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The Oxalate Hazard

Steroid Hormone Testing
Pros and Cons of Various Methods

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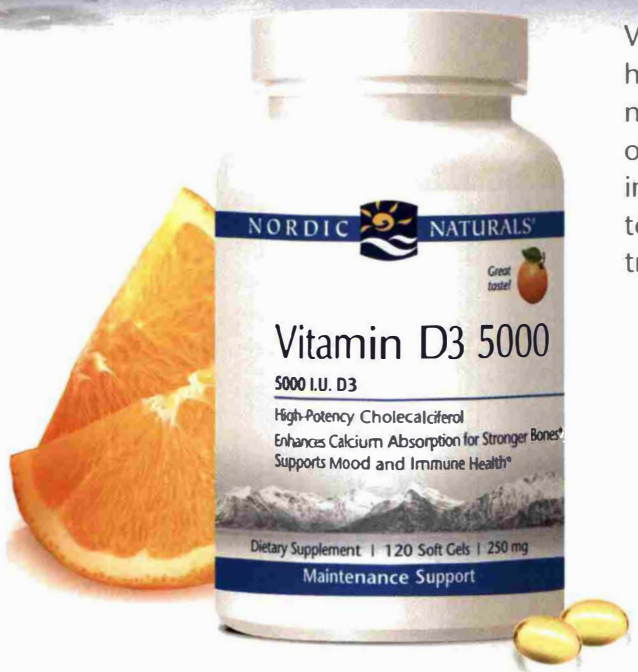
ISSUE #378
JANUARY 2015

Vitamin D3 5000

*for high-potency immune support**

New!



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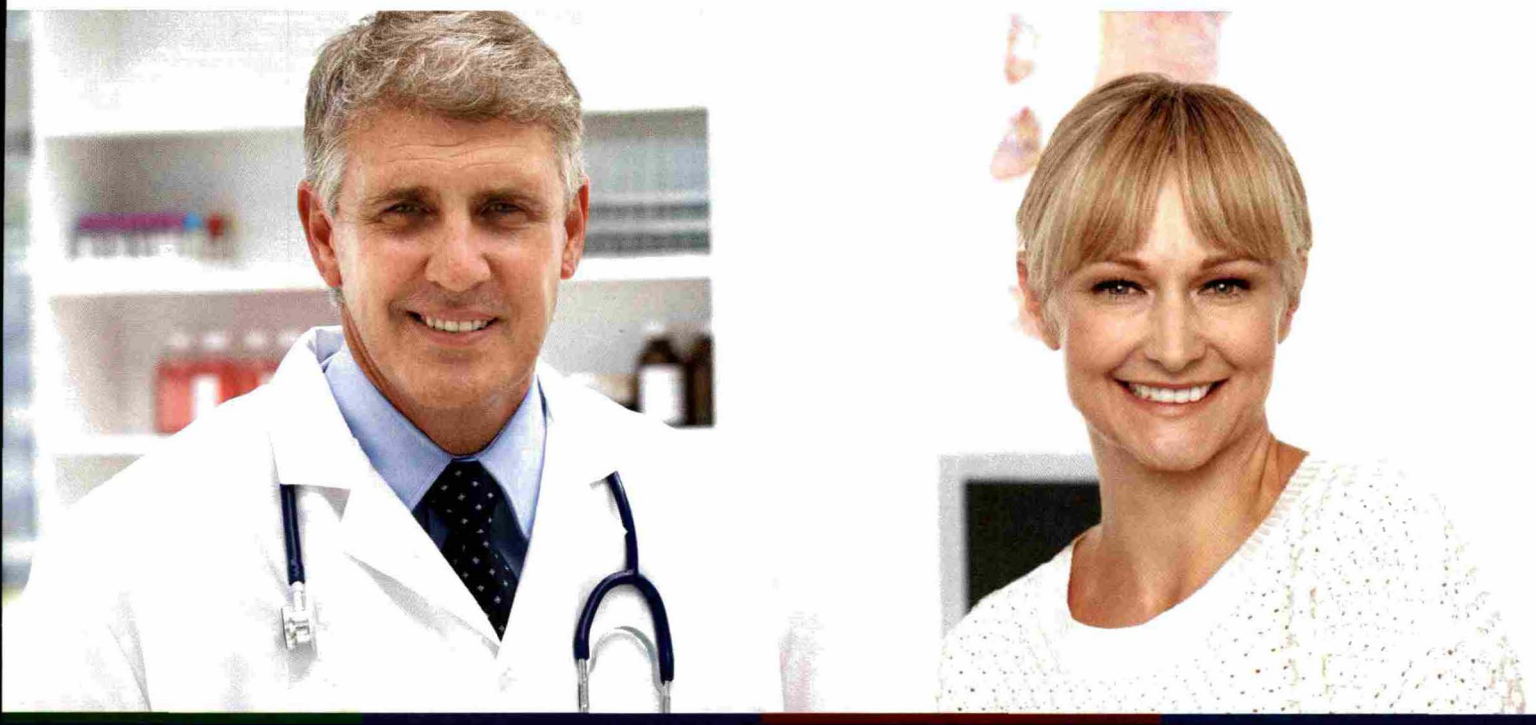

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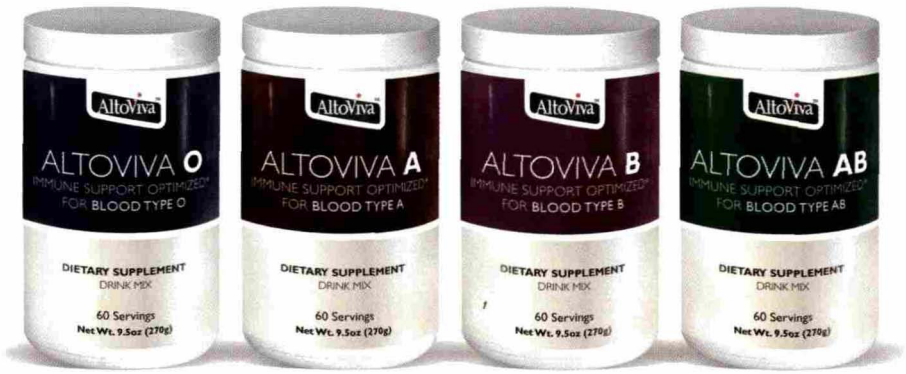

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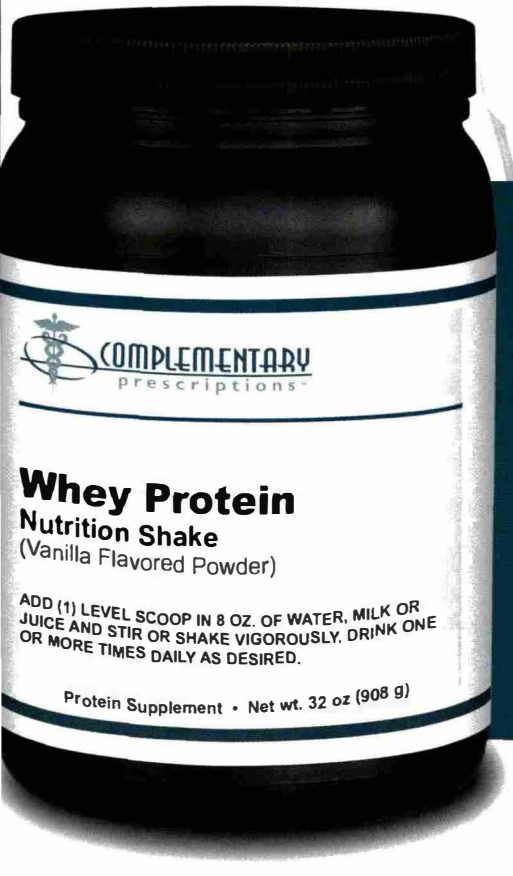

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From the Publisher

Oral Glutathione Supplementation Effective in Replenishing Glutathione Stores

One of the tenets of naturopathic and functional medicine is that stress, illness, and exposure to pollutants deplete the body of antioxidants, weakening the immune and hormonal systems. A junk-food diet inadequate in fruits and vegetables contributes to a reduction of antioxidants. Hence, the recommendation to eat one's fruits and vegetables, as moms have coaxed us for ages, is the way to build up one's antioxidants. The most important intracellular antioxidant is glutathione. However, it is difficult to accumulate adequate glutathione just from eating a well-rounded diet. Glutathione synthesis depends not only on having adequate amounts of three amino acids – cysteine, glutamic acid, and glycine – but also on the activity of two important enzymes. Variability and impairment of a glutathione-synthesizing gene will affect glutathione production. When the body is depleted of glutathione, it may fail to replenish the vital antioxidant. Hence there is a need to supplement glutathione to increase tissue content. At least two studies reported that oral glutathione supplementation was not effective in increasing glutathione

continued on page 8 ➤

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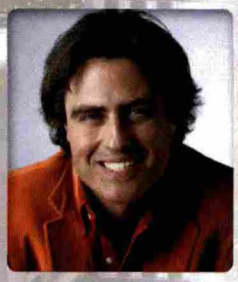

