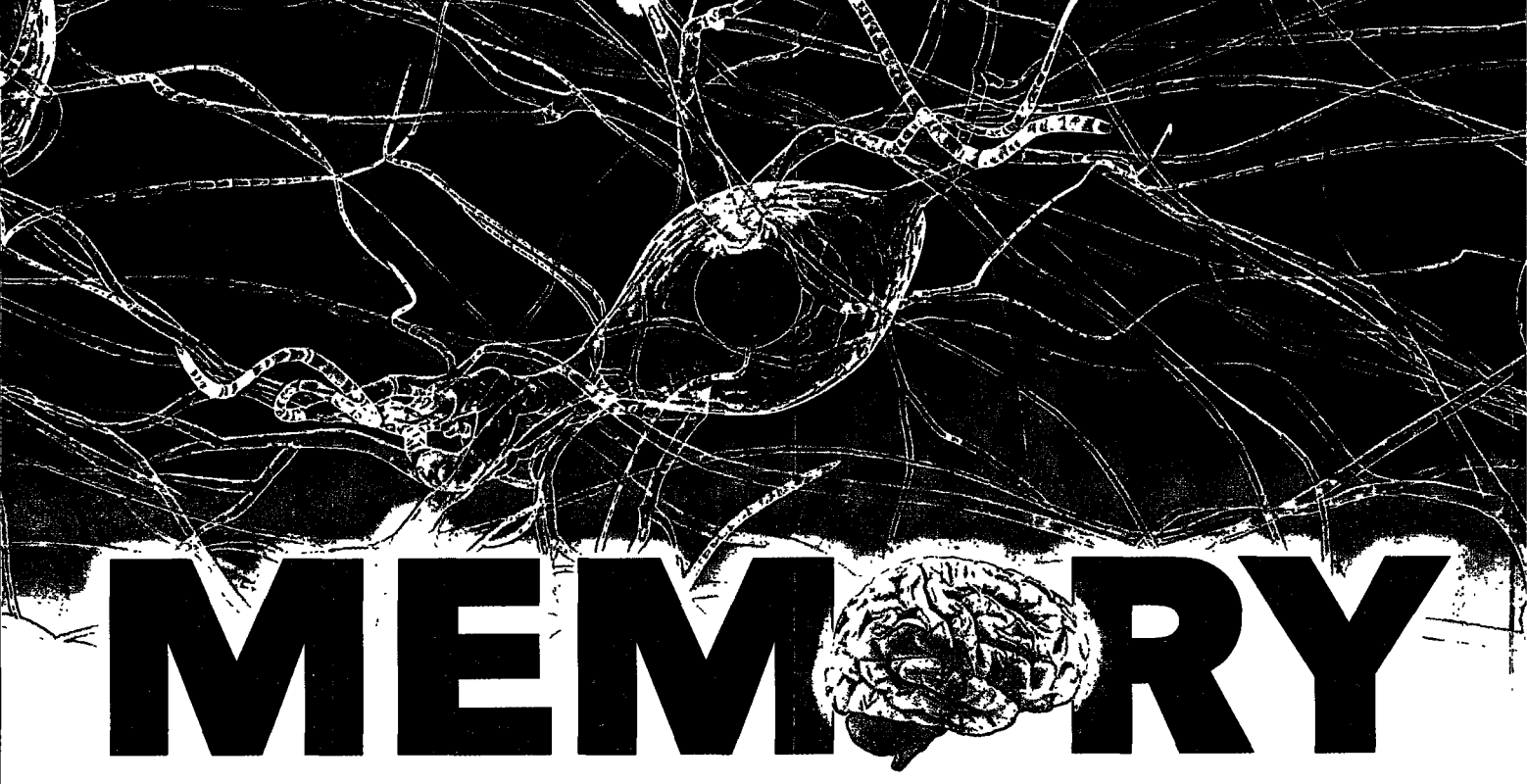

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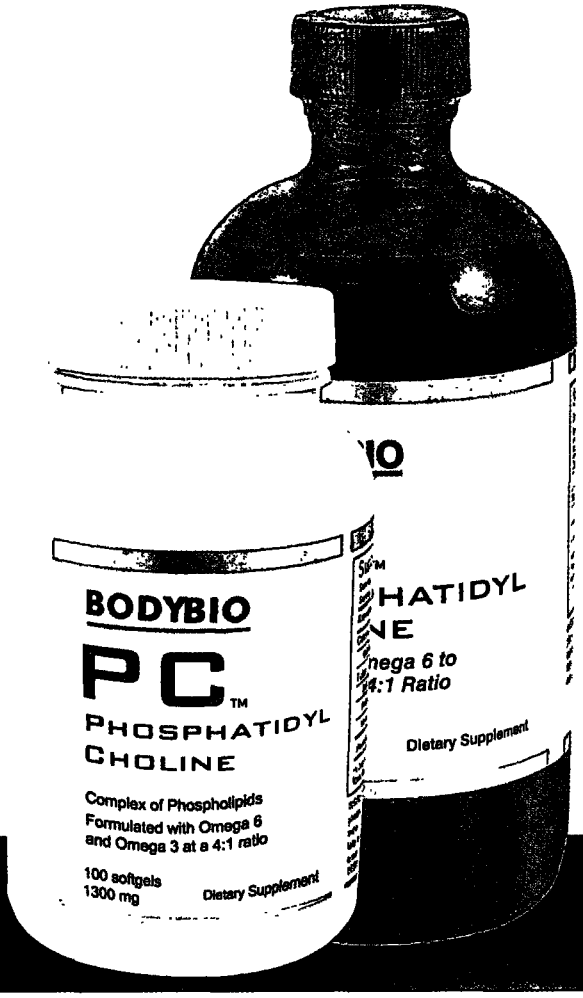

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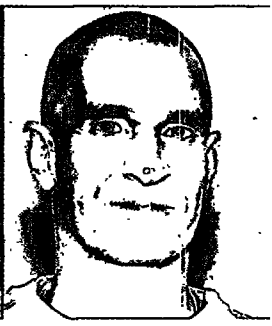

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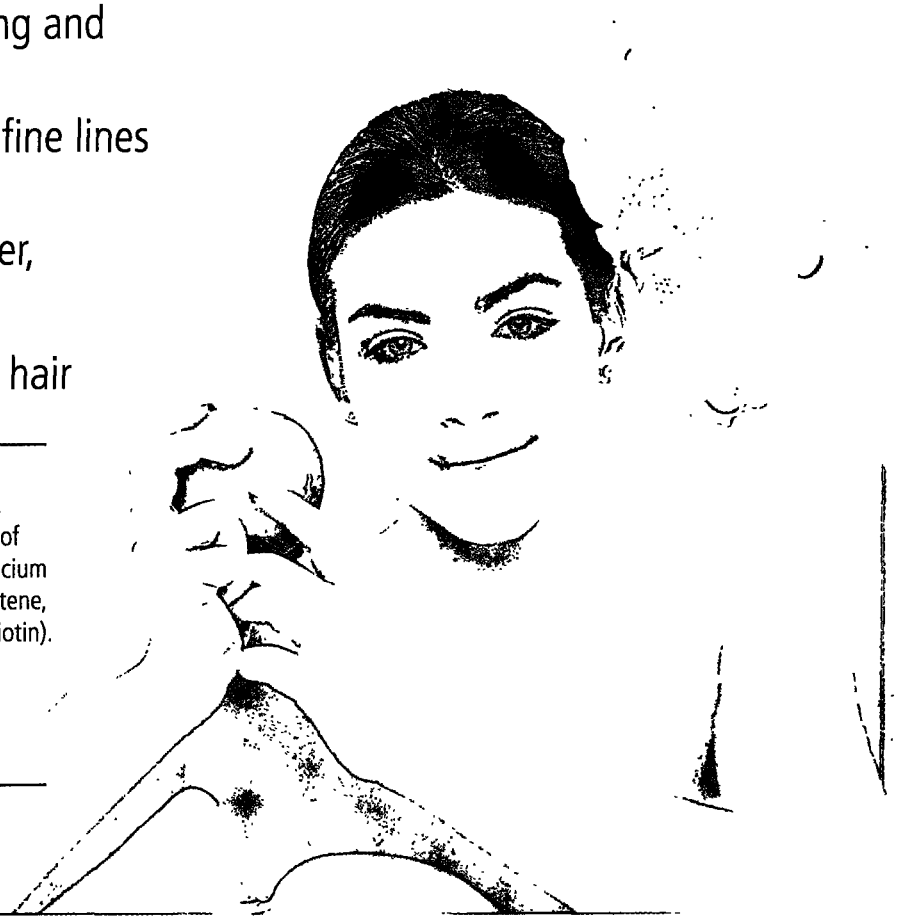

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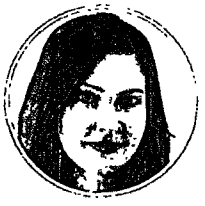

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Gaby's Literature Review

➤ *continued from page 32*

days, compared with baseline, mean pain severity had improved by 94% in the vitamin B12 group and by 65% in the placebo group. At that time, mean pain severity was significantly lower in the vitamin B12 group than in the placebo group ($p < 0.001$).

Comment: The results of this study suggest that topical application of vitamin B12, as an adjunct to a topical glucocorticoid, decreased pain in patients with aphthous ulcers. The mechanism of action is not known. Further research is needed to determine whether vitamin B12 alone (without a glucocorticoid) would be beneficial.

Liu HL, Chiu SC The effectiveness of vitamin B12 for relieving pain in aphthous ulcers: a randomized, double-blind, placebo-controlled trial *Pain Manag Nurs*. 2015;16:182–187.

N-Acetylcysteine for Tobacco Addiction

Thirty-four patients (mean age, 51 years) with therapy-resistant tobacco use disorder were randomly assigned to receive, in double-blind fashion, 1500 mg of N-acetylcysteine (NAC) twice a day (morning and evening) or placebo for 12 weeks. All patients received smoking-focused group behavioral therapy. The proportion of patients who quit smoking (defined as exhaled carbon monoxide concentration of less than 6 parts per million) was significantly higher in the NAC group than in the placebo group (47.1% vs. 21.4%; $p < 0.01$). In addition, compared with placebo, NAC significantly decreased the mean score on the Hamilton Depression Rating Scale.

Comment: There is evidence that a subnormal concentration of glutamate in the nucleus accumbens region of the brain increases compulsive or addictive behaviors. Administration of NAC has been shown to increase glutamate concentrations in the nucleus accumbens. NAC has been used with some success in the treatment of cannabis addiction and gambling addiction. The results of the present study suggest that NAC, as an adjunct to behavioral therapy, may also help some individuals to quit smoking.

Prado E et al N-acetylcysteine for therapy-resistant tobacco use disorder: a pilot study. *Redox Rep*. 2015;20.215–222.

Thiamine for Parkinson's Disease

Fifty patients (mean age, 70.4 years) with Parkinson's disease (mean disease duration, 7.3 years) received 100 mg of thiamine intramuscularly twice a week for 3 months to 2.3 years. Significant improvement was seen in both motor and non-motor symptoms. The mean score on the Unified Parkinson's Disease Rating Scale (parts I-IV) improved significantly by 53% within 3 months and remained stable thereafter. The mean motor score (Unified Parkinson's Disease Rating Scale part III) improved significantly by 55%. Some patients with milder disease had complete clinical recovery. The mean Fatigue Severity Scale score in 6 patients who had fatigue at baseline improved significantly by 55%. The authors hypothesized that a dysfunction of thiamine-dependent metabolic processes could cause selective neural damage in the centers typically affected by Parkinson's disease, and might be a fundamental molecular event provoking neurodegeneration. They also suggested that thiamine might have both restorative and neuroprotective action in Parkinson's disease.

Comment: It is certainly encouraging when a safe and inexpensive treatment is reported to produce substantial benefit in patients with a difficult-to-treat condition such as Parkinson's disease. However, the results should be viewed with caution, since the study did not include a control group. Thiamine has been available for many decades, and it has been used in large doses (both orally and parenterally) to treat a wide range of conditions, including some neurological disorders. If thiamine is indeed an effective treatment for Parkinson's disease, it would be surprising that no one has previously observed this effect. Although placebo-controlled trials are needed to confirm the present report, a therapeutic trial of thiamine would be reasonable for patients with Parkinson's disease. Clinicians who try this treatment are encouraged to report their findings in the *Townsend Letter* or elsewhere.

Costantini A et al. Long-term treatment with high-dose thiamine in Parkinson disease: an open-label pilot study. *J Altern Complement Med*. 2015;21:740–747.

Vitamin C and Athletic Performance

Plasma vitamin C levels were measured in 100 healthy males (mean age, 22 years). Compared with the 10 subjects with the highest levels (Group B), the 10 subjects with the lowest levels (Group A) had a significantly lower mean VO2 max value during the performance of aerobic exercise to exhaustion. All subjects were then were randomly assigned to receive, in double-blind fashion, 1000 mg per day of vitamin C or placebo for 30 days. After a 60-day washout period, each person received the alternate treatment for an additional 30 days. At baseline, mean daily vitamin C intake was 33 mg in Group A and 166 mg in Group B. Compared with placebo, vitamin C supplementation increased VO2 max ($p < 0.08$) in Group A, whereas this value decreased nonsignificantly in Group B, such that the difference in VO2 max between groups was no longer significant.

Comment: In this study, a substantial minority of healthy young males consumed less than the Recommended Dietary Allowance (RDA) for vitamin C of 90 mg per day. Low vitamin C intake was associated with worse aerobic capacity, and this reduced aerobic capacity was corrected by vitamin C supplementation. Thus, adequate vitamin C intake is essential for optimal athletic performance. It is not clear whether vitamin C supplementation would improve athletic performance in people whose diet meets the RDA for vitamin C.

Paschalis V et al. Low vitamin C values are linked with decreased physical performance and increased oxidative stress: reversal by vitamin C supplementation *Eur J Nutr*. 2016;55:45–53.

Magnesium for Chronic Postherpetic Neuralgia

Thirty patients with severe, intractable postherpetic neuralgia were randomly assigned to receive intravenous magnesium sulfate (30 mg per kg of body weight) or ketamine (1 mg per kg of body weight) every other day for a total of 3 treatments. The patients were given the infusions over a period of 1 hour, after being sedated with midazolam. Two weeks after the last infusion, the mean decrease in pain (as determined by a visual analogue scale) was 40% with magnesium and 51% with ketamine ($p = 0.4$ for the difference in the change between groups). Seven of the 15 patients in the magnesium group and 10 of the 15 patients in the ketamine group had at least a 50% reduction in pain 2 weeks after the end of the treatment.

Comment: Chronic postherpetic neuralgia is frequently refractory to treatment. The results of the present study suggest that intravenous magnesium can relieve pain in some patients with this condition. The beneficial effect persisted for at least

2 weeks after the treatment was discontinued. Ketamine is a drug used to start and maintain anesthesia and is also used in some cases to treat chronic pain. Side effects, sometimes severe, are relatively common in patients receiving this drug. While magnesium was somewhat less effective than ketamine, it is much less likely to cause adverse effects. Intravenous magnesium should therefore be considered as a treatment option for patients with chronic postherpetic neuralgia.

Kim YH et al. Is magnesium sulfate effective for pain in chronic postherpetic neuralgia patients comparing with ketamine infusion therapy? *J Clin Anesth.* 2015,27:296–300.

Adverse Effect of Intravenous Iron

Four patients developed severe and symptomatic hypophosphatemia after receiving intravenous iron (ferric carboxymaltose) for iron-deficiency anemia due to heavy menstrual bleeding. Three of the 4 patients had secondary hyperparathyroidism (due to vitamin D deficiency) or tertiary hyperparathyroidism (parathyroid hormone promotes urinary phosphorus excretion), but the other patient had no risk factors for abnormal phosphate homeostasis. Serum phosphate levels prior to intravenous iron administration were normal or near-normal in all cases. The nadir of serum phosphate typically occurs around 2 weeks after the start of intravenous iron administration, but the time course can be prolonged. In 1 of the 4 cases, hypophosphatemia persisted for up to 3 months.

Comment: Intravenous administration of iron is becoming increasingly popular, because it is more effective and causes fewer gastrointestinal side effects than oral iron. In previous studies, intravenous administration of ferric carboxymaltose induced hypophosphatemia (generally asymptomatic and transient) in 70% of women with iron-deficiency anemia due to gynecological conditions and in 3.8% of patients with non-dialysis-dependent chronic kidney disease. The decrease in serum phosphorus induced by intravenous ferric carboxymaltose appears to be mediated by an increase in serum levels of fibroblast growth factor 23 (FGF23). Since patients with chronic kidney disease have impaired renal excretion of phosphate and upregulated levels of FGF23, a further increase in FGF23 levels would be expected to have only a minimal effect on their renal phosphate excretion. In contrast, individuals with normal renal function are more likely to have a substantial increase in urinary phosphate excretion in response to intravenous iron.

In the treatment of hypophosphatemia, intravenous and oral phosphate should be administered with caution, because they have the potential to cause hypocalcemia, arrhythmias, ectopic calcification, and acute phosphate nephropathy. It is recommended that serum creatinine and serum phosphate be measured prior to treatment with intravenous iron. In patients with good renal function and low or low-normal phosphate levels, the authors of this report recommend measuring serum phosphate again 2 weeks after starting intravenous iron.

Blazevic A et al. Severe hypophosphataemia after intravenous iron administration *Neth J Med.* 2014,72:49–53 ◆

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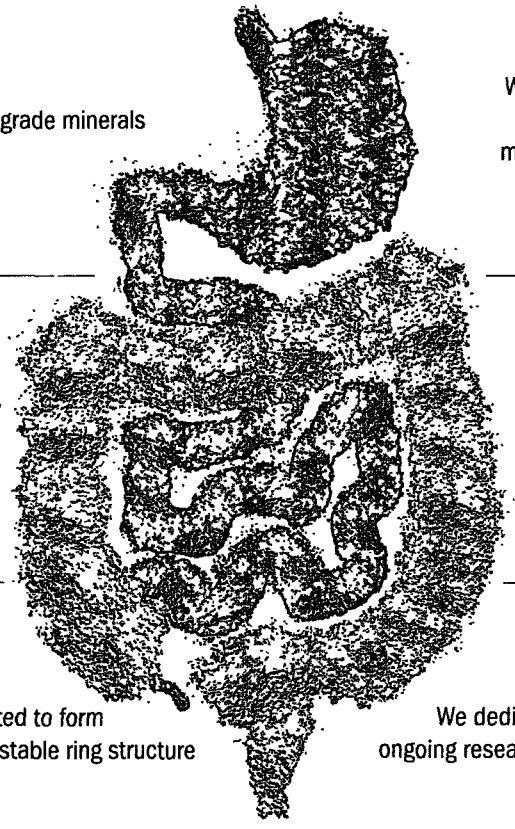

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Integrating Nutrition into Regenerative Orthopedics: An Interview with Kenneth Cintron, MD, MBA

Regenerative orthopedics is an emerging specialty that is changing the practice of orthopedics and sports medicine at a very fast pace. This month's *Townsend Letter* focuses on alternative therapies for inflammation and arthritis. Regenerative therapies such as platelet rich plasma (PRP) and stem cells offer new treatments to patients with arthritis. When introduced early, these treatments can end disability, reduce the need for pain medications, and prevent surgery altogether. How do regenerative therapies work? They tap into the body's innate healing processes, the metabolic pathways well known to *Townsend Letter* readers.

To traverse this exciting bridge from orthopedic surgery to integrative therapies, I spoke with Dr. Kenneth Cintron. Dr. Cintron is a foot and ankle surgeon who now specializes in regenerative therapies for his patients. He observed that the therapies are more successful, requiring fewer treatments and bringing more full recovery, when a patient's metabolism is functioning properly. Dr. Cintron guides patients through the needed metabolic corrections. He's the only doctor I know who is board certified in both orthopedics and integrative medicine.

Here I highlight my discussion with Dr. Cintron.

IK: What sparked your interest in integrative medicine?

KC: My daughter developed type 1 diabetes, and I was looking for the best therapies for her. [Now his daughter is thriving!] I had hypothyroidism which was undertreated and had led to adrenal fatigue. I was too tired to exercise and eat right. But in two months of integrating functional medicine strategies into my care, I was like a new person and I was finally able to do the lifestyle approaches. That's why I decided to train in integrative medicine, and the way it applied to orthopedics was very clear to me.

IK: What conditions do foot and ankle surgeons commonly treat?

KC: Achilles tendon tears, fractures, and sports injuries. Foot and ankle injuries are common among athletes, so common that I was the team physician for Puerto Rico's national sports teams. Bunions are also very common, especially in middle-aged women.

Kenneth Cintron, MD, MBA

IK: Most practitioners of medicine assess the health of their patient's musculo-skeletal system with physical exam and diagnostic testing. During surgery, you visualize the tissues directly. What do you learn from this "insider" view?

KC: Very often we can readily determine if the patient has osteoporosis or even osteopenia. Patients may not have been evaluated for bone loss or they may have had a false negative test. (Bone strength is not the same as bone density.) By placing screws or other hardware in bone, we are making a very direct assessment of bone strength.

Healthy tissue bleeds well. By looking at the tissue, we can determine if the patient has peripheral vascular disease or other reasons for reduced bleeding. The blood vessels to the feet are the longest and thinnest in the body.

Nonunions (fractures that don't heal) may be a clear indication that the patient has metabolic imbalances. [As the interviewer I could think of only one exception to Dr. Cintron's rule, a perfectly healthy patient at South Pole Station, Antarctica.]

IK: Who are the best candidates for regenerative therapies?

KC: As an orthopedist, I can recognize what conditions could work. Most successful are early stages of osteoarthritis,

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Best of Naturopathic Medicine 2017

The *Townsend Letter* is pleased to announce our eighth Best of Naturopathic Medicine competition. Naturopathic students, faculty, researchers, and practitioners are invited to submit research papers, reviews, and articles. Selected papers will be published in our February/March 2017 issue. The author of the winning paper will be awarded $850. Runner-up papers will be published and authors will receive an honorarium.

Papers submitted should be 1500 to 3500 words and referenced. Author guidelines are available at the *Townsend Letter* website: www.townsendletter.com. Papers should be submitted digitally, preferably as a Microsoft Word document. Papers authored by multiple writers are acceptable; the lead author should be an ND graduate or candidate of an accredited four-year naturopathic school. Papers submitted for the competition may not be submitted to other publications or have previously been published. All entries must be submitted by October 31, 2016.

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partial tears of ligaments and tendons, and synovitis. What regenerative therapies can't do is correct mechanical problems. Complete or displaced meniscal tears and complete rotator cuff tears should be treated surgically because of mechanical dysfunction. And once bone is rubbing on bone and osteophytes have developed in the joint, the condition is too advanced for long term relief from regenerative therapy.

Dr. Cintron emphasized inflammation's causal role in arthritis and synovitis. The growth factors in PRP are strongly anti-inflammatory.

There are many factors that influence how effective any single PRP treatment will be. These include the time of day the plasma was drawn, the patient's metabolism as mentioned, and even the brand of centrifuge. Unfortunately these variables are usually omitted from clinical research papers, making it difficult to generalize the findings and advance the science.

IK: What have you learned from your foot and ankle patients that made you interested in regenerative therapies?

KC: My orthopedics patients overall want to be more active. They are in a dilemma. They are limited by joint pain. But they want to avoid surgery. Now I can give them what they want, hopefully at low enough cost to them. From the Centers for Medicare & Medicaid Services perspective, this is value-based medicine. It's great outcome at low cost.

Summary

Optimizing our patients' metabolism can benefit them in yet another way. By improving our patients' metabolism their regenerative therapies are more likely to result in long-term healing. We heard from a foot and ankle surgeon who somewhat literally "got a foot in the door" in this emerging field of regenerative orthopedics.

Ingrid Kohlstadt, MD, MPH, FACPM, FACN
Faculty Associate, Johns Hopkins Bloomberg School of Public Health
Executive Director, NutriBee National Nutrition Competition Inc.
Editor, *Advancing Medicine with Food and Nutrients* (CRC Press; 2013)

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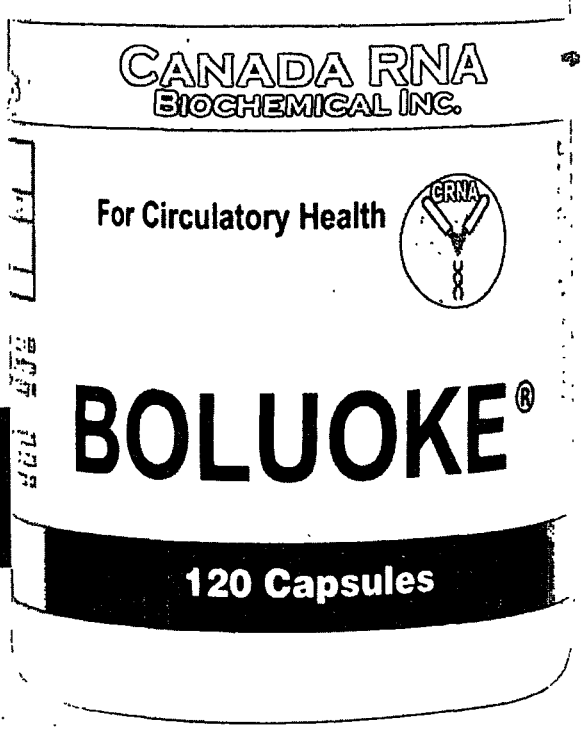
- ✔ Decreases microbial resistance: breaks down biofilm
- ✔ No significant effect on INR or PTT



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A Glimmer of Hope About ALS Causation: An Interview with David Steenblock, DO

by Bob Frost

For more than a century, the medical community has been puzzled by amyotrophic lateral sclerosis (ALS; Lou Gehrig's disease). No cause or cure has come forth, according to most researchers.

David Steenblock, DO, says he knows one of the major causes. He hopes to publish a paper with his theory sometime this year.

ALS afflicts perhaps 20,000 people in the US and several hundred thousand people globally. It involves degeneration and death of motor neurons in the brain and spinal cord. It's invariably fatal, often within a few years.

Steenblock, 73, an osteopathic physician and independent researcher based in San Clemente, California, says that ALS is "the most puzzling and insidious human disease there is." He believes that it's generated by a series of events.

His theory in summary form:

> There is an initial trauma to the neck. Following this trauma, over a period of years, degenerative joint disease develops in the neck. Then another injury to the same area introduces a break, an opening, between the blood and the cerebrospinal fluid. Blood carries toxins to the damaged spinal nerve; from there the toxins enter into the cord and cause injury and death of motor neurons.

Steenblock's forthcoming paper will present evidence based on his study of 54 patients, of whom 52 had these changes as revealed by cervical CT (computerized tomography). He believes he has found the most positive biomarker yet for helping to diagnose ALS – a 97 % correlation between (a) spinal nerve injury and reinjury and (b) occurrence of ALS. If his theory holds up, it will represent a major breakthrough and might contribute, in time, to new treatments.

There are two basic forms of the ALS – spontaneous (affecting 85% to 90 % of patients; this is the focus of Steenblock's work) and familial (the remainder).

ALS killed baseball star Lou Gehrig in 1942 (age 37), actor David Niven in 1983 (73), and historian Tony Judt in 2010 (62). Soccer star Patrick Grange had ALS at the time of his death in 2012 at age 29. Physicist Stephen Hawking has a rare slow-progressing form.

Steenblock was born and raised in Iowa farm country. His family raised corn, oats, and soybeans on 160 acres near the town of Buffalo Center in the northern part of the state. The Steenblocks were poor. By age 7, David was doing a full load of chores, getting up at 5 a.m., running a tractor or working in the barn for a couple of hours, going to school, getting home at 4 p.m., and doing chores until dark. Then homework. "It was a little tough," he recalls, "but I learned to work hard, and I've been working hard ever since."

Graduating from Iowa State University in 1964 with degrees in zoology and chemistry, Steenblock enrolled at the College of College of Osteopathic Medicine and Surgery in Des Moines (now known as Des Moines University) and earned a medical degree and a master's degree in biochemistry. He did a rotating internship at a very large medical center in Seattle, spent a couple of years as sole practitioner in a small town in the Pacific Northwest (with a 32-bed hospital), studied anatomical and clinical pathology for three years at Case Western Reserve University in Cleveland, and did a year of clinical pathology at the University of Oregon in Portland.

In the 1970s, as alternative medicine gained ground in the US, he visited chelation pioneer Garry Gordon MD in Sacramento, California, and came away impressed by the treatment successes. In 1978, in Lake Forest, California, Steenblock opened one of the country's first comprehensive, integrated, holistic medical centers.

Steenblock's current clinic and laboratory in San Clemente covers 14,400 square feet. It holds 60,000-plus medical books, he says, and about 1 million cataloged scientific medical articles. Steenblock spends two or three days a week in the clinic (he and his team treat many other conditions, including multiple sclerosis, stroke, Parkinson's disease, and cerebral palsy) and fills the rest of his working hours with research. He works seven days a week just as he did on the family farm in Iowa.

Steenblock's website is personalized-regenerative-medicine.com. It will include publication details on his ALS paper as soon as they are available. The website for his nonprofit foundation is stemcelltherapies.org.

BF: When did you begin studying ALS, Dr. Steenblock?

DS: In 1977. That's when I had my first case. I developed my theory of primary causation almost immediately, and I've been working ever since to prove it, which I believe I've now done.

BF: No one else has put forth this exact theory?

DS: That's correct.

BF: Let's get to the theory in a moment. First, I want to ask you the burning question that every ALS patient wants answered: What are the chances for a cure in the immediate future, or for really solid treatments that will extend lifespan by many years? I will note here that ALS patients and their families have been disappointed many times over the years by failed approaches to the disease.

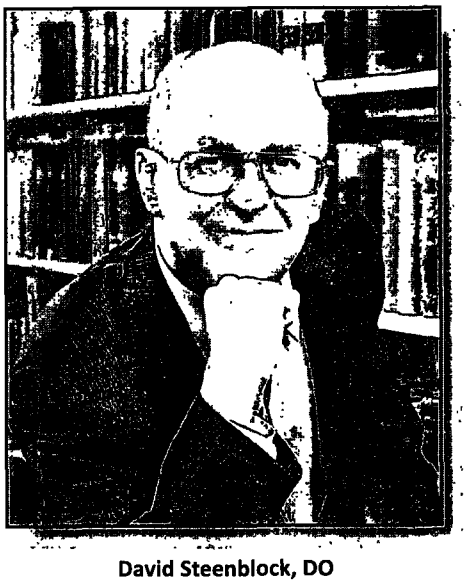
DS: In terms of a cure, I don't know when. But in our clinic we already can slow the disease and oftentimes reverse it. *Reverse* means a regaining of lost functions; this regaining can be long-lived or short-lived depending on how effective we are at ridding the body of all the bad toxins and putting in really good stem cells.

The exciting thing is that we now know that an infection of some type is involved in this disease. In the intestine, this infection usually is a combination of yeast and bacteria which forms a biofilm. There are tests we can use to determine what type of infection, and special assays to better know how to treat them.

In addition to the most common form of infection – yeast and bacteria – various other things may be involved: retroviruses, prions, misfolded proteins, damaged neurofilaments, and other cell-derived aggregates. Dissolving these aggregates as they occur in cerebrospinal fluid is a promising new method of treatment we are working on.

"Cure" means for the disease to go away and never come back. This may be possible, eventually, with the right agents to rid the body of biofilms, heavy metals, retroviruses, prions, amyloid, misfolded proteins, CSF aggregates, hydrocarbons, and other toxins. Identification of each of these toxins, and treating each individual successfully for their specific toxins, and use of stem cells, should give us the cure. As I say, I don't know when this will happen, but I'm optimistic that we have this disease cornered. We just have to beat the bugs before they beat us.

BF: Please elaborate on what, in your opinion, causes this terrible affliction.



David Steenblock, DO

DS: I believe that ALS is a complicated combination of unfortunate circumstances that occur sequentially.

The first occurrence – for most cases – is a neck injury, perhaps caused by a fall, a collision on the sports field, whiplash, some kind of trauma that injures the cervical or neck vertebrae. This injury generally occurs many years before the onset of symptoms – perhaps in high school or shortly thereafter. The injury heals to a certain extent, but it also degenerates from wear and tear, so that, 20 or 30 years later, you see degenerative joint disease such as osteoarthritis, and also something called neuroforaminal stenosis (NFS), a narrowing of the spinal nerve canal, often with calcium deposits around that spinal nerve. It takes many years of chronic irritation for this constriction to occur. So, over time, you're seeing an increase in the amount of extracellular calcium in and around the affected spinal nerve.

There's a reinjury of the same area at some point years later. As a result of this reinjury, a number of toxins are able to penetrate into the spinal cord, including extracellular calcium. Also penetrating are white blood cells – monocytes – which deposit their toxic interior contents in the cord. These toxins lead to the death of motor neuron cells. This is ALS.

There's an almost 100 % correlation between ALS and a breach in the blood/cerebrospinal fluid barrier. Junk from some type of infection in the body is going in and damaging the cord. And that, in a nutshell, is my conclusion about the primary cause of ALS.

There's a lot more to it, of course. ALS is truly a holistic disease, a fact not understood by mainstream researchers.

BF: They overlook the gut?

DS: Yes. In my opinion, the gut is the source for many of the poisons that trigger the ALS disease process. Now, I will note, most patients with ALS do not have diagnosed intestinal problems. Their bowels seem fine in the sense that they don't have pain, diarrhea, or constipation. They really cannot believe, nor do most doctors believe, that the intestinal tract has anything to do with ALS. But it does, in my opinion. When you do lab tests with these patients, you discover they *do* have gut problems. These problems are consistent with chronic inflammatory infections seen in colitis and ileitis.

So their guts have infections, especially in the terminal ileum. Generally speaking, the infection is a biofilm. This consists of yeast and bacteria that have taken up residency in the gut wall and have been there for a long time. They sit there and fester, and fester, and fester. So biofilm is a key part of thinking about this disease. It's a very new idea that biofilms are part of ALS.

BF: I'll insert a bit of background here – microbial biofilm consists of "aggregated microorganisms surrounded by a self-produced matrix adhering to surfaces or located in tissues or secretions." The concept was recognized in the 17th century. Biofilm infections started getting serious attention in the 1970s.

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The term *biofilm* was introduced to medicine in the 1980s. Biofilm has been the subject of intense study in recent years; for example, in 2002, the National Institutes of Health issued a major invitation for grant applications for study of the material.

DS: Biofilm protects the yeast and bacteria that make it up. The protection is kind of like a hard-to-penetrate sheet. This prevents the patient's immune system from attacking biofilm; often the patient cannot mount an attack against these bugs.

