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ISSUE #432

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† Hickey S., Roberts H, Miller N, (2008) Pharmacokinetics of oral vitamin C.

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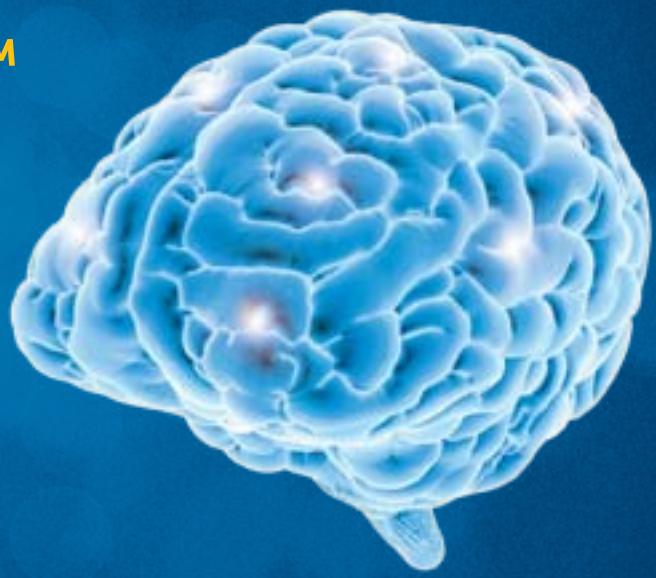

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From the Publisher

Is Writing a Vaccination Exemption Hoisting Oneself on One's Own Petard?

Kenneth Stoller, MD, was informed on May 8th that the City of San Francisco was investigating him for writing medical exemptions for vaccinations. Stoller is a noted anti-vaxxer who has been prominently praised by parents on Google for providing such exemptions. The City Attorney subpoenaed his patient records to determine if Stoller falsely wrote exemptions not justified on a medical basis. One source stated that Stoller used data from patient 23andme genetic reports to justify medical exemption.

Stoller's attorney, Richard Jaffe, is highly critical of the authorities' motivation for the investigation, purportedly that unvaccinated individuals represent a "public nuisance" by substantially increasing the incidence of preventable infectious disease such as measles. Jaffe states:

continued on page 6 ➤

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Letter from the Publisher

➤ *continued from page 4*

> The use of the state public nuisance laws as a basis/ pretext of investigating a physician's medical decisions is unprecedented and represents intrusion into the physician/ patient relationship. We believe City Attorney's action is part of the campaign to pass SB276 to eliminate a physician's ability to write medical exemptions under SB 277, and to attack physicians who are following SB 277 in their vaccine exemption decision making.

Physicians, particularly alternative medicine practitioners, naturopathic doctors, and chiropractors are being asked to write vaccine medical exemptions, although it is unclear whether chiropractic letters are legally acceptable. Previous history of severe adverse reactions post-vaccination is clearly appropriate for exemption. Suppression of the immune system and weakness during and following cancer chemotherapy are also reasons to skip immunization. An allergy to eggs also is justification. However, once these criteria are examined and ruled out, is there a basis for medical exemptions? If Stoller wrote an exemption without "proven" medical criteria, simply because he and his patient's parent(s) wished to avoid vaccination, did he improperly and illegally provide it?

Might this be a harbinger for further physician investigations in California and elsewhere? Maybe. However, it is clear that society and conventional medicine are not happy with the recent mushrooming measles outbreak. Despite legitimate concerns with loss of freedom of choice in medical decision making, the concept of herd immunization by vaccination remains absolutely proven and indisputable by the medical authorities. That being the case, doesn't writing vaccine exemptions amount to hoisting oneself upon one's own anti-vaxxer petard?

For those who would like to support Dr. Stoller, please visit GoGetFunding.com and search "Legal Defense Fund for Dr. Kenneth Stoller." GoFundMe dropped Dr. Stoller's defense fund from its website.

Yes, It's a Yeast Infection, But a Deadly One, Resistant to Antifungal Drugs

If I had to designate time periods for the clinic work I have done, one of them would be when I focused on the diagnosis and treatment of the "yeast syndrome." Before that it would have been "hypoglycemia," and after that it would have been "chronic fatigue syndrome," and more recently, "Lyme disease." The work on the yeast syndrome was a strange business in that conventional medicine has always considered a yeast infection caused by *Candida albicans* to be just a localized infection immediately treatable with an antifungal medication, such as nystatin. However, a number of integrative and functional medicine physicians and researchers have thought that the infection was not so localized; and the yeast in its various forms, as well as the mycotoxins it generated, was quite harmful to many individuals, especially those whose immune system if not compromised was to some degree impaired. C. Orian Truss, MD, observed early in the 1980s that a certain component of psychiatric patients suffering from depression and related disorders were infected with a yeast infection and that the use of nystatin reversed their depression and psychiatric symptoms. (The story is detailed in his books, *The Missing Diagnosis* and its sequel.) William Crook, MD, dedicated his career, after reading Truss's work, to the treatment of yeast, which he wrote about in *The Yeast Connection*. My use of the term, the yeast syndrome, derives from the book of the same title written by John Trowbridge, MD, and Morton Walker, DPM.

The thinking of all of these physicians was predicated on the systemic nature of a yeast infection capable of rendering a wide constellation of physical and mental symptoms. Treatment largely consisted of a restrictive diet of meat, eggs, vegetables, and yogurt (MEVY). Anti-fungal medications included nystatin with limited effectiveness on the surface of the tissue it was applied to or within the confines of the digestive tract, as well as those that were absorbed systemically such as ketoconazole and fluconazole. Naturopathic treatment employed plant-based anti-microbials such as olive leaf extract and fatty acids such as caprylic acid derived from castor bean or coconut oil. For many patients, diagnosis and treatment of the yeast syndrome facilitated a dramatic recovery unattainable with the "usual" treatment offered in primary and specialty medical care. Trowbridge, the only physician of the aforementioned group who is still practicing, continues to recommend immediately ruling out yeast syndrome as a primary diagnostic strategy in all patients suffering with chronic physical and mental symptoms. From his perspective, digestive distress, depression, chronic fatigue, recurrent rash, and chronic muscular pain are symptoms of yeast syndrome until proven otherwise; furthermore, an untreated yeast diagnosis could be complicating the treatment of many more serious diseases, including autoimmune illness and Lyme disease.

Quite a different scenario is now unfolding on the world stage, and it has health authorities worried much more than the current myriad cases of measles and episodic bouts of Ebola. Meet another yeast, one that has emerged as one infectious disease expert has characterized it from the black lagoon, *Candida auris*. An April 6 report in the *New York Times*, "A mysterious infection, spanning the globe in a climate of secrecy" by Matt Richtel and Andrew Jacobs, well summarizes the fear that a "harmless" fungus has caused mental paralysis of hospital administrators and CDC researchers. Like *C. albicans* this organism is extremely capable of establishing itself wherever it settles and will not lend itself to early demise with simple bleaching or being gassed with ozone. And once it has infected an immune-compromised individual, despite heroic use of all the antifungals, death occurs within 90 days in more than half the cases. A decade ago there was one identified case – a woman in Japan who had a curious ear infection yielding the name *C. auris*, from the Latin term for ear. Over the past ten years, the organism has infected individuals around the world creating nightmares for hospitals treating these patients. Following the demise of an infected patient in a Brooklyn hospital, maintenance staff needed to nearly nuke the facility to eliminate the organism, using poisonous

chemicals, as well as cutting out floor and ceiling tiles. Testing revealed its presence not just on clothing and blankets but on all the medical equipment. Needless to say, hospital staff are not thrilled about working with these patients, worrying that they will acquire the infection themselves or pass it on to their loved ones by bringing it into their households. Most outrageously, hospital administrators attempt to hush any scuttlebutt and refuse to divulge any information to the press and local authorities about a patient being treated for *C. auris*. Imagine coming into a hospital for non-emergency surgery and being exposed to it!

Why has *C. auris* emerged "from the black lagoon" appearing in hospitals worldwide? Just like our love for feeding antibiotics to chickens, pigs, and livestock, farmers are generously spraying antifungals on food crops to avoid plant disease. And just like bacteria that are becoming resistant to antibiotics, fungi are evolving that are resistant to azole antifungal drugs. For hospitals, finding a solution to controlling *C. auris* could not come soon enough. In the interim, keep track of the infectious disease incident reports of your local hospital, especially if you reside in New York City, Newark, or Chicago as well as London, Valencia, Delhi, Islamabad, Johannesburg, Tokyo, Amsterdam, and Caracas. Medical tourists travelling abroad for less expensive cosmetic surgery may want to reconsider that decision.

Integrative MDs may want to rethink whether azole drugs are the best choice for treating yeast syndrome patients.

Ritchie Shoemaker, MD, on Moldy Buildings and Damaged Brains

Ritchie Shoemaker, MD, has made a career of helping sick people with brain fog by identifying the initiating factor as a water-damaged building with mold. As a physician who strongly believes in scientific method and evidence-based medicine, including peer-review double-blinded studies, he has sought credible diagnostics and therapeutics that explain why individuals with a laundry list of symptoms are never properly diagnosed by conventional medicine. The problem is that inflammagens, the toxins or microorganisms that cause inflammation, beget more and more inflammation in an endless loop of exacerbation and misery. Much of the problem begins in the water-damaged building, a structure that is not always the wreck remaining from a hurricane or flood, but the ordinary school, home, or office building that sustains continuous water leaking day-by-day, year-by-year. From Shoemaker's viewpoint, attempting to reverse chronic inflammatory disease without attending to the reversal of the water damage and leaking is a certain recipe for failure. Of course, for many sick individuals, remediation of a domicile or workplace is not within one's means, and landlords and employers frequently shirk off any responsibility to fix the "leak" and mold.

Letter from the Publisher

Shoemaker, together with mycologist David Lark and genetic-testing CEO James Ryan, PhD, has put together a five-part article on water-damaged buildings, chronic inflammatory response syndrome, and repairing the body and damaged brain. The first part, in this issue, will provide an overview of what Shoemaker et al. use to approach the problem diagnostically. Shoemaker emphasizes that the approach is substantiated and that the doctor and patient should be able to understand chronic inflammation, confirm that the illness is caused by microbes and toxins in the water damaged building(s), employ protocols to diagnose and treat the condition, and document physiologic markers to quantify the extent of disease and monitor progress in treatment. Shoemaker even dares to broach the "cure" word.

Why Hidden Infection Must Be Part of Our Diagnostic Hunt by Jason Bachewich, ND

When a patient presents with peculiar pain, strange dermatitis, a bizarre change in thinking or mood, unexplained autonomic symptoms such as hypotension, tachycardia, flushing, or hot/cold flashes what diagnostics can we do? If it's localized, we could do x-rays or scans; but when they come out normal, what's next? Sure, we can do chemistries, blood count, sed rate, C-reactive protein, and other routine tests, but what do we do when these are all normal? Assuredly, let's not reach for the prescription pad and prescribe a tranquilizer or antidepressant. Perhaps we should consider investigating for microbes – Lyme, not just Borrelia, but co-infections, viruses, Mycoplasma, parasites, mold and more.

Dr. Jason Bachewich, a naturopathic physician who practices in Winnipeg, Manitoba, Canada, thinks that we have been ignoring infectious disease etiology in our workups. The infections may not be obvious, but that does not mean that they are stealth or completely hidden. In this issue Bachewich discusses his experience treating a patient with severe, chronic testicular pain that ultimately proved to be a strange form of herpes zoster, an "internal" form of shingles. Another patient suffering with bowel pain was eventually diagnosed

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Letter from the Publisher

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with Yersinia infection. He argues that even when there is a confirmed diagnosis with a name, like multiple sclerosis or certain cancers, we need to rule out a microbial etiology. Whatever the condition might be, if an underlying infection is diagnosed and treated, the likelihood of success will be much higher.

Mast Cell Activation Syndrome: A Diagnosis Whose Time Has Come by Patel, Farshchian, and Forsgren

Beyond mitigating mold that one has been exposed to from residing or working in a water-damaged building, as well as treating a hidden infection, one must also address the disruption of the immune system caused by acute and chronic inflammation. From the vantage point of Raj Patel, MD, Thalia Farshchian, ND, and Scott Forsgren, FDN-P, that dysfunctional state could manifest as the mast cell activation syndrome (MCAS). Mast cells are white blood cells in the skin, mucosal, and connective tissue, as well as the blood brain barrier. They resemble basophils with substantial nuclear granular material that release histamine, heparin, and other enzymes upon activation. In normal circumstances vasodilation by histamine, anti-coagulation by heparin, and enzymatic degradation by proteinases enable immune defense against allergens and pathogens such as parasites, as well as provide support for many other functions, including wound healing. In abnormal circumstances the release of these substances can act pathologically on the body resulting in flushing, heat flashes, pallor, hypotension, hives, itching, pain, headaches, diarrhea, brain fog, and much more. Uncontrolled mast cell activity has been designated as MCAS since 2010; its behavior is much like mastocytosis except there is not an unusually high number of mast cells, just excessively activated mast cells.

Patel, Farshchian, and Forsgren discuss the triggers that incite the mast cells into such a state of frenzy. Beyond the microbes, mold, and parasites, are the thousands of chemicals and heavy metals that insult our system daily. Ignored by high tech is the effect of EMF on mast cells. But the one that has most immediate impact for MCAS sufferers is the role that diet has on perpetuating the excitability of mast cells – everyday foods, "good" foods, organic or otherwise, are pivotal in causing mast cells to degranulate. Foods such as shellfish, mushrooms, tomatoes, spinach, potatoes, citrus, berries, grapes, yogurt, cheese, pita bread, beans, tofu, walnuts, flax seeds, honey, vinegar, and alcohol all contain "high" amounts of histamine. The first and most important step in addressing MCAS is eating a low-histamine diet. It is not easy but relief can be secured in less than a week by consuming less histamine.

Maksim Chmerkovskiy

The authors detail lab testing, medication, and herbal supports for MCAS in this issue. Unravelling and avoiding the myriad of triggers is the key to successful symptom control and reduction in inflammation.

Connie Strasheim on Becoming Happy, Healthy, and Free after Lyme Disease

Unfortunately, not every symptom can be addressed by diet, removing EMF, countering microbes, and abating water damage – some issues can only be healed emotionally, mentally, and spiritually. As a Lyme disease patient, survivor, advocate, and best-selling author, Connie Strasheim is familiar with the challenges faced in being diagnosed with the condition. What goes largely undiscussed is the depression, anxiety, PTSD as well as the deeper psychospiritual issues that medical professionals prefer to ignore. It's easy to hand out a prescription for Prozac or Xanax; but not only are these drugs only minimally effective, they pose major problems when one would like to discontinue their use.

Strasheim had to deal with the latter problem – it's a battle, a brutal one at that, tapering off these drugs, especially withdrawing from the benzodiazepines and related "insomnia" medications. She touts the benefits patients experience employing amino acid therapy to build up precursors for the neurotransmitters. Hormone balancing and augmenting reduced hormone levels is critical for beating depression. Following a dietary program to reduce inflammation and using anti-inflammatories are key to improving anxiety and related mood disorders. Ultimately each patient also needs to dig deep and face the issues that have blocked one's living and spirituality, a path Strasheim discusses in this issue that is vital for successful healing.

Dancing with the Stars – Maksim Chmerkovskiy

Our cover story this issue is part 2 of Karina Gordon's interview, "Dance: A Healing Art," featuring *Dancing with the Stars*' Maksim Chmerkovskiy. Working with non-professionals is a constant stress and strain on the body and subjects even the best dancer to injury. In fact, Maksim did sustain a medial calf tear that he rehabilitated with orthopedist Dr. William Seeds using platelet-rich plasma and stem cell therapy. Of course, Chmerkovskiy credits much of his healing to a well-disciplined diet, the use of optimized supplementation, and peptides. He also employs contrast hydrotherapy, massage, stretching, adequate sleep, and maintaining fitness.

Maksim thinks that we all can do more on maintaining a disciplined diet that is key to preventing injury no matter what activities we engage in. Of course, he is an advocate of encouraging each of us to take up dance, perhaps the best means to rehabilitate our weakened muscles and regain our range of motion.

Jonathan Collin, MD

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Clinical Study #1 (1999)

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

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

Clinical Study #2 (2007)

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

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

Clinical Study #3 (2014)

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

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

Clinical Study #4 (2016)

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

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

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Shorts

briefed by Jule Klotter
jule@townsendletter.com

Virulence and Imperfect Vaccination

Can a vaccine that decreases mortality but still allows transmission of the disease promote the increase of very virulent strains of the pathogen? That is the question that a team of US, UK, and Australian researchers sought to investigate in their 2015 study. Andrew F. Read and colleagues write: "This idea follows from the notion that natural selection removes pathogen strains that are so 'hot' that they kill their hosts and, therefore, themselves. Vaccines that let the hosts survive but do not prevent the spread of the pathogen relax this selection, allowing the evolution of hotter pathogens to occur." The problem lies with 'leaky vaccines,' vaccines that allow pathogen transmission as opposed to vaccines that block transmission. In this study, the researchers present the results of a series of experiments involving chickens and Marek's disease.

Marek's disease (MD), caused by a highly contagious cancer-causing herpesvirus, affects the poultry industry throughout the world. Infected chickens shed the virus, which can remain infectious for months, from feather follicles into the chickens' environment. Chicks born in a contaminated poultry house soon become infected and remain so for life. Before the 1950s, Marek's disease was seen as a paralytic disease that affected older birds. Then, lymphomas in multiple organs affecting younger birds became common. Over the years, Marek's disease has become increasingly virulent, "characterized by more severe lymphomas and mortality at increasingly early ages and, under some circumstance, paralysis and death in the first weeks of life, well before lymphoma formation." The first vaccines for MD became available in the 1970s. Although these live virus vaccines extend lifespan, they do not prevent transmission of the disease; birds, typically vaccinated as 18-day-old embryos or on the day of hatch, can still become infected and shed the wild-type virus.

In one experiment, the researchers infected vaccinated and unvaccinated chicks (kept in separate isolators) with one of five viral strains that had differing virulence. The least virulent strain killed 60% of the unvaccinated birds within two months, and the most virulent strain killed all unvaccinated birds within 10 days. Few deaths occurred in age-matched chicks that were vaccinated eight days before exposure, and those deaths occurred late in the experiment in birds exposed to the most virulent strains. Twice a week over the two-month period, the researchers collected dust from the isolators and measured the concentration of virus genomes using real-time PCR. Vaccinated birds shed less virus genome copies than unvaccinated birds infected with the same strain. Unvaccinated chicks exposed to the two most virulent strains shed very little virus before they died.

The researchers report, "Vaccination suppresses the concentration of virus in dust, but by keeping hosts alive, prolongs the infectious periods of hyperpathogenic MDV [Marek's disease virus]. This means that cumulative number of virus genome copies shed per bird is suppressed by vaccination for the least virulent strain and enhanced by several orders of magnitude for the most virulent." They came to the same conclusion after another experiment in which hens were vaccinated so as to transfer antibodies to their offspring. The researchers also noted that maternal antibody transfer was not as effective in preventing early mortality as directly vaccinating the chicks.

"Our data provide that: by enhancing host survival but not preventing viral shedding, MDV vaccination of hens or offspring greatly prolongs the infectious periods of hyperpathogenic strains, and hence the amount of virus they shed into the environment," say the authors. They do not claim that this data shows leaky vaccines to be responsible for the evolution of these highly virulent viral strains; other factors, such as high-density rearing in industrial poultry farms and greater genetic homeogeneity among the breeds, may play roles.

Vaccines that do not prevent pathogen transmission and prolong lifespan, like the MD vaccines, may inadvertently contribute to the evolution of highly virulent strains. But, the authors say that any mitigation technology, "including disease-ameliorated drugs or genetic enhancements of host resistance," may have the same effect. "This does not mean that such technologies should be avoided, particularly when

continued on page 12 ➤

Dr. Iichiroh Ohhira: A Pioneering Genius in Probiotic Science

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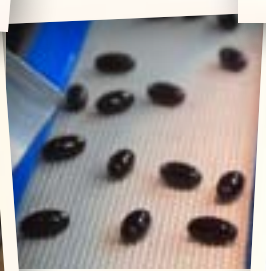

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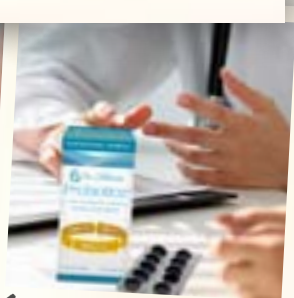

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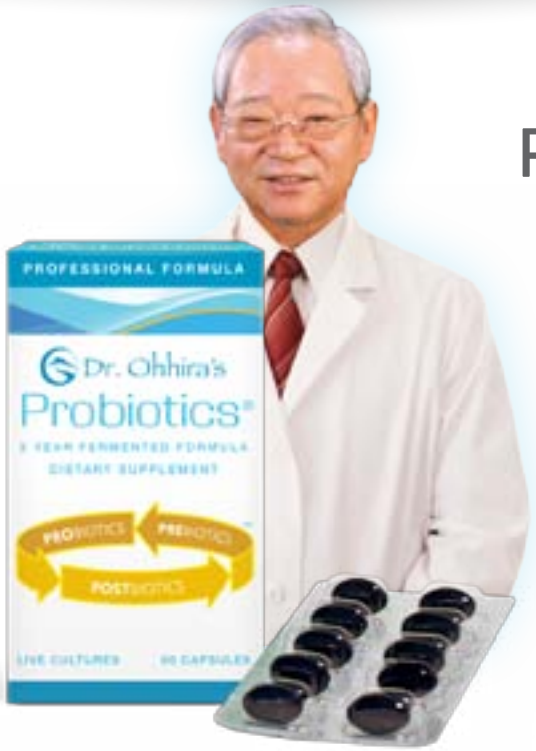

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Shorts

➤ *continued from page 10*

alternative options are limited. Vaccination has massively reduced yield losses due to MD, despite the evolution," the authors write. "However, when protecting all individuals is impossible, or evolution is ongoing, the use of additional transmission-blocking interventions such as improved hygiene might be essential."

The researchers note that most human vaccines, unlike the MD vaccine, block the transmission of the pathogen, but they believe that we need a greater understanding of the impact on pathogens that goes beyond Phase III clinical trials or studies of antigenic and serotype frequencies: "The future challenge is to identify whether there are other types of vaccines used in animals and humans that might also generate these evolutionary risks."

Read AF, et al. Imperfect Vaccination Can Enhance the Transmission of Highly Virulent Pathogens. *PLOS Biology.* July 27, 2015.

Tetanus

Tetanus made headlines in March 2019, with the story of a six-year-old, unvaccinated, Oregon boy who developed the illness after getting a cut on his forehead while playing on his family's farm in 2017. His wound was cleaned and sutured at home. The boy developed signs of tetanus within days (jaw clenching, general spasticity, involuntary muscle spasms, and breathing difficulty), at which time his parents contacted emergency medical services. The boy was taken to the hospital, where he spent 47 days in intensive care. In addition to receiving medication to address the tetanus toxins, he had to be sedated, kept in a darkened room, and wear ear plugs to minimize sensory input that caused his body to tense up; muscle relaxants alone did not prevent the painful spasms. The boy also required a ventilator for over five weeks to help him breath. After leaving the hospital on day 54, he needed another 17 days in rehabilitation before returning home and his normal activity.

Tetanus is one of those illnesses that no one wants. It results from *Clostridium tetani*, a bacterium whose spores are found in soil and animal feces. *Any break* in skin (not just puncture wounds) that becomes contaminated with the spores will allow the bacteria to develop, multiply, and produce powerful toxins that affect muscles. "Wounds with devitalized (dead) tissue (for example, burns or crush injuries) or foreign bodies (debris in them) are most at risk of developing tetanus," says Charles Patrick Davis, MD, PhD, in an emedicinehealth.com article.

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911 Tyler Street
Pt. Townsend, Washington 98368-6541 USA
www.TheTownsendLetter.com | info@townsendletter.com

Editor-in-Chief	Jonathan Collin, MD
Publisher	Jonathan Collin, MD
Editor	Jule Klotter
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Design Team
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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.

Davis explains that tetanus can take four forms: (1) generalized tetanus that affects all skeletal muscles, (2) local tetanus with muscle spasms near the wound site, (3) cephalic tetanus affecting face muscles after a head injury or ear infection, and (4) neonatal tetanus, a generalized tetanus that affects babies under one month. Neonatal tetanus results from umbilical cord contamination and primarily occurs in areas with poor hygiene. People who do not receive the tetanus vaccine or booster vaccine are at higher risk for tetanus. Contraindications to vaccination include a serious allergic reaction to the toxoid (anaphylaxis, coma, or seizures) or the development of other illnesses (such as Guillain-Barré) after a previous vaccination.

According to CDC, 233 tetanus cases were reported for the United States from 2001-2008; "among the 197 cases with known outcomes, the case-fatality rate was 13.2%." While the majority (71.7%) reported having an acute wound before tetanus onset, others had a chronic wound or infection (diabetic ulcers and dental abscesses), were injected drug users, or reported having no wounds or infections. Vaccine status was available for 92 (39.5%) of the 233 patients. Thirty-seven of the 92 (39.5%) had received no tetanus inoculations. The remainder had received one or more doses of the tetanus vaccine: "26 (28.3%) received 1 dose, five (5.4%) received 3 doses, and 24 (26.1%) received ≥ 4 doses."

"Tetanus is almost completely preventable by active immunization, but very rarely unexpected cases can occur in individuals who have been previously vaccinated," write Onder Ergonul, MD and colleagues in a 2016 article for *The Lancet Infectious Diseases.* Ergonul et al present a case report of a young woman who developed tetanus despite being up-to-date on the vaccine. Also, a 1992 report in *Neurology* discussed three immunized patients with high serum levels of anti-tetanus antibody who developed severe tetanus.

Given the seriousness of the illness, Harri Hemilä and Teija Koivula called for investigation of intravenous vitamin C (IVC) for the prevention and treatment of tetanus in a 2013 Cochrane review. Scientific evidence that IVC would be useful is sparse: a few animal experiments in which IVC reduced mortality, and one non-randomized, unblinded, controlled 1984 trial in Bangladesh involving 117 tetanus patients. In that study, all children (age one to 12 years) receiving one gram/day of IVC along with conventional treatment survived, compared to a 74% death rate in the children given conventional treatment only. In older patients (age 13-30), the mortality rate was 37% in the IVC group (1 g/day) and 68% in the conventional

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treatment group. (I wonder if the death rate would have further decreased if IVC dosage had been adjusted for their greater body weight.)

Hemilä and Koivula give several possible reasons why IVC might decrease tetanus mortality, including vitamin C's role in catecholamine metabolism and its ability to improve phagocyte function. They also note that research shows that tetanus patients who died had lower vitamin C levels than those who survived; and all tetanus patients in one study had elevated levels of the oxidized form of vitamin C (dehydroascorbate). They conclude: "Tetanus is a severe disease afflicting about 1 million people annually and vitamin C is a safe and inexpensive essential nutrient. The possibility that vitamin C may have an action on tetanus is therefore worthy of systematic consideration."

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Candida auris

Candida auris, a drug-resistant pathogen first reported in 2009, has hospitals on edge. Reports indicate that the fungus spreads quickly in critically ill patients and those undergoing invasive procedures, producing candidemia, pericarditis, and respiratory and urinary tract infections. Because the infection tends to afflict seriously ill patients, it is difficult to quantify its contribution to the high rate of mortality found in some parts of the world; death rates of patients infected with *C. auris* are reportedly over 50% in Asia, the Far East, and the United States. Genetic analysis has identified four clades (species) that emerged simultaneously in South Asia, South Africa, South America, and East Asia. US isolates have been linked to the South Asian and the South American clades. As Anna Jeffery-Smith and colleagues explain in their 2018 review article, hospital efforts to stem the spread of this pathogen are hampered by its ability to spread quickly in an environment, its resistance to drug treatment, and difficulty in identifying the organism using conventional techniques.

Jeffery-Smith et al report that *C auris* may be acquired from an infected patient or environment in as little as four hours. Patients have developed invasive infections within 48 hours of being admitted to intensive care. The organism's resistance to triazole antifungal agents and, in some cases, amphotericin B has led to increased use of echinocandins; but there are reports that *C. auris* isolates have developed reduced susceptibility to these drugs also. To prevent its spread in hospitals, the United Kingdom, US, Europe, and South Africa recommend measures used to control other treatment-resistant organisms such as MRSA: patient isolation, contact precautions, and cleaning equipment and environments. Jeffery-Smith et al report that high-concentration chlorine solutions in combination with hydrogen peroxide vapor or UV light appear to eliminate the organism from patient areas after patients are discharged.

The review authors attribute the increasing prevalence of this drug-resistant *Candida* species "to be driven largely by the increasing use of prophylactic antifungal agents such as fluconazole." But widespread use of antifungals in agriculture may be an even greater contributor. A *New York Times* article points out that "azole pesticides...used to dust crops the world over...account for more than one-third of all fungicide sales." These types of fungicides are chemically similar to antifungal drugs. Azole pesticides destroy the more prevalent fungi but not *C. auris*, which is able to develop resistance to the pesticide and to the chemically similar therapeutic antifungal drugs. Promoting a soil environment of diverse fungi, using organic farm methods such as crop rotation, may crowd out pathogenic strains such as *C. auris*, says Mark Buchanan.

Buchanan M. Big Agriculture Is Breeding a Worldwide Health Crisis. May 3, 2019.
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Richtel M, Jacobs A. A Mysterious Infection, Spanning the Globe in a Climate of Secrecy. *New York Times.* April 6, 2019.

Identifying Measles Virus Vaccine Genotype

Felicia Roy and colleagues have developed a real-time reverse transcription-PCT (RT-PCR) method to quickly identify vaccine strain genotype A measles virus: "During measles outbreaks, it is important to be able to rapidly distinguish between measles cases and vaccine reactions to avoid unnecessary outbreak response measures such as case isolation and contact investigations." About five percent of people receiving a measles vaccination develop a fever and rash that looks like wild-virus measles. Many of the suspected measles cases in the 2015 California outbreak occurred in people who had been recently vaccinated. The WHO recognizes 24 genotypes of measles virus. All measles vaccines use genotype A. Roy et al say, "Wild-type viruses of genotype A are no longer circulating."

According to the authors, 73 of 194 measles virus sequences from US patients were identified as vaccine sequences (unpublished data). In contrast, only 11 of 542 cases in Germany were associated with the vaccine virus; wild-type measles outbreaks are common in Germany. Roy et al say, "Endemic transmission of measles virus was interrupted in the Americas in 2002, but since then, importations of measles from areas of endemicity have caused frequent and sometimes large outbreaks and a recent transitory suspension of the elimination [not eradication] status." The RT-PCR method takes two days to identify vaccine virus strains. Germany has found it useful for guiding public health responses.

Roy F, et al. Rapid Identification of Measles Virus Vaccine Genotype by Real-Time PCR. *J Clin Microbio.* March 2017;55(3): 735-743.

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In this Issue

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Our August/September issue focusing on Cancer will be mailed on August 7th. (No issue mailed in July)

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International College of Integrative Medicine (ICIM) Meeting – A Message from Your Heart

by John Parks Trowbridge, MD, FACAM

Recognizing the accelerating pace of new scientific understandings for cardiovascular disease and its sequelae, the International College of Integrative Medicine (ICIM) hosted a five-day meeting in March 2019, in Philadelphia, Pennsylvania, to introduce advanced treatment approaches that can be employed in the office "on Monday morning." In acknowledgment of the multifactoral elements of degenerative diseases, program chair Eric Born, DO, of Grand Rapids, Michigan, created a general sessions program spanning all interests. Inflammation took center stage.

Studies continue to show the impact that frustration and stress have on contributing to heart diseases, said James Greenblatt, MD, of Waltham, Massachusetts. Strikingly he offered that many of those suffering with mental illness will die 25 years earlier…from cardiovascular disease. Treatments for inflammation are critical for stress, depression, and suicide risk, to reverse cytokine interruption of neurotransmitters. Lowest blood total cholesterol levels have been shown, by meta-analysis, to be associated with higher suicide rate, similarly for higher iron levels. A biological model shows specific nutritional interventions that can address a model of prevention for the broken heart syndrome.

Looking beyond reduction of toxic metals through IV treatments, Anita Baxas, MD, of Miami, Florida, presented personal and scientific history and present use of IV phosphatidyl choline (Plaquex) for resolution of occlusive vascular changes. While treatment has been offered in Europe for many years, adoption in the United States has been slow. Plaquex alone or alternating with chelation treatments has shown reduction in occlusive plaque burden over several weeks; persistence of the effect has been questioned but reduction in clinical symptoms has been promising.

Increasing evidence for the role that marginal thiamine (Vitamin B1) deficiency plays in general health and specifically in cardiovascular impairment (and prevention) was reviewed by Helen Kwon, MD, of Westlake, Ohio. Key to understanding the pathophysiology is relative (or actual) cofactor shortage creating a pseudo-hypoxia state with reduction of ATP-production efficiency in mitochondria in all cells, especially prevalent in nerve, heart, and brain tissues.

Advances in using ozone to reduce cardiovascular disease effects were reviewed by Robert Rowen, MD, internationally known for research, clinical practice, and teaching medical oxidation therapies, especially ozone. Foreign research continues and American research is now confirming the powerful antioxidant/anti-inflammatory changes induced by ozone administration via various routes, improving all organ functions affected by different pathologies.

Speaking from his vast experience and continuing laboratory and clinical research, Russell Jaffe, MD, PhD, of Ashburn, Virginia, shared a deeper understanding of relevant predictive biomarkers for cardiovascular and other degenerative diseases, in order to create and monitor disease-reversing then health-enhancing programs. Key data to assess functional age are hemoglobin A1c, hsCRP, homocysteine, hsLRA Lymphocyte Response Assay, first AM urinary pH, vitamin D, omega-3 index, and 8-OH-guanine. Epigenetic lifestyle choices (especially diet and supplements) have significant impact on these biomarkers and future survival by correcting inflammation pathology and resolving repair deficit.

Carotid intima-media thickness (CIMT) screening has the potential for early diagnosis and continuing management of diseases of heart and arteries, according to data presented by integrative cardiologist Alicia Williams, DO, of East Lansing, Michigan. Inflammation and oxidative stress markers, especially blood sugar, blood insulin, and abnormal lipids, are usually elevated in patients with thickened carotid intimal medial thickening, consistent with increasing cardiovascular risk. CIMT relates to carotid risk while stress echocardiogram can correlate evolving cardiac risk (related to soft plaque), even before calcium score elevation can be demonstrated.

World renowned Florida integrative cardiologist Thomas E. Levy, MD, presented the latest studies relating calcium and dental diseases to cardiovascular (and other degenerative) diseases. The pathophysiology of all such diseases is inflammatory, and studies of interaction with vitamin C is confirmatory, suggesting that most problems are "relative scurvy" of those

tissues. For example, osteoporosis treatment requires stimulation of collagen production and interlinking, dependent upon osteoblastic precursor cells and then osteoblastic conversion – all stimulated by vitamin C. One hundred percent of degenerative diseases involve increased oxidative stress, leading to elevated intracellular calcium levels. Decalcification of these injured cells can help restore better health. Metastatic cancer is a classic model as well, where higher levels of intracellular calcium are found – along with neurodegenerative diseases. Long-acting calcium channel blockers decrease the chances of death from all causes; magnesium is nature's antagonist, lowering intracellular calcium and pulling in vitamin C. Women with highest bone density have the highest incidence of breast cancer. Higher coronary calcium score on the CT scan is correlated with higher death from all causes. Iron is pro-inflammatory as well, and ferritin should be below 20 ng/mL so long as no microcytic anemia observed.

Reduction of elevated homocysteine, as presented by Su Fairchild, MD, of Bloomsberg, Pennsylvania, shows considerable benefit in proper management of tissue inflammation. The methylation cycle and dependent production of nitric oxide are required for optimal health, especially of endothelial cells. Elevated cholesterol with all its sequelae (including coronary artery disease risk) can result from high homocysteine levels, while low levels appear to be related to peripheral neuropathy. Phosphatidyl choline supplementation helps ameliorate methylation impairment.

Stunning reductions in cardiovascular events due to reductions in body burden of toxic metals (lead and cadmium) has led the National Institutes of Health to the funding and initiation of the TACT 2 (Trial to Assess Chelation Therapy 2) to study more closely the amplified effects in diabetics. Miami, Florida cardiologist and Columbia professor of cardiology, Gervasio Lamas, MD, again is principal investigator. He notes that further mining of the TACT 1 data is revealing that environmental toxic exposure appears to be an independent and successfully modifiable risk factor for heart disease, certainly for those who have already suffered an infarction.

Cardiologist Thomas Levy, MD, presented the increasingly persuasive evidence for oral infections as a (the?)

Columbia professor of cardiology, Gervasio Lamas, MD, presents NIH TACT 1 data on reduction of coronary events with chelation protocol

primary contributor to promotion and exacerbation of cardiac (and other degenerative) diseases. Exposure to mercury-amalgam fillings, root canals, periodontitis, persistent tonsillitis – indeed, chronic oropharyngeal and other infections of any kind – must be addressed in any comprehensive approach to virtually any lingering illness. Increased oxidative stress caused by pathogen-related toxins (and by compromised metabolic pathways) is a common denominator, so treatment requires repair of biomolecules that have been damaged and malfunctioning, creating the various disease findings. Likely the primary function of the immune system is to deliver vitamin C to areas under oxidative attack. Coronary (and cerebral) artery occlusive disease is a chronic acute response to persistent seeding/colonization of infection into the endothelium.

Patrick Theut, of Manistique, Michigan, offered data suggesting that suboptimal levels of vitamin K2 are a sadly unrecognized risk factor for cardiovascular and bone health – as well as all other organ systems. Data suggest that insufficient MK-7 resident on or in LDL, HDL, or VLDL contribute to heart disease, interacting with a number or physiologic abnormalities (low thyroid, low magnesium, APO-E status, fat soluble vitamins, several others). Vitamin K2 deficiency has emerged as an unrecognized contributor to degenerative diseases through carboxylation impairment, and reversal of occlusive changes is possible.