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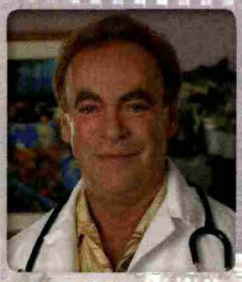

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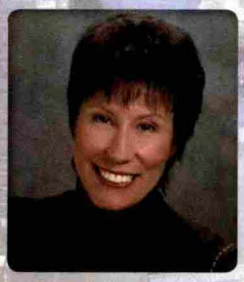

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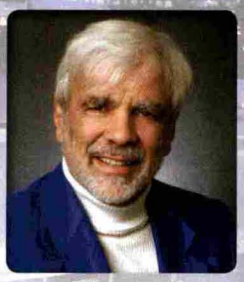

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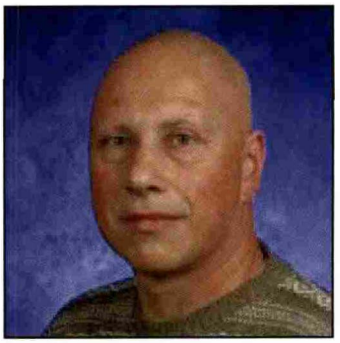
Letter from the Publisher

➤ continued from page 6

levels.[1,2] Recent research demonstrated the opposite – that oral glutathione supplementation is effective in augmenting GSH (reduced glutathione) levels in body tissues.



John P. Richie Jr., PhD

At the October 2014 Supply Side West EXPO in Las Vegas, Kyowa Hakko sponsored John P. Richie Jr., PhD, who lectured on his glutathione research. I was delighted to hear Dr. Richie's talk. Richie is a researcher at the Penn State Cancer Institute in Hershey, Pennsylvania. He is the lead author of a randomized, controlled trial of oral glutathione supplementation that was published in May 2014 demonstrating that body stores of glutathione do indeed increase with supplementation.[3] Unlike with previous studies of oral glutathione in humans, Richie's group studied supplementation for 6 months using low-dose and high-dose glutathione compared with placebo. GSH levels were measured in blood, erythrocytes, plasma, lymphocytes, and buccal mucosa. Additionally, a number of immune markers were assessed after 1, 3, and 6 months of supplementation. Impressively, GSH levels increased more than 30% in erythrocytes, plasma, and lymphocytes in patients treated with 1000 mg of oral glutathione. GSH levels also increased more than 15% in patients treated with 250 mg of glutathione. The GSH levels also increased more than 200% in the buccal mucosa in patients supplemented with high-dose glutathione. Additionally, there were reductions noted in oxidative stress in both treatment groups. The glutathione (Setria) used in the controlled trial was provided by Kyowa Hakko. Richie concluded that this is the first human trial to demonstrate that oral glutathione is able to increase GSH stores in the body. The research is consistent with numerous animal studies showing that oral glutathione is effective in replenishing glutathione body stores.

Monitoring Mercury Chelation in a Patient with Elevated Mercury Levels

One of the primary concerns that integrative physicians consider in treating patients with chronic medical problems is the possibility of a toxic element burden. While conventional medicine focuses heavily on lead toxicity in children, adults are seldom considered to have metal toxicity as a diagnosis except when there is occupational exposure or industrial accident. Alternative practitioners frequently screen patients for increased toxic elements, especially mercury and lead. Generally, blood testing for heavy metals proves to be nonsignificant, with serum

continued on page 13 ➤

For internal detox, recommend the master antioxidant.*

As a healthcare practitioner, you know glutathione is one of the most important molecules in the body because it protects cells from the damaging effects of toxins and oxidative stress. Setria® Glutathione is an absorbable tripeptide manufactured through a patented fermentation process that can help replenish the body's reserves that may be depleted through poor diet, pharmaceutical drugs and even the natural aging process.* Setria is also pure, vegetarian and allergen-free. For your patients who could use nutritional support to help lighten their internal toxic load, recommend supplements formulated with Setria.*

Clinically studied to increase blood glutathione levels[1]

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1) Enhanced glutathione levels in blood and buccal cells by oral glutathione supplementation. J.P. Richie. Published in the European Journal of Nutrition, May 2014

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PEER-REVIEWED PUBLISHED RESEARCH

Tri-Fortify™ Orange

Oral Liposomal Glutathione Gel

Experience the only liposomal glutathione that you squeeze onto a teaspoon and enjoy. No need to mix in juice. Natural orange flavor & GMO-free.

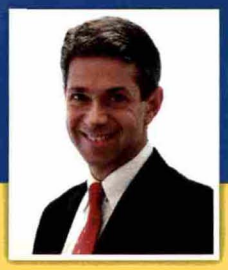
☑ HIGH DOSE

Each serving offers:

- 450 mg of reduced glutathione
- 50 mg of Vitamin C

☑ HEAT STABLE

We contracted with a third party lab to subject Tri-Fortify™ Orange to the most extreme conditions: 104°F and 75% humidity for 90 consecutive days. ***The result:*** product met and exceeded the nutrient content on the label.



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24 Hr. Fax – 360/385-0699
911 Tyler Street • Pt. Townsend, Washington 98368-6541 USA
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info@townsendletter.com

Editor-in-Chief	**Jonathan Collin, MD**
Publisher	**Jonathan Collin, MD**
Editor	**Lauren Brown**
Contributing Medical Editor	**Alan Gaby, MD**
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Columnists & Writers

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Robert A. Anderson, MD	Ronald Klatz, MD, DO
Jason Barker, ND	Ingrid Kohlstadt, MD, MPH, FACN
Eleonore Blaurock-Busch, PhD	Marianne Marchese, ND
Julie Chen, MD	Ralph W. Moss, PhD
Marcus A. Cohen	Judyth Reichenberg-Ullman, ND
Tami Duncan	Jacob Teitelbaum, MD
Nancy Faass, MSW, MPH	Jade Teta, ND
Peter A. Fields, MD, DC	Keoni Teta, ND
Alan R. Gaby, MD	Robert Ullman, ND
Michael Gerber, MD, HMD	Rose Marie Williams, MA
Robert Goldman, MD, PhD, DO, FAASP	Paul Yanick, PhD
Garry F. Gordon, MD, DO, MD(H)	Elaine Zablocki

Contributing Writers

Beatrice Trum Hunter • Gary Null, PhD • Katherine Duff

Editorial Advisory Board

Dharma S. Khalsa, MD • Tom Klaber • Robert A. Ronzio, PhD • Kerry Bone, FNIMH
Adrianne Harun • Melvyn Werbach, MD

Layout & Design	Barbara Smith/Sign Me Up! Inc.
Design Team	Barbara Smith; Joy Reuther-Costa; Jonathan Collin
Cover Art Credit	Vladimir Piskunov
Printing	Dartmouth Printing Company
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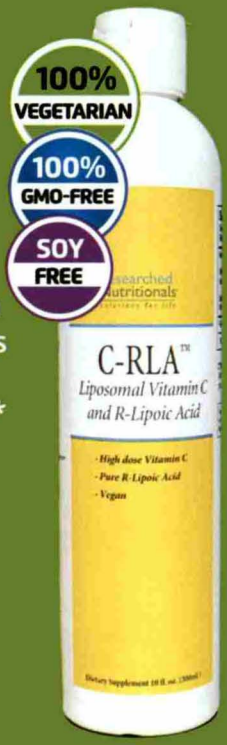

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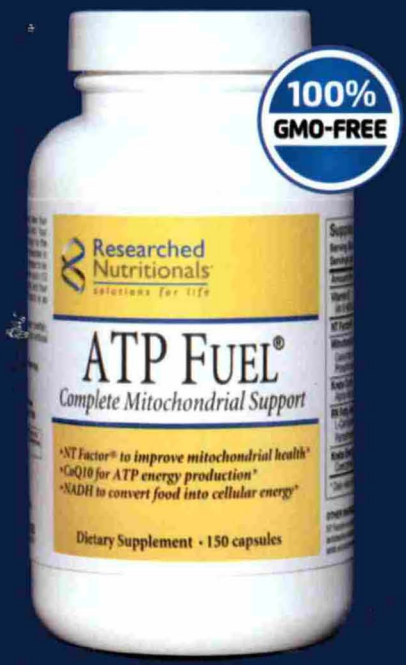

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PRODUCT BENEFITS

Supports:
Improved Memory*
Word recall*
Learning*

INDICATION

Prevagen Professional is for patients concerned with memory problems associated with normal aging and for patients who wish to support healthy brain function.*

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Prevagen Professional is a first-in-class memory supplement which contains apoaequorin, a protein originally discovered in jellyfish, shown to support neuronal calcium balance.