Biofilm is extremely complicated stuff. It's tough to get it out of there. It's like barnacles on the bottom of a ship that have been there for years and are cemented on there. You pretty much have to take a hammer and chisel to them. White blood cells – the monocytes – do what they can to fight biofilm. There's not a lot for them to attack.

OK, now I want to tell you about superoxide.

The bacteria and yeast on the inside walls of the intestine produce free radical molecules called superoxide. This stuff is poison. The white blood cells try to deal with it, try to protect the body, by secreting an enzyme known as superoxide dismutase (SOD). This is a much-studied enzyme. It has been found to have many mutations in the familial form of ALS. These mutations cause the SOD to not operate correctly, and to form aggregates that poison the cord in the familial form.

Within the monocyte is the endoplasmic reticulum, which is like a little river flowing to the outside of the cell. On the banks of the river are ribosomes that make SOD. The SOD molecules, when they're released into the endoplasmic reticulum, are not in a completed form. They're in an unfolded form. They need to get folded in order to be effective against superoxide.

They travel along this river, from the inside of the monocyte cell to the outside, and exit. As they travel along the river they're escorted by chaperones, little tugboats. These chaperones get the superoxide dismutase to fold properly, so that by the time the SOD exits the monocyte, it's folded and fully functional.

In ALS, the SOD doesn't get properly folded. The chaperones aren't working, they're rusted out, they're falling apart from the toxins the cells are trying to deal with. So the misfolded SOD is trapped inside the monocyte, it can't get secreted unless it's folded properly. There's a gate at the monocyte's surface that stops it from getting out. The misfolded SOD accumulates in the monocyte's endoplasmic reticulum.

The monocyte is attracted to the reinjured area of spine. It deposits its contents in the constricted damaged spinal nerve. These contents include the misfolded SOD and other toxins. These toxins are joined by the extracellular calcium we discussed previously.

The toxins lead to the formation of aggregates which are engulfed by microglia and astrocytes within the cord. This in turn leads to the production of free radicals and peroxynitrates and so on; and these cause damage to the motor neurons, which is a defining part of the ALS disease process.

Various other materials are also involved in this – endotoxins, serotonin, arginine, tumor necrosis factor, gamma interferon, certain cytokines. And, very importantly, high mobility group box 1, which I think is a key trigger for the disease process, and is a hot topic these days in the study of ALS and all the autoimmune diseases. It's found in the cytoplasm, the nucleus, and so on. It's triggered by inflammation, infection, ischemia, a lot of things.

Heavy metals are a part of this too, especially mercury and lead. In 1968, we saw the first four cases linking lead toxicity to ALS, and since then we have seen a lot more cases, but to this day, the standard conventional doctor doesn't think that heavy metals are a contributing factor. These heavy metals damage cell membranes and allow calcium to enter into the cells; this excess calcium damages and will even kill the cells. Calcium influx is the "final common pathway for cell death." Most alternative doctors – comprehensive, holistic, integrative – understand this concept. They're much better doctors when it comes to handling complicated diseases such as ALS which have holistic or "many systems" origins.

I'll add here that the poisons that cause ALS can come from places other than the gut. Sinus infections can be involved. Also *Helicobacter pylori*, Lyme disease, mouth spirochetes, osteonecrosis of the jaw, dental abscesses. Treatment of these can result in significant improvement. But probably 90% to 95 % of all ALS cases originate in the gut.

BF: What's your treatment protocol for ALS?

DS: We use a variety of agents, especially stem cells, to seal the injured area in the spine where the poisons are entering the cord. We inject stem cells directly into the injured cervical spinal areas to stop the leak and the progression of the disease. Intravenous and intranasal stem cells are helpful in this regard and also for overall treatment.

I do a lot of testing to identify the biofilm bugs and then try to treat them appropriately. The biofilm is usually the number one enemy, and to treat that effectively, one must use a variety of treatments all at the same time. In our clinic we throw everything we can at biofilms including antifungals and antibiotics plus electrical stimulation to open up cell membranes. Ultrasound. Photodynamic therapy, laser therapy, hyperthermia, intravenous vitamins and minerals. Ozone – IV and topical. Autohemotherapy. Oxidizing agents. I have a microbiology laboratory to do some really fancy testing. Our stem cells are from our own laboratory.

We have a few patients in remission. We're the first clinic in the world, as of the autumn of 2015, that can do T cell therapy against ALS. This involves taking blood from someone with ALS and converting their T cells into immunologically stimulating cells that work well against yeasts or whatever infections they have in their system.

We believe that we are on the cusp, here in our clinic, of getting people truly well. Now that we've identified one of the principle causes, it's just a question of identifying the best therapy. I think each patient will be different in terms of the bugs involved. I'm open to

suggestions about therapies, by the way. I solicit ideas.

BF: Could you provide some nutritional advice that might be helpful for an ALS patient?

DS: I recommend a ketogenic diet, which is high fat, adequate protein, and low carb. Stay off all sugars – fruits, fruit juices, candy, cakes, ice cream, alcohol. Avoid acidic foods such as tomato sauce, processed foods, dairy products. Avoid salt. Eat small, frequent, bland meals. Wear a neck collar; avoid injuries to the neck, including twisting. Take as many natural antifungal agents as you can, such as caprylic acid and garlic. Take a level teaspoon of freshly crushed raw garlic 3 times a day. Mix a quarter teaspoon of calcium EDTA, a chelating agent, with this, if you tolerate it. Coconut oil is very good – it's the cheapest and best antiyeast product we have – 4 tablespoons a day is great, up to as much as 8 to 10 tablespoons a day. Scale up slowly. So, definitely, the natural things are good, but as I say, you also need the antifungals and antibiotics, and stool tests and so forth.

Interestingly, arginine, which is found in abundance in nuts and seeds, may well help the immune system fight biofilms. But at the same time, arginine stimulates the growth of yeast, so when arginine is consumed, one needs to treat yeast with antifungals and a no-sugar diet. Nuts and seeds should not be taken intact by ALS patients, since nuts can irritate the gut and worsen the condition. Ground nuts like almond butter or peanut butter should be used instead of whole nuts. Arginine in the form of a supplement is OK if used with antifungals and a no-sugar diet. Arginine alpha-ketoglutarate (AAKG) is especially helpful.

BF: What is your view of mainstream ALS research?

DS: For the most part, ALS researchers are very academically oriented; they're located at big universities and big research centers; they talk about the mutations that cause the familial form of the disease, and how those mutations might help us figure out the spontaneous form, how we can extrapolate from the one to the other. Some lessons from familial can be applied to spontaneous, but really, in terms of the spontaneous, I think I've pretty well pinned it down in terms of primary causation.

BF: Is there anything new in the mainstream that's interesting to you?

DS: There's a new technique called CRISPR whereby it will be possible to cut out bad genes and maybe put good ones in, but this has a ways to go before we can use it to treat the familial form. We're starting to look at it in our clinic.

BF: Some ethical concerns about that, yes?

DS: That's right.

BF: With regard to research priorities – I'm not clear why most research focuses on the familial form of ALS, since it represents just a small fraction of cases.

DS: This focus happens because you can use a mouse model in dealing with the familial. The PhDs doing the research can look at mouse genes and say, "Oh! Here's an interesting gene! You get the misfolded SOD with this!" They've found about 170 different mutations of familial ALS. What does that have to do with spontaneous? Not much.

The researcher can take a mouse or rat and tear it apart and look at every little detail and run it through a lot of high-powered technology, and write papers, and boy, that's great! Writing papers and getting published – then you get more money from the government, and you can keep running on your happy little treadmill. They work 20 years and they say, "We have a lot of really interesting discoveries, but we need at least another 20 years." You say, "What have you come up with that's practical?" They say, "Well, we haven't really come up with much that's practical, but we sure know a lot about the disease now! And one of these days we're going to have the answer! This has a lot of potential!" And nothing ever happens because there's nothing there.

The lack of practical knowledge on the part of the PhDs is a real problem. They don't see patients, generally; they're in laboratories and attending research conferences. They talk about things that are very academic, very complicated, and very detailed, and they need to spend all their time doing that if they're going to get ahead. They study the most minutely detailed material such as genes and proteins, RNA, DNA. Yet they really don't have a clue about the spontaneous form of the disease.

BF: Can you elaborate on how your training in alternative medicine, and decades of experience in the field, helped you arrive at your causation theory?

DS: I would never have solved this if I had not been looking holistically at the microbiome and seeing that yeast infections are a problem; if I had not known about certain metabolites found in the urine; if I had not known about serotonin problems associated with ALS and why they are occurring. And so on. My training and experience in alternative medicine have actually been more important to me than anything else for understanding and better defining this disease.

BF: You have established the Steenblock Research Institute, a nonprofit 501(c)(3) that accepts donations that are tax deductible. Suppose someone donates $5 million for ALS research. How would you spend it?

DS: First of all I'd buy a couple of very special machines such as a MALDI-TOF spectrophotometer, and some new molecular-weight mass spectrometers, to look at the aggregates in the cerebrospinal fluid, and try to better identify what they're made of, and what we can do to dissolve them. I think the thing that can lead to a cure is solving these aggregates, and superoxide dismutase, and the prions, and the neurofilaments that are involved. Mass spectrometry allows us to look at the yeast and bacterial metabolites in the blood and intestinal tract and cerebrospinal fluid. So that's close to $2 million right there. Then you need a laboratory to fit around these machines, and qualified personnel. So $5 million would get me up and running for about 3 to 5 years and then I'd be out of money. But by that time I would probably pretty much know what was going on, and what to do, and how to do it.

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Alcoholic Liver Disease: a Worldwide Health Threat and Its Unani Treatment

by Shabnam Ansari, BUMS, MD, Scholar Moalejat (Medicine), Faculty of Medicine (Unani)

Alcoholic liver disease (ALD) encompasses a spectrum of injury, ranging from simple steatosis to frank cirrhosis. It may well represent the oldest form of liver injury known to humankind. Evidence suggests that fermented beverages existed at least as early as the Neolithic period (ca. 10,000 BC) and liver disease related to it almost as long. Unani scholars well apprehended the basic concept and treatment of the disease. In *Warm-e-Jigar haar safrawi* (an inflammatory liver condition in Unani medicine [hepatitis with discernible jaundice]), they proclaimed alcohol intake a plausible cause.[1,2] However, alcohol remains a major cause of liver diseases worldwide.

Geographical variability exists in pattern of alcohol intake throughout the world. Alcohol consumption per adult resident is highest in Europe and lowest in the mostly Islamic regions of the eastern Mediterranean. After 1980, alcohol consumption has risen steadily in developing countries, alarmingly so in India. Apart from alcohol dependence, research shows that alcohol consumption is correlated with death from the consequences such as injury and coronary artery and liver diseases. ALD is the third leading preventable cause of death in the world.[1,2]

How Does Alcohol Affect the Liver?

ALD, which occurs after years of heavy drinking, damages the liver and its function. Alcohol can cause inflammation in the liver. Over time, scarring and cirrhosis can occur. Cirrhosis is the final phase of ALD.[3,6]

What Are the Different Types of Alcoholic Liver Disease and Their Symptoms?

Fatty liver disease is the buildup of extra fat in liver cells. It is the earliest stage of alcohol-related liver disease. There are usually no symptoms. If symptoms do occur, they may include fatigue, weakness, and weight loss. Almost all heavy drinkers have fatty liver disease.

Alcoholic hepatitis causes the liver to swell and become damaged. Symptoms may include loss of appetite, nausea, vomiting, abdominal pain, fever, and jaundice. Alcoholic hepatitis can be mild or severe. If it is mild, liver damage may be reversed. If it is severe, it may occur suddenly and quickly lead to serious complications including liver failure and death.

Alcoholic cirrhosis is the scarring of the liver – hard scar tissue replaces soft healthy tissue. It is the most serious type of alcohol-related liver disease. Symptoms of cirrhosis are similar to those of alcoholic hepatitis. Between 10% and 20% of heavy drinkers develop cirrhosis. The damage from cirrhosis cannot be reversed and can cause liver failure. Abstaining from alcohol can help prevent further damage.[4,6]

How Is Alcoholic Liver Disease Diagnosed?

Diagnosis of ALD is based on a combination of features, including a history of significant alcohol intake, clinical evidence of liver disease, and supportive blood tests such as liver function tests (LFT). Imaging of the liver may be used to rule out other liver diseases. Your doctor also may need to do a liver biopsy.[4,6]

How Is Alcoholic Liver Disease Treated with Unani Medicine?

Treatment for alcohol-related liver disease requires a healthful diet, including alcohol avoidance. Unani physicians suggest changes in the diet to help the liver recover from the alcohol-related damage to reverse the protein and vitamin malnutrition that are commonly found in alcoholics. Unani (Greco-Arabic) medicine, a system of alternative medicine, has been treating diverse forms of liver diseases for centuries.

Majoon-e-Rewand, an Unani compound formulation, when tested in patients with ALD, showed its efficacy by reducing inflammation as well as alleviating the constellation of symptoms of the disease.[2] Milk thistle (*Dhoodhi khurd*) has been postulated to be protective against ALD. Its active ingredient, silymarin, has been tested for its effect on normalizing liver biochemistry and histology in six different trials in patients with ALD.[1] Similarly, *Majoon Dabid-ul-Ward*, a reputed polypharmaceutical Unani formulation, has been recommended by Unani scholars as a common medicine beneficial for all kind of liver diseases and is now scientifically demonstrated to have hepatoprotective effects against liver damage.[5] In our center at Majeedia Hospital, we have successfully treated several alcoholic hepatitis and even cirrhosis cases. Consult an Unani physician for diagnosis and efficient treatment in ALD. Treatment may also require you to participate in an alcohol recovery program.

Call Your Health-Care Provider If:

- you are concerned about your personal alcohol use or that of a family member;
- you are interested in more information regarding alcohol use, alcohol abuse, or support groups;
- you are unable to reduce or stop your alcohol consumption, in spite of attempts to stop drinking.[4]

What Is Responsible Drinking?

If you drink alcohol, it is best to do so in moderation. *Moderation* means that the drinking is not getting you intoxicated (or drunk), and you are consuming no more than 1 drink per day if you are a woman or 2 if you are a man. A *drink* is defined as 12 ounces of beer, 5 ounces of wine, or 1½ ounces of liquor.[3]

Notes

1. Ahmad N et al. Evaluation of efficacy of Majoon Rewand in alcoholic hepatitis. MD thesis. NIUM; Bangalore; 2012.
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Lectins = Toxins

by Betty Wedman-St Louis, PhD

Lectins are carbohydrate-binding proteins that promote inflammatory responses such as Crohn's disease, systemic lupus, asthma, and rheumatoid arthritis. They were discovered over 100 years ago and cause leaky gut and gastrointestinal dysbiosis, yet the push for a plant-based diet focusing on legumes as meat alternatives has overlooked the damage that lectins cause to the gut. Legumes offer inferior nutrition compared with animal proteins, so toxicity needs to be considered when recommending food choices.

As carbohydrate-binding proteins, lectins are difficult to digest and irritate the brush border of the small intestine. Consequently, the tight junctions of the microvilli are damaged by prolamins and agglutinins, which can lead to numerous disorders of the gastrointestinal tract and autoimmune diseases. Lectins are also a major contributor to leptin resistance, which contributes to obesity.

As described in *The Handbook of Plant Lectins: Properties and Biomedical Applications* (John Wiley; 1998), foods that contain these toxic lectins are members of the pea family and include peanuts, pigeon peas, soybeans, kidney beans, mung beans, lima beans, lentils, fava beans, chickpeas, carob, green peas, and yellow peas. Green beans, snow peas, and snap peas are usually well tolerated once the gut has been healed since they are immature protein sources with minor amounts of lectins.

Lectins are found in other foods, including grains and pseudograins. Grains are seeds from grasses – barley, oats, rice, rye, millet, wheat, teff, corn, kamut, spelt, and possibly wild rice. Many gastroenterologists believe that the detrimental effects of lectins in grains are a factor in the development of celiac disease. Genetics and frequent consumption possibly play a critical role in the severity of sensitivities to these foods.

Pseudograins are seeds from broadleaf plants – amaranth, buckwheat, chia, and quinoa. These seed products were geographically limited to specific populations and only available on a limited basis seasonally. But modern agriculture has greatly increased the consumption of these pseudograins because they can be labeled "gluten-free," as US standards allow any grain with less than 20 ppm to be called gluten free.

Omitting toxic lectins – prolamins and agglutinins – from the diet is critical for gut health. Prolamins are predominately found in the seeds of plants. Gluten is the most widely known source of prolamins. They get their name from the high content of the amino acid proline. Research studies have shown that the prolamins in quinoa, corn, and oats can damage the digestive tract in people with celiac disease, yet these grains are frequently included in a gluten-free diet.

Agglutinins are named for their ability to cause clumping of red blood cells. The most recent example of how this toxic lectin works is the bioterrorism agent ricin. Ricin is the compound in castor beans that is so toxic that only tiny amounts are needed to cause death. Agglutinins are found on the seed coatings of grains and pseudograins and serve to protect the seed from fungus growth. Genetically modified crops – wheat, corn, soybeans – have higher amounts of agglutinins to insure higher yields.

A leaky gut is harmful to the innate and adaptive immune systems. Toxic lectins cause inflammation and induce cytokine production. As few as five soaked, uncooked kidney beans can lead to gut distress for the raw foodies, while 1 tablespoon of peanut butter leads to peanut agglutinins' entering the bloodstream soon after consumption.

Paolo Zatto and Pamela Zambenedetti from Padua, Italy, studied lectins, microglia, and Alzheimer's disease (AD) as reported in *Lectins and Pathology* (2000). The microglia of 10 AD brains stained intensely for agglutinins. Their research concluded that the glycation reaction seen in AD from lectins may serve as a significant factor in amyloid plaque development and disease progression.

Bacteria overgrowth in the gut is associated with a wide variety of diseases – septicemia, pulmonary infections, enteropathies. Adhesion of pathogenic bacteria to epithelial cells in the gut can be a critical first stage in the infectious disease process. Michele Mouricout and Bruno Vedrine of Limoges, France, described how lectins cause adhesion of numerous bacterial strains to intestines, brain tissues, urinary tract, lungs, and corneal cells. Their research reported in *Lectins and Pathology* (2000) illustrates the mosaic effect of how agglutinins cause tissue damage.

Even though lectins have been identified for decades, little interest has been shown by biological and medical science. Since they are so widely distributed in foods consumed daily, lectins may finally become recognized as partners in the pathogenesis of diseases like cancer. Galectin-3 (gal 3) galactoside-binding lectin is found on the surface of most cancer cells and has been reported to promote angiogenesis. Lectins are not oncogenes, but they help in cancer progression once initiated. Some are implicated in adhesion, while others cause metastasis.

Isn't it about time that nutrition science took a closer look at the lectin levels in foods consumed daily and customize the diet for lectin sensitivity to better manage inflammation and autoimmune diseases? The higher the levels of GMO food in the diet, the more lectins are consumed. Without food labeling of GMOs, consumers will continue to be misled and sick. ◆

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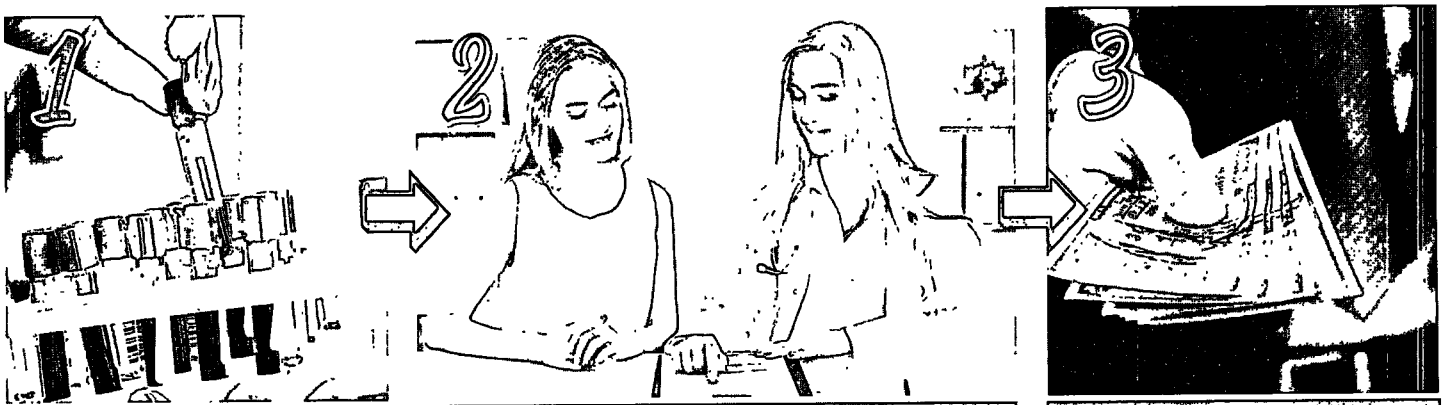

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Healing by Design

by Rajgopal Nidamboor, PhD

Any effective treatment plan for osteoarthritis should be aimed to address two fundamental objectives. The first objective is to control pain per se, the second to slow down and, if possible, reverse the progression of the joint disorder.

All the same, one fact needs to be highlighted: conventional treatment offers a smorgasbord of remedial measures in the treatment of osteoarthritis today. However, for the most part, it provides only symptomatic relief, not viable or safe long-term respite. Conventional treatment may be referred to as palliative, not all-encompassing. Besides, you have the specter of a "grand" side-effect profile of the powerful drugs used.

Is there a way out – a safe, dependable, "drugless," effective alternative option? There is. Glucosamine and chondroitin, two natural dietary supplements, meet the basic parameters for long-term, effective pain relief in the osteoarthritis treatment plan. They offer both "twinge" release and control. In addition, they provide for the recovery of cartilage function and promote healing – all without the flagrant side effects of conventional medications. What's more, the duo extends sustained comfort from joint pain and tenderness (sensitivity to touch) and, in the process, improves mobility – naturally and safely.

Glucosamine

Glucosamine is the basic building block for proteoglycans. Proteoglycans, a sine qua non for healthy joint function, act like natural sponge; in so doing, they retain water that is essential for vibrant joint function. In simple terms, glucose, or sugar, and an amino acid, or protein building block, combine to form glucosamine.

Nature has endowed the human body with the ability to manufacture its own glucosamine. However, in osteoarthritis, every bit of reinforcement with glucosamine could bring about a world of difference to your joint health. The reason is simple. Glucosamine helps "form" cartilage in joints; it is also needed for the formation of blood vessels, bone, ligaments, nails, skin, synovial fluid, and tendons, aside from mucous secretions of our digestive tract. More importantly, glucosamine is fundamentally needed by the body to make chondroitin.

When taken orally in capsule or tablet form, glucosamine is absorbed from the gastrointestinal (GI) tract quickly and almost fully (approximately 90%). Once it is absorbed, the body sends the bulk of the "wrapped-up" compound to areas of cartilage – to build new and healthy cartilage.

The growing worldwide interest in glucosamine and chondroitin is not new. That glucosamine was synthesized more than 100 years ago may be news to some of us; it may also be news that medical research first got its "clue" in the mid-1950s that the substance could play a pivotal, or adjuvant, role in the management of osteoarthritis.

The first uncontrolled studies were, of course, not meticulous – if not totally flawed. They also invited cynicism about "positive" results – as a result of "fanciful" thinking by both physicians/therapists and their patients – when no conclusive proof was verifiable or replicable.

The idea may not have changed much today, although research across the globe (aside from the US) has showed that glucosamine helps augment and improve joint health. This has spawned the "new collagen era." What's more, it has also given adequate impetus for further studies. By the end of the 1960s, glucosamine had been documented to relieve patients affected by osteoarthritis. However, it is only recently that sustained research has led to the development of a more stable and dependable compound with a long shelf life.

A quick recap: in the early days, glucosamine was injected to bring about relief from pain and improve mobility in patients. It was a difficult and cumbersome agenda. In the course of time, glucosamine became available in an oral pill, capsule, or tablet form; this is, obviously, the much-preferred choice, like most medications today.

Chondroitin

Chondroitin (or chondroitin sulfate, to use its technical name) is quite like glucosamine. It is made within the body. It is also an essential component of our cartilage and other connective tissues. It belongs to a group of compounds called glycosaminoglycans.

The sulfate, for the sake of convenience, is referred to as one substance; actually, it is not. There are unique albeit structurally identical types of the compound too – the most abundant in the body being chondroitin-4-sulfate and chondroitin-6-sulfate. The numbers for each are related to the location of the sulfate molecule, next to the chondroitin sequence. It may be mentioned too that there is a marginally different structure of chondroitin sulfate molecule – with each individual structure having different weights.

Research does not agree on a universal "format" on how different weights influence or promote absorption in the use of chondroitin compounds. Be that as it may, there is a general consensus that the lower the weight of the compound, the more

readily it is absorbed. This, of course, does not relate to what could be defined as "ideal" structure – one that could be thoroughly recommended for use.

Chondroitin was first identified in the 1940s, as a component of cartilage. Its early research was confined to animals – to observe, or evaluate, possible results of its application in human joint health. As studies progressed, research on animals showed its supplemental ability to augment proteoglycans' production. This culminated in clinical trials on human subjects. The results have been consistent: chondroitin relieves joint pain, improves mobility, reduces swelling in the affected part, and also reduces one's "reliance" on nonsteroidal anti-inflammatory drugs (NSAIDs).

Whatever the inference, the fact remains that chondroitin isn't as absorption-friendly in the body as glucosamine is. Less than 10% of chondroitin is absorbed vis-à-vis 90% of glucosamine.

The issue is being peremptorily debated and researched, just as scientists are speculating how low-molecular mass chondroitin – available on the market – could be absorbed with better effect. While it is as yet scientific conjecture as to what happens after chondroitin is swallowed, studies in general have shown that the dietary supplement is more than equal to the task of providing good joint health and/or comfort.

They Help Rebuild Cartilage

Glucosamine can help rebuild cartilage affected by osteoarthritis. When a pill, capsule, or tablet of the supplement is ingested, most of it ends up in the tissues of our joints. When glucosamine enters the chondrocytes – the cartilage-building assembly line inside the cartilage tissue – it is utilized to form new proteoglycans, which are responsible for healthy joint function. This by itself is a vital contribution, because in osteoarthritis the body's resources to manufacture adequate levels of new proteoglycans are depleted.

While ringing in the new, and ringing out the old, is nature's own maxim in the cell-replacement process, the process is regulated and facilitated by our body's enzymes that mortify the old cells. When such a breakdown occurs more quickly and replacement does not keep pace with it, the outcome is imminent – frail cartilage. This situation calls for supplemental glucosamine intake. Glucosamine not only stalls the "enzymatic" destruction of proteoglycans, it also provides for anti-inflammatory responses in the affected joint.

Magic Bullet ... Or?

Critics or skeptics often observe that glucosamine adherents have an ostentatious pitch: that the supplement has "the unique ability" to provide pain relief and help regenerate damaged tissue in joints. They ask, is this a well-orchestrated marketing gimmick – one that you should run after and take?

Some critics also refer to glucosamine as nothing short of the "gingko" of osteoarthritis therapy – a popular "natural" remedy. This is not without reason. In a survey of 2146 primary-care physicians and rheumatologists and 90 patients conducted by *Arthritis Today*, 34% with the disorder rated glucosamine as their favorite alternative to over-the-counter (OTC) conventional pain medications. As a matter of fact, physicians/therapists rated its utility higher – with 45% preferring to call glucosamine their "supplement" of choice.

However, not everyone is impressed with the beneficial effects of glucosamine. A section of rheumatologists and researchers remains unconvinced and adheres to one quip: there have been no long-term clinical studies of the supplement in human beings. They also extend their pessimism to the fact that since glucosamine is a nutritional supplement, and therefore not regulated by the Food and Drug Administration (FDA) in the US (the regulation of course may not be relevant elsewhere), there can be no certainty in quantifiable terms regarding its potency or purity.

According to Timothy E, McAlindon, MD, MPH, chief of Division of Rheumatology, professor at Tufts University School of Medicine (US), and author of a topical study reviewing the scientific evidence about glucosamine and chondroitin, "The jury is still out on whether this works." Nevertheless, McAlindon and his colleagues agree that there is convincing evidence that "some glucosamine products" may actually help reduce inflammation and alleviate pain of osteoarthritis. What they are ambiguous about is whether glucosamine (and, chondroitin) can also "freeze" and "turn around" the disorder. Other researchers maintain that a number of documented benefits may be exaggerated – or that the conclusions of several studies were "inclined" and methodologically inconsistent. Some say that it is just the opposite. Their rationale: 1 of the major 15 studies was sponsored by manufacturers and/or pharmaceutical companies.

However, in an article published in *Osteoarthritis and Cartilage*, principal investigator Amal K. Das, MD, found that glucosamine/chondroitin sulfate dietary supplement (Cosamin DS) was effective in the management of joint pain in the knee. The randomized, placebo-controlled, peer-reviewed, clinical study was conducted in a group of patients, with a combination of glucosamine and chondroitin sulfate, while using a standardized index to measure joint pain. In the study, participants on glucosamine/chondroitin supplements showed significant improvement in the management of joint pain in the knee. The response rate was 52% in comparison with 28% in the placebo group.

Glucosamine

- increases the lubricating pattern in the joints
- increases hydration of joints and tissues and, in so doing, reduces stiffness
- stimulates the production of sugars that support the cartilage matrix
- reduces the action of degradative enzymes that breakdown cartilage
- activates anti-inflammatory responses

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Chondroitin

- protects the health of joints, muscles, cartilage, ligaments and tendons
- helps relieve inflamed joints associated with aging and osteoarthritis
- promotes elasticity
- shields the body against joint destruction
- improves the body's natural ability to heal itself
- acts as a shock-absorber for the joints

Glucosamine Sulfate versus NSAIDs (Ibuprofen)

Clinical studies suggest that a definitive decrease in the intensity of osteoarthritis is almost a norm during the first week with the use of ibuprofen, but not with glucosamine sulfate. However, by the second week, as reported in most clinical trials, the glucosamine group holds on to its own – the result in terms of pain relief and osteoarthritic symptoms is apparent. Yet the most important difference between NSAIDs and glucosamine is reflected by way of the former's side-effect profile. In one study, 1 in 3 of the ibuprofen users complained of tummy upset; there were no reported side-effect symptoms from patients taking glucosamine sulfate. The supposition is relevant, although most of the studies were not extensive, the longest trial lasting just 2 months. However, the overall pattern of results certainly shows ample promise in the use of glucosamine for the reduction of "reported" pain levels.

Oral Glucosamine Sulfate versus Placebo

In clinical trials, patients in the oral glucosamine sulfate group have often reported a significant decrease in pain and inflammation compared with the placebo (dummy pill) group. No adverse reactions were reported by patients, treated with glucosamine sulfate. This, as some clinicians opine, makes it an effective treatment option for osteoarthritis.

Glucosamine Sulfate versus NSAIDs and Placebo

In studies conducted on both NSAIDs and glucosamine sulfate groups of patients, each symptom of osteoarthritis improved, but to a much quicker and greater extent in the group treated with glucosamine. No placebo group has ever shown such results or improvement.

Side Effects of NSAIDs

- tummy ache, heartburn, and nausea
- cartilage degeneration
- leaky gut syndrome; gastrointestinal bleeding
- cramps and diarrhea
- fluid retention and weight gain
- drowsiness, dizziness, mental confusion
- wounds bleed easily; they heal slowly
- adverse reaction with alcohol
- ringing in ears, or tinnitus
- lowered melatonin (a regulatory hormone) levels at night and body temperature

Aspirin

Millions of people are taking the wonder drug, aspirin, on a daily basis. Aspirin has shown its efficacy to significantly reduce the risk of heart attack and stroke, and quell osteoarthritis pain. For some of its adherents, aspirin is a miracle remedy. But one fact remains: for all its benefits, aspirin can also damage the lining of the gastrointestinal tract.

To alleviate the difficulty, a recent, more stomach-friendly aspirin called NCX-4016, which also encompasses the cyclooxygenase-2 (COX-2) inhibitor celecoxib, is sold under the brand name Celebrex, with promising results. The new aspirin, unlike its "old" model, releases nitric oxide, which increases the blood flow in different parts of the body. Research suggests that traditional aspirin probably damages the stomach, because it may reduce blood flow to the lining of the stomach. Studies reckon that the dissipation of nitric oxide, triggered by the "new" drug, which has run into rough weather due to its deleterious effects on patients with heart afflictions, opens up the blood flow and may protect the stomach lining. The jury is out.

Things are gradually changing for glucosamine; it is no longer a question of why one has not heard about it yet. The fact is that several progressive physicians/therapists are prescribing glucosamine sulfate for osteoarthritis. But the ticklish question that we encounter is the label – glucosamine is classified as a nutritional or dietary supplement, not a drug. Hence, it may be an out-of-pocket expenditure in some countries (though not in the UK, where it is available on National Health Service).

In addition to subjective clinical studies – except for a brace of quality clinical trials that detractors point out as not being substantial, or all-embracing, it may also be mentioned that most studies offer data on the basis of animal-based clinical trials performed to evaluate how glucosamine works. It has, however, been found that in vitro, glucosamine sulfate stimulates cartilage cells to synthesize both glycosaminoglycans and proteoglycans.

Oral glucosamine sulfate has demonstrated beneficial effects on inflammation and joint pain in clinical studies. However, one question remains: how do glucosamine supplements, taken orally, really get to the "right place" in the joint to stimulate new cartilage growth, as most pro-glucosamine bodies and prescribers maintain?

In an article published in the *Journal of the American Medical Association* (*JAMA*), a group of participants was given glucosamine sulfate tagged with a radioactive dye. The objective was simple. The technique allowed investigators to follow the glucosamine "trail" through the body. The results showed that oral glucosamine sulfate became a component of cartilage – supporting all of the subjective results experienced and reported by patients, from time to time.

Growing Disenchantment with Conventional Treatment

Although the two supplements have been in vogue as a means of primary treatment in Europe, they

have made their presence felt in the US and elsewhere, including India, and with good effect. The reason for such a development is not difficult to understand.

Pharmaceutical companies often spend their hefty resources, not just in terms of money, or inclination, researching and marketing drugs – such as NSAIDs – to treat illness or disease. This is also where their organized "action" bears fruit – getting patents for their drugs. Besides this, patented medicines help them to recover their enormous investments. This also helps them protect, garner, even conquer markets and/or charge prices higher than those manufactured by their competitors.