Integrative cardiologist, James Roberts, MD, of Toledo, Ohio, presented a delightful correlation he terms "CardioRheumatology," carefully tying together the pro-inflammatory links that disorder immune system responses in seemingly disparate organ systems – all relating to ongoing (even accelerating) degenerative changes. Oxidative stress, the kindling in the bonfire of degenerative disease (including arteritis), can be related to an induced pseudo-infection response in the absence of demonstrable infection. Minimal-dose colchicine added to conventional care

Robert Rowen, MD, explains latest protocol advances for ozone therapies

lowered hsCRP and risk calculation over three years, specifically for acute coronary syndrome. By a similar mechanism, allopurinol appears to have significant benefits in many degenerative diseases, especially when avoiding high fructose corn syrup to reduce the chemical challenges needing reversal.

Increasing understanding of the contributions made by the APO-E gene diet to better cardiovascular health was

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ICIM Meeting

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shared by Pamela McDonald, FNP, of Danville, California, showing societal patterns associated with promoting inflammation. Changes in farm/food reporting have resulted in inflated calorie statistics for companies to show greater profits, and drugs administered to cows to increase milk production have led to pathophysiology creating increases in breast cancer and other degenerative diseases. APO-E typing allows selection of proper dietary intake to "fuel the engine" with regard to fat and sugar management. APO-E 4's who get diabetes get Alzheimer's dementia, and their treatment has to be carefully managed for reversal. Similar resolution of peripheral ulcers can be obtained as well. APO-E 2/3, 3/3, or 3/4 must be monitored for adequate and proper food choices, especially aimed to reduce body fat and increase lean mass (BMI). In many respects, the APO-E molecule appears to fats what insulin is to sugars.

Ready availability of the ultrafast CT scan has given increasing data regarding coronary calcium score progression,

Board advisor Jeannette Soriano, MD, (left) of Banff, Alberta, Canada, congratulates executive director Wendy Chappell, MBA, on another successful ICIM meeting

as offered by Jeff Dach, MD, of Davie, Florida, in the midst of a paradigm shift in cardiology. Inflammation, particularly associated with infections, has been directly implicated in calcification changes in all tissues, including coronaries, signaling the demand for a changing paradigm in severe disease development and treatment. EDTA chelation therapy was first shown in 1992 to reduce calcium scores in selected patients.

Surprising perspectives on metabolic endotoxemia were presented by Joel Kahn, MD, of Detroit, Michigan, where dietary changes are critical to address this "primary insult" that activates the gut-induced inflammatory state. Omega-3 fatty acids can be most protective, particularly against saturated fat intake associated with toxic LPS (microbial lipopolysaccharides). Studies need to be done to understand benefits and risks specifically for MCT (medium chain triglycerides), cream, and coconut oil. Causal relationships between fat-associated endotoxins and obesity, metabolic syndrome, and diabetes remain to be elucidated. Spore-based

continued on page 22 ➤

Healthy Parents, Healthy Children:

Healing the Next Generation. Approaches to Infertility and Childhood disorders

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We all learned in high school biology that for something to be considered "living", it needs to have 7 key traits: Homeostasis, Organization, Metabolism, Growth, Adaptation, Response to Stimuli, and Reproduction. It seems that humans are having a harder and harder time on the last one: reproduction. If you have seen the post-apocalyptic 2006 movie "Children of Men", you will recall that the world falls apart when humans can no longer reproduce. What happens to us then? Do we fail to become "living organisms"? Do we face extinction like so many species before us? What about those who are able to have children, but with such difficulties and such complications that it cripples our society?

Sajad Zalzala, MD

One of Einstein's many famous quotes were "We cannot solve our problems with the same level of thinking that created them." Our Medical Industrial Complex helped create this problem and we need to look beyond this paradigm to help solve it.

The conference was designed to help develop an understanding of what the problem is. Once we understand the underlying issues - the root causes - we can better understand the solutions. Central themes of the conference are Toxic burden, Nutritional insufficiency, and Epigenetics.

Most ICIM members are family physicians that specialize in integrative medicine. Join us for rejuvenating new ideas, and tools to build new hope at *"Healthy Parents, Healthy Children; Healing the Next Generation. Approaches to Infertility and Childhood disorders" to Toronto.*

ICIM Meeting

➤ *continued from page 20*

probiotic supplementation reduces post-prandial dietary endotoxin and triglycerides in response to high-fat meal challenge. Trimethylamine oxide (TMAO) is a gut-derived metabolite associated with dietary nutrients from fatty-loaded meats. Dietary choline accelerates atherosclerotic deposition, inhibited by antibiotics, suggesting microbial production of TMAO. Elevated TMAO not only can blunt HDL-removal of occlusive fatty changes but also promote macrophage uptake and occlusive deposition of lipids. The Mediterranean diet is a low-TMAO program for a variety of reasons. The abundance of carnitine in "energy drinks," especially when combined with choline, is of concern for development of unexpected platelet aggregation and thrombosis. Fasting-mimicking diet modulates microbiota and promotes intestinal regeneration to reduce inflammatory bowel markers.

Past president Charles Adams, MD, (left) recognizes program chair and president Eric Born, DO, for an outstanding meeting

Barrie Tan, PhD, of Hadley, Massachusetts, explained the cardiometabolic benefits of vitamin E tocotrienols, noting aside that studies are underway on other pathologies (obesity, cancer, fertility, neurodegenerative diseases). The "trienols" have taken a backseat to alpha-tocopherol, the marketed vitamin E discovered 100 years ago to help bring a fetus to term. Dietary intake is markedly deficient in meeting basic body need of about 250 mg daily. Ninety percent of antioxidants in cell membrane phospholipids are tocopherol – the remaining are mostly tocotrienols. Alpha-tocopherol-free supplementation is important to avoid antagonism and a reduced tocotrienol effect against inflammatory molecules, which interfere with protective benefit and tissue recovery from arteriosclerotic oxidative stress. Dr. Tan related that a hallmark observation from Stanford professor Gerald Reaven, MD, discoverer of metabolic syndrome: "Hypertriglyceridemia will always precede hyperglycemia," suggesting early supplementation might reduce emergence of pathology. Obesity and non-alcoholic liver steatosis result from disordered glucose/lipid metabolism. Tocotrienols have helped to reverse the associated inflammation and early fibrosis along with sponsoring weight loss. Infection (hepatitis C) and malignancy (liver and pancreatic cancer) appear to be advanced changes from metabolic syndrome.

Training Front Line Leaders

ICIM Office Support Staff Leader Natalie Patierno, NP, of Cumming, Georgia, chaired a two-day workshop sharing practical aspects of nursing assessment, clinical recordkeeping, and assembly, performance, and management of various intravenous therapies. Staff and patient safety procedures for all practices are important and are increasingly expected by federal and state regulators. Key elements of staff satisfaction include identifying your natural leaders and promoting effective communications.

Environmental Vasculotoxic Insults

As ToxHealth adds dozens of new reports daily on the contribution that toxic heavy metals make in the development and extension of degenerative diseases, ICIM hosted a two-day chelation therapy program, Basic and Advanced Training in Heavy Metal Toxicology, chaired by John Parks Trowbridge, MD, FACAM, of Houston, Texas.

L. Terry Chappell, MD, of Bluffton, Ohio, and Conrad Maulfair, DO, of Allentown, Pennsylvania, shared personal experiences and extensive historical data on development of safe and effective metal removal treatment protocols to reverse the ravages of occlusive cardiovascular disease that kills millions of Americans each year.

Doing heavy lifting for the meetings, Joseph Hickey, MD, of Hilton Head, South Carolina, shared published references and clinical experience on the largely ignored topic of gadolinium (MRI contrast) toxicity and the relationship of toxic heavy metals and cancer as well as other degenerative diseases.

Richard Plumb, DO, of Troy, Ohio, presented increasingly persuasive evidence on cardiovascular diseases treated by chelation therapy and troubling details on lead, mercury, cadmium, and arsenic toxicities.

Charles Adams, MD, of Ringgold, Georgia, reviewed the current socioeconomic situation with regard to insurance (non)coverage, power wielded by hospital systems, and interesting challenges of demonstrating the science of chelation treatments to prospective patients.

Eric Born, DO, of Kalamazoo, Michigan, gave a delightful presentation on treatment quandaries, reviewing

dosages of chelating medications, preferred routes of administration, and supplementation needed to avoid deficiency issues and to promote better outcomes.

Since mercury toxicity is increasingly recognized as a major contributor to degenerative diseases, finding safe and effective approaches to prevent or reduce its impact are essential. Emeritus chair of chemistry at the University of Kentucky and lifelong chelation chemist, Boyd Haley, PhD, gave a fascinating update on progress toward FDA approval for marketing once again his natural-based mercury chelator. With increasing confirmation of specific metabolic interruptions in virtually all organ systems devastated by lingering mercury concentrations, genuine improvements for debilitating conditions are better understood.

Russell Jaffe, MD, PhD, of Ashburn, Virginia, shared perspectives on D-penicillamine as an oral chelator, one that was available readily until just the past few years. One major contribution provided by D-Pen is the ability to get a general indication of total body toxic burden by performing the Jaffe challenge test and collecting urine. The utility of this simple approach cannot be overstated.

Drawing on over 20 years of treating patients with chelation therapy, Robban Sica, MD, of Westport, Connecticut, presented a comprehensive review of pitfalls in patient assessment, treatment planning, and protocols for safety and effectiveness.

Ellie Campbell, DO, of Cumming, Georgia, offered a complete overview of practical treatment planning, assembling and administering the IV treatments whether chelation or nutritional in nature.

Honoring the ICIM commitment to patient education, general counsel John J. Richardson, Esq., of Chicago, Illiniois, offered insights into the keys to patient satisfaction and the desirability for a clear and comprehensive chelation treatment consent form.

As clinical research shows that oxygenation procedures produce increasingly positive results, internationally acknowledged experts Robert Rowen, MD, of Santa Rosa, California, and Howard Robins, DPM, of New York, New York, hosted a one-day meeting on Fundamentals and Principles of Ozone Therapy. Infections, inflammatory conditions, and pain treatments were reviewed in the context of expanding the reach of an integrative medicine practice.

This 66th meeting of the International College of Integrative Medicine garnered outstanding reviews not only from members but also from dozens of new attendees. The next meeting, “Healthy Parents, Healthy Children,” is scheduled for October 23 – 27, 2019, in Toronto, Ontario, Canada. To schedule your attendance, visit www.icimed.com. To connect with speakers for further details on their excellent presentations or to exhibit at our meeting, contact Wendy Chappell-Dick, executive director, at 419-303-9768, or wendy@icimed.com.

John Parks Trowbridge, MD, FACAM
281-540-2329
Past President and Advisor to the Board of Directors, ICIM
Life Celebrating Health, Humble (Houston), Texas
Marquis Who’sWho Top Doctor in Advanced Medicine
Marquis Who’sWho Lifetime Achievement Award

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Literature Review & Commentary

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

Probiotic Prevents Otitis Media in Children

Sixty-one children (mean age, 3.3 years) living in Spain who were experiencing recurrent acute otitis media received the probiotic organism, *Lactobacillus salivarius* PS7, orally at a dose of 10^9 colony-forming units per day for six months. This strain was selected because it had previously been shown to have antimicrobial activity against organisms that can cause otitis media. Compared with the six months before the intervention, there was an 84% decrease in the number of episodes of acute otitis media during probiotic treatment.

Comment: Acute otitis media (inflammation of the middle ear) is usually caused by a bacterial or viral infection, although it may also result from an allergic reaction to foods. Probiotics have the potential to prevent various types of infections by competing with pathogenic organisms and by enhancing immune function. The probiotic used in this study was selected specifically because of its capacity to inhibit the growth of otopathogens, so one cannot assume that other probiotic strains would have a similar effect. In addition, because there was no placebo group in this study, it is possible that some or all of the observed improvement was due to a placebo effect or to age-related spontaneous remission. The product used in this study does not appear to be commercially available at this time.

Other interventions that may help prevent otitis media include restricting sugar intake, identifying and avoiding allergenic foods, and regular oral use of xylitol chewing gum or syrup.[1]

Cardenas N, et al. Prevention of recurrent acute otitis media in children through the use of Lactobacillus salivarius PS7, a target-specific probiotic strain. *Nutrients*. 2019;11:E376.

Probiotics Prevent *Clostridium difficile* Infection in Patients Receiving Antibiotics

A recent Cochrane review pooled the results of 39 randomized controlled trials that examined whether supplementing with probiotics can prevent the development of *Clostridium difficile* infection in patients receiving antibiotics. In the pooled analysis, the incidence of *C. difficile* infection was 60% lower in patients receiving probiotics than in those receiving placebo or no treatment (1.5% vs. 4.0%; $p < 0.001$).

Comment: *C. difficile* is a Gram-positive bacterium that is a common cause of antibiotic-associated diarrhea and pseudomembranous colitis. *C. difficile* infection occurs most often in frail elderly hospitalized patients but has also been seen in previously healthy individuals. The infection usually manifests as mild-to-moderate diarrhea, but severe colitis culminating in colectomy or death may also occur. In recent years, there has been an increase in the incidence of *C. difficile* infection. Increases in disease severity and mortality rates have also been observed, apparently because of the emergence of a more virulent strain of the organism.[2] *C. difficile* infection is usually treated with vancomycin or metronidazole. The infection recurs in approximately 20% of patients after treatment with these antibiotics. Probiotics may prevent the development or reduce the recurrence rate of *C. difficile* infection by competing with *C. difficile* for nutrients and colonization sites in the intestinal tract, by producing compounds that inhibit the growth or decrease the virulence of *C. difficile*, or by producing compounds that neutralize *C. difficile*-associated toxins.

Although probiotic preparations are generally well tolerated, in rare cases sepsis due to *Saccharomyces* fungemia or *Lactobacillus* bacteremia has occurred after oral administration of the respective probiotic agent. Risk factors for the development of this complication include being debilitated or immunosuppressed, having a damaged gastrointestinal barrier, receiving broad-spectrum antibiotics, and having a central venous catheter.

Goldenberg JZ, et al. Probiotics to prevent *Clostridium difficile* infection in patients receiving antibiotics. *JAMA*. 2018;320:499-500.

Thiamine Reduces Mortality in Patients with Septic Shock

A retrospective cohort study was conducted on 123 patients with septic shock who received intravenous thiamine within 24 hours of hospital admission (median, 6.4 hours; range, 3.8-11 hours) and 246 matched controls who did not receive thiamine. Two-thirds of the patients received 500 mg of thiamine every eight hours for three days; the others received 100-400 mg (apparently every 8 hours for 3 days). Compared with no thiamine, thiamine treatment was associated with more rapid lactate clearance (which is a predictor of increased survival) and a significant 33.4% reduction in 28-day mortality.

Comment: Septic shock is a serious condition that has a mortality rate of 40-50%. Critically ill patients are frequently deficient in thiamine, and in these patients the presence of thiamine deficiency is associated with an increased risk of death. In the October 2017 issue of the *Townsend Letter*, I discussed the work of Dr. Paul Marik and coworkers, who administered vitamin C, hydrocortisone, and thiamine intravenously to 47 patients with septic shock. As compared with similar patients who did not receive this treatment, those given vitamin C, hydrocortisone, and thiamine had a 79% reduction in the mortality rate. Previous research had provided evidence that intravenous vitamin C by itself can reduce the death rate in patients with severe sepsis. The results of the present study suggest that thiamine was an important component of Marik's protocol, and that it may have enhanced the benefits of vitamin C.

Woolum JA, et al. Effect of thiamine administration on lactate clearance and mortality in patients with septic shock. *Crit Care Med*. 2018;46:1747-1752.

Does Cow's Milk Cause Iron-Deficiency Anemia?

Of 51 children under four years of age (median, 1.4 years) in Taiwan who had iron-deficiency anemia, seven (13.7%) had cow's milk protein allergy. Four of those seven children had occult blood in their stool. All seven patients recovered from iron-deficiency anemia within seven months of avoiding cow's milk and receiving iron supplementation. All four children with positive occult blood in their stool became negative after 1.5 months of cow's milk avoidance.

Comment: Allergy to cow's milk was implicated as early as the 1960s as a common cause of both occult and gross gastrointestinal bleeding in infants; and it appears to be an important contributing factor to anemia in that age group. The adverse effect of fresh pasteurized cow's milk appears to be much more pronounced than that of commercial milk-based formulas. The results of the present study should remind us to consider cow's milk sensitivity in children with unexplained iron-deficiency anemia.

Lai FP, Yang YJ. The prevalence and characteristics of cow's milk protein allergy in infants and young children with iron deficiency anemia. *Pediatr Neonatol*. 2018;59:48-52.

Is Cow's Milk "Mucus Forming?"

Twenty-six men and 82 women who experienced symptoms of excessive nasopharyngeal mucus secretion, who had no history of intolerance to cow's milk or soy protein, and who had negative skin prick tests to milk and soy, consumed a dairy-free diet for six days. During the last four days on this diet, they were randomly assigned to consume, in double-blind fashion, a daily cow's milk-based or soy-based milkshake (350 ml per day). During the first

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three days (no dairy in either group), both groups experienced a significant reduction in the mean severity of mucus secretion. On the last day of the study, the amount of nasopharyngeal mucus secretion was significantly less in the dairy-free group than in the group that consumed dairy. The effect size was 0.55 (medium).

Comment: There is a widespread belief that drinking cow's milk increases mucus formation, but there has been little scientific support for that idea. In the present study, consumption of a dairy-free diet significantly decreased mucus secretion in adults with symptoms of excessive nasopharyngeal mucus secretion. Cow's milk is one of the most common food allergens, and mucus secretion is one of the symptoms of an allergic reaction. Therefore, it remains unclear whether there is something inherently mucus-forming about cow's milk, or whether an increase in mucus production is simply a manifestation of milk allergy.

Frosh A, et al. Effect of a dairy diet on nasopharyngeal mucus secretion. *Laryngoscope*. 2019;129:13-17.

Does Diet Influence the Risk of Developing Macular Degeneration?

The association between diet and risk of developing aged-related macular degeneration (AMD) was examined in a prospective cohort study of 4,202 participants in the Rotterdam Study who were at least 55 years of age at baseline (mean, 66.6 years) and were free of AMD. During a mean follow-up period of 9.1 years, 754 people developed AMD. Consumption of fish at least twice a week, as compared with less fish consumption, was associated with a significant 24% decrease in the incidence of AMD. Intake of at least 200 g per day of vegetables or intake of fruit at least twice a day was not associated with AMD risk. However, among participants who achieved all three of these dietary patterns (fish, vegetables, and fruit), the incidence of AMD was 42% lower than among those who did not achieve all three dietary patterns.

Comment: In this study, consumption of fish twice a week was associated with a decreased risk of developing AMD. Consumption of abundant amounts of fruits and vegetables were not by themselves associated with a lower incidence of AMD. However, consumption of fruits and vegetables increased the protective effect of fish consumption. While observational studies do not prove causation, the results of this study raise the possibility that eating fish, fruits, and vegetables can help prevent AMD, which is the most common cause of visual loss in elderly people.

de Koning-Backus AP, et al. Intake of vegetables, fruit, and fish is beneficial for age-related macular degeneration. *Am J Ophthalmol*. 2019;198:70-79.

Whole Grains and Nonalcoholic Fatty Liver Disease

Fifty overweight men (aged 45-70 years) and postmenopausal women were randomly assigned to consume, in double-blind fashion, refined wheat or whole wheat products for 12 weeks. The mean concentration of intrahepatic triglycerides (measured by proton magnetic resonance spectroscopy) increased by 49% in the refined wheat group and increased by 11% in the whole wheat group ($p = 0.03$ for the difference in the change between groups).

Comment: Hepatic steatosis (excessive accumulation of fat in the liver) is one of the two main features of nonalcoholic fatty liver disease, the other being chronic hepatic inflammation. Hepatic steatosis affects as many as 25% of Americans and 58-74% of obese people. Hepatic steatosis appears to be an independent risk factor for cardiovascular disease and is also associated with increased all-cause mortality. In addition, the presence of hepatic steatosis may increase the progression rate of other liver diseases, such as hepatitis C.

There is evidence that excessive consumption of fructose and sucrose is a major risk factor for the development of hepatic steatosis. The results of the present study suggest that consumption of refined grains is another contributing factor, and that switching to whole grains may decrease the accumulation of fat in the liver. As compared with refined grains, whole grains contain substantially higher amounts of magnesium, copper, choline, betaine, and vitamin E. Each of these nutrients has been shown in animal studies, human trials, or both to be useful for preventing and/or treating fatty liver.

Schutte S, et al. A 12-wk whole-grain wheat intervention protects against hepatic fat: the Graandioos study, a randomized trial in overweight subjects. *Am J Clin Nutr*. 2018;108:1264-1274.

Selenium and Diabetes

Four hundred ninety-one volunteers (aged 60-74 years) in Denmark (a population with moderately low selenium status) were randomly assigned to receive, in double-blind fashion, 100, 200 or 300 µg per day of selenium (as selenium-enriched yeast) or placebo for two years. Compared with placebo, there were no significant changes in the mean hemoglobin A1c (HbA1c) concentration in any of the three selenium groups, either at six months or at two years. There was a nonsignificant trend suggesting a beneficial effect of selenium on HbA1c levels.

Comment: Concern has been raised that selenium supplementation could increase the risk of developing diabetes. That concern was based on a retrospective analysis of a double-blind study, which found that selenium supplementation (200 µg per day) was associated with a 50% increase in the incidence of new cases of diabetes, compared with placebo, during a follow-up period of 7.7 years ($p = 0.05$).[3] However, when a retrospective analysis reveals an effect of only borderline statistical significance, there is a reasonable likelihood that the finding was due to chance. A meta-analysis of four randomized controlled trials (including the retrospective analysis mentioned above) found that supplementation with 200 µg per day of selenium for 5-12 years nonsignificantly increased the incidence of type 2 diabetes by 9% ($p = 0.085$).[4] Diabetes is not one of the reported manifestations of selenium toxicity in humans. Moreover, in an animal model of type 2 diabetes, selenium supplementation exerted an antidiabetic effect.[5] Thus, the small increase in diabetes incidence observed in the meta-analysis may have been due to chance.

The findings from the new study provide evidence that selenium supplementation does not have an adverse effect on blood glucose regulation. However, the new study lasted only two years, so it remains possible that longer-term use of selenium could result in a small increase in diabetes risk.

Stranges S, et al. Effect of selenium supplementation on changes in HbA1c: Results from a multiple-dose, randomized controlled trial. *Diabetes Obes Metab*. 2019;21:541-549.

1. Gaby AR. Otitis media. In Gaby AR. *Nutritional Medicine*, 2nd Edition. Concord, NH, 2017. www.doctorgaby.com, chapter 269.
2. Kelly CP, LaMont JT. Clostridium difficile - more difficult than ever. *N Engl J Med*. 2008;359:1932-1940.
3. Stranges S, et al. Effects of long-term selenium supplementation on the incidence of type 2 diabetes: a randomized trial. *Ann Intern Med*. 2007;147:217-223.
4. Mao S, et al. Selenium supplementation and the risk of type 2 diabetes mellitus: a meta-analysis of randomized controlled trials. *Endocrine*. 2014;47:758-763.
5. Mueller AS, Pallauf J. Compendium of the antidiabetic effects of supranutritional selenate doses. In vivo and in vitro investigations with type II diabetic db/db mice. *J Nutr Biochem*. 2006;17:548-560.

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New Understanding of Autoimmunity Development Through T Helper Cell Regulation, Part 2

by Debby Hamilton, MD, MPH

Introduction

As autoimmune disease continues to rise, we need to learn how to bring the immune system back into balance. In Part 1 of "New Understanding of Autoimmunity Development through T Helper Cell Regulation," I discussed the new understanding of how elevated Th17 cells were involved in autoimmunity. Previously it was thought that elevated Th1 cells created autoimmunity; but with the identification of Th17 cells, researchers now believe Th17 cells appear to be the primary driver.

When Th17 cells are activated by pathogens or toxins along a mucosal border, they trigger an inflammatory response, leading to the development of autoimmunity. Since they are antagonistic to Th1, the Th1 cells are driven to lower levels, which increases the risk of infections. These infections can then trigger more elevation of Th17, continuing and worsening the autoimmune cycle. With the elevation of Th17, there is a decrease in Treg cells causing a loss of immune tolerance. With the lowering of Th1, there is an increase in Th2 with a concomitant increase in allergies.

Treatment Goal: Immune Balance

With autoimmune disease, the goal is to return the immune system to balance. This entails decreasing Th17 and Th2 while increasing Th1 and Treg cells. A balanced immune system decreases autoimmune disease and its triggers along with decreasing allergies. In addition, immune tolerance will be restored, and the immune system will be strengthened in its ability to fight infections.

Autoimmune disease is a chronic inflammatory disease. Therefore, one of the goals in treating autoimmune disease is to decrease inflammation. Elevated Th17, activation of STAT3 (the transcription factor for Th17), and activation of NFkB all contribute to chronic inflammation. All three of these drive neutrophils into the tissue. Neutrophils are the first line of immune defense and are necessary to mount a needed immune response. Macrophages are called in next, and they are responsible for removing neutrophils from the tissue after they complete their function in fighting infections. If there are too many neutrophils and they are not removed, they self-destruct, causing release of ATP and other damaging molecules that lead to tissue destruction. Chronic inflammation and tissue damage arise from a continual activation of neutrophils.

Transfer Factors

Transfer factors are one tool to help with immune imbalance. They are small proteins with RNA that are made by activated T helper cells. Transfer factors by other mammals appear to be molecularly similar to human transfer factors. Antibodies are like transfer factors in that they are proteins but released by B cells as immune markers instead of by T cells.

Transfer factors are part of cell mediated immunity which is considered a Th1 response needed to fight viruses and other intercellular infections.[1,2] Research has found efficacy of transfer factors for fighting many of the herpes viruses and HIV.[3,4] When a patient has a low Th1, supplementing with transfer factors is a good option to support this system. By increasing Th1, this helps balance and decrease elevated Th17 levels. Transfer factors then help the body fight infections better, without tilting the body towards elevated Th17 response and autoimmunity.

The cell mediated immune response starts with an infection that invades the body. A phagocyte engulfs the infected body cell and then forms an antigen on its surface and releases cytokines to notify the Th1 CD4 cells to mount a cell mediated response. These Th1 CD4 cells release transfer factors and Th1 cytokines, which stimulate an increase in new T helper CD4 cells, new cytotoxic T CD8 cells, natural killer cells and macrophages. The transfer factors bind to an antigen on an infected body cell. The CD8 killer T cells target the cell tagged with the transfer factor to destroy it. Natural killer cells are also cytotoxic by releasing proteins called perforin that form holes in the cell membrane where granzymes enter to destroy the virus inside the cell. NK cells are activated in response to interferons or macrophage-derived cytokines. They serve to contain viral infections while the adaptive immune response is generating antigen-specific cytotoxic T cells that can clear the infection. ➤

T Helper Cell Regulation

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Transfer factors are derived from leukocytes (dialyzable leukocyte extract: DLE), bovine colostrum, or egg yolk. General transfer factors increase the number of T helper CD4 cells, T cytotoxic CD8 cells, macrophages, and natural killer cells so the immune system is ready to fight infections. Targeted transfer factors can be made in a manner to promote passive immunity. Chickens or cows are infected with attenuated specific antigens. Once the animals produce an immune response, the transfer factors are collected. These targeted transfer factors when used as a supplement give the person passive immunity to that antigen. Research has shown this can be an effective way to support the immune system. Children with cancer and no immunity to varicella were randomized to receive a targeted transfer factor to varicella or placebo.[5] After 12 to 30 months, only one out of 16 children developed varicella in the transfer factor group versus 13 out of 15 children in the placebo group developed varicella.[5] Research has not repeated studies like this one even though the results were significant for strengthening immunity.

Transfer Factor Multi-Immune™

To learn more about transfer factors' specific effects on the immune system, research was done on a supplement called Transfer Factor Multi-Immune™ (TFMI).[6] This product is a multi-ingredient supplement that contains transfer factors, a small amount of colostrum along with immune-supporting mushrooms and herbs, zinc, and selenium. In vitro research was completed to investigate both immune response and immune modulation. Much confusion has existed about whether proline rich peptides are the same as transfer factors, so Transfer Factor Multi-Immune™ was compared to proline-rich peptides (PRP) with the additional immune support the same as the supplement. Colostrum with the herbal blend but no transfer factors was also compared. All were measured against a control.

The three products compared for the study:

1. Transfer Factor Multi-Immune™ (Researched Nutritionals) plus colostrum/herbal blend
2. Colostrum and Herbal blend portion (excludes transfer factor)
3. Proline-rich Peptides (in place of transfer factor), colostrum and herbal blend

The study measured immune activation, cytokine response, and cytotoxic response. The research studied three different effects on the immune system:

1. Immune activation: How the body begins an immune response by activating specific types of white blood cells
2. Cytokine (inflammatory) response: Measurement of cytokine chemical messenger release from white blood cells
3. Cytotoxic response: Measurement of cell destruction ability by natural killer cells

The study found a difference between the three supplements for immune activation and immune modulation. With this information, it appears that transfer factors and proline-rich peptides (PRP) are not the same entity, as the transfer factors demonstrated the most powerful response in all immune categories tested. For both natural killer cell activation and T and B cell lymphocyte activation, TFMI had a three- to four-fold improvement over the colostrum and PRP supplements. For an acute immune reaction, a strong immediate cytokine response is needed; TFMI was significantly stronger than the PRP and colostrum blends. Immune modulation is needed to prevent autoimmunity and allergies. This involves keeping a balance between Th17, Treg, Th1, and Th2 cells. TFMI showed a greater immune modulation than the other two products, including an elevation of the anti-inflammatory cytokine IL-10 needed for the development of Treg cells. Overall the research showed the efficacy of transfer factors' supporting a strong immune response along with immune modulation needed to balance the immune system.

Natural Anti-inflammatories

Autoimmune disease is a chronic inflammatory state. Therefore, decreasing inflammation is a critical part of treatment. Inflammation supports the development and the continuation of autoimmune pathology. There are several transcription factors that influence the development of inflammation and can be either pro- or anti-inflammatory. Activation of NFkB and STAT3 both lead to an increase in pro-inflammatory cytokines, inducing Th17. In contrast, activation of the transcription factor Nrf2 leads to an increase in cellular protective responses, including increasing many antioxidants in the body. When researching natural anti-inflammatories, finding herbs and nutrients that impact these pathways has been helpful. Increasing Treg cells to increase immune tolerance is another mechanism to decrease autoimmune disease. Several supplements have been discovered that impact autoimmunity through this mechanism. Below I will discuss some examples of some researched-backed natural compounds that improve immune balance. Other natural anti-inflammatories exist but were excluded due to insufficient research.

Curcumin

Curcumin is one of the active ingredients in turmeric. It is one of the most well known and researched natural anti-inflammatories. By targeting multiple cell signaling molecules, it has many actions in the body. Two of the resulting mechanisms of action from these molecules are active antioxidant and anti-inflammatory effects.[7] It has been shown to benefit multiple inflammatory conditions including pain, metabolic syndrome, and chronic kidney disease.[7] The primary mechanism of action that has been studied is curcumin's ability to block the activation of NFkB and therefore the release of the pro-inflammatory cytokine TNF-alpha. NFkB is then activated further by TNF-alpha, creating an escalating inflammatory cycle.[8]

For the autoimmune inflammation created by elevated Th17 and low Treg cells, curcumin also appears to play a role. Il-23 is one of the main cytokines that induces the formation of Th17 from naïve T cells. Curcumin plays a role in inhibiting the formation of Th17 by selectively inhibiting the production of Il-12 and Il-23 by dendritic cells.[9] The transcription factor STAT3 that is related to the development of Th17 is silenced by curcumin.[9] In addition to decreasing Th17 and therefore Il-17, curcumin also has a

role in increasing Treg cells.[10] Research has shown a modulation of the Th17/Treg balance away from autoimmune conditions such as SLE (lupus).[10] Treg cells are the primary producer of the anti-inflammatory cytokine IL-10. Curcumin enhances IL-10, which may be one of its anti-inflammatory mechanisms.[11]

One of the main drawbacks of curcumin clinically is its poor bioavailability. Much of the curcumin is broken down in the intestine before it is absorbed systemically.[12] Many companies have created better absorbed forms of curcumin that have been researched and found to achieve better curcuminoids in the blood stream.[12,13] What is important when using curcumin is to dose it appropriately for the form being used for inflammation.

Resveratrol

Resveratrol is a well-known polyphenol. It is best known for its presence in red wine, presumably leading to its benefits. In a manner similar to curcumin, resveratrol has an impact on many cellular pathways. Its anti-inflammatory effects appear to be from its negative impact on NFkB. By inhibiting NFkB, it causes a decrease in TNF-alpha and a subsequent decrease in IL-23, leading to decreased levels of autoimmune stimulating Th17.[14] Part of the mechanism of TNF-alpha is to cause a T-cell proliferation, which is inhibited by resveratrol.[14]

Another mechanism for decreasing NFkB is through the activation of SIRT-1. Resveratrol activates SIRT-1 which deacetylates NFkB.[15] Sirtuin 1 (Sirt-1) is a longevity gene related to multiple diseases associated with aging. Its mechanism of action is through a NAD+ dependent protein deacetylase which is how it inactivates NFkB.[16] Sirt-1 also has a role as a master metabolic regulator. Resveratrol by increasing SIRT-1 has an anti-aging effect as well as an anti-inflammatory and anti-oxidative stress response.[16]

Autoimmune disease through activation of Th17 can be stimulated by dysbiosis. Therefore, restoring the microbiome can decrease inflammation, driving an increase in Th17 and a decrease in immune tolerance. In a mouse model of colonic inflammation, resveratrol led to a restoration of the bacterial microbiota in the intestine with a concomitant increase in the short chain fatty acid butyrate.[17] This was accompanied by a decrease in Th17 cells and an increase in Treg cells.[17] Because of its multiple mechanisms, resveratrol appears to be a good anti-inflammatory and anti-autoimmune supplement.

Quercetin

Quercetin is a flavonoid compound found in many fruits and vegetables. Flavonoids are part of the group of polyphenols that are used in integrative medicine for their antioxidant and anti-inflammatory properties. Quercetin is most well-known for its influence of decreasing histamine levels and IL-4 and IL-5 and therefore allergies.[18] It appears to also have a role in autoimmune regulation. It decreases the release of the pro-inflammatory cytokines, IL-6 and IL-1 through inhibition of MAPK signaling.[19] A decrease in these pro-inflammatory cytokines leads to a suppression in Th17 and subsequently IL-17 production.[20]

Another mode of action for quercetin is inhibition of the protein kinase called mTOR (mammalian target of rapamycin). The function of mTOR as a serine/threonine kinase regulates cell growth, cell proliferation and survival, protein synthesis, transcription of proteins and autophagy.[21] A new role of mTOR appears to be regulation of T-cell homeostasis.[22] There are two different mTOR subunits that together can promote Th1, Th2, and Th17 differentiation.[22] When quercetin inhibits both mTOR forms, it decreases Th17 and induces Treg development.[20,22] Quercetin helps promote immune tolerance in this way and decreases the tendency towards autoimmunity.

EGCG

Epigallocatechin-3-gallate (EGCG) is a green tea polyphenol with well-known antioxidant and anti-inflammatory effects. It also plays a role in modulation of T helper cell differentiation. EGCG inhibits T helper cell differentiation into Th1 and Th17 cells through impacting their respective signaling transducers and transcription factors.[23] It also has a role in increasing Treg cells.[24,25] Some of the mechanisms are by decreasing Th-17 associated pro-inflammatory cytokines including IL-1β, IL-6, IL-17A, and TNF-α expressions.[25] To do this, EGCG can down regulate the transcription factors STAT3 and mTOR.[23] These results suggest that EGCG may improve T-cell-mediated autoimmune diseases.

With autoimmune disease, the goal is to return the immune system to balance. This entails decreasing Th17 and Th2 while increasing Th1 and Treg cells. A balanced immune system decreases autoimmune disease and its triggers along with decreasing allergies.

Probiotics

Autoimmune disease triggered by elevated Th17 is often from dysbiosis or an imbalanced microbiome in the intestine. Severe imbalance with elevated Th17 and its cytokine IL-17 can lead to chronic intestinal inflammation promoting the development of inflammatory bowel disease (IBD).[26,27] Probiotics have an anti-inflammatory effect in the intestine through immunomodulation and suppression of Th17 cell elevation.[26] Probiotics impact the immune system through several mechanisms including signaling through the Toll-like receptor family.[26] Several studies have shown the effectiveness of probiotics in preventing and treating IBD (ulcerative colitis, and Crohn's disease).[27] In addition to decreasing Th17 cells, probiotics along with prebiotics increase Treg cells and therefore immune tolerance.[28] With the majority of people now without a normal microbiome, it makes sense as a preventative measure to supplement with probiotics.

Vitamin D

Vitamin D appears to have a role in autoimmune disease. VDR or the vitamin D receptor is present on lymphocytes leading to one mechanism of interaction with the immune system.[29] VDR contains many polymorphisms that lead to a difference in risk for vitamin D deficiency. Autoimmune diseases appear to be correlated with vitamin D levels where patients have an increased risk and increased severity of disease with lower vitamin D levels.[29]

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How vitamin D influences autoimmune disease has been researched in several autoimmune diseases. It appears to influence two of the mechanisms of autoimmune development. It can inhibit the differentiation and increasing levels of Th17.[30] Through this influence on Th17, vitamin D helped decrease symptom severity in children with asthma.[30] Multiple studies have shown vitamin D to have a role in supporting Treg cells.[31,32] The higher the vitamin D level, the higher the level of Treg cells leading to improved immune tolerance.