In a published, double-blind, placebo-controlled study, Prevagen improved memory, word recall and learning as early as 30 days. Prevagen Professional is exclusive to the healthcare practitioner market.

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Each Prevagen Professional vegetarian capsule contains 40mg of apoaequorin.

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Prevagen® Professional (apoaequorin)

EVIDENCE

The positive effects of Prevagen on cognition were demonstrated in a published double-blind, placebo-controlled trial. 218 older adults with memory concerns were assessed over a 90 day period using a computer based cognitive testing protocol developed by Cogstate Ltd.

Overall, participants in the Prevagen arm saw a significant positive change over the three month study period in the following cognitive functions:

- ✓ ***Verbal Learning****
- ✓ ***Memory****
- ✓ ***Delayed Recall****
- ✓ ***Executive Function****

Additionally, the participants scoring 0-1 on the AD8 in the Prevagen arm experienced a statistically significant and robust reduction in total cognitive errors of 29% compared to baseline.*

SUGGESTED USE

Adults take 1 vegetarian capsule daily in the morning, with or without food, or as directed by a healthcare professional.

SAFETY

Prevagen Professional is a safe and well-tolerated supplement for better memory.* Prevagen has no known drug or supplement interactions. Prevagen is made without common allergens.

Supplement Facts

Serving Size: 1 capsule
Servings per container: 180

Amount per capsule		% Daily Value
Sodium	20 mg	<1%*
Apoaequorin	40 mg	†

* Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value not established.

Other ingredients: white rice flour, cellulose, salt, vegetable sourced magnesium stearate, acetic acid.

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Letter from the Publisher

➤ continued from page 8

results revealing levels "below detection limits." However, it is not infrequent to do a hair analysis screen that reveals increased levels of mercury, lead, cadmium, or arsenic. Further screening of the patient through a provocative chelation "challenge" also reveals elevated levels of one or more toxic elements. It is uncommon, however, to measure an increased serum level of mercury in a patient without industrial exposure.

A commercial fisherman residing in Alaska presented to an integrative medical clinic in 1993 and underwent preventive lab screening including a hair analysis. The analysis revealed a marked elevation of mercury and a slight elevation of lead. The 39-year-old male did not have major medical symptoms and did not elect to pursue further diagnostics of the increased mercury level. In 2013 he developed marked dizziness that was notable while he was working on his fishing boat; he would not be stable to work on board the vessel. The dizziness was accompanied by headaches; he would need to lie supine in the wheelhouse for lengthy periods of time before attempting to walk around the boat. When he had an evaluation at the hospital clinic, it was determined that he did have indeterminate hyperopacities on MRI of the brain and unspecified monoclonal gammopathy. Multiple sclerosis was part of the differential diagnosis. He also had a marked elevation of his mercury level on serum testing of 60 mcg/L (normal less than 11 mcg/L).

As a commercial fisherman, he had a diet that included consumption of a great amount of fish, especially halibut. In addition, he had extensive dental work including multiple amalgams and other dental restorations. He also had "amalgam tattooing" of his gums, rendering his gums gray in coloration. As part of his initial workup, he did have postchelation testing of his toxic elements: both mercury and lead were markedly elevated. It was recommended that he quit eating fish while he was detoxifying his mercury burden. He initiated both IV and oral chelation using DMPS and DMSA, respectively. Retesting of his serum mercury revealed a reduction to 28 mcg/L before engaging in his chelation program. After approximately 10 IV chelation sessions and 3 weeks of oral chelation, his serum mercury level dropped to 23 mcg/L. He proceeded with further IV and oral chelation, and his mercury level decreased to 18 mcg/L. He then began a two-phase removal of all his amalgams and silver-containing restoration work. A dentist familiar with biologic dentistry and appropriate protocol for removing amalgam conducted the amalgam removal. Chelation treatment proceeded during the next month. A repeat serum mercury test revealed no mercury detected. After a few months more of IV and oral chelation, he had a repeat testing of his urine toxic elements following chelation. His urine mercury and lead levels were substantially reduced from his initial testing.

He is no longer having major dizziness or headaches, although there are some lesser symptoms. A repeat brain MRI reveals that the hyperopacities are still present but have not increased in size. The gammopathy is also present. However, he is able to carry out his fishing work now without difficulty. The neurological diagnosis is that the increased mercury burden played a key role in his symptom presentation.

This case illustrates the need to do further diagnostic evaluation of toxic elements when screening by hair analysis or postchelation testing reveals an increased toxic element burden.

Early Detection of Insulin Resistance

With the increasing incidence of obesity in the US and worldwide, there is also increasing incidence of metabolic syndrome characterized by elevated BMI, hypertension, hypercholesterolemia, and insulin resistance. While metabolic syndrome may not necessarily develop into diabetes, it increases the risk for cardiovascular disease, cancer, and neurologic disorders. Many practitioners measure fasting glucose and insulin as well as hemoglobin A1c to assess a patient's risk for insulin resistance. Pushpa Larsen, ND, reviews in this issue the testing recommended by Joseph Kraft, MD, who has researched insulin reactivity and diabetes since the 1970s. Kraft teaches that insulin resistance is better observed using a glucose tolerance test that measures both glucose and insulin at set time points. Superimposed graphs of glucose and insulin reveal remarkably abnormal patterns if both are measured for 4 hours. Larsen argues that the ready availability of newly refined finger-stick testing for insulin and glucose permits early diagnosis of insulin resistance before it has reached a severe stage.

Manual muscle testing, a technique widely employed by chiropractors, is an important diagnostic tool. In what is commonly referred to as "kinesiology," chiropractors frequently "muscle test" their patients before performing an adjustment. Kinesiology when properly performed provides a basis for a clinical diagnosis such as adrenal stress disorder. Laboratory testing using salivary hormone testing is an important means to diagnose adrenal stress disorder. Scott Cuthbert, DC, and his associates wanted to know if there was a correlation between manual muscle testing and salivary hormone screening. Cuthbert's retrospective case series report in this issue examines whether manual muscle tests and salivary hormone tests do correlate.

Jonathan Collin, MD

Notes

1. Witschi A, Reddy S, et al. The systemic availability of oral glutathione. *Eur J Clin Pharmacol.* 1992; 43: 667–669.
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3. Richie JP, Nichenametla S, et al. Randomized controlled trial of oral glutathione supplementation on body stores of glutathione. *Eur J Nutr.* Epub May 5, 2014.

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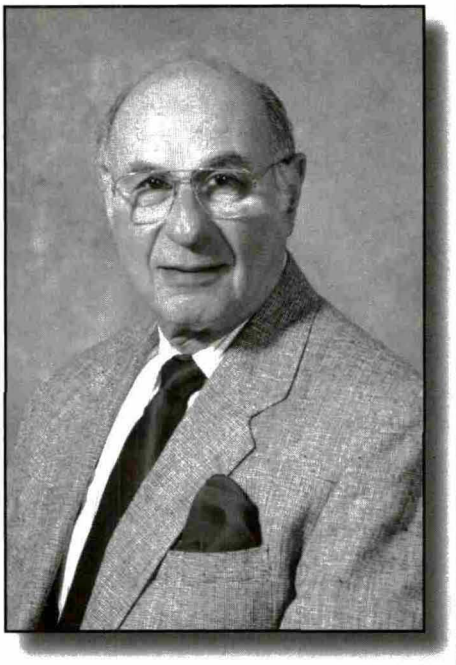
In Memoriam:
Dr. Morton Walker



Many longtime readers will remember my father's column, "Medical Journalist Report of Innovative Biologics," in the *Townsend Letter* starting back in the early days of this informative publication. My father, who always introduced himself as "Dr. Morton Walker," came along at a time when holistic medicine needed a voice and a champion. He picked up that sword, a sword disguised as a pen, a tape recorder, and a typewriter, and willingly joined the fight for natural alternatives to pharmaceutical drugs and surgery. At that time there was no Internet; all publicity had to be gotten through the print media, books, magazines, and sometimes newspapers. And there was bad publicity also; anyone fighting for holistic medicine could expect to be defamed, doctors and journalists alike, because natural medicine was under attack from all sides. Many well-meaning conventional doctors and government regulators tasked themselves with the mission that the public needed to be protected from the kooks and quacks who advocated and acted on their theories that the human body greatly benefits from the addition of natural substances that enhance its inherent healing mechanisms. There was an orchestrated attempt to silence these practitioners.