Not that the drive for patents is "bad" medicine. It is good, because it gives the lead to the development of more useful and life-saving medications. But there is a downside to the idea – nutritional supplements, such as glucosamine and chondroitin, cannot be patented. Hence, pharmaceutical companies have little interest in them. This also explains why most companies in the pharmaceutical business hanker for new (patented) drugs that bring in wealth, even if they cause adverse side effects in patients using them.

The incongruity is perceptible. Funding is a difficult word for research efforts for nutritional supplements – even if they sound as glamorous as patented medicines by their names. This isn't all. Nutritional supplements don't really attract a first-rate budget for their development, although this does not in any way detract from the merits of their therapeutic, sometimes incredible, healing properties. Also, the whopping investment in "adverteasements," if not advertisements, is another "knob" to give top pharmaceutical companies a handhold toward its reach in "tapping" prospective customers, which supplements cannot match.

On the upside, things are now changing – not because enthusiasm has expanded for natural supplements, and this has led to money coming in for research. Far from it. Thanks to the ubiquity of the Internet, and disenchantment with conventional medicine, there seems to be a growing hunger for information on natural supplements, especially glucosamine and chondroitin, among patients and the public at large – besides dispassionate conventional, alternative, and integrative medicine physicians and therapists.

More on Chondroitin

Chondroitin is somewhat akin to glucosamine in its beneficial function. It also plays a similar, or complementary, role. Besides, it ushers in a new era of "crop" production – in this case, healthy, water-trapping proteoglycans.

Chondroitin has a negative charge. This explains why each of its molecules is drawn away from nearby molecules to make room for water to fill within the cartilage structure. While laboratory studies suggest that chondroitin, along with glucosamine, boosts the creation of proteoglycans, the absorption of water into the cartilage is just as important a factor. Cartilage has no blood supply of its own; it has to depend to a large extent on the movement of fluids to direct necessary nutrients into the joint. You'd call it the "shock-absorber effect," caused during joint movement.

It may also be emphasized that certain enzymes destroy the proteoglycans to "loop" in new ones. In osteoarthritis, such enzymes are "out of bounds" with new proteoglycans. It is precisely in such a situation that chondroitin plays a significant role. It stalls and slows down the imbalance caused by the death of proteoglycans and collagen in the cartilage. A study in Italy, to cull just one example, showed the use of oral chondroitin sulfate for a period of 5 days by a group of individuals with cartilage degeneration, and another with healthy cartilage, to significantly decrease the levels of degradation.

Chondroitin, like glucosamine, has the wherewithal to decrease joint inflammation – which reaches alarming levels as the osteoarthritis disorder progresses and debilitates the affected individual. The best part is that the two supplements do not alter or harm prostaglandins, the hormonelike substances or natural chemicals, involved in inflammation, unlike NSAIDs, which alter them and cause side effects such as gastrointestinal distress.

Remodeling the Joints

The two supplements, glucosamine and chondroitin, restore the joint modeling process and elevate balance – balance holds the key to stopping osteoarthritis from running wild. Besides, they prop up the proteoglycans' building, or rebuilding, ability, aside from chondrocytes. In a major (double-blind) study, reported in the *Lancet*, researchers from four countries found convincing evidence that glucosamine could prevent osteoarthritic progression in 212 study subjects. Double-blind trials are thought to produce objective results, since the researchers' and volunteers' expectations about the experimental substance do not affect the outcome.

The study was no quick clinical "mug shot" of glucosamine; it was based on sound scientific principles and adhered to the strictest norms. This isn't all. Neither the patients nor medical professionals had the "ghost of an idea" as to who among the trial group was taking glucosamine and/or placebo. The study was also without bias, because there is always, paradoxically, the prospect of detracting from the merits of any benefit as having emerged due to "straight-line" thinking, or wishful contemplation.

The patients in the study were all afflicted with osteoarthritis of the knee joint. Exactly half of the individuals took 1500 mg of glucosamine sulfate per day; the other half were given placebo. The supplement "diet" went on for a period of 3 years, and the end result was encouraging. Pain dropped by 20% to 25% among the participants taking glucosamine; symptoms increased by 10% in the placebo group. X-ray studies also substantiated the progress – the glucosamine group showed no deterioration in knee-joint abnormalities, whereas the placebo group continued to experience worsening abnormalities.

This was a groundbreaking outcome – even though it did not necessarily excite researchers who had already concurred that glucosamine could help the cartilage rebuild itself with the aid of scanned electron micrographs. The experience was similar with patients taking chondroitin supplements.

In another example, when an adult group of patients, with thinning cartilage, was given oral doses of chondroitin and placebo, for a period of 1 year, the cartilage in the former not only stopped thinning but also improved in its thickness. Besides this, the group showed adequate improvement in pain and joint mobility, including other parameters.

In a review published in *JAMA*, which was based on (re)analysis of research conducted over a three-decade period (1966–1999), researchers concluded that the two supplements do in fact show a "moderate-to-large" effect for alleviating symptoms of osteoarthritis. The reports, published in two prestigious journals, are not just suggestive but also indicative of the fact that glucosamine and chondroitin are resolute, and fairly safe, contenders in the long-term management and treatment of osteoarthritis.

The real shot in the arm for the two supplements emerged, thanks to the "reception" that they received from Drs. Jason Theodosakis, Brian Adderly, and Barry Fox's landmark book, *The Arthritis Cure*. The book clearly contended the medical fact that glucosamine and chondroitin could halt, reverse, and even cure osteoarthritis. Soon enough, the two supplements became names as big as the latest blockbuster movies from Hollywood or Bollywood.

It is, of course, quite easy for one to go overboard in view of the fact that the two supplements seem to break new ground with every realistic trial. It would also be no exaggeration to say that several highly qualified and respected researchers have gone on record, despite their usual scientific inclination for discretion, and recommend that it would be useful to try the two-supplement-option prior to the use of aspirin, NSAIDs, or surgery.

Research, however, asserts that this is no fail-safe start; it also cautions that this is no total solution to taking the osteoarthritic bull by its horns. However, what most studies espouse is that glucosamine and chondroitin are the most sensible options to begin with, for two reasons. Their potential to provide ample benefit to the patient is high; at the same time, they also have a relatively minimal side-effect profile. In other words, they are more than relatively safe, unlike powerful pharmaceutical drugs.

The upshot is far from determined, because it is not possible yet to predict who will win the "race." A long scientific journey into the realms of finding out an appropriate statement to address the issue is still unfinished. The essential of the essentials in the glucosamine/chondroitin fulcrum was put to the litmus, if not ultimate, test in an US$14 million study, to cull a recent exemplar – the Glucosamine/Chondroitin Arthritis Intervention Trial [GAIT] – set up by the National Center for Complementary and Alternative Medicine and the National Institute of Arthritis and Musculoskeletal Disease, US.

The study examined whether glucosamine and chondroitin do indeed relieve the pain of osteoarthritis. It enrolled over 1600 patients, for 24 weeks, in as many as 13 different clinical centers. This was followed by a subset of participating subjects for another 18 months. The study measured, in actual terms, the efficacy of the two supplements, separately and in combination, and compared results with celecoxib for alleviating osteoarthritic knee pain. The results were predictable: they implied that the two supplements could "perhaps" or "possibly" work in mild-to-moderate osteoarthritis – and perchance merely or marginally improve quality of life (QoL) – nothing more than that. You be the judge.

Slow Starters, but Safe and Effective

For patients used to taking ibuprofen and experiencing relief within a week's time, a short course on glucosamine/chondroitin isn't going to give quick results or benefit. It is obvious that the two supplements are slow starters, but when they get into you, after 1 full month of use, the results are often good, sometimes impressive. It is rightly said that what takes time to heal, heals best. The two supplements work at a level that NSAIDs don't; they go to the "root cause" of the osteoarthritic problem, rebuild the joint structure, and provide the platform to create new, healthy tissue – a process that has to be time consuming.

In a study led by Florent Richy, an epidemiologist with the University of Liege (Belgium), researchers analyzed data from 15 studies of glucosamine/chondroitin compounds. They found that the two "nutrients" do work on symptoms; provide mobility, pain relief, and better QoL; and are "very safe." The studies in Richy's analyses all focused on osteoarthritis of the knee, and found that 1775 patients – 1020 taking glucosamine and 755 taking chondroitin

– showed "significant changes" in symptoms. No placebo group showed this kind of improvement.

Richy's findings also suggested that glucosamine significantly improved joint space narrowing. In addition, two chondroitin studies showed comparable results and indicated that the two supplements significantly reduced symptoms, such as pain, stiffness, physical functioning, and joint mobility. Symptom improvement began about 2 weeks after starting the supplements.

Research also suggests that taking at least 1500 mg/day of oral glucosamine sulfate for 3 years was most effective in slowing down the degenerative process. As regards chondroitin, the findings are more or less similar, if not as clear cut. However, according to Richy, the overall safety of glucosamine and chondroitin can be considered excellent. There are, he contends, substantial beneficial effects on osteoarthritis symptoms of glucosamine and chondroitin therapy when compared with placebo.

The two supplements also reduce the swelling of the inflamed joint and morning stiffness, or when the joint has been inactive for a while. Individuals who take glucosamine and chondroitin contend that they are able to move their affected joint better; many have also reported improved walking activity.

These are some of the obvious benefits of taking the two supplements, though the decision to take them is an individual choice. However, one fact remains: osteoarthritis, if not treated early enough, is a progressive degenerative condition, which only gets worse as time rolls by. Not doing anything at all poses enormous risk, including that of deformity.

Conclusion

The use of glucosamine and chondroitin therapy in osteoarthritis is aimed at decreasing joint pain and helping to maintain or improve joint function. While the pharmacological treatment of osteoarthritis has included the use of aspirin, acetaminophen, and NSAIDs, studies in the recent past have investigated and deduced the potential role of chondroprotective (cartilage-protecting) agents, such as the two supplements, in repairing articular cartilage while slowing down the degenerative process of osteoarthritis.

It goes without saying that the duo has gained extensive popularity in the treatment of osteoarthritis, including usage in preventative treatment. Though some clinicians are unconvinced of its value vis-à-vis OTC supplements, numerous patients and newly validated, but not substantially diverse, evidence-based studies have turned the tide – even if they are not sizeable – in the supplements' favor, by reporting excellent symptomatic relief, comparable to any NSAID drug, but without the latter's harmful side-effect profile.

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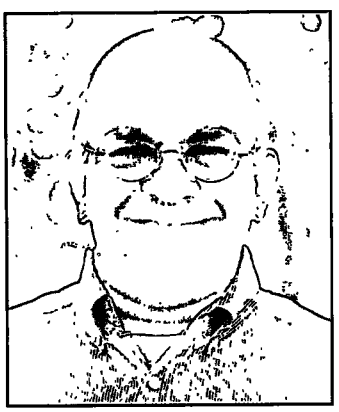

The Bureaucratic Mind and Your Health

by Kenneth Smith

Throughout our lives we are governed by our thoughts. During childhood we are fed a packaged diet of how this world is, what it all means, and how we should behave. By adulthood this conditioned thinking reflects starlike constellations formed by connecting bits and pieces about our world and arranging them in such a way as to provide meaning and reference to navigate life. Floors, walls, ceiling, and windows are four stars in the constellation "house," for example. Assortments of constellations such as those reflected by transportation, education, health care, and government create the basis for a worldview of galactic proportions. The more the various constellations interrelate, the grander their meaning – and the deeper we become locked in a reality constructed by the forces of time and culture.

One effect of this process is the bureaucratic mind, a dynamical process where perception, thought, and subsequent behavior are rigidly organized in line with consensus, status quo, and stereotype. As though it were a bureaucracy, thinking is compartmentalized, departmentalized, and passed on to others with minimal examination of value. While thinking may eventually change, the interim is often marked by hostility to different ideas. For instance, whereas once the earth was seen as being flat and later nothing existed beyond the parameters of a 3D material world, now physics is tracking the possibility of there being a multiverse containing an infinite number of interacting dimensions.[1]

The bureaucratic mind and its effects, small and large, are pervasive and reflective in such things as excessively polarized political environments, domineering religious zealotry, unyielding philosophical perspectives and, as we'll see, the daily practice of medical science. This inescapable condition of life not only stultifies personal growth but may also adversely affect physical and psychological health: a meta-mind/body dynamic.

Characteristics

The bureaucratic mind is fostered by education, conditioning, expectation, authority, and sense of membership. All of these interrelate, each influencing the others, each combining to form not only states of mind but states of health.

In daily practice, what matters is the self-maintenance of a particular mindset. It requires sustenance; in other words, maintaining a mindset requires ongoing effort or a lack of effort to change. Dogma and fundamentalism therefore characterize the bureaucratic mind.

The findings of science that promulgate a certain worldview, for example, often trump the practice of science as a learning methodology. The historical focus of science on examining the material world is projected into materialism wherein nothing beyond the physical exists. Research on energy healing or psychic functioning, which counters a materialistic worldview, is summarily dismissed. As a result, the marvelous findings of science, and the powerful capacity of science, diminish into a political playbook rather than being a tool for the advancement of awareness.

During the early- to mid-1900s, through political means, the burgeoning discipline of medical science effectively shut down what is now considered to be alternative medicine.[2] Homeopathy, for instance, was forced to the side under the political pressure of science. In recent years, however, it has regained popular interest as well as surviving scrutiny in several successful clinical trials for different disorders.[3,4]

A bureaucratic mind, then, bends perception out of shape so the world might be viewed as being flat even with evidence to the contrary. It creates blind spots so people will deny global warming even though ice caps are melting and biodiversity is decreasing due to climate change. The bureaucratic mind also lends itself to a social order wherein there is continued human production of toxins flooding the environment in spite of substantiated reports of the harm they cause.

Benefits

Interestingly, this calcification of perception has a high side. Organizations, institutions, and society are formed and maintained by bureaucratic processes. This allows for the order, focus, purpose, and communication necessary to realize common goals such as cleaning up environmental toxins. It provides for standards such as airline rules and regulations. It allows you to play a music CD no matter where you brought it, requires consistent restaurant health standards, and a stay in a hospital that can save your life.

There's no doubt that corporations produce beneficial products and services. A corporate structure facilitates success. Costs aside, the benefits of conforming to standards allow for innovation and technologies that lead to changes in thinking.

Causes

A central feature of human perception is psychological closure. If you're reading a paragraph where a word has been removed, for example, you're more than likely to fill in that space without even realizing it, and thereby keep the continuity and meaning of what you're reading intact. Just as *closure* indicates, we naturally close off perception. Computer programs are binary; open and close commands produce finished product. Learning hinges on opening and exploring and then closing and consolidating. We need to do this; otherwise; life would be a constant stream of unintelligible information. Closure confines and illuminates.

Abraham Maslow's hierarchy of needs provides insight into another cause of rigid thinking. His model is divided into two principal levels: deficit and growth needs.[5] In the deficit arena, people deal with innate drives of survival, safety, membership and belonging, and self-esteem. We may give way to a general fear about survival. In the pursuit of social acceptance, we may also place ourselves at the mercy of peer pressure to fit in and reliance on external authority to form our thoughts and actions.

Enculturation also plays a role. As David Graber writes, we have become so habituated to a social order that we don't even notice the bureaucratic mind.[6] To get along in school, to focus on that next raise, to hope we're getting proper medical care, we have become conditioned to accept the status quo. It is when these concerns are held in abeyance that we enter Maslow's arena of growth needs, where self-actualization and the pursuit of knowledge are the guiding lights.

Authority

Authority, especially when backed by accepted credentials, carries social meaning and therefore stands as another pillar of bureaucratic thinking. Expertise as represented by authority has its place. It might not be wise to have a gardener perform brain surgery. Yet a homeless person might have more philosophical insight about life than a credentialed philosopher. So it is a matter of fluency in learning and having the opportunity to articulate this that produces authentic authority.

Education

The pillars of a bureaucratic mindset are also supports of society. Meaning, expectation, membership, and the pecking order of authority are promulgated by various forms of education. From family life to peers to academia, we are conditioned to values, accepted behaviors, and, generally speaking, accepted thought. In broad strokes, we rely on certifications and degrees to gain social standing and be perceived as an authority which may be the basis of putting food on the table. In addition, membership, which provides a sense of belonging and authority or knowing, can promote groupthink, a form of bureaucratic thinking.

Beginning in elementary school, we are often trained to respond quickly in order to demonstrate that we know the answer. Often little thought, expectation, and experience go into teaching how to learn. Success on standardized testing becomes an indication of personal value as higher scores open more doors. Yet research indicates that the format of standardized tests rewards those who are temperamentally disposed to the subject or to rote learning. An emphasis on speed of delivering answers may work against people who are quite bright but have a different approach to the subject matter or to testing.[7]

To survive financially, educational institutions are run as corporations. The emphasis on profit ensures that students are immersed in a bureaucratically approved curriculum designed to meet market needs. As part of this, standardized testing is backed by ever-expanding technologies to speed and cement the circular process. This is big business.[8]

Health Care

As with education, health care requires bureaucracies with their own established rules and their own need to survive. In some instances, this mindset has produced patient bills that are 10 times higher than hospital costs.[9] As a group, hospitals respond that they can't have too many non-paying patients without offsetting the loss of income or they can't help others. Doctors are also encouraged to see an increasingly large number of patients. Time limits are imposed to help keep the number of patients seen, and corresponding revenues, higher.

In addition, rather than a physician practicing the art of healing, regulations and laws have become the guiding influences. Adverse side effects associated with prescription drugs are seen as unavoidable, if not the accepted norm. And the threat of lawsuits hangs over health-care providers like a dense fog.

Metrics

But can thinking be quantified in relation to health? The catch-22 is that any measurement of bureaucratic thinking is itself a reflection of that type of mindset. There is no way to quantity the effect of mind on results. For instance, a 2005 population study revealed those who became obese during middle age were more likely to develop dementia.[10] Yet there was no determination regarding whether or not one's mindset that may have led to obesity was responsible or whether weight gain in and of itself led to dementia.

Breaking through barriers of the bureaucratic mind does occur, however. As medicine became more laboratory oriented and began resembling an industry, consumers at the grassroots level became more assertive.[11] Alternative medicine, for instance, has become more pronounced to where a struggle now ensues in which consumers advocate for more and better options

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while, maintaining concern for patient safety, governmental bureaucracies are tightening the reins on what is available.

In turn, advances in thinking are often sparked by the resources a corporate environment provides such as investing in frontier research. And sometimes this sheds light on unexpected places. The relatively new fields of epigenomic and placebo research, for example, are revealing not only more of how the body works but also how the mind and body interact to produce health or disease.

Epigenomics

The epigenome consists of DNA methylation, histone proteins, chromatin fiber, and noncoding RNA. DNA methylation, the attachment of carbon groups directly to DNA, is the best characterized portion of the epigenome. It is responsible for cellular memory and stabilizing cellular processes.[12] Methylation patterns are also heritable.[13]

Genomic expression was only recently seen as a process wherein the mechanical sequence of DNA determined the shapes and functions of proteins that build who we are. This was the conditioned mindset. Evidence accumulating over the last few decades, however, reveals that the epigenome regulates DNA activity.[13] Alterations in DNA methylation, for instance, can affect DNA expression without changing the sequence of the base chemicals comprising DNA.[14] This is a significant shift in thinking away from what was once bureaucratically accepted as true.

Alterations of each component of the epigenome are highly coordinated and occur throughout an organism's life, especially in the early stages of development wherein selection for specific organs and sex take place. At any stage, though, environmental stress such as exposure to toxins can produce epimutations that turn on or off the wrong genes. The resulting aberrant DNA methylation has been linked to various cancers, obesity, allergy, and neurodegenerative, cardiovascular, and aging disorders.[15-17] In addition, certain kinds of psychosocial stress, such as maternal behaviors, have also been linked with changes in DNA methylation,and, as we'll see shortly, psychological stress such as bureaucratic thinking is another environmentally related influence known to lend itself to disease.[18]

Placebo

Placebo research is another area of investigation that directly calls into play the connections between states of mind and health, revealing that they are intimately related. Perhaps more than epigenomic research, this area of investigation illuminates the effects of conditioning, expectation, and authority.

A placebo response is considered to be the psychological component that delivers a therapeutic effect beyond natural history and spontaneous remission.[19] In turn, a placebo effect is typically thought of as the physiological mechanisms that are associated with healing. Different opioid pathways, for example, have been linked to placebo responses based on expectation and/or conditioning.[20] Other known mechanisms include pathways in the immune, endocrine, and nervous systems. For instance, the placebo response has been shown to involve reward pathways related to dopamine-guided learning, dopamine being a neurotransmitter having effects throughout the body. It also has been clearly linked to a variety of psychosocial conditions, and can occur within the context of all medical and psychological treatments.[21-23]

Moreover, placebo is a learning phenomenon. Studies have yielded two known neurological pathways linked to psychosocial conditions: conscious (expectation) and unconscious (classical conditioning). Expectation forms by verbal cues wherein a subject is led to believe that he/she will receive analgesic and relief of pain, for example. Classical conditioning relies on repeated association of a neutral, conditioned stimulus with a drug, the unconditioned stimulus. A patient's beliefs also play a role as does prior experience and nonclassical or general forms of conditioning.[24] All of these tie together to form what some have referred to as placebo being a meaning response.[25]

Conditioning and expectation are often singled out as driving forces of placebo-related responses.[20] These forms of learning form strong social and individual stereotypes, pillars of a bureaucratic mind. For instance, Prozac is more effective in the US than in Western Europe and South Africa, whereas Valium is better in France and Belgium than in the US. Blue-colored pills are better than red ones for tranquilizers, except for Italian men, as blue is associated with the national soccer team. As a result, geography related to culture has become a determinant in clinical trial site selection.[26]

Over recent years, the placebo response has been validated by science as a real phenomenon. There has also been more mass communication and so more general awareness and education about it. As a result, enrolling in a clinical trial now has an automatic effect.[27] Those who simply believe themselves to be in the treatment group respond better.[24] Furthermore, placebo responses in trials are increasing. There have even been positive trial results even when subjects are told they are being given placebo.[28] Along these lines, the placebo response has gone from being perceived a nuisance in clinical trials to being an active therapy whereby physicians may intentionally influence a patient's state of mind and their relationship with disease in order to promote healing.[29] The same dynamics pertain to nocebo responses, wherein a psychosociological condition produces ill health.

Homeodynamics

Homeostasis is a term used to indicate internal stability that can resist change, a constant state while interacting with the environment.

However, since maintaining balance with an ever-changing environment is required, more researchers are describing this as *homeodynamics* to account for the complexities.[30] The response to stress of all forms is a crucial element of homeodynamics.

Stress produces a response by cells, tissues, and organs. It is a fundamental characteristic of living systems to respond to internal and external stresses and disturbances. It represents an ability to survive.[31] Imbalance in the innate regulation of the body lends itself to disease.[32] Aging disorders, for instance, reflect diminished homeodynamic resilience and can be indicated by changes of DNA methylation.[31]

During the 1930s and 1940s, endocrinologist Hans Selye's ground-breaking rat studies led to his publications concerning "general adaptation syndrome," later to be known as "stress response." He initially considered this to be a neuroendocrine response, but later found that almost every organ was involved in stress. He also distinguished between distress and eustress in order to differentiate negative and positive types of stress and their effects on the body, noting that how one reacts to stress is the main factor between negative and positive reactions.[33]

Psychological stress is associated with an assortment of diseases including cardiovascular, depression, and mental and behavioral problems. In addition to producing inflammation, which underlies many illnesses and is linked with aberrant DNA methylation, poorly managed states of mind adversely affect the immune and endocrine systems.[34-36]

Chronic stress and certain kinds of acute stress can therefore challenge homeodynamics. Research has illuminated pathways relating to psychological stress, finding involvement of cytokines and other inflammation-producing mediators, activation of the sympathetic nervous system causing release of hormones, a stressor-elicited endocrine response, and other physiological events leading to a range of disorders.[34-37]

Health is also oriented to cultural values.[11] This pertains to corporate cultures and demands of the workplace. A bureaucratic mindset by its nature is not flexible and adaptive to other points of view, thereby creating psychological stress which Selye addressed.

Psychological Homeodynamics

Psychological stress occurs when an individual perceives that environmental demands exceed adaptive ability. This can produce changes in psychological well-being and behavioral responses that influence disease onset and progression.[34] Stress can lead to atherosclerosis, for example.[35] Psychosomatic disorders such as pain, acidity, and anger increase with levels of psychological stress, including that from work, home, and interpersonal relationships.[36, 38]

In the case of religious fundamentalism, studies revealed significant emotional distress in members where an authoritarian leader exerts control. This is also associated with mindsets independent of religious content where leadership traits included intolerance, denial, and imposition of beliefs.[39]

Psychological homeodynamics, in turn, refers to a state of mind that correlates with physical homeodynamics. Maslow's growth needs provide reference to engage life and respond in such a way as to maintain mental and emotional health as well as to learn and adapt, behaviors supporting physical health. In contrast, lack of mental and emotional health may reflect a deficit need orientation producing stress that results in physical disease.

Emotional Intelligence

Emotional intelligence (EQ) is a component, if not a regulatory aspect, of psychological homeodynamics and mind-body states. It pertains to recognizing your feelings as they occur, and incorporates the ability to manage emotions and relationships of all kinds. It is a skill that fosters immersion in learning and emphasizes tolerance over personal bias.[40] Emotional governance is fostered by reappraisals of sudden, emotion-driven behaviors without suppressing awareness. This process thereby cultivates objectivity, discernment, and the wherewithal to change behaviors.[41]

Connections among emotions and physiological processes are documented. Research has shown, for example, how neuropeptides and the cellular receptors are underpinnings of awareness and manifest in emotions, beliefs, and expectations.[42] In addition, signaling molecules such as neurotransmitters and cytokines are messengers acting across regulatory systems and so connect all parts of the body into a whole, with emotions influencing their release. Emotions can therefore be viewed as a bridge between mind and body that influences homeodynamics.[43]

Other research has shown that the analytical neocortex sprouted from the emotion-producing limbic system. Emotions are therefore key to neural architecture. The limbic system provides for types of learning, remembering, and empathy with different areas of the system responsible for various tasks. Yet the cortical area helps one decide appropriate emotional responses.[41]

Behavior, including thinking, reflects a formation of neural networks. These weblike channels of communication facilitate how information is perceived, processed, interpreted, and acted on.[43] Conscious recognition of stress, for example, can allow you to employ EQ. Explosive emotions produce a reaction before reason can alter the course. At the same time, well-regulated emotion is crucial to effective thinking.[44] EQ is therefore the regulation of stress, an antidote to hardened thinking, and an avenue to emotional well-being which assists physical health.[45]

Models

Models form when the abstract is reduced into something understandable

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and manageable. From bench lab studies to paradigms to worldviews, models come in all shapes and sizes. While they serve as valuable references, people may cling to them in order to maintain a sense of stability.

Due to the expanse of life, we need models for something to grasp, something to help us relate to life and to learn. But they may also hinder learning by commanding rather than guiding perception. They may determine outcomes such as those found with experimenter bias when a researcher unwittingly establishes expectations and thereby influences the results. Or they may unduly affect diagnosis such as when only those symptoms reported by a patient that fit a textbook model are noted even though other symptoms may tell a different story.

And while models evolve, it isn't just a matter of knowing that change occurs. As evidenced by the evolution of DNA and placebo research, it is a matter of understanding that mindset carries power. Not so long ago, brain activity was viewed as being locked in place once a person reached a certain age. This long-held dogma was replaced with considerations of neuroplasticity, or the brain's ability to rewire neural networks through the positive stress of learning, no matter one's age.[46] The elderly were once considered to be more or less doomed to senility due to an age-related deteriorating brain. With a new understanding of neuroplasticity and learning, one wonders how many elderly people in the past were subjected to nocebo influences that led to senility when they only needed to be influenced by a different model.

Remedy

On a global level, new models of medicine, education, business, and politics would result in a shift of worldview. However, conditioned thinking due to forming and educating a different worldview would still be part of this new mindset. For good and ill, then, the force of the bureaucratic mind is inherent within a culture, institution, or social organization. But it is a manageable situation.

In general terms, the basic remedy for a bureaucratic mind is to educate oneself in order to avoid getting corralled by any mindset. Fluency in looking at the world in different ways interferes with the natural tendency to close off perception. Inquiry and verification of information establishes personal responsibility and a more enhanced sense of the world.

Since the bureaucratic mind removes us from self-actualization, Maslow's hierarchy offers a model for growth. Maslow lists characteristics of psychological health as including having a clearer perception of reality, a firm identify with personal meaning, increased objectivity, and the wherewithal to blend concreteness with abstractions.[47] Each of these counter bureaucratic processes.

Another proven, mind-based technique to better manage the bureaucratic mind is meditation. Once considered a fool's folly, meditation is now recognized as a deautomatization process of suspending automatic, conditioned responses.[48] It is well established as reducing stress and having a positive effect on cardiovascular health.[49] Mindfulness mediation is now practiced in various health-care environments.[50]

Summary

Bureaucratic thinking is prevalent and unavoidable. As such, it offers a multifaceted, multidisciplinary reference to examine the nature of the human mind. Epigenetic, placebo, and psychological research provide ample evidence that states of mind produce physiological responses leading to health or illness. Realizing the nature of the bureaucratic mind, however, may not indicate the absence of a stultifying mindset but having reached a higher level of it. The point is that the bureaucratic mind is always with us as part of our heritage, part of what we bequeath, and always something to manage.

Kenneth Smith serves as the communications director of Beech Tree Labs Inc. (www.beechtreelabs.com), a discovery and early-stage development biopharmaceutical company, and as the executive director of Beech Tree's sister company, the Institute for Therapeutic Discovery (www.tiftd.org), a nonprofit organization focused on bridging biochemistry and biophysics.

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Can Dowsers Detect Maximum Zones of Severe Chronic Diseases?

by Dr. Reimar Banis

Over the course of the many decades in which I, as a naturopathically oriented physician, treated chronically ill patients, energetic testing has in hundreds of cases revealed geopathic burdens, more colloquially known as "georadiation" – an as yet not clearly objectifiable physical anomaly in local radiations fields, including the earth's magnetic field. With long-term exposure, geopathies are potentially dangerous and, in my experience – as well as that of numerous colleagues such as the biological oncologist Josef Issels or the biological dentist and physician Helmut W. Schimmel – can do lasting damage to biological systems.[1,2] Many chronically ill patients are subjected to geopathic stresses; once these are eliminated, the therapist has eliminated an important obstacle to healing.

Detecting Georadiation

The typical symptoms of geopathy – such as sleep disorders, exhaustion, pain states, tension, nightmares, bruxism, and the like – might not always be present, but they are so ambiguous anyhow that one has to rely on energetic test procedures in order to arrive at a diagnosis. When the patient is stressed by georadiation, test ampoules with similar vibrational patterns will respond for every third to fourth patient. In such cases, I used to use Silicea D60 (Vega test method), but now, with Psychosomatic Energetics (PSE), I use the test ampoule Geovita, a homeopathic compound agent that has proved quite reliable. When checking out a home's bed location with experienced dowsers, there is nearly total agreement with my tentative diagnosis based on test results.

If, based on my tests and the anamnesis, I as a physician suspect geopathy, I recommend that the patient have a reliable and experienced dowser examine the bed site in the home and then seek out a neutral location to sleep at in the future. After examining the sleeping location, a good dowser can determine a maximum zone on the patient's bed with a high degree of accuracy – one that agrees with the patient's symptoms and ailments. Thus, in the case of a brain tumor, a good dowser will determine the most harmful georadiation zone to be in the head region or, in the case of prostate carcinoma, the pelvic region.

On principle, I tell patients not to tell the dowser anything in advance about their illness, and not leave any revealing utensils, doctor's letters, self-help guides, and the like lying around. In my experience, the accuracy of good experienced dowsers is very nearly 100%. Out of several hundred cases, I have seen a good half-dozen of them hit the bull's-eye every single time when determining the maximum zone. I have tried to demonstrate this often-repeated surprising experience (both for me and my patients) statistically in a small pilot study, which I'd like to present below. It goes without saying that the study is not intended merely to display the outstanding abilities of certain dowsers – which is in itself remarkable – but rather also to point out the unclear (yet evidently extremely important) role that geopathy plays in the pathogenesis of many chronic diseases.

Study Design and Results

In the spring 2013 issue of the dowser trade journal *Wetter-Boden-Mensch* (*Weather-Soil-Man*), I published a call for participation in a study looking into whether maximum zones of severe chronic diseases such as unambiguously localizable cancers could be determined by dowsers examining the patient's bed site; for example, a zone in the chest region for breast cancer cases. If there is agreement – that is, between geopathic maximum zone and corresponding disease segment – then the dowser has done a good job. I have marked out five areas in which the dowser, after examining the bed location, should

Most people think that dowsing is quackery – and unfortunately this is true in many cases. Few dowsers have the ability to find severe geopathic spots matching the location of diseases. I am sure that animals such as the sniffing dogs used at customs could be trained to do the same, as animals are unbiased.

By the way, many people feel the negative effects of geopathic stress, which in my medical experience is the reason for more than 25% to 30% of all sleep problems (childlessness, tumors, behavior problems, etc.). Unfortunately, they are not told to move their beds to another location perhaps a meter or more away, or sleep on a futon in the kitchen, because after a few nights, they would start sleeping better (it takes usually a few nights to adapt to the good spot). This is why people love cruise ships; they are free of geopathic stress (like houseboats).

make a cross in the corresponding geopathic maximum zone: head, neck, chest, upper abdomen, pelvis.

It is of course a precondition of the study that the dowser know nothing about the disease before establishing the maximum zone. I have had this lack of foreknowledge confirmed in writing with each dowser's notarized signature. In addition, I have asked the dowsers' clients for a photocopy of a current doctor's letter or hospital discharge report, in order to pin down the maximum zone from the medical side, which I have likewise assigned to one of the five body segments.

If one of the five segments were to be checked at random, then there would be a 20% probability of checking the "right" segment. As a physician, I determine "right" when, for example, in a case of meningioma, I determine the head to be the affected and thus only important segment that can be geopathically stressed.

Now, a year later, I have 13 findings from two dowsers, 12 from Hans Zürn (engineering graduate, Überlingen), considered among experts to be one of the most experienced and best dowsers in Germany, as well as 1 from Dieter Garten of Steina, also an experienced dowser. Plus, for each of the findings I have a corresponding specialist or clinic report at hand, which I compared to assign either "Yes" (agreement) or "No" (disagreement) for each set (Cf. Table 1).

Based on the data, the dowsers' "hit ratio" is 92.3%, if one takes into account the unfortunate (because misleading) result of a systemic neural disease that extended over four segments (amyotrophic lateral sclerosis in one patient). Although, considering the clinical picture, it was impossible to arrive at a definite segment assignment, I have evaluated it along with the rest, even though it detracts from the end result, which would otherwise have been 100%. The 95% confidence interval of the "hit ratio" is (64.0%; 99.8%). This does not include the 20% probability of having identified the correct body segment. Thus, the "hit ratio" of 92.3% is significantly greater than 20%.