Vitamin A

Vitamin A, like vitamin D, appears to play a role in autoimmunity by modulating the balance of Th17 and Treg cells. Patients with SLE who had lower levels of vitamin A in the blood had higher levels of Th17 cells.[33] Retinoic acid is the metabolite of vitamin A that is the key regulator in modulating this balance.[33,34] Retinoic acid in the presence of TGF-B promotes the conversion of naïve T cells into Treg cells.[35] It also inhibits IL-6 from driving the naïve T cells into the development of the pro-inflammatory Th17 cells.[34] Overall the retinoic acid can lead to different differentiation by being an important regulator of TGF-B.[34]

Summary

With the increasing rates of autoimmune disease, it is important for practitioners to understand the underlying immune mechanisms. Research has consistently shown autoimmune disease to be associated with immune dysregulation. This dysregulation leads to an elevation of Th17 and Th2 with a decrease in Th1 and Treg cells, which creates a cycle of chronic inflammation and infection, perpetuating autoimmune disease. With the understanding of the immune mechanisms underlying this imbalance, we can use our tools in integrative medicine to break this inflammatory cycle.

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Dr. Debby Hamilton, MD, MPH, is a pediatrician with experience in primary care, integrative medicine, research, speaking, and writing. Her education includes an undergraduate degree from Wesleyan University followed by a medical degree from Chicago Medical School, where she graduated with honors. She is board-certified in pediatrics, physician nutrition, and integrated/holistic medicine (AIHM), and has a Master of Science degree in Public Health (MPH). Dr. Hamilton founded Holistic Pediatric Consulting in Colorado in 2005. Her practice focused on treating children with chronic diseases such as autism and ADHD and preconception counseling based on her book, *Preventing Autism and ADHD: Controlling Risk Factors Before, During & After Pregnancy.* Her book led to her collaboration in the writing of *The Healthy Child Guide* through the Neurological Health Foundation. She has also contributed chapters for *Child Decoded*: *Unraveling Learning and Behavioral Disorders*. In 2017, Dr. Hamilton joined Researched Nutritionals. Her focus is managing and expanding Researched Nutritional's clinical research on the efficacy of nutritional supplements, working on protocol development, and promoting the education of healthcare professionals.

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How Lyme and Hidden Infections Sabotage Our Clinical Outcomes

by Jason Bachewich, ND

What if I told you that as a clinician, you were potentially misdiagnosing a large percentage of your autoimmune patients? What if the arthritis, Alzheimer's, cancer, or Grave's disease was actually caused by an infection? The research is starting to show that perhaps our bodies are not flawed or simply have bad luck but rather sabotaged by chronic and hidden infections. Our treatment plans would be different, and our outcomes more positive. This is the beginning of a whole new understanding of chronic disease, and the potential is hugely exciting.

Lyme disease has been gaining a lot of attention in the media lately. Doctors are becoming more aware of the symptoms, but why just look at Lyme disease? There are multiple bacterial, viral, and other parasitic infections that can sabotage our clinical outcomes and have been ignored or assumed to be benign. This article is going to help you to identify those key symptoms to look for, how to test for the infections, and familiarize you with the most common hidden infections that we are not taught about in medical school.

Lyme Disease

Lyme is the ultimate mimicker. Sometimes it looks like arthritis, sometimes like MS or rheumatoid arthritis, and other times like chronic fatigue.[1-3] A patient may present with adrenal fatigue or weird facial or muscle tics, unusual skin sensations, and periods of feeling okay and other times struggling to get out of bed. On top of this, all diagnostic testing comes back mostly normal: no indication of autoimmunity, normal organ function testing, and no nutritional deficiencies.

My experience over the last few years has taught me to throw out the "facts" that I have been taught about chronic infections:

1. The bullseye lesion is rare, incredibly rare, and often can look like a bruise or present as a rash on a different part of the body than the bite location.
2. There is no season to Lyme disease or co-infections. Ticks have two main peaks in their life cycle; and when you take into account global warming, increased songbird migration range, and the international travel of our clients, never rule out an infection based on time of year.
3. It was thought that the tick needs to be attached for 24 hours, that bites need to be seen; but this is not the case.[4] In fact, many of my patients rarely remember a tick being on them. Many of these infections can also be transmitted by fleas and mites and intimate contact with someone already infected.
4. Definitive diagnosis based on lab work is not always possible. Lab tests can be accurate and flawed. Does the lab you use test for one of the more than 52 strains identified? It is believed that four to six of the strains are the disease causative ones, but a few years ago we believed it was only one or two. Did the lab test occur before the one month mark or after the three month mark? Was the lab test performed after antibiotics had been initiated? Did the lab also test for co-infections? Many tests are performed improperly, at the wrong time, or are inherently flawed.
5. Autoimmune disease doesn't usually "just happen." Sometimes, we do have a fluke in nature, and the body short circuits; but it is becoming more and more apparent that the body does not intend to start destroying itself. Often the immune system is hunting something inside the cells of the tissue itself and destroys healthy cells in the friendly fire. A great example of this is the link between Epstein-Barr virus (EBV) and thyroiditis/Graves' disease.[5,6]

I find it shocking to think that the medical profession believes that something as simple as herpes virus 1 or 2 can come out as a lesion on our skin yet not create a lesion inside the body and produce symptoms that are hard to understand, while diagnostic imaging would be negative and blood tests all show normal.

The World Health Organization in 1997 estimated that some cancers are 84% attributable to viruses, bacteria, and parasites and estimate that 15% of all cancer cases could be prevented by preventing the infection in the first place. They also went on to state that treating the bacterial, viral, or parasitic infection could result in the remission of cancer.[7]

One of my first patients was a gentleman with chronic debilitating testicular pain. He had every test in

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the book done on him, and everything was fine; yet he was in excruciating pain. I questioned him extensively and discovered that despite having no obvious trauma to the testicles, his pain started shortly after a couple weeks of extreme stress, sleep deprivation, and poor diet. My mind immediately thinks "immune suppression," and what occurs when the immune system is weak is these hibernating viruses come out to play. I asked his doctor to test him for chickenpox and herpes, and sure enough, it was internal shingles. We were not taught about these abnormal and internal presentations of the disease in school, but if you look in the literature, it exists. Antiviral therapy, B12 injections, nutraceuticals supporting the immune system and suddenly the pain subsided.

…his pain started shortly after a couple weeks of extreme stress, sleep deprivation, and poor diet. My mind immediately thinks "immune suppression," and what occurs when the immune system is weak is these hibernating viruses come out to play.

Anytime a patient presents with abnormal symptoms and no obvious event or cause, you need to think infection. I have had patients with chronic migraines, sudden onset, no history and nothing abnormal in conventional medical investigation; yet their labs come back as positive for a secondary occurrence of Cytomegalovirus.

We have to add in the fact that patients might have acquired an infection, but Lyme is not the only possibility.

Ehrlichia/Anaplasma often presents with symptoms similar to Lyme, but there are a few distinguishing differences. Often patients will have sharp, knife-like headaches, muscle pain (not joint), sudden onset of psychiatric symptoms, and possibly a diffuse rash over large parts of their body. The treatment is often the same as Lyme, but this infection is often missed by simply not testing for it. In the area where I live, rate of co-infection with Lyme and Ehrlichia is 50%, meaning if you get Lyme, there is a 50% chance you also contracted Ehrlichia/Anaplasma. The published data shows much less with rates closer to 10% in Manitoba,[8] but infectious disease doctors have confided that their experience shows that it is much higher.

Bartonella has some very unique and confusing symptoms. Being that all of these infections can theoretically infect the brain and spinal cord, we need to look for mood disorders and psychiatric changes of sudden onset. Patients may experience morning fevers, muscle twitching/seizures, striae across their backs that look like stretch marks, and extreme fatigue. In addition, Bartonella can lead to endocarditis, retinitis, epilepsy, aseptic meningitis, and liver and spleen enlargement. Patients that are hospitalized with these conditions would not be typically tested for infection. There are even associations with pediatric and blood borne cancers.[9,10]

Babesia is similar to malaria in many ways, which perhaps is the reason why it responds so well to artesunate IV's or oral artemisia medications. Patients will often have issues with sweating, temperature control, stiff neck, air hunger, stomach pains, rapid onset of fever, and feel mentally dull and tired. This infection can often be confused with menopausal symptoms, adrenal fatigue, and simply being stressed out and run down. Malarone, Plaquenil, or quinine are the drugs of choice; but it does respond well to natural medications and often requires multiple supports and medications.

Rickettsia has a similar presentation to Babesia with fevers, headaches, swollen lymph nodes, and nausea/vomiting; but it can also simply present as a rash.

Chlamydia pneumoniae is not the STD that most patients assume it is. It is usually contracted through human contact and results in an upper respiratory infection. However, in those with a compromised immune system, it can develop into arthritis, brain fog, ear/nose/throat chronic concerns, and tendovaginitis. There have even been papers published showing a connection to multiple sclerosis, rheumatoid arthritis, depression, Alzheimer's, autism, and other neurological pathologies.[11-13]

Mycoplasma pneumonia is also an acute, usually self-limiting, upper respiratory infection. However, it can set up shop in a run-down individual and create symptoms that mimic so many other diseases. Fatigue, joint pain, swelling, headache, insomnia, anxiety, memory loss are all symptoms I have seen in patients with this infection. The literature also shows an association with ALS, Gulf War syndrome, esophageal cancer, and encephalitis.[14]

Yersinia is associated with short-term but acute bowel symptoms, but it can be much more complicated. In my practice, I had a gentleman presented with acute bowel pain, just above the umbilicus, no precipitating event. Eating relieves it for five minutes but increases the pain after. Pain killers have little effect, and lab work/scopes all show normal. My first thoughts were to try an elimination diet and do a complete digestive stool analysis to see what was reacting and what was growing in him. He displayed some food sensitivities, and the stool analysis showed some overgrowth but no parasites. I decided to run an infection panel through a German lab, and we discovered his immune system was fighting Yersinia. Upon further investigation, I learned that Yersinia usually is self-limiting but, on rare occasions, can burrow into the muscular tissue of the bowel and create chronic symptoms.[15] In the end, we ended up treating with antibiotics and natural supportive agents. This was another perfect example of a hidden infection.

Viral infections add a whole other bag of complications to our patients. More often than not, a Lyme patient will be treated, and their symptoms get 50% better; but they wax and wane. Many practitioners will say "biofilm" or "cysts" and augment the treatment protocol. Sometimes it works but often it doesn't. I have found that in many of my chronic patients, their latent viruses come back

to life—Epstein-Barr virus (EBV), Herpes 1-8, Coxsackie, Cytomegalovirus (CMV) amongst others. Never mind other infections such as Powassan virus that very few labs test for.

EBV is a tricky beast. Acutely known as "mono," few doctors realize that it can become chronic. How many doctors have had patients that we treat that have said that they have never been well since having mono as a teenager? Or how many patients have all the pain symptoms resolve after treatment for Lyme but have persistent fatigue issues now being called "post Lyme syndrome"? My clinical experience has shown that if a person still feels sick for a long period of time, they are still fighting something. It is normal to have a medication hangover from long-term antibiotics and inflammation, but anything past a couple months should raise alarm bells. EBV has also been associated with non-Hodgkin's lymphoma.[16]

Herpesvirus 6, 7, and 8 are usually acquired during childhood and can re-emerge later. The symptoms for herpesvirus 6 mimic MS, Hashimoto's, and fibromyalgia. Bone marrow suppression seems the main characteristic, so abnormal white blood cell counts should get you thinking. Herpesvirus 7 (roseola) is acute but also chronic. The key mechanism to think about is myelin degradation. Signs include memory issues, twitches, headaches, unusual sensations, and muscle spasms or knots that don't relate to tension or overuse. Herpesvirus 8 is usually associated with the immune compromised (such as HIV/AIDS). Patients will often present with fatigue, arthralgia, and fevers. In HIV/AIDS patients, this virus is associated with the onset of Karposi's sarcoma.

Cytomegalovirus does not stand out in terms of unusual symptoms. They are typically fatigue, fever, and swollen lymph glands. However, there are some papers to show that there is an association between this virus and colitis, atherosclerosis, esophagitis, hepatitis, pneumonitis, and non-Hodgkin's lymphoma.[17,18]

Clinical Outcomes

Parvovirus (slapped cheek disease) can reinvigorate during adulthood and clinically present as polyarthritis and chronic fatigue. The arthritis would typically be symmetric and chronic, showing a similar pattern to rheumatoid arthritis.

Coxsackie (hand, foot & mouth disease) in children presents with the classic sore throat, cough, fatigue, headache, night sweats, and conjunctivitis. Complications that can arise include diabetes, aseptic meningitis, and central nervous system paralysis. However, I have noticed that many of my chronic fatigue syndrome patients have tested positive for active Coxsackie and responded quite well to anti-viral therapies. Coxsackie has been associated with chronic fatigue syndrome many times in the literature.[19]

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Laboratory Testing

This is the developing part of the story. Many labs still rely on the standard IgG and IgM antibody testing. While this may be useful in the acute onset of the disease, these tests can be useless in the second coming of a latent virus. Some labs have started to develop new tests such as the Elispot test that looks at the activity of the immune cells over the last 72 hours. There are a few labs in the world using this test now but call it by different names. This has been extremely useful as antibody testing can be flawed. Western and Southern blot and DNA PCR testing can be helpful but are often plagued with false positives from cross reactivity or false negatives from lack of genetic strain diversity. Cystic forms of the disease such as in Lyme disease can now be tested for using antibody testing. While no test exhibits 100% accuracy, my experience has taught me that we are better to check off more boxes on the test requisition form than less. Many infections present as chronic fatigue, so how do you pick which one? Some useful tips for using lab tests include the following:

- Test for more than less. It is easier to convince a patient to spend a bit more than to see a negative test come back and convince them to send another kit back in.
- Call the lab and talk to the physician or lab director in charge of testing to interpret results that are not clear. I have learned a ton doing this.
- Most labs use great technique and science. If one lab says they are the best and tells you not to use another lab, be wary. Profit should not trump care.
- Don't test too often or too early. You will drive yourself crazy as these diseases wax and wane. A good pattern is 12-week protocol with retesting.If we test the CD57+/CD 56, do antibody testing, DNA PCR, and Elispot testing, we can get pretty darn close to 99% specificity and 99% sensitivity. This usually will come to $2000 - $3000 to put together a full panel. I currently use three different labs – two situated in the United States and one in Germany (see the Resources section). As a clinician, there is nothing worse than sending away for testing after convincing the patient to drop a fair chunk of money and have it come back negative for everything.

Some naysayers will preach that if you check off enough boxes, you will eventually find something. This could be true, but that is the meaning of the word medical "practice." Experience will show you trends that lead you to the diagnosis. There are always going to be false positives; but if you combine that with knowledge and clinical experience, the true diagnosis will reveal itself. At the end of the day, we need to park the ego and realize that we have to continue to learn and grow as a clinician. So, the next time a patient does not respond to treatment, perhaps you will start to think about the possibility of a hidden infection.

Now the fun part begins as you will notice that there are very few proven medical treatments for these chronic infections, but there are many natural interventions with historical use and success. But that is another article.

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Resources

Arminlabs (Germany): www.arminlabs.com
Pros:

- Can test for bacteria, viruses, parasites, and mold as well as many others.
- Turn-around time is usually 1-2 weeks sometimes even less.
- Do not need a centrifuge; simply draw and ship Monday or Tuesdays.
- Price is relatively lower than other labs for complete viral and bacterial panel, about $1000 - $1500 US
- Gives you the option of testing for cyst or round body form of Lyme disease, which is pretty unique.
- Elispot testing shows recent cellular activity so it is a way of tracking.

Cons:

- Have to draw and send by UPS early in the week to ensure it gets there quick enough, which can be hard for some people's schedules.

IgeneX (US): www.Igenx.com
Pros:

- Similar testing options to Arminlabs now; their version is called the Immunoblot (vs. Elispot).
- May be easier shipping option for doctors in the US.

Cons:

- Need to centrifuge the samples prior to shipping.
- Similiar comprehensive panel could cost about $1500 -$3000 US.
- Less viral options for testing.

DNA Connexions (US): www.dnaconnexions.com
Pros:

- Easy urine sample – great for pediatric, young kids, or people with terrible veins.
- Cheap: about $500 US

Cons:

- Tests Lyme and co-infections but no viruses.
- DNA PCR testing; it is possible that the absence of DNA in the urine does not mean you are free and clear of infection.

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Jason Bachewich, ND, is a naturopathic doctor practicing in Winnipeg, Manitoba, Canada. He is the owner and clinical director of Nature Doctors and has a keen interest in infectious disease and cancer. He graduated from the Canadian College of Naturopathic Medicine and has consulted for many of the large professional nutraceutical manufacturers. He has lectured internationally on a number of topics and has been a presenter on many local television stations. For more information, please see www.lymedoc.net or www.thenaturedoctors.ca.

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Moldy Buildings, CIRS, Sick People, and Damaged Brains, Part 1: Living in a Water-Damaged Building

by Ritchie C. Shoemaker, MD

Medical Director, Center for Research on Biotoxin Associated Illnesses

David Lark

Mycologist, MouldLabs, Australia

James C. Ryan, PhD

Chief Science Officer, ProgeneDx

Imagine being trapped by your home, workplace or school. You can see the mold, smell the bacteria. You are living in a microbial dungeon. Deep down, you know the building is making you sick, but you can't leave when there is a lease, a mortgage, a job, or needed education dragging you back into the dangerous building. Trapped: you know that you can't stay either. Every day brings more symptoms, more brain fog and thoughts that living this kind of life just isn't worth it.

Finally, you leave your porous possessions behind and flee to a safe house (that is, one you thought was safe). But you don't get better. Removal does not bring resolution. Your illness isn't an allergy. Your chronic inflammatory response syndrome (CIRS) is based on never-ending dysregulation of gene transcription, both activation and suppression.[1,2] Your genes relentlessly recruit more physiologic abnormalities: if the genes aren't fixed, you aren't fixed.

You seek out help, but what do you show the health care provider who tries to help you? How do you *prove* that you have fatigue, cognitive impairment, abdominal pain, and neurologic findings that change from day to day, in addition to twenty other symptoms? How do you show a third party your painful musculoskeletal problems when joints aren't red or warm, and sed rates are normal?

It doesn't take long to hear, "No one else has all these symptoms and all your standard tests are normal. Have you been under stress lately?"

You kept searching to find a physician who might be able to know what is wrong with you. You had already been humiliated by a fistful of specialists who gave you meaningless diagnoses, others sold you worthless nostrums that had no chance of helping, and then there is the referral to a psychiatrist. And that guy didn't help you either. Yes, you are stressed, but so what? Who wouldn't be upset when your life, your brain, your marriage, or your job are lost? Not to mention the $50,000 you wasted on IVs and internet cures, all the while seeking your old self, the self you had before the wet building trapped you.

You bring the doctor photos of ugly-looking black patches on the walls or pictures of collapsed ceilings. "Here is the evidence," you exclaim. "OK, show me how these photos are transformed into causation of your illness?" Where is the irrefutable objective evidence? No one trying to help you knew that your evolutionarily conserved cell systems designed to make protein and create ATP for energy were damaged by other descendants of evolutionary survivors whose ancestors waged war on other one-celled creatures 3 billion years ago.

Imagine a biological weapon that didn't kill people but disabled them instead.

If the problem tragically is present in your child who attends a school where the custodial staff quickly put out buckets to catch the rainwater coming through the old flat roof Monday through Friday, what happens when you complain? The school district just cut funding for art classes to save money: there is nothing in the budget for a new roof this year. Besides, only a handful of kids say they are sick, and we think your home is the problem, not our school.

The trap gets worse, when you turn on the computer. Now you read breathless claims for cures for black mold, toxic black mold, spreading black toxic mold, and more; you risk being squeezed dry, bereft of your savings and hope. The Internet hype is just a sham. There is no science to be seen anywhere that confirms peer-review and evidence basis for magical cures of poultices, oils, diets, supplements and herbs. Yes, you were told to put some Petri dishes in your living room and let some mold settle from the air. Maybe something grows (so what?). Now breathe these special salt fumes (straight from Nepal!). Just look at these clear Petri dishes opened after the salt vapors are layered on! Just type in your credit card today!

You hear about lawsuits. Negligence caused the personal injury. The jury awarded millions! Except that *your lawyer* has no clue and wants a lot of money up front to open the case, and then lots more money to pay experts, commission reports, and schedule depositions. Be aware that the defense attorneys pool their experiences in countless mold cases; they will not be polite or gentle; get ready for more humiliation. Even if your case is heard in court and you win, you won't see any money until the attorney collects his fees and all his costs are paid.

It happens every day across the US. This scenario isn't written for the *Twilight Zone* or authored by Stephen King: it is happening as you read these words.

The Way Out of the Trap

In this special five-part series written for the *Townsend Letter*, I want to work with you as you start to learn from the published science:

1. What a chronic inflammatory response syndrome (CIRS) is and why you need to know a lot about your illness;
2. How you can confirm your illness is caused by exposure to a mixture of specific elements found inside a water-damaged building (WDB) and some non-specific elements too;
3. How you can use published, peer-reviewed protocols to define your illness and start to heal your damaged brain;
4. How you can quantitate physiologic parameters that demonstrate your deranged physiology and correct suppression of both ribosomal and nuclear encoded mitochondrial genes (a) in support of the diagnosis of CIRS and (b) in support of ongoing salutary effects of treatment.

In 2019, we now use the "cure" word, albeit cautiously, but we can use it. After over 20 years of no cure, seeing a steady increase in number of cases return to normal is terrific. As yet, no one is guaranteed anything other than use of solid protocols, grounded in accepted science. Now that the magic of transcriptomics, differential gene activation, is available, we don't have to guess about treatment any longer.

And let all be informed: the problem is far more than mere mycotoxins.

There is much you can do to help protect yourself. The most neglected expense needed for building health is maintenance. Even if WDBs aren't hurting you yet, exposure to damp indoor environments isn't healthy for anyone. If you are ill, then removal from exposure is job number one. You won't feel back to normal if you don't stop inflammation, the basic disease process of CIRS, from recruiting more genes to do bad things to your processes of antigen presentation, innate immune response, and metabolism.

First, begin by stopping assumptions.

Second, stop guessing about what is wrong.

Third, don't believe "expert" opinion in the absence of *rigorous* confirmation by published, peer-reviewed academic work, including case/control and prospective studies. Double-blinded, placebo-controlled studies would be nice.

No, your body and especially your brain can't afford any more inflammatory attacks made by an over-zealous innate immune system!

The basic concept is that regaining your health begins by recognizing what objective biomarkers you have based on longstanding science, focus on correcting them, all the while casting out any false knowledge (with thanks to Aldous Huxley) that you might have picked up from the Wild, Wild West found on the Internet regarding the field of mold exposure and human health.

I want you to become familiar with the tools needed to show the skeptical physician a host of objective biomarkers that are found in cases of CIRS, but not in controls, that improve with therapy but not passage of time alone – tools that will demonstrate the transcriptomic basis of the illness and successful therapy. You will see what I mean when I say, "If you don't know the transcriptomics, you don't know the disease."

But first, what is a water-damaged building? Simply stated, water coming inside a building where it should not be, accompanied by amplified microbial growth, makes a building water damaged (WDB).

Water intrusion commonly affects buildings in the US. As many as 50% of our public buildings are water damaged.[3] That is a huge number of buildings. Wet buildings are not safe buildings. What makes WDB unsafe is the growth of a group of single cell microbes invariably found in WDB that make specific compounds that can cause inflammation (called inflammagens) or toxins made by bacteria (endotoxins or exotoxins), fungi (mycotoxins), mycobacteria (mycolactones) and actinomycetes. Add to the rogues' gallery of en-suite bad actors the very small cell wall fragments of fungi (beta glucans and mannans), fungal and bacterial enzymes/proteins (hemolysins, spirocyclic drimanes and proteinases), not to mention the result of each of these non-living elements acting synergistically, one with another. Is it any wonder that this indoor collection of inflammation causers can cause inflammation that hurts *some* of those exposed[4]?

The most neglected expense needed for building health is maintenance. Even if WDBs [water-damaged buildings] aren't hurting you yet, exposure to damp indoor environments isn't healthy for anyone. If you are ill, then removal from exposure is job number one.

I emphasize some because curiously, and fortunately, not everyone exposed becomes ill. And even more curiously, people with successfully treated illness will relapse with re-exposure unless they are protected by use of preventive medications. What is our protective antibody arm of the immune system doing? Sleeping? Could antigen detection and antigen presentation *both* be defective? These concepts will return in later discussion.

As we will discuss, it is inflammation that sets off more inflammation, uncontrolled like a runaway freight train without brakes, causing changes in gene activation (*NOT* allergy) that is the ultimate source of CIRS.

It is a basic tenet of real estate that landlords/building owners bear the

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responsibility to provide a safe indoor environment for users of that indoor space. Builders/sellers of buildings have a duty to provide buildings that are safe for new occupants. When an outdoor deck collapses, for example, throwing a group of wedding guests into a creek, an injured guest might claim that negligent construction caused the personal loss, pain, and suffering. Exchange of money might not make a person whole again, but the idea of compensation for caused injury applies.

Who is negligent if water gets indoors, foments growth of one-celled creatures, that then cause inflammation, creating a multisystem, multi-symptom illness that most docs don't know about? Who pays the plaintiff when causation of personal injury is confirmed in court?

As far as WDB goes, when water enters an enclosed space, and that space stays wet for as little as 48 hours, there will be microbial growth.[5] While bacteria might be the first colonizers, fungi aren't far behind. Precisely what microbes grow is completely dependent on availability of moisture. We call this availability of water or water activity "$A_{(w)}$." $A_{(w)}$ of 1.0 (or 100% relative humidity, RH) is open water compared to the water vapor pressure above the water. Bacteria and "wet" fungi, like *Chaetomium* and *Stachybotrys,* need a minimum $A_{(w)}$ of > 0.9 (>90% RH) to grow. "Medium wet" filamentous fungi, like *Aspergillus versicolor*, need $A_{(w)}$ of 0.8-0.9 to grow. "Drier" fungal organisms, including *Aspergillus penicillioides* need a minimum $A_{(w)}$ of 0.58-0.8 to grow. The dry (xerophilic) fungi, especially *Wallemia sebi*, like a range of $A_{(w)}$ that can go as low as 0.55 to 0.75,[6] to grow.

Available water has relevance for all of us in the WDB field. Just look at your nasal mucus. It is full of water, yet mucus prevents growth of the vast percentage of potential pathogens that land in your nose as you breathe. Why doesn't every germ in the nose cause infection? Simple, the water needed for growth of bacteria and fungi *isn't bioavailable*. The mucopolysaccharide matrix prevents the water from nourishing fungi, for example. In the end, who cares if fungi are in nasal secretions? They won't make toxins or secondary metabolites without available water!

Cases of fungal sinusitis have 2.4 species of fungi cultured in mucus in their noses, but controls have 3.1 species cultured.[7] Eighty-seven percent of all cases had positive cultures, but 91.3% of controls also had positive cultures in a classic German report from 2003. Because "fungi can be identified in almost everybody's nose…when inhaled, these airborne fungi are only 'in transit' through the nose. Positive fungal cultures from nasal secretions have to be considered normal findings."[7]

If we only assay dust found in a WDB for fungal DNA, the presence of indicator fungal DNA tells us a lot about the building ecology as described by $A_{(w)}$. Just by looking at indicator DNA, we can get a solid idea what is abnormal in the ecology of a WDB that is making people sick.

Perhaps the most important organisms found in WDB are actinomycetes. No, not fungi, not mold, not black molds, not toxic black molds, but these filamentous bacteria are only recently becoming recognized in clinical dust samples as major players in adverse human health effects.[8] If we add assays for endotoxins and actinomycetes to assays of fungal DNA, we can obtain a robust picture of the harmful microbes in a WDB.

Ritchie C. Shoemaker, MD, remains active in the field of biotoxin-associated illnesses, the focus of his practice since 1997. At that time, an outbreak of unexplained human illness, associated with exposure to blooms of a dinoflagellate, *Pfiesteria piscicida*, attracted his attention and interest. Pfiesteria was the first example of an acute and then chronic biotoxin-associated illness recognized and published in peer-reviewed literature. Shoemaker's two papers on diagnosis and then treatment were the first in the world's literature on acquisition of illness from Pfiesteria in the wild. Since that time, other sources of biotoxin-associated illnesses have come forward including other dinoflagellates, cyanobacteria and, most importantly, organisms resident in water-damaged buildings.

Shoemaker has spent the last 22 years treating patients and conducting research that unveils the extraordinary complexity of these illnesses, now called chronic inflammatory response syndromes (CIRS). Starting with no biomarkers and now progressing to over 25, CIRS has been shown to have abnormalities in proteomics and transcriptomics with differential gene activation, the final ultimate pathway of disease production in the world of chronic fatigue.

His collaboration with Dr. James C Ryan, transcriptomist, has led to multiple publications that have application, not just to chronic fatiguing illnesses but to the inflammatory illnesses of the 21st century including atherosclerosis, diabetes, obesity, and autoimmune illness.

As Shoemaker's work has progressed on the complex problems of grey matter nuclear atrophy, a small but growing cohort of patients with multinuclear atrophy and cognitive impairment have led to improvements that may have application to illnesses such as Alzheimer's disease.

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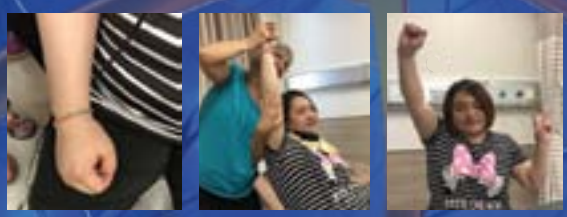
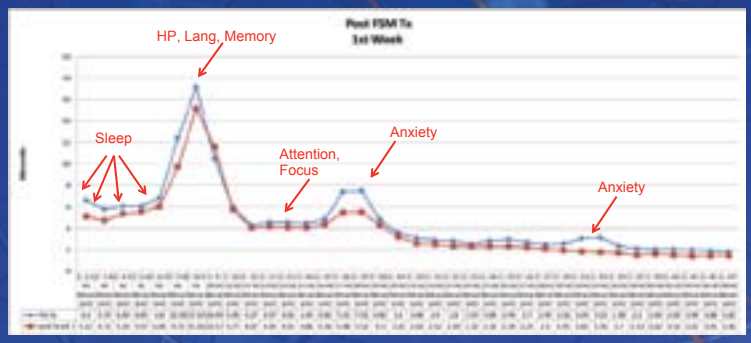
Treatment After a Stroke



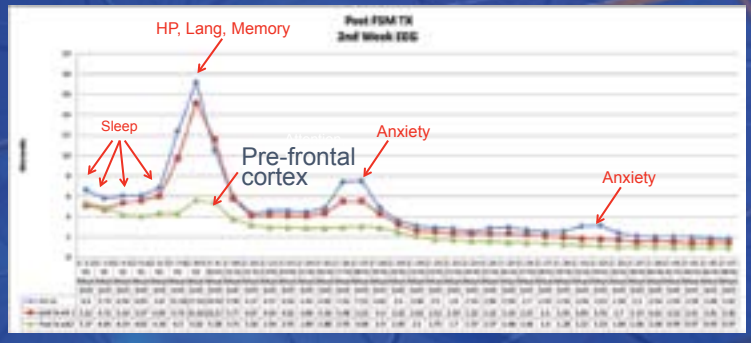
A patient 3 years post stroke was treated with FSM for two, one hour treatments resulting in permanent recovery with improved mobility, flexibility and dexterity.

Frequencies Help Brain Injuries

Post FSM Treatment – Week 1

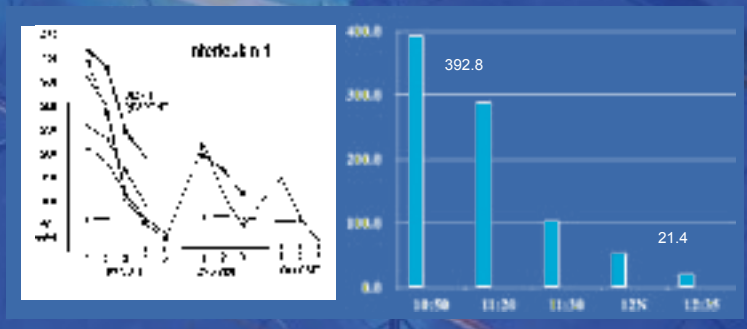


Post FSM Treatment – Week 2



The affects of FSM on treating traumatic brain injury.

Frequencies Reduce Inflammation



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FCT: Treating Lyme and All Infections the Simple Way

by Savely Yurkovsky, MD©

Quoting retired Harvard biology professor Edward O. Wilson, PhD,[1] that scientists enjoy falling in love with their ideas, this article is to sound the alarm about Lyme disease. While Professor Wilson also stated that a lifetime of most ideas does not exceed a few seconds because they are unviable, the ones about Lyme disease have managed to extend their natural life span and taken themselves to an even more dangerous level. This is well reflected in a recent book of a 'leading Lyme disease specialist' who, like the rest of them, calls for even more antibiotics and other toxic drugs to kill Lyme and co-infections than before.[2] This only magnifies the vicious circle created by antibiotics in all chronic infections since health cannot be restored by the very means that destroy it. Even the reputable infectious disease specialists have realized this problem. One of these, professor of infectious diseases at NYU and former president of the Infectious Disease Society of America, Martin J. Blaser, MD, published a well-referenced book on health-destroying effects of antibiotics, leading to a long list of chronic diseases.[3] Even the discoverer of antibiotics, Professor Alexander Fleming, MD, forewarned in his Nobel Prize acceptance speech as long back as in 1945, that microbes will outwit antibiotics, which are to be used with great caution to prevent deadlier infections than the original, due to mutations.

Yet, while pharmaceutical medicine is capable of making sound statements, it is completely incapable of offering physicians sound alternatives. As a result, the words went out the window and the prophecy has come to pass where our federal healthcare agencies have been sounding the alarm about a mounting number of antibiotic-resistant strains keeping millions of people sick and killing 23,000 Americans annually. But in the absence of a better means to harness infections, medical practitioners have continued the antibiotic onslaught; and the death toll has skyrocketed to 162,000 a year, according to the latest statistics. However, on top of this, there is another death toll in progress as the result of another pharmaceutical killing spree, which is also widely utilized by the Lyme "literate specialists." This concerns killing yeast microorganisms in the gut with antifungal drugs, herbs, and other pharmaceuticals. This book's author presents it as another act of medical wisdom that amounts to undoing the damage of one rat poison, antibiotics, which cause fungal infections, by another – antifungals.

For years, FCT has been stating that rotating rat poisons will only add more aggressive, mutated, and systemic fungal infections on top of bacterial or parasitic ones. This isn't the heck of a prophecy, but an elementary evolutionary fact that mutations or adaptations of microbes to hostile impacts have endowed them with the billions of years of survival long before our ancestors, monkeys, even showed up. Not surprisingly, the scientific literature started warning about another time bomb in the making, candida species and mold displaying genetic mutations with decreased sensitivity to an antifungal drug, yet not offering better alternatives.[4] As a result the antifungal pharmaceutical onslaught has gone on, and so, off the bomb. The major media has just reported the outcome of its explosion, a lethal epidemic in the US and worldwide, killing thousands by a mutated *Candida auris* that can't be stopped by any antifungal drugs.[5] It spreads all over medical facilities, furniture, furnishings, walls, windows, and equipment. The hospitals keep it a secret for fear of scaring potential patients. Those few infectious disease specialists who did divulge this information have said that they are scared for their own lives when treating these patients, and blame this on antifungal drugs. Yes, those popular nystatin, Diflucan, caprylic acid, antifungal herbs and other yeast killers that Lyme specialists and other practitioners dispense.

Although antifungal treatments weaponize fungal infections, yeasts – in spite of their bad reputation – happen to be our internal allies, like other gut flora, too.Their ability to produce useful nutrients as well as killer toxins against hostile bacteria has been established.[6] Since all biochemical pharmaceutical approaches in chronic diseases operate blindly, where they can neither know the primary causes of disease nor the extent of the harm of their

treatments, the vicious cycle created by rat poisons of Lyme treatments has no end in the common approach marketed by the book. The approach makes allegedly concerted efforts to fix mitochondria with one set of pills, which are ineffective, yet use antibiotics that destroy the mitochondria; our mitochondrial DNA contains bacteria and DNA.[7-11] Other drugs offered that destroy mitochondria are steroids, anti-inflammatories, and psychotropics. Cells of the immune organs and tissues have mitochondria too. How would destroying these cells help one's immune system to ever defeat Lyme? Worry not, as there are more pills on the way for the immune system?!! (Help me, Mama!)

While one of the main goals of Lyme treatment is relief from pain and its sufferings, the most devastating of all antibiotics, fluroquinolones, are offered too, and are known to inflict horrendous pain, due to neurological damage, that has driven thousands to commit suicide and hundreds of thousands, worldwide, to become invalids. This compelled the FDA to mark this rat poison with the black box warning. While the good specialists tell us that they need so many and even the most toxic antibiotics to penetrate biofilms, scientific literature advises us that fungal infections, which antibiotics foster, promote growth of bacterial biofilms – thus, leading to another oxymoron.

Other relevant side effects of antibiotics include damage to kidneys – the very organ that is supposed to function well in order to excrete loads of mercury and other toxic metals mobilized from the tissues into the blood stream by the prescribed chelating agents. While this therapeutic goal is very important, its actual process has been grossly oversimplified and misrepresented. It is viewed as some special chelating-binding or detoxifying substance loaded in a tank of a toilet that once flushed, all the bad things or metals would be jetted out of the body through a powerful stream.