The truth is my father liked that kind of fight. He grew up in a tough ethnic neighborhood in the Queens borough of New York City where he was the outsider, so he learned from an early age to face off against a bully, and he had no hesitation about fighting back with everything he could muster. He soon realized that the greatest foes of all are old age, disease, and death, and he was determined to win that fight also.

My father wrote an amazing number of books during his journalism career, about 90. His titles included, *The Miracle Healing Power of Chelation Therapy, DMSO Nature's Healer, Nutrients to Age Without Senility, Hyperbaric Oxygen Therapy, The Gerson Therapy*, and many others. Dr. Walker's journalism career spanned 40 years, beginning with his first book, *Your Guide to Foot Health*, published in 1964 while he was still running a thriving podiatry practice, his profession prior to becoming a full-time medical journalist.

With only a degree from the Illinois College of Podiatric Medicine and about 15 years of treating patients in Stamford, Connecticut, Dr. Morton Walker began an arduous journey that tested him mightily in the realm of authoring commercially salable books on a technical subject. For the next 40 years he assisted innovative doctors and entrepreneurs with their efforts to expand the boundaries of modern medicine. The cures that he wrote about rely on the human body's own defenses against malfunction and disease. His numerous books and articles and lectures increased the popularity of these remedies at a crucial time before their widespread acceptance, a time when the main source of fund-raising for developing and researching these products and ideas came from willing patients and enthusiastic customers. Dr. Morton Walker was there and helped make that happen with his hard work and perseverance and with his boldness. His access to the print and radio media also gave a voice to everyone else who had something important to say. Many dedicated physicians, members of the American Academy for Advancement in Medicine, and *Townsend Letter* advertisers have thanked him for that over the years.

My father recently lost his battle against old age and death, but not without putting up a good fight. Thanks to Dr. Morton Walker, many patients and medical professionals now know and embrace the possibility that they have an interesting alternative to clinical allopathic medicine, a medical specialty which has evolved into "integrative medicine." As time goes on, thanks to Dr. Morton Walker and all his collaborators, editors and publishers, and the Internet, integrative medicine has a very bright future. We'll still lose the battle against old age, disease, and death, but less badly. And that's something which we can all be proud of.

Our thanks to the *Townsend Letter* and all its readers and advertisers for helping us honor the memory of our father, Dr. Morton Walker.

Sincerest regards,
Randall Walker and the Walker Family

Special Coverage of the Natural Products Expo East

September 17-20, 2014; Baltimore Convention Center; Baltimore, Maryland

by Ingrid Kohlstadt, MD, MPH

As health-care practitioners, we espouse sayings such as "You are what you eat." Each year, as more and more new foods are manufactured, it's to our benefit to become aware of which ones stand out as the most healthful. My book *PickNIC: 100 Best Brown Bag Lunches* is a resource for patients on what is currently available. A great way to experience nourishing foods even before they reach the marketplace is attending the annual Natural Products Expos.

What synchronicity. Just as the Orioles cinched the AL East Title and the humidity evaporated into glorious early autumn, Baltimore welcomed the Natural Products Expo East 2014. The expo, albeit smaller than its West Coast counterpart, is huge, with 1250 vendors exhibiting products in such categories as natural living, health and beauty, organic supplements, and grocery. Despite the event's size, my exhibit hall experience was wonderfully personable.

I got an im-"press"-ive start. When told I could only register as either press or as a health-care practitioner, I chose a press pass in order to photograph the exhibit hall. The media got perks of which I wasn't aware, such as a networking lunch to sample the top 70 new product launches. As in a Montessori classroom, vendors were eager for us to describe the multisensory experience. "How does it taste? Did the texture surprise you? Interesting aroma, yes?" Company founders shared their stories about the food industry in a way that felt refreshingly genuine. They made our job as press easy, too. "What information can I get for you? Did you have your questions answered?" Health-care professionals should be able to eat their way through the conference, too.

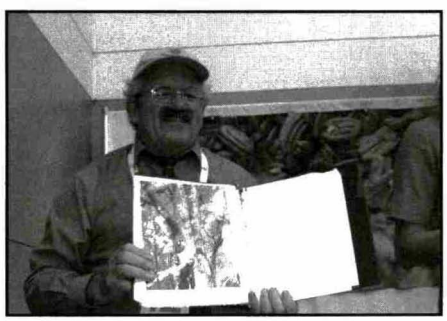
"The Best of East Award is the official Natural Products East show award, voted on by more than 300 members of the press, and given to the three most innovative products and emerging entrepreneurial brands exhibiting at the event." Based on our votes, the top three winners overall were chosen. Among them was one of my favorites, TeaPops by DeeBee's SpecialTea Foods Ltd. The company's muses are founder Dr. Dionne Laslo-Baker's two children. When one son wanted to make herb tea and the other wanted to make popsicles, they struck a deal. "Let's make tea-sicles."

Enjoy the following snapshots of my Expo East experience. May yours be as broad and flavorful! ◆

Baltimore Convention Center view of Camden Yards, where Baltimore's heritage is woven into the new story. Similarly at Expo East, people come together to find ways to safeguard important traditions while charting a bold and innovative future.

My borrowed eco bike featured here comes with petals and pedals. The blender that prepared my greens drink runs on my pedal power. What do you think; should I enter a Maker Faire?

From right to left: Katrina Kamaretsos and Dionne Laslo-Baker, PhD, of DeeBee's SpecialTea Foods; Roberta Scher of KosherEye; and David Nico, PhD.



"My trees are 290 years before GMO," beams Drew Kimmell, a managing partner of his family's multigenerational business, Missouri Northern Pecan Growers.

Law Firm Wins Major Victory for Citrulline Case

Patent attorney William R. Trueba Jr., a founding member of the intellectual property law firm of Espinosa Trueba, argued a motion for summary judgment on behalf of a joint defense group before a California federal judge, obtaining a ruling that invalidated all asserted claims of two nutritional supplement patents by a nonpracticing entity (NPE).

"This ruling sends a clear message that defending against meritless patent infringement claims may be the better approach over settling," said Trueba. "This is a major victory for the client and it illustrates the positive risk/benefit analysis between settling and defending on the merits when you know that the patents should never have been granted in the first place." Late in 2013, the US House of Representatives passed a bill to curb infringement lawsuits by NPEs, and the Senate was also considering additional legislation earlier this year.

On June 13, 2014, the Honorable Judge S. James Otero of the US District Court for the Central District of California ruled from the bench memorializing his decision. This decision dealt a huge setback to the Tawnsaura Group, a well-known California NPE who filed suit in mid-2012 against over 85 defendants that sell nutritional supplements nationwide. Judge Otero has taken a strong interest in patent infringement cases and is a founding member of the Judge Michel Intellectual Property American Inn of Court and is a Central District Patent Pilot Judge. Judge Otero has sat by designation on the US Courts of Appeals for the Federal Circuit, the appellate court that hears all patent appeals. He has also been a panel speaker for the Federal Circuit Bar Association, the American Bar Association Section of Intellectual Property Law, the Intellectual Property Law Section of the State Bar of California, American Business Trial Lawyers, the Los Angeles Intellectual Property Law Association, and the NAPABA Convention on Patent Damages.

After filing suit, Otero effectively consolidated the cases for purposes of streamlining the pretrial activities in the various cases, thus causing the creation of a joint defense group representing the various defendant companies. Throughout that time, dozens of the defendant companies settled with the Tawnsaura Group, paying the NPE licensing fees. Based upon the judge's pretrial schedule, the defendants jointly filed a motion for summary judgment seeking to invalidate the patent claims at issue in the two patents. Trueba and two other attorneys were chosen by the joint defense group of remaining defendants to divide the topics and argue the motion for summary judgment. In the days leading up the hearing, there was a flurry of settlement discussions between the Tawnsaura Group and various defendants. Two days prior to the argument, the two other attorneys designated to argue informed Trueba that their clients had in fact settled and they would not participate in the argument. Trueba reviewed the other two attorneys' topics and argued the motion. During the hearing, the judge issued a positive ruling from the bench, an uncommon occurrence in a patent infringement lawsuit. The court held that the various patent claims being asserted were invalid on the basis of prior technology and prior knowledge of the claimed methods.