Hans Zürn, aged 92, a retired engineer, is Germany's most famous dowser with a high success rate of finding geopathic stress zones which almost always match with the diseases of the person sleeping there.

What Does This Result Mean?

Skeptics will no doubt suspect that segment localization might have been influenced by very subtle sensory perceptions on the part of the dowser or quite straightforward forms of unintentional knowledge, for instance inadvertent disclosure of the diagnosis by the patients or their relatives. Since I can vouch for the reliability of both dowsers, I do not consider the second counterargument to be valid. And, because I have also experienced comparably accurate results in my decades of clinical experience with highly skeptical patients who did everything they could to make sure that they didn't reveal anything whatsoever to the dowser, I consider the counterargument of hidden foreknowledge to be implausible.

The idea that cancer sufferers might be radiating something ominous into the bed, which the dowser then sniffs out like a bloodhound, as it were, is also highly improbable. Mr. Zürn told me that some patients had moved ➤

Table 1: Patient (Numeric Code), Geopathic Maximum (Dowser), Clinical Picture, Agreement (n = 13)

Patient	Maximum (dowser)	Disease	Agreement
1	Head	Meningioma	Yes
2	Pelvis	Prostate carcinoma	Yes
3	Chest	Mammary carcinoma	Yes
4	Upper abdomen	Head of pancreas carcinoma	Yes
5	Chest	Mammary carcinoma	Yes
6	Head	Brain tumor (malignant)	Yes
7	Chest	Mammary carcinoma	Yes
8	Pelvis	Malignant testicular tumor	Yes
9	Pelvis	Bladder carcinoma	Yes
10	Chest	Mammary carcinoma	Yes
11	Upper abdomen	Large intestine carcinoma (colon transversum)	Yes
12	Upper abdomen	Liver carcinoma	Yes
13	Head Neck Chest Abdomen	Amyotrophic lateral sclerosis	No (indefinite)

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their beds before his examination without his knowledge, and without its being noticeable through scratch marks on the floor or suchlike. For his bed site examination, Mr. Zürn lays out yardsticks; their points of intersection correspond to the maximum zones. If the shifted bed is then moved back to its original location, then the geopathic maximum zones coincide with the disease in question. This clearly contradicts any theory of some sort of disease emanation that would betray the corresponding stress zone to the dowser.

In my opinion, the study shows that good dowsers can determine the geopathic maximum zones of bed sites with a very high degree of probability, even without knowing anything about the corresponding disease. Even though dowsing is, unfortunately, generally still not taken seriously and considered to be unscientific, my experience as a physician emphatically disagrees: good dowsers achieve impressively accurate results that well in line with reality. Their poor reputation is due to other reasons which I have addressed elsewhere.[3]

Moreover, since this small pilot study confirms my more than 30 years of experience, as well as that of other therapists, it seems extremely unlikely that the impressive study results can be due to mere chance. But if we are dealing here with real phenomena, what then does the result mean specifically from a medical standpoint? If one finds geopathic maximum zones in the majority of cancer cases, as the results in Table 1 indicate, then it seems pretty safe to conclude that the two are somehow related.

Depending, probably, in the individual case on genetically influenced robustness, geopathic zones can be classified as cocausal factors in many chronic diseases. It would therefore seem to be urgently essential to take a closer scientific look at this important disease source. Until we have some usable results, it seems a good idea to act on one's own. From my viewpoint as a doctor, I recommend an examination by a good dowser in cases involving sleep disorders and other applicable indications. If previous occupants suffered from severe chronic diseases, or possibly died, then the bed should not be placed where the previous owners became ill.

Summary

A small study involving 13 test subjects who had been examined by two dowsers looked into the question of whether georadiation maximum zones could be related to local severe chronic diseases when both of them were independently assigned to one of five body segments (such as georadiation in the pelvic region for prostate cancer cases). One prerequisite is that the dowser know nothing about the corresponding disease in advance, which can be assumed with a high degree of probability, but which should be further investigated in future studies under laboratory conditions.

In 12 of the reports received, geopathic maximum zone and local disease agreed; in one case involving a systemic neural disease, no segmental assignment was possible, so it was classified as nonagreement. Statistically speaking, the results argue against mere chance, since the confidence interval exceeds 95%, so that the result must be considered significant.

It seems plausible – and further studies need to clarify this – that, in the case of numerous severe chronic diseases, georadiation is a cocausal factor. It is quite conceivable that a future double-blind study will have beds of cancer patients and healthy persons prospectively examined by dowsers in order to eliminate any doubt regarding possible dowser foreknowledge. In addition, fundamental research into the physical nature of geopathogenic zones, as well as studies in sleep labs, should definitely be undertaken in order to investigate the hypothesized dependence of dowsers on the location of bed sites.

Evaluation: Dr. Silke Lange, certified statistician, Witten (Ruhr). The study was financed by the Internationale Gesellschaft für Psychosomatische Energetik (International Society for Psychosomatic Energetics), a nonprofit professional association based in Switzerland (www.igpse.ch). Many thanks here to certified engineer Hans Zürn and Dieter Garten for their participation!

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Reimar Banis, MD, ND, has been a naturopath since 1975 and an MD since 1985 (US MD certification through ECFMG, 1984). He conducted research with experts such as Prof. H. Heim in electroacupuncture and Dr. Schimmel, developer of the Vega test, and codeveloped segmentelectrography and thermoregulation; this knowledge, combined with extensive research on energy medicine and energy psychology, led him to create Psychosomatic Energetics (PSE). He first introduced PSE for peer review at a presentation in 1997 at the renowned Baden-Baden Medical Week convention, where he is now an annual presenter. In 1998, he developed the REBA test device with biophysicist Dieter Jossner. He has lectured extensively on PSE worldwide and has developed a comprehensive PSE seminar series, which leads to designation as a Certified Energy Tester.

Dr. Banis has been in general practice since 1985 at his clinic in Saarland (Germany). He has authored over 200 articles on such various topics as adrenal fatigue, fibromyalgia, and the emotional components associated with cancer. He is also the author of 7 books, including *Psychosomatic Energetics: A Handbook for Therapists* and *New Life Through Energy Healing*. Trained as a medical doctor, Dr. Banis has the unique ability to bridge the gap between conventional and naturopathic healing methods. He is regarded as one of the most advanced and well-known experts in energy medicine in the world.

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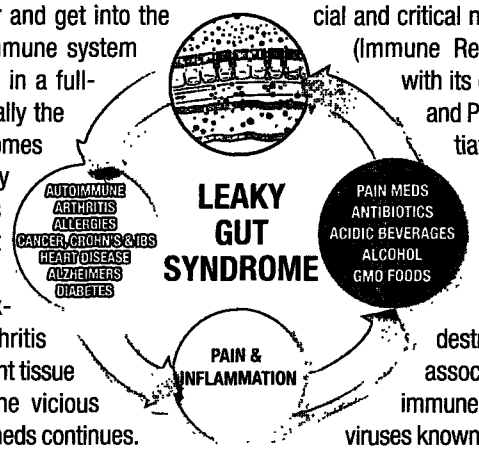
The One-Two Punch for Arthritis

Millions of Americans treat their achy joints and arthritis pain with over-the-counter pain relievers and prescription pain medications. These drugs bring temporary relief but do nothing to halt the progression of joint damage and what's even worse is that these pharmaceuticals are contributing to other co-existing chronic and autoimmune conditions. The pain they and you hoped to alleviate is actually causing your patients MORE pain!

Pain medications mask pain, but continue to damage GI tissue, thereby exacerbating Leaky Gut Syndrome (LGS). When undigested food particles and toxins cross the intestinal barrier and get into the bloodstream, the immune system produces antibodies in a full-scale attack. Eventually the immune system becomes overrun, and the body starts attacking its very own tissues (not just the undigested food particles and toxins). The pain of arthritis increases as more joint tissue is destroyed, and the vicious cycle of taking pain meds continues.



Simply put, unless you heal LGS, you can't stop the *primary* cause of arthritis.

Colostrum-LD® is the only substance clinically proven to repair and prevent LGS, and healing a patient's permeable gut halts disease progression. But, that's only half the solution. Existing cellular and tissue damage caused by LGS still remains, and inflammation resulting from a hyped-up immune system must be attenuated if true healing and natural pain relief is to occur. This is the function of Proline-Rich Polypeptides (PRPs) in colostrum.

PRPs are powerful immune modulators which help regulate the thymus gland and stimulate the production of either helper or suppressor T lymphocytes, depending on the need to either stimulate or suppress immune system activity. PRPs also induce the growth and differentiation of ß lymphocytes and stimulate cytokine production, particularly IL-10, an anti-inflammatory cytokine. The most active PRPs in colostrum are the PRP-2s whose mechanism is primarily antimicrobial, and the PRP-3s whose mechanism is primarily anti-inflammatory. PRPs are not species specific, which makes bovine colostrum an excellent and abundant source. PRP-3s are absolutely critical to stopping the destruction of joint tissue.

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Sovereign Laboratories is on the forefront of colostrum research and processing to maximize bioavailability of active components. The Liposomal Delivery (LD) system is an applied coating which allows powdered colostrum to readily dissolve in liquids and ensures that it will bypass digestion; will be transported through the bowel wall; will circulate throughout the body; will reach the organs and cells; and will remain bioavailable at the cellular level. "Liposomal Delivery makes colostrum up to 1,500% more bioavailable" (Douglas Wyatt). When used in combination, Colostrum-LD and IRM are clinically proven to provide the one-two punch for arthritis and other chronic conditions.

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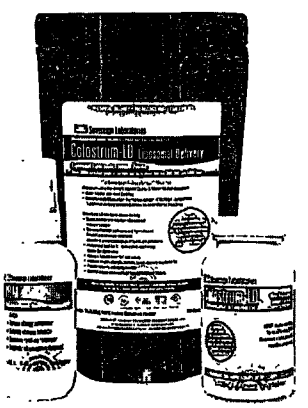

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Sovereign Laboratories

Where Do You Find A Doctor Like Hippocrates When You Need Him?

by Laurie Dennison Busby, BEd

Never take away a person's hope.
It may be all he has.
– Author unknown

A series of insults to my health within a year's time (blood poisoning from a fire ant sting, a pesticide exposure immediately followed by a virus that lasted months) left me with a multitude of unexplained signs and symptoms: overwhelming fatigue, tremor, tachycardia, orthostatic hypotension, swollen painful lymph nodes, crimson crescents on my pharyngeal pillars, and upper airway reactions, which would later turn into more systemic hypersensitivity reactions. So began a search to get well.

Based on my family history, my first stop was an endocrinologist, who told me that fatigue came with age; after all, I had just turned 30. He had overlooked my strong family history of endocrine diseases (Hashimoto's thyroiditis, Addison's disease, and type 1 diabetes) in order to reach that conclusion. Within a year and a half of that visit, a partial thyroidectomy and biopsy for what turned out to be a Hürthle cell thyroid tumor also showed that I was developing Hashimoto's thyroiditis (HT). So much for it being just my age.

Prior to the surgery, I had begged the surgeon to send one of my lymph nodes for biopsy too. They had been swollen and painful ever since the virus, and this was an opportunity to find out why. He had said he wouldn't unless the tumor turned out to be cancerous, but during surgery, the lymph nodes looked "so deteriorated" that he had changed his mind. The lymph node showed reactive hyperplasia. At least I had a clue.

The next doctor whom I saw suggested an antihistamine for the hypersensitivities, and if that didn't work, an antidepressant, because he had heard that I was divorced. He had jumped to an erroneous conclusion without running any tests and while once again overlooking my personal and family medical history. To be so sick and get this response was devastating. I felt hope slipping away that I'd find any help getting better.

It was at this point, my aunt, a nurse anesthetist, insisted that I learn how to read medical studies. She had been down this road before, looking for answers at a time when there were few. Her husband, a doctor, had died from multiple sclerosis complications. She handed me his huge medical school dictionary and a few medical studies and told me I was going to learn as much as I could because I had something with no answers.

My aunt had given me what the illness and the doctors had taken away: a sense of empowerment. However, while she had given me an incredible gift, my aunt was a nurse and more reluctant to give up on the medical community. She encouraged me to keep sharing my symptoms with doctors in hopes of getting an answer. If my body had been crushed by this illness, my spirit continued to be crushed by those encounters.

In an effort to avoid a known trigger, lawn spraying nearby, I sometimes had to leave my home and drive to a parking lot and sleep in my car. (The hypersensitivity reactions would have made looking for a hotel too difficult.) On one of those occasions in my car, I woke up sick with a respiratory infection, and with my doctor out of town, I went to a walk-in clinic.

By now I was beginning to believe that I had chronic fatigue syndrome (CFS) and the hypersensitivities that often accompany it.[1,2] In one CFS cohort, 46% of the patients developed autonomic symptoms after a viral infection, and in another, some of the patients with a viral-trigger were left with crimson crescents on their pharyngeal pillars.[3,4]

When the doctor heard that I thought I had CFS, he told me, "CFS is just depression."

I didn't bother to try to defend myself. It is hard to prove a negative, but I did try to defend the illness. I said, "Depression is common in any chronic illness. Look at MS."

He said, "Yes, but MS is a devastating illness," implying that this was not. I thought of his words that night as I slept in my car.

For years, I had been faithfully reading the studies as if it were my sole occupation, but I wasn't getting anywhere, since fatigue and hypersensitivity reactions were not disease-specific symptoms and had a multitude of possible explanations. Then my mom developed dilated cardiomyopathy (DCM) and a reaction

to her medicine hydralazine (testing positive for antinuclear antibodies), and I saw a new endocrinologist.

When I told the endocrinologist that I was having a hard time taking my thyroid medicine because it made some things better but the tachycardia and fatigue worse, she said, "Hashimoto's thyroiditis is usually easy to treat, but I have a handful of chronic fatigue syndrome patients, and all of them tell me they have a hard time taking the medicine."

What were the chances that one endocrinologist would have a handful of other patients with CFS, Hashimoto's thyroiditis (HT), and the same reaction to their medicine? In addition, some patients in a CFS cohort had left ventricle dysfunction and dilation.[5,6]

I wondered about a possible genetic predisposition and if these and other diseases were more prevalent in patients with CFS and their families. I surveyed almost 100 patients, and many reported a personal and/or family medical history strikingly similar to my own, especially in patients with a viral trigger. The results also allowed me to see definite subgroups of patients. I contacted several CFS researchers with the findings, and one suggested that I try to get the results published.

Meanwhile, I was also reading about hydralazine reactions, which had several known risk factors, among them the patient's human leukocyte antigens (HLA).[7] HLA are immune-system genes that play a role in response to infection, the risk of developing autoimmune diseases, and the risk of adverse drug reactions. While several HLA had been associated with HT and DCM, from the studies that I could find, only HLA-DR4 had also been associated with Hürthle cell thyroid tumors and reactions to hydralazine.[7–11] In addition, HLA-DR4 was one of the HLA that had been found in CFS.[12] In that cohort, patients had evidence of viral reactivation.[12] I asked our family doctor if we could be tested. Mom and I were both positive.

In contrast to HLA-DR4 and the diseases associated with it, another potential CFS HLA, HLA-DQB1*06, was not just different but appeared to be almost the mirror opposite, possibly protecting from some of the diseases that HLA-DR4 conferred risk of while also conferring risk of diseases such as narcolepsy.[13–17] HLA-DQB1*06 was found in a CFS cohort with sleep disorders.[18] CFS researchers appeared to be looking at different subgroups of patients, if

not different diseases, and this could help explain the inconsistencies in the research findings and help them subgroup patients for future studies.

As hard as it was for me to make the trip, I thought that it was important to try to go to Washington, DC, and give this testimony before the Chronic Fatigue Syndrome Advisory Committee (CFSAC) to the Department of Health and Human Services (HHS), but it seemed to fall on deaf ears. So did any progress I tried to make with specialists.

I thought I had learned enough that if I tried another specialist, it might turn out differently. Instead, on my return visit, the specialist handed me an out-of-date 20-year-old study which theorized that CFS was just depression. By now, I had been sick well over a decade. My eyes started to well up with tears as I realized that nothing had changed, there was still little hope of finding help, I was never going to get any better, and on top of all that, it was costing me a lot of money to be treated this way.

The doctor pointed to the tears as evidence that she was right, saying: "I told you it was just depression." I wanted to tell her the only depression that I felt was iatrogenic, caused by the doctors.

With each disastrous visit, it took longer for me to get up the courage to go back to a doctor and put myself through that again, but by now the hypersensitivities had expanded to include swelling of my face and throat and excruciating rashes that started below the surface of my skin and covered my entire trunk and to exclude more and more medicines that I could take, particularly antibiotics, so once again, I looked for help.

I saw an immunologist who asked why I was there. I told her about the rashes and that I needed to be able to take antibiotics but, "I have a hard time taking medicine because I tend to react to everything,"

She told me, "That's impossible!" (She was probably thinking in terms of allergies, wherein you make IgE to a specific thing.)

However, to her credit and despite what she said, she tested me for some of the known causes of hypersensitivity reactions: total IgE, tryptase (a marker of mast cells), and so on. However, when most of the tests came back normal, she wanted to look at my soaps as the source of my reactions. All I could think was she must not have much faith in her patients if she believes that a person could be sick as long as I had and not have tried eliminating things such as that long before they ever came to see her. ➤

I knew that these reactions weren't "impossible" and that there had to be a test for them somewhere. I took the few clues that I had (my symptoms; my personal and family medical history; and my test results, positive and negative) and went back to searching for studies. While the results from the tests that she had run had been within normal limits (WNL), I noticed that complement C4 was at the low end of normal.

I remembered reading something about low C4 from when I was searching for causes of facial swelling. Low C4 and decreased levels or activity of the C1-inhibitor (INH) are seen in hereditary angioedema and acquired angioedema. In those conditions, C1-INH deficiency or dysfunction can result in uncontrolled swelling, and when the throat was involved, the swelling could be life threatening. In one study, up to 30% of those untreated patients died of asphyxiation.[18] In addition, that type of swelling was due to bradykinin and not histamine, so medicines used to treat classic allergies, antihistamines and steroids, had little if any effect.[19] They were incredibly difficult diseases to live with, "Despite striking advances in medical knowledge ... patients continue to die from laryngeal attacks. The disease thus imposes an enormous burden on patients as well as their families, often preventing them from leading a productive life."[20]

I asked our family doctor to test me for C1-INH levels, and that test also came back at the low end of normal, 12 (normal range 11–26). I wrote a researcher in the field and asked if I could still have the disease. He said, "Yes," and suggested that I have the test rerun during a reaction, when the levels would be expected to fall further. I was in the habit of only getting blood tests on my best days, since my reactions were so severe on my worst days that I was afraid to do anything that could possibly make them worse, especially since I hadn't found a way to stop them.

My doctor asked if I wanted to be retested, but I told him, "No, not yet." I believed that this might be part of the answer, but if I was going to have to fight insurance to run tests, I'd rather move on to a new one that might explain the rashes.

I went back to HLA-DR4, one of the few definitive test results that I had besides autoantibodies to thyroid peroxidase. HLA-DR4 had been associated with other hypersensitivity reactions including chronic urticaria (CU).[21,22] The studies on chronic urticaria led me to studies on multiple drug hypersensitivities (MDH), a.k.a. multiple drug "allergy" syndrome, and those patients "... show a marked propensity to react to several chemically unrelated antibacterial drugs."[23,24]

In some patients with these and other hypersensitivity conditions (asthma, CU, and MDH), there was an increased frequency of autoantibodies to thyroid peroxidase (TPO) or thyroglobulin (Tg); a positive autologous serum skin test (ASST); autoantibodies to the high affinity IgE receptor (Fc epsilon RI [FcεRI]); and/or autoantibodies to IgE.[23–27] (A lab even includes tests for anti-TPO and anti-Tg in its CU panel.)

In some patients, anti-FcεRI, anti-IgE, or another unidentified factor could cause histamine release from basophils and anaphylaxis.[21,23,27,28] There was a particularly strong association between being HLA-DR4 positive and the ability of a person's sera to induce histamine release in patients with CU.[21]

I had found a test that I believed would be positive. I went to one last specialist, another immunologist. I pulled out the test I had found, anti-FcεRI. He told me with confidence that he had heard of it, but it wouldn't be positive in me.

I had always held out hope that even if the doctors couldn't or wouldn't help, I might be able to find the right studies as I had been able to do to help my mom when she had developed DCM and was slipping into heart failure. The studies showed that numerous cardiologists had kept her on the wrong medicine.

But something changed in me after that last doctor's visit. I had been determined not to let the illness win, but I didn't have the energy to continue to fight it and the doctors too. The immunologist had been so convinced of his pronouncement, I lost faith in myself. I finally gave up and let go of the hope that had been keeping me afloat.

I suffered through the rashes for about the next two years, and if my health hadn't gotten worse, I might never have gathered the courage to ask for the test again, but the rashes just wouldn't let up, and another search of the studies brought me back to the same test. This had to be it.

No more specialists. I wrote to a researcher at Harvard to ask which lab they used to do their study and asked my family doctor, who is truly a saint, if I could be tested for anti-FcεRI and anti-IgE. Both tests came back positive, but only anti-FcεRI were at levels considered significant.

Based on my HLA and comorbid Hashimoto's thyroiditis, a follow-up basophil activation test (BAT) or basophil histamine release assay (BHR) is likely to be positive and show histamine-releasing ability.

I believe I have found at least part of my answers. Ironically, all these years while I didn't have an accepted name for what I had or a test to prove it, when I tried to avoid my triggers, people judged me. Now, I had a test result in common with other hypersensitivity conditions, and those patients were being told to avoid their triggers.[29]

After the test came back positive, I e-mailed CFS researchers and researchers who had tested for these autoantibodies in other diseases. I was hoping that they might check some of the other patients with CFS, who also had the hypersensitivities.

One researcher said that he had retired but that any reputable researcher would want to take a look at this. Another, who had heard my testimony in Washington, DC, encouraged me to write up the results and try to get them

published, which *Townsend Letter* did. Then there were the other responses, the dismissive ones, similar to what I had gotten from doctors over the years.

I have come to believe that doctors take the Hippocratic oath but don't always internalize his words. Hippocrates also said, "Cure sometimes ... comfort always." Even though my primary doctor couldn't always help me, he always made me feel as if I was believed and heard, which left me hope, which is powerful.

I met so few truly great doctors along the way. Where do you find a doctor like Hippocrates when you need him? To doctors, I would like to ask, are you going to be that kind of doctor?

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Laurie Busby received a BEd from the University of Missouri. At age 30, she developed chronic fatigue syndrome and the hypersensitivities that sometimes accompany it. Shortly thereafter, her aunt, a nurse anesthetist, handed her a huge medical dictionary and some studies, insisting that Laurie learn how to read them because she had something with no answers. Since that time, Laurie has asked for several tests that have given her incredible clues about her illness, conducted a family medical health survey among patients, testified before the CFS Advisory Committee to the US Department of Health and Human Services, and started a chronic illness blog, cfsfmmcsandrelatedstudies.tumblr.com, in an attempt to share what she has learned.

A New Method For Lowering Blood Glucose Levels While Satisfying Cravings for Sweets

by Brian Scott Peskin, BSc

There are over 29 million Americans with diabetes, and another 57 million are prediabetic (as of 2012).[1] From 1997 to 2007, the number of diabetics increased by 48%.[2] In the US, the incidence of diabetes is increasing approximately 1% per year with no end in sight.[3] Pre-1940, there were no type 2 diabetics, and type 1 diabetes was rare. Diabetic complications can be significant. For example, diabetic foot ulcers (DFUs) alone cost the health-care system over $10 billion/year, and the chance of death within 5 years of DFU diagnosis is greater than that for many cancers.[4]

What Caused the Diabetic Explosion?

Over the last 50 years, the following events stand out: (a) The US government wanted to grow America's farming industry. High-glycemic wheat products became king. So did fruit juices. (b) The US government embraced the notion of a high-fiber diet. Irish physician and surgeon Denis Burkitt postulated (guessed) in 1971 that Africans had less cancer and heart disease because they consumed more plant foods containing fiber. Heart researcher Dr. George Mann did work documenting that a high-fat/animal source diet of the Masai tribe lacking plant-based (fiber) foods did not predispose them to heart disease, and was conspicuously absent from Burkitt's book, *Western Diseases*. With this vital information overlooked, America embraced the oat-bran fad whereby 60% of caloric content would be from grains. No one calculated that this would add a minimum – based on only a 2000 calorie/day diet – of 60 teaspoons of sugar (glucose) to the bloodstream each day, making existing diabetics' blood sugars significantly worse. (c) Researchers wrongly focused on minimizing salt intake. Science was suppressed showing that natural salts (such as minimally processed sea salt) are active transports (via facilitated diffusion) for insulin – making existing insulin and injected insulin *more effective* (decreased insulin resistance).[5–7] Most health practitioners believe that all salt elevates blood pressure. That is incorrect, and salt consumption is *not* the cause of elevated blood pressure in the vast majority of patients.[8] The 10,000-patient INTERSALT Study concluded: "Salt has only a small importance in hypertension."[9] Lack of salt is now known to increase insulin resistance and increase the risk of CVD.[10,11] (d) The next mistake made by medical researchers was advocating a supposed heart-healthful, low-fat "Prudent Diet" (promoted post-1957). This diet advocated replacing saturated fats from eggs, butter, cheese, cream, and lard with highly processed polyunsaturated vegetable oils such as margarine. It is now known that *processed* (nonfunctional) polyunsaturated linoleic (LA) acid-based cooking oils such as interesterified fats (the supposedly more healthful replacement for transfats) – sold in supermarkets and used in restaurants – significantly elevate blood glucose levels.[12,13]

There Are Three Distinct Components to Insulin Resistance

Insulin Resistance – Phase 1: Pancreatic Overload

Let us now turn to the etiology of insulin resistance. First, humans were never meant to ingest the enormous numbers of carbohydrates so common in America today. For example, a 5-fold increase in plasma glucose, approximately just 5 teaspoons of sugar, causes a 20-fold increase in insulin output (Figure 1).[14] Diabetic patients often consume more than 10 teaspoons of sugar at just one meal, and they often eat 4 to 6 times or more per day. Additionally, many diabetic patients consume 15 to 20 teaspoons of carbohydrate in a single sitting. Although blood glucose levels above 250 mg/DL are uncommon, they can occur, as the *Textbook of Medical Physiology* illustrates (Figure 1).

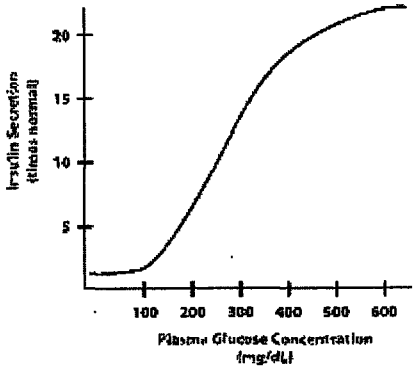

Figure 1: Insulin secretion response to blood glucose. Image from Guyton AC, Hall JE. *Textbook of Medical Physiology*. 9th ed. W. B. Saunders Co.; 1996:977. Courtesy W.B. Saunders.

Continued on page 74 ➤

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Lowering Blood Glucose Levels

➤ *continued from page 72*

Every 20 calories/5 grams of carbohydrate = 1 teaspoon of sugar potentially in the bloodstream – raising BG levels.

Insulin Resistance – Phase 2: Impaired Insulin Clearance Rate (MCRI)

What is not so obvious is that there is often an additional problem – impaired clearance of excess insulin generated by supraphysiologic amount of glucose. This supraphysiologic carbohydrate-induced insulin response is often accompanied by a decreased insulin clearance rate – the metabolic clearance rate of insulin (MCRI).[15] This abnormality allows blood glucose levels to potentially drop dangerously low.

Perfect Disaster – Glucose Overload + Impaired MCRI

This excess insulin production coupled with the impaired insulin clearance rate is a "perfect disaster." Because of these simultaneous conditions, a corresponding yet abnormally dangerous "low" blood glucose levels always follow high levels of blood glucose. Therefore – in an attempt for homeostasis – the body will eliminate (destroy) pancreatic beta cells so that less insulin is produced. This will likely be termed an "autoimmune disorder," but it is probable to be instituted as a protective mechanism at the tissue/organ level. Of course, with decreased beta cell functionality, blood glucose in these patients now remains elevated, but the body has no choice; elevated blood glucose levels are less dangerous than low blood glucose.

Insulin Resistance – Phase 3: Impaired Cellular Membranes

A Problem Unforeseen by Nature

The widespread use of *processed* linoleic acid (LA – also termed parent omega-6) in supermarket and restaurant cooking oils has caused havoc in human beings. Cellular fluidity and permeability are impaired with processed LA.[16] Imagine how a plasticized cell membrane would work? At best, inefficiently. These nonfunctional oils impair the cell membrane so hormone transport into the cell is diminished; that is, insulin resistance at the cellular level. Clearly, functional LA is critical to maximizing cellular insulin activity as follows:

2016 Newsflash – LA and AA Decrease Risk of Type 2 Diabetes

- It was recently reported (March 2016) that LA decreases insulin resistance in humans.[17]
- It was also reported that high serum levels of LA are linked to both a decreased risk of CVD and to a "significantly decreased risk of type 2 diabetes."[18]

It is important to understand that omega-3 series oils – such as flax or fish oils – are never used for cooking because, when heated, they are far too reactive with oxygen, becoming rancid quickly. The entire issue is the processed omega-6 oil.

Cellular Specifics

All 100 trillion cellular membranes comprise 50% lipid and 50% protein. The bilipid membrane contains a total of 25% to 33% LA and ALA with a fixed ratio of LA/ALA per organ.[19] All cells have an abundance of LA (parent omega-6) – the LA:ALA ratio is highly in favor of LA (the brain's LA/ALA ratio is 100:1; its DHA/AA is 1.4:1).[20–23] Epithelial cells comprise nearly 100% LA. The typical organ cell has a 4:1 ratio of LA:ALA.[24–26] Muscle tissue cells have even more – a ratio of 6.5:1.[27]

Diabetic Patients Develop Harmfully Modified Cell Membranes

The following example illustrates the physiologic stress that just a small amount of trans fats, interesterified fats, or other processed LA causes: A mere 0.5 gram of processed/adulterated oil – amounting to just 1% of the total oil – causes an overload of 100,000 defective molecules per cell.[27] Does it matter? Yes, it does. Many of these defective substances become incorporated into the cell membrane and change its composition, leading to decreased permeability and insulin resistance.

Cell membranes are specifically regulated for fatty acid composition depending on species.[19] However, there is an exception to this lipid regulation: When manmade oils not naturally occurring in Nature are consumed, they become incorporated in the cell membrane because the body does not recognize them as nonfunctional. Nor will they get "oxidized away." These nonfunctional lipids disrupt the functionality of the cell's membrane.[28] It is further known that the incorporation of these processed fats and oils into both cell membranes and tissues is in *direct proportion to their consumption*.[29,30] Therefore, because most diabetic patients consume significant amounts of processed foods containing these processed oils, they must have significantly impaired cell membranes. This consumption of processed LA in cooking oils is one of the direct causal reasons for the epidemic of insulin resistance in type 2 diabetes.

All diabetic patients must have significantly impaired cell membranes.

Ratio of Tissue Composition

Tissue	Percentage of Total Body Weight	Omega-6 PEO	Omega-3 PEO
Brain/Nervous System	3	100	1
Skin	4	1000	1
Organs and Other Tissues	9	4	1
Adipose Tissue (bodyfat)	15-35	22	1
Muscles	50	6.5	1

Diabetic Patients Suffer Highly Impaired PGE1 Binding Activity

Inflammation adversely affects the delta-6 desaturase pathway leading to decreased PGE1 production [LA→GLA→DGLA→PGE1]. This inflammatory condition is common in diabetic patients because of their elevated blood glucose levels. It is well known that inflammation is caused by glucose autoxidation.

Furthermore, the binding activity of PGE1 – the body's most potent natural anti-inflammatory – is decreased by 58% in diabetic patients.[31] LA and GLA directly improve this deficiency, allowing the diabetic patient to heal faster and suffer fewer inflammation-based pathophysiologic issues. Most importantly, the physiological concentration of insulin required to produce a given effect is lowered with the increase of PGE1 (best supplied from GLA supplementation – bypassing the impaired delta-6 desaturase pathway, maximizing PGE1 production.).[31] Unprocessed LA is also known to decrease the cravings for carbohydrates and improve associated blood chemistry.[32]

> Diabetic patients will improve their insulin sensitivity and lower blood glucose by supplementing with an organic plant-based LA/ALA/GLA formulation daily.

Night Snacking/Cravings for Sweets Solved ... the Secret of the Right Fruits

The protein powder/fruit smoothie combo has the glycemic load of just 1/8 to ½ of cakes, candies, or pizza.

The worst time for a diabetic patient is the evening, when willpower disappears and snacking occurs. This leads to highly elevated blood sugars throughout the evening and into the morning, which is a self-imposed disaster.

Enter the Protein Powder/Fruit Smoothie Combo.

I thank Doug Graham, DC, and Robert Rowen, MD, for their assistance in explaining that all fruits aren't equally glycemic in raising blood sugars. My wife has been a type 1 diabetic for over a decade, so when Dr. Rowen introduced me to this secret, I "experimented" on her. The results astounded me. Debra drank an entire protein powder smoothie made with 10 oz. of frozen peaches. That's over a half-pound of fruit, and with the water added – more than enough to expand anyone's stomach to the maximum.

Before the experiment, I made sure that she hadn't eaten anything for the previous 3 hours and that her blood sugars were on the high side (they were 150 mg/dL) to limit the effect of any possible endogenous insulin that she still produces. Less than ½ ounce of protein powder has negligible effect on raising blood glucose, but I calculated that with this amount of peaches, her blood glucose (BG) should have risen by at least 150 points. It rose 17 points as measured 2 hours after she was finished eating (with a highly accurate meter). I was dumbfounded. By comparison, with the consumption of a half pound of cake/pie/ice cream, patient blood sugars would rise significantly higher. Of course, I redid the experiment the next day under the same circumstances. BG increased 15 points – the exact result within the accuracy of the meter. A teaspoon of glucose (from a soda, cake, or ice cream, etc.) raises blood sugar by 70 to 90 mg/dL. How did the glucose from the fruit "disappear"? That will be answered shortly.