Yet, the real setting of flushing in a human body amounts to thousands of mini-streams circulating through internal organs and tissues where portions of metals become stuck. Which exact organs are affected, neither the lab tests nor the flushing doctors can tell. These organs, if already sick, become sicker; if healthy, they turn sick, with the kidneys being the primary potential victim. In the science of toxicology, dumping or redistribution of metals may damage mitochondria and the immune organs, too.

Scientific research has uncovered even more destructive effects of antibiotics, which "special Lyme protocols" do not mention. These are cancer, through mitochondrial damage and increase in free radical production, with the latter leading to another tripping over one's feet.[12,13] As pharmaceutical medicine offers "nutraceuticals" or antioxidants to reduce this risk, science reports that these impair antibiotics' power to kill infections as well as stimulate the immune system by free radicals. For the record, improper timing of administered probiotics decreases the potency of antibiotics, too. Besides, we have barely a few dozen probiotics to replace the thousands of strains of bacterial flora, which may disappear for good, due to antibiotics use. More inconvenient truth for Lyme "specialists" and their victims. "Previously, it was thought the antibiotics only killed gut bacteria and blocked some immune functions in the gut. But the new study shows they also destroy cells in the intestinal epithelium."[14] Destroyed intestinal epithelium and gut flora, along with flourishing fungal infections, lead to another disaster, leaky gut, which requires more "wise" treatments with loads of pills. These and many other examples of blindly chasing one's own tail are concealed with hyped test reports, presented as "comprehensive panels," some 16 Point Differential Diagnostic Map, and impressive functional medicine "individual profiles."

In reality, all of these only add to an already huge pile of symptoms without having anything to do with individual real causes of disease.

Instead, determine which exact poisons render the patient vulnerable to these infections and which specific organs these poisons, microbes, and other morbid factors have invaded – not the least of which are the noxious environmental factors and therapeutic agents that continue re-poisoning the body in the process of treatment. If any map is necessary here, it is to determine the correct therapeutic hierarchy between the detected main causes and which treatments and measures are truly effective to address all of these. For this, one needs to go beyond the serious limitations of lab tests and extract this information directly from the internal organs. Without such capable diagnostic and therapeutic means to address all of these key issues, the "specialist," in spite of using many words having something to do with science, ends up presenting only counterfeits of Lyme cure.

One of these, a patient named Larry, whose entire "success story" lasted only for one visit, preceded by being loaded with steroids and consuming a slew of pills and intravenous antibiotics. Following this we never hear of Larry again, until I met him in my office years later, in an indescribable state of health, destroyed more by the treatment than Lyme infection itself. It is to the point where he fights suicidal thoughts 24/7 due to inhumane sufferings. This drug destruction of the body is the prevailing general pattern of Lyme treatments, which have mushroomed through "progressive" clinics country wide. One of their patients, a high-ranking corporate executive, shared with me that he was surprised to see how these clinics produce deceptive marketing by filming endorsements from patients who are still hooked to intravenous drugs. It is a travesty that Lyme foundations poison their members with "specialists" and books like these.

Addressing Acute, Chronic and Mutated Lyme and Co-Infections the Simple Way

Out of respect for infections' ability to mutate, FCT allows only the patient's own immune system to do the killing, at its own pace, as the treatment stimulates its recovery. This also develops a much higher resistance to future tick bites, which usually jumpstart the disease,

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even after years of antibiotic treatment. The simplicity of FCT is carried out with a realization of the opportunistic nature of infections; they don't make someone sick by infecting them – someone must be already sick in order to be infected.

This sick state is present even in seemingly robust, "healthy" people, joggers, and other avid exercise lovers whose high energy level, thanks to their genetically strong endocrine system, is confused with healthy immunity. Yet, I have seen quite a few of them who, like other Lyme patients, have succumbed to the tick overnight and become endlessly ill even after years of Lyme treatments.

It takes only minutes to determine the reasons for vulnerability to infections by screening the immune, endocrine, excretory, detoxifying, brain, and other organs for exact poisons, infections, electromagnetic fields, toxic drugs, and other relevant morbid factors through bio-resonance testing. The therapeutic priorities between sick organs and their primary causes are determined based on the order they are displayed by individual patients' bodies and is guided by a practitioner's knowledge and experience.

The main treatment consists only of specific homeopathic energetic signals that direct and stimulate specific immune and other organs to begin releasing the main causes of their malfunction. Specific signals also stimulate their repair and help to prevent the dumping or redistribution of mercury and other toxic metals in the course of their detoxification. The key environmental precaution in this process is to drastically reduce electromagnetic exposure, with its destructive impact on the brain, immune organs, and the rest of the body, through Memon technology.

The most common cause of malfunctioning immune organs are mercury, other heavy metals, organic pollutants, antibiotics and, sometimes, antimalarial and antibacterial drugs that are senselessly employed to kill cystic forms and biofilms of Lyme and co-infections. I have presented the cured cases of Lyme disease by FCT prior, in this publication, and am presenting briefly a few more of the new patients. For the record I don't specialize in Lyme or any disease but only in their causes; and that is why this formal non-specialty makes the approach far more successful than any specialty. As the aforementioned Professor Wilson stated, successful algorithms require far less formal knowledge.

Case 1: A young woman after years of antibiotics, other drugs, and supplements for Lyme disease. "I would not have survived this last year without your amazing medical intervention. Thank you so much for work that you do."

Case 2: A middle-aged woman after years of antibiotics, intravenous ozone, other drugs, and supplements for Lyme disease. Following a single FCT treatment: "I am about 80 percent improved!!!!!!... I do have a good amount of energy during the day now for the first time... I did two autohemotherapy/ozone treatments when I first got back from the East Coast

but have not needed them since (which is remarkable!).“

Case 3: An elderly woman with 20 years of fibromyalgia and after 17 years of Lyme treatments with antibiotics, off and on, and you name it. At her first visit, she could barely walk with a cane and was getting out of breath after only five steps. After two FCT treatments: “I can’t even tell you how much better I feel. I just sanded the whole floor in my house that I wouldn’t even dream of doing it before. Also, I help out other people. For me to do this, I must have enough energy.” Her cane was gone, pains much lessened, and walking distance greatly increased. After her next/third treatment: “It’s been astronomical progress. I can’t express it. It’s been an amazing experience. From four antibiotics before I came here, to none.”

Case 4: A middle-aged woman after years of antibiotics and God knows what treatments for Lyme. She was cured by FCT and was surprised that when she found a Lyme tick on her, it did not produce Lyme symptoms, as had always been the case before.

Case 5: A young woman treated for years for Lyme and co-infection with antibiotics and a virtual Yellow Pages of Lyme interventions. She made dramatic progress in her quality of life on FCT, yet some problems have uncharacteristically continued to linger. This is usually the case when people get re-poisoned through food, water, environment or other treatments. In her case, one of these was “rich in mineral salts” that contained mercury, and her house as pinpointed by bio-resonance testing. However, she kept denying that the house might have been the source. In this regard, this email of hers is of interest:

Following this email, I advised her that I canceled my appointment with a psychiatrist.

Conclusion

We need to learn how to properly diagnose and treat primary causes of Lyme disease because this is what ultimately defeats it.

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Savely Yurkovsky, MD, is board-certified in internal medicine and board-eligible in cardiovascular medicine. He undertook a particular interest in mercury toxicity as both its victim and a clinician managing a busy private practice. Shortly after moving to the US from the former Soviet Union, he received several silver amalgam fillings, which he recognized later as the cause of his mounting health problems. These problems persisted despite removal of fillings, which prompted him to explore various mercury-detoxifying approaches: oral, intravenous, homeopathic. After observing their corresponding partial benefits, limitations, and aggravations on himself and his patients, he resorted to bioresonance testing and causative homeopathy, based on relevant knowledge from physics and toxicology to optimize benefits and safety of the detoxification. The guidance of his physics consultant, the Stanford University materials science professor William A. Tiller, PhD, was instrumental in enhancing the diagnostic ability of bioresonance testing to address the known limitations of lab tests to detect the presence of toxicants in the internal organs. This testing also was used to draw a better comparative capacity between various mercury detoxifying treatments as well as to evolve a safer therapeutic strategy leading to minimize the re-intoxication or dumping effect which are common to these treatments. Bioresonance testing also optimizes the unlimited therapeutic potential of homeopathy that has a unique capacity to therapeutically connect with any organ and tissue, via specific signals, as no other treatment can.

His book, *Biological, Chemical, and Nuclear Warfare – Protecting Yourself and Your Loved Ones: The Power of Digital Medicine*, has been endorsed by Professor Emeritus William A. Tiller, PhD, of Stanford University and IT Physics Professor George Pugh, PhD. He presented this system at the Combating Bioterrorism Conference in 2005, sponsored by the Office of Homeland Security.

Dr. Yurkovsky founded a teaching organization, “*SYY Integrated Health Systems, Ltd.*,” in 1999 which is dedicated to training health practitioners in this biophysical system under the concept of FCT – Field Control Therapy®. He has lectured extensively in the US and Europe.

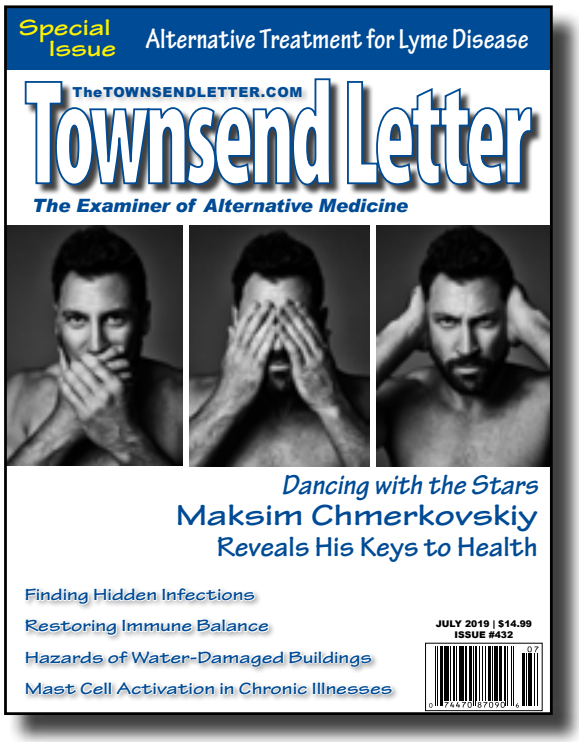
From: Ms. _____ @gmail.com
Subject: Gas
Date: Jan 14, 2019 at 11:09:57 AM
To: info@yurkosky.com

Dr. Yurkovsky-

For almost two years you have been telling me that I’m getting repoisoned and kept finding gas in my house even though the house is electric. I had to share this insanity with you – my husband bought gross scented detergent (because I guess he’s trying to take me out. kidding!) and all of a sudden the strong smell of laundry detergent was coming through every vent in our house. Here, when we had our basement finished 7 years ago the workers knocked the dryer pipe and venting loose. The gas (along with other toxins) from our dryer has been emptying in our house all of these years!

I had to share. What a crazy story! No wonder I was getting repoisoned!

Sincerely,
Julie



On the cover

Dance: A Healing Art

by Karina Gordin

Maksim Chmerkovskiy earned the reputation of "ballroom's bad boy," on *Dancing with the Stars*, but off the dancefloor he's long been regarded as a role model – championing health and wellness to his fans and growing family. "On TV you see a dance pro, but what many don't know is that this same dance pro once faced potentially career-ending health challenges," Maksim reveals. "My road to recovery was a learning process and now it's my mission to share what I learned and help others." Maksim largely credits a healthful diet and lifestyle for his prompt return to dance, and now hopes to spread awareness about the important role nutrition and dance play in optimal health and recovery.

MC: Before we begin, I'd like to first give you some background. *Dancing with the Stars* has been an incredible journey, but it's brutal on the body, just brutal. Yes, the rehearsals and scheduling were very fast paced, but it's more than that. People assume I spent a couple of hours per day rehearsing and then leave and move on. That is incorrect. More like, we have a couple of rehearsals per day. That is reasonable for a dance show, but then you factor in your celebrity. It's an honor to work with them, I feel very blessed, but they usually have very little dance experience. You're not dancing with a professional so you have to constantly compensate physically for the celebrity's limitations and perform ranges of motion that can be uncomfortable or taxing. On TV, what you're seeing are energetic, professional dancesport athletes. What you're not seeing is the stress that *Dancing with the Stars* puts on our bodies because of the nature of who we compete with. Again, I am not complaining, I just want to put this profession into perspective before we start discussing my approach to dealing with injuries and what works best for me. Writing about health, you probably know it's all about diet and exercise regimens, about optimal training, and most importantly the rehabilitation.

KG: What is your approach to rehabilitation?

MC: Contrast hydrotherapy, massages, cupping, stretching, getting enough sleep, NormaTec pants. But on *Dancing with the Stars*, I'd be lucky if I ate. In a typical day I would go from rehearsal, to an interview, back to rehearsal. The interview could be an injury risk in itself. For an interview, I have to clean up, look presentable, I sit with the host chatting, so inevitably after all that my body has cooled down. At this point I'm no longer warmed up, but I have to jump up and head back to the studio to rehearse the "pro number," – that's where dance professionals perform together. As expected, the range of motion is greater for these numbers – more knee and ankle flexion, hip rotation, lower-back and hamstring flexibility. After cooling down though, my range of motion is diminished, so I'm prone to injury.

KG: Is that how you sustained a microscopic medial calf tear?

MC: You could say I really let my body cool down – my son was born. I ended up taking time off from *Dancing with the Stars* to focus on my family and neglected my training routine. Eventually, when I felt ready and returned to the show, I was understandably not as physically fit as I probably should've been. Plus, I had again resumed my training routine and was *really* sore. During a particularly physically intensive dance, the jive, I put too much pressure on the Achilles tendon, and my calf was not ready. I felt a really sharp pain in my calf like somebody hit it. I have to say, though, it could've been far worse. My son was born, and my world turned upside down, but the whole time I kept to a strict dietary regimen. I may not have been disciplined with my training, but I maintained a healthy diet and lifestyle. So, although I did sustain an injury, the extent of the injury long-term was much less severe than if I wasn't disciplined with my health first and foremost. I will personally attest to the fact that a healthy diet is the most important criteria for musculoskeletal health. You cannot sustain exercise of any level if you do not fuel your body with fruits, vegetables, nuts, protein, and healthy fats (whole foods). And water. Water lubricates your joints, it boosts exercise performance, it flushes out toxins – you need water. Even if you work behind the register, or sit for work, drink water. I don't recommend ice cold water – maybe it's a cultural thing – but chilled water is said to affect digestion and lowers your core

body temperature.

KG: While we're on the subject of ice-cold water – earlier you mentioned rehabbing with "contrast hydrotherapy," can you briefly elaborate on that?

MC: I do recommend contrast hydrotherapy. Alternating between ice-cold and hot water. It can even be done in the shower. It's cheap, fast, and safe. Before my son was born, I went on tour with my brother Val – we performed 53 shows in under two months. I was in top shape and remained injury-free in large part thanks to regular massages and contrast hydrotherapy. Immerse yourself in hot water and then immediately switch to cold, and repeat. That really stimulates your circulation, decreases swelling and helps control inflammation, and overall just really important for post-exercise recovery of your muscles.

KG: After your calf injury, I understand you took extra measures, including supplementing with peptides to hasten recovery?

Maksim Chmerkovskiy performing on *Dancing with the Stars*

MC: I work with amazing people who introduced me to peptides. I was able to compete on *Dancing with the Stars* for as long as I did because of peptides. About eight years ago, I completely changed my diet. I always knew not to drink soda, but I didn't know about GMO foods, I didn't know about peptides, so working with an amazing team of athletes I took my diet and lifestyle to a new level. I was blown away – so you're telling me that more than half of the average grocery store is stocked with GMO foods? And even more than that is "food" that's so processed your body wouldn't even recognize it as food? Why it resonated with me, I don't know, *maybe it just takes being more open-minded*. It's exciting to learn these things and then seeing them for yourself. Shopping for that remaining 20 percent of food is eye-opening, and now I even avoid the bread aisle. Most breads are proinflammatory and rank high on the glycemic index because of the incredibly high sugar. You're not eating a harmless bagel, what you're eating are processed carbs, which enter the bloodstream rapidly causing a sugar spike, so in response your body has to work hard to produce the hormone insulin to basically drive out that glucose from the bloodstream. Then you eat that bagel again, and once more it spikes your blood glucose levels, and the prolonged cycle can cause a whole spectrum of illnesses. At this point your body is just trying to keep you normal, forget trying to achieve fitness or get to a certain athletic level – that's no longer even an option. But to answer your question, after working on my nutrition I wanted to level up my health and learned about peptides, which help boost athletic performance (in a natural, organic way), protect connective tissue, and of course build-up muscle.

KG: About that – peptides are rather controversial and have earned a poor reputation in the sports industry for their growth promotion and performance-enhancing properties.

MC: I disagree with that, peptides are nothing like steroids. Peptides are not just about your muscles getting bigger, they're about improving the quality of your life. Peptides facilitate recovery, reduce inflammation, and a whole host of other benefits. Yes, peptides can help bulk you up, but it wasn't that for me at all and don't think for a second it was. The goal isn't to dance the fastest or jump the highest, no. The goal is to rehab and get a second lease on what I love to do without detriment to my body. The only reason I'm doing any of this stuff is because I want to live longer, I want to live healthier, I want to sustain this level of activity, but I want to also sustain my happiness. Mid-40's you start visiting the doctor much more often, I don't want to be that guy.

KG: I agree, and peptides serve many functions, including supporting joints and muscles.

MC: What more can I ask for as a professional dancer? Taking peptides and eating healthy sets your body up for rehabbing itself. Massages help, hydrotherapy helps, but if you're not rehabbing on the inside, external measures can only help so much. Just as a side, I even get sick less now. And when I do get sick, I'm not lying in bed with fever and chills. Maybe I get some sniffles and my throat gets itchy, but I feel uncomfortable for only like half a day. Peptide optimization boosts your immune system. That and a good night's rest, and I'm fine. It's not rocket science, it's just the right lifestyle.

KG: And thanks to this lifestyle you're clearly not slowing down –

MC: I am still here, I am still very much at the top of my game, I'm still pursuing my goal of whipping my son's butt at basketball when he's 16 and taller than me. But I couldn't have done any of this without the medical professionals in my life, it was definitely a coordinated effort.

KG: It takes two to tango, after all.

MG: It does, and knowledgeable medical staff can make such a difference. Look, not everyone has medical staff like professional athletes have. Most people are left to their own devices and left to figure this out on their own, so thank you, by the way, for spreading this important message and helping me carry this banner. I would most like to thank orthopedic surgeon Dr. William Seeds. He's the one who introduced me to peptides and other natural therapies and it's thanks to him I was back on my feet three days after the injury!

KG: What was Dr. Seeds' treatment protocol?

MC: I will put you through to him and you could find out the details, but basically – platelet-rich plasma together with peptides. I flew out to Dr. Seeds and spent a week with him. During that time, he extracted some of my bone marrow stem cells, created a concentrate out of it, which he then mixed with platelet-rich plasma, and re-injected that solution into my site of injury. Three days after that procedure I was back on my feet. I spent about a day and a half on crutches all together, and a week after that I was basically dancing. Slowly, but dancing. Remember, a typical recovery takes about six-to-eight weeks, just to put it into perspective.

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KG: You were a great candidate for platelet-rich plasma prolotherapy, and the treatment is quite straightforward – blood is drawn and separated (via centrifugation) into three layers: platelet-rich plasma (PRP), platelet-poor plasma (PPP), and red blood cells. In short, the PPP is discarded and the PRP is reinjected back into the site of injury. I'm thrilled to hear you received PRP – it's a very effective, safe, and comparatively inexpensive treatment. Platelets are a natural source of growth factors that are responsible for healing and regeneration.

MC: That's exactly it, and I regained my full range of motion. I jumped right back into the show. I don't think that I came back too soon. And as you know, the show is live, everything happens right in front of your eyes, and you're seeing me rehearse and perform in real-time. I wasn't pre-shooting and airing my dances in pieces. No, you saw me dance three-and-a-half weeks after the injury, and so everyone who knows about the extent of my injury understands that this was an unprecedented recovery. Even now talking with you, I'm sitting drenched in sweat post workout, working on my hamstrings, quads, hip flexors. My hips were out of whack. It wasn't just about this calf injury. Many don't know this, but I had a massive trauma when I was 12 years old – I had shattered my right femur. I was already dancing then. I have been dancing since the age of four. When everything was put back together, a titanium rod was inserted and when time allowed, I went to have the rod taken out. Miraculous as my original surgery was that allowed me to have my leg back and continue to dance, the extraction of the rod was done in such malicious and amateur way that they complete dismantled my right hip flexor. Keep in mind, this is 1993 in Ukraine, and though a lot of progress was made, post USSR, there was still some neglect. I don't want to get into politics, but the point is, there were some people that were amazing, but many were negligent, and I fell into the hands of a negligent doctor who did not put any effort into my case. When he took out the rod, I was in so much pain for weeks. For weeks. I was told that after removing the rod, it's like getting your appendix removed, you can just get up and go. Well, I couldn't, and it was so traumatizing to me, I didn't understand what was wrong with me, nobody could explain it to me. Over the next years I figured out how to compensate for the very limited range of motion in my right hip, and that brings us to where we are today. I met Rashad Jennings on *Dancing with the Stars*, and he introduced me to his trainer. I started working with him, and I wish I knew all this when I was 20. But I'm making the best of it now, I'm going to continue dancing, and most importantly I'm going to pass this opportunity to my son.

KG: What are some of your training techniques with Rashad Jennings' trainer?

MC: For the longest time, when I would use my right leg to step up, I would feel sharp pain outside of my right knee. I thought there was something wrong with my knee but working with the trainer I discovered it was my ankle! We went through various exercises to improve my ankle mobility and recover the signals being sent to the brain to reconnect some of the muscles that weren't firing. Isn't it funny how the brain could just shut off signaling to this part of the muscle?

KG: I have to ask if you've experimented with acupuncture, homeopathy, or other more alternative therapies.

MC: Dry needling. I experience immediate relief and therefore immediate feedback. Whether you have a severe spasm or a small muscle knot, dry needling is like a miracle. We're talking three seconds, four seconds of inserting the needles and they do this twisting thing with the needles and you feel relief. I am a big fan of dry needling. We shouldn't not be allowed access to this treatment just because of some vague notions the medical industry may have that it's not legitimate. I am also a big fan of saunas.

KG: Infrared sauna?

MC: I was put on an infrared sauna regimen for a little bit, but I prefer the banya. It's a Russian sauna where the heat is very dry and penetrating. Again, with my culture – I have that Russian, Ukrainian in me – in my culture we go to banya. With my banya routine, once I feel really heated on the inside, I come out and take a cold plunge. The pool is maintained at about 6 degrees Celsius. Quite a drastic difference, so you go from 120 degrees Celsius in a dry room to a 6-degree plunge, and your body releases a healing protein. It's that release of protein that you don't get in any other activity. I also drink an amino acid mix in water to stay hydrated, and it gives me the extra healing boost. The next day I feel even better.

KG: Have you tried cold-laser therapy or any tech-based recovery systems?

MC: I can recommend NormaTec pants. This system massages your legs and essentially re-circulates oxygenated blood back toward your heart and then toward your extremities. I'm not a spokesperson for the company or anything, but it definitely works for me. After 30 minutes of this with your legs elevated above your heart, it really rehabs. But you tell me, how can it be otherwise? So that's a perfect day. I wake up, warmup, have a beautiful protein-rich meal and supplement with vitamins like K2 to offset some of the carcinogens that can be in my meat, then a long rehearsal, followed by banya. I do the hot, I do the cold, sip on aminos, I go home and eat a hearty meal, use my NormaTec pants for about 50 minutes, flush everything out of my legs, play with my son, and go to bed. That allows me to start over fresh and pain free. This has been an amazing journey, and a privilege.

KG: That is a perfect day, but do you think this approach can benefit everyone, or largely athletes?

MC: I can't stress enough, in my immigrant, not-English-as-my-first-language accent, that it's for everyone. I will make it my mission to explain to everybody the necessity of this. People say, "I like chocolate cake and there's nothing I can do about that." What do you mean you can't do anything about that? It's your mouth. No one's holding the fork and force-feeding you the chocolate cake. I love chocolate cake! I *love* dessert*, but I love feeling good even more*. You don't have to be like me and drink aminos while alternating between freezing cold and sweltering hot temperatures. No, you can do contrast hydrotherapy in your own shower and drink coconut water. My point is, yes, this is for everyone. It HAS TO BE for everyone. You know, growing up, my grandparents had a farm and grew naturally organic food. Today in 2018 the organic food that they ate cheaply is so expensive at the supermarket. Who can afford that, right? I get that, but at the same time you can control what's in your control, like not eating that chocolate cake, or not drinking that soda. When I was little, I hated being sent to my grandparents – they lived on a smelly farm with cows, chickens, no gaming systems like kids have now – but I remember waking up and gathering eggs straight

from the chicken coop, or going to a stable, milking the cow and drinking it fresh out of a glass! Grandma would pick some stuff from the field and now you have your breakfast. And I just remember reading books under the peach tree and the cherry tree, and eating the fruits picked straight from the tree that moment. That is incredible, and an experience I would've loved for my son. We don't have that now and it's upsetting. What's more upsetting is that I have to go to this market that charges an arm and a leg to get organic peaches that arrived from somewhere I don't even know. The peach might be organic, but the soil is still probably depleted of the vitamins and minerals, so that's where supplementing comes in.

KG: What is your supplement regiment like?

MC: I became a spokesperson for LivOn Labs because I really feel a difference taking their supplement line. They use a Liposome Encapsulation Technology, which essentially delivers more bioavailable nutrients to your body. If you have gastrointestinal issues for instance, not all the vitamins you take can be absorbed and carried to parts of the body that need them most. Liposomal nutrients, on the other hand, are in these protective bubbles of fat that are carried through the digestive system directly into your bloodstream. Besides that, every morning I take a probiotic, I take vitamin K2, 10,000 IU's of vitamin D3, and krill oil. B-complex is important for nerve repair, and actually my father has been taking that and it's really made a difference for him. In Ukraine we weren't rich. All the money would go toward my dance lessons or Val's dance and violin lessons. My dad had a herniated disc and we didn't have money to pay for the best medicine and treatments. What happened was his herniated disc pressed on a nerve and essentially rendered it useless. His glutes and hamstrings started to atrophy. Moving here, my dad has access to LivOn Labs and other amazing supplements, and now he walks everywhere and recently even started going out for runs! I know you also spoke with Tony [Dovolani] and his approach is to source vitamins mainly from his diet, and that's just as important. Personally speaking, supplements play an important role for me because I need that extra support.

KG: I think you and Tony might agree though – dancing is the best medicine.

MC: 100 percent. I am the co-owner of eleven Dance With Me dance studios. We have students of all ages and of all physical capabilities. Students with hip or ankle replacements, full knee reconstructions, you name it. They come in and after about six months of dancing, they regain muscles, they regain range of motion, they feel like themselves again. I've had older people that kicked away their canes and walkers and jive better than anyone out there. I'm sure Tony would agree that you have to do your research about where you dance and who teaches you, just like you have to do your research about what clinic you go to and what doctor treats you. This is your body, and dancing can indeed be the best medicine.

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Katrina Gordin is a medical journalist and currently writes for a variety of commercial and peer-reviewed health publications. She would like to thank her father, Dr. Leonid Gordin, for advocating the importance of meditation and mindfulness, which has informed her writing and research.

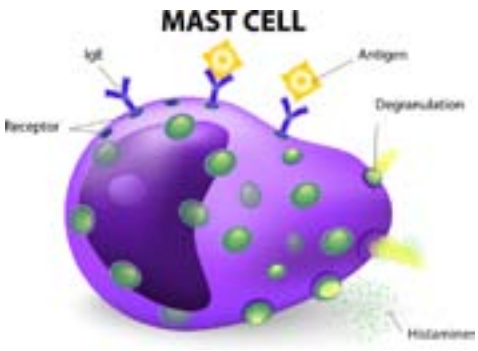
Karina can be reached at Write@HealthWright.org.

Mast Cell Activation Syndrome: A Key Exploration in Recovering from Chronic Lyme Disease

by Raj Patel, MD, Thalia Farshchian, ND, and Scott Forsgren, FDN-P

Successful treatment of patients with chronic Lyme disease often requires exploring many different factors in order to regain wellness. A focus on antimicrobial strategies alone is rarely enough to move the needle in the direction of health. It is important to cast a broad net in order to maximize recovery from chronic Lyme disease and conditions such as mold illness, chronic fatigue syndrome (ME/CFS), fibromyalgia, multiple sclerosis, and other complex, chronic health issues.

Raj Patel, MD, and Thalia Farshchian, ND, of Medical Options for Wellness (MOW; http://medicaloptionsforwellness.net) in Foster City, California, have observed clinically how important it has become to evaluate their patients for mast cell activation syndrome (MCAS). Managing this inflammatory process is often a key exploration in restoring health from chronic Lyme disease and related conditions. In MOW's patient population, over 50% of patients are believed to have MCAS as a component of their ongoing health challenge. In those with Lyme disease and/or mold illness with resulting immune dysregulation, the incidence of MCAS may be as high as 90%.



While MCAS has gained attention in recent years and has become more readily recognized, patients are also far more compromised today than they were five to ten years ago. There are many insults that can contribute to chronic illness, and several of these may serve as triggers for the activation of mast cells, release of histamine, abnormal immune response, and resulting inflammation in the body. No longer does 1 + 1 + 1 = 3; the synergistic effect of these various triggers makes things far more challenging and adds insult to injury.

In the context of a well-planned treatment protocol, MCAS must be addressed early on in order to minimize inflammation within the body and maximize response to broader treatment. This approach not only improves the patient's symptoms in the short-term but facilitates treatment of the underlying factors triggering MCAS, which then results in longer-term health improvements and eventual resolution of MCAS.

Mast Cells in Health and Chronic Conditions

Mast cells are a type of white blood cell derived from the bone marrow. They contain basophilic granules that release histamine, cytokines, and other substances that are involved in producing inflammatory and allergic reactions. These reactions help the body in fighting off offending agents and are typically triggered in response to parasites, infections, medications, stress, and other offending agents.

Mast cells are long-lasting and reside primarily in connective tissue. They are also found in large numbers along the epithelial lining in the body including the GI tract and the bronchial mucosa where they frequently serve as an initial line of defense for the immune system. Their normal physiological functions also involve maintaining vascular homeostasis, playing a critical role in wound healing and

angiogenesis, supporting bone growth and remodeling, and in maintaining the integrity of the blood-brain barrier.

The pathophysiology of mast cells in the development of disease is still a growing and evolving area. Mast cell diseases vary in severity and can be segregated into two general categories. The first, mastocytosis, involves overproduction of genetically altered mast cells and ranges from localized benign forms, as in cutaneous mastocytosis, to serious systemic malignancies as in mast cell sarcoma. The second category, mast cell activation syndrome, the focus of this article, is a relatively newly recognized condition that has received attention mostly in the last 10-15 years.

MCAS involves inappropriate, excessive, or episodic release of histamine and other allergic compounds. Although less serious, it can be significantly debilitating with wide-ranging systemic symptoms involving practically every organ system in the body. The diagnostic criteria are still evolving and are discussed later in this article.

MCAS is becoming increasingly recognized as a major comorbid condition accompanying Lyme disease and other tick-borne infections, parasitic infestations, chronic viral reactivation syndromes, multiple chemical sensitivities, and sick building syndrome. Proper recognition and treatment of MCAS can dramatically improve the treatment outcome of these chronic conditions.

Mast Cell Activation Syndrome

In MCAS, normally protective mast cells can become activated by numerous triggers, leading to an overproduction and release of histamine and other chemical mediators that result in increased inflammation throughout the body. There is an exaggerated response of the mast cells to a trigger, which leads to uncontrolled inflammation and resulting symptoms—though the number of mast cells is generally not notably increased.

MCAS symptoms may include rashes, hives, flushing, itching (with or without rashes), bloating, reflux, nausea, diarrhea, low blood pressure, shortness of breath, heart palpitations, headaches, brain fog, anxiety, fatigue, weight loss, weakness, dizziness, osteoporosis, and many others.

In alignment with what is understood about autoimmune disease, MCAS is an immune system misdirection. As the to-do list of the immune system becomes longer and longer, the immune system becomes dysregulated and unable to function with precision.

Fun Fact: Mast cells were first described by German immunologist and microbiologist Paul Ehrlich. The term "mast cell" comes from the German word "mastzellen" which means "fattening," as mast cell granules were initially incorrectly believed to be nourishing. A common co-infection of Lyme disease, Ehrlichia, was also named after him.

In those with conditions such as Lyme disease and mold illness, the immune system may become imbalanced, resulting in a shift from Th1 to Th2 (types of T helper cells). This imbalance in favor of Th2 leads to autoimmune shifts, hyper-allergic responses, and a microbial backlog that the body becomes unable to address. Mast cell degranulation inhibits Th1 immunity while promoting a Th2 immune response leaving patients feeling allergic, inflamed, and unable to respond adequately to chronic infections.

Triggers

Mast cell activation syndrome (MCAS) and histamine intolerance have been discussed in the medical literature for over a decade. A connection between *Borrelia burgdorferi*, the causative agent in Lyme disease, and the activation of mast cells was discussed in a study in 1999. However, understanding of the clinical significance of MCAS in conditions such as chronic Lyme disease and mold illness has been gaining only in recent years.

One of the challenges in treating MCAS is that the list of potential triggers is extensive and may include the following: mold exposure, parasites, EMR/EMFs, viruses and retroviral activation, Lyme and coinfections, opportunistic infections such as *Chlamydia pneumoniae* and *Mycoplasma pneumoniae*, heavy metals and other environmental toxins, medications, supplements, hormones, foods, temperature changes, physical injury, and physical, mental, or emotional stress or trauma—among others.

A significant percentage of MOW's patients with chronic Lyme disease have experienced an inflammatory response from a current or past exposure to environmental mold from water-damaged buildings. A primary trigger for mast cell activation is mold exposure in these patients. To minimize potential MCAS triggers, the environment must be evaluated and remediated early on in patients with mold illness in order to rein in inflammation within the body.

Mast cells are immune cells intended to protect us from parasites and other invaders, and thus, parasites are often a key trigger. Further, parasites may serve as sponges for heavy metals, which are also triggers for MCAS; thus, when treating parasites, the potential for additional release of heavy metals and increased mast cell responses must be anticipated. Aggressive heavy metal detoxification interventions may aggravate MCAS.

Continuing with the environment as a trigger for MCAS, exposure to electromagnetic radiation (EMR/EMF) is becoming a more commonly recognized trigger for mast cells. Theo Theoharides, PhD, MD, has stated that mast cells fire ten times more in the presence of a cell phone. There is a connection between EMR/EMF and mold as well. The more threatened or irritated mold is by its environment, the more toxins it produces to protect itself. Addressing EMR/EMF in the environment may be another tool to further calm down both mold reactivity and MCAS.

Viruses, retroviral activation, Borrelia, Lyme co-infections (such

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as Bartonella, Babesia, and others), Chlamydia, Mycoplasma, and other microbial burdens may serve as triggers for activation of the mast cells leading to further histamine release and higher levels of inflammation. Eradicating these infections helps in calming down mast cell reactions in some patients.

Histamine-containing or histamine-liberating foods can trigger numerous symptoms in MCAS patients, often resulting in patients tolerating very few foods. Some medications, supplements, and hormones may also serve as triggers. MCAS is a key player in why many patients are often unable to tolerate the very substances that are needed to get them well.

Temperature changes such as moving from one environment to another or encountering hot or cold water in a shower can trigger MCAS. Almost any type of stress including physical, mental, or emotional stressors can serve as a trigger.

Some contend that MCAS is a life-long condition. If one approaches treatment primarily with tools that attempt to calm hyperactive mast cell responses and reduce histamine, the condition may in fact persist. However, if the underlying triggers are explored and addressed simultaneously, MOW has found that the condition often resolves without the need for indefinite interventions.

The key message is to rely less on supplements and medications focused on treating MCAS and to focus instead on addressing the underlying triggers; simultaneously supporting stabilization of mast cells and reduction of histamine in the body is essential. In most patients, multiple triggers may be present and will require broad treatment. While an MCAS focus is often very helpful in the short-term, long-term treatment success requires exploration of the underlying drivers of the condition.

Testing

Clinical clues for recognizing MCAS frequently stem from a patient's symptoms when consuming fermented foods and high histamine foods such as citrus, tomatoes, and spinach. MCAS is much easier to recognize when the presentation is more severe; milder cases may overlap with symptoms of Lyme disease and mold illness and can be more of a challenge to identify. MOW keeps a high index of suspicion in their patient population.

Testing for MCAS is imperfect, and several tests are often needed to identify MCAS. The following tests have been helpful:

- Matrix metalloproteinase-9 (MMP-9) (LabCorp; serum)
- N-Methylhistamine (Quest; 24-hour urine)
- Histamine (LabCorp; plasma)
- Tryptase (LabCorp; serum)
- Prostaglandin D2 (PGD2) (Quest; 24-hour urine)
- Chromogranin A (Quest; serum)

Prior to collecting samples for these tests, a provocation is generally recommended whereby the patient consumes foods known to be high in histamine, resulting in the triggering of their MCAS-associated symptoms. Many of these markers are very transient in the system; and without provocation immediately prior to testing, false negative test results are not uncommon. Even with a provocation, negative test results do not rule out the condition.

When clinical symptoms are not obvious, all of these tests may be used in an attempt to document the condition. Otherwise, clinical presentation is often combined with MMP-9, n-methylhistamine, histamine, and tryptase to arrive at a diagnosis of MCAS. Even then, MCAS is often a clinical diagnosis, and treatment may be explored in absence of positive laboratory findings.