In this matter, Trueba represented Vitacost.com Inc. (NASDAQ: VITC), a leading online retailer of health and wellness products, including dietary supplements. Tawnsaura alleged that Vitacost.com's sales of a vitamin supplement called L-citrulline, whose benefits on the human body were well known for many years prior to the inventor's applying for his two patents, infringed Tawnsaura's patent rights. During the course of the case, the defendants uncovered information that showed that the methods of administering L-citrulline claimed in the patents had already been practiced and used many years prior to the critical date of the patents. In fact, the defendants also learned that the named inventor of the patents, Dr. William Waugh, had attempted to publish an article on his purported discoveries, but the publication rejected the article on the basis that his disclosure did not provide any information that was not already well known.

Furthermore, defendants learned that Waugh was made aware of the commercial sales of Stimol by a French company in the early 1990s. Stimol was an L-citrulline-based supplement that was provided to patients. Waugh failed to inform the US Patent and Trademark Office about these particular events, though he had a duty to do so. Thus, the defendants asked for judgment in their favor stating that the relevant portions of two patents were invalid in view of the preexisting knowledge and use of the claimed inventions.

Earlier this year, the judge in the case asked the parties to provide supplemental briefing on the issue of whether the claimed inventions were invalid on the basis that the difference between inventions and the prior use of L-citrulline was "obvious" to those skilled in the technology. The parties did so, and the matter proceeded to oral argument. Trueba's practice focuses on the domestic and international enforcement of intellectual property rights. In addition to his electrical engineering academic background, Trueba has practical experience from his years of working in the industry. He is a patent attorney registered with the US Patent and Trademark Office. In addition to litigation, he is also experienced in the prosecution of patent and trademark applications.

The law firm Espinosa Trueba, PL, focuses on litigation and prosecution of trademarks, patents, copyrights, trade secrets, contracts in restraint of trade, customs & border protection, anticounterfeiting, cloud computing, social networking, computer law and Internet law. For more information, visit www.etlaw.com. ◆

NCNM Introduces The Hevert Collection: Historical Book Series Features Collected Works of Naturopathic Pioneer Dr. Benedict Lust

As one of the initial collaborations in the newly formed partnership between Hevert Pharmaceuticals and National College of Natural Medicine (NCNM), a new book series, The Hevert Collection: In their Own Words, has been released by NCNM Press. This remarkable 12-volume anthology unearths and dramatically restores to their original luster the revered writings of founding naturopath Dr. Benedict Lust. Through the dedicated efforts of Hevert and NCNM, and the painstaking work of editor Dr. Sussanna Czeranko, naturopathic physician and NCNM Library's rare-book curator, this historic collection has now been brought back to life and relevance.

Hevert USA President and CEO Wolf Aulenbacher said, "We are extremely pleased to support the resurrection of such an important compilation of scientific wisdom and take part in its reissue to the current generation of naturopathic practitioners. Restoring Dr. Lust's collection to light underscores our mission of bringing natural medicines based on the traditional complex homeopathic research of Pastor Emanuel Felke and Emil and Dorothea Hevert to the practitioner community and public. We commend Dr. Czeranko and NCNM for producing such a beautiful series."

The first book in the series, *Origins of Naturopathic Medicine*, is a historical overview of the formative years of the naturopathic profession drawn directly from Lust journals published between 1900 and 1923, while the second, *Philosophy of Naturopathic Medicine*, comprehensively explores the underlying conceptual foundations of naturopathy. Volumes 3 through 12 will focus on topics as far ranging as pioneering clinical practices, dietetics, and hydrotherapy. The collected articles present naturopathic medicine as it was practiced a century ago, making the wisdom of the founding American naturopathic physicians accessible to today's naturopathic practitioners.

NCNM President David J. Schleich, PhD, said, "The Hevert series affirms NCNM's enduring commitment to the roots of traditional naturopathic medicine by making the best of the early literature available again. NCNM has safeguarded the extraordinary Lust legacy for years under lock and key in our library, where it gathered dust for 27 years. We are now able to publish the priceless wisdom within these many volumes through the partnership and support of Germany's Hevert Pharmaceuticals, a family-run company dedicated to naturopathy and natural medicines. We are most grateful."

Dr. Czeranko said, "These books inform the practice of modern naturopathic medicine by taking its practitioners back to the origins of the medicine. We can learn from the early doctors as they convey their confidence and skill in treating many patients who came to them dangerously ill by using the simple tools they passed down to us. I've been practicing medicine for nearly 20 years and I've learned a tremendous amount from the pioneers of our profession."

The remaining 10 books of the series will be published successively with an expected completion date of 2016.

Ordering information: To order volumes 1 and 2 of The Hevert Collection, *Origins of Naturopathic Medicine* and *Philosophy of Naturopathic Medicine*, please visit www.ncnm.edu/origins, call 503-552-1532, or e-mail lburch@ncnm.edu.

For additional program details and information on Hevert Pharmaceuticals, please visit www.hevertusa.com.

For more on NCNM, please go to www.ncnm.edu.

About Hevert

Hevert Pharmaceuticals is dedicated to naturopathy and the development of natural medicines. An independent, family-owned company founded in Germany in 1956 and run by Marcus and Mathias Hevert, its third-generation managing directors, Hevert is one of the world's leading manufacturers of homeopathic and herbal medicines. The company's extensive product portfolio includes medicines for virtually every treatment area relevant to natural medicine.

About NCNM

Founded in Portland in 1956, NCNM is the oldest naturopathic medical school in North America and an educational leader in classical Chinese medicine and CAM research. NCNM offers three accredited four-year graduate medical degree programs in naturopathic and classical Chinese medicine, as well as master of science degrees in integrative medicine research and nutrition. Its community clinics provide low-cost medical care throughout the Portland metropolitan area. In addition to the campus-based NCNM Clinic, NCNM practitioners attend to approximately 40,000 patient visits per year. ◆

Transmission of Infectious Disease During Air Travel

by Charles B. Simone, MMS, MD

Tom Frieden, MD, director of the Centers for Disease Control, said, "At this point there is zero risk of transmission of Ebola on air flight. It does not spread from someone who doesn't have fever or other symptoms" (USA Today, October 2, 2014).

That's not exactly true (*Lancet.* 2005;365:989–996). Ebola spreads in primate's by aerosol transmission and also by direct contact with blood, mucus or other fluids from an infected person. Ebola and Lassa are two viruses that cause hemorrhagic fever. They have longer incubation periods, making infected passengers potentially symptom free and unaware that they are infected at the time of travel, even though they can spread disease by droplet transmission. These droplets are created by infected persons when they cough, sneeze, or speak; and the droplets are propelled up to 3 feet and deposited on a susceptible host's eyes or mucous membranes. Other infectious diseases that can be transmitted during air flight: tuberculosis, SARS, the common cold, influenza, meningococcal disease, measles, salmonella, cholera, and smallpox.

What can you do to help yourself?

Defend Yourself From A Viral Attack (excerpt from my book *How To Save Yourself From A Terrorist Attack*)

1. Wash your hands and face often with soap.
2. Use diluted bleach to decontaminate skin and inanimate objects.
3. Keep sinus ports open with steam.
4. Hydrogen peroxide: gargle twice a day.
5. Zinc: weekly dose 50–70 mg/day.
6. N-acetylcysteine 600 mg/day.
7. Vitamin C: 2–4 grams/day.
8. Quercetin: 500 mg twice a day.
9. Jet planes should use only outside air for the cabin. Commercial airlines are a suitable environment for the spread of infectious disease carried by passengers or crew. The air quality in the cabin is important. Request the pilot to bring in fresh air from the outside. This increases the use of fuel and therefore is not frequently done because of cost. You can also turn off the vents just above your head to prevent that recirculated cabin air from blowing directly on your face.