I call this great combo of protein powder and fruit the "water diet" because so much of the fruit's content is water. This special combination uniquely fills the patient's stomach – both volume-wise and in satisfying the craving for sweets – the patient won't want to eat anything else afterwards for many hours, if at all. Furthermore, your patients obtain protein and fully functional LA (from the fruit), too. Peaches, cantaloupe, watermelon, strawberries, and blueberries are a few good choices. For optimal effectiveness, I recommend 5 to 10 ounces of fruit per smoothie. I cut up the fruit, place it in a plastic bag, and freeze it, eliminating the need for ice. Just add water and blend for an ideal consistency.

> No fruit juices, dried fruits, bananas, or pineapple are to be used.[33,34]

Consuming whole fruit satisfies your patients much more than fruit juice, which significantly increases blood glucose levels while *not* fulfilling the appetite. ("Consuming whole fruit produces ratings of satiety more than fruit juice."[34])

What Makes Fruit Different?

Fruits are combinations of three different types of sugars: glucose, fructose, and sucrose. Sucrose is a naturally occurring combination of 1 part glucose and 1 part fructose and is naturally very resistant to breakdown via hydrolysis: these molecules normally stay together. Glucose is blood sugar, so pure glucose is the benchmark against other insulin-response foods. Fructose is known as the "fruit sugar"; it is the most satisfying (sweetest) of all sugars, and the natural fructose from fruit does not cause a significant rise in blood glucose, or cause liver issues. Nature created an ideal food. Patients can perform their own individualized "fruit experiment" to determine the specific fruits for minimum BG rise.

> *Processed* fructose such as "high-fructose corn syrup" (HFCS) is the problem, not natural fructose.

GLUTs: The Sugar Transporters

There are 14 glucose transporters (GLUTs); 7 can transport fructose, with GLUT5 being the sole specific fructose transporter. Physicians are familiar with GLUT4, regulated by insulin: with an improper insulin response, you get fat. But there are many other pathways the sugars in fruit utilize that don't make you fat or increase BG levels. For example, GLUT1 / GLUT3 fuel the central nervous system – not adding to adipose tissue. They have kinetic and regulatory properties in both cellular and whole body glucose homeostasis. GLUT5 regulates fructose in the intestines, testis, kidney, skeletal

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muscles, and brain – not raising blood sugar. Physicians need to have their patients find specifically what fruits are best for them.

Success with LA/ALA/GLA and Protein Powder / Fruit Smoothie Combo

I have been vegetarian for many years. ... Lately, I have noticed a rise in my blood sugar count to the high borderline, which means prediabetic. I have been asking myself what was I doing wrong. I have started using the unprocessed, organic omega-6 and -3 in the ratio as Prof. Peskin suggests.[35]

I also recommend it to my patients, friends, and family. Almost immediately, I felt a significant decrease in carb cravings ... which was followed by losing weight, feeling energetic and satisfied.

– Nurit Nitzan, clinical psychologist/ holistic health practitioner Israel

I was born in 1961 and received the prediabetic diagnosis in 2009. When I was first diagnosed with prediabetes, I started a vegan diet based on a best-selling author known as an excellent resource for vegans. But it didn't work for me. My sugars would skyrocket ... it was frustrating to say the least. I then tried the ADA diet that was a "little" better but not ideal. I stayed away from juices, cookies, sugar, etc. and still had glucose meter readings of 125–180 after meals.

After adopting his [Peskin's] recommendations, I quickly normalize my postmeal sugars to a range of 85–105. It was amazing. I also have a device that allows me to monitor my LDL, HDL, and triglycerides. Although my total cholesterol went up to 185 from 155, my HDLs went from 30 to 75 and my triglycerides went from 115 down to 70. The protocol works – my sugar has continued to stay in a range of 85–105 and morning fasting sugars typically stay in the 85–95 range. What a difference from the vegan and ADA diets.

– Ed E.

Thank you for recommending the protein powder/fruit smoothie. Up until then, Paul has only had one strawberry a day for fear of raising his blood sugar. We were very surprised when the protein powder/ fruit smoothie did not raise his blood sugar. Also, he has not awakened starving in the mornings like he had been.

– Paul and Rhoda M.

Acknowlegement
Special thanks to pediatric endocrinologist Amid Habib, MD, for his technical assistance.

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Brian Scott Peskin, BSEE, is a translational research scientist with a long-term interest in diabetes and its underlying pathophysiology. He specializes in lipids-based pharmacognosy – a class of drug derived from plant-based sources; specifically, seed oils. Consulting for numerous nutritional companies, including Your Essential Supplements (USA), BioAge Ltd. (UK), Pure Form Omega (Canada), Natural Bodz (Australia), and Succesboeken (Netherlands), he holds multiple patents regarding plant-based lipid formulations. Peskin earned his bachelor of science degree in electrical engineering from the Massachusetts Institute of Technology, founded the field of Life-Systems Engineering Science in 1995, and was appointed adjunct professor at Texas Southern University in the Department of Pharmacy and Health Science from 1998 to 1999. He is chief research scientist at Peskin Pharmaceuticals (prof-peskin@peskinpharma.com).

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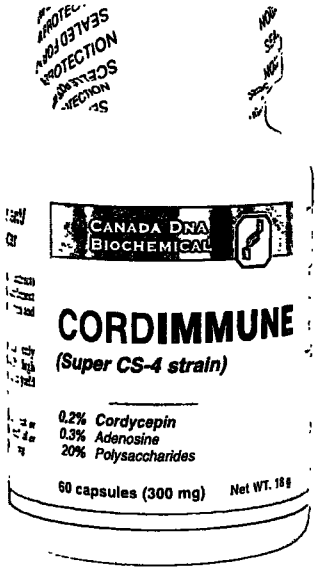

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Field Control Therapy and Documented Reversals of Type 2 and Even Type 1 Diabetes

by Savely Yurkovsky, MD

The spectrum of conditions associated with diabetes is very broad. It includes excessive weight and physical inactivity leading to insulin resistance and so-called metabolic syndrome, food allergies, autoimmune disease and low thyroid, infections with candidiasis and parasites, excessive sugar and carbohydrate consumption, and other disorders. Lately, scientific research has established that even external energetic influences such as electromagnetic fields (EMFs) can also cause serious metabolic problems, including glucose dysregulation in the blood and brain. A wide variety of alternative interventions, besides oral medications and insulin, have been offered for diabetes but with a mixed degree of success. The importance of effective treatment of diabetes is underscored by the fact that besides this condition causing cardiac and systemic vascular disease, the drugs, oral and especially insulin, lead to the same even if at a slower pace, besides other side effects. Therefore, discontinuation and reduction of these medications by attaining good blood sugar control is a medical necessity in itself. We report several cases of successful treatment of diabetes based exclusively on body energy based diagnosis, bioresonance testing, and Field Control Therapy (FCT) homeopathic treatment.

A Case of Reversed Diabetes

A middle-aged man, likely with type 2 diabetes, was receiving a total of 50 units of insulin daily, on a chronic basis, as prescribed by his diabetes specialist.

Bioresonance testing revealed the presence of dental metals, silver amalgam, and mercury in many organs including the pancreas. Homeopathic isodes of silver amalgam and mercury were administered in the potencies determined by testing along with proper homeopathic organ support in order to assure appropriate excretion of these metals from the body.

Follow-up: Two weeks after this treatment, the diabetologist discontinued the insulin prescription because the patient's blood sugar concentration was dropping rapidly. However, he prescribed an oral diabetes medication because "the diabetic patient cannot lose his diabetes."

Bioresonance testing indicated an adverse reaction to the drug especially against the normal energetic reading of his pancreatic gland, suggesting its return to normal function. The drug was discontinued in order to avoid potentially dangerous hypoglycemic spells.

Follow-up: Throughout a period of 1 year, blood glucose levels remained consistently normal.

A Case of Reversed Diabetes, Coronary Heart Disease, and Prostate Disease

A man in his 60s with recent-onset severe diabetes had experienced a 30-pound weight loss and was hospitalized on an emergency basis due to very high blood glucose and ketoacidosis. He was released on combination insulin therapy, with a total of 55 units a day. His other medical problems included 50% vision loss, thought to be due to diabetes, elevated serum prostate marker, PSA, and extensive coronary artery disease with the presence of several significant circulation defects or ischemia documented by stress-imaging testing.

Bioresonance testing suggested systemic mercury intoxication, likely of a dental origin, invading many organs, including the pancreas, coronary arteries, and prostate. Opportunistic infections, especially *Candida albicans* and parasites, were present as the result of metal-induced immune toxicity and disturbed gastrointestinal bacterial flora caused by mercury and previous administration of oral antibiotic drugs. Blood testing confirmed the presence of mercury in his body.

Treatment: Primarily, homeopathic isodes to remove the aforementioned causative agents, with appropriate homeopathic and glandular organ support. The patient was advised to begin tapering off his daily insulin dose gradually in order to avoid hypoglycemic attacks in anticipation of recovery of his pancreatic and general metabolic functions.

Follow-up: 1 month later, insulin was completely discontinued while his blood glucose remained in the low normal range. Two months after homeopathic therapy was initiated and continued periodically, he reported a complete restoration of his vision. Several months later, the patient was placed on weekly

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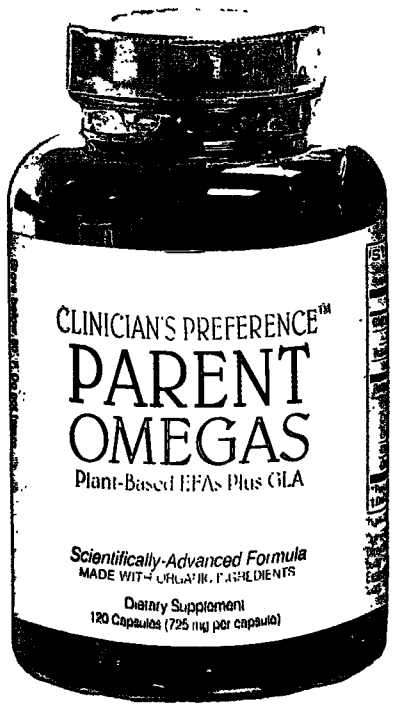

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FCT and Diabetes

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intravenous infusions of EDTA chelation therapy, upon his request, to enhance the treatment of his atherosclerotic vascular disease. The previously elevated serum PSA concentration decreased 4-fold and became normal. One year following the initial abnormal cardiac imaging scan, the new report concluded: "I have compared this study to the previous study, and I do not see the findings previously reported. Based on my review, this study appears within normal limits. I see no definite evidence of ischemia or infarction."

It should be noted that this patient had not been placed on any strict low-fat diet, cholesterol-lowering agents, or heart medications. This case was treated many years ago and I did not have the necessary hospital records, at that time, to indicate if this was type 2 or type 1 diabetes.

The Case of a Significant Improvement of Diabetes, So Far

A man in his 70s with a year-long history of type 2 diabetes, on a strict no-sugar and low-carbohydrate diet, controlled weight, yet poorly controlled diabetes on high doses of insulin and an oral diabetic drug. His blood glucose was consistently running in the high 300s and low 400s (normal range: 65–99 mg/dL), with the most recent glucose level at 361 and HgbA1C at 12.9 (normal range: 4.8–5.6) His prior FCT treatments for mercury toxicity, candidiasis, and parasitosis, all of which helped his other medical problems, did not significantly affect his diabetes.

Bioresonance testing indicated the main disturbance in the liver, along with other afflicted organs, due to a variety of toxic metals.

FCT treatment addressed these exclusively homeopathically.

Follow-up: His self-monitored blood tests registered consistent glucose levels in the 90s and low 100 range, while both his daily insulin and oral diabetic drug were reduced. The laboratory blood test confirmed this by registering a reduction of his glucose level to 93 and HgbA1C to 7.5. The treatment is still in progress and he reported further reduction of his HgbA1C level, obtained by his diabetologist.

A Complete Reversal of Type 1, Insulin-Dependent Diabetes

This case was reported by a recently trained and capable FCT practitioner Lonnie Herman, DC, of Griffin, Florida (askdrherman@gmail.com).

A teenager was admitted to a hospital after not feeling well for months, in a state of lethargy, severe ketoacidosis, and very high blood glucose level, exceeding 700 mg/dL, and HgbA1C at

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14. She was diagnosed as having type 1 diabetes, as she had low C-peptide levels and high GAD-65 antibody, both indicating pancreatic failure to produce enough insulin due to an autoimmune process of an unknown cause. She was discharged on a strict diabetic diet and high daily doses of insulin, in the 30 unit range.

Bioresonance testing 1 month following her hospital discharge suggested many potential causative agents. Most notable among these were mercury, pesticides and organic chemicals, residues of antibiotics and childhood vaccines – MMR and DTP – infections with funguses, molds, viruses and worms, all complicated by environmental electromagnetic radiation.

Treatment: She was treated exclusively through homeopathic FCT system, and EMF-reducing Memon technology. Following only several treatments, her laboratory tests confirmed complete normalization of her blood glucose, HGbA1C, C-peptide, and GAD-65 antibody levels, with her daily insulin treatment discontinued for months so far. Her blood glucose levels remained normal even after her indulging in sweets.

Conclusion

While billions of dollars have been spent on diabetes research over decades, with the research and treatments aiming at a broad range of possible factors, the reported FCT experience confirms one simple recipe in solving problems. This, as expressed by Israeli-born, famous professor of physics at Cambridge University, David Deutsch, PhD, simply states: "Breadth makes it difficult, but depth makes it easy." This means that even while breadth does certainly play a role, it is the depth of both testing and treatment that ultimately distinguishes the most important factors from mere bystanders. ◆

Savely Yurkovsky, MD, has evolved a novel medical model that interfaces important knowledge from biology, medicine, toxicology, and physics. Its primary focus is on the most important aspect of chronic disease – its causes – along with the most effective diagnostic and therapeutic means to address these. This has transformed the often imprecise medical interventions into a far more effective, exact, and predictable science. He has founded a teaching organization, SYY Integrated Health Systems Ltd., which provides training in this medical system under the concept of FCT (Field Control Therapy). He has presented it at many professional symposia in both the US and Europe, including the annual bioterrorism 2005 conference, Unified Science & Technology for Reducing Biological Threats & Countering Terrorism, affiliated with the Department of Homeland Security and Harvard Medical School, among others. Dr. Yurkovsky was nominated for the prestigious Bravewell Leadership Award for "significant contributions to the field of medicine" and "compelling vision for the future of medicine," in 2005. He has authored numerous articles and the book *The Power of Digital Medicine*, which was endorsed by prominent scientists from MIT and Columbia and Stanford Universities, and contributed a chapter on homeopathy to the *Textbook of Integrative Gastroenterology*, edited by the Gerard Mullin, MD, chief of the Integrative Gastroenterology Department at Johns Hopkins University medical school. Dr. Yurkovsky maintains a private practice in Chappaqua, New York.

Announcing The Best of Naturopathic Medicine Competition 2017

The *Townsend Letter* is pleased to announce our eighth Best of Naturopathic Medicine competition. Naturopathic students, faculty, researchers, and practitioners are invited to submit research papers, reviews, and articles. Selected papers will be published in our February/March 2017 issue. The author of the winning paper will be awarded $850. Runner-up papers will be published and authors will receive an honorarium.

Papers submitted should be 1500 to 3500 words and referenced. Author guidelines are available at the *Townsend Letter* website: www.townsendletter.com. Papers should be submitted digitally, preferably as a Microsoft Word document. Papers authored by multiple writers are acceptable; the lead author should be an ND graduate or candidate of an accredited four-year naturopathic school. Papers submitted for the competition may not be submitted to other publications or have previously been published. All entries must be submitted by October 31, 2016.

Send papers to editorial@townsendletter.com. The subject line should read: "Paper for Best of Naturopathic Medicine 2017."

Dried Urine Analysis: Improved Collection, Shipment, Processing, Testing and Storage of Samples

by Theodore Zava

Introduction

Dried urine collection and testing from laboratory-grade filter paper is a relatively new process that is increasing in popularity. Similar to blood spot collection, in which blood drops are collected on a filter card and allowed to dry, the collection procedure for dried urine is simple and can be completed at any location. ZRT Laboratory first realized the feasibility and benefits of collecting and testing dried urine for elements with the successful development and validation of urinary iodine and creatinine tests.[1] These tests were then followed by the successful development and validation of a multielement dried urine assay including iodine, bromine, selenium, arsenic, cadmium, and mercury, which will be used in this article to help describe the benefits of dried urine testing.

Volume of Urine Required is Minimal

Depending on the size of the collection device, it takes very little urine to saturate a filter strip (2 mL for a 2.5 × 6 cm strip of Whatman Grade 903 Specimen Collection Paper). Unlike blood or saliva, urine is plentiful and can be collected throughout the day. Even without urinary urge, sufficient urine can usually be collected to saturate a filter strip.

Collection, Storage, and Shipment of Urine on Filter Strips is Simple

Collection of urine onto filter strips is very simple and can be completed in places such as at home, a doctor's office, or remote locations. Urine is applied to a laboratory-grade filter paper either by dipping the filter paper in urine collected in a vessel or by urinating directly on the strip. The urine quickly saturates the filter strip and can be removed from the urine source immediately after it is applied. After at least 4 hours of drying, the sample is ready to be stored or shipped to the testing laboratory for analysis.

Stability of Elements in Dried Urine Is at Least 1 Month

Analyte stability under different environmental conditions is a major concern for liquid samples, as most are transported and stored prior to testing. Without the addition of antimicrobial/stabilizing agents or refrigeration/freezing of liquid samples, analytical results may be compromised. Liquid urine mercury analysis requires extra care during collection, transportation, and storage of samples to prevent analyte loss, often requiring a preservative such as hydrochloric or

Figure 1: Mercury is stable in dried urine samples stored at room temperature over 27 days.

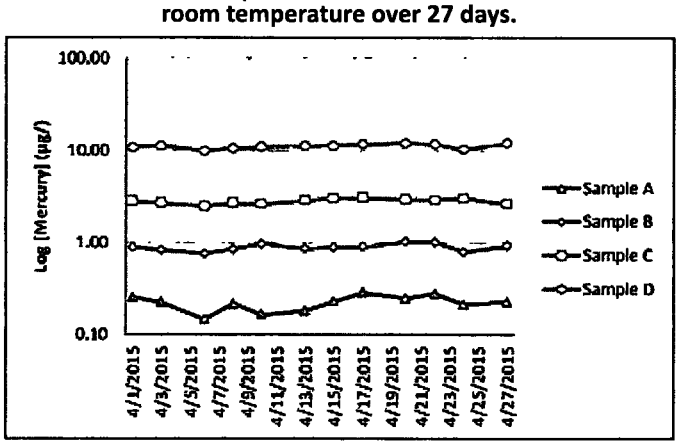
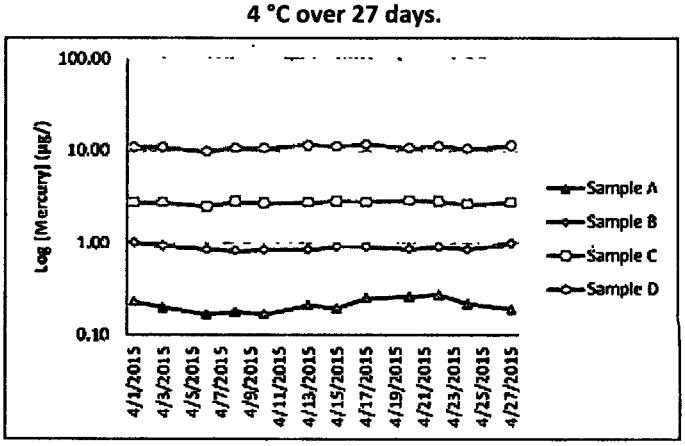


Figure 2: Mercury is stable in dried urine samples stored at 4 °C over 27 days.



sulfamic acid to prevent the adsorption or transpiration of mercury in collection vessels.[2] Addition of these stabilizers can dilute or contaminate the sample, or interfere directly with analysis.[3] Without the use of preservatives, urine mercury may be unstable, especially at higher temperatures or lower concentrations.[3,4] Because of mercury's instability in liquid samples, testing laboratories often recommend or require refrigerated or frozen transportation of urine for mercury analysis, which is expensive and not always an available option. Stability tests show that mercury analyzed from human urine dried on filter paper is stable at room temperature, refrigerated, or frozen for at least 1 month (Figures 1–3).

Transport of Dried Urine Has Few Restrictions and Is More Economical

Dried urine filter strips are very small and weigh very little in comparison with liquid urine collections. Multiple urine filter strips can be packed inside a small shipping device with plenty of room to spare (Figure 4). Since refrigerated or frozen transport is not necessary, shipment around holidays or late in the week (involving extended transfer times) is not an issue.

Bacterial Growth is Not an Issue with Dried Urine

A major issue in liquid urine samples that aren't frozen is bacterial growth occurring before, during, or after transportation. Urine dried on filter paper is not subject to rapid bacterial growth as long as samples are properly dried before storage.

Laboratory Preparation for Testing Is Much Easier with Dried Urine

Liquid samples may require sample pretreatment; for example, centrifugation and/or manual transfer of samples (with its inherent risk of spilling) that can significantly increase sample analysis time. Dried urine samples can easily be processed for testing using a laboratory hole-punch into 96-well blocks, reducing sample preparation and analysis time, which translates to a reduced turnaround time for the client.

Accuracy of Element Testing Is Excellent in Dried Urine Specimens

Analyte results from urine dried on filter paper are equivalent to, and for certain tests outperform, liquid urine samples. Liquid external controls with certified analyte concentrations are dried on filter paper, analyzed, and compared with their known values (Table 1). We further check accuracy by running liquid and dried urine in parallel using inductively coupled plasma mass spectrometry (ICP-MS) and plotting results against each other (Figure 5, p. 84). Some external laboratory controls, once reconstituted from their lyophilized form, are only stable for a few hours, but drying them on filter stabilizes them for over a month.

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Table 1: Analyzed Dried Urine Reference Controls Compared with Their Expected Values

	Iodine (µg/L)		Bromine (µg/L)		Selenium (µg/L)		Arsenic (µg/L)		Cadmium (µg/L)		Mercury (µg/L)	
	Result	Expected	Result	Expected	Result	Expected	Result	Expected	Result	Expected	Result	Expected
Sero Norm Trace Elements Level 1	105	105	3033	3000	29.1	15.8	171.0	158.0	0.25	0.19	0.004	0.096
Sero Norm Trace Elements Level 2	297	297	2910	3000	84.3	71.7	257.6	261.0	4.63	4.90	42	44
ClinCheck Trace Element Level 1	115	120			25.0	29.9	37.5	43.0	2.43	2.46	2.96	2.30
ClinCheck Trace Element Level 2	486	497			70.2	83.2	70.7	83.3	13.9	14.4	24.5	17.3
BioRad 400 Lyphochek Urine Metals Control Level 1					83.6	81.4	60.5	66.8	9.60	9.81	44.3	41.7
BioRad 405 Lyphochek Urine Metals Control Level 2					239.9	217.0	156.0	162.0	18.8	18.4	122.4	123.0
BioRad 376 Lyphochek Quantitative Urine Control Level 1											14.4	15.0

Figure 3: Mercury is stable in dried urine samples stored at −20 °C over 27 days.

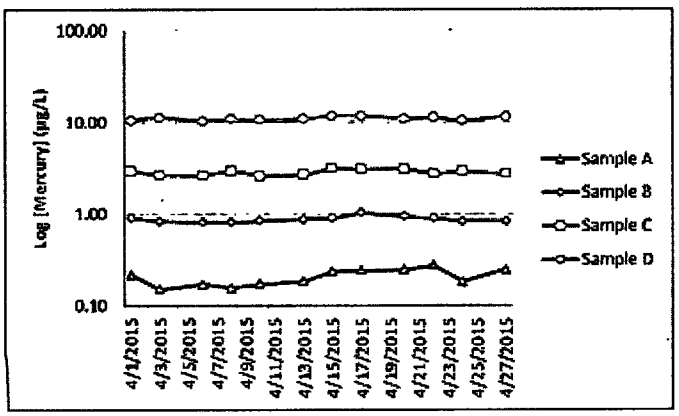

Figure 4. Dried Urine Filter Paper Transportation and Storage

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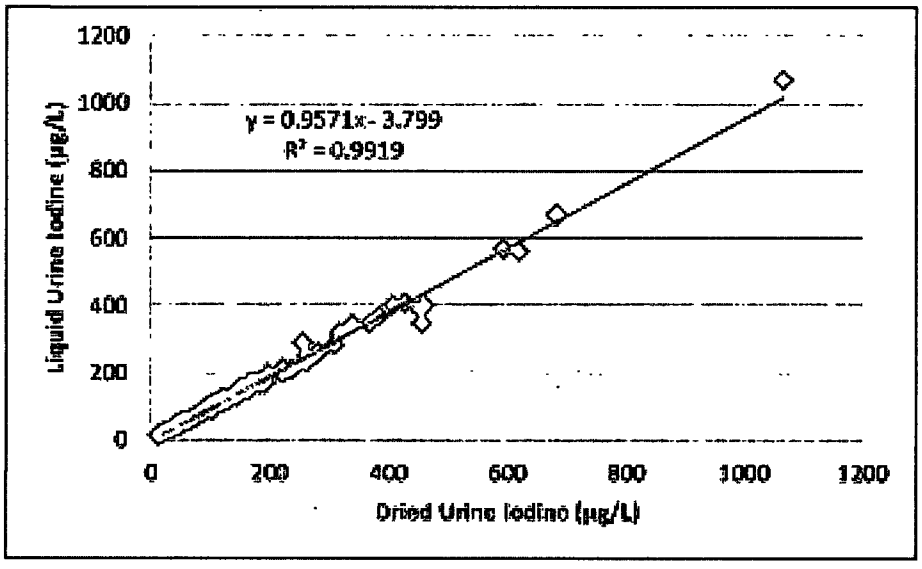
Creatinine Correction Is an Important Part of Dried Urine Testing for Analytes

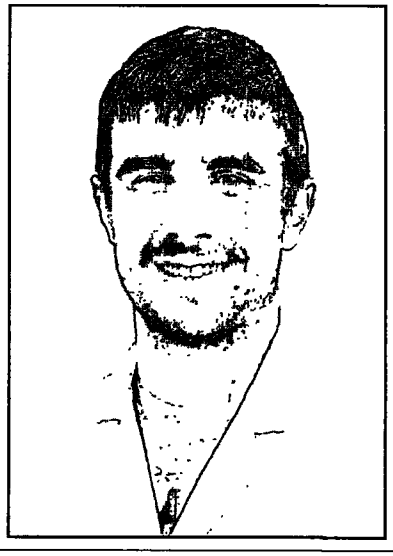
Creatinine is excreted by the body at a relatively constant rate as a breakdown product of creatine phosphate. It is commonly tested along with other analytes in urine to correct for hydration status.[5] Without creatinine correction, individual results will vary widely depending on daily fluid intake. Dilute urine generally appears clear, while concentrated urine might be bright yellow. Visually, it might not be possible to determine if filter paper is saturated or partially saturated with urine, making creatinine a useful indicator of proper collection as well as the degree of concentration of the urine.

Figure 5: Dried Versus Liquid Urine Iodine Comparison (n = 100)



Summary

Improvements in laboratory technology, such as increased sensitivity and specificity for mass spectrometers, have opened new doors for microsampling and analysis of dried samples. Collection of liquid samples on filter paper have gained popularity over the last decade, led primarily by dried blood spot testing and recent advances in dried plasma and dried urine testing.[6] Urine dried on filter paper is advantageous for both clinical testing and research studies due to increased analyte stability and small storage requirements, while simplifying sample collection and transport. Although it will take time for dried urine testing to become a part of mainstream laboratory testing, the benefits of dried samples are becoming well known and are being applied to resolve problems associated with liquid sample types.



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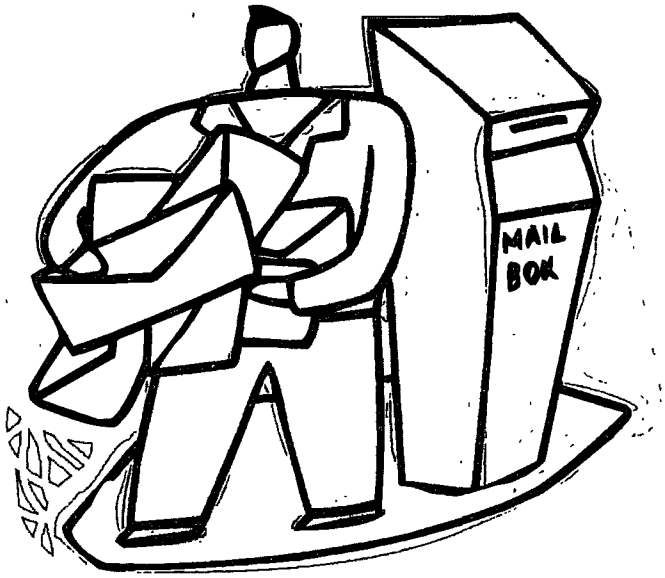
Theodore Zava received his bachelor's degree in biology from Oregon State University in 2009. He is a research associate at ZRT Laboratory in Beaverton, Oregon, where he developed a test to measure iodine, bromine, selenium, arsenic, cadmium, mercury, and creatinine levels in dried urine. His current research focuses on new test development using dried samples while linking intake and excretion of essential elements and toxic metals to cancer and disease.



Letter to the Editor

Re: The Death of Dr. Nicholas Gonzalez

In the February/March edition, Dr. Serge Jurasunas wrote an article about physicians who do not follow their own advice when it comes to lifestyle choices and self-care. While I agree that this is a very important issue to discuss, it was absolutely appalling to use this as a segue to question Dr. Nicholas Gonzalez's health-care regimen. To base an entire article on speculation is an example of an author who prefers opinion over fact. It comes across as a veiled attempt at trying to smear one of the most incredible physicians and research scientists of our time. Obviously the author did not actually know Dr. Gonzalez. To answer the disrespectfully posed questions, Dr Gonzalez "walked his talk" better than most. His diet, supplement regimen, and detox methods were on par with the treatment plans that he recommended. There has been much speculation among the public and scientific community about his actual cause of death. His unfortunate passing came at a time when several other holistic medical doctors met with untimely deaths. If one were to jump to any conclusions, it would not be to accuse Dr. Gonzalez of unhealthy lifestyle choices. One can imagine how unsettling this is for his friends, family, and colleagues who are dedicated to genuine science and medicine.

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Coming in the July Issue: Update on Treating Lyme Disease

A 2014 survey of 3000 patients with chronic Lyme disease found that more than 50% had coinfections with 30% having two or more. The most common confections were *Babesia* (32%), *Bartonella* (28%), *Ehrlichia* (15%), *Mycoplasma* (15%), Rocky Mountain spotted fever (6%), *Anaplasma* (5%), and tularemia (1%).

How Many Do You Know How to Treat?

Lyme disease journalist and patient CJ Puotinen provides us with a nice primer on integrative approaches to treating tick-borne disease. Connie Strasheim discusses integrative approaches to treating "Lyme brain dysfunction." And Christine Schaffner, MD, and Dietrich Klinghardt, MD, update their comprehensive diagnostic and treatment approaches.

The Challenges of Chronic Illness

review by Katherine Duff

Living Well with Chronic Illness: A Practical and Spiritual Guide, by Richard Cheu
Dog Ear Publishing; 4010 West 86th Street, Suite H, Indianapolis, Indiana 46268
© 2013; $16.95; 218 pp.

A severe or chronic illness can throw anyone's life into chaos. Some have referred to this as playing 52 card pick-up with one's life. How those cards are reassembled to carry on will affect quality of life, including treatment choices and adherence to treatment guidelines. Richard Cheu addresses that challenge in his book *Living Well with Chronic Illness: A Practical and Spiritual Guide.*

Richard Cheu's background has given him insight into the coping mechanisms that have been successful and those that have not. He is currently a hospital chaplain in New York City, having been an emergency medical technician, neurophysiologist, and stress-management consultant in the past. The need for this book arose out of awareness that there are not enough doctors to care for the growing number of people afflicted with chronic illnesses.

A diagnosis of chronic illness can throw a person into the stages of grief for loss of the life that they have always known. Initially there will be Shock, followed by Anger, then Resistance, and finally, Acceptance. The goal is to reach Acceptance so that a new life can be constructed. The book details the steps to take and how to recognize and move past the roadblocks to change.

How one adapts to change is key to moving forward. Whether one usually adapts easily or with great difficulty, the potential obstacle is fear. The author discusses methods to overcome fear, beginning with a clear understanding of the illness itself. For this, Cheu recommends learning everything possible about the illness and its current and future effects. This can not only reduce the fear of the unknown but prepare the person for possible treatments.

The author refers to fear as the Super Glue of negative emotions, and he dedicates a lengthy discussion to understanding the nature of fear, which may present as anxiety and phobias. He notes that anxiety is the unconscious mind's assessment that the person's coping ability is not adequate. This can be changed and anxiety reduced by learning all one can about the illness and developing coping methods. The book includes a Self-Help Fear-Management Plan to help readers understand their fear and build an action plan.

A serious response to illness can also be despair. This state of hopelessness can have dire consequences, so in addition to providing coping methods, the author recommends seeking help from family and friends, and a professional therapist if necessary.

The person with a severe or chronic illness, after working through the stages of grief to arrive at Acceptance, has the task of rebuilding their life with new limitations and new freedoms as well. Now the author turns to positive psychology, a new branch of psychology started by Dr. Martin Seligman in 1998. Rather than using psychology to just identify weakness and damage, it seeks to identify the strengths and resilience in individuals.

"Everyone grieves in their own individual way. The same can be said of coping. You choose how you will cope with your illness."

Seligman's team reviewed the teachings of major philosophies and religions to arrive at 6 virtues common to all. They then identified 24 types of strength that can be used to achieve the virtues. For example, the virtue of *strength of temperance* can be developed by forgiveness and mercy, humility, prudence, and self-regulation.

The book concludes with a discussion of spirituality and its benefits in coping with chronic illness. Cheu defines spirituality as "*a way of thinking and living* that uses the positive aspects of human thinking, feelings, and behavior to achieve meaning and purpose in life." The author does not advocate a religion but asks readers to open their minds to their connections to other people and the natural world.

Reassembling one's life after a diagnosis of a severe or chronic illness is no small challenge. Treating physicians should find this a good book to recommend to financially stable patients to put them on a positive track in coping with their illness. But I would hesitate to suggest this book to anyone struggling financially.