MMP-9 in MCAS

MMP-9 (matrix metalloproteinase-9) has been the best clinical and most consistently reliable indicator for MCAS at MOW. MMP-9 is readily available from LabCorp. While it has historically been used as an indicator of biotoxin illness, MOW has found it a useful marker in exploring MCAS as well. Similar to other markers, a provocation whereby the patient consumes high histamine foods prior to the blood draw may be recommended.

MMP-9 Level	Interpretation
<= 250	Normal; MCAS unlikely
251-399	Lyme, mold, or mild MCAS
>= 400	Uncontrolled inflammation from MCAS likely

MMP-9 elevations can be found in those with Lyme disease or mold illness from water-damaged building exposures. However, these generally lead to mild elevations in absence of MCAS. When MCAS is present, MMP-9 elevations are often much higher. At MOW, MMP-9 has been a "home run" in identifying those with MCAS clinically.

The beauty of MMP-9 is that it can be used to monitor improvement of the MCAS condition once the diet, supportive supplements, and concurrent treatment of triggers are in place.

Low-Histamine Diet

One of the cornerstones of MOW's overall treatment approach is to reduce inflammation as much as possible early on and keep it low throughout the entire course of treatment. A significant portion of a patient's systemic inflammation is often driven by MCAS and histamine intolerance. Thus, reduction of MCAS triggers is a key to successful treatment, and one of the most important areas to explore early on is diet.

Patients are often instructed to incorporate a low-histamine diet from the onset in support of inflammation reduction when MCAS is suspected. Avoiding leftovers and freezing foods in single-use portions for peak freshness is a key component of the diet. Eating out is difficult due to lack of control over ingredient freshness.

Many of the things that have historically been considered healthy options are not ideal for those with MCAS. Fermented foods, bone broth, and avocados are examples of foods that are generally considered healthy, but these are often best avoided with MCAS. Specific details of the low-

histamine diet recommended to MOW patients are included elsewhere in this article. It is critical to be as strict as possible with the dietary interventions early in the course of treatment.

If there are no improvements in symptom presentation after a patient has been on the diet for a month, the likelihood of a notable mast cell contributor is minimal. This scenario may be observed in those with an initial MMP-9 below 400. MMP-9 is often redrawn within two-to-four weeks after starting the dietary interventions. Most patients do see reduction of MMP-9 within a month of implementing a low-histamine diet. MMP-9 reductions of over 100 ng/ml have been observed in as little as four days on the diet; though maximal decline can take a full month or longer.

In the few where MMP-9 levels were elevated and have not reduced with the dietary interventions, it becomes important to explore other potential triggers such as mold exposure, EMR/EMF exposure, or chronic infections. The triggers for the MMP-9 elevation in these cases may be less from digestive and gut-associated issues and more from environmental exposures or microbial overgrowths.

As total histamine load reduces in the first month, many patients notice significant improvements in their symptoms. At least 70% see symptomatic improvements with the dietary changes. Reductions in headaches (including migraines), abdominal bloating, joint pain, and anxiety are often profound. Even if symptomatic changes are not observed, reduction in inflammatory markers often serve as an indication of success of the dietary changes. When combining those who see symptomatic improvement with those that see improvements in MMP-9 levels, approximately 85% of patients benefit from the dietary changes. Additionally, as inflammation reduces, the treatment toolbox broadens in terms of the items that a patient may tolerate, and the response to treatment for underlying triggers is expedited.

While mast cells are involved in the production of TGF-β1 (transforming growth factor beta 1; another marker commonly evaluated in those with biotoxin illness), MOW has not observed a correlation with dietary changes leading to reduction in TGF-β1 on the same scale as what has been observed clinically with MMP-9.

Dr. Thalia says, "The primary goal is to get people off the ground knowing there will be some initial turbulence; diet is a key component of this. As inflammation reduces and the plane is off the ground and at altitude, you are then cruising through the remainder of your treatment. Unaddressed MCAS and mold exposure are the two key factors that keep people from getting to altitude; addressing these factors significantly reduces the turbulence of the ongoing protocol."

The key message is to rely less on supplements and medications focused on treating MCAS and to focus instead on addressing the underlying triggers; simultaneously supporting stabilization of mast cells and reduction of histamine in the body is essential.

Most patients will remain on the diet for at least a year and may then be able to start reintroducing foods with fewer reactions as the key drivers of their MCAS have been addressed. Patients unwilling to comply with the dietary recommendations may find themselves stuck in a cycle of limited progress.

Gastrointestinal Health in MCAS

MOW views gastrointestinal inflammation and intestinal hyperpermeability, or leaky gut, as a symptom of MCAS as well as mold illness, Lyme disease, viruses, and other factors. It is the immune system dysregulation and inflammation from these conditions that ultimately results in leaky gut. Attempting to treat the leaky gut without addressing the underlying triggers that led to it is generally not a helpful long-term strategy. To complicate matters, once intestinal hyperpermeability is present, this may lead to further activation of the immune system and MCAS. It becomes a self-propagating, vicious cycle.

MCAS leads to inflammation in the GI tract. This inflammation leads to rapidly increasing food reactions, which may then set the stage for SIBO, and further lead to malabsorption or maldigestion. SIBO is the result of an overgrowth of bacteria in the small intestine, and imbalances in the microbiome can be a trigger for MCAS.

Issues with the nervous system in the gastrointestinal tract can lead to dysmotility. In complex cases of SIBO, Lyme and coinfections are often underlying issues that need to be explored in order to lead to long-term resolution. Bartonella may play a role in SIBO and other GI-associated issues. In patients with bloating after meals, this may not be entirely from SIBO alone, but may be the result of MCAS; thus, simultaneously exploring both SIBO and MCAS in these situations is often important. The majority of MCAS patients have some degree of SIBO and gastrointestinal inflammation.

In order to break the cycle, a clean, low-histamine diet must be implemented, inflammation must be reduced, SIBO must be treated, and immune-modulating or desensitization strategies put in place to calm the body's response to various foods.

Many probiotics add fuel to the fire in those with MCAS and histamine intolerance. Certain strains of beneficial flora found in many probiotic supplements, particularly some Lactobacillus strains, are histamine producers. In patients with MCAS, these are often best avoided. Given the importance of optimizing the microbiome to minimize MCAS over time, probiotics are still an important consideration. However, the key is selecting those that will not further exacerbate the problem. MOW often

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uses spore-based probiotics, soil-based probiotics, or those with specifically selected strains known not to increase histamine. These may include: Seeking Health® ProBiota™ HistaminX, Microbiome Labs MegaSporeBiotic™, Corganic GutPro®, Researched Nutritionals® CoreBiotic™, and others.

A promising tool in the area of improving gut health is oral BPC-157, which may help heal the gut barrier, improve leaky gut, and modulate immunity and inflammation. In patients with overlapping SIBO and MCAS, LDN (low-dose naltrexone) may also be helpful as it can help with motility and modulation of the immune system. Digestive enzymes may be required to help with the breakdown of food, and stomach acid may be low and require support to improve digestive defenses.

MOW is further exploring the possibility that, in those with MCAS, the body may be reacting to certain strains of bacteria in the gastrointestinal tract including beneficial flora such as Bacteroides. The use of LDA (low dose allergen immunotherapy) to modulate the body›s immune response to its own microbiome is being further explored as another tool for reducing MCAS in these patients.

Treatment

Successful treatment of MCAS consists of incorporating a low-histamine diet (see below), modulating immune response and stabilizing mast cells, and simultaneously addressing underlying triggers. All of these are key components of resolving the condition.

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Type of Food	Foods Allowed	Foods Restricted
Meat, Poultry, Fish	Immediately frozen meat including ground meat Any freshly caught, gutted and cooked fish Plain gelatin; Pasture-raised eggs; Pasture-raised chicken	Ground meat; All Shellfish, Roe and Caviar All Processed Meats (e.g. ham, smoked meats) Canned Meats/Fish (e.g. tuna); All pickled eggs, meat, and fish Flavored gelatin; Mincemeat
Vegetables	All pure, fresh/frozen vegetables/juices except those listed to the right Avocado (peak freshness; Broccoli/Broccolini; Zucchini (peeled) Cauliflower/Romanesco; Celery; Corn; Cucumber (peeled) Brussel sprouts; Lettuce; Cabbage; Asparagus; Kale Fennel; Carrots (peeled); Parsnip (peeled)	Avocado (overly ripe or exposed to air for extended time) Broad beans; Green beans; Eggplant; Mushrooms; Pumpkin; Sauerkraut; Spinach; Tomato (including sauce/ketchup); Over-ripe vegetables; Pickled vegetables; Packaged salad mixes; Packaged, peeled vegetables; Potato; Bell peppers; Root vegetables (peeled); Sweet potato
Fruit	All in-season pure, fresh/frozen fruits/juices except those listed to the right Melons (Watermelon); Apple (skinless); Pear (skinless); Fig Passion fruit; Plantain; Pomegranate (fresh peeled/frozen) Rhubarb; Starfruit; Longans; Lychees; Frozen peaches (skinned) Frozen berries: cranberries, blueberries, blackberries, raspberries	Citrus: lemons, limes, oranges, grapefruit Stone fruit: peaches, nectarines, plums, apricots Berries: cranberries, blueberries, blackberries, raspberries, strawberries Bananas; Grapes; Kiwi; Currants; Dates; Raisins; Papaya; Mangos; Pineapples; Dried fruit including prunes/raisins, etc.; Passionfruit; Watermelon
Dairy	Anything without microbial cultures (e.g. ricotta, feta, mozzarella) Ice cream free from restricted ingredients Cream; Plain Pasteurized Milk – skim/lactose free/goat milk Substitutes – Rice and Coconut Milk*	Fermented milk products:; Cheese; Sour cream; Buttermilk; Yogurt; Kefir
Grains	Unbleached Flour/Grain; Biscuits; Muffins; Rice noodles; Oats Puffed rice crackers/cakes; Millet; Rice (freshly made) Tortilla chips (without restricted ingredients); Quinoa (freshly made)	Bleached flour Yeast-risen breads/baked goods:; Bread (including gluten free); Pizza dough; Buns; Pita bread; Croissants; English muffins; Crumpets; Cracker with yeast
Legumes	Lima beans Dried beans: Chickpeas; Pinto beans; White beans; Navy beans Black-eyed peas; Black beans; Lentils; Split Peas	Green peas; Sugar/sweet peas; Red beans; Soybeans (including soy milk); Tofu Fermented soy: Soy sauce; Bean curd; Soybean paste; Shrimp paste; Chili soybean paste; Miso; Teriyaki sauce
Nuts	All plain nuts and their flours except those listed to the right (e.g. unbleached almonds); Macadamia nuts (small amounts)	Walnuts; Pecans; Cashews; Coconuts*; Sunflower seeds (small amounts); Flax seeds (small amounts)
Fats and Oils	All cold pressed oils: Extra virgin olive oil; Jojoba oil Butter (without rancidity); Ghee (without rancidity)	Processed oils Coconut oil*
Sweets and Sweeteners	Maple syrup	Unpasteurized honey Chocolate/cocoa
Spices and Seasonings	All fresh, frozen, or dried herbs except those to the right Baking powder; Baking soda; Dried turmeric (stored in refrigerator) Dried herbs (stored in refrigerator); Fresh herbs; Cream of Tartar	Vinegar Anise; Black pepper; Cinnamon; Chili powder; Curry; Cayenne; Nutmeg; Baker's yeast; Nutritional yeast; Brewer's yeast; Prepared mustards
Beverages	Plain milk; Pure juices of allowed fruits/vegetables Plain/carbonated water; Coffee (fresh ground and brewed) Fresh herb teas	Sodas; Apple cider; All caffeinated teas; Alcohol; Non-alcoholic beers; Herbal Teas

*Coconut is not tolerated by all MCAS patients.

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Mast Cell Activation Syndrome

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A low-histamine diet is pivotal in successful treatment outcomes for the majority of patients with MCAS. MOW has found that while treatment options discussed in this section can be very helpful, they build on the foundation of dietary strategies; they are not a replacement. Consider a sinking boat with a hole in the bottom; mast cell stabilizers and antihistamines are akin to bailing out the water with a Dixie® cup while the dietary interventions plug the hole. Approaching treatment solely from a medication and supplement perspective generally results in less than optimal results.

A helpful app "ALL i CAN EAT" is available for iOS and Android; more information available at https://all-i-can-eat.com

Once a patient has incorporated a low-histamine diet, mast cell stabilizers and antihistamines are introduced to further calm the immune dysregulation and resulting inflammatory response.

Low-Histamine Dietary Guidelines

Key points:

- No leftovers; freeze everything in individual portion sizes
- No fermented foods: kimchi, sauerkraut, kombucha, pickles, relish, fermented soy foods
- No high histamine foods from the restricted food list (those in *italics* may or may not be triggers)

Pharmaceutical Interventions

H1 blockers such as cetirizine (Zyrtec), loratadine (Claritin), levocetirizine (Xyzal), fexofenadine (Allegra), or chlorphenamine (Chlorphen) may be used. H2 blockers such as famotidine (Pepcid) or ranitidine (Zantac) are rarely used due to the resulting reduction of stomach acid, potentially inviting other problems longer-term. Leukotriene inhibitors such as montelukast (Singulair) may be helpful. Mast cells stabilizers such as cromolyn sodium (Gastrocrom) or ketotifen can provide patients with notable improvements.

Nutraceutical Interventions

Natural tools that are often helpful include the following: quercetin, luteolin, vitamin C, Seeking Health™ Probiota HistaminX, Algonot NeuroProtek®, Gaia Herbs Holy Basil Leaf, Mirica™ (Palmitoylethanolamide and Luteolin) or US Enzymes SunBalance™, CBD, black cumin seed oil, and other anti-inflammatories. Pantethine supports the process of acetylation and may assist in metabolizing and detoxifying histamine in the body as well.

Combination products that may be helpful include QuickSilver Scientific® Hista-Aid™ or Beyond Balance™ MAST-EASE™. Researched Nutritionals HistaQuel™ is a newer option in the toolbox. DesBio Histamine homeopathic has been of clinical value in extremely sensitive patients.

Surprisingly to some, DAO has not risen to the top of the list of helpful interventions for most patients and is only occasionally used; it is useful in the 10-15% of MOW patients with an inherent deficiency in the production of DAO presumably associated with a genetic predisposition.

Optimizing liver function can be a helpful strategy in breaking down histamine in the body. Tools such as Energetix® Hepatic Tone, BioRay® Liver Life, Beyond Balance™ TOX-EASE™, Pure Encapsulations® Liver GI Detox and others may be used in support of this goal and are synergistic with other interventions used.

Higher levels of histamine are often associated with low methylation function. Gently supporting methylation can help the body to reduce histamine; aggressive methylation support may lead to higher levels of inflammation as toxins begin to move and overwhelm the body's drainage pathways and is not recommended. Simultaneously supporting methylation and addressing microbial burden generally leads to an opening of the detoxification pathways, including supporting the excretion of heavy metals from the body without aggressive interventions.

Environmental and Microbial Support Interventions

Beyond the interventions that may support stabilization of mast cells and reduction of histamine, the underlying triggers of the MCAS condition must be simultaneously addressed. This may include environmental remediation from mold exposure in mold illness patients, addressing parasites and other microbial burdens including Lyme disease and co-infections, reducing EMR/EMFs, detoxifying heavy metals and other environmental toxins, limbic system retraining in those with stress and emotional trauma, and others as previously mentioned.

Reduction of EMR/EMF exposure is emerging as another therapeutic intervention in managing the activation of mast cells. MOW recommends turning off Wi-Fi, avoiding cordless phones, minimizing cell phone usage, mitigating dirty electricity, and implementing an EMR/EMF-reducing canopy using silver-lined cloth in the sleeping location. This often promotes a cellular parasympathetic state that leads to increased detoxification and unloading of toxins, including heavy metals. When done too quickly, however, this can overwhelm the body's drainage pathways and further trigger MCAS responses. Thus, a very specific protocol is used for the introduction of the shielding canopy in order to avoid an exacerbation of symptoms. Ensuring that binders and drainage remedies are being used and supporting methylation can make this process much smoother.

Emotional Support Interventions

The average Lyme and/or mold illness patient has been through tremendous emotional trauma. Whether this trauma occurred prior to the illness and may have set the stage or is the result of experiencing the illness itself, the emotional trauma often results in significant abnormal wiring in the brain. Meditation and other tools,

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which may help the body to shift to a parasympathetic nervous system state, can be very helpful in reducing MCAS symptoms.

Limbic system retraining (or rewiring or rebooting), such as with Annie Hopper's DNRS (Dynamic Neural Retraining System™), has led to dramatic improvements in many patients. Some patients experience an 80-90% improvement in their condition in the first few months; others experience non-specific improvement in overall well-being. The extent to which this may be helpful depends on how much of the condition is the result of limbic system dysfunction. Additionally, actual threats such as living in a moldy home should be addressed prior to incorporation of a limbic system retraining methodology.

Conclusion

In those patients with a chronic illness such as Lyme disease or mold illness, MOW has found MCAS to be a key area of exploration in regaining an improved state of health. Overall patient response to treatment has improved significantly since incorporating MCAS therapeutic interventions into MOW's broader treatment approach.

MCAS itself is not the core issue; it is a response to deeper issues triggering a misdirected, inflammation-producing immune response. In approaching treatment of a condition such as chronic Lyme disease, exploring and addressing MCAS while simultaneously addressing underlying triggers often results in patients finding higher ground. MCAS is a treatable condition that can be entirely resolved, and health can be fully restored.

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Raj Patel, MD, (http://medicaloptionsforwellness.net) is trained to work with people of all ages with his education in family medicine. Dr. Raj Patel received his master's degree in physiology from Rutgers University and his medical degree from Robert Wood Johnson Medical School in New Jersey. Over the years, Dr. Patel has specialized in treating patients with autism spectrum disorders (ASD), Lyme and tick-borne diseases, and mold illness (or "sick building syndrome") from exposure to water-damaged buildings.

Dr. Patel's interest in Lyme disease started in 2004 when he was diagnosed with it after having suffered from numerous seemingly unrelated symptoms for several years. Having successfully gone through his own journey with chronic Lyme disease utilizing a variety of treatment modalities, Dr. Patel has been able to refine his approach to treating chronic Lyme sufferers with incredible success. Dr. Patel is an active member of the International Lyme and Associated Diseases Society (ILADS). He has also completed advanced training in pediatric Lyme disease and is a frequent speaker at Lyme conferences.

Thalia Farshchian, ND, (http://medicaloptionsforwellness.net) is an accomplished healthcare practitioner who specializes in the field of integrative medicine. Dr. Farshchian completed her doctorate in naturopathic medicine at the National College of Natural Medicine and her B.A. in psychology from the University of California, Santa Barbara. She has advanced certifications in nutritional intravenous therapy and Herscu Model of Homeopathy.

She began her practice with a focus on digestive, hormonal, and autoimmune conditions. In the process of working with patients affected by these conditions, she began to see an infectious correlation with all of the above conditions. Over the past three years, she has been studying and implementing diagnostics and treatment in chronic viruses, Lyme disease and co-infections, and mold illness and CIRS (also known as Chronic Inflammatory Response Syndrome).

Scott Forsgren, FDN-P, (http://betterhealthguy.com) is a health coach, blogger, podcaster, health writer, and advocate. He is the editor and founder of BetterHealthGuy.com, where he shares his 22-year journey through the world of Lyme disease, mold illness, and the myriad of factors that chronic illness often entails. His podcast "BetterHealthGuy Blogcast" interviews many of the leaders in the field. He has lectured on his recovery from chronic illness as an invited speaker of the Klinghardt Academy, at AutismOne, and on several online health summits. He is a consultant to Victory Belt Publishing (http://victorybelt.com).

He serves on the Board of Directors of LymeLight Foundation (http://lymelightfoundation.org) which provides treatment grants to children and young adults dealing with Lyme disease. He is a member of ILADS (International Lyme and Associated Diseases Society; http://ilads.org) and ISEAI (International Society for Environmentally Acquired Illness; http://iseai.org). He is the co-founder and moderator of The Forum for Integrative Medicine (http://forumforintegrativemedicine.org) which hosts an annual conference bringing together some of the top integrative practitioners to share practical tools for treating complex, chronic illness.

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by Dietrich Klinghardt, MD, PhD, and Christine Schaffner, ND

Introduction

At the Sophia Health Institute, we continue to treat patients with complex chronic illnesses; whether we call it persistent Lyme, MSIDs, CIRS…the patients who come to us are suffering. Their symptoms often include brain fog, poor memory, migraines, seizures, chronic sinusitis, swollen lymph nodes, chronic pain, shortness of breath, heart palpitations, reflux, bloating, constipation, diarrhea, neuropathy, hopelessness, and despair. Like many of us in the field, we see the patients who are stuck, plateaued; no matter what we try, there is very little symptom improvement. Having these patients requires us to continually search and try to understand what we are missing. And then every so often we find a new remedy or treatment that for some of those who are stuck works like a miracle – they get their life back. The correct use of an old malaria drug, "quinacrine," has been one of those discoveries. A patient with a resistant tapeworm brought the information about this drug to us. It not only helped her but many others.

In this article, we reintroduce this old medication and how it may help your patients.

Quinacrine

Quinacrine/mepacrine (trade name Atrabine) is an anti-malarial drug that Bayer patented in 1931. It is known and accepted as a treatment of leishmaniosis, giardiasis, subcutaneous lupus erythematous, discoid lupus, pneumothorax prophylaxis, malaria, and malaria prophylaxis. It also treats tapeworms and schistosomiasis and improves EHS (electro hypersensitivity syndrome).

Quinacrine is known to reduce inflammation, reduce phospholipase A2, and upregulate p53. It also makes our cell membranes more flexible and less resonant with microwave radiation.

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Quinacrine shows a 100% clearance rate in refractory giardiasis after treatment with metronidazole, tinidazole, and nitromidazole has failed. Refractory giardiasis occurs in about 20% of cases treated and is common in our patient population.

There are well known applications of other anti-malarial medications for Lyme as well as connective tissue disease.

Pharmacokinetics

Quinacrine is rapidly absorbed in the gastrointestinal tract with plasma levels increasing two-to-four hours after administration and reaching a peak in 8-12 hours. It concentrates most highly in the following tissues: liver, spleen, lungs, adrenal glands, skin, fingernails, hair, and pancreatic islet cells. Quinacrine's half-life is between five to fourteen days, depending on the dosing regimen. When a patient stops consumption, plasma concentration falls by 10% daily. The renal system is the primary route of elimination for quinacrine. This remedy has a long half -life of several weeks which allows for a slow build-up of tissue levels. The die-off effects do not come all at once but are staged over a few weeks and easier to alleviate than with other approaches.

Side Effects

Quinacrine is a yellow powder and can turn the skin, nails, and urine temporarily yellowish, which typically occurs one-to-two weeks post treatment. This yellowing of the skin is not jaundice (but always check liver enzymes anyway). Quinacrine accumulates as granular deposits in the skin and nail. After completing the course of medication, the skin discoloration usually resolves within a few weeks; however it may persist for up to four months post treatment. Anecdotally, one patient sped up the clearance of the yellow dye with regular far infrared sauna and R-lipoic acid.

Quinacrine may cause a short psychotic episode if the die-off is in the CNS. Research suggests that B vitamin deficiency may make patients more susceptible. Use caution with patients who are prone to anxiety, depression, hallucinations, or psychosis and load all patients with B vitamins prior to prescribing.

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Rare adverse eye symptoms may include corneal edema and/or retinopathy but only with prolonged or high dose therapy. However, it appears to create much less oculotoxicity than chloroquine and less often.

Dosing

We have quinacrine compounded at Care First Pharmacy. For some patients we do a loading dose of 200 mg every 15 minutes to a total of 800 mg. The target dose is 100 mg three times per day for 10 days. Sometimes, if the chronically ill patient has amazing improvement with this approach, we might have patients on several months of treatment (if well tolerated). We have also seen patients respond to lesser doses: 50 mg twice per day for 14 days. Consider multiple rounds if well tolerated with longer pauses between rounds.

Mast Cell Activation Syndrome Case Report

One patient had been sick for about 3.5 years prior to the mepacrine. Her top symptoms included burning of the peripheral nerves, itching, prickly arms, legs and torso and at its worst brain burning when she would eat ANY food (even low histamine). She was down to white rice and ghee for one year and white rice and potatoes for the last year. She struggled with a number of health issues secondary to the nutritional deficiencies of her long-term diet void of nutrients. She was very chemically sensitive and needed to sleep 10-12 hours/night and was down to 106 lbs (Currently at 125 lbs).

She started mepacrine at 100 mg twice a day, no loading dose. Her histamine symptoms disappeared! The effect was immediate. As she started titrating down (due to substantial skin yellowing), she started noticing some breakthrough histamine symptoms (itching, prickly). She is still on a low histamine diet due to the breakthrough symptoms.

She also had a root canal removed at the same time that she started the mepacrine.

She made the switch from 75 mg/day of mepacrine to 100 mg/day of Plaquenil. The yellowing decreased substantially.

Prior to the mepacrine, she did several rounds of anti-parasitics (Alinia, albendazole, mebendazole, ivermectin) with little change in histamine issues but improved health in other ways.

Another important factor in her case is that she is committed to daily meditation practices recommended by Joe Dispenza, DC, which made a big difference for her with respect to her internal psychological energy metabolism and her mindset. She learned to self-induce a parasympathetic state and not be physically addicted to stress-related adrenaline anymore. However, the breakthrough only occurred after adding the mepacrine into her overall regime.

Chronic Parasites and Constipation Case Report

Another patient had been sick for 30 years, however, actively in treatment for six years. She lived and travelled with her own colon-hydrotherapy instrument. Her life depended on it. Without it she felt so awful that "life was not worth living."

Her top symptoms included chronic parasitic infections in the gut with chronic constipation.

Prior to mepacrine she had been on optimum doses of Alinia, fenbendazole, Biltricide, ivermectin, and a short course of Paramomycin. All of these medications had been helpful, but she needed on average four times the dose given in the average patient prescription in order to feel somewhat okay about living.

She did the recommended tapeworm loading dose of 200 mg every 15 minutes for 800 mg, then 100 mg three times per day for one month. She felt reborn. She came off the mepacrine for one month and had a minor relapse of gut symptoms. She then restarted the medication and progressively increased the dose to 400 mg at bedtime and noticed a shift around her typical dreaded full moon symptoms (insomnia, food cravings, etc). She stayed at this dose for three months. She is unique in that she could handle and needed higher doses of most medications prescribed. She experienced yellowing of eyes and nails and no other side effects. Being on mepacrine was "the best she ever felt" in over 30 years.

Six months later, she stopped medication and has not needed any other pharmaceuticals since. In fact, she is enjoying her newly found freedom and is also off all vitamins and supplements, other than a few herbal tinctures.

She now reports that she is living the best life she could ask for, following a strict dietary regimen that works for her, and her gut and bowel movements are the best they have ever been.

Mepacrine was not the sole solution in her case but was critical in eradicating the resistant parasites that she was struggling with.

Chronic Gut Dysbiosis Case Report

The following case taught me (CS) the true healing potential that is possible with mepacrine.

I had seen this patient for two years; and prior to seeing me, she had been in treatment for two-to-three years. Significant to her case is that her husband is from South Africa, and she had traveled to South Africa the year she fell ill.

Her first symptoms began in 2014 with anxiety and depression, then escalated over the next four years to chronic pain, fatigue, and psychotic episodes. She had chronic insomnia, nightmares, suicidal thoughts, loss of appetite, digestive issues, lost weight, low blood pressure, social anxiety, could not listen to music or watch television, could not tolerate loud sounds or bright lights. She was not able to read properly and sometimes had seizures and was unable to speak. Prior to seeing me she had tried IV antibiotics and anti-parasitics, including Alinia (which caused seizures and psychotic episodes).

The two years of treatment included herbal and prescription strategies to treat Lyme and co-infections, viruses, parasites, and heavy metal toxicity. She also had cavitation surgery for non-healing jawbone infections.

She tended to be sensitive to treatment, so I started her slowly with

only 50 mg twice per day for 14 days. The first week she felt worse, weak, and nauseous. She felt like her health was going backwards, and her old symptoms were escalating. But then in the second week, she started to feel better. She had more energy, she was able to sleep, she regained her appetite. Within the month, she was able to function like her old self again, to drive, socialize, eat out, and then enrolled in some community college classes. She no longer has anxiety or depression. The episodes of chronic pain were less and shorter in duration but would flare up occasionally, especially at night.

When asked what else she would like to share about her experience, she said, "It is a miracle and I couldn't be happier. It came out of nowhere. I didn't think I was ever going to get well again. It makes me wonder about how many people out there with similar symptoms to mine could be helped by treating possible infectious causes of their conditions."

This case was one of the highlights of my career thus far.

Word of caution, like any drug or therapeutic strategy what is miraculous for one patient could feel poisonous to another. We have had a range of case reports from no change to – rarely – nausea, vomiting, and intolerance to the medication.

Protocol Update

In our previous articles, we have included updates to the protocols we are using at Sophia Health Institute.

Retroviral Protocol Update. We continue to be inspired by the work of Dr. Judy Mikovits and have seen positive results with our retroviral protocol. New additions to our protocol, include a liposomal preparation of anti-retroviral herbs (BiopureUS: En-V tincture): bitter melon, green tea, olive leaf, reishi, St. John's wort, stinging nettle. All of these have been found effective in the peer-reviewed literature. We continue to use organic Chinese skullcap tincture and started to add in BiopureUS organic Baikalin powder, an extract of *Scutellaria baicalensis*. Baikalin extract is not only helpful for the immune system but also can permeate the blood brain barrier. It is known to be neuroprotective and helpful for increasing blood flow as well as increasing memory. The full protocol is as follows: 1. Cistus incanus tea (6-8 cups/day) 2. Baikalin powder (½ tsp twice daily) 3. Broccoli sprout extract capsules (3 twice daily) 4. En-V tincture (2-3 dropperful twice daily) 5. Pantethine (1000 mg twice daily) 6. Selenium (up to 800 mcg/day).

Lyme Protocol Update. We have seen solid positive results with the Klinghardt/BioPure Lyme approach: 1. Biopure Cocktail (4 dropperful am, 2 dropperful pm) 2. Biopure sublingual Hyaluronic Acid (1 dropperful 4 times/day) 3. Mediterranean Cistus tea sweetened with "Organic Whole Leaf Stevia." For resistant Babesia we add artemisinin powder (600 mg/day). For Bartonella we add the Biopure Liposomal Calendula tincture (1 dropperful 3 times/day) and liposomal propolis (4 dropperful/day). Most importantly we realized that aluminum (Al) toxicity is an important and frequent growth factor for Lyme disease. We use the Sophia aluminum detox tincture and the ionic footbath to decrease the Al body burden, an important part of the treatment of chronic persistent Lyme.

EMF Protocol. With 5G coming, we need to continue to educate patients on the importance of EMF precautions as well as internal protections. We recommend patients eliminate Wi-Fi in their home, keep cell phone usage to a minimum, always keep cell phones off your body and away from your head. Other responsible use of technology recommendations include using only red night lights, no alarm systems, no baby monitors, no cordless phones, no smart LEDs, and not using "internet of things" technologies in your home.

In order to create a low EMF healing environment at home, we may recommend shielding paint (Y-shield), window films, Stetzer filters, and turning off the fuses at night.

Our internal protection protocol includes decreasing heavy metals using Biopure cilantro, ionic foot baths, binders, coffee enemas, colonics, metal detox agents (DMSA, EDTA, DMPS), Biopure propolis (CAPE), Biopure rosemary tincture, membrane stabilizing oils (Biopure Liposorb/Lipowell), and melatonin.

We have been using melatonin in several forms: melatonin (Biopure Liposomal Melatonin, transdermal melatonin up to 250 mg/mL (VitaHealth Apothecary, New York), and melatonin suppositories. Melatonin is hugely beneficial; it is neuroprotective, detoxes the brain from heavy metals and pathogens, supports optimal functioning of the glymphatic system, is anti-cancer, and mitigates peroxynitrite and other damaging effects from electromagnetic radiation.

Conclusion

In patients that have failed reasonable treatment attempts for chronic persistent illness, quinacrine is a unique anti-malarial drug that can be extremely effective and should be considered as treatment option for difficult and seemingly unsolvable clinical situations. ◆

Dietrich Klinghardt, MD, PhD, was born, raised and educated in West Germany, where he graduated from Freiburg Medical School/Albert Ludwigs University in 1975. He also studied psychology and completed a 3-year research project/PhD in angiology. He is internationally known for his successful treatment of chronic pain and illness. Dr. Klinghardt combines nonsurgical orthopedic medicine with immunology, endocrinology, toxicology, neural therapy, hypnotherapy, and energy psychology. He has been in practice for over 40 years and has been a pioneer in the diagnosis and treatment of Lyme disease, applying his 5 Levels of Healing model. Dr. Klinghardt founded Sophia Health Institute in Woodinville, Washington, where he sees patients.

Dr. Christine Schaffner is a board-certified naturopathic physician who graduated from Bastyr University. She completed her undergraduate studies in pre-medicine and psychology at the University of Virginia in Charlottesville, Virginia. Dr. Schaffner specializes in the treatment of chronic illness and is the clinic director of Sophia Health Institute in Woodinville, Washington.

A Natural Solution to Drug-Resistant Malaria

by Sue Visser

Herbal treatments for malaria. Do they really work? For thousands of years, Chinese and other cultures have used herbs like Artemisia to treat malaria. Quinine was another very effective herbal remedy, and olive leaf came to the fore in 1820 as a cheaper and more abundantly available alternative. Despite the recent onslaught of drug-resistant malaria on a global scale, these natural remedies are still effective. When chloroquine resistance developed, many other drugs[1] were used, and the most widely promoted of them was the Artemisinin Combination Therapy (ACT). It was upheld as the standard treatment for malaria – until it failed. We need to understand more about why a plant extract would fail and not the use of 100% of the Artemisia leaf. Ironically, modern day science is discovering that these old-fashioned dry leaf herbal remedies hold the key to banishing malaria. A cup of olive leaf tea, anybody?

Artemisia and olive leaf used as a 100% dry leaf remedy is worth considering to help overcome the threat of worldwide malaria epidemics.

It is said that every 30 seconds somebody in the world dies from malaria, and we don't yet have a vaccine that is guaranteed to prevent it. We do, however, have some old-fashioned plant-based options that still work. A number of scientific studies show that they are in most cases more effective than patent drugs in both treating as well as preventing malaria. No drug resistance has ever developed with these alternatives, and there are no adverse side effects. They are also free of contaminants like mercury and aluminium. More and more malaria patients are dying or suffering from severe complications as a result of the failure of modern anti-malarial drugs. Yet, there are plant-based remedies available that can save their lives. Embracing a more integrative approach to malaria treatment can help to outwit the growing threat of drug resistance that is rapidly spreading around the world.

The famous African explorer Kingsley Holgate has suffered from over 30 bouts of malaria during his travels through Africa and donates mosquito nets to Africans to control the disease with chemically treated mosquito nets. Indeed! What about the bites you receive when you go out to the toilet at night or stand in the shower? I heard his interview with Nancy Richards, the presenter of a radio show called *Otherwise*, 18 years ago on SABC. It saddened me that people still supplied mosquito nets to Africans who use them as fishing nets! Meanwhile they chop down wild olive trees without knowing that the leaves from this tree can both prevent as well as cure malaria.

During Nancy's radio interview with me a few weeks later I spoke about Artemisia and herbal remedies, such as olive leaf, to help treat as well as prevent malaria. Now validated by modern science many years later, these have become tried and tested remedies for travellers who request alternatives to anti-malarial drugs, nets, sprays, and chemicals. For more than 20 years we have shared these anti-malarial strategies with people who request alternatives to anti-malarial drugs. Apart from olive leaves, people can grow their own *Artemisia annua* or *afra* bushes and make tea or use the powdered dry leaves, mixed with honey, to fight malaria. Known as wormwood, with a distinctive "herby" aroma, it is also available in tablet, tincture or capsule form, used as a traditional medicine. Two decades later, a recent survey of scientific studies and trials based on Artemisia and olive leaves supply ample proof that they are more than just anti-malarial drugs in their own right.

Artemisia

Artemisia prevents and cures malaria after standard treatments failed to do so. Anamed is an association that promotes the use of Artemisia, especially the tea that rural, impoverished people around the world can make themselves. Anamed provides *Artemisia annua* seeds and shares their expertise freely. As a tea or a whole leaf tablet, Artemisia has always been a reliable, safe, and cheap remedy for malaria. But chemically treated nets, patent drugs and the artemisinin/drug-based combination therapy (ACT) were

upheld as the standard treatments for malaria.[2] A lot of money could be made and so companies did their best to discredit the efficacy of Artemisia tea in order to promote their indiscriminate profiteering. Their recent failure to both treat and prevent malaria, especially the drug-resistant strains, bear testimony to the futility of trying to compete with natural medicine that grows on trees. During April 2017, an outbreak of incurable malaria in the Congo presented an opportunity to once again demonstrate the efficacy of 100% Artemisia leaf.[3] It is forty times more potent than artemisinin and much cheaper! In the Congo, tablets made from the whole dried *Artemisia annua* leaves were used to successfully treat 18 cases of advanced malaria (symptoms that can include loss of consciousness, respiratory distress, convulsions, and pulmonary edema; and in this case, one child was already in a coma). The much publicised and over-promoted ACT treatment had failed to cure them, and none of the other standard drugs made any difference to what had become a near-fatal situation.

None of the patients even responded to artesunate, the frontline medication for severe malaria. Yet after five days on the Artemisia tablets, all 18 of the patients fully recovered. Laboratory tests showed they had no parasites remaining in their blood. During 2017, over 100 other drug-resistant malaria patients were also successfully treated with the experimental Artemisia tablets, thanks to the pioneering work of Professor Pamela Weather and her lab team at Worcester Polytechnic Institute (WPI). "It's a small study, but the results are powerful" she says. She won her argument. The ever-increasing antimalarial resistance has spread from Southeast Asia to Africa. It has become a severe problem[4] for medical staff in hospitals that overflow with malaria patients suffering from advanced stages of the infection. They could easily benefit from cheap, sustainable, and very effective home-grown herbs and help to create a local industry. Traditional medicine, we call it.