Charles B. Simone, MMS, MD, is an internist (Cleveland Clinic 1975–1977), medical oncologist (National Cancer Institute 1977–1982), tumor immunologist (NCI 1977–1982), and radiation oncologist (University of Pennsylvania 1982–1985), and is the founder of the Simone Protective Cancer Institute (1980). He wrote *Cancer and Nutrition, A Ten Point Plan for Prevention and Cancer Life Extension* (1981; 3rd rev. 2005), *The Truth About Breast Health – Breast Cancer* (2002), *The Truth About Prostate Health – Prostate Cancer* (2005), *How to Save Yourself from a Terrorist Attack* (2001), and *Nutritional Hydration, Medical Strategy for Military and Athlete Warriors* (2008); helped organize the Office of Alternative Medicine (NIH; 1992); helped write the Dietary Supplement Health and Education Act of 1994, helped win landmark cases against the FDA by showing that it violated the First and Fifth Amendment rights of Americans; helped introduce the Health Freedom Protection Act of 2005 (H.R. 2117); and was bestowed the first Bulwark of Liberty Award in 2001 by the American Preventive Association and the James Lind Scientific Achievement Award in 2004.

In 1980 Dr Simone founded the Simone KidStart Prevention Program, the first of its kind. Since 1980 he has worked with inner-city churches to teach prevention, detection, and treatment. He is a consultant for heads of state of the US and other countries and for celebrities, and advises many governments regarding health care. He testifies for the Senate and House on matters concerning health, cancer, disease prevention, children's health programs, FDA reform, and alternative medicine. He appears on *60 Minutes*, *Primetime* Live, Fox News, and others. Dr Simone coaches some world-class elite endurance athletes, such as Khalid Khannouchi ("Greatest marathoner ever" – *USA Today*), some Gold Medal Olympians, and others. He developed the patented Nutritional Hydration formula (Simone Super Energy) that was first used in desert warfare in 1990, worked closely with Special Operations Forces, and in December 2003 was presented with the Distinguished Speaker Award at the Special Operations Medical Conference in Tampa, Florida. Dr Simone is currently working to improve combat effectiveness using nutritional hydration for the Air Force Special Operations Command at Hurlburt Field, Florida. All of his research in prevention, detection, and treatment is culminating in his most compelling work that will positively change the health-care system. Recognizing a looming health-care crisis, he submitted a simple method in 1993 that was finally patented. Dr Simone's method is imperative to follow because of ObamaCare. Employees, no matter what duration of employment, pay an increased portion of health insurance premiums *and* can voluntarily participate in the program that quantifies costs for controllable risk factors. Employees can change that behavior or take personal responsibility for the increased cost attributable to the behavior by paying more for insurance. America spends the most on health, ranks last among the top 19 nations, and has one of the highest infant mortality rates. Without Simone's initiative, we will witness the catastrophic collapse of the health system – then America as we know it.

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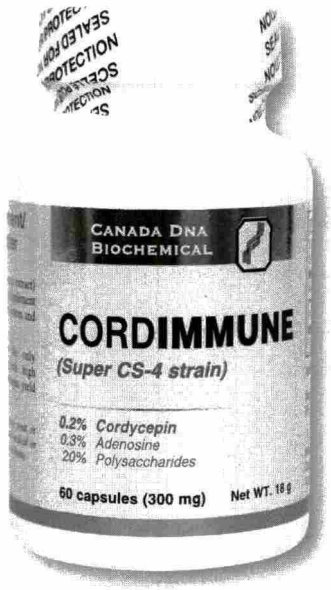

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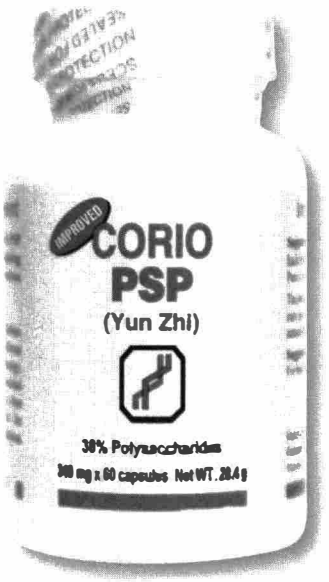

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Pathways to Healing

by Elaine Zablocki

Finding Health Insurance Information When You Need It

Kathryn A. Paez, RN, PhD

Kathryn A. Paez, RN, PhD, started out as a nurse in a hospital med-surg unit. "Nurses are very focused on prevention, maintaining health, and helping people live with chronic conditions," she says. "I was one of the first certified diabetes educators in the country. Diabetes has always focused on educating patients to self-manage their conditions, so I began thinking about ways to apply this approach to other health conditions."

Paez assembled a team of therapists, physicians, and nurse educators to work with arthritis patients and try different approaches to see what worked best. "We took a holistic approach to help people be more functional in living with arthritis," she says. "We developed a pool therapy program and it was very successful. Exercise in a warm water pool meant people could improve their muscle strength without putting weight on their joints. Going forward we developed a community pool exercise program for people with arthritis that reduced their pain so they could live more actively."

She describes this as one of her first experiences in health-care quality improvement. "Quality improvement is really about trying different approaches to see what actually works," she says. Today she is a principal researcher at the American Institutes for Research (AIR), a nonpartisan, not-for-profit organization that conducts behavioral and social science research. Much of her work focuses on quality improvement, chronic conditions, and disparities in health-care delivery.

Most recently, Paez coauthored an issue brief titled "A Little Knowledge Is a Risky Thing: Wide Gap in What People Think They Know about Health Insurance and What They Actually Know." Last fall, when AIR conducted a national study on how much Americans know about health insurance, it found wide gaps. For example, while about 3 out of 4 Americans are confident that they know how to use health insurance, only half of the people who responded to the survey could describe the general characteristics of different kinds of health plans. Only 1 in 5 could correctly calculate how much they would owe for a routine doctor visit.

Most people could identify common insurance terms, such as "appeal" and "premium," but fewer could identify more complicated concepts, such as "step therapy" or "medically necessary." When comparing plans, most people were moderately or very likely to find out which hospitals and physician were covered in each plan, but a sizeable minority wasn't likely to consider this basic information.

The survey found that people who haven't been insured in the past may have significant misconceptions about how health insurance works. "We found that some of them equate health insurance with car insurance, so they think there will be a deductible every time you go in," Paez said. "We also found that some people expect health insurance to pay for everything."

Seek Health Insurance Information During Open Enrollment

Each year there's an open enrollment period for health insurance when people can sign up for coverage or change to a different health plan for the coming year. The current open enrollment period for the marketplaces created by the Affordable Care Act began November 15, 2014, and continues until February 15, 2015.

The AIR issue brief includes a valuable consumer checklist with key questions to review when choosing health insurance. AIR recommends talking to a marketplace navigator for help in understanding health insurance

options, and using an online calculator to estimate out-of-pocket costs.

However, exactly what sort of resources will be available depends on your location. "Some states have many people available to provide counseling. They are called 'navigators' or 'assistors,'" Paez says. "Generally the state-based marketplaces have more consumer assistance resources than the federal marketplaces." She recommends going to www.healthcare.gov, where you can enter your zip code and get suggestions on where to go for help. This website includes links to all the state marketplace websites; those websites generally offer information about community groups offering free advice and information about health insurance.

The Affordable Care Act means that all insurers now offer a standardized summary of benefits and coverage, to make it easier for consumers to compare different plans. "Consumers should look at the examples of coverage for specific situations at the end of these standardized documents," Paez says. "For example, they all offer calculations on the coverage offered for a typical year of diabetes care, or a typical pregnancy, and labor and delivery."

Finding the Best Care for Chronic Illness

People with chronic, hard-to-diagnose illnesses often have great difficulty finding the most appropriate form of care. "I know from personal experience within my family that this is challenging. There is no magic answer," Paez says. "My most effective solution is to be persistent and talk with many people within your community. When you talk with physical therapists, occupational therapists, and counselors, since they're working with patients who see many different physicians, they often have a good idea about the most suitable physicians for a particular condition."

She adds that it's always best to look for a physician who treats many patients with a specific condition, who spends time reading about it, who knows from experience what works and what doesn't work. "Find somebody who really takes an interest in that particular condition," Paez says. "The other thing is, team-based care is always better."

She looks at arthritis as an example. "Find a rheumatologist who works together with physical therapists, occupational therapists, counselors, perhaps a physiatrist (a doctor of physical medicine)." Many primary care clinics and medical homes are setting up integrated teams where several practitioners work together. "In team-based care, practitioners tend to have more in-depth knowledge about a condition, because they learn from the other team members," Paez says. "They know what other practitioners are going to do, so they mutually reinforce each other's treatments."

She suggests one more resource of special interest to anyone who values complementary medicine. Under the Affordable Care Act, insurance plans must cover 10 different categories of "essential health benefits." Each state was able to select an existing plan and use it as a benchmark for these benefits. The existing plans varied from state to state, so now coverage for essential benefits is defined differently in various states. The end result: chiropractic care is an essential benefit in 45 states, acupuncture in 5 states. California is an anomaly because it includes acupuncture as an essential health benefit but not chiropractic care.