For those who have lost their ability to work and support themselves, this book is lacking in understanding of those challenges – in fact, it may increase frustration. A very real consequence of chronic illnesses that prevent one from working is the slide into poverty and obscurity. Loss of employer-based medical insurance can change one's access to medical care to emergency room only. The attempt to get disability benefits from Social Security often takes years. Medicaid coverage, which could restore access to medical care, commences only after all assets are spent down. If loss of home is involved, subsidized housing has long waiting lists. These are just some of the realities of severe and chronic illness that are not discussed in this book. Yes, the strategies suggested by Cheu will be applicable to people in these situations, but acknowledgement that their journey through the stages of grief will be more difficult would have been considerate. And would it not help those who are financially stable to count their blessings, that they are not trapped in such difficulties? ◆

Advanced Prevention of Heart Disease

review by Ira L. Goodman, MD, FACS, FAARM, ABIHM

Beat the Heart Attack Gene, by Bradley Bale, MD, and Amy Doneen, ARNP
Turner Publishing, New York
© 2014; Soft cover; $ 16.95; 322 pp.

Bradley Bale has a unique practice. He provides every patient with a written guarantee for 100% of the fees paid if they have a heart attack after implementing his plan. According to the book, he has only had to give one refund to date. Given that CVD is considered the leading cause of death, with 2 million events per year in the US and 800,000 deaths, this is an impressive feat. Theoretically, this is a disease that is 100% preventable; it's just a matter of knowing what to do and, more importantly, doing it, preferably before an event at all. More than 100 million Americans have at least one risk factor for CVD, so this book should be a great interest to most people. Bale, a family–medicine trained practitioner, also serves as the medical director of the Heart Health Program in Lubbock, Texas; as well as cofounder of the Heart Attack & Prevention Center in Spokane, Washington, of which Doneen is cofounder and medical director.

A number of carefully selected case reports illustrate the Bale/Doneen method, a combination of correct diet, exercise, nutraceuticals, pharmaceuticals, comprehensive laboratory evaluations, lifestyle, and so on. When I first started reading the book. I thought it would be a rehash of the functional medicine paradigm, in which I am well versed; but I was pleasantly surprised with how much new information I learned. There were many cases following the standard of care that, after a look under the hood, revealed significant risk. The standard of care may be enough to prevent a lawsuit but not enough to prevent CVD in some cases.

The authors' 6-step plan has the acronym EDFROG: Education, Disease, Fire, Root cause, Optimal care, and Genetics. Each one of these steps is described in detail. Given that only 1% of arterial plaque actually obstructs blood flow (the other 99% is in the arterial wall without obstructing flow), the standard angiogram is a very late-stage procedure. The endothelium is only 1 cell thick but is the body's largest organ and could cover 6 tennis courts if laid out flat. This is a big part of the overall picture. The conventionally overemphasized cholesterol level (fueled by Pharma) is actually a minor player unless more sophisticated markers are used. Simple home blood pressure readings and waist measurements serially can be more valuable than many lab tests. The CIMT test is promoted as an accurate surrogate for disease burden; the genetic markers such as APOE, 9p21, and K1F6 as predictive and inflammatory markers such as CRP, Lp-PLA2, and galectin-3 are also described. Proper evaluation of metabolic syndrome, clotting tendencies, dental health, sleep apnea, depression, vitamin deficiencies, and resting pulse are all stressed. The possibility of hormone replacement therapy – if started at the right time – is discussed. A great deal of discussion on the coronary calcium score is included and description of the new low radiation methods currently available. The key is putting it all together under the proper framework with adequate follow-up. This is the critical difference between the Bale/Doneen method and that of most other practices. They are almost exclusively set up for CVD prevention and have organized their lives and practices around that goal.

This is a book about a comprehensive primary and secondary prevention program that is guaranteed to work by the physician or you get all your money back.

Advanced inflammatory markers as well as oxidative stress measurements are advised (F2-isoprostane, fibrinogen, hs-CRP, urine microalbumin, Lp-PLA2, MPO).

The highly accurate 2-hour postprandial glucose is advised over the standard A1C measurement.

My Take

I agreed with most of what was said in this book but objected to the use of relative risk statistics rather than the more clinically relevant absolute numbers. These statistics were used to promote statins and aspirin, and to report the dangers of elevated markers. All of this is misleading. The same can be said about Bale's comments on antihypertensive meds. Other than that, his method appears sound and if followed closely could be beneficial. ◆

Help Patients Harness Habits

review by Jacob Schor, ND, FABNO

The Power of Habit: Why We Do What We Do in Life and Business, by Charles Duhigg
Random House
© 2012*

> All our life, so far as it has definite form, is but a mass of habits, – practical, emotional, and intellectual, – systematically organized for our weal or woe, and bearing us irresistibly toward our destiny, whatever the latter may be.
> – William James, *Talks to Teachers* (1899)

I was late to work this morning, and I can't blame anyone but myself. I've driven the same route for 20 years. Driving to work is a habit, and I don't think twice about where I'm going once I click my seatbelt on until I unlock my office door. Denver is installing new light posts on Monaco Boulevard, necessitating lane closures, mergers, and traffic coming to a total standstill. Of course I should take another route to work; Quebec would certainly be faster, yet I never think of this while I'm driving. Habit takes over, I make the turn onto Monaco, and the next thing I know I'm stuck in traffic and late to work again. I am a creature of habit.

Habits and how much they control our lives has been on my mind this summer as I've slowly worked my way through a fascinating book called *The Power of Habit*. Written by Charles Duhigg, it is an important book to read, understand, and incorporate into our practices.

I make a list for each patient at every visit of things that I think they should do in regard to exercise, diet, and supplements, under the assumption that because I told them to do these things, they will. How ludicrous. What I should be doing instead is to reinforce my patients' good habits and shifting their bad habits to be less harmful. Duhigg's book explains how to do this.

Here's one example from the book of how habits work. Scientists implanted probes into the brains of rats to monitor brain activity and then placed these rats one at a time at one end of a maze with some chocolate at the far end. On its first time in the maze, a rat would slowly meander its way though until finding the chocolate. The brain probes revealed this seemingly lackadaisical behavior on the part of the rat was a false impression. The neurosensors recorded intense neural activity; the brain was furiously at work with every sniff. Each time the rat was placed back in the maze, it found the chocolate faster. As the rats learned their ways through the maze, something happened in their brains; the faster they ran, the less brain activity occurred. As the path through the maze became automatic the brain worked less. As the habit was formed, the brain had less work to do and the rat thought less and less about what it was doing.

The process when the brain converts a sequence of actions into automatic behavior is called *chunking*, and we rely on chunking to get us through the day, from brushing our teeth, to making our coffee, to driving the car; these complex sequences of activity and thought have become automatic. Chunking and habit forming occurs so naturally, we rarely notice that it is going on.

As Duhigg writes, "Left to its own devices, the brain will try to make almost any repeated behavior into a habit, because habits allow our minds to conserve energy. It feels good to conserve brainpower; it feels good to be lost in the routine of a habit.

We've devised a clever system to determine when to let a habit take over. It happens whenever a chunk of behavior starts or ends. Our brains look for cues that tell it when to turn on or off the automatic program."

Our brains create habits in a three-step loop. First, there is a cue, a trigger that tells the brain to go into automatic mode and which habit to use. Then there is the routine, which can be physical, mental, or emotional. For the rat, it is running through the maze. For my morning commute, it's driving the car. Finally, there is a reward, the end gain that lets your brain know that this particular automatic behavioral loop is worth remembering for the future.

This loop of cue, routine, reward; cue, routine, reward, becomes automatic, so neurologically intertwined, that a sense of craving emerges. The rat wants its chocolate as soon as the door to the maze clicks open. Most cues and rewards are so quick and so subtle that we are rarely aware of them in day-to-day life. But our brains do notice them and build neural pathways that reduce effort in every way that they can. Once a habit is established, your brain stops participating in the decision making; it's riding on cruise control. No wonder it is so hard to change people's habits.

It's easy enough to make a list of lifestyle changes for patients that will make them healthier, but we should be focused on how to turn these lifestyle behaviors into habits?

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A Confidence-Builder for Vaccine Critics

review by Jim West
harvoa.org

Vaxxed: From Cover-Up to Catastrophe,
written by Andrew Wakefield and Del Bigtree, directed by Andrew Wakefield
www.vaxxedthemovie.com
© 2016; 91 minutes

This is an amazing, professional work, the result of great technical, political, and aesthetic skills; a confidence-builder for vaccine critics, it clearly documents CDC corruption and militant arrogance. It describes pharmaceutical industry power. The film keeps its cool and does not go over the top.

Most powerful were the numerous interviews with parents who watched their children take the MMR vaccine and immediately fall into intense permanent disability. Parents know their children. No case-control study is required to prove what happens to a child run over by a car. It is that dramatic.

Polly Tommey, mother of an autistic child, interviewed in the film, a noble soul and now an autism activist: "We wanted to be perfect parents. My child had the normal vaccines at 2, 4, and 6 months, a little bit sniffly-chesty-coldy after maybe the last one. In my perfect-mother mode, I took him back to the doctor. The doctor prescribed more and more antibiotics. My mother, a homeopathic hippie, said, 'Why are you chucking those things into your child?' I answered, 'With all due respect mother, you're just an artist and I'm talking to a doctor. ...'"

Andrew Wakefield, director

Polly also spoke during the panel discussion: "There is little hope for my children. There is no benefit for me telling you this. I'm telling you this so you can avoid what we are going through."

And the science, leaked from the CDC, was heavy and presented well.

Available before and after the film were the famous "discredited" scientist Andrew Wakefield (director), Del Bigtree (producer), and Richard Castro (distributor). Bigtree is a producer/director who had previously produced various major TV series such as *The Doctors*, *Dr. Phil*, and others. Also present and eloquent, was Brian Hooker, PhD, a scientist whom the CDC put a lawyer on years ago, to make it illegal for him to contact the agency for data. He still managed to record long phone conversations with the "CDC Whistleblower," William Thompson.

The film has been lambasted by the drug tabloid the *New York Times*, describing the film as if it were primarily about the already-demonized Andrew Wakefield. Its willingness to bend far in order to reject this film is presently being reflected throughout all mainstream media. (See my breakdown of the *New York Times'* board of directors, substantially medical product reps, at www.harvoa.org/polio/nyt_board2008.htm.)

Del Bigtree, producer

The film is actually about Thompson, a high-ranking epidemiologist at the CDC, who became the Whistleblower. Though Wakefield directed the film, he did not give his own work much attention.

While listening to Bigtree, I heard this: Years ago, he was stunned by the alternative news regarding the Whistleblower. He could not mention the Whistleblower in his own work because of his dependence on sponsors from the pharmaceutical industry (CDC, etc.). He assumed that the story would make mainstream headlines elsewhere, yet no mainstream outlet mentioned the Whistleblower. He knew his "show was run by Pharma," and he began to realize that "all mainstream media is run by Pharma."

I conversed with a guy who had driven from Ohio to see the film. He had been listening to his wife for 20 years talking against vaccines, and he had said,

Insight for Practitioners and Patients

review by Jenna Henderson, ND

BreakFree Medicine: A Systematic and Integrative Guide to Balancing Your Body, by Sarah LoBisco, ND
Balboa Press; 1663 Liberty Dr., Bloomington, Indiana 47403
© 2016; $15.99; 194 pp.

Dr. LoBisco has written a remarkably informative guide that will not only help patients make sense of a complicated medical world, but also offers clinical pearls with new insights for practitioners. By first looking at the limits of mainstream medicine, Dr. LoBisco identifies many of the obstacles to cure that so many patients face. As explained in "For the Love of Pseudoscience and Medicine," there are limits to the current paradigm.

LoBisco challenges the reader to look more deeply at their health concerns, addressing both the physical issues and the mental/emotional issues. By taking a systemic view, patients can gain a better understanding of what they need to do and how naturopathic and functional medicine can help. Recycling serotonin will not be the quick fix if the patient doesn't make enough serotonin to begin with. But the solutions are not just chemistry, as *BreakFree Medicine* reiterates the importance of finding joy in one's life.

BreakFree Medicine explains why healing the gut is an essential first step and why the gluten-free trend is not going away anytime soon. With food as the foundation of a good protocol, LoBisco debunks the quest for the miracle pill. She also explains how new information is helping the use of targeted strains of probiotics for specific health concerns.

As explained in "For the Love of Pseudoscience and Medicine," there are limits to the current paradigm.

Specific lab tests are also explained, helping the patient understand how a holistic practitioner can help guide them.

Building on the foundation of good nutrition, LoBisco addresses patients' most common complaints – obesity, fatigue, and low libido – with good hormonal health. What I found most helpful about this book was the breakdown of issues with the nervous system, by looking at 5 distinct regions of the brain. Rather than taking a generic approach to brain support, practitioners can address OCD behavior, anxiety, depression, or lack of mental clarity more directly. *BreakFree Medicine* also gives a great explanation on the importance of addressing environmental toxicity and why liver detox is so essential in the modern world. LoBisco also shines as a practitioner of essential oil therapy, showing us what this underutilized therapy can offer.

BreakFree Medicine is both succinct and comprehensive in its approach to functional medicine. As Dr. LoBisco has helped her patients break free from their own personal limitations, her clinical strategies can help patients achieve their goals.

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Simply understanding how habits are formed helps people gain better control over their lives. Duhigg reviewed a study in which 256 participants took part in classes on the importance of exercise. Half the participants took a second class on the theories of habit formation. The study participants who took the habit class identified the cues and loops in their lives that affected their exercise and in the end spent twice as much time exercising.

If you want to start running each morning, choose a simple cue (like leaving your running clothes next to your bed) and a clear reward (like a midday treat or ritually recording your distance or times in a log book). Your brain will anticipate that reward, either the treat or the sense of accomplishment, and that's how the habit is formed.

Habits may be deeply rooted in the mind but they aren't destiny. People can choose their habits. They have to figure out what their cues and rewards are and then make the decision to change.

Duhigg writes in a style reminiscent of Malcolm Gladwell. Each has a way of weaving multiple stories together into a single narrative that slowly builds on an idea from a variety of angles, that creates a complex story that is pure pleasure to read, but in the end takes you to the conclusion he is hoping you will reach.

Duhigg provides a valuable resource, a body of knowledge that can help you do a better job with your patients. Having read this book, I see my job a bit differently; my task is to help my patients identify, preserve, and strengthen the positive habits in their lives and to alter their bad ones.

* Long in the habit of being a cheapskate, I held off purchasing this book until I found it in paperback.

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Problems Found with 32% of Multivitamin/Multimineral Supplements

You can't always judge a supplement by its label – or by its price, according to a new report from ConsumerLab.com, which recently tested dozens of multivitamin/multimineral supplements.[1] "Consumers should know that multivitamins vary widely in quality, with some providing far more or less ingredient than claimed," says Tod Cooperman, MD, president of ConsumerLab.com. "Fortunately, we discovered that you don't have to spend a lot to get a good multivitamin." Americans spend over $5 billion per year on multivitamins, according to *Nutrition Business Journal*.

ConsumerLab.com found that among the 41 multivitamins sold in the US and Canada (including 3 products for pets) that it selected for review, 13 failed to pass tests necessary to obtain ConsumerLab.com approval. Several products also exceeded tolerable intake limits established by the Institute of Medicine for nutrients such as niacin, vitamin A, folate, and magnesium. Exceeding these levels puts one at increased risk for side effects and toxicities, although this may be appropriate in certain situations. Higher price did not mean higher quality: Many inexpensive multivitamins (costing less than 10 cents per day) passed all tests and gained approval, while several more expensive products (costing more than 40 cents per day) failed to be approved.

ConsumerLab.com tested multivitamins for key water-soluble and fat-soluble vitamins, minerals, and contamination with the heavy metals lead, cadmium, and arsenic, and checked for proper labeling. Tablets were also checked to make sure they would disintegrate properly.

Key Findings, by Type of Multivitamin Product

General adult: Several quality, all-around multis were identified, costing as little as 3 cents per day. However, one product was found to contain only 17% of its listed folic acid, an important B vitamin.

Women's: Several quality, all-around multis for women were identified, costing as little as 4 cents per day. However, one product was found to contain only 17.5% of its listed vitamin A.

Women's 50+: A quality, all-around women's 50+ multi was identified, costing only 3 cents per day. However, one product was found to contain 20% less vitamin A than listed and 41% more calcium than listed.

Prenatal: Two quality prenatals were identified which provided the 800 mcg of folic acid recommended to help prevent neural tube defects and 150 mcg of iodine recommended for proper brain development. Although no prenatal vitamin failed to contain listed ingredients, many lacked the recommended iodine.

Men's: A quality, all-around men's multi was identified which cost only 3 cents per day. However, a men's multi failed to properly disintegrate – requiring more than twice the allowed time to break apart in solution.

Men's 50+: The one product tested in this category contained only 58% of its listed vitamin A.

Children's: A quality children's gummy multi was identified, costing only 8 cents a day. However, it did not include iron in its formulation (likely out of concern for iron toxicity if overconsumed as a candy by children). Most children are not iron deficient, but, particularly for adolescent girls, iron is important – see the "Teen" section below. One children's multi contained only 28% of its listed folic acid, providing much less than the recommended intake for children. Another product contained 74% more folate than listed, but the listed amount was small and this is not a health risk.

Teen: Several quality multis for teens were identified, although all provided higher than recommended amounts of certain nutrients. Adolescent girls may be better off taking a moderate-dose women's multi, with iron and calcium. Adolescent boys may be better off taking a general multi that includes iron, as they need more iron than younger children and men. One teen multi contained only 40% of its listed vitamin A and 48% more calcium than listed.

Pet: None of the pet multivitamins were approved: One contained only 30% of its listed vitamin C; one had only 16% of its vitamin C and 8% of its vitamin D; and one contained only 52% of its listed vitamin A.

Two specialty multis, one for people with diabetes, and one for people who have undergone bariatric surgery, were also tested and approved, although they may not be ideal for all such people, as noted in the report.

Dr. Cooperman says that consumers should take stock of their personal nutritional needs before considering a multivitamin. Using ConsumerLab.com's review as a guide, they can find quality and value without hidden surprises. "If you need nutritional support from a multi, it's possible to get it from a good, safe product for just pennies a day," he says.

ConsumerLab.com's Multivitamin/Multimineral Supplements Review provides test results and comparisons for 61 multivitamin products: 41 selected for testing by ConsumerLab.com and 20 which passed the same testing in the voluntary Quality Certification Program.[3] These products are: 1-800-PetMeds Soft VitaChews for Cats, 21st Century Sentry Multivitamin & Multimineral, All One Active Seniors Multiple Vitamin and Mineral Powder, Alpha Betic Multivitamin, Bariatric Advantage Chewable Multi Formula, Berkley & Jensen Men's Daily (BJ's), Bluebonnet Targeted Multiples Age-Less Choice for Women 50+, Centrum Silver Adults 50+, Centrum® Chewables Multivitamin/Multimineral, ChildLife Multi Vitamin & Mineral — Natural Orange/Mango, Country Life Seniority Multivitamin, CVS/pharmacy Spectravite Adults 50+, DG Health Adult Formula Complete 50+, Doctors Foster And Smith Multivitamin for Adult Dogs, Douglas Laboratories Ultra Preventative Teen, Dr. Mercola Whole Food Multi Plus, Dr.

"Yeah, yeah. ..." His wife told him, "You are going to see this film!" So he drove to New York. He is now a convert to the vax-critical position.

I pitched my ultrasound/autism research to Castro, Bigtree, and extensively to Wakefield, as it reinforces the vaccine view and resolves key contradictions. It was a challenge getting through the crowd, lights, video teams, and attractive groupies who were clustering up for Wakefield photos.

The film describes a great scandal, but it is almost politically safe, and that's how it almost made it to the mainstream audience. The film advocates single-dose vaccines and is critical of the triple-dose MMR vaccine. It is otherwise provaccine, advocating that instead of one MMR shot, children get three single-dose shots.

Robert De Niro, with an autistic child of his own, was planning to introduce the film at the Tribeca Film Festival before being knocked back by the powers in the final hours. The Angelika Film Center then offered to premiere the film.

The film teaches us that a large portion of children with autism have previously had the MMR, disproportionately to those without MMR. The parents of autistic children witness severe damage occurring immediately or very soon after the MMR injection. The CDC is refusing to do an unambiguous vaccinated vs. unvaccinated comparison study, as is its history with all vaccines. Vaccines are not categorized as pharmaceuticals and are therefore not as stringently tested. It appears that the CDC is hiding meeting records, hiding and shredding data, corrupting studies to dilute results, and so on. The relation of CDC execs to the pharmaceutical industry is a revolving door.

For more information, see the interview with Del Bigtree on the Autism File website: www.autismfile.com. ◆

No Deaths from Supplements. No Deaths from Minerals. No Deaths from Amino Acids. No Deaths from Herbs.

by Andrew W. Saul, Editor, Orthomolecular News Service

Not only are there no deaths from vitamins, there are also zero deaths from any supplement. The most recent (2014) information collected by the US National Poison Data System, and published in the journal *Clinical Toxicology*, shows *no deaths whatsoever* from dietary supplements across the board.

No Deaths from Minerals

There were zero deaths from any dietary mineral supplement. This means there were no fatalities from calcium, magnesium, chromium, zinc, colloidal silver, selenium, iron, or multimineral supplements. Reported in the "Electrolyte and Mineral" category was a fatality from the medical use of "Sodium and sodium salts" and another fatality from nonsupplemental iron, which was clearly and specifically excluded from the supplement category.

No Deaths from Any Other Nutritional Supplement

Additionally, there were zero deaths from any amino acid or single-ingredient herbal product. This means no deaths at all from blue cohosh, echinacea, ginkgo biloba, ginseng, kava kava, St. John's wort, valerian, yohimbe, Asian medicines, Ayurvedic medicines, or any other botanical. There were zero deaths from creatine, blue-green algae, glucosamine, chondroitin, or melatonin. There were zero deaths from any homeopathic remedy.

But When in Doubt, Blame a Supplement. Any Supplement.

There was one death attributed to a "Multi-Botanical Without Ma Huang or Citrus Aurantium." It is interesting that they knew what was not in it but did not know what *was* in it. This is hearsay at best, and scaremongering at worst. There was one death alleged from some "Unknown Dietary Supplement or Homeopathic Agent." This, too, indicates complete lack of certainly as to what may or may not have been involved. One fatality was attributed to "Energy Products: Unknown." First of all, energy drinks or "products" are not nutritional supplements. But more importantly, how can an accusation be based on the unknown? Equally unscientific are the two deaths attributed to "Energy Products: Other." Well, what products were they? These are no more than vague, unsubstantiated allegations. Claiming causation without even knowing what substance or ingredient to accuse is baseless.

The Truth: No Man, Woman, or Child Died from Any Nutritional Supplement. Period.

If nutritional supplements are allegedly so "dangerous," as the FDA, the news media, and even some physicians still claim, then *where are the bodies*?

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The lengthy, full text article is also available for free download from https://aapcc.s3.amazonaws.com/pdfs/annual_reports/2014_AAPCC_NPDS_Annual_Report.pdf or fromhttp://www.aapcc.org/annual-reports/.

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Whitaker Forward Gold Daily Regimen for Adults 65+, Enfamil Expecta Prenatal, Equate Active Adults 50+ Complete Multivitamin, Flintstones Gummies Complete, Garden of Life Kind Organics Women's Multi 40+, Garden of Life Raw One for Women, GNC Mega Men, GNC Mega Men Sport, GNC Women's Ultra Mega, GNC Women's Ultra Mega Active, Jamieson Vita-Min Regular Multi, KAL Enhanced Energy Teen, Kirkland Signature (Costco) Daily Multi, Life Extension Two Per Day Tablets, L'il Critters Gummy Vites Complete, Mega Food Women Over 40 One Daily, Melaleuca Vitality Multivitamin & Mineral — Men, Bariatric Advantage Chewable Multi Formula, Natural Factors Men's 50+ - Dr. Murray Formulated, Nature Made Multi For Her, Nature's Bounty ABC Plus Senior, Nature's Plus Animal Parade GOLD Children's Chewable Multivitamin & Mineral Supplement, Nature's Way- Alive! Once Daily Women's 50+ Ultra Potency, Nature's Way Alive! Whole Food Energizer Women's Multi Max Potency, New Chapter Every Man's One Daily Multi, NOW Prenatal Gels + DHA, Nutrilite Double X, One-A-Day Women's Formula, Pet Naturals of Vermont Daily Best for Dogs, Pure Encapsulations LiquiNutrients — Natural Mango/Orange Flavor, Puritan's Pride ABC Plus Senior Multi Iron Free Formula, RiteAid One Daily Women's 50+, Shaklee Vita-Lea Iron Formula, Simply Right [Sam's] Women's 50+ Multivitamin, Spring Valley [Walmart] Ultra Multivitamin for Woman, Stop Aging Now (SAN) Multi Nutrient Formula Basic, Swanson High Potency Softgel Multi Without Iron, Thorne Research Al's Formula, Trader Joe's Super Crusade, Up & Up (Target) Women's Daily Multivitamin, USANA BabyCare Prenatal Chelated Mineral, USANA BabyCare Prenatal Mega Antioxidant, USANA Body Rox, USANA Essentials Chelated Mineral, USANA Essentials Mega Antioxidant, USANA Usanimals, VitaFusion PreNatal, Vitamin World ABC Plus Senior, Well at Walgreens Women's Multivitamin Gummies, and Whole Foods Women's Food Based Multi.

In addition to the new multivitamin report, ConsumerLab.com provides a free listing of the latest recommendations for vitamin and mineral intakes.[4]

Founded in 1999, ConsumerLab.com is a leading provider of consumer information and independent evaluations of products that affect health and nutrition. Membership to ConsumerLab.com is available online and provides immediate access to reviews of more than 1000 products from over 400 brands. The company is privately held and based in Westchester, New York. It has no ownership from, or interest in, companies that manufacture, distribute, or sell consumer products.

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Vaccinations, Vitamin C, and 'Choice'

by Helen Saul Case

Some folks are pretty appalled that my husband and I had our children vaccinated. People write and tell me that vaccinations are dangerous. They warn me about the side effects of this vaccine and that one. They share alternative, natural ways to improve immunity. What we've got here is a failure to communicate. I am sorry that I did not explain myself better the first time.[1]

Let's fix that.

Vaccinations Can Be Dangerous

You don't have to tell me this. I already know. I watched my child suffer a severe vaccine reaction before my very eyes. Seeing my 15-month-old baby, screaming, trying to walk to me but not being able to because she was stumbling and falling over and uncoordinated, is a vision I will never be able to get out of my mind. It was horrific.

I also watched high-dose, saturation level vitamin C return her to normal. I will never forget this either.

But why didn't I just stop the shots right then and there?

'Choosing' to Vaccinate

In the article I wrote: "My husband and I chose to have our children vaccinated." We did. We could have chosen not to.

We could have said no to all shots by choosing a religious exemption stating that shots are against our sincerely held religious beliefs. We chose not to make this our religion.

Philosophical, personal, or conscientiously held belief exemptions to vaccinations are not lawful in New York State, where our family lives. We could have chosen to move to a different state where philosophical exemptions are allowed. But we chose not to move.

We could have chosen to just flat out refuse immunizations and go face to face against state government and school districts and child protective services. Ultimately, we chose to comply only with state mandated vaccinations, but just the ones required for school, and no more.

So yes, we chose to have our children vaccinated. Truly, though, we didn't feel we had much choice. Nobody really does. "Choice" can be taken away in an instant.

Shots for Every Child

Pay attention: this is important. As states push stronger and more stringent immunization laws onto their citizens, mandatory vaccination is quickly becoming the rule rather than the exception. You can argue about the dangers of vaccinations, but I will just agree with you. That doesn't change the fact that children are still getting shots every day. Vaccine reactions and side effects are a real danger. Doctors agree. This is the cold, hard reality.

I do not agree with all of the shots recommended for children. I do not agree with the timing of shots for children. I do not agree that toddlers and babies and infants should be given shots so early in their life, so many at a clip, and three, and four, and five doses of the same ones over and over again. I do not agree that pregnant mothers of developing babies should be given shots. And I do not condone the fact that no medical or governmental authority instructs parents how to protect against vaccination damage by giving massive doses of vitamin C.

> A young child may receive 49 doses of 14 vaccines before age 6, And 69 doses of 16 vaccines before age 18. It is also worrying when you examine the various ingredients that are

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present in these vaccines. What does make sense is the use of bowel tolerance amounts of oral vitamin C to counter the toxic effects of vaccines. – Ken Walker, MD

My opinion notwithstanding, every year more than 10 million vaccines are given to children less than a year of age.[2] Only somewhere between 1% and 10% of vaccine reactions are ever reported.[3] That one comes as no surprise to us. Our daughter's pediatrician did not report her vaccine reaction. We did.

In most states, when it comes to vaccinations, you must become an extremist or you must comply. Parents in my state are not allowed to postpone shots for their children past state mandates without medical exemptions. We can only delay them and spread them out within these limitations. Saying yes to some shots and no to others is not permitted; the law does not allow families a "buffet" approach. As states look to tighten the screws on medical exemptions, eliminate philosophical and conscientious exemptions, and even try to (unconstitutionally) limit religious exemptions, it is becoming more likely than not: a needle is going into your child.

And we had all better be ready.

I feel strongly that vaccinations have to be considered separately as applied to the individual and tracked for effectiveness. There will never be a good vaccine for every infectious disease. I would hope that many will heed the fact that high-dose C does wonders in reducing vaccine side effects. – Ralph Campbell, MD

High-Dose Vitamin C for Everybody

High-dose vitamin C safely prevents and treats vaccine side effects.[4] This has been evident in our experience. We watched high-dose, saturation-level vitamin C bring our daughter back to health after a vaccine reaction. We watched high-dose, saturation-level vitamin C prevent vaccination side effects. We give both of our children saturation levels of C before, during (yes, right at the doctor's office), and after immunizations. We don't give the amount of vitamin C that we think might work; we give enough to get the job done.

This is no small task. It takes determination like you have never had before to get your children to take very high amounts of vitamin C again and again, day after day. It also takes love, patience, understanding, praise, yummy "chasers" after taking vitamin C powder in juice, and when all else fails, straight-up bribery.

Keeping kids as healthy as possible takes a great deal of effort. And it is worth it. Even our doctor marvels that our children only visit the office for wellness appointments and vaccinations.

I see it this way: when you are a parent and are breast-feeding or giving a bottle, you don't just give up if your child doesn't eat. You see to it that your baby gets the nutrition he or she needs. You do it until. That's how we feel about vitamin C. It is that important.

No Shots Until My 20s

In my article I say "We (my husband and I) believe some immunizations to be worthwhile." And I do. Two, in fact.

In my 20s, I received a single tetanus shot after I stepped on a nail that went up through my foot while I was walking through an old barn. Horse dung naturally carries tetanus bacteria and can survive dormant in encased spores for decades.[5] While the chance was probably quite slim that I would actually end up with tetanus, I thought it a "good idea" to get a tetanus shot under such circumstances. So did my doctor. I got the shot and took lots of vitamin C too.

I also received a single dose of an MMR (measles, mumps, rubella) vaccine years before I became pregnant. My doctor made a case for this one being a good idea if I wanted to have a family. Getting measles while pregnant can result in serious problems for a developing baby. We discussed if any other shots would also be worth the inherent risk. The answer was no. Again, I took vitamin C to bowel tolerance. I was spared any ill effects from the MMR inoculation.

So yes, this would mean I believe some shots are worthwhile. I, myself, have had two. But there's more to it than that. I did not have a single shot as a child. My parents chose to use vitamins and nutrition as the answers to (and more often for the prevention of) our health problems. Not surprisingly, we were really healthy kids. I was raised all the way into college with no shots, and no antibiotics either. They used vitamins instead because they are safe and they work. But this was a very tough road for my parents and for me to travel. That road is even more difficult to navigate now with so much more pressure to vaccinate and more vaccinations to be pressured for.

We All Want Healthy Kids

We must meet parents where they are. While we work to mandate vaccine safety, demand informed consent, and advocate for real choice, when it comes to whether or not to vaccinate, let's minimize any chance of vaccine damage now. Children are powerless. We aren't. Whether we have a choice to vaccinate or not, let's choose to give them vitamin C and lots of it.

Helen Saul Case is the author of *The Vitamin Cure for Women's Health Problems* and coauthor of *Vegetable Juicing for Everyone*. Her latest book is titled *Vitamins & Pregnancy: The Real Story*.

To Learn More

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Nutritional Medicine is Orthomolecular Medicine

Orthomolecular medicine uses safe, effective nutritional therapy to fight illness. For more information: http://www.orthomolecular.org.

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Twenty-Five Years in Dietetics: A Critical Reflection

I have waited 25 years to write this article. Despite forays into alternative careers, I have returned time and time again to my initial passion for nutrition. With great fortune, 15 years ago, I fell into the field of nutrigenomics and I have remained there ever since. Yet I have always had a level of discomfort with my chosen profession, never feeling entirely proud to define myself as a dietician. It is only in the last few years that I have understood what that may be about. Ignited by the writings of Michael Pollen, Marion Nestle, and Raj Patel, I have come to understand that there is something wrong in the way nutrition is being researched, advocated, and practiced.

Gyorgy Scrinis defines the ideology of *nutritionism* as a nutritionally reductive approach whereby nutrition is understood as nutrients rather than as food.[1,2] For the past century, nutritionism has been the ruling ideology of nutrition and dietetics. It is the ideology of the food industry, regulatory bodies, health institutions, and professional training. There is a great need for a new nutrition ideology, a new way of seeing and knowing about food, nutrition, health, and conditions such as obesity. I believe that studying the interactions between food, nature, and society will provide a new way of seeing and knowing food and health.

Nutrition and dietetic professionals throughout the world have been trained in the current ideology of nutritionism. Food is taught, spoken about, and practiced in a biomedical model, with little consideration of the social, environmental, political, and economic relationships that govern food production and consumption. Dietetic and nutrition associations (and many dietitians and nutritionists) have unashamedly collaborated with the food industry for sponsorship and income, although there are hopeful signs that this is changing.

I have unwittingly been a part of nutritionism in my work, looking at nutrition primarily through genetic interactions and biochemical pathways. As my perspective expands, I now feel like the mother in the *Incredibles* movie, with one of my elastic arms stretched out to encompass the very important nutritional biochemistry and nutrigenomics (diet and genetics) and the other arm encompassing the social and environmental interaction with food.