In South Africa, our *Artemisia afra* subspecies has also been used to successfully treat not only malaria but a number of parasite-borne diseases. *Artemisia afra* contains the highest concentration of the flavone luteolin, a molecule with demonstrated anti-plasmodial, anti-inflammatory, and anticancer properties. I personally have used a parasite tincture[5] that contains 25% *Artemisia afra* as a cure for leishmaniosis tropicana (fever, vomiting and diarrhea that is usually fatal) after being bitten by infected sand flies in Zanzibar. Furthermore, when tested for bilharzia (I had it unknowingly for 20 years) we treated it with the anti-parasite combination of Artemisia, olive leaf, cloves, and ivy leaf. After one week no more parasites were present in my blood. There were no side effects - apart from stimulating my appetite!

Olive Leaves

Olive leaves can also cure and prevent malaria and are considered safe for pregnant women. When quinine lost favor as the earliest treatment for malaria, olive leaf tea became a popular substitute in the 1820s. Later, chemists isolated a compound they called oleuropein that protects leaves against the lacey-winged olive fly that attacks the fruit. By 1906, scientists claimed that olive leaf extracts were superior to quinine,[6] the primary treatment for malaria at the time. A case report from a clinic in Mexico announced a complete cure of a full-blown case of malaria in a 34-year-old woman after taking two olive leaf supplements every six hours for six months. There are a host of other valuable phytochemicals present in 100% olive leaf products, such as the anti-malarial agent cinchonine. No wonder it worked!

In 2002, my husband Jim was relieved of malaria within a few days using only olive leaf tablets[7] made from 100% olive leaf. He was on holiday in China, and the breakout occurred on top of a high mountain we had climbed. That night, in the remote hotel, his fever broke loose and he became delirious.

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Luckily, we had olive leaf tablets in our first aid bag, and he took two every two-to-four hours. The next morning, he was able to climb down unassisted. A few weeks later, his malaria backlash was once again alleviated using only the olive leaf tablets. We were then at home and could get the proper diagnosis. He recovered fully. Olive leaf, as in the case of Artemisia, is more potent as a 100% dry leaf remedy. *Ideally, one needs to munch up the whole leaf to receive the most benefit!*

Now that malaria has developed resistance to many of our present-day drugs, clinicians may once again turn to olive leaf remedies.[8] Many scientific studies have been performed throughout Europe and the United States to show that olive leaf extracts have strong antiviral, antifungal, antibacterial, and anti-parasitic activity. Olive leaf does not harm beneficial bacteria as is the case with regular antibiotics, and it also helps to eliminate biofilms that shield off colonies of bacteria, causing drug resistance.

In our village complex, we have a number of African gardeners who visit their families in Zimbabwe, Mozambique, and Malawi once a year. Before they leave, they come to me for their bottle of anti-parasite tincture. It contains olive leaf, Artemisia, cloves, and ivy leaf. None of them have ever had malaria since taking "Madam's muthi," and they also give it to their families back home. Whenever they feel the need to "clean their blood," they ask for this tincture. I show them the olive trees and the Artemisia plants in our complex and tell them to make their own tea. But no. Some of them say that they no longer test positive for HIV/AIDS and offer to pay for the medicine because it makes them feel good. (It tastes terrible, so that boosts credibility!)

A group of four cyclists who travelled from Cape to Cairo also used the anti-parasite tincture during their epic journey and told us that it also helped to prevent tummy bugs as well as colds and flu. Although they travelled through mosquito-infested countries along the way and were bitten a lot, nobody got malaria. Herbal remedies are medicines in their own right. They also have side effects as well as contra-indications that need to be respected. Artemisia can be used as a solo remedy for preventing and treating malaria, but it is not safe for pregnant and breastfeeding women. Neither are regular drugs. A safer alternative is to use olive leaf tablets, extracts, or tinctures. They have been used to good effect by pregnant women, babies, and breastfeeding mothers under the supervision of naturopaths and doctors of integrative medicine. Although anecdotal, no reports of malaria have been declared. Not even from the babies and toddlers who were given olive leaf tablets – crushed with honey to make the medicine go down!

For many years the missionaries and their families who visited Mozambique used these 100% olive leaf tablets and never got malaria. Olive leaf has a number of other therapeutic effects, including lowering blood pressure, improving insulin functionality, warding off colds and flu, and eradicating viruses, microbes, and parasites. It does not wipe out beneficial gut flora. Unlike many of the popular anti-malarial drugs, no drug resistance has been reported with olive leaves. Seven olive leaves are used for one olive leaf tablet[9]; so when making tea or tinctures,[10] one needs to bear that in mind as a dosage guideline. The most studied active components of olive leave are oleacin and oleuropin; but in nature, the synergy from the entire leaf or plant component seems to be far more effective than its mere extracts. At the time, during the pioneering work over 20 years ago, we did not even know that the whole leaf contained a blast of cinchonine[11] – a drug similar to quinine.

Going back to the original plant source opens up a new vista of therapeutic possibilities. Artemisia and olive leaf used as a 100% dry leaf remedy is worth considering to help overcome the threat of worldwide malaria epidemics. It is sustainable and can help impoverished communities to generate a lucrative income. What would Hippocrates have done?

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Sue Visser is a natural health researcher, product developer, writer, and Agony Aunt. She specialises in nutrition and herbal medicine with a working knowledge of most of the popular modalities of natural/alternative medicine. She has contributed to the world of radio, television and journalism for over 20 years. Sue wrote, illustrated and published her popular book: *Healthy Happy Eating* for all blood types followed by *The Holistic Guide to a Healthy Happy Heart.* The second book was co-authored by Dr James Liddell. Sue is also a product developer and has formulated a wide range of alternative health products based on her unique insight and research. www.naturefresh.co.za

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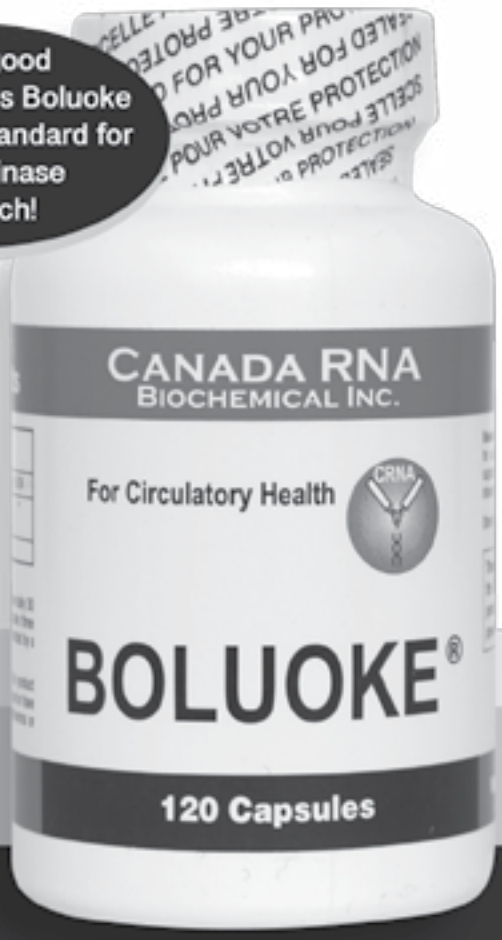

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A Top-Down Approach to Healing Mental-Emotional Disorders in Lyme Disease

by Connie Strasheim

As a former Lyme disease patient, researcher, and advocate for many others with Lyme disease, I've found that the mental and emotional symptoms caused by Lyme are amongst the most challenging to treat and debilitating to live with. Depression and anxiety are rampant in people with chronic Lyme and, depending on their severity, can complicate recovery on multiple levels.

Depression, anxiety, and the varied manifestations of these conditions may be caused, first and foremost, by inflammation and toxins from the infections, such as ammonia, as well as limbic system dysfunction, which puts the body in a perpetual sympathetic or "fight or flight" response. In addition, mold, heavy metals, and other toxicities common in those with Lyme cause mental-emotional issues that compound the problem.

Add to this the fact that people with Lyme disease face a myriad of situational challenges, such as financial stress, isolation, a lack of compassion and understanding from their health care practitioners and loved ones, and other symptoms such as unrelenting pain that compound the depression and/or anxiety.

Last but not least, Lyme disease often exacerbates mental-emotional disorders that preceded infection with Lyme. I believe that depression and anxiety can even open the door for infections and toxins to gain a foothold in the body. Prolonged trauma or stress can cause these conditions, and program the body to operate in a state of continual sympathetic dominance, or fight or flight mode, which weakens the immune system.[1] In addition, stress and trauma, especially when they occur as a result of long-standing childhood abuse, cause people to adopt harmful beliefs, thoughts, and behavioral patterns, which also adversely affect the immune system.

To illustrate, award-winning journalist Donna Jackson Nakazawa states in her book, *The Last Best Cure*, "Scientists are now showing in wide scale studies that long ago childhood trauma and adversity play a significant role in how well our immune system functions in adulthood, impacting our lifelong health."[2] She also shares that Dr. Anastasia Rowland-Seymour, a clinician and assistant professor of internal medicine at Johns Hopkins, contends that early life trauma sparks neural pathways and a pattern of hormone and inflammatory chemical cascades that impact the body at a cellular level for decades. It sets in place an early pattern of inflammation and cellular aging that significantly increases the person's risk of developing all kinds of disease later in life.[3]

Therefore, healing must address all causes of the depression and/or anxiety. Often, I've heard practitioners state, "The patient will feel better (emotionally) once we address the infections." They may then prescribe an antidepressant or a benzodiazepine, or some valerian root or 5-HTP to manage their patients' symptoms in the meantime.

Unfortunately, for people battling severe depression and anxiety, these measures are often insufficient; and, if patients are given pharmaceuticals, this can cause them greater harm in the long run, as I just shared.

I myself took a variety of antidepressant medications and benzodiazepines for years, to manage the severe anxiety and depression that accompanied my battle with Lyme disease. However, in hindsight, I regret doing this as I paid a very high price – psychologically, physiologically and otherwise – as a result of taking them. The withdrawal process was horrendous, and I believe they further damaged my body.

It is no small matter to take prescription antidepressants and benzodiazepines. While they can be helpful in the short run, and even essential for people who find themselves in life threatening or very debilitating situations, they can present a whole new array of unacceptable symptoms and long-term challenges that affect patients' health adversely, on top of whatever infections they may be battling.

Benzodiazepines, in particular, have been shown to cause brain damage and cognitive dysfunction, and cause dangerous, protracted and sometimes months or years-long withdrawal symptoms.[4]

Robert Whitaker, *New York Times* bestselling author of the book *Anatomy of an Epidemic: Magic Bullets, Psychiatric Drugs, and the Astonishing Rise of Mental Illness in America*, says, "French researchers surveyed 4,425 long-term benzodiazepine users and found that 75 percent were 'markedly ill to extremely ill . . . a great majority of the patients had significant symptomatology, in particular major depressive episodes and generalized anxiety disorder, often with marked severity and disability."[4] Lyme disease patients have enough of that as it is.

Again, I believe there is a place for medications in recovery, but I have found that there are often better tools to manage depression and anxiety in Lyme disease – but it takes time, patience, wisdom, and understanding to learn how to utilize these effectively. It took me over a decade to discover and implement these tools for myself; but because of what I've learned, I am now fully recovered, without medication.

During the years that I was really sick though, the depression and anxiety, which were caused by Lyme and other factors, affected every aspect of my life: from my ability to interact with people and participate in society, to my ability to follow my treatment regimen and find work opportunities. Most importantly, these conditions affected my motivation, judgment, and my belief in my body's ability to heal. This is because depression and anxiety cause people to see reality in a pessimistic, fearful, and negative light, and foster a chronic state of hopelessness that can keep them mired in symptoms and a mindset that treatments can't and don't work for them.

This is why I believe that physicians and other health care practitioners must address depression, anxiety, and/or related mental-emotional disorders in their Lyme patients because it is a person's spirit and mindset that impacts his or her recovery above all else. This is what I've learned from a decade and a half of personal experience, as well as from my experiences with other Lyme patients and interviews with doctors.

Further, anxiety and depression keep the body in a perpetual state of sympathetic dominance, which isn't conducive to healing. When the body is in this state, the immune, digestive, and neuroendocrine systems don't work properly, and toxins build up in the body.[1]

Yet depression and anxiety are multifactorial in people with Lyme disease, so remedying the symptoms isn't always a simple as taking an antidepressant or an herb. Again, these simplistic approaches can work for some, but probably not most, although it depends on the severity of the symptoms, among the other challenges that the patient may be facing, such as a lack of social or financial support.

In my earnest passion and desire to provide people with Lyme disease with better answers and to spare them the same kind of intense suffering that I went though, I published a book this year entitled, *Happy, Healthy and Free: Spirit-Soul-Body Solutions for Healing from Depression*. While the book primarily focuses on depression, most of the principles also apply to those with anxiety disorders, as well. It is targeted to those with neurological illness, although I don't provide protocols for eliminating infections or toxins in the book because there are plenty of other books that do that.

Instead, I share tools and strategies for addressing the spiritual, emotional and physiological causes of depression in people with neurodegenerative diseases like Lyme and mold illness, the latter of which is a common Lyme co-condition.

First and foremost, the book is based on the premise that we are a spirit with a soul and a body, not a body with a soul and a spirit. The distinction is important because if our spirit is the core or essence of who we are and the highest level of our being, then it means that it can influence the lower two levels of our being: our soul and body, when we care for and nurture the spirit properly. Renowned integrative Lyme-literate doctor Dietrich Klinghardt, MD, PhD, who contributed a chapter to my 2016 book, *New Paradigms in Lyme Disease Treatment: 10 Top Doctors Reveal Healing Strategies that Work* even alludes to the fact that spiritual healing is the highest level of healing there is, in his 5 Levels of Healing philosophy.[5]

Yet, I've observed that spiritual and emotional healing are often given lesser priority in Lyme disease treatment by many doctors and patients. It's usually treated as secondary to the physical causes of disease such as infections and toxins because, in general, little focus is devoted to emotional health as part of patients' recovery. Even those of us that espouse emotional and spiritual healing as foremost in recovery often invest little time or energy in it in our day-to-day lives.

I found in my own healing journey that addressing the psycho-emotional causes of illness was at least as important as addressing infections, toxins and other physical causes of disease, if not more.

I believe this lack of focus is because 1) deep down, we don't really believe healing emotional and/or spiritual issues can be the key to resolving severe illness; 2) healing the emotional or spiritual aspects of disease feels too difficult or time-consuming; or 3) treatment guidelines for healing the soul (mind, will, and emotions) and the spirit are often vague and provide no guarantee of any kind of physical healing, which is what a person in agony with Lyme disease believes they need most.

However, I found in my own healing journey that addressing the psycho-emotional causes of illness was at least as important as addressing infections, toxins and other physical causes of disease, if not more. I progressed exponentially faster in my healing by paying attention to and investing in my recovery from the mental-emotional causes of disease. I've witnessed the same in many other Lyme patients.

Therefore, in *Happy, Healthy and Free: Spirit-Soul-Body Solutions for Healing from Depression,* I share tools and strategies for healing depression on all three levels of the person, regardless of the initial triggering cause of the depression. The spiritual component of healing is based on the premise that our human spirit was created for relationship with a loving God who is energy and light (as some know God) but also a person with a will and emotions.[6] Spiritual healing isn't about following rules or religious practices but realizing that all of us are deeply loved by our Creator, who desires for us to be totally healed and in a close relationship with Him. I have seen people healed by this realization alone; and in *Happy, Healthy and Free,* I suggest some ways for readers to connect with God and receive divine healing.

For the healing of the mind and emotions, which can also take place as a byproduct of spiritual healing, I share a variety of mind-body tools. Among the most important of these tools are brain re-training programs. These involve re-wiring the brain, especially the limbic system, using affirmations, visualizations, and body movements, among other techniques. Brain re-training programs such as Dynamic Neural Retraining (DNRS) or Gupta's Amygdala Retraining entrain the brain out of a "fight or flight" response, while re-programming, or teaching the mind to adopt healthier beliefs and thoughts.

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Mental-Emotional Disorders in Lyme Disease

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Many anecdotal reports from Lyme-literate physicians such as Neil Nathan, MD, author of *Toxic*, illustrate that these programs have been extremely effective for healing people from depression and anxiety and disorders linked to limbic system dysfunction such as Lyme disease, chronic fatigue syndrome, fibromyalgia, and others.[7] I've even heard of people experiencing remission from multiple sclerosis and Parkinson-like symptoms, which are often related to Lyme.

Helping people to discover their life's purpose, even while they are in recovery, and helping them to take baby steps to walk that out in practical ways can become a source of hope that gives people something to look forward to as they recover.

Brain training teaches people how to identify harmful beliefs, thoughts and behaviors related to disease, and how to replace those with life-giving beliefs, thoughts, and behaviors. This is not so easy to do when you are battling a neurological disease; but speaking from personal experience, it can be done. In *Healthy, Happy and Free* I share this, as well as a few other tools for creating a positive, life-giving mindset. I believe that it's difficult to get well if your mind is a constant mess of negativity, but the good news is, I have found these and other tools to help even the most depressed and brain-fogged of people to get well in this area.

Additionally, I encourage readers to examine their relationships, and I share tips for how to identify those that may be life draining versus life giving. Toxic relationships can be a hindrance to recovery and a major cause of mental-emotional symptoms. Lyme presents a whole slew of challenges when it comes to relationships, and throughout the book, I share some of my own challenges and how I handled those so that I could recover.

Discovering one's purpose in life and taking practical steps to walk that out can also help some people to overcome depression and anxiety. When people are sick, it can be difficult for them to see the forest for the trees and believe that they have something to offer the world – that their life yet has meaning and purpose, even when they can't do much or their emotions are in disarray. Helping people to discover their life's purpose, even while they are in recovery, and helping them to take baby steps to walk that out in practical ways (even if that means simply spending a few minutes daily to create a mental picture of an ideal future, in as much detail as possible) can become a source of hope that gives people something to look forward to as they recover.

Finally, in *Healthy, Happy and Free,* I share tools that address the physiological causes or aspects of depression, which include but aren't limited to infections, neurotransmitter, hormone and nutrient imbalances, inflammation (especially in the brain), gastrointestinal problems, mitochondrial dysfunction, and blood-sugar imbalances – among a few others.

Following, I highlight, in very basic terms, solutions for some of the most important of these. More about these and the other tools that I recommend can be found in *Happy, Healthy and Free.* I am also currently creating a companion workbook that people can use to more easily implement the tools contained therein.

Amino Acid Therapy

Neurotransmitter imbalances are a foremost cause of depression and anxiety in Lyme, mold illness, and other toxicity/infectious conditions. The primary neurotransmitters that regulate mood and cognition (as well as energy and sleep) are dopamine and serotonin, although acetylcholine and GABA also play a role. These tend to be low in people with Lyme, especially dopamine and GABA, although at times there can be excesses, particularly of serotonin, due to metabolic dysfunction.

The amino acid precursors to dopamine are L-phenylalanine and L-tyrosine, and the precursors to serotonin are L-tryptophan and 5-HTP. Therefore, giving patients dopamine and serotonin precursors can be very helpful for mitigating depression. I have also found GPC choline and phosphatidylcholine to impact mood. In addition, the body uses these latter two to make a neurotransmitter that aids in cognition, called acetylcholine, as well as for cellular detoxification and cell membrane repair.

GABA and serotonin precursors can be useful for managing anxiety. However, caution is warranted when prescribing dopamine precursors to people with severe anxiety, as they can exacerbate the condition.

It may also be important for some patients to take methylators along with amino acids, since many with Lyme have methylation issues that prevent them from being able to synthesize and break down neurotransmitters. Some common methylators used for this purpose include methyl B-12, SAM-e, P5P, pyridoxal phosphate and methyl-folate. It's important to dose these slowly, preferably one at a time, and according to patients' lab and/or genetic test results.

If you prescribe your patients amino acids and they either feel no differently or feel worse when taking them, consider that methylation problems may be why. The first time I took 5-HTP for sleep, I felt more brain fogged and depressed on it, until I realized that my body needed methylation support. Then, it worked beautifully.

Another consideration when dosing amino acid precursors is to make sure that new amino acid imbalances aren't created in the body. Serotonin and dopamine must be present in a balanced ratio, for instance; otherwise, patients can feel worse. Doing an amino acid and neurotransmitter panel through labs like Sabre Sciences may be helpful for determining what patients need.

For more information on amino acids and how to use them, see *Healthy, Happy and Free.* Julia Ross, MA, has also written some good books on amino acid therapy.

Hormone Balancing or Replacement Therapy

Lyme disease causes adrenal and thyroid hormone imbalances, both of which can cause depression and/or anxiety. Hypothyroidism is a foremost cause of depression, and adrenal insufficiency can cause both depression and anxiety, depending on the severity and other factors.

A couple of Lyme-literate doctors have shared with me that their 20, 30, and 40-something year-old female patients with Lyme disease sometimes have a hormonal status that looks similar to that of a woman in menopause.

Therefore, balancing the hormones with adaptogenic herbs such as ashwaghanda and licorice, adrenal and thyroid glandular formulas, and bioidentical hormone replacement therapy is crucial not only for mitigating depression and anxiety but also for helping the body to more effectively overcome disease. Cortisol and thyroid hormones, in particular, are vital for immune function and emotional wellbeing, although low or too-high levels of estrogen, progesterone and testosterone can also profoundly affect the mood, especially in women and men over 35.[8]

Hormone balancing is a complex topic but one that I encourage people with Lyme and their practitioners to explore. One of the most powerful things that I did for my recovery, seven years after I got sick, was to begin taking pregnenolone, DHEA and progesterone for adrenal gland support, along with bio-identical thyroid hormone. I was only 37 years old at the time but wish I had started the therapy much sooner.

Anti-Inflammatory Therapy

I never knew how much inflammation in the brain could cause depression until I experienced it for myself. Inflammation seemed to be a lesser cause of the depression I battled, until at some point later in my healing journey when I was exposed to mold and developed mast cell activation disorder (MCAD). The inflammation created by MCAD and mold illness was profound, and with that, the depression.

I found mast cell stabilizers and H1 histamine receptor blockers, such as the compounded medication ketotifen, to shut down the worst of the depression caused by MCAD. Mold- and Lyme-literate Neil Nathan, MD, recommended this to me. In his new book, *Toxic,* Dr. Nathan also recommends cromolyn sodium, loratadine (Claritin), famotidine (Pepcid), and natural antihistamines like quercetin and HIST DAO and Allqlear to treat MCAD.[9] A low histamine-diet also may be helpful for some people.

Inflammation in the brain can also be quelled at times by taking omega-3 essential fatty acids, intravenous phosphatidylcholine, cannabinoids (CBD and CBN) and natural herbal anti-inflammatories like Chinese Skullcap. I have even found licorice to provide some benefit. Brain retraining is another powerful tool for reducing inflammation, at least based on anecdotal evidence, which is now substantial.

Blood Sugar Support

Blood sugar dysregulation is also common in those with Lyme and related co-conditions and has been found to cause or exacerbate depression. Hypoglycemia, for instance, is an oft-unrecognized cause of depression. There are several ways to support proper blood sugar balance.

The first and most logical way is by prescribing patients a diet that emphasizes healthy fats and proteins, and which is relatively low in carbohydrates. Paleo, The Plant Paradox, GAPS, or ketogenic are a few such diets. Encouraging patients to have ➤

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a bedtime snack can help those with hypoglycemia or unstable blood sugar to sleep longer and more deeply.

Intermittent fasting can be helpful for lowering insulin levels and bringing high blood sugar back into the normal range, but I believe fasting can also make blood sugar imbalances worse in the long run for some people. This is because fasting causes the body to release adrenaline, and in people who battle adrenal fatigue, fasting may exacerbate this condition. The more exhausted the adrenal glands, the worse blood sugar imbalances may become, perpetuating a vicious cycle.

I've done weeks-long vegetable and juice fasts and always ended up weaker and more compromised at the end. Fasting has tremendous benefits, but it's not for everyone. Even a 16-hour fast can be difficult for a person with adrenal insufficiency, which is many people with Lyme.

On another note, natural substances such as chromium, cinnamon, and berberine have been found to help the body utilize glucose. In one study, berberine was found to be just as effective as the diabetes drug metformin for lowering insulin and blood sugar.[10]

Mitochondrial Support

The mitochondria, or the cell's energy powerhouses, are often compromised in people with Lyme and depression. Indeed, one study found that people with depression had significantly fewer mitochondria, or energy producing organelles, than those who weren't depressed.[11] In another study, elderly women with good cognitive function were found to have greater numbers of mitochondria than those with poor cognitive function associated with depression.[12]

Nutrients that facilitate mitochondrial health and provide energy to the cells include coenzyme Q10 and acetyl-L-carnitine. Both of these nutrients also have mood-enhancing properties, due to their ability to reduce oxidative stress and toxicity in the neurons and improve energy within the cells. Studies have shown CoQ10 levels to be significantly lower in people who are depressed or have chronic fatigue.[13] Consequently, CoQ10 can improve symptoms of depression. And, in another study, acetyl-L-carnitine was found to alleviate chronic depression.[14]

Gut-Healing Diets and Supplements

Brain function has been intimately linked to gut health, and vice versa. Certain gastrointestinal bacteria have been found to influence mood,[15] and most neurotransmitters are made in the gut. Therefore, optimizing gut health is important for healing from depression and anxiety.

In *Healthy Happy and Free* I cite some gut bacteria that have been linked to emotional health and probiotics that may be helpful for improving mood. However, healing the gut, through a gut-healing diet like Plant Paradox or Gut and Psychology Syndrome (GAPS), and gut-healing products like Restore™, are just as important. This is a complex topic, so the information here is just a starting point for further research.

In summary, treating depression and anxiety in patients with Lyme disease and common co-conditions like mold toxicity is vital since mental and emotional health play a foremost role in recovery. Proper treatment enables patients to feel and function better while undergoing antimicrobial therapy, make wiser decisions, stick with their treatment plan, and remain hopeful and encouraged throughout their healing journey. Healing from depression and anxiety is possible – I have done it, and I had a severe case of both conditions. And if I can do it, I believe anyone can. So if you are a health care provider, please encourage your patients to believe that healing is possible for them, too!

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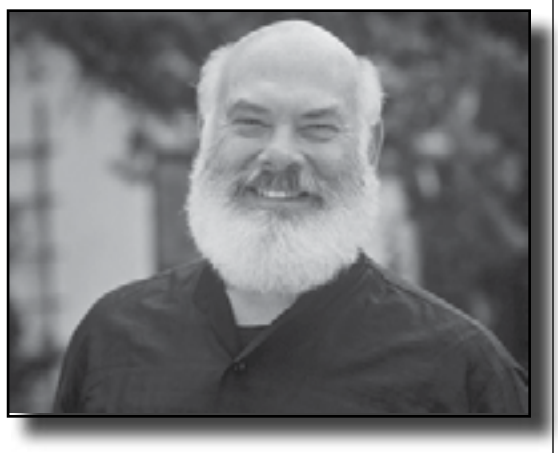
Connie Strasheim is a medical researcher and author or co-author of 13 books on Lyme disease, cancer, nutrition, depression recovery, spiritual healing and sleep, including *Insights into Lyme Disease Treatment: 10 Top Doctors Reveal Healing Strategies that Work.* She is also a prophetic healing prayer minister and health consultant, who enjoys helping people with complex chronic illnesses find freedom from disease through relationship with God, prayer, whole body medicine and lifestyle changes. Over the years, Connie has collaborated with over 100 integrative doctors and healers in her books and podcasts. To learn more about Connie and her work, see ConnieStrasheim.org.

Interview with Andrew Weil, MD, on His Gifting $20 Million to the Arizona Center for Integrative Medicine



by John Weeks

Editor's note: This interview was published first through the Integrator Blog News & Reports, a twice-monthly newsletter published by John Weeks that focuses on policy and organizational activity in integrative health and medicine. Weeks began his work in this arena writing a column for the *Townsend Letter* (1995-2000) called "Charting the Mainstream: A Review of Trends in the Dominant Medical Systems." He has published the Integrator in various forms since 1997.

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The news broke last week that the physician most associated with the term "integrative medicine," Andrew Weil, MD, had donated $15 million to fuel the work of what is now known as the University of Arizona Andrew Weil Center for Integrative Medicine. The donation comes on top of $5 million Weil has already gifted the program he founded over two decades ago. In October 1996, I met him during a small symposium on the coverage issues in integration co-sponsored by the National Institutes of Health and Weil's nascent program. (For perspective on one of the program's influences, it was held in the first week of work of the individual Weil chose as his program's first executive director, Tracy Gaudet, MD, now head of the VA's Office of Patient Centered Care and Cultural Transformation.) A time of beginnings. The huge gift seemed a good excuse to connect with Weil on his generous bequest and to ask him to muse on developments in an "integrative" field that in 1996 had just been birthed as such. This article reconstructs some of that conversation.

The context, for those who need it, is that the program Weil founded has been far and away the principal driver of academic integrative medicine. More generally, it set the educational standard for integrative medicine leadership in hospitals and medical delivery organizations in the United States. The Center's flagship programs – Fellowship in Integrative Medicine, Integrative Medicine in Residency – are among contributions that also range back to 2004 co-authorship by Gaudet's successor Victoria Maizes, MD, of the field's Core Competencies in Integrative Medicine and more recently to the federally-funded National Center for Integrative Primary Healthcare.

Weeks: First, I recall when you spoke at the 1996 meeting that you and Wayne Jonas, MD, at the NIH Office of Alternative Medicine, and others put together, you shared that you were not certain how much headway could be made in getting insurance coverage of complementary and alternative medicine practitioners given the challenges you were then having in getting healthy food into the University of Arizona kitchens. That's changed, hopefully.

Weil: It has. There are healthy options.

Weeks: Good. How long has this $15-million gift been in the planning?

Weil: For a year, year and a half.

Weeks: I would have assumed it had been longer. You've been giving substantially and continuously to the Center for years and years. What was the main source of the $15 million?

Weil: The sale of True Food Kitchen. I was the primary investor there. I am still involved. I still own 2% and am involved in recipes and food sourcing and promotion – but I made a windfall off the sale [of majority ownership].

Weeks: Interesting. I had assumed that it was profits from your sales of supplements and other products that I knew you'd been donating to the Center for years and had made such a huge difference there – considering how everyone in other integrative academic centers is always scraping for money. I gather from the media accounts of this gift that you'd already given some $5 million from other sources.

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Weil: My main source of money [for me personally] has been sales of books and speaking fees. I always have donated my salary from the University of Arizona to the Center. And all of the sales of any products that are associated with my name and likeness, I give away to the Weil Foundation. The Foundation to date has given away about $6 million, the majority of which has gone to the Center.

Weeks: Before we talk about the recent gift, what do you point to with most pride that your philanthropy Center has already helped accomplish?

Weil: A lot has gone to the Integrative Medicine in Residency program, led by Patricia Lebensohn [MD, Program Director]. It's now in 70 US medical schools. It's in a medical school in Germany. It will grow in other international locations. The funds have supported the director and gone toward development of the curriculum and to creating the online materials, which are very expensive. It's our long-term goal to make it a required course in every residency training in all fields.

Weeks: The new money will help that. So, how is that $15 million coming in? What are the first priorities?

Weil: It's staged. The first will be to endow two chairs. Victoria [Maizes, MD, the center's executive director] will be the Andrew Weil Endowed Chair in Integrative Medicine, and Esther Sternberg [PhD] will be the Andrew Weil Endowed Chair for Research in Integrative Medicine. Some of the rest will go into a building fund for which the university has pledged to raise a matching amount. The changes will be significant. We've operated under a scarcity mentality. Now with the center we are constructing, we will have a consolidation in one place. We'll finally have a real presence of a clinical center in Tucson. I expect we'll have enough funds to hire new people as we need to. We are planning on a strategic visioning retreat soon.

Weeks: Of course, once everyone starts dreaming, you'll realize that $15 million doesn't go very far …

Weil: (laughs) Right. We do hope it will stimulate more philanthropy from new people and from donors who have given before.

Weeks: Let's go large for a second. Put yourself back in 1996. What's your biggest surprise from the movement to date?

Weil: I am delighted that it has progressed this far – and at the same time I am amazed that there is still so much pushing back. I assume that will go away sometime. The Fellowship has a waiting list. The new people who are coming in are great. I see them giving great credit to the movement.

Weeks: Yes, those paradoxical thoughts. Seems to be the story with most long-timers. One sign of success for the field – linked to your work – is Tracy Gaudet's work at the VA. In1996 she was the first director of the program and there she is now, heading up the most significant healthcare transformation effort in the United States in the VA's whole health program. Now, if you would, cast your vision forward. Be practical. What does 2030 look like for integrative medicine?

Weil: I'm hoping we have a new model of health care that we have launched in our center, that is replicable, sustainable, and saves money. I hope that our basic curriculum is part of all residencies.

Weeks: I have some ideas about how that model might work – but I'll bug you with them later! One last thing. I published a note in the *Integrator* recently about a venture with which you are involved via Seabourn Spa and Wellness Cruises with Dr. Andrew Weil.

Weil: This has been a fun opportunity to have a chance to take groups of Center faculty on a cruise to teach. I'm not a cruise person. I've never been on a cruise. I expect it's going to be fun.

Weeks: Here's hoping you all enjoy it. Thanks, on behalf of the field, for the past gifts and this incredible one. And thanks for the time.

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Connecticut Conference

by Jacob Schor, ND, FABNO

I took great pleasure in attending a conference sponsored by the Connecticut Association of Naturopathic Doctors near the end of March. I've been making an effort to attend state and regional conferences over the past few years (British Columbia, Calgary, New Hampshire, Pennsylvania, Illinois, and of course Colorado) in addition to the mainstays such as AANP and OncANP. The reasons why I make the effort to attend these far flung conferences are not easy to elucidate. It's not the continuing education. I typically have a surplus of CE hours when I fill out my Oregon license renewal each winter. Nor, to be honest, do I find all the lecture topics all that interesting. Honestly, our profession's best speakers don't always make the effort to submit abstracts to state conferences. (I'm going to regret writing this because of a long list of people who will take offense.) Truth be told, I'm kind of ADD and have trouble sitting still during slow lectures, in particular ones that repeat things I can read in the Merck Manual. These smaller conferences aren't where I expect to hear big new ideas. These state local conferences serve our profession more as fundraisers; I have yet to see a state organization that is not struggling to pay lobbyist fees in the hope of advancing a legislative agenda. (Connecticut's association under the competent lead of Dr. Liva is hoping to add prescribing privileges to their ND licensing law that has been on the books since 1926.)

Personally, while I think these groups might be better served by buying a shredder and feeding it the money... the need for money does inspire us to organize conferences and that is certainly a worthwhile endeavor. That's because these conferences remain vital to our profession. Not because of the money raised. Not because of their educational value; but for the sole reason that they allow us to see each other in person and be reminded that we're part of a larger endeavor. They reinforce our unique world view.

This is the value of attending conferences; it's not the CE hours, nor the fundraising. It's the comfort of shared belief in the power of nature.

So many practice in isolated, small or even solo offices, it's easy to forget exactly who and why we are. Oh yes, some doctors work for our schools or live close by to these educational hubs but most of us are out there, on our own and alone. Even in Connecticut, where NDs have been licensed and practicing legally since 1926, the average person on the street has no idea what a ND is or a naturopathic doctor does. Practicing in a state like Connecticut is still a lonely business.

Listening to our own colleagues speak helps contrast what we do and how we practice in comparison to other providers. It is not easy to define this exactly; in fact as I've pointed out in the past, we do not have a clear definition of naturopathic medicine. The "principles" that we list as a definition do not adequately delineate naturopathy from other schools of medicine. Quoting the line about *non nocere* doesn't set our practices apart from those of a medical doctor. Employing unproven natural therapies shouldn't necessarily lump us together with the ill-informed natural practitioners content with using pendulums as their sole diagnostic tool. What we do is rather unique; we practice something that our friend Tina Kaczor describes as "evidence informed natural medicine." We do that without subscribing to cultish beliefs, relying on rational understandings of biology and general science.

And for the most part, we do this on our own. I have been fortunate on several occasions in recent years to find myself hospitalized and experiencing the best of modern medicine. I honestly doubt I would be writing this if it weren't for the skills of teams of medical specialists. The important word here is "team." In mainstream medicine it doesn't seem like anyone works on their own. They are part of a practice, a team, a department. Not only are there providers but there are hierarchies of support staff; in the hospital each tier is assigned a differing color for their uniforms. Of course, as we all know, it's the doctors (and now the PAs who get the white coats). I am not advocating that we naturopaths adopt this professional hierarchy that stratifies their workplace like something descended from the middle ages. What I want to point out is that these medical practitioners are not alone in their practice. They have support both emotionally in bearing the weight of patients undergoing tragedy but also support to strengthen their medical worldview. We don't experience that sort of support day to day. My day-to-day existence is the opposite. Instead I find myself butting heads with medical oncologists who live in a very different paradigm than I do.

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This is why I enjoy conferences. I get to sit next to people who share a world view that is closer to my own. Granted few would admit to being too mentally congruent with me. Let us say people who sort of share a similar world view. Nevertheless, that experience often comes as a relief, a respite from the day-to-day struggle. This is the value of attending conferences; it's not the CE hours, nor the fundraising. It's the comfort of shared belief in the power of nature.