For more details, see "Essential Health Benefits: 50-State Variations on a Theme," listed in the Resources section.

Resources

AIR Issue Brief on Health Insurance Literacy: http://www.air.org/sites/default/files/Health%20Insurance%20Literacy%20brief_Oct%202014_amended.pdf.

Insurance Counseling Resources for People Under Age 65: https://www.healthcare.gov/apply-and-enroll/get-help-applying.

Insurance Counseling Resources for People Age 65 and Over: http://www.seniorsresourceguide.com/directories/National/SHIP.

Summary of Benefits and Coverage under the Affordable Care Act: http://www.cms.gov/CCIIO/Programs-and-Initiatives/Consumer-Support-and-Information/Summary-of-Benefits-and-Coverage-and-Uniform-Glossary.html.

Guide to Health Insurance Marketplaces: https://www.healthcare.gov/get-coverage. This website offers specific information for each state, including links to state marketplaces.

Essential Health Benefits – Variation among the States: http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2014/rwjf416179. This issue brief includes a chart showing which states include chiropractic and/or acupuncture as essential benefits.

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

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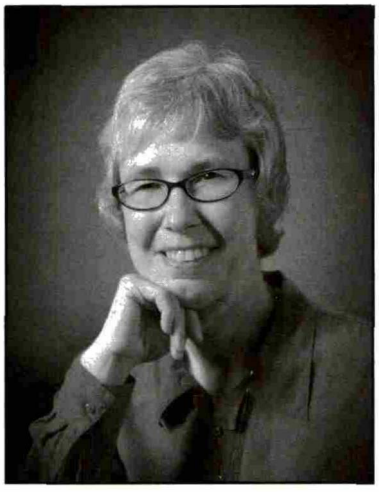

Shorts

briefed by Jule Klotter
jule@townsendletter.com

FDA Whistle-Blowers

Public safety is not the FDA bureaucracy's primary focus, according to agency whistle-blowers. About six years ago, a group of FDA scientists, responsible for reviewing medical imaging devices, became frustrated with FDA upper management's refusal to acknowledge safety issues. The scientists believed that some mammography and colonoscopy imaging devices exposed patients to dangerous levels of radiation. The scientists contacted Congress members, the White House, and the Health and Human Services inspector general. Two of the scientists were quoted in a March 2010 *New York Times* article about device safety.

Instead of reexamining its stance on the devices, FDA upper management approved covert installation of spy software on the scientists' computers. For two years, FDA officials intercepted "confidential letters to at least a half-dozen Congressional offices and oversight committees, drafts of legal filings and grievances, and personal e-mails," according to Eric Lichtblau and Scott Shane at the *New York Times*. The FDA justified the surveillance as being necessary to protect device manufacturers' trade secrets.

After accidentally learning about the surveillance, six scientists filed a lawsuit in September 2011, accusing the FDA of violating their constitutional rights. Four of the scientists had already lost their jobs. In September 2014, Judge Reggie B. Walton dismissed the case because the scientists had not completed the Civil Service administrative complaint process before filing suit. The Office of Special Counsel, which is charged with protecting whistle-blowers, began a full investigation into the scientists' device safety claims in 2012; but the investigation has not yet concluded.

FDA bureaucratic concern for protecting companies at the expense of consumer safety is also present in the agency's drug division, according to Ronald Kavanagh, PharmD, PhD, a former FDA drug reviewer. In an interview with Martha Rosenberg for Truthout, Kavanagh said, "While I was at FDA, drug reviewers were clearly told not to question drug companies and that our job was to approve drugs. We were prevented, except in rare instances, from presenting findings at advisory committees." If a reviewer refused to approve an unsafe drug despite management pressure, management gave the review "to someone who would simply copy and paste whatever claims the company made in the summary document," says Kavanagh.

According to the Food, Drug, and Cosmetic Act, FDA employees are legally allowed to share trade secrets with members of Congress when public safety is at risk. However, FDA management threatens reviewers with job termination, jail, or worse if they speak against the agency, according to Kavanagh. Most people succumb to the pressure.

Lichtblau E, Shane S. Vast F.D.A. effort tracked e-mails of its scientists. *New York Times*. July 14, 2012. Available at http://www.nytimes.com/2012/07/15/us/fda-surveillance-of-scientists-spread-to-outside-critics.html?pagewanted=all&_r=0. Accessed October 14, 2014.

Rein L. Judge dismisses lawsuit by FDA whistleblowers. *Washington Post*. September 24, 2014. Available at http://www.washingtonpost.com/blogs/federal-eye/wp/2014/09/24/judge-dismisses-lawsuit-by-fda-whistleblowers. Accessed October 14, 2014.

Rosenberg M. Former FDA reviewer speaks out about intimidation, retaliation and marginalizing of safety [online article]. Truthout. July 29, 2012. http://truth-out.org/news/item/10524. Accessed October 14, 2014.

Hospital Microbe Environment

"A new hypothesis says that hospital-acquired infections are being driven not by the existence of harmful microbes but by the absence of helpful species," according to an *Environmental Health Perspectives* article by Carrie Arnold. Like the human body, indoor environments are home to countless beneficial, neutral, and disease-producing microbes. Before genetic sequencing technology became available, microbiologists relied on growing cultures to track microbes in the environment, but many microbes do not culture easily or at all. As a result, the vast diversity and number of environmental microbes remained undetected.

Microbiologists are now aware that disease-causing microorganisms found in hospitals are just part of an ecosystem with its own checks and balances. Antimicrobial cleaning solutions that target pathogens also kill harmless bacteria that compete with pathogens. "'Some sterilization efforts may not be helpful in the long run because you're going to be clearing out ecosystems which are then vulnerable to being recolonized by pathogens and not just regular, boring bacteria,'" microbial ecologist Jonathan Eisen told Arnold.

The Hospital Microbiome Project, led by environmental biologist Jack Gilbert, is looking at the formation of indoor microbial ecosystems. Gilbert's team collected microbes with cotton swabs from floors, air vents, beds, computers, and other surfaces several times a day for over a year in University of Chicago's new hospital pavilion, starting before its opening in February 2013. Initial observations indicate a dynamic microbial exchange between building and occupants. "'Humans shed microbes wherever we go,' Gilbert says." Consequently, a room's microbial population quickly changes with each new patient. "'Within hours,'" he told Arnold, "'the new person's microbiome became the dominant force in that room.'"

The reverse also occurs. Research at a neonatal intensive care unit (NICU), led by microbial ecologist Brandon Brooks, shows that a hospital's microbiome can change human microbial composition. Microbial population of a newborn's gastrointestinal tract begins during the birth process and gradually increases with exposure to the world outside the womb. Brooks and colleagues took fecal samples from NICU newborns and samples from NICU surfaces every three days. The researchers observed that the predominant bacterial species in the NICU (*Staphylococcus epidermidis, Klebsiella pneumoniae, Bacteroides fragilis,* and *Escherichia coli*) became the main bacterial species in the babies' fecal samples.

If antimicrobial cleaning solutions aren't the best method for controlling pathogen populations, what is? Architectural design and environmental conditions, such as ventilation and humidity, may hold the answer. Rooms with the greatest airflow and humidity had the lowest percentage of potential pathogens, according to a 2011 study at Oregon's Providence Milwaukie Hospital. "'Back in the 1800s, Florence Nightingale knew that patients did better with an open window,' [microbial ecologist James Meadow] says. 'We've known for a while that just opening a window can drastically change the microbes around us in the air, and this might just influence our health in the long run.'"

Arnold C. Rethinking sterile: the hospital microbiome. *Environ Health Perspect.* July 2014;122(7):A182–A186. Available at http://ehp.niehs.nih.gov/122-A182. Accessed November 15, 2014.

Nutrigenomics

Genetic tests spawned by the new field of nutrigenomics (or nutritional genomics) present intriguing clinical possibilities and a need for consumer caution. Nutrigenomics refers to the interplay between genes and nutrition: "... how nutrients affect gene function and how genetic variation affects nutrient response" (Nielsen & El-Sohemy). Direct-to-consumer genetic nutritional tests, available on the Web, do not always live up to their claims, says journalist Anne Hart. Some companies use testing as the basis for making

inaccurate predictions about future illness, illness that can be averted with the company's overpriced supplements. Others simply provide generalized dietary advice regardless of genetic variations. Costs for the direct-to-consumer tests range from about $100 to $1000 or more.