Recently, I came across the Giessen Declaration and the New Nutrition Science Project. The Giessen Declaration was established from a meeting held in 2005 under the auspices of the president of the University of Giessen in Germany, the president of the International Union of Nutritional Sciences, and the president of the World Health Policy Forum. Some of the best nutrition scientists in the world were present. "This Declaration emphasized that the most relevant and urgent work to be done by professionals working in nutrition science and in food and nutrition policy is in its three biological, social and environmental dimensions all together."[3] The declaration led to the establishment of the New Nutrition Science Project. These nutrition scientists proposed that nutrition science "retain its current 'classical' identity as a biological science, within a broader and integrated conceptual framework, and will also be confirmed as a social and environmental science. As such it will be concerned with personal and population health, and with planetary health – the welfare and future."[4]

Nutrition science has made giant strides in the last century. But the human population continues to increase, and the global climate is changing, with vast implications. Our science has been good in specific ways, but has ignored and overlooked planetary welfare and thus the basic determinants of human health and well-being. We must now ensure that the practice of our science supports sustainable ecosystems and healthy environments.[5]

The *New Nutrition Science Project* puts forth the idea of "wholesome nutrition" as the most suitable way to eat and drink.[6] Wholesome nutrition consists mostly of foods of plant origin that have been processed as little as possible but as much as necessary. Fresh foods beneficial to health are prepared as tasty meals. The main foods to be eaten are fruits, vegetables, whole-grain products, legumes, and nuts, as well as dairy products. If desired, small amounts of meat, fish, and eggs may be included. About half of the amount of foods eaten in this approach are fresh raw foods (fruits, salads, nuts). In addition to the health interactions of food and nutrition, social, ecological,

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and economical aspects of food consumption are taken into account to achieve sustainability. This means, among other things, a preference for organic and seasonal food produced locally. The packaging of food should be environmentally benign. If foods from abroad are consumed, they should originate from fair trading.

There is no doubt in my mind that what the New Nutrition Project proposed in 2005 is what is missing from the way nutrition is currently taught and practiced within academia and mainstream medicine. But there are many questions that arise for me. Why were no dietitians included in the Giessen Meeting? Why did they not have a voice? What has happened to the working agenda defined in 2005? Why did it take me 10 years to find it? Why was it not embraced by the nutrition and dietetic profession as the way to move forward?

Despite my general disappointment with the way dietetics has been taught and managed in the past, there are many signs that things are changing:

- Functional medicine and functional nutrition are providing health professionals with a different paradigm to work within, a more effective way to treat the patient in entirety.
- The USA-based Academy of Nutrition and Dietetics has committed itself to looking at how it has done things in the past 100 years, including its sponsorship policy. Sonja L. Connor, president of the Academy of Nutrition and Dietetics, is looking for a new way to move forward. "We can re-engineer ourselves as an organization and a profession, moving to the forefront in implementing systems that improve health and well-being."
- The Nutrition Academy has two outstanding dietetic practice groups (DPG) that do excellent work and reflect my own interests within this field: the Hunger and Environmental Nutrition DPG, and the Dietitians in Integrative and Functional Medicine DPG.
- The progressive nutrition and dietetic curriculum offered by universities such as New York University and the University of Vermont has shown a different way of teaching and knowing nutrition and dietetics by including biological, social, and environmental nutrition.
- The recently published Qatar Dietary Guidelines are distinct from others around the world; they include both the social and environmental dimensions of nutrition and reflect the wholesome nutrition described above. Similarly, in the Mediterranean diet pyramid, biodiversity, seasonality, traditional, local, and eco-friendly products are included. They also recommend culinary activities (cooking), regular physical activity, adequate rest, and conviviality.[7]

Most importantly, I continue to encounter many outstanding individual dietitians working for change, dieticians who have made the effort to gain more knowledge, and to challenge the profession to be better and do better than they have been doing. I look very much forward to another 25 years as our profession unfolds.

Yael Joffe, RD, PhD

In the rapidly evolving disciplines of nutrigenomics and nutrigenetics, Dr. Yael Joffe is acknowledged globally as an expert in the field. From her background as a dietician, she obtained her PhD from the University of Cape Town, exploring the genetics and nutrition of obesity in South African women. She is a regular speaker at conferences and workshops, tailoring her presentations to the needs of clinicians. She has coauthored *It's Not Just Your Genes*, has published on nutrigenomics in peer-reviewed journals, and has been involved in the development and supervision of nutrigenomics courses around the world. Dr. Joffe is currently an adjunct professor, teaching nutrigenomics at Rutgers University, and has developed and teaches the Manuka Translational Nutrigenomics online course.

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A New Day Dawns for Vitamin C?

Below is a rebuttal argument that I put together to help a physician in responding to an action taken against him by his state medical board. After an hour or so meeting with the board, no fault was found with his therapy for the patient in question, nor with the use of vitamin C and glutathione in that patient's treatment. In accordance with this finding, no fines were levied, and no restriction was placed on his license. Some additional CME (continuing medical education) was about the only tangible recommendation that resulted.

It should be noted that this physician not only rendered excellent medical care, he had never had an action initiated against him in roughly 40 years. Furthermore, he put together a massive and, I believe, excellent written scientific defense of his course of medical care for this patient. Nevertheless, the last communication before the hearing took place seemed to focus on the vitamin C and glutathione aspect of the patient's care, as the board expert continued to press with his or her lack of awareness of "any significant uses for vitamin C and glutathione in the treatment of sepsis."

While it is doubtful it will ever be known exactly what the board's reasoning was, it would appear that some truly objective scientific minds were part (or all?) of the committee ruling on this case. While I will not mention what state board this was, I will say that this was one state that has historically been absolutely brutal in dealing with any physicians who did not tow the mainstream party line. Maybe the hard-liners are finally disappearing, who knows.

So, are the times a-changing? This is only one case, but it tells me that the mainstream is finally beginning to recognize the legitimacy of the non-mainstream (aka alternative, complementary, integrative). Progress by microincrementalism goes slow, but it does proceed.

Feel free to use the reasonings and concepts in this letter for any similar cases in the future that you might encounter.

Best regards,
Thomas E. Levy, MD, JD

An Evaluation and Rebuttal of the Expert Rebuttal Opinion on Respondent ——— MD Rendered on ——— Legal Division Case No. ——— Investigation Log No. ———

by Thomas Levy, MD, JD

This evaluation/rebuttal will focus primarily on the use of vitamin C in the treatment of sepsis as utilized by ——— in the treatment of a patient with sepsis.

Most significantly, the following statement was made in the Expert Rebuttal Opinion, author not specified: "I am not aware of any significant uses for vitamin C and glutathione in the treatment of sepsis."

I would respectfully suggest that the case of ———, should it continue to be pressed, to be reviewed by someone who is familiar with the massive body of literature addressing the use of vitamin C in the treatment of a wide variety of infections, including life-threatening sepsis. If the above statement is as plainly truthful as it reads, this particular expert should recuse himself or herself from this case in which serious questions have been raised over the appropriateness of using vitamin C for the treatment of ——— patient. It would truly be no different than having a pediatrician review the work of a cardiothoracic surgeon, or vice versa.

In my book, *Vitamin C, Infectious Diseases, and Toxins*, first edition published in 2002, the benefits of vitamin C in the treatment of infectious diseases are clear cut. In particular, *Staphylococcus* and *Streptococcus* are two bacteria that have been found to be exquisitely sensitive to the bacteriocidal abilities of vitamin C, both in vitro and in vivo. A detached, purely scientific and medical review of the data accumulated on this aspect of vitamin C therapy leaves no other reasonable conclusion than that vitamin C is not only of benefit, but that it is actually the agent of choice for such infections, when properly dosed. Virually all current therapies used today have vastly less profound and less voluminous data to support their clinical application than is the case for vitamin C in patients with *Staphylococcus* and *Streptococcus* infections.

The fact that vitamin C is virtually absent from the formalities of all hospitals in the US is not a valid argument against its use. The lack of an awareness of a valid therapy by a majority of physicians is not a scientific argument of its lack of effectiveness. It only speaks to the fact that a large, although minority, number of equally trained physicians throughout the world effectively and frequently use a therapy that the majority of physicians prefer to leave unacknowleged.

Aside from its effectiveness and completely appropriate use in the treatment of infections that have proceeded to sepsis, it needs to be emphasized that clear documentation attests to the fact that vitamin C has no defined level of toxicity, and caution is only routinely indicated in its application with patients with renal failure, as in the case with virtually all prescription medicines as well. This level of safety contrasts greatly with the well-established toxicity of the appropriately prescribed antibiotic used by the patient with sepsis. The literature clearly shows that vitamin C, in patients without renal failure, helps to resolve kidney stones, not cause them. Yet this medical myth continues to be bandied about by many physicians who have virtually zero exposure to vitamin C literature and who have definitely used it even once in the treatment of a hospitalized patient. The article by Padayatty cited at the end of this rebuttal is impressive in its scope, and by no means is the only article documenting the safety of vitamin C. It is cited as being exemplary of the many other similar articles on the exceptional safety of vitamin C. ◆

Anti-Aging Medicine

by Ronald Klatz, MD, DO, and
Robert Goldman, MD, PhD, DO, FAASP
www.worldhealth.net

An Anti-Aging Approach to Oral Health

Having healthy teeth and gums is an important part of any healthful lifestyle. As part of an anti-aging regimen, it should be considered that oral wellness changes with age. Not only can the condition of teeth cause one to look older, by discoloration and/or tooth loss, but certain warning signs may be present in the mouth. One can tell a lot about a person's overall health by their dental health, which is often a reflection of the rest of the body. Dental issues can expose health problems that one may otherwise not have been aware of, and can also be a predictor of upcoming issues. For increased longevity, it is important to be alert to the oral health problems that often accompany aging and what they can signify. Below are recent studies which have determined health issues that may be predicted from oral wellness.

Tooth Loss Predicts Cardiovascular Disease

A chronic inflammatory disease affecting the teeth and oral tissues, periodontitis has been shown by previous studies to raise the risk of atherosclerotic vascular disease. J. M. Liljestrand and colleagues from the University of Helsinki (Finland) assessed the correlation between the number of missing teeth and incident cardiovascular diseases (CVDs), diabetes, and all-cause death. Analyzing data collected on 8446 participants, aged 25 to 75 years, in the National FINRISK 1997 Study with 13 years of follow-up, the team found that more than five missing teeth increased the risk for coronary heart disease events and myocardial infarctions by 140%. More than nine missing teeth indicated an increased risk for cardiovascular diseases (51%), diabetes (31%), and death (37%). Observing, "Even a few missing teeth may indicate an increased risk of [cardiovascular disease], diabetes, or all-cause mortality," the study authors submit: "When individual risk factors for chronic diseases are assessed, the number of missing teeth could be a useful additional indicator for general medical practitioners."

Liljestrand JM, Havulinna AS, Paju S, Mannistö S, Salomaa V, Pussinen PJ. Missing teeth predict incident cardiovascular events, diabetes, and death. *J Dent Res*. 19 May 2015.

Poor Oral Health May Signal Prostate Issues

Prostatitis is a chronic inflammation of the prostate gland that can compromise a man's quality of life. Naif Alwithanani and colleagues from Case Western Reserve University (Ohio, US) studied 27 men, aged 21 years and older, all diagnosed with prostatitis within the past year (via biopsy and prostate specific antigen [PSA] test). The men were assessed for symptoms of prostate disease by answering questions on the International-Prostate Symptom Score (IPSS) test. Of the 27 participants, 21 had no or mild inflammation, but 15 had biopsy-confirmed malignancies, and 2 had both inflammation and a malignancy. Each of the subjects had at least 18 teeth, and all of them showed moderate to severe gum disease. They received treatment and were tested again for periodontal disease 4 to 8 weeks later and showed significant improvement. During the periodontal care, the men received no treatment for their prostate conditions. But even without prostate treatment, 21 of the 27 men showed decreased levels of PSA. Those with the highest levels of inflammation benefited the most from the periodontal treatment. Six participants showed no changes. Symptom scores on the IPSS test also showed improvement. The study authors write: "Periodontal treatment improved prostate symptom score and lowered PSA value in men afflicted with chronic periodontitis."

Alwithanani N, Bissada NF, Joshi N, Bodner D, Demko C, et al. Periodontal treatment improves prostate symptoms and lowers serum PSA in men with high PSA and chronic periodontitis. *Dentistry*. 5:284.

Teeth Tell of Toxins

Akin to the rings in a tree trunk, teeth provide a chronological record of exposure from their microchemical composition in relation to defined growth lines. Manish Arora and colleagues from the Mount Sinai School of Medicine (New York, US) analyzed iron deposits in teeth as a method for retrospective determination of exposure to the metal. In particular, the team sought to explore whether early iron exposure could be linked to late-life brain diseases such as Parkinson's and Alzheimer's,

which are associated with the abnormal processing of iron. While not all formula-fed babies will experience neurodegeneration in adulthood, the combination of increased iron intake during infancy with a predisposition to impaired metal metabolism such as the inability of brain cells to remove excessive metals may damage those cells over time. Their study suggests that too much iron in infant formula may potentially increase risk for neurodegenerative diseases in adulthood; Writing, "We discuss the potential long-term implications of excessive iron intake in early life, propose the analysis of iron deposits in teeth as a method for retrospective determination of iron exposure during critical developmental windows," the study authors urge that a priority in pediatric research should be the rigorous determination of iron supplementation needs of infants according to their individual iron status.

Hare DJ, Arora M, Jenkins NL, Finkelstein DI, Doble PA, Bush AI. Is early-life iron exposure critical in neurodegeneration? *Nat Rev Neurol*. 23 June 2015.

Poor Dental Health Linked to Depression

Using data from a comprehensive health survey of more than 10,000 people, aged 20 to 75 years living in the US, researchers from the Deakin IMPACT Strategic Research Centre (Australia) found that poor dental health (as measured by the number of dental conditions that a person had) increases the likelihood of depression. Adrienne O'Neil and colleagues found that the more numerous the dental conditions, the greater the severity of depression. Even adjusting for other factors that could potentially play a role in the inflammatory process, the study authors write: "A positive association exists between poor dental health and depression that is independent of [C-reactive protein] and [body mass index]."

O'Neil A, Berk M, Venugopal K, Kim S-W, Williams LJ, Jacka FN. The association between poor dental health and depression: findings from a large-scale, population-based study (the NHANES study). *Gen Hosp Psychiatry*. May–June 2014;36(3):26–270.

Poor Heart Surgery Outcome Linked to Dental Extractions

Among candidates for heart surgery, abscessed or infected teeth often are removed prior to surgery, in an aim to reduce the risk of infections including endocarditis, an infection of the inner lining of the heart that can prove deadly. Prosthetic heart valve-related endocarditis accounts for up to one-fourth of infective endocarditis cases and proves fatal for up to 38 of patients who develop it. Kendra Grim and colleagues from Mayo Clinic (Minnesota, US) completed the largest review so far evaluating adverse outcomes after precardiac surgery dental extractions. The researchers studied outcomes in 205 adult Mayo patients who had teeth pulled before cardiovascular surgery. Eighty percent of the patients were men, the median age at the time of tooth extraction was 62 years, and the median time lapse between dental extraction and heart surgery was seven days. Six patients, or 3%, died in the period between their tooth extraction and the planned cardiac procedure. Another 6 died after heart surgery, all while still hospitalized. Ten patients, or roughly 5%, had other major adverse outcomes after heart surgery, such as bleeding, stroke, kidney failure requiring dialysis, acute coronary syndrome or strokelike transient ischemic attacks. The study authors warn: "Patients with planned dental extraction before cardiac operation are at risk for major adverse outcomes, including a 3% risk of death before cardiac operation and an 8% risk of a major adverse outcome."

Smith MM, Barbara DW, Mauermann WJ, Viozzi CF, Dearani JA, Grim KH. Morbidity and mortality associated with dental extraction before cardiac operation. *Ann Thorac Surg*. March 2014;97(3):838–844.

To stay updated on the latest breakthroughs in natural approaches that may help you to reduce your risks of stroke, visit the World Health Network (www.worldhealth.net), the official educational website of the A4M and your one-stop resource for authoritative anti-aging information. Be sure to sign up for the free Longevity Magazine e-journal, your weekly health newsletter featuring wellness, prevention, and biotech advancements in longevity.

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Monthly Miracles

by Michael Gerber, MD, HMD
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Arterial Calcification in Diabetes

Making Bone in Arteries

When I first began using EDTA chelation therapy in 1976, it was our custom to collect a urine sample from the patients after the chelation session. We mixed about 15 ml of urine in a used B12 injection bottle with an equal amount of Sulkowitch reagent (oxalic acid, ammonium oxalate, and glacial acetic acid) to precipitate the calcium. The patients enjoyed placing the bottles sequentially on their mantels at home and watched the amount of calcium precipitate start at about 80% of the total volume and recede to about 20% after the 30th chelation. In retrospect, I think we became tired of the same old sequence repeating itself, or perhaps it was the eau d'urine that became offensive; but we discontinued the process many years ago.

The TACT Connection

One of the fascinating findings of the TACT (Trial to Assess Chelation Therapy), which monitored 1708 patients who suffered nonfatal myocardial infarction and nonfatal stroke and followed their course over a 5-year period after receiving 40 chelations and measured total mortality, recurrent MI, stroke,

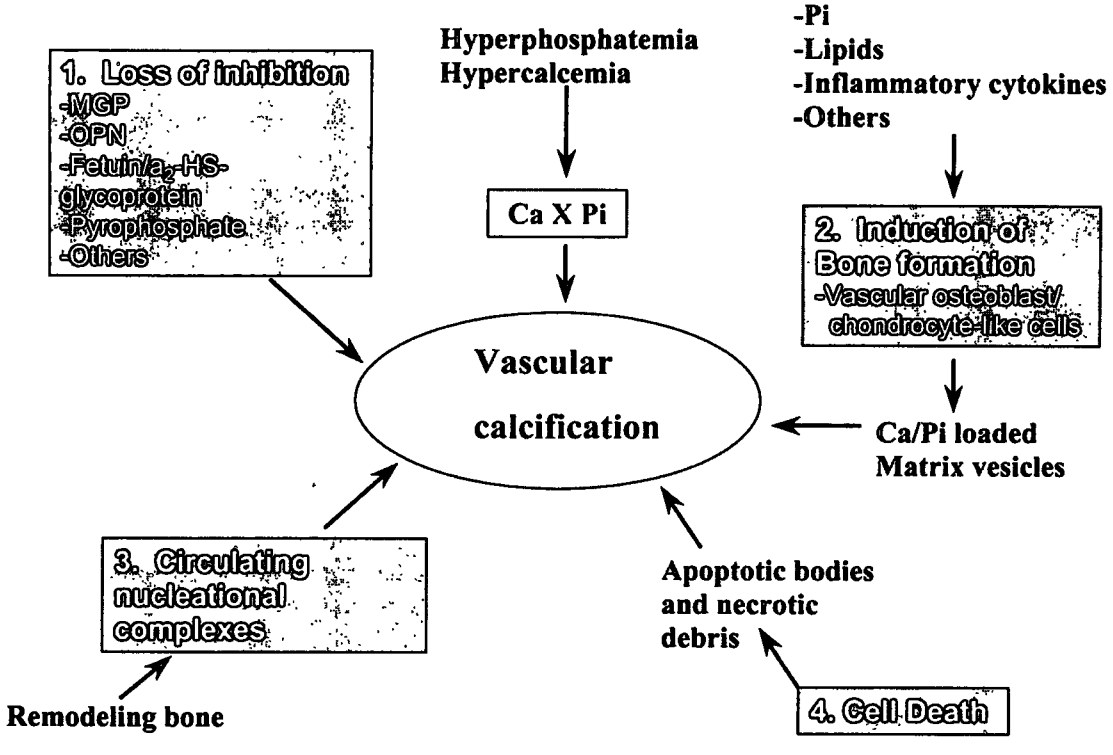

Figure 1: Schematic illustration of four, nonmutually exclusive theories for vascular calcification: (1) loss of inhibition as a result of deficiency of constitutively expressed tissue-derived and circulating mineralization inhibitors leads to default apatite deposition, (2) induction of bone formation resulting from altered differentiation of vascular smooth muscle or stem cells, (3) circulating nucleational complexes released from actively remodeling bone, and (4) cell death leading to release of apoptotic bodies and/or necrotic debris that may serve to nucleate apatite at sites of injury.

coronary revascularization, and hospitalizations for angina, was the diabetes connection. The composite reduction in events was 18%, anterior MI 37%, and in diabetic patients 39%. Does removal of arterial calcification relate to the better outcome for diabetic patients?

Transforming Vascular Smooth Muscle Cells into Osteoblastlike Cells

This process is a very complex, multivariate system. Many review articles have been printed since the 1980s and detail the increasing number of known factors which trigger the pluripotential, mesenchymal stem cells originating from the bone marrow and are seeded from the circulation into the target tissues, where they differentiate in the process of arterial calcification. Mesenchymal stem cells respond to potentially harmful stimuli by secreting bone morphogenetic proteins and trigger the differentiation of osteogenic cells. This was first shown in atherosclerotic plaques in 1993.[1] Many proteins as well as high glucose and phosphate levels also aggravate this process.[2] It is also a process of cellular checks and balances and is very sensitive to low vitamin D levels. Increased oxidative stress, inflammatory processes such as AGE, insulin resistance, and warfarin all aggravate the calcification process. Neuropathy and retinal damage are also related to this process.[3]

Diabetic calcification is associated with an increased prevalence of atherosclerotic vascular disease and cardiovascular mortality. Arterial calcification is also associated with end stage renal disease.[4] Uremic vascular calcification is an active cell-mediated process resembling osteogenesis in bone rather than passive precipitation. Osteopenia and arterial calcification often coexist. Realizing the reticence of chelating physicians to chelate patients with end-stage kidney disease, perhaps rethinking very low dose EDTA intervention in ESRD might be worth investigating.

Older Chelation Studies

From time to time I have reminded our readers of a collection of 23 human studies on chelation therapy on a DVD available from my office. One of those studies by C. Hancke, MD, and K. Flytlie, MD, from Denmark reviewed 470 patients who had received chelation therapy; it was published in 1993.[5] Of 65 patients referred for bypass surgery, 57 no longer required it, a success rate of 85%. 27 amputation patients had been referred for surgery and only 2 had to proceed with surgery for a positive result of 92%.

Richard Casdorph and Charles Farr, both MDs and PhDs, published an article in 1983 that reviewed four patients cases that were scheduled for imminent amputations with infection, ulceration, cellulitis, and gangrene, in which after chelation and supportive therapy it was no longer needed.[6] The improvement was long lasting. Before and after pictures of the patient's feet included in the study are terrific.

The earliest reported research using EDTA for removal of metastatic calcium deposits was conducted in 1946 at the University of Zurich and in 1947 and 1948 at the University of Bern.[7]

Is diabetes a general indication for chelation therapy? Probably.

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Environmental Medicine Update

by Marianne Marchese, ND
www.drmarchese.com

Lead in the Drinking Water: An American Crisis – Again!

Introduction

Lead poisoning is a phrase that Americans have not heard in the news in over two decades. Many assumed, since lead has been removed from household paint and gasoline, that the sources of exposure have been removed. Then came the 2016 news reports of lead in the drinking water in several US cities. The first report was from Flint, Michigan – that thousands were exposed to lead in the drinking water. Next came the *USA Today* report showing lead in the drinking water of several schools and day-care facilities across the US. Both cases have brought public awareness to the fact that lead is indeed not gone from our lives. It's time to revisit the heavy metal lead, its source of exposure in today's environment, and its health effects on adults and children.

Lead

Lead is a well-known heavy metal that is ubiquitous in the environment. Its adverse health effects have created public health crises throughout the world. Lead is commonly found in pipes, batteries, weights, ammunition, cable covers, and sheets used to shield us from radiation. The largest use for lead is in batteries in cars and other vehicles. Lead compounds are used as pigment in paints, dyes, and ceramic glazes and in caulk. Lead was once used in the US as a gasoline additive to increase octane rating. It is no longer used in gas, paints, dyes, and pigments in the US, but it's still in the environment.[1]

Lead enters the environment from mining and from factories that make or use lead or compounds. Lead is released into the air during the burning of coal, oil, or waste. Once it's in the air it travels and can enter our water supplies and land the soil.[1] Most of the lead in the soil comes from old houses that had lead paint and from previous car exhaust emitted when gasoline contained lead. Other sources of lead include lead that falls to the ground from the air and chipping of lead-based paint from buildings, bridges, and other structures. Lead from pipes may be released into the water when the water is acidic or "soft." Lead enters the drinking water primarily as a result of the corrosion of piping materials. It may remain in the environment for many years.

Exposure

In addition to air, water, and soil, we are exposed to lead through various products, herbal medicines, food sources, and jewelry. Lead has been found in children's jewelry sold in vending machines and stores. Some costume jewelry designed for adults has also been found to contain lead. Common Ayuvedic herbal products have been found to contain lead.[2] The metal may be in foods or liquids that have been stored in ceramics, pottery, china, or crystal. Lead can be found in candy, wrappers, pottery containers, and certain ethnic foods. Some nonglossy, vinyl miniblinds from foreign countries contain lead.[2] The Agency for Toxic Substances and Disease Registry (ATSDR) provides a nice summary below of the sources of lead exposure and how contamination occurs.

Lead Source	Contaminated Media
Lead solder/pipes	Drinking water
Packages or storage containers	Food, beverages
Paint (pre-1978)	Household dust and soil
Production sources	Imported foods, remedies, cosmetics, jewelry
Mining and smelting	Outdoor air and dust
Workplaces involving lead	Outdoor and indoor air and dust
Gasoline (pre-1988)	Soil

Source: Lead toxicity: where is lead found? [Web page]. Agency for Toxic Substances and Disease Registry. http://www.atsdr.cdc.gov/csem/csem.asp?csem=7&po=5.

Health Effects

The adverse health effects of lead exposure are well documented. Lead can affect the immune system and cause chronic infections as well as autoimmune conditions.[3] These effects can occur whether exposure takes place in adulthood, childhood, or in utero. Unborn children are at the greatest risk of adverse health effects, including low birth weight and premature birth. In children, lead exposure has been associated with decreased intelligence, slowed growth, and hearing problems. Exposure to high levels of lead can result in kidney and brain damage as well.[3]

Acute exposure, considered lead poisoning, can cause loss of appetite, headache, hypertension, abdominal pain, kidney damage, fatigue, arthritis, hallucinations, and vertigo. Acute exposure is typically a high dose of lead in a short amount of time. Chronic exposure to lead can result in serious issues for children, including mental retardation, birth defects, psychosis, autism, allergies, dyslexia, weight loss, hyperactivity, paralysis, muscular weakness, and brain and kidney damage. [4] Chronic exposure can be low doses of lead over a short or long duration. Early symptoms of lead exposure prompting a doctor to test for lead may include muscle weakness, fatigue, ADD, muscle pain, joint pain, decreased appetite, changes in taste, headache, insomnia, irritability, and weight loss.

Once exposed, lead is mostly stored in our bones, and early life exposure can create health problems during aging. Bone turnover that occurs with normal aging or due to early osteopenia can release lead into the blood and soft tissues. This can also occur during pregnancy, when there is an increase in bone mobilization, accounting for lead in the umbilical cord blood or newborns. This phenomenon was highlighted years ago in an article by M. Hernandez-Avila published in October 1996 in *Environmental Health Perspectives*.

Lead in Drinking Water

Schools and Day-Care Facilities. The March 20, 2016, issue of *USA Today* highlighted an investigation that found lead in the drinking water of schools and day-care facilities across the US. An analysis by the Environmental Protection Agency (EPA) showed that about 350 US schools and day-care centers failed lead tests a total of about 470 times from 2012 through 2015. Children at an elementary school in Ithaca, New York, were found to have elevated blood lead levels. The source was the schools drinking water. The EPA states that any amount of lead in the water over 15 parts per billion (ppb) warrants immediate action. One water sample at a Maine elementary school was 41 times above the EPA limit. A preschool in Pennsylvania was 14 times higher than the EPA limit, and a sink in a music-room bathroom at the Ithaca elementary school tested this year at 5000 ppb of lead.[5]

Schools typically do not test their own water for lead and other hazardous substances. They depend on their water sources such as municipal utilities to do the testing. Among schools and day cares required to test, the *USA Today* analysis found problematic lead levels in 42 states.[5] The lead contaminated water at these schools isn't used just for drinking, but also for cooking, and washing hands. Schools often sit empty for long stretches over the summer, allowing unused water to stay in contact with old lead pipes; and if the water is particularly corrosive, it can dissolve lead from the pipes. If schools are not testing for it, this problem can go undetected for months or years. Sometime the parents are not immediately told about the problem even once the school is aware. The lack of transparency is also at the heart of the Flint water crisis.

Flint, Michigan. By now most people are aware of the crisis in Flint, where thousands of people were exposed to lead in the drinking water. City and state officials knew about the exposure long before making the public aware and offering guidance on how to avoid exposure, get tested for lead in the body, and correct the problem that caused the exposure. It is estimated that over 8000 children were exposed to lead in Flint.[6] The public outcry and media attention is what drove *USA Today* to investigate if there is lead in the water of other US cities. So what happened in Flint?

Flint happened due to economics. The city was bankrupt and looking to save money, so officials decided to stop buying drinking water from Detroit, which charged Flint $21 million in 2011. The original plan was to join a new water treatment system that, like Detroit, drew water from Lake Huron, but that system wasn't ready.[6] So in 2014, the city began using treated water from the Flint River. The river water was corrosive, which, as stated above, can wear away pipes, leaching lead into the water. The city of Flint didn't properly treat the water from the river to make it less corrosive, and the state didn't properly test the water for lead levels. Both the city and state downplayed concerns from residents, pediatricians, and even General Motors, which stopped using the water because it was too corrosive. The state finally admitted that something was wrong after scientists from Virginia Tech went to Flint to test the water and found elevated lead levels in 40% of homes.[6] Residents were exposed to lead in the water for a longer period of time than they should have been, almost 2 years, due to the inaction of state and city officials.

Testing

Doctors are responsible for screening patients for lead exposure and linking various symptoms and disease to the effects of lead. Symptoms may not appear immediately after exposure, thus making lead toxicity hard to diagnose. The Centers for Disease Control and Prevention (CDC) states that lead is best tested in the blood (whole blood), but in some instances urine is necessary. The problem with most labs' offering lead tests is that the reference range is set too high, and interpreting the result is not always done correctly. Pediatric blood levels come with various reference ranges based on

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the child's age. The CDC states: "No safe blood lead level in children has been identified." There is no toxic threshold for lead, meaning that there is no measurable level of lead in the body below which no harm occurs. So having reference ranges really doesn't make any sense. Either it's there or it's not.

In 2016 the CDC updated the level of blood lead considered elevated in a child and set it at 5ug/dl.[7] For people exposed to lead chronically, the levels found in the body are significantly elevated. Blood lead levels of 30 to 80 µg/dL have been found in children living in old houses painted with lead-based paint, levels of 77 to 104 µg/dL in pottery-glaze workers, 90 to 137 µg/dL in those who consumed contaminated herbal medicines, 109 to 139 µg/dL in indoor firing range instructors, and up to 330 µg/dL in individuals who had drunk juice from glazed pottery.[8] Studies show that the amount of lead present in the body can determine if that person is at risk for disease. The blood lead level linked to adverse effects can be below the CDC's elevated range of 5ug/dl. This is especially true for children, as outlined in this table from the CDC.

Lead is mostly stored in two parts of the bone and in soft tissues such as the liver. The lead in the bone's surface can easily pass into the blood, whereas lead stored in cortical bone is immobilized. Studies have reported that 40% to 70% of lead in the blood of adults originates from bones.[8] Since lead is stored in the bone, a blood lead test may not accurately reflect body burden of lead in someone with chronic exposure or with high-dose exposure wherein it's out of circulation and stored in the bone. Bone lead will only show up in the blood if it is currently being mobilized by bone turnover or chelation therapy.[9]

This is where both blood and urine testing are appropriate to catch circulating levels and stored levels of lead. Urine lead testing would consist of both random urine and provoked urine testing using a chelating agent to mobilize lead stored in bone.[9] The January 2011 Environmental Medicine Update column of the *Townsend Letter* discussed provocative urine metal testing; that is, proper testing method and which chelator is best to use depending on exposure history and symptoms.[10] Lead concentration in cortical bone can also be measured through X-ray fluoroscopy (XRF). Provocative urine testing with a chelating agent and bone XRF are known to be the most sensitive techniques for determining the degree of lead accumulation in the body.

Treatment

Once it is established that lead is present in the body, the treatment to remove lead consists of chelation therapy. The ATSDR states: "Chelation therapy is necessary when blood lead levels are higher than 45µg/dL." This of course makes no sense when the CDC states that health effects are seen in children with levels in the blood as low as 3ug/dl. A chelating agent is a substance that can form several bonds to a single metal ion.[11] The most common chelating agents are ethylenediaminetetraacetic acid (EDTA), dimercaptosuccinic acid (DMSA) or 2,3-dimercapto-1-propane sulfonic acid (DMPS), dimercaprol (British anti-Lewisite [BAL]), and penicillamine.

Blood Lead Levels	Educational Impact	Size of Study	Location of Study
≤ 3 µg/dL	Decreased end of grade test scores	More than 57,000 children	North Carolina (Miranda et al. 2009)[1]
4 µg/dL at 3 years of age	Increased likelihood learning disabled classification in elementary school	More than 57,000 children	North Carolina (Miranda et al. 2009)[1]
	Poorer performance on tests	35,000 children	Connecticut (Miranda et al. 2011)
5 µg/dL	30% more likely to fail third grade reading and math tests	More than 48,000 children	Chicago (Evens et al. unpublished data)
	More likely to be non-proficient in math, science, and reading	21,000 children	Detroit (Zhang et al. 2013)
5–9 µg/dL	Scored 4.5 points lower on reading readiness tests	3,406 children	Rhode Island (McLaine et al. 2013)
≥ 10 µg/dL	Scored 10.1 points lower on reading readiness tests	3,406 children	Rhode Island (McLaine et al. 2013)
10 and 19 µg/dL	Significantly lower academic performance test scores in 4th grade	More than 3,000 children	Milwaukee (Amato et al. 2012)
≥ 25 µg/dL	$0.5 million in excess annual special education and juvenile justice costs	279 children	Mahoning County, Ohio (Stefanak et al. 2005)

Source: Centers for Disease Control and Prevention. *Educational Interventions for Children Affected by Lead.* Atlanta: US Department of Health and Human Services; 2015. Available at http://www.cdc.gov/nceh/lead/publications/Educational_Interventions_Children_Affected_by_Lead.pdf.

Calcium disodium EDTA (CaNa2EDTA; often listed simply as CaEDTA) and DMSA have a greater affinity for lead than the other chelating agents.[10] Only CaNa2EDTA can be used for treating lead poisoning, not Na2EDTA (disodium edetate). Na2EDTA should never be used, because it will induce tetany and possibly fatal hypocalcaemia. CaNa2EDTA is FDA approved for treating lead poisoning. It is administered intravenously and can increase urinary lead excretion 20-fold to 50-fold. CaNa2EDTA removes lead from the extracellular compartment only, because it does not enter cells.