Writing these words got me to dig through my computer's hard drive to find a piece I wrote after Robert Timberlake passed away in 2008:

> The longer we engage in the daily work of this profession, the more it shapes us. We share similar routines, hone similar skills, taste similar herbs, and share similar frustrations and dreams. As if the power of nature, in drawing us along a common path, makes us its individual agents of healing and over time brings out certain common aspects in who we are. The longer we practice the more easily we recognize the resultant commonality in each other. The same current of life that drew us to this profession in the first place and that continues to draw us along year after year, draws us closer. What we have in common becomes more apparent with each passing year.[1]

It is this commonality with conference attendees that makes attendance something I look forward to. It is the fact that we face similar challenges day after day in our work, that we seek amelioration for our patients from a similar armament of therapies, that we see the world as a place in which nature provides these agents of relief that leads me to feel at home.

The East coast conferences in particular are interesting to me as many of those colleagues out there do not journey west for the AANP conferences, and it's been decades since I've seen some of these old friends. The opportunity to make new friends was certainly an unexpected delight that caught me off guard in Connecticut. Apparently, some people recognize my name and rather than airing unjustified grudges quickly become old friends. Perhaps that's why I enjoy these smaller conferences; people don't know me well enough to be offended by my attendance.

A friend who lives in the boondocks of Vermont asks me, "Why do you think we have so many family reunions in Vermont?"

"It's a great way to meet girls."

Reference

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Dr. Christine Girard Named President of National University of Natural Medicine

Recognized Leader and Educator in Integrative Natural Medicine Returns to Her Roots

The National University of Natural Medicine (NUNM) Board of Directors has appointed Christine Girard, ND, MPH, as the 18th president of NUNM in Portland, Oregon. Dr. Girard will succeed David J. Schleich, PhD, who is retiring from the position after 12 years of service. Girard, a 1997 NUNM graduate, will assume the post July 1.

"I am truly honored for the privilege to serve as the next president of NUNM, where I first learned leadership as a student more than 20 years ago," Girard said. "I look forward to working together with NUNM's dedicated faculty and staff, whose unwavering commitment to educational excellence and student success is changing the world in which we live. I am grateful to all those who have come before me, leaving a strong legacy upon which I can continue to build, bringing NUNM to its next level of growth."

With more than 20 years of academic, clinical, and hospital-based leadership, Girard brings significant experience and a deep understanding of natural medicine within the rapidly changing field of health care. Her career has focused on integrative medicine and undergraduate and postgraduate medical education.

Girard served as executive vice president at the Southwest College of Naturopathic Medicine (SCNM) in Tempe, Arizona, for more than 10 years. There she provided oversight of SCNM's clinical, academic, and research enterprises. Her accomplishments included helping to lead strategic planning for a campus master plan revision and successfully fundraising and supervising the design and building of several community clinics and a 48,000-square-foot LEED Platinum mixed-use facility. She also led a complete curriculum revision and gained approval for the SCNM residency program. In addition, Girard achieved a number of partnerships and accreditation successes—among them, an articulation agreement with the University of Arizona College of Public Health for a joint ND/MPH program for SCNM students.

Prior to SCNM, Girard was appointed the director of naturopathic medicine at Southwestern Regional Medical Center (SRMC), a Cancer Treatment Centers of America Hospital in Tulsa, Oklahoma, where she provided integrative oncology care, had oversight of a staff of NDs, expanded the department's services to include acupuncture, and participated in the planning and design of SRMC's new hospital.

In 1999, Girard co-founded and co-directed with David L. Katz, MD, MPH, the Integrative Medicine Center at Griffin Hospital, a Yale-affiliated acute care community hospital in Derby, Connecticut. She provided outpatient and in-patient clinical care and taught undergraduate and postgraduate medical education across medical disciplines. While at Griffin Hospital, she created an integrative medicine residency program for naturopathic physicians in conjunction with the University of Bridgeport College of Naturopathic Medicine. She was also a clinical research specialist in complementary and alternative clinical research at the Yale-Griffin Prevention Research Center, helping attract substantial research funding for the center.

Girard is a former board member of the American Association of Naturopathic Medicine (AANP) and the Council on Naturopathic Medical Education, which is recognized by the US Department of Education to accredit doctoral programs in naturopathic medicine. She was named Physician of the Year by the AANP in 2010, the highest honor a naturopathic physician can receive; it is awarded in recognition of an individual's dedicated leadership and achievement on behalf of the naturopathic profession.

In addition to her doctorate in naturopathic medicine from NUNM, Girard received a Master of Public Health degree with a concentration in health services administration from the University of Arizona, where she has been a member of the faculty in the Mel and Enid Zuckerman College of Public Health, teaching both undergraduate and master's level public health online programs.

"Dr. Girard demonstrates a strong and collaborative leadership style that unifies diverse constituencies, as well as a personal commitment to NUNM and the values that guide us in all we do," said Moore. "Her strategic vision for the future of health care will help NUNM continue to build its future as a world-class university and a leader in natural medicine."

About NUNM

Founded in 1956, NUNM is the oldest accredited naturopathic medical school in North America and the leader in natural medicine education and research. In addition to three undergraduate degrees in health sciences, NUNM offers a number of doctoral and master's degree programs in naturopathic and classical Chinese medicine, nutrition, research, mental health, global health and Ayurveda; and will soon launch an online Master of Science in Nutrition degree. NUNM Institutes provide community education seminars, workshops and conferences. NUNM Health Centers, the SIBO Center for Digestive Health, and NUNM's affiliated Portland metro community clinics provide healthcare services to thousands of patients each year. Visit nunm.edu for more information.

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Letters to the Editor

Bravo to Erik Peper's Article on Medical Self-Defense

I applaud Dr. Erik Peper's excellent and extremely practical tips for preventing and surviving medical errors. There are indeed a number of strategies that one can use proactively to experience better medical and surgical outcomes. There are just a few things I would add to Dr. Peper's recommendations.

I, personally, have experienced a number of surgeries and have learned a number of my own lessons in the process.

My first surgery, in early 1998, was a complete surprise, after being diagnosed with DCIS (ductal carcinoma in situ). Fortunately, I knew enough to choose probably the best-trained surgeon in the Seattle area in the most avant-garde surgical technique for breast reconstruction at the time: a nine-hour abdominal free flap procedure. Rita Wong, MD, had learned well from her UCLA mentor, and she was one of only two surgeons here who knew the procedure. I interviewed a surgeon at Swedish Medical Center but went with Dr. Wong despite her being at Highline Hospital way down south in Burien. I did not fare as well with the breast surgeon, who did the mastectomy. Nor did I find out until post-surgery that she had removed nineteen (!) lymph nodes because the DCIS was so large. Her name escapes me, which is just as well. She apparently had a nervous breakdown shortly after my surgery, and I never saw nor heard from her again. No surgical follow-up whatsoever from her! Fortunately, I never needed radiation or chemotherapy.

Six months later, still 50 years old, I had my second surgical procedure: a hemi-thyroidectomy. I had a large thyroid nodule and needle biopsies couldn't give a definitive diagnosis. After my breast cancer scare, I didn't want to take a chance. When I suggested removing only half my thyroid, the endocrinologist gave me a hard time. "Within 10 years you'll be on thyroid anyway because the other half of your thyroid will burn itself out from doing all the work." Still, it made no sense to me to remove the other lobe of my thyroid, which seemed perfectly healthy. Now, twenty- one years later, I have plenty of energy and have never needed thyroid medication.

Twelve years later I was diagnosed with invasive ductal carcinoma of my other breast. Had ultrasounds and MRIs been done annually, instead of only mammograms, the DCIS would have been diagnosed years early before it became invasive. Again, I opted for a mastectomy as sole treatment. I chose an excellent breast surgeon at Seattle Cancer Care Alliance to do the mastectomy: Dr. David Byrd. Kind man, highly skilled, excellent bedside manner. I thought I chose the best plastic surgeon as well. In fact, he was the president of the national association of surgeons of the US. What I didn't factor in was that he was too busy and traveled too much to be there for me. So, a month post-surgery when I developed significant swelling in my lower leg and was hospitalized at the UW, he was there for my admission, suggested a high-tech vascular radiographic procedure to rule out a hematoma, but his attending physician never followed up on it. In fact, I felt like I knew more about my own case than this young substitute doc. I was pumped full of Vancomycin, was never offered a port, and was discharged three days later. It was only from the RNs that I learned how destructive Vanco is to the veins.

Three days later, never having gotten to the root of the infection, I was back at the UW. This time the surgical staff had the sense to do the vascular procedure (very painful) to locate a huge hematoma in the area of the thigh reconstruction of the breast. Another three days of Vanco with no port recommended. The result: I have almost no veins in my arms adequate for drawing blood and it is very traumatic when I go for my annual bloodwork. I inquired afterwards about a possible malpractice suit but was told (by a woman in the field) that I should just count my blessings that I was a breast cancer survivor! What I learned: When you shop for surgeons, find one with a great deal of experience but who is not too busy to be around when you need her/him.

My last surgical procedure, nine months ago, was for an abdominal hernia resulting from that abdominal reconstruction twenty-one years ago. I called around to find the most experienced hernia surgeons and interviewed two seasoned male surgeons. The first spoke only to Bob, my husband, though it was my body that was in question. Well-dressed and well-spoken though he was, he was just too sexist for me! The second surgeon, about the same age with decades of experience, was about as folksy as you could ever find. It was his relaxed attitude and the Converse sneakers that sold me. He wore those sneakers into the office and into surgery. Laparoscopic surgery wasn't needed, I required only *one* stitch, and I healed very quickly.

In all cases, of course, I used a naturopathic and homeopathic pre- and postsurgical protocol, which can be found on our website www.lhealthyhomeopathy.com.

Judyth Reichenberg-Ullman, ND

Letters

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Re: Dyfunctional/Functional Medicine

The recent article by Dr. Yurkovsky encouraged me to reach out to more practitioners and connect with them. Yes, indeed, functional medicine (dysfunctional medicine) is now practiced everywhere by not only MDs, NDs, DCs, Chinese medicine doctors, Pharm D, but also nutritional coaches, life coaches, dietitians, or someone who enrolled in a "functional genomic nutrition" company. Everyone can self-proclaim the newest and the one-more-last discovery that is the turnkey to fantastic health, slimmer body, energized focused brain, autoimmune cure, and cancer cure.

After practicing both conventional ICU care and nursing home "slow dying" care for eight years in 2006, I fell ill at age 42, from a traumatic brain injury, chronic stress from running behind in the income-overhead-paying-taxes game, also chronic stockpiling of toxins from China (DDT, heavy metals and 8 root canals and a mouth full of mercury). I was lucky enough to stop and step back instead of adding more and more supplements and treatments and expensive gadgets.

For the past 14 years, I have decided to start from the true roots of diseases: stress and toxicities (chemical, heavy metal, electromagnetic and mold toxins). I have built a meaningful passive income by doing a few simple things. Now I am able to quit the one-on-one practice and can connect with leading practitioners such as Dr. Yurkovsky, organic farmers, community leaders, green engineers, environmental scientists, film makers, and educators so we can create a less toxic and less inflammatory environment where our sick and complex patients can truly heal and thrive again.

To make dysfunctional medicine truly functional again, we must be willing to see and discuss what is not working and admit humbly that in order to have sustainable health (particularly in those who are seriously ill) we must teach about the importance of environmental health, live consciously, and choose consciously and wisely. Taking bags of supplements and being professional patients have not been giving functional medicine a good reputation.

I see the triangle of health as being (1) planet health (2) economic health for all (not just the top 1%) (3) true upstream medicine approach and collaboration among all healers. I think this vision might be too big for many to take on. But I am a dreamer and an action taker. Please send my message out to all the heart-centered practitioners. I am gathering a true game-changing team.

Our project: national chemical detection and detox project.

For those who do not respond or are very ill, I am looking forward to sending them to Dr. Yurkovsky and many pioneer holistic doctors. Thank you so much for your work.

With infinite love and gratitude,

Shanhong Lu, MD, PhD
Mt. Shasta Integrative Medicine
www.drlumd.com
drlu@drlumd.com
530-925-0565 cell; 530-926-1000 office

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Bees: Worth Their Weight in Gold

by Rose Marie Williams, MA

Forget the Rembrandts. Forget the diamonds. The new hot commodity luring thieves into the darkness of night is stealing bees. Petty bee thefts are nothing new, but things have escalated to unheard of proportions. The biggest heist ever, an estimated one million dollars, took place in central California, January of 2017.

The story, reported by Josh Dean, appeared in the July 2, 2018, edition of *Bloomberg Businessweek*. It recounts the struggles of a third-generation beekeeper from Montana who once made a comfortable living selling honey until he began to suffer the impact of bee die-offs from mysterious causes affecting bees in the US and Europe. The cost of maintaining bees was increasing as the returns were shrinking.

In California's central valley where 80% of the world's almonds are grown, there is a desperate need for pollinators during the brief pollination season. Bees are so crucial to the almond crop that it requires more than half of the 2.4 million commercial colonies in the US. Severe bee decline in the past 25 years has forced almond growers to import bees from Australia.

In February over one million acres of almond trees begin to flower, and almond pollination is crucial at that time. As in all business, prices are controlled by supply and demand. Almond growers need bees in February, and beekeepers can make a handsome sum at this time. Many small-scale beekeepers find it tempting to truck their hives to California for the February almond season, where they can earn $200 per hive for a few short weeks of pollinating. Such was the case with Montana beekeeper, Lloyd Cuniff, who dreaded the idea of hauling his bees to California, but the extra money was a big incentive.

In January of 2017, he loaded 488 bee boxes onto a semitruck trailer and began his 1,000-mile trip to almond country in Fresno County, California. He had business contacts with Strachan Apiaries in Yuba City, and they matched him up with a farmer in need of bees. They advised Cuniff to unload his bees next to a sunflower field near Yuba City so the bees could acclimate before reaching almond country.

When the monetary worth of a commodity increases to the point where some are willing to steal, that gets our attention, and hopefully will expand our appreciation of the importance of bees in our world.

He left his bees in his special hand-constructed bee boxes and stayed in a hotel that night. His nightmare began the next morning when he drove in thick fog to where he left his bees. He searched everywhere, but there were no bees to be found. All 488 boxes with nearly 500 million bees disappeared. Panicked, he called the Strachans, who immediately recognized this as the work of professionals, as later proved to be correct.

Tracks in the dirt revealed the presence of single-axle, dual-wheeled trucks with fork-lifts to raise the boxes. Cuniff wasn't the only victim. More than 700 boxes in total, worth one million dollars were stolen that night. The chances of finding the stolen bees were slim to nothing. Bee theft had been escalating over the years, but this one topped them all.

The California State Beekeepers Association (CSBA) mobilized and offered a $10,000 reward for information that would lead to finding the bee thieves. Law enforcement got involved. The bee community was on the lookout, having been provided with a description of the stolen boxes. During the brief but crucial time the trees are flowering the almond growers are less likely to be concerned about where the bees come from, than the fact that they desperately need pollinators.

Cuniff returned to Montana with no money and no bees. Things were not looking good. A few months passed, and in late May of 2017 the case of the stolen bees got a break when a Fresno County Sheriff's Office received word of a suspicious sighting on a vacant lot filled with broken boxes in complete disarray and agitated bees everywhere. Detectives, in proper bee outfits, went to the site and found one man splitting each colony in two, so there would be twice as many hives to sell. An accomplice was found nearby painting and stenciling the boxes with a new name – Allstate Apiaries, Inc. Detectives apprehended the owner, a Ukranian immigrant, who had been renting hives to local growers in addition to selling hives to buyers around the country. The only honest thing about the operation was the name. The stolen bees came from many states and were being sold back to beekeepers in any state.

Many of the stolen boxes had names of the original owners still on them. Cuniff's boxes did not, but their design was recognizable from the description he provided. Cuniff was notified that some of his boxes had been found. He caught a plane to California; and before he landed, authorities had found two additional places with stolen hives. More than 600 hives were recovered at three different locations. The two suspects were charged with ten felony counts of possession of

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stolen property with an estimated value of $875,000 dollars, making it the largest bee heist ever reported in Fresno County.

Cuniff was not able to load up all his boxes on one truck and returned the next day to collect the remaining bees; but in the morning they were gone! "They had come in and stolen some of the stuff again," Cuniff remarked. Luckily for Cuniff, those boxes were also recovered. Beekeepers do not believe this is an isolated incident, but rather part of a larger criminal network.

This story is important because in our materialistic society it helps raise awareness of the enormous value of bees, so often overlooked and clearly lacking in respect. When the monetary worth of a commodity increases to the point where some are willing to steal, that gets our attention, and hopefully will expand our appreciation of the importance of bees in our world.

Wild and managed bees provide us with a wide range of services. They contribute to food security, provide livelihoods for farmers and beekeepers, as well as provide greater biodiversity and ecosystem stability.[1-3]

Causes of Bee Demise

Wild bees and honeybees are the most prevalent pollinators, but others include butterflies, moths, other insects, birds, and bats. The modern world is becoming increasingly inhospitable to all pollinators on many fronts. What some think of as progress and scientific advances are threatening bee survival, which poses a threat to human survival.

Changes in land use that once were fields and meadows of wild forage are paved over for shopping malls and parking lots. Increased use of ever more potent pesticides, which include herbicides, fungicides, rodenticides, miticides, and other chemicals designed to kill some form of living matter are affecting bees too.

Increased exposure to proliferating electromagnetic frequencies (EMFs) from cell towers, cell phones, smart meters, etc., is suspected of interfering with their natural navigational instincts, as well as weakening their immune systems against mites and other assaults.

GMOs (genetically modified organisms) and GE (genetically engineered) plants introduced into the food supply in the 1990s now include 90% of all corn, soybeans, cotton, canola, and sugar beets. Additional crops include potatoes, papaya, squash, alfalfa, and some apples. One major focus of GE crops was to design corn and soy that could withstand the onslaught of increased applications of the herbicide Roundup, without actually killing the crop plant. As so often is the case, Nature will not be bullied into man's desires and retaliates in other ways. The very pests, insects and weeds, that are subjected to the pesticides, quickly develop a greater resistance to them. The same cannot be said for bees, other pollinators, and humans.

Additional use of pesticides by municipalities and utility companies to kill weeds along roadways and right-of-ways eliminated a viable source of forage for pollinators for longer periods of time than mowing. Honeybees requires a mix of pollens from a variety of plants for proper nutrition.[2]

Climate change is real and verifiable. Hurricanes of greater intensity, excessive rain in some parts of the world, excessive drought in other areas, all take a toll on pollinators and the plant pollens they require for sustenance. UK Professor Dr. Simon Potts explains that bees face two major threats caused by climate change: habitats moving, and the changing seasonal behavior of different bee species. In the UK it has been observed that bees "are emerging earlier and earlier…by 7 to 10 days per decade," while the "flowers are blossoming only 4 to 5 days earlier each decade." The time lapse between bee emergence and the arrival of pollen for them to feed on is posing a threatening risk of local extinction.[3] After three decades of this time differential, bees could be emerging 9-15 days ahead of any forage for them to feed on.

New Hope for Bees

Leigh Kathryn Bonner, fresh out of college, decided to do something to help bees by convincing corporate heads to install honeybee hives on their grounds in urban areas where bees could thrive on the varied flora. She and a few employees collect the honey and maintain the hives. Her company, Bee Downtown, also helps corporate employees learn more about bees by showing them how to find the queen bee or weight the honey, helping them understand the importance of sustainability and agriculture. And sometimes, as a bonus they get to keep some of the honey. Not only do the bees benefit from their new habitat, but the employees say the hives make them prouder to work for their company, with a majority of employees saying it was their favorite employee engagement activity of the year.

"If we get people excited for agriculture and learning where food comes from, we could really start to change agricultural processes, and make a really big impact on the world," she says. The bee entrepreneur is a fourth-generation beekeeper from the Raleigh, North Carolina (NC) area. Her business, Bee Downtown, is located in Durham, NC. Some of her clients include IBM, Burt's Bees, Chick-fil-A, and Intercontinental Exchange. With additional financial backing, she is planning to expand into the Atlanta area. She expected her revenue in 2018 to reach the one million dollar mark.

It is very gratifying to know that bees have an ambassador advocating on their behalf, educating corporate heads and staff about the importance of helping bees, and especially helping bees find new habitat with plenty of new forage among a wide variety of plants that are used in corporate landscaping.[4]

Rose Marie Williams, MA, is a writer and frequent lecturer on environmental risk factors, risk reduction, and health protection. She was president of the Cancer Awareness Coalition, Inc., a grassroots environmental and health organization, from 1995-2005. She has written for Foundation for Advancement in Cancer Therapy, Ltd. (FACT), *Well-Being Journal*, *Health and Healing Journal* (Australia), South Africa's *Journal of Natural Medicine,* and has had several articles in *Townsend Letter* since 1999. Contact: jwill52739@aol.com

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Pediatric Pearls

by Michelle Perro, MD

Welcome to the *Townsend Letter*'s new section to be featured every other month, bringing you tips and treasures regarding integrative care for our little ones. Sections will be focused on a case report with selected relevant references for your review. The recognition is that many of you are not pedi-people, so explanations will be given, which might be more routine for pedi-practitioners. Treatment focus is generally homeopathic combined with herbal remedies when needed. The foundation of care is based on an organic diet without exception. Nutraceuticals and supplements are added when necessary with the understanding that administering to little ones may be challenging if they are dealing with sensory defensiveness or are "picky eaters." Therefore, treatment regimens and choices should be carefully selected. This section will be clinically focused with a "how-to" orientation.

Our launch feature is related to this month's highlighted topic, Lyme disease and co-infections, referred to as "Lyme disease," an overlooked and mishandled issue in pediatric care. An emphasis will be placed on clinical management with real cases complete with on-the-frontline dilemmas.

Management of Congenital Lyme Disease Infection

Mom R is a 32 year old under my care for chronic Lyme disease, with positive antibodies to *Borrelia burgdoferi* and *Bartonella henselae* via Igenex®. While in the office, I noted her three year old to have linear red lines on her extremities, and we began treatment for bartonella infection for the three year old. However, the mom was insistent on getting pregnant although she was cautioned against it until we had a better response to her Lyme disease. The family was lost to follow up, and they returned with an eight-month-old baby girl one year later, who was also exhibiting linear red lines appearing intermittently on her body. Mom R recognized that this "rash" was not "the baby scratching herself" as she was told by her doctor, but a manifestation of bartonellosis.

The pregnancy was remarkable for poor weight gain. Baby A was born via NSVD (normal spontaneous vaginal delivery) without any complications. Her birth weight was 5 lbs, borderline SGA (small for gestational age). Her history was remarkable for prolonged fevers after her first immunization with DTaP, and she hadn't received any further immunizations since. She was presently being nursed while mom was on herbal antibiotics for bartonella treatment. Baby A's physical exam was notable for height and weight, which were below the 3rd percentile, a slightly enlarged spleen to palpation, and linear red lines on her trunk and extremities.

The family was unable to pay for any labs tests outside of regular insurance coverage. Her labs were remarkable for a low vitamin D level and borderline low platelets. Her borrelia and bartonella antibody tests were negative via Quest Diagnostics.

Congenital Lyme Infection

Congenital infections are recognized in the Western literature for Lyme disease and co-infections, such as bartonella.[1-4] The challenges that present include the fact that they are not routinely looked for due to often absent or misdiagnosis in the mother. Additionally, routinely ordered labs via conventional testing miss many Lyme infections and are of limited reliability. Looking at the case of Mom R, she was self-treating after her initial visits with me and also didn't report to her midwife what she was doing. (Real life scenarios!) Whether the baby also had a mixed infection was unclear, but presumably likely. The rate of infection transmitted to the newborn goes down significantly when mom is treated with antibiotics. Dr. Jones reported at a 2011 ILADS conference that the rate of Lyme transmission is 50% in women that are untreated, dropping down to 25% when women are treated with one antibiotic and to 5% when treated with two antibiotics. I could not find statistics as to whether the same

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effect is noted with herbal antibiotics.

When treating Lyme disease in children, particularly in babies, there are several factors to first consider:

1. What is the nutritional status/immune status of the infant and mother?
2. Is the infant nursing, and is the baby pooping adequately?
3. What is the detoxification capacity of the infant?
4. What can the parents handle and afford?
5. Which lab tests would be most useful?

Because this infant was not in any distress at the time of the visit and for the most part thriving except for the notable growth issue, we had the luxury of looking at the above factors before launching into any type of therapeutics. Which labs to draw to assist in the management of this baby can be tricky. The blood volume of an infant is approximately 100 ml/kg. This infant weighed 6 kg at the first visit, so her entire blood volume is only about 600 ml. Additionally, finding a qualified pediatric phlebotomist can be challenging! A baseline CBC, Vitamin D level, and an urinalysis are helpful to begin with, which will offer a window to immune function, iron and B12 status, and kidney function. I try to obtain labs that are covered by insurance when possible and to use urine and stool instead of venipuncture, which the parents (and the child) will appreciate as well.

The first step was to ensure an organic/nutritious diet of mom. Mom R also had been diagnosed with Hashimoto's thyroiditis previously and was off dairy and gluten. This baby was only nursed, and I did introduce solids into her diet to increase her protein intake and baseline weight. Baby A was able to poop without issue. This topic must be addressed in every child since constipation may be affecting nearly one-third of children, often unknown by the parents since once kids are potty-trained, parents are often unaware what is going on behind the bathroom door. I usually ask for pics of the poop (which the siblings will think is very funny) since it can be diagnostic and will spare the need for a stool test. Mom was MTHFR homozygous, so presumptively the baby was likely at least heterozygous for the MTHFR snp methylation issue, which I took into consideration.

Prior to treatment, I began the mom on a detoxification program using German Biological Medicine (Bioresource®), also known as bioregulatory medicine (https://www.chelseagreen.com/product/bioregulatory-medicine/) for liver, kidney, and lymph with the thinking it would get into the breast milk. Breastfeeding can be an effective way to treat babies gently. I did this for one month and brought the baby back for reassessment. She still was doing well and gained a small amount of weight. During the detox, the mom noted more frequent rashes in the infant, which could represent a flare of her infection from a possibly clearing. Mom tolerated the detox without any issues.

I then started the infant on Vitamin C 500 mg/day and silver (Argentyn 23®) two drops daily for two weeks which she tolerated well. The thinking was to give her antioxidant support and antimicrobial support prior to addressing the core infection.

The challenge at this juncture was whether to treat her with herbal antibiotics or homeopathics. Because I had experience with this family, I knew the other family members had responded well to homeopathic treatments in the past. If you note that a certain treatment works well in parents or siblings, this data can be extrapolated for the patient. I began the baby on a homeopathic series kit for bartonella from Desbio®, the most prominent infection noted in this infant clinically. I reduced the dosing to one-half of what I would normally use in an adult, and this treatment continued for two months. (https://desbio.com/featured/series-therapy/)

At the follow-up visit, Mom R reported that the baby had gained weight (now on the 5th percentile; weight gain is a very positive sign!) and noted fewer red linear lines that we had presumed were due to bartonella (which we used as a marker to monitor her progress), although still present. Not convinced we were done, I began a course of herbal antibiotics with MC-bar 1 (Beyond Balance®), starting low and slow at one drop twice a day, slowly increasing to five drops twice a day. Epsom salt baths were utilized to offset possible Herx reactions, which this baby did not seem to exhibit. Another herbal preparation I would have used is Tox-Ease from Beyond Balance® to off-set potential Herx reactions since these herbs are well-tolerated in children and are gentle and effective.

Ideally, to maximize excretion of organisms on testing, I usually like to test approximately three weeks into treatment, now preferring urine PCR testing in children (https://dnaconnexions.com/lyme-panel-temp/, for example). A negative test does not rule out infection, and I base treatment on clinical parameters using laboratory data as an adjunct to care of the child.

After six months of treatment and bringing in MC-bar 2 after we completed the MC-bar 1, the infant was thriving, and the weight and height growth leveled off at the 10th percentile. No further rashes were noted, and Baby A is being monitored at this point. She is being maintained on probiotics (sauerkraut juice), methyl B12/methyl folate at 400 mcg each, and Vitamin C 500 mg. daily. If I were to bring in probiotic treatment, I've now been evaluating sporebiotics from Microbiome Labs®, presently introducing a new pediatric spore preparation; a topic for future kiddie korners!

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Michelle Perro, MD, is a veteran pediatrician with nearly four decades of experience in acute and integrative medicine. More than fifteen years ago, Dr. Perro transformed her clinical practice to include pesticide and health advocacy. She has both directed and worked as attending physician from New York's Metropolitan Hospital to UCSF Benioff Children's Hospital Oakland. Dr. Perro has managed her own business, Down to Earth Pediatrics. She is currently lecturing and consulting as well as working with Gordon Medical Associates, an integrative health center in Northern California. She has co-authored *What's Making Our Children Sick?* with Vincanne Adams, PhD, and is executive director for the prominent science and health-based website, www.gmoscience.org.

Monthly Miracles

by Michael Gerber, MD, HMD
Practitioner of Homeopathic Medicine
contact@gerbermedical.com

Unsuspected, Uninvited Visitors

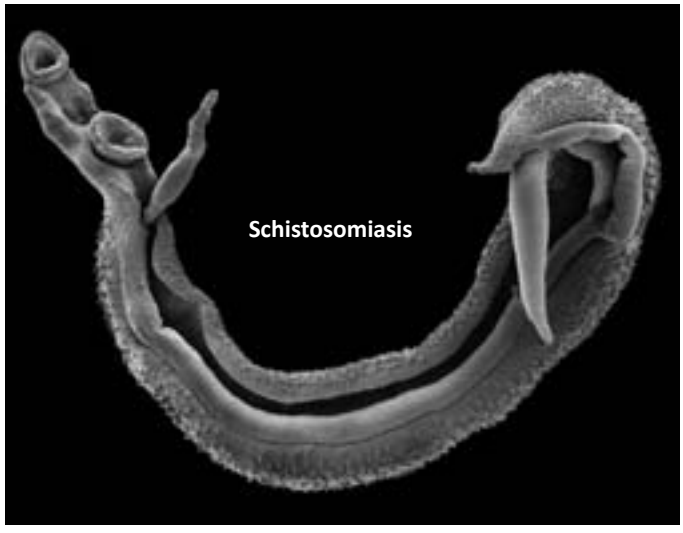
As integrative medicine practitioners, we see patients with seemingly mysterious health afflictions. They present with normal blood tests and radiology evaluations and yet are chronically ill with horrible fatigue, cognitive dysfunction, pain issues, mood, sleep and digestive disorders to name a few. Over the years I have been able to diagnose these patients, mostly with an EAV Biomeridian computer and stool testing, with a broad range of parasites. Although they may respond to herbal remedies and homeopathic nosode dilutions, I find pharmaceutical antiparasitic and antibiotic medications are usually necessary.

Giant Intestinal Fluke, *Fasciolopsis buski*

The reader may remember my column of last year "Just A Fluke." It recalls a 36-year-old male with severe jaundice and a bilirubin of 11.6 (n=1.1). He had been worked up by his local gastroenterologist and was found negative to hepatitis A, B, C, and autoimmune hepatitis. His radiology of liver, gallbladder, and pancreatic ducts was normal. Having seen many other members of his family, they brought him to see me. They had many animals, and he shot and ate wild pigs. After one day's dose of praziquantel, his urine turned clear in two days; and bilirubin was 1.0 in two weeks. It was necessary to re-treat him in about one month.

This parasite is endemic in Asia and India, occurring in Taiwan, Thailand, Laos, Bangladesh, India, Vietnam, and Hawaii. It is especially prevalent in areas where pigs are raised. It has a prevalence of up to 60% in India and mainland China and adheres to the small intestine of its host, remaining until it dies or is removed. It also inhabits horses and cows and breeds continuously, producing about 16,000 eggs per day, with an average number of offspring from 13,000 to 26,000, and measures 20 to 75 mm. They inhabit most of the intestinal tract starting with the stomach. Other members of the genus invade the liver.[1-3] Remembering Hulda Clark's admonition that all cancer patients have Fasciolopsis, I'm beginning to think she was correct. I am finding it in cancer patients. Why it is here is a good question; but with the consumption of foods from international sources, it is not too much of a stretch to look for this fluke.

One of my diagnostic signatures of the fluke is that the patient complains they eat and blow up, eat and blow up. It can be any food even if avoiding tested and suspected food allergens. After praziquantel (Biltracide), the digestion usually improves in several days generally without a dramatic die off. The dose is 25 mg/kg in three divided doses for one day, four to six hours apart with food. Some patients have observed it works better if avoiding coffee and alcohol the day before, day of, and day after praziquantel as they



may impair the medication's ability to paralyze the fluke's mouth parts, which adhere to the intestines and liver. It may need to be repeated in several weeks if the digestive symptoms return or if the flukes weaken the patient on EAV. Ordering the praziquantel from your compounding pharmacy made without lactose can cost $150.00 to $200.00 depending on patient weight. Commercially, it could be many times that. Adding bile salts with the meal and herbal support such as MarcoPharma Cholenest to improve portal stasis has been helpful.

Other drugs used against fasciolopsiasis are mebendazole, thiabendazole, pyrantel pamoate, oxyclozanide, nitroxinil, and hexachlorophene. Black walnut green hulls have been used against adult worms, and wormwood herb kills larvae.

Symptoms of infections can include allergic reaction, anemia,

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ascites, diarrhea, fever, obstruction of the bowel, abdominal pain, swelling of the skin, and generalized toxemia. I postulate that right upper quadrant pain or epigastric swelling with normal or abnormal liver function tests should raise suspicion of Fasciolopsis infestation. It may be that liver congestion from the fluke reduces bile flow, which would disrupt fat emulsification and bicarbonate production. Remembering that all the pancreatic enzymes work in an alkaline environment, it makes sense that impaired digestion of fats, proteins, and carbohydrates exerts a powerful toll on nutrient absorption. Undigested carbohydrates ferment, proteins putrefy, and fats become oxidized and rancid; and the patient is miserable.

Schistosomiasis

After reading the editorial last year from our fearless leader Jonathan Collin, MD, publisher of *TL,* questioning the presence of schistosomiasis in our northern hemisphere, I became more curious about the possibility this blood parasite may be infecting our patients. As an avid student of live blood analysis, I was shocked to acknowledge many of the long worm-like structures I had observed for decades in the blood were Schistosoma and resembled structures of the parasite in online microscopy.

Afflicting many patients especially those with a history of foreign travel, it is endemic to Africa, Egypt, South America, parts of the Caribbean, Southeast Asia, and Yemen in the middle East. Schistosoma penetrate the skin directly from fresh water as well as from food and contaminated water ingestion. Schistosomiasis, also known as snail fever and Bilharzia, is a disease caused by parasitic flatworms. The urinary tract or the intestines may be infected. Symptoms include abdominal pain, diarrhea, bloody stool, or blood in the urine. It also may affect the lungs, liver fibrosis, spleen, spinal cord, nervous system, and the brain. More than 200 million people world-wide have schistosomiasis according to the CDC. It can also cause pulmonary hypertension and a higher risk of bladder cancer.

Treatment is praziquantel at 25 mg/kg in three divided doses for two days and needs to be repeated at two months. Patients with chronic schistosomiasis may need 40 mg/kg for two days. The chronically infected may need to have yearly treatments.

Paragonimus westermanli is a Mexican lung fluke. When treating refractory lung conditions that are not responsive to usual antibiotic or antifungal treatments, consider Paragonimus, especially if the patient has a history of living or traveling through central, southern Mexico or Central America. It is treated with a one-day prescription of praziquantel, 25 mg/kg in three divided doses. It occasionally needs to be repeated.

Coccidiomycosis imitis, valley fever, should always be considered in chronic lung afflictions especially if the patient has resided in the California central valley or Arizona. Treatment with fluconazole is usually effective.

Babesia microti, a co-infection of Lyme disease, *Borrelia burgdorferi*, is frequently worse than Lyme and may cause extreme fatigue, heart symptoms, cognitive decline, and joint symptoms. It is a red cell parasite like malaria and can be diagnosed only with difficulty using a Giemsa stain. Live cell analysis can show red cell lysis. EAV has been reliable in my hands.

After trying several treatment modalities including quinine, which has many unfavorable side effects, I have been able to achieve good results with azithromycin 250 mg twice per day for one week and atovaquone, Mepron, 750 mg/5 ml, #70 ml taking one tsp twice per day for one week. Atovaquone comes as a fluorescent yellow liquid with dubious sweetening and coloring agents, but it is generally well tolerated. This regimen frequently needs to be repeated.

Roundworms, Cestodes (Tapeworms). Ascaris, roundworm, tapeworms and *Trichinella spiralis* (pork worms) can be treated with albendazole, 200 mg for two weeks twice per day. It can play a dramatic role in some patients' lives. Asthma and chronic lung conditions are one of the manifestations of Ascaris with patients passing large worms in the stool, coughing them up, and coming out the nose. Our compounding pharmacy makes this two-week regimen without lactose for $66.00. Regular retail price can cost from $900.00 to $4,000.00. Tinidazole 250 mg twice per day for two weeks is also a good backup. Our patients from Brazil routinely take albendazole whenever leaving the country and are quite blasé about its routine use.

Fasciola hepatica. Another common liver fluke, sheep liver fluke, is acquired from sheep, watercress, and other vegetables and can also cause maldigestion. Treatment is with Alinia, nitazoxanide, 500 mg twice per day for one week. Brand name Alinia is frequently shockingly expensive. Remember to check GoodRx.com for competitive pricing from various pharmacies and coupons for a discounted price. Patients from Mexico, Canada, and South America find their off shore cost at $12.00 or $18.00.

Lyme/*Borrelia burgdorferi* has been frequently reviewed in these pages. Many of our venerable teachers advocate years of treatment with herbal compounds. I find that symptoms usually resolve in about one month with daily azithromycin and Nutrimedic's Samento (Cat's claw), Coumanda, and Burbur for drainage of die-off symptoms. Individualizing the dosing schedule according to patient tolerance is important. Give the tinctures from one to fifteen drops per day, let the mixture of tinctures stand for one minute, and increase gradually 12 days on and two days off to allow for Lyme's pleomorphism. In children, I find using the tinctures by themselves is frequently successful.