Chelation therapy can result in a decrease in essential minerals from the body, thus causing some side effects. DMSA has been found to not cause a decrease in minerals such as zinc, iron, calcium, and magnesium and is the most efficient and safe chelating agent for lead exposure.[11] The drawbacks of CaNa2EDTA are that it contributes to a greater loss in minerals compared with DMSA.[11] The FDA approved DMSA in January 1991 for treating children with blood lead levels > 45 µg/dL. DMSA is an effective oral chelating agent.

New strategies in heavy metal chelation therapy include the use of combination therapy such as DMSA and CaNa2EDTA and the coadministration of antioxidants and nutrients. Taurine, vitamin B6, quercetin, vitamin E, vitamin C, garlic, curcumin, and lipoic acid have all been shown to decrease the effects of lead exposure or help remove lead from the body.[11] These nutrients are often used along with chelation therapy. The replacement of essential minerals is necessary with chelation because minerals are pulled out along with metals.

Summary

The water crisis in Flint, Michigan and the *USA Today* report on schools and day-care facilities, have brought to light the fact that people are still at risk for lead toxicity from water. Lead exposure through the drinking water has significant health effects on adults and children. Doctors need to know how to screen patients for signs, symptoms, and health conditions linked to lead. Proper interpretation of blood and urine tests help diagnose exposure and determine if chelation therapy is indicated. The recent media reports have increased public awareness of lead poisoning which will hopeful prevent further exposure by remediating the source and clear lead from the drinking water.

Notes

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Curmudgeon's Corner

by Jacob Schor, ND, FABNO
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Lucky Me!

An obscure case report published last July caught my attention and has left me feeling like I just won the lottery. Terry Golombick and Terry Diamond of St George Hospital in Sydney, Australia, along with Arumugam Manoharan and Rajeev Ramakrishna of the University of Wollongong, also in Sydney, described the case of a 72 year-old male patient who had come to their hospital in 2006 with laryngeal amyloidosis. In 2009, this patient started taking curcumin, initially at 1500 mg/day and gradually increased his dose to 3600 mg/day. Golombick and colleagues report that over the next year, the patient's supraglottic swelling decreased significantly and that he has had no further disease progression during a follow-up of 5 years.[1]

These are rather spectacular results.

Amyloidosis is a plasma cell disorder, a relative of the other plasma cell dyscrasias, most notably multiple myeloma but also soldering myeloma, and of monoclonal gammopathy of undetermined significance (MGUS). The actual name for this condition, amyloidosis, is terribly misleading. Congo red staining is used to diagnose the disease, since amyloid deposits hold onto this stain while healthy tissues do not. Since Congo red stain is typically used to stain starch deposits, it is understandable why early investigators may have misunderstood what they were looking at. Amyloid deposits are not starch at all, but rather clumps of antibodies; they are protein, not starch.

These excess antibodies are made by plasma cells, the workhorses of the immune system; these antibodies are made to protect the body against specific antigen-bearing "enemies." In the case of amyloidosis, though, one of these plasma cells goes awry and starts making antibodies that don't work quite right. These faulty antibodies misfold and possess two defining characteristics:

1. The body can't destroy them, so they accumulate.
2. Their shapes allow them to clump together into long linear fibrins.

These fibrins form what are called amyloid plaques. Alzheimer's disease is an example of a condition caused by amyloid plaque deposits.

Amyloidosis is actually a group of related diseases. What they all have in common are these extracellular deposits of insoluble fibrils in various tissues and organs. The fibrils have a characteristic beta-pleated sheet configuration. Many different types of proteins can form these fibrils. Amyloid diseases are classified by the type of protein and the location of the depositions, whether they are localized or systemic. In systemic disease, the proteins are produced at a site distant from the area of deposition, while in localized disease, production is close at hand to area of deposition.

The symptoms of amyloidosis are also systemic or localized to a particular area of the body. Typical areas of fibril congregation are heart, kidneys, or GI tract. Varying locations give rise to very different symptom pictures.

Currently, 25 different protein types have been identified that have this capacity to clump and lead to amyloid disease. Diseases that result from amyloid deposits are apparently much more common than we think and should be on our differential diagnosis lists.

A good source of further information is the booklet *Amyloidosis Awareness* (available at http://www.amyloidosissupport.org/AmyloidAware_Booklet.pdf).

I found this report by Golombick et al. of great interest for rather personal reasons. Twenty years ago, a biopsy removed from my larynx did in fact stain positive for amyloid by Congo red staining. The diagnosis explained why for the several years prior, I could not speak. It put to rest once and for all the frequently advanced theory that I was suffering from chronic occult GERD. You may recall that a decade or so back, I wrote frequently about the risks associated with taking proton pump inhibitors. I had a motive. I learned about the side effects of these drugs the hard way without any benefit in laryngeal function.

Suggested treatment for amyloid diseases vary with location of the plasma cells that are causing trouble.

- For systemic amyloidosis, where the troublesome plasma cells are in bone marrow, chemotherapy and stem cell transplants are the suggested current treatment.

- For localized amyloidosis, these systemic therapies are of no help. Instead local radiation treatment or surgical interventions are used to control progression.

In my own case, the disease has been localized to my vocal cords and nearby areas. I had two options for treatment, radiotherapy to the larynx or surgical removal of the deposits with laser. The specialists whom I consulted thought that the disease was too advanced for laser surgery, and radiotherapy struck me as worse than the symptoms so it was delayed. (One doctor viewing an MRI about 10 years ago admitted to being impressed that I could still swallow food.) Wait and watch was to be the temporary strategy, but 20 years later, here I am still waiting and watching.

I started taking curcumin regularly in 2001. My decision was inspired by an article in *Science News* that described the work of two UCLA researchers, Greg Cole and Sally Frautschy, who had advanced the idea that curcumin might be useful in treating Alzheimer's disease.[2] Their rationale was simple. In 2000, Ian Mackenzie had reported that anti-inflammatory drugs lowered risk of Alzheimer's disease.[3] Lifetime use of NSAIDs might not be desirable, so Cole and Frautschy wondered whether turmeric might have a similar effect, as it was known to have anti-inflammatory effects. As India has both the world's highest consumption of turmeric and the lowest incidence of Alzheimer's disease, this idea made sense.

Exactly how or why I rationalized my own decision to take curcumin is hard to remember; brain amyloid deposits are dissimilar to the laryngeal ones, but I probably assumed that beta sheaths are beta sheaths. I probably thought that maybe if curcumin could dissolve one type of amyloid, perhaps it could work on other types. It was a hopeful guess. This seems, in hindsight, to have been a good call.[4]

Until reading this Australian paper, I hadn't realized quite how lucky I have been. My disease has been stable for nearly two decades. As the Australians seem to think that 5 years of stable disease is worth reporting in a journal, I'm feeling pretty lucky.

Some of you know that I sometimes speak at conferences and will be wondering how this is possible if my vocal cords are just lumps of inflexible amyloid. Above the true vocal cords are two skin folds, called the false vocal cords; these are holdovers from some evolutionary precursor to modern humans. (I should probably amend that sentence as I recently received an e-mail from one of my readers, disgusted because I appear to believe in evolution.) It turns out that when one loses use of one's true vocal cords, one can, over time, learn to vibrate these false cords (put there by the Infinite Wisdom of the Creator) instead. What was seemingly redundant can be used to create something of a voice. A Godfather-like voice, albeit what is technically called a "false cord voice," but who am I to complain? I feel pretty lucky to have any voice.

With a microphone and an amplifier, I can speak to a crowd; the rest of the time I'm an obligate introvert. My voice isn't loud enough to be heard in most social situations.

I wrote to the Australians as soon as I read their paper to let them know that their *n* had doubled in size; we are at *n* = 2. They let me know that they already have other similar patients whom they are following. So perhaps, I am *n* = 5 or 6?

My lucky choice to take curcumin all those years ago has left me pondering how lucky we are as naturopaths; we have the freedom to experiment with our patients, much like I did on myself. Sometimes we find things that work, long before clinical practice has caught up to the research. Our therapies are for the most part nontoxic, so safe, and so benign that we can get away with an attitude of "it might help, it certainly won't hurt, let's try it and see what happens."

This is far different from the worldview of the medical oncologists whom I share the care of many of my patients with. They live in a world in which the majority of the treatments that they employ can be deadly. Rather than the easygoing approach that I can take, they live in a "without proof that this works, it's not worth the risk to take" kind of world.

We naturopathic doctors are lucky. Patients who come to us want to try things like curcumin instead of prescription drugs, and equally important, we get to help and encourage them do so. We get the chance to make sick people better.

As naturopathic doctors, we can explore the latest science regarding medicine and health and extrapolate from there to design experiments for an individual patient, to borrow a term from Gurdev Parmer, in which the *n* = 1. Our philosophical guidelines encourage this freedom.

We get to try "nature's cures" in situations one would have never thought they could be used just a few years ago. For example, recent papers suggest that curcumin may reduce anxiety.[5] The choice to at least try curcumin before prescription antianxiolytic drugs should, in many situations, be a no-brainer. (Perhaps this newly published association between taking curcumin and reduced anxiety explains my easygoing attitude about some things? Perhaps what you are reading here is just the result of my taking curcumin? Is feeling lucky the same as having low anxiety?)

Still, sometimes, as in my case, we seem to get lucky, and work small miracles.

Notes

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Women's Health Update

by Tori Hudson, ND
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Fatty Acid Supplementation: Liver Fat and Cardiovascular Disease

Polyunsaturated Fatty Acid Supplementation and Nonalcoholic Steatohepatitis

The prevalence of non-alcoholic fatty liver diseases (NAFLD) has increased substantially in the past decade or more. Non-alcoholic steatohepatitis (NASH) and liver failure induced by NAFLD are associated with morbidity and mortality with no specific or highly effective conventional treatments for NAFLD or NASH. Dyslipidemia from years of high simple-carbohydrate and high-fat diets are a fundamental element for the development of NASH. The pathophysiology of NAFLD and NASH includes lipid overload and lobular liver tissue inflammation

Because polyunsaturated fatty acids (PUFAs) can improve lipid disorders and reduce inflammation and oxidation, it is a reasonable hypothesis that PUFA supplementation might be able to improve NASH. The current randomized, prospective, controlled trial was conducted to investigate this possibility.

All participants had a NASH diagnosis, and not due to excess alcohol consumption, medications, viral hepatitis, or autoimmune diseases. A total of 78 participants were enrolled and randomly assigned to either the control group or the PUFA group of 50 ml of PUFA with a 1:1 ratio of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Both groups were advised to exercise 30 minutes at least 5 days per week along with low-fat, low-cholesterol, and low-carbohydrate diets. Several laboratory tests of metabolic function were tested at the initial visit and at 6 months posttherapy. In addition, liver biopsies were taken at the initial visit and at the 6 months post PUFA that assessed steatosis grade, necroinflammatory grade, fibrosis stage, and ballooning. Most of the patients were male, overweight or obese with elevated liver enzymes, elevated triglycerides, total cholesterol and LDL cholesterol, elevated markers of inflammation, and higher fibrotic parameters.

After 6 months of PUFA therapy, liver function was significantly improved in the treatment group compared with the control group as indicated by significant reduction in the liver enzymes/triglycerides/total cholesterol, profound reduction in the inflammatory markers, and significant improvement in the fibrotic parameters. In addition, after 6 months of PUFA therapy, all the histopathological parameters as seen from the liver biopsies demonstrated that the severity of NASH was significantly improved in the PUFA group when compared to the control group.

Comment: Lipid-lowering medications, insulin-sensitizing agents such as metformin, and antioxidants such as vitamins C and E have previously been studied with disappointing results. Previous studies reveal that increased PUFA nutrition is known to modulate lipids, provide some glycemic control, improve hypertension, and reduce inflammation. These effects prompt the reasonable consideration that PUFAs could also improve NAFLD and NASH. In the current study, after just 6 months of PUFA treatment, the laboratory parameters improved, and most importantly, the cellular changes of the chronic liver disease profoundly improved. It appears from this simple study and simple treatment that PUFA supplementation inhibited lipid accumulation, ameliorated inflammation, and reduced the hepatic fibrosis involved in NASH and NAFLD.

Yun-Hua Y, Lu-Hua Y, Kai-Hui S, et al. Efficacy of poly-unsaturated fatty acid therapy on patients with nonalcoholic steatohepatitis. *World J Gastroenterol.* 2015;21(22):7008–7013.

The Effect of Docosahexaenoic Acid Supplementation on Hepatic Fat in Children with Nonalcoholic Fatty Liver Disease

As is true in adults, children and adolescents with fatty liver have metabolic abnormalities that are risk factors for cardiovascular disease and include insulin resistance, glucose intolerance, and dyslipidemia. There are important associations between NAFLD and subclinical atherosclerosis. It might be said that NAFLD is the hepatic aspect of metabolic syndrome (MetS) and a significant risk factor for atherosclerotic disease, even in children. NAFLD is also a risk factor for myocardial insulin resistance, abnormal left ventricular and diastolic function, and altered metabolism of cardiac energy.

Weight loss and increased physical activity are the currently accepted approaches to decrease hepatic fat with no pharmacologic approved options for NAFLD in children. However, omega-3 fatty acids may have benefit for NAFLD in children as well as adults.

In adults, we have published clinical trials which have shown that supplementation with fish oils can reduce hepatic fat. In children, DHA supplementation improves liver steatosis and reduces serum alanine aminotransferase (ALT) and triglycerides, and improves insulin sensitivity. Whether or not this then leads to cardiovascular benefit in children with NAFLD is unknown.

The current study investigated the influence of omega-3 fatty acids, specifically DHA, on hepatic fat, abdominal visceral fat, subcutaneous fat, epicardial fat, and associated cardiovascular risk factors.

This double-blind, parallel-group, placebo-controlled, randomized trial was conducted in 58 children in which 51 completed the study with a total of 25 receiving the DHA and 26 the placebo. A supplement of 250 mg/day of DHA or placebo was given for 6 months. After 6 months, the liver fat was reduced by 53.4% in the DHA group and 22.6% in the placebo group. The DHA group also had 7.8% reduced visceral abdominal fat and 14.2% epicardial fat vs. 2.2% and 1.7% respectively, in the placebo group. Fasting insulin and triglycerides significantly decreased in the DHA group although there were no changes in ALT or body mass index.

Comment: The effects of DHA in this study confirm the results of previous studies in children that used 250mg/day of DHA, and 500 mg/day of DHA combined with diet and exercise. In these studies, liver steatosis improved, insulin sensitivity improved, and serum triglycerides and ALD were reduced.

Children with NAFLD should be encouraged to take fish oil supplements, and in particular at least 250 mg/day of DHA in order to decrease liver and visceral fat and improve metabolic abnormalities with the longer-term benefit of reducing their cardiovascular risk factors.

Pacifico L, Bonci E, Di Martino M, et al. A double-blind, placebo-controlled randomized trial to evaluate the efficacy of docosahexaenoic acid supplementation on hepatic fat and associated cardiovascular risk factors in overweight children with nonalcoholic fatty liver disease. *Nutr Metab Cardiovasc Dis*. 2015;25:734–741.

Grapefruit Juice Flavonoids Reduce Arterial Stiffness in Postmenopausal Women

There is an increased risk of cardiovascular disease in postmenopausal women. This randomized, double-blind, controlled, crossover trial investigated the effects of grapefruit on the vascular function of postmenopausal women.

Women were between the ages of 50 and 65, were 3 to 10 years postmenopause, Caucasian, nonsmokers, and had normal blood pressure, normal electrocardiogram, and a body mass index (BMI) between 19 and 30 kg/m^2. Exclusions included those on hormone replacement therapy within 3 months prior, on drugs that could interact with grapefruit juice, allergy to citrus, on specialized diets or supplements, exercising >5 hours/week, and a diet higher in flavonoids.

A concentrated grapefruit juice drink was standardized to contain the flavonoid naringenin at 212.9 mg per 340 ml. A control drink without naringenin was also provided. Women were randomized and each drink was ingested daily for 6 months, 170 ml with morning and midday meals. There was then a 2-month washout period and each group then consumed the opposite drink for 6 months.

The primary outcome in this study was brachial artery flow-mediated dilation. Blood pressure, carotid-femoral pulse wave velocity, and digital peripheral arterial tonometry, cellular markers of vascular activity, glycemia, and insulinemia were secondary outcomes. Measurements were taken at baseline and following the 6-month consumption of each drink.

A total of 52 postmenopausal women were included and randomly assigned with 26 in each group, although during follow-up, 4 women in the grapefruit juice group were excluded due to abnormal electrocardiograms.

After 6 months of grapefruit juice consumption, pulse wave velocity measurements of carotid and femoral arteries, which indicates improved vascular stiffness, were significantly decreased as compared with those in the control drink group. Flow-mediated dilation and peripheral arterial tonometry measurements were not different between the groups. Blood pressure and cellular markers of endothelial function were not significantly different, nor was body weight, plasma glucose and insulin, inflammation, and antioxidant capacity between the grapefruit juice and control groups.

Comment: Grapefruit juice, high in the flavonoid naringenin, showed a significant decrease of arterial stiffness in certain vascular tissues of postmenopausal women without improving blood pressure or endothelial function in this study. I am not in the habit of recommending daily intake of citrus juice, or any fruit juice for that matter, to my patients. While this study is interesting, and flavonoids are an important compound that can potentially reduce cardiovascular risk, I'm not sure that grapefruit juice will find its way into my clinical advice.

Habauzit V, Verny M-A, Milenkovic D, et al. Flavanones protect from arterial stiffness in postmenopausal women consuming grapefruit juice for 6 mo: a randomized, controlled, crossover trial. *Am J Clin Nutr*. July 2015;102(1):66–74.

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Calendar

Please submit an announcement of your event 90 days in advance. Event publication must be limited to 25 words or less. Multiple event listings require paid advertising. Contact calendar@townsendletter.com for details.

JUNE 3-6: MEDICINES FROM THE EARTH HERB SYMPOSIUM in Black Mountain, North Carolina. CONTACT: 541-482-3016; http://www.botanicalmedicine.org

JUNE 4: THE BRAIN: NUTRITIONAL PERSPECTIVES & CONSIDERATIONS in Albuqueque, New Mexico. CONTACT: https://www.facebook.com/BioticsResearch

JUNE 4-5: MASTERING THE SCIENCE OF INTEGRATIVE BLOOD CHEMISTRY in Falls Church, Virginia. CONTACT: https://www.facebook.com/BioticsResearch

JUNE 6-10: APPLYING FUNCTIONAL MEDICINE IN CLINICAL PRACTICE – 5 day foundational course in Austin, Texas. Also, **SEPTEMBER 19-23** in Baltimore, Maryland. CONTACT: https://www.functionalmedicine.org/AFMCP

JUNE 9-11: INTERNATIONAL CONGRESS FOR INTEGRATIVE HEALTH & MEDICINE in Stuttgart, Germany (near Stuttgart Airport). CONTACT: Academy of Integrative Health & Medicine, 310-623-0050; http://icihm.org

JUNE 11: HORMONES & CARDIOMETABOLIC FUNCTION – Getting to the Heart of the Matter in New York, New York. CONTACT: https://www.facebook.com/BioticsResearch

JUNE 16-18: METABOLIC MEDICAL INSTITUTE MODULES on Nutrition & Exercise in Chicago, Illinois. CONTACT: http://www.mmimedicine.com/metabolic-medicine-event-schedule.html#201606chicago

JUNE 16-18: SOPMED (Society of Oxidative & Photonic Medicine) CONFERENCE near Salt Lake City, Utah. Oxidative, light, and energy medicine. Limited to 300 participants. CONTACT: 517-242-5813; info@sopmed.org; http://www.sopmed.org

JUNE 17-18: A4M INTRAVENOUS NUTRITIONAL THERAPY SYMPOSIUM in Chicago, Illinois. CONTACT: http://www.a4m.com/nutritional-symposium-chicago-june-2016.html

JUNE 18: THE ROLE OF NUTRITION & NUTRACEUTICAL SUPPLEMENTS IN INTEGRATIVE CARDIOVASCULAR MEDICINE in Houston, Texas. CONTACT: https://www.facebook.com/BioticsResearch

JUNE 18: ORGANIC ACIDS WORKSHOP FOR DISCOVERING UNDERLYING CAUSES OF CHRONIC ILLNESS with Kurt Woeller, DO in Cherry Hill, New Jersey (near Philadelphia). CONTACT: http://organicacidworkshop.com

JUNE 23-25: A4M BHRT SYMPOSIUM in San Diego, California. CONTACT: http://www.a4m.com/2016/june/san-diego/a4m-symposium.html

JUNE 23-25: METABOLIC MEDICAL INSTITUTE MODULES on Weight Management and Compounded Prescriptions in San Diego, California. CONTACT: http://www.mmimedicine.com/metabolic-medicine-event-schedule.html

JULY 1-3: 3rd INTERNATIONAL CONGRESS ON NATUROPATHIC MEDICINE in Barcelona, Spain. CONTACT: http://icnmnaturopathy.eu

JULY 15-17: HORMONE ADVANCED PRACTICE MODULE – RE-ESTABLISHING HORMONAL BALANCE in National Harbor, Maryland (DC) CONTACT: https://www.functionalmedicine.org/Hormone

JULY 15-17: ENERGY REGULATION ADVANCED PRACTICE MODULE – Illuminating the Energy Spectrum in National Harbor, Maryland (DC) CONTACT: https://www.functionalmedicine.org/Energy

JULY 22-24: 4th COLORADO INTEGRATIVE MEDICINE CONFERENCE – Focus on Mind-Body Medicine & Lifestyle Management in Estes Park, Colorado. CONTACT: 970-310-3030; info@altermedresearch.org; http://www.altermedresearch.org/cimc2016/

JULY 27-30: AMERICAN ASSOCIATION OF NATUROPATHIC PHYSICIANS' ANNUAL CONFERENCE & EXPOSITION in Salt Lake City, Utah. CONTACT: http://www.naturopathic.org/aanp2016.

AUGUST 6-7: GREAT PLAINS LABORATORY WORKSHOPS ON ORGANIC ACIDS TESTING AND GENETIC TESTING in San Jose, California. CONTACT: http://www.gpluniversity.com

AUGUST 10-13: 25th ANNUAL IAACN SCIENTIFIC SYMPOSIUM – Renovation of the Structural Integrity of the Human Body Through Biomolecular Interventions Beyond the Collagen Connections in Jacksonville, Florida. CONTACT: http://www.iaacn.org/symposium/

AUGUST 11-13: METABOLIC MEDICAL INSTITUTE MODULES on Gastroenterology and Toxicology & Detoxification in Las Vegas, Nevada. CONTACT: http://www.mmimedicine.com/metabolic-medicine-event-schedule.html

AUGUST 25-28: NORTHWEST HERB SYMPOSIUM – "Botanicals at the Beach" with Practitioner Track @ Camp Casey Conference Center on Whidbey Island, Washington. CONTACT: http://nwherbsymposium.com/

SEPTEMBER 3-9: HEALTHY BIRTH, HEALTHY EARTH @ Findhorn Foundation, Scotland. CONTACT: https://www.findhorn.org/programmes/healthy-birth-healthy-earth

SEPTEMBER 9-10: INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY (IAOMT) ANNUAL CONFERENCE & JOINT MEETING WITH IABDM in Reno, Nevada. CE credits. CONTACT: https://iaomt.org.

SEPTEMBER 9-11: 10th ANNUAL INTERNATIONAL HYPERBARIC MEDICINE CONFERENCE in New Orleans, Louisiana. CONTACT: http://www.hbot2016.com

SEPTEMBER 15-18: 2016 ACAM & AAPMD JOINT ANNUAL MEETING – An Interdisciplinary Approach to Advanced Prevention in Tucson, Arizona. CONTACT: http://www.acam.org/ACAM2016

SEPTEMBER 15-18: 14th ANNUAL INTERNATIONAL RESTORATIVE MEDICINE CONFERENCE – Cutting-edge Protocols for Treating Chronic Conditions: Practical Clinical Skills You Can Use Monday Morning in Hilton Head, South Carolina. CONTACT: http://restorativemedicine.org/aarm2016/

SEPTEMBER 19-23: APPLYING FUNCTIONAL MEDICINE IN CLINICAL PRACTICE - 5 day foundational course in Baltimore, Maryland. CONTACT: https://www.functionalmedicine.org/AFMCP

SEPTEMBER 21-24: A4M BHRT SYMPOSIUM in Dallas, Texas. Also, ABAARM & ABAAHP exams. CONTACT: http://www.a4m.com/conference-schedule.html

SEPTEMBER 22-24: METABOLIC MEDICAL INSTITUTE MODULES on Neurology, Autoimmune Disease, Cardiovascular, & Stem Cells in Dallas, Texas. CONTACT: http://www.mmimedicine.com/metabolic-medicine-event-schedule.html

SEPTEMBER 24: A4M SYMPOSIUM – A New Prescription for Pharmacy Practice in Dallas, Texas. CONTACT: http://www.a4m.com

SEPTEMBER 29-OCTOBER 2: 7th ANNUAL INTEGRATIVE MEDICINE FOR MENTAL HEALTH CONFERENCE in Reston, Virginia (near D.C.). CONTACT: http://www.immh2016.com/

SEPTEMBER 30-OCTOBER 1: A4M SYMPOSIUM in Washington, DC. CONTACT: http://www.a4m.com/2016/washington-dc/a4m-symposium.html

SEPTEMBER 30-OCTOBER 2: 10th ANNUAL MICROCURRENT CASE CONFERENCE in St. Pete Beach, Florida. CONTACT: http://microcurrent.info.

SEPTEMBER 30-OCTOBER 2: KLINGHARDT EUROPEAN NEURAL THERAPY & INJECTION TECHNIQUES in Kenmore, Washington. A transformative workshop: basic to advanced skills. CONTACT: 908-899-1650; info@klinghardtacademy.com; http://www.klinghardtacademy.com/Seminars-Workshops/Injection-Techniques-and-Skills-2016.html

OCTOBER 1-2: WASHINGTON ASSOCIATION OF NATUROPATHIC PHYSICIANS ANNUAL CONFERENCE – Staying Current in Primary Care in Shoreline, Washington (near Seattle). CONTACT: http://www.wanp.org/calendar

OCTOBER 6-9: AMERICAN ACADEMY OF ENVIRONMENTAL MEDICINE ANNUAL MEETING – The Role of Mitochondria in Health & Disease near San Diego, California. CONTACT: AAEM, 316-684-5500; http://www.aaemconference.com

OCTOBER 7-9: HOMEOPROPHYLAXIS: The Evidence-Based Choice in St. Petersburg, Florida. CONTACT: http://www.WorldWideChoice.org

OCTOBER 22-23: 10th AUSTRALIAN HOMEOPATHIC MEDICINE CONFERENCE in Brisbane, Australia. CONTACT: http://www.homeopathyconference.com

OCTOBER 28-30: DETOX ADVANCED PRACTICE MODULE – Biotransformation and Toxicity in Chicago, Illinois. Live Streaming Available. CONTACT: https://www.functionalmedicine.org/Detox

OCTOBER 30-NOVEMBER 3: AIHM ANNUAL CONFERENCE – PEOPLE, PLANET, PURPOSE: Global Practitioner United in Health & Healing in San Diego, California. CONTACT: http://www.aihm.org/aihm-conference/

NOVEMBER 5-6: GREAT PLAINS LABORATORY WORKSHOPS ON ORGANIC ACIDS TESTING AND GENETIC TESTING in Dallas, Texas. CONTACT: http://www.gpluniversity.com.

DECEMBER 8-11: A4M WORLD CONGRESS ON ANTI-AGING MEDICINE in Las Vegas, Nevada. Also, ABAARM & ABAAHP exams. CONTACT: http://www.a4m.com/conference-schedule.html

DECEMBER 9-11: METABOLIC MEDICAL INSTITUTE MODULES on Endocrinology, Clinical Practice Protocols, Weight Management, & Stem Cells in Las Vegas, Nevada. CONTACT: http://www.mmimedicine.com/metabolic-medicine-event-schedule.html

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The Drugging of Our Population

A recent study published in the *Journal of the American Medical Association* found a disturbing increase in prescription drug use among adults in the US.[1] Between 1999–2000 and 2011–2012, the proportion of adults who were using at least one prescription drug increased significantly, from 51% to 59% ($p < 0.001$). During the same time period, the proportion of adults who were using five or more prescription drugs nearly doubled, from 8.2% to 15% ($p < 0.001$). These trends remained statistically significant after adjustment for age. Each of 18 different classes of drugs was being used by more than 2.5% of the population during the study. Among those 18 drug classes, the prevalence of use increased in 11, including proton pump inhibitors (PPIs), muscle relaxants, antidepressants, antihypertensive agents, lipid-lowering agents, diuretics, antianxiety drugs, and bronchodilators. In the year 2014, Americans filled 4.3 billion prescriptions at a total cost of $374 billion.[2] And that's not to mention the millions, if not billions of over-the-counter medications purchased each year in the US.

Does taking all of these drugs improve our health? There are certainly some examples of where medications are beneficial. Statin drugs and antihypertensive agents reduce the risk of cardiovascular events; anticoagulants prevent strokes in people with atrial fibrillation; and certain cardiac medications prolong survival in patients with congestive heart failure. However, many widely used medicines simply suppress symptoms without addressing the cause, and all too often they create new problems that lead to the use of even more medications.

For example, PPIs are used by millions of Americans to treat heartburn and gastroesophageal reflux disease (GERD). By suppressing gastric acid production, these drugs can decrease the absorption of a wide range of nutrients, including magnesium, iron, vitamin B12, and essential amino acids. Low magnesium status can trigger or exacerbate anxiety, depression, hypertension, muscle spasm, or asthma, potentially creating the need for antianxiety drugs, antidepressants, antihypertensive agents, muscle relaxants, and bronchodilators, respectively. PPI-induced depletion of iron, essential amino acids, and vitamin B12 can also trigger or exacerbate depression. Low magnesium and iron status may also worsen congestive heart failure, which might lead the practitioner to prescribe or increase the dose of magnesium-depleting diuretics, thereby creating a vicious cycle of more magnesium deficiency and more drugs. PPI use is also associated with an increased risk of osteoporosis, which might lead to prescriptions for a bisphosphonate or other osteoporosis medication.

The vicious cycle of drugs leading to more drugs extends well beyond drug-induced nutritional deficiencies. Drugs that can cause heartburn (potentially leading to a prescription for a PPI) include certain antidepressants and antianxiety medications, theophylline (used to treat asthma), calcium-channel blockers (used for hypertension), nonsteroidal anti-inflammatory drugs, and bisphosphonates. Drugs that may cause depression include beta-adrenergic blockers (used to treat hypertension), calcium-channel blockers, some antianxiety medications, and statins (used for hypercholesterolemia). I have seen many patients in whom longstanding symptoms resolved rapidly after they discontinued one or more "nonessential" medications that had been prescribed by another doctor. Some conventional doctors are aware that common, nonspecific symptoms are often caused by medications, but all too many doctors seem to overlook that fact. Not surprisingly, practitioners who are familiar with and interested in alternatives to medications such as dietary modifications, nutritional supplements, exercise, stress reduction, and botanical remedies are often more aware than their conventional counterparts about medication side effects.

Common conditions for which pharmaceuticals are typically prescribed can frequently be treated successfully with nondrug approaches. For example, many patients can discontinue their PPI if they chew their food better, identify and eliminate allergenic foods, and avoid symptom evokers such as refined sugar and alcohol. Depression can in many cases be treated successfully by L-tryptophan, St. John's wort, or other nontoxic interventions. Hypertension can often be successfully treated without medication, by means of dietary modification, weight loss, exercise, stress reduction, and nutritional supplements such as coenzyme Q10 and magnesium. Anxiety frequently responds to caffeine avoidance, dietary changes, exercise, and supplementation with magnesium or niacinamide.

In my experience, patients who opt for nondrug approaches to their medical conditions are generally healthier and happier than those who rely on the pill-for-every-ailment method. Fortunately, the number of practitioners interested in alternatives to prescription drugs, and the number of patients interested in pursuing these alternatives, continue to grow. Hopefully, the next study on prescription drug use will find that the worrisome trend has been reversed.

Alan R. Gaby, MD

Notes

1. Kantor ED et al. Trends in prescription drug use among adults in the United States from 1999-2012. *JAMA* 2015,314:1818–1831.
2. Sifferlin A. Americans spent a record amount on medicine in 2014. *Time*. April 14, 2015. http://time.com/3819889/medicine-spending. Accessed March 28, 2016

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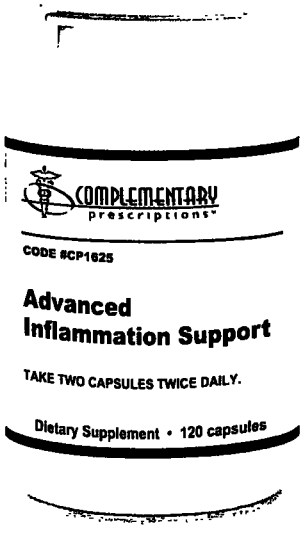

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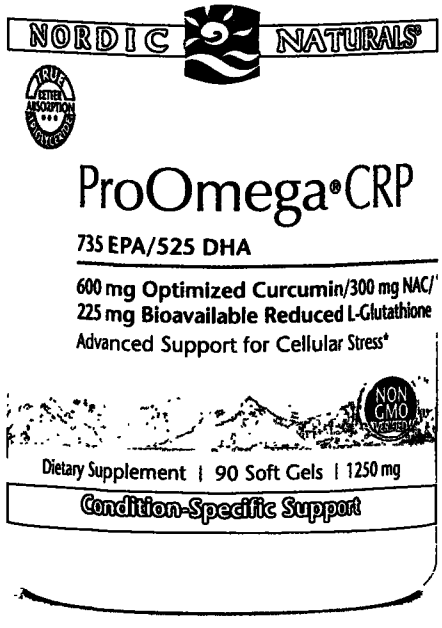

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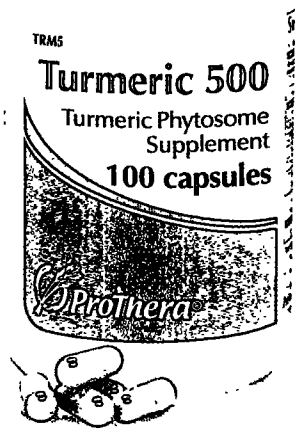

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