Bartonella henselae, cat scratch or cat bite fever and a co-infection of Lyme, frequently manifests with severe lymphadenopathy, day sweats, anxiety, pain on the soles of the feet, a rash that looks like stretch marks, severe cognitive dysfunction, neurologic symptoms of numbness or sharp, stabbing or burning pain, or abdominal pain for which there is no identifiable cause. Treatment with doxycycline is frequently effective as a first-line treatment. Nine species have been discovered.

Closing Thoughts

Parasites are with us. Deworming pet animals is routine in veterinary practice. We should have a high index of suspicion of blood-borne and intestinal parasites. Foreign travel is not a prerequisite for evaluation of parasites. They are here, and patients who are unresponsive to lifestyle and immune-supportive therapies need a stronger approach.

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Ask Dr. J

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

Lyme Disease Tissue Collection Program

Apparently neither Einstein nor Ben Franklin made the following statement: the definition of insanity is doing the same thing over and over again and expecting a different result. Fortunately, the Bay Area Lyme Foundation, who oversees the Lyme Disease Tissue Collection Program, won't stand for this reductionist philosophy.

Let's undertake a tiny medical history lesson first. Some parts of the medical establishment still refuse to believe in the idea of Lyme disease as having a chronic form. Lyme disease is caused by a bacterium that is classified as a spirochete. Another spirochete, *Treponema pallidum*, is a bacterium that has more than likely drastically changed human history. This interesting bacterium is the cause of syphilis, which has a tertiary form of the disease that affects the brain. Though scientifically unproven, many people attribute the irrational behavior of several famous people later in their life, like Napoleon and Hitler, to the tertiary form of syphilis. So then, if one spirochete has a stage that can affect the brain, why couldn't the spirochete that causes Lyme also affect the brain? As they say: absence of evidence is not necessarily evidence of absence! Hopefully some other enterprising writer will explore that topic.

My subject matter for this article is connected to work being done by the Lyme Disease Biobank/LDB. The Bay Area Lyme Foundation created the biobank to bridge the gap in Lyme disease because there is a lack of available well-characterized biological samples needed to facilitate research in the field of Lyme disease and other tick-borne infections. Biorepositories of infected tissue/blood/urine are important resources for furthering scientific research about the clinical effects of chronic Lyme disease on various groups of people. The availability of these samples, along with well-characterized clinical information provided by donors to the biobank's partner MyLymeData.org, will give investigators new tools to advance the search for a documented cure for diseases caused by tick-borne infections.

A unique opportunity to advance understanding of the clinical manifestations of chronic tick-borne infections is provided by procuring human tissue from infected individuals. This information can't necessarily be gained from in vitro or animal models. In addition, it can identify biomarkers and help identify the roles of inflammation in the progression of these diseases.

A quick aside: *Toxic: Heal Your Body From Mold Disease, Lyme Disease, Multiple Chemical Sensitivities, and Chronic Environmental Illness* by Neil Nathan, MD, is an incredible wealth of information on understanding how to identify and treat the debilitating effects of chronic tick-borne infections.

The acquisition of tissue is strategically challenging. First there is a large amount of expertise required to collect the samples in a timely manner, process them, and store them in a manner that will not impact tissue quality. Next, additional processing is often needed. Finally, some tissues can only be collected post-mortem, which will require spouses and relatives (next of kin) who are sympathetic to this well-deserved cause or a forward-thinking individual who registers in advance with the Bay Area Lyme Foundation's program.

Fortunately, there is a group that can assist in the procurement of samples. The National Disease Research Interchange/NDRI provides thousands of specimens from their nationwide procurement network to researchers worldwide. They are the leading source of human tissues, cells, and organs in the United States. NDRI is accredited by the College of American Pathologists as a biorepository and a sponsor facility. Using a professionally accredited source like NDRI really helps to ensure that nationally recognized experts are collecting and processing the samples so that researchers are being supplied with viable samples that will aid in their research.

There are two ways in which tissue will be collected. One is by having doctors collect samples from patients who are undergoing surgery. This tissue is acquired from discarded tissue taken in surgeries involving infected people. The other collection method is post-mortem. The biobank collects 13 different organs and tissue. Priority tissues to be collected include neurologic tissue (brain, spinal cord, and nerves), cardiovascular tissue (heart and arteries), musculoskeletal tissue (muscle, cartilage, and synovial membrane), lymph nodes, liver, bladder, and spleen.

Post-surgical tissue collection is conducted on a case-by-case basis with a focus on tissue from total knee replacements. Obviously, arrangements must be made at least a month before the surgery is performed. Unfortunately, tissue from prior surgeries cannot be utilized.

Who is eligible to donate tissue? Each potential donor must be 18 years or older, live in the continental US, and be diagnosed with Lyme disease by a licensed health care provider. The eligibility process will also include testing results, a thorough medical history, and a case review by clinical experts. Donors can also elect to enroll in the MyLymeData Registry and connect their data with their tissue sample.

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MyLymeData is a patient-powered registry and research platform that was developed and launched by LymeDisease.org. The goal is to enroll large numbers of infected people, so that big data research tools are used to allow patients to pool their data quickly and privately to facilitate the procurement of sizeable data pools to help find a cure. People interested in enrolling in MyLymeData can easily sign up by visiting MyLymeData.org.

There is no cost, and the research being conducted will be shared publicly when published by researchers. The Lyme Disease Tissue Collection Program is funded by the Bay Area Lyme Foundation and the Steven and Alexandra Cohen Foundation.

Different strains exist in various parts of the country, so tissue is being collected from across the country. There will also be co-infection testing of all samples that will include testing for Babesia, Anaplasma, *Borrelia miyamoti*, and *Borrelia mayonii*. Serology will utilize Elisa, Western Blot, IgM/IgG, and C6 peptide. In addition, PCR testing will be conducted.

All health care providers need scientific evidence to back up what they find clinically: that these various pathogens appear to commonly infect various organs of the body even if antibody tests return negative. These pathogens are smarter than the average bear. They appear to be able to adapt to their host, escape immune recognition, tolerate various antibiotics, and invade vital organs such as the brain and heart. As a result, diverse clinical data collection is required. Also, collaboration between multiple disciplines and multiple researchers is key to not only finding effective treatment regimens for the syndromes that have developed but also in convincing all practitioners and government entities that chronic tick-borne infections are real.

Finally, Pink Floyd was correct in their lyrics for the song "Brain Damage" from the album *Dark Side of the Moon*: "There's someone in my head but it's not me." Now we need the clinical evidence to make sure everyone believes this seemingly undisputed fact. Please encourage your tick-borne infection patients to participate in this search for knowledge and viable treatment regimens.

Information for this article was obtained from the following:
The Bay Area Lyme Foundation (https://www.bayarealyme.org)

The Lyme Disease Biobank (https://www.bayarealyme.org/our-research/biobank/)

NDRI's registration page (www.ndriresource.org/lyme-disease)

A PowerPoint about the Lyme Disease Biobank, which was presented at the Bay Area Lyme Foundation's speaker series in March 2019 by Eric Gordon, MD

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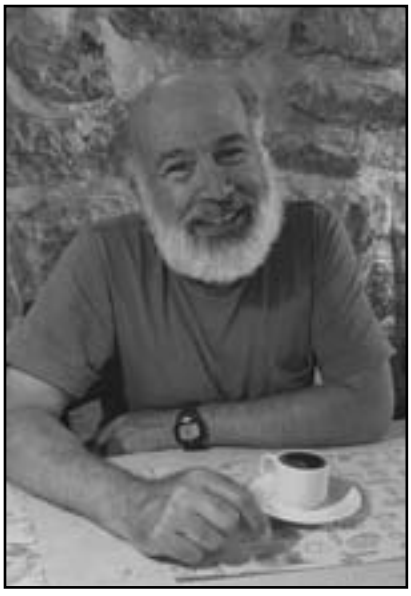

Curmudgeon's Corner

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

Eating Crow: That c/16 Estrogen Ratio Surfaces Again

Eating crow is a colloquial idiom, used in some English-speaking countries, that means humiliation by admitting having been proven wrong after taking a strong position. Crow is presumably foul-tasting in the same way that being proven wrong might be emotionally hard to swallow. The exact origin of the idiom is unknown, but it probably began with an American story published around 1850 about a dim-witted New York farmer. Eating crow is of a family of idioms having to do with eating and being proven incorrect, such as to "eat dirt" and to "eat your hat" (or shoe), all probably originating from "to eat one's words," which first appears in print in 1571 in one of John Calvin's tracts, on Psalm 62: "God eateth not his words when he hath once spoken." (Wikipedia, April 8, 2019)

The January 2013 issue of the *Townsend Letter* contained an article I wrote arguing that the science we relied on to categorize certain estrogen breakdown products as good or bad no longer held true and that it was time to abandon our reliance on measurement of these metabolic byproducts as predictive tools for assessing risk of breast cancer.

This set off a lively debate in subsequent issues of the magazine with Jonathan Wright, MD, and others advancing the argument that testing for these chemicals remained a useful practice. These letters only led me to dig in deeper.

Multiple large trials had been conducted without proving that this good vs. bad estrogen theory was valid. As far as I was concerned at that time, the debate was over.

I wrote, in hindsight rather smugly:

> As naturopathic physicians, we are often ahead of the curve in translating new theories published in the scientific literature into clinical protocols for use with our patients. This 'early adopter' tendency has its merits. We will sometimes find ways to help our patients when 'regular' medicine has yet to develop a treatment. Because we limit our interventions to relatively non-toxic, low-risk therapies, we set the bar relatively low in regard our requirement of proof before experimenting with new ideas. We can justify our experimentation with a 'might help and won't hurt' summation of risk analysis. If we were using more dangerous therapies, we would surely raise the bar, asking for stronger evidence before trying a new idea.
>
> Thus, adopting this estrogen metabolite theory early on before it was well proven did not threaten to hurt anyone if it eventually turned out to be wrong. Except that many people, patients in particular and also some practitioners, forgot that it was theory and considered it proven fact.
>
> Being an early adopter does come with responsibility; if a new idea, doesn't pan out, we need to abandon it and we need to let others know. It is easier for us to take on new ideas than it is to let go of them. In the case of estrogen metabolites, the theory that the 2-hydroxy form is good for women and that 16α-hydroxyestrone is bad, is not holding up. Growing evidence suggests that there is little correlation between these hormones and cancer risk; the situation is more complex than we first thought. There may be other theories that will make sense of this. My colleagues after reading the results of these studies, quickly scramble to find alternate theories, '… perhaps there's another metabolite that's the key, maybe the 4 hydroxy?' Maybe, but maybe not.
>
> Sometimes you've just got to admit when you were wrong and move on. It is past time that we let this idea go.[1]

That's what I wrote nearly five years ago.

Now, I may have to eat my words. A *Science Daily* article from this April Fools' Day has me reconsidering my position. It described a study presented at the American Association for Cancer Research Annual Meeting by Tengteng Wang, a doctoral student at the University of North Carolina. Wang and fellow researchers conducted a study in which they measured levels of estrogen byproducts in urine from a group of women with breast cancer. Relative levels of "good" versus "bad" estrogen byproducts were linked to survival. These good and bad estrogen byproducts are the same good 2-hydroxyestrone, and bad 16-alpha-hydroxyestrone, we argued about five years ago.[2]

According to Wang, "'A lot of research has been done to link these two metabolites with the probability of developing breast cancer. So far, we believe we are the first to look at the association of metabolites in relation to mortality after 18 years of breast cancer diagnosis.'"[2]

This idea was echoed by Marilie Gammon, PhD, professor in the UNC Gillings School of Global Public Health and supervising

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author of the study. "'This ratio may therefore represent an individual's inherent estrogen metabolism profile. Our study reported here is the first to focus on the association between urinary estrogen metabolites and survival after breast cancer.'"[2]

The researchers examined the balance of these two metabolites in relation to mortality: "Specifically, they found that if the level of 2-OHE was more than, or equal to, 1.8 times the level of 16-alpha-OHE in urine, there was an associated 26% reduction in any cause of death in women with breast cancer. They also saw that there was a lower risk of breast cancer death, or cardiovascular death, for women who had higher levels of the 'good' metabolite."[2]

The researchers had examined these associations in a group of 687 women who were diagnosed with breast cancer between 1996 and 1997, and who participated in the Long Island Breast Study Project. Levels of estrogen byproducts were measured in urine within three months after diagnosis.

They found that a higher urinary concentration of the 'good' versus the 'bad' metabolite was associated with a 24 to 27% reduced risk of dying from breast cancer, cardiovascular diseases, and any cause of death among breast cancer survivors. This association held even when other factors, such as lifestyle, diet, medical history, and menopausal status were factored in. Bottom line, as Dr. Gammon said: "'…regardless of the assumed levels of estrogen in a woman's body, the relative balance of the estrogen metabolites appear [sic] to predict prognosis after breast cancer.'"[2]

The details of this study have yet to be published, but they certainly are intriguing. If these findings hold true, we have another tool to add to the predicting long-term outcome. While these results do not tell us whether shifting this estrogen ratio through diet or supplements will change a woman's prognosis, the idea that it might is certainly compelling.

As Richard Lord, Bradley Bongiovani, and Alexander Bralley from Metamatrix Labs pointed out in an article in *Alternative Medicine Review* back in 2002:

> The CYP1A1 enzyme that catalyzes 2-hydroxyestrone (2-OHE1) formation is inducible by dietary modification and supplementation with the active components of cruciferous vegetables, indole-3-carbinol (I-3-C), or diindolylmethane (DIM). Other dietary components, especially omega-3 polyunsaturated fatty acids and lignans in foods like flax seed, also exert favorable effects on estrogen metabolism. Thus, there appear to be effective dietary means for reducing cancer risk by improving estrogen metabolism.[3]

To this list of foods that induce a shift in estrogen metabolite metabolism, we may have to add crow. I've heard it tastes like chicken.

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2. UNC Lineberger comprehensive Cancer Center. Estrogen byproducts linked to survival in breast cancer patients. *ScienceDaily.* April 1, 2019.
3. Lord RS, Bongiovanni B, Bralley JA. Estrogen metabolism and the diet-cancer connection: rationale for assessing the ratio of urinary hydroxylated estrogen metabolites. *Altern Med Rev.* April 2002;7(2):112-29.

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

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

JULY 12-13: THE GREAT PLAINS LABORATORY, INC. presents GPL ACADEMY PRACTITIONER WORKSHOPS in Boston, Massachusetts. Organic acids testing, toxic chemical testing, and mycotoxin testing, among others. CONTACT: http://www.GPLWorkshops.com

JULY 26-28: PRIMARY CARE FOR WOMEN in Portland, Oregon. CEUs available. CONTACT: http://instituteofwomenshealth.com/

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

AUGUST 15-18: 10th ANNUAL INTEGRATIVE MEDICINE FOR MENTAL HEALTH (IMMH) CONF. in San Diego, California. CMEs available. CONTACT: https://www.immh2019.com/

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

SEPTEMBER 4-7: 20th ANNUAL FALL CONFERENCE ON INTEGRATIVE MEDICINE IN WOMEN'S HEALTH in Napa, California. CONTACT: http://www.symposiamedicus.org/

SEPTEMBER 6-8: EMFC 2019 – DIAGNOSIS AND TREATMENT: EFFECTS OF ELECTROMAGNETIC FIELDS EXPOSURE in Santa Cruz, California. CONTACT: https://emfconference.com/

SEPTEMBER 12-15: 17th ANNUAL RESTORATIVE MEDICINE CONFERENCE in San Diego, California with Tieraona Low Dog, MD. CONTACT: https://restorativemedicine.org/conferences/2019-annual-conference/

SEPTEMBER 13-15: KOREN SPECIFIC TECHNIQUE (KST) in Detroit, Michigan. Locate and release physical and emotional stresses. Also, **OCTOBER 11-13** in Philadelphia, Pennsylvania; **NOVEMBER 22-24** in Seattle, Washington. CONTACT: www.korenspecifictechnique.com; phone 267-498-0071.

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

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

SEPTEMBER 27: PERINEURAL INJECTION THERAPY (Neural Prolotherapy) COURSE with Bryan Rade, ND, in Halifax, Nova Scotia. Learn a minimally invasive therapy for pain. Space limited. CONTACT: https://www.eastcoastnaturopathic.com/

SEPTEMBER 27-29: GREAT PLAINS LABORATORY presents ENVIRONMENTAL TOXIN SUMMIT in Seattle, Washington. Also, **NOVEMBER 8-10** in Nashville, Tennessee. CMEs available. CONTACT: 913-341-8949; https://www.gplworkshops.com/

SEPTEMBER 28-29: OZONE THERAPY CERTIFICTION COURSE with Bryan Rade, ND, in Halifax, Nova Scotia. Learn intravenous and intraarticular ozone therapy. Space limited. CONTACT: https://www.eastcoastnaturopathic.com/

OCTOBER 3-5: IVC ACADEMY @ Riordin Clinic in Wichita, Kansas. Learn the fundamentals of using intravenous vitamin C for cancer and chronic illnesses. CMEs available. CONTACT: https://riordanclinic.org/events-archive/ivc-chronic-illness-symposium/

OCTOBER 10-13: AMERICAN ACADEMY OF ENVIRONMENTAL MEDICINE FALL CONFERENCE – Fatigue: A Complex Diagnosis and Treatment Dilemma in Louisville, Kentucky. CMEs available. CONTACT: http://www.aaemconference.com/fall/

OCTOBER 11-13: AMERICAN INSTITUTE OF HOMEOPATHY CONFERENCE – Mapping the Cancer Journey with Dr. Farokh Master in Charlottesville, Virginia. https://homeopathyusa.org/education/2019-conference.html

OCTOBER 12-14: FIELD CONTROL THERAPY® (FCT) INTENSIVE TRAINING with Savely Yurkovsky, MD, in White Plains, New York. CONTACT: 914-861-9161; http://www.yurkovsky.com

OCTOBER 24-27: INTERNATIONAL COLLEGE OF INTEGRATIVE MEDICINE (ICIM) – Healthy Parents, Healthy Children in Toronto, Ontario. CONTACT: https://icimed.com/

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

OCTOBER 25-27: ADVANCED APPLICATIONS IN MEDICAL PRACTICE (AAMP) FALL EVENT – Integrated Oncology at the Next Level in Seattle, Washington. CONTACT: 954 540 1896; https://aampconferences.com/

NOVEMBER 1-2: SCIENCE, SPIRIT & CLINICAL PEARLS, NHAND 19th ANNUAL CONFERENCE in Nashua, New Hampshire. CONTACT: https://www.nhand.org/call-for-abstracts/; conference@nhand.org

NOVEMBER 2-3: ARIZONA NATUROPATHIC MEDICAL ASSOCIATION CONFERENCE in Scottsdale, Arizona. CONTACT: https://www.aznma.org/

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Classified Ads

Women's Health Update

by Tori Hudson, ND
womanstime@aol.com

Effect of N-Acetylcysteine on Bronchietasis

I recently diagnosed bronchiectasis in a patient, with the help of a pulmonologist, so I was especially interested in this condition and this study. Bronchiectasis is a chronic lung disease that is described as permanent dilation of the bronchi and bronchioles and enlargement of mucus-secreting glands. Patients experience chronic excessive mucus secretions into the airway that results in a chronic cough and constant desire to expel the mucus. Inflammation, injury and changes to the shape of the bronchi, mucus collection, and respiratory infections are the four major aspects that underlie bronchiectasis.

The treatment of bronchiectasis is focused on managing the symptoms and reducing the number of respiratory infections. Mucoactive agents such as hypertonic saline, mannitol, and erdosteine can bring about some improvements in some patients. Studies on inhaling dry powder of mannitol for 12 weeks reduced sputum in these patients, and short-term use of erdosteine plus chest physical therapy reduced mucus secretion; but sample size has been small, and duration is too short to conclude anything definitive. Long-term antibiotic regimens are also used to reduce the frequency of exacerbations, although this approach can increase the risk of bacterial resistance and adverse events.

N-Acetylcysteine (NAC) is a dietary supplement used to thin the mucus, amongst many other uses, and reduces the viscosity and elasticity of sputum as well as having anti-inflammatory and antioxidant activity. This action of thinning the mucus and reducing inflammation, plus a clinical trial using NAC 1200 mg/day that reduced the rate of exacerbations and improved quality of life in chronic obstructive pulmonary disease patients, suggests that it could be helpful for those with bronchiectasis as well.

The purpose of the current study was to assess whether NAC 600 mg twice daily might reduce the number of exacerbations and improve quality of life. An exacerbation is defined as the increase in three or more key symptoms: cough, sputum volume and/or consistency, sputum purulence, breathlessness and/or exercise intolerance, fatigue, and coughing up blood for at least 48 hours.

A total of 161 patients were randomized with 81 receiving oral NAC 600 mg twice daily and 80 in the control group. Due to dropouts and deaths in both the treatment and control groups, there were in the end, 69 patients taking NAC and 70 in the control group. To emphasize the potential seriousness of bronchiectasis, one patient died of an acute exacerbation of bronchiectasis in the NAC group, and two died of the same cause in the control group.

The incidence of exacerbations in the NAC group was significantly lower than in the control group (1.31 vs 1.98 exacerbations per patient-year). The average number of exacerbations in the NAC group was one, compared with two in the control group. A total of 24.7% in the NAC group and 11.3% in the control group remained free of any exacerbation during the 12-month period. In addition, while the time to the first exacerbation did not differ between the NAC group and the control group, the time to the second exacerbation was longer in the NAC group.

Commentary: This study is very encouraging in light of a disease with no known cure. Not only did it reduce the number of exacerbations, it also

reduced the volume of sputum and improved quality of life. NAC was also very well tolerated with a low incidence of adverse reactions, and long-term use of a year was found to be safe. It should be noted that there are subtypes of bronchiectasis, one being a dry bronchiectasis, and it is not clear if these individuals would benefit from NAC. While this study used NAC in oral encapsulated delivery, nebulized NAC might be a more effective way to deliver the medicine. I will be curious to learn if anyone has experience with that.

Qi Q, et al. Effect of N-acetylcysteine on exacerbations of bronchiectasis: a randomized controlled trial. *Respiratory Research*. 2019:20:73

Greater Cardiovascular Fitness in Midlife Women Leads to Lower Dementia Risk Later

This study was done looking at 200 Swedish women aged 38-60 who underwent cycling testing that measured cardiovascular fitness. They were followed for an average of 29 years. Using objective assessments and repeat neuropsychiatric evaluations, 23% were diagnosed with dementia at a mean age of 80. Researchers compared women who had medium cardiovascular fitness at baseline to those who had high fitness levels and found that those with a higher fitness level had an 88% lower risk for dementia over the course of the follow-up years. Of those that were in the high fitness category who were diagnosed with dementia, it developed about 11 years later compared to those with medium fitness.

Commentary: While fitness level cannot be asserted to be a causal effect, it is worth emphasizing the possibility that improved cardiovascular fitness in midlife could modify a woman's risk and delay or prevent dementia. There are several herbs and nutrients that have shown some suggestive influence in providing neurocognitive protection, but all research should be multifactorial in this area, given the growing numbers of individuals affected. Causation, prevention, and treatments all deserve assertive research and across the spectrum of issues related to causation: environmental exposures, stressors, diet, brief and long-term medication exposures, and genetics. Prevention: stress, nutrition, optimal sleep habits, herbal/nutrient supplements, and medications. Treatments: natural and pharmaceutical interventions.

Horder H, et al. Midlife cardiovascular fitness and dementia: A 44 y.r. longitudinal population study in women. *Neurology*. 2018; March 14; e-pub

Fenugreek/Ginger/Turmeric Combination Increases Breast Milk Supply

Health care providers, governments, and private organizations are supportive of the benefits of exclusive breastfeeding to promote health and optimal development of newborns. The World Health Organization recommends that infants should be exclusively breastfed for the first six months of life. Not all women around the world are able to accomplish this due to education, confidence, nutrition, nipple problems, pain, milk storage issues, and adequate milk volume. Many breastfeeding mothers do try to increase their milk volume and use traditional foods and medicines and herbal preparations. In Thailand, where the current study was conducted, fenugreek, ginger, and turmeric are traditional galactagogues.

The study was a randomized double-blind placebo-controlled trial, conducted at the Mahidol University in Thailand. Fifty breastfeeding women, ages 20-40, who were one month postpartum and exclusively breastfeeding were enrolled in this study. Women were randomly assigned to the herbal supplement or placebo, with 25 in each group. The herbal formula contained 200 mg fenugreek seed, 120 mg ginger, and 100 mg turmeric per capsule. Three capsules three times per day of herbal combination or placebo were given for four weeks.

Breastfeeding mothers receiving the herbal supplement had a 49% increase in milk volume at week 2 and a 103% increase at week 4. The increases in the placebo group were 11% at week 2 and 24% at week 4. The energy and nutrient composition of the human milk before and after the intervention was similar between the treatment and placebo groups, although the percent change in vitamin A tended to increase in the herbal group.

Commentary: Fenugreek is used in many parts of the world, including the US as a galactagogue and has been proven to be safe and effective. The major compounds in fenugreek are flavonoids, terpenoids and saponin (diosgenin). These compounds stimulate the anterior pituitary gland to increase prolactin. The increase in milk production often seen with fenugreek occurs within 24-72 hours. Ginger also can increase milk flow, possibly by improving blood circulation. Turmeric is used as a galactagogue in India but may also be able to decrease pain, tension, and inflammation in the breast. Ginger and turmeric may also stimulate the anterior pituitary to produce more prolactin resulting in increased quantity of milk.

Bumrungpert A, et al. Effects of fenugreek, ginger and turmeric supplementation on human milk volume and nutrient content in breastfeeding mothers: A randomized double-blind controlled trial. *Breastfeeding Medicine*. 2018;13(10).

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Editorial

➤ *continued from page 96*

intervention, the earliest date the authors would have been able to start evaluating their data was four weeks after the date the paper was submitted to the journal. In the letter I also cited another study[3] in which Asemi et al submitted a paper before it was apparently possible to have completed the trial (I have now found 5 such instances of seemingly impossible dates among papers by Asemi et al).

In their response to my letter,[4] Asemi and his coworker changed the recruitments dates that had been listed in those two papers. One of the changes was to shorten the recruitment period in a gestational diabetes study from two or three months originally, down to three weeks. That is, during a three-week period, they recruited 60 women from a single clinic who were between 24 and 28 weeks gestation and who had gestational diabetes. After reading their response, I found data on the birth rate in the region of Iran where the study took place. I also found data (from some of Asemi's other studies) about the proportion of pregnant women in that region who develop gestational diabetes. Based on that information I calculated that, even if the study had enrolled every woman with gestational diabetes in the entire city where the study was conducted (population, approximately 500,000), no more than 36 women could have been enrolled in a three-week period.

Ethical issues

By my count, Asemi and coworkers have published at least 22 randomized controlled trials on various nutritional treatments for gestational diabetes. One of the earliest studies in that series found that, in women with gestational diabetes, supplementation with magnesium significantly decreased the incidence of neonatal hyperbilirubinemia and infant hospitalizations.[5] The effect size for both of those outcomes was relatively large, with a number-needed-to-treat of five. And yet, in most of the subsequent studies by Asemi et al that examined a wide range of individual nutrients or a combination of two nutrients, women with gestational diabetes were forbidden from taking any supplements other than iron, folic acid, and the nutrient(s) being tested. One would think that it is unethical for researchers to withhold a treatment (i.e., magnesium) that they, themselves, have previously shown to improve neonatal outcomes.

Vitamin A for Ulcerative Colitis

One hundred fifty Iranian patients (aged 20-45 years; mean disease duration, 4.2 years) who had been referred to a gastroenterology clinic for ulcerative colitis, and who were symptomatic despite treatment with oral and topical 5-aminosalicylic acid, continued their medication and were randomly assigned to receive, in double-blind fashion, 25,000 IU per day of vitamin A or placebo for two months. Mean disease activity, as determined by the Mayo Clinic Disease Activity Index, improved by 22% in the vitamin A group and did not change in the placebo group ($p < 0.001$ for the difference in the change between groups).[6]

This study (in which Asemi was not involved) raises a number of issues. First, the mean Disease Activity Index at baseline was 8.68 out of a maximum score of 12, indicating that the patients on average had moderate-to-severe disease. One would think that patients referred to a gastroenterologist with moderate-to-severe ulcerative colitis unresponsive to 5-aminosalicylic acid would first be given a trial of a different medication. Instead they were asked to try a relatively low dose of a vitamin, for which there had been no prior clinical evidence of efficacy, and also to accept a 50% chance of being given a placebo. One might question the ethics of conducting such a trial. While all of the participants were said to have given "informed, written consent," one wonders what information they were provided before giving such consent. Second, the study was presumably quite expensive, since it included, among other tests, 293 endoscopies conducted by an "expert gastroenterologist-endoscopist." One might wonder how the researchers were able to obtain funding for this study without having first demonstrated possible efficacy with case reports or a small uncontrolled trial. Third, some of the baseline characteristics of the participants are unusual. That is, while the vitamin A group was significantly shorter than the placebo group (mean height, 161.4 cm vs. 165.7 cm; $p < 0.001$), the mean weight of the vitamin A group was significantly greater than that of the placebo group (73.6 kg vs. 69.8 kg; $p = 0.03$). The probability that the difference in mean body mass index between groups occurred by chance was less than 1 in 1,000: not impossible, but possibly eyebrow-raising.

Green Tea for Acute Cystitis

Seventy Iranian women experiencing their first episode of acute uncomplicated cystitis (diagnosed by an infectious disease specialist, based on medical history, physical examination, clinical manifestations, and urinalysis) were randomly assigned to receive, in double-blind fashion, 2 g of dried aqueous extract of green tea or placebo once a day in the evening for three days. All patients were treated with trimethoprim-sulfamethoxazole. The green tea extract provided daily 131 mg of (–)-epigallocatechin (EGC), which the authors stated is the only green tea catechin excreted in the urine after oral administration. After three days, the proportion of women who had symptoms of cystitis was 63% in the placebo group and 2% in the green tea group ($p = 0.0001$). The authors concluded that green tea was an effective adjunct to trimethoprim-sulfamethoxazole in women with acute uncomplicated cystitis.[7]

This study (in which Asemi was not involved) also raises various issues. First, one wonders why an infectious disease specialist would waste his or her time evaluating and treating first episodes of acute uncomplicated cystitis, a condition that is often treated by mid-level practitioners or even over the telephone. Second, only 72% of the women were experiencing cystitis symptoms at the time they were enrolled in the study. That fact might make one wonder why the other 28% would have gone to a medical clinic, and why they were given a diagnosis of cystitis (as opposed to asymptomatic bacteriuria). Third, the rationale for conducting the study is open to question. Based on my review of the research cited in the paper, the lowest concentration of EGC that has been found to inhibit *Escherichia*

coli in vitro is more than 50 times higher than the concentration that would be achieved in the urine after administering the green tea extract used in the study. While a sub-inhibitory concentration of EGC could conceivably act synergistically with antibiotics, the available *in vitro* data (in the absence of any prior clinical evidence of efficacy) does not seem sufficient to have justified conducting an expensive double-blind trial. Fourth, 91% of the women in the placebo group had bacteriuria at baseline, which suggests that in the vast majority of cases the acute cystitis was due to a bacterial infection. Symptoms of an acute first-episode urinary tract infection typically resolve within 24-48 hours after the start of antibiotic treatment. It is therefore difficult to understand how 63% of the women in the placebo group remained symptomatic 72 hours after they received antibiotics.

Honey for *Herpes simplex* Gingivostomatitis in Children

One hundred Egyptian children (aged 2-8 years) who presented to the Otolaryngology, Head and Neck Surgery Department, Minia University Hospital, Minia, Egypt, with primary herpes simplex gingivostomatitis (PHGS) were randomly assigned to receive, in double-blind fashion, acyclovir suspension plus honey or acyclovir plus placebo.[8] The dosage of honey was 5 ml swallowed slowly over a few minutes, every four hours for seven days. The placebo was a sugary syrup that was similar to honey in consistency and color. All patients underwent viral culture and serology testing for herpes simplex. To be included in the study, patients had to have a positive culture, positive serology, and clinical manifestations of PHGS. The patients were examined at enrollment and on days 3, 5, and 7. The median time until the lesions disappeared was significantly less in the honey group than in the placebo group (3 days [range, 1-7 days] vs. 6 days [range, 3-13 days]; p = 0.02).

This study raises several issues. First, the paper states that there was no funding source, so the study was presumably funded by one or more of the three authors. According to Wikipedia, the monthly salary of doctors in Egypt ranges from $69 to $361, so one wonders how the researchers would have been able to pay for 100 viral cultures and 100 serological tests, as well as the other costs of the study. If the authors did pay for the study, one wonders why they would have been willing to invest in an expensive double-blind trial when there had been no prior clinical evidence that honey is an effective treatment for PHGS. If the patients were being asked to pay for these tests (72% of health care expenditures in Egypt are paid for out of pocket [Wikipedia]), it is likely that many of the parents would have opted for empirical treatment with acyclovir in lieu of laboratory testing.

Second, in order to be included in the study, the children had to have a positive viral culture and positive serology. Herpes simplex cultures take an average of three days to become positive, and it may take up to 14 days for the culture to be reported as negative. Regarding serology tests, it could take weeks or even months after symptom onset for antibodies to appear in the blood. Therefore, it is not clear how the patients could have been enrolled in the study and started on treatment on the day they presented to the clinic. There is no mention of post hoc exclusion of participants after the test results came back.

Third, since the final clinic visit was seven days after treatment was started, and there was no mention of any follow-up after day 7, it is not clear how the researchers could have known that the lesions took as long as 13 days to disappear.

Fourth, some of the baseline characteristics of the children in the study are difficult to comprehend. The mean age was 1.3 years less in the honey group than in the placebo group (5.1 vs. 6.4 years). Yet, despite being younger, the mean body weight was greater in the honey group than in the placebo group (15.6 kg vs. 14.2 kg). It seems highly unusual that 50 five-year-old children would have a mean body weight greater than that of 50 six-year-old children.

The Response from Journal Editors

I have made several attempts to alert journal editors to the types of concerns described in this article. Some editors did not respond to my communication. Others conducted a cursory investigation before dismissing my concerns. For example, one editor forwarded my concern about possible ethics violations to a medical ethicist, who concluded that withholding magnesium from women with gestational diabetes was not unethical because the study had been approved by an ethics committee. One would have thought that, before rendering such an opinion, the ethicist would have been interested in seeing the document the researchers submitted to the ethics committee. Other editors seemed willing to accept a flimsy or factually incorrect response from the study authors and then refused to allow me to submit a follow-up letter. I have been in contact with some other investigators who have attempted to voice concerns about published papers, and their experiences with journal editors are similar to mine.

The Problem Is Getting Worse

During the past few years, the number of "concerning" papers in the field of nutritional medicine seems to have increased exponentially. I spend a lot of time on PubMed, scanning the table of contents of the latest issues of medical journals, looking for research in my areas of interest. I also receive daily emails from PubMed, notifying me about new articles that conform to my various search criteria. I have not attempted to quantify how often I have credibility concerns about new research papers, but it may be as high as a dozen times per month.

Alan R. Gaby, MD

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Why I Am Believing More and More Nutrition Research Less and Less

During the past 46 years, I have reviewed and analyzed more than 50,000 papers from the biomedical literature, most of which were related to the field of nutritional medicine. Doing this work has given me some understanding of how to assess the reliability of a study. Over the past 5 to 10 years, an uncomfortably large and growing number of published papers related to my area of expertise have left me wondering whether the research was fabricated; that is, whether people were writing papers about research that had not actually been conducted. This article should not be construed as an accusation against anyone. But when I see my colleagues citing and relying on research that I find concerning, that concerns me as well.

The studies that have raised my eyebrows have come primarily from Iran and to a lesser extent from China, Egypt, India, Japan, and a few other countries. Characteristics of these eyebrow-raising studies typically include one or more of the following:

1. The study comes from an investigator or research group that has published an enormous number of randomized controlled trials in a relatively short period of time.
2. The number of participants in the trial is unusually large, when considering the resources that appear to be available to the researchers.
3. The recruitment period for the trial is unusually short.
4. The paper is submitted to the journal unusually rapidly after the study is completed, or in some cases before it would have been possible to have completed the trial.
5. A randomized controlled trial is conducted before there is any preliminary evidence of efficacy in humans (such as case reports or uncontrolled trials). Because randomized controlled trials are expensive to conduct, such trials are generally reserved for treatments for which there is some evidence of efficacy.
6. The magnitude of the reported improvement is much larger than is typically seen in trials using just one or two nutrients.
7. No funding source is listed, or the study is listed as self-funded. This issue is especially noteworthy when the number of participants or the number of tests conducted is large, or when participants undergo relatively expensive testing.
8. The design of the study raises ethical issues, such as participants not being permitted to use treatments that have previously been reported to prevent adverse outcomes in the offspring of pregnant women.
9. One or more baseline characteristics of the study group appear to be implausible.

A few of the many papers that have caught my eye are examined below.

Prolific Iranian Researcher

In a double-blind trial from Iran, conducted by Zatollah Asemi and a coworker, and published in the *Journal of Clinical Endocrinology and Metabolism*, administration of 50 mg of soy isoflavones per day for 12 weeks significantly improved insulin resistance, hormonal status, triglyceride levels, and biomarkers of oxidative stress.[1]

For several years I have been watching the work of Asemi with skepticism, in part because of the large number of randomized controlled trials in which he has been involved and the fact that nearly every trial reported positive results (often with a large effects size), regardless of the nutrient being tested or the condition being treated. A researcher might be considered prolific if he or she was involved in, say, half-a-dozen or so randomized controlled trials over a period of a decade. In contrast, Asemi and coworkers have published (by my count) a total of 191 randomized controlled trials, including 148 between January 1, 2016 and March 30, 2019.

In a letter to the *Journal of Clinical Endocrinology and Metabolism*[2] regarding the study cited above, I pointed out that, given the stated recruitment period and duration of the

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