The clinical possibilities for nutritional genetic testing are exemplified by the experience of Lara Pizzorno, recounted in the book *Pottenger's Prophecy*. Lara developed osteopenia during midlife despite a bone-healthy lifestyle and supplements. Her mother, aunt, and grandmother suffered with osteoporosis, indicating a genetic component. A genetic test showed that Lara had a vitamin D receptor genetic variation that lessened vitamin D's ability to bind to cell receptors. With the guidance of her husband, naturopathic physician Joseph Pizzorno, Lara gradually increased supplemental D3 intake to 25,000 IU twice a week and 4000 IUs on the remaining days. Although these high doses would be toxic for some people, Lara's body responded with normal D3 levels and bone recalcification.

Nutrigenomic testing might encourage people to make beneficial dietary changes, according to a study conducted by Canadian researchers Daiva E. Nielsen and Ahmed El-Sohemy. Their 2012 randomized controlled study involved 149 highly-educated adults (aged 20–35 years). The control group received reports with general dietary advice regarding caffeine, vitamin C, sugar, and sodium intake. The intervention group received the same advice along with their genotype, an explanation of the genotype, and a personalized recommendation for each of the four dietary components. For example, the caffeine section gave Health Canada's recommendation for daily consumption and provided sources of caffeine and content amount. In addition to this general information, the intervention group received personal genetic-based advice such as "Since you have the CC version of the CYP1A2 gene, you might benefit from limiting your caffeine intake to no more than 200 mg/day." More participants receiving the personalized reports than controls found the dietary advice understandable (93% vs. 78%; $p = 0.009$) and useful (88% vs. 72% ; $p = 0.02$).

The UK's Nutrition Society, at its 2012 Summer meeting in Belfast, Ireland, looked at nutrigenomics and personalized nutrition. Michael J. Gibney and Marianne C. Welsh found "few ethical and legal issues" involved in providing dietary recommendations according to genotype. However, the effect of such advice needs to be tested in dietary intervention studies with patient groups having the same genotypes.

Gibney MJ, Walsh MC. Conference on "Translating nutrition: integrating research, practice and policy." Symposium 2: Intervention study design and personalized nutrition [abstract]. *Proceed Nutr Soc.* May 2013;72(2):219–225. Available at http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8884175&fileId=S0029665112003436. Accessed October 23, 2014.

Graham G, Kesten D, Scherwitz L. *Pottenger's Prophecy*. Tumwater, WA: Destiny Health Publishing; 2011:18–20.

Hart A. Best DNA testing firms for tailoring foods to your genetic signature. Examiner.com. February 14, 2010. Available at www.Examiner.com/article/best-dna-testing-firms-for-tailoring-foods-to-your-genetic-signature. Accessed November 9, 2014.

Nielsen DE. El-Sohemy A. A randomized trial of genetic information for personalized nutrition. *Genes Nutr.* 2012;7:559–566. Available at www.ncbi.nlm.nih.gov/pmc/articles/PMC3448037. Accessed October 23, 2014.

Polymerase Chain Reaction (PCR) Testing for Infectious Disease

Polymerase chain reaction (PCR) assay, which amplifies DNA, is used to test for infectious organisms that are difficult or impossible to culture, such as *Leptospira, Ehrlichia,* and some viruses and mycobacteria. When RNA is converted to DNA (reverse transcriptase) before amplification, the process is called RT-PCR. In addition to identifying uncultivable organisms, PCR and RT-PCR assays have the advantage of obtaining quick results, often within 24 hours. A positive PCR test result, however, does not necessarily mean that a person is sick, according to Colorado State University Diagnostic Laboratories: " ... because the technique detects DNA or RNA of both live and dead organism, positive test results may be achieved even if the infection has been controlled."

"The most serious shortcoming of the RT-PCR assay is the greater ease with which false positives and false negatives can be generated," according to a 2004 article about the use of RT-PCR during the August 2000–January 2001 Ebola outbreak in Uganda. Several factors can compromise results, including sample contamination, antimicrobial drugs given before taking a sample, and the presence of RT-PCR inhibitors in a patient's blood. German researcher Christian Drosten and colleagues say that plasma from patients with severe viral hemorrhagic fevers, such as yellow fever and Ebola, "may contain large amounts of RT-PCR inhibitors, probably resulting from the decay of tissue." PCR inhibitors increase false-negative results. (CDC recommends PCR use within a few days after symptoms arise, not in patients with late stage Ebola or after recovery.) The Ugandan researchers used an antigen-capture diagnostic assay (IgG ELISA assay) in addition to PCR and found the combination "very effective as field diagnostic tools."

The US Department of Defense and the US Centers for Disease Control developed three RT-PCR assays, which the FDA authorized for emergency use in 2014, to detect Ebola virus DNA. Neither RT-PCR nor antigen-capture ELISA detects Ebola before symptoms arise. Symptoms of Ebola include fever (greater than 38.6 °C or 101.5 °F), severe headache, muscle pain, weakness, diarrhea, vomiting, abdominal (stomach) pain, and unexplained hemorrhage (bleeding or bruising). These symptoms usually appear between 8 to 10 days after exposure to Ebola but can arise as early as 2 days or as late as 21 days after exposure. "Laboratory test results should always be considered in the context of clinical observations and epidemiologic data in making a final diagnosis and patient management decisions," the CDC says.

Centers for Disease Control and Prevention. Diagnosis: Ebola hemorrhagic fever [Web page]. September 19, 2014. www.cdc.gov/vhf/ebola/diagnosis/index.html. Accessed October 14, 2014.

Colorado State University Veterinary Diagnostic Laboratories. PCR detection of infectious diseases. *Lab Lines.* Spring/Summer 2010. Available at http://csu-cvmbs.colostate.edu/Documents/vdl-lablines-volume-15-issue-01.pdf. Accessed October 14, 2014.

Drosten C, Panning M, Guenther S, Schmitz H. False-negative results of PCR assay with plasma of patients with severe viral hemorrhagic fever. *J Clin Microbiol.* November 2002; 4394-4395. Available at www.ncbi.nlm.nih.gov/pmc/articles/PMC139694/pdf/0722.pdf. Accessed October 14, 2014.

Towner JS, Rollin PE, Bausch DG. Rapid diagnosis of Ebola hemorrhagic fever by reverse transcription-PCR in an outbreak setting and assessment of patient viral load as a predictor of outcome. *J Virol.* April 2004;4330--4341. Available at www.ncbi.nlm.nih.gov/pmc/articles/PMC374287/pdf/1940.pdf. Accessed October 17, 2014.

Verifying Scientific Studies

Studies published in respected, peer-reviewed journals tend to be taken at face value. Preclinical discoveries in these journals become the impetus for new avenues of treatment before independent researchers have verified the original research. Upon closer examination, however, many studies cannot be confirmed. When two companies – Amgen (U.S.) and Bayer HealthCare (Germany) – looked at the science underlying their research and development projects, their scientists were dismayed. Bayer HealthCare scientists found that only 24% of the studies that provided foundational support for the company's R&D projects could be confirmed. For Amgen, only 6 of 53 "landmark papers" – just 11.3% – were sound. "Whole fields of research, including some in which patients were already participating in clinical trials, are based on science that hasn't been, and possibly can't be, validated," wrote Michael Hiltzik in his *Los Angeles Times* article.

Why are confirmatory studies not being performed? Researchers and journals aspire to publish articles that attract widespread attention. "'A paper that actually shows a previous paper is true would never get published in an important journal,'" biologist Michael Eisen, cofounder of the open-access repository Public Library of Science (PLoS), told Hiltzik, "'and it would be almost impossible to get that work funded.'"

Prepublication peer review cannot take the place of scientific validation. In the flurry of excitement over a novel study, flaws can be overlooked. Moreover, most experts perform peer review without pay and are busy with their own projects. Eisen told Hiltzik that " ... unpaid reviewers seldom have the time or inclination to examine a study enough to unearth errors or flaws."

The US National Institutes of Health hopes to encourage ongoing peer review with its website PubMed Commons (www.ncbi.nlm.nih.gov/pubmedcommons), introduced in October 2013. PubMed Commons allows any scientist whose work appears in PubMed to post comments about published papers. Instead of relying on just a handful of reviewers, PubMed Commons makes it possible for an article to be reviewed by legions of scientists – if they have time and interest. Scientists' comments are open to the public.

Hiltzik M. Science has lost its way, at a big cost to humanity. *Los Angeles Times.* October 27, 2013. Available at http://articles.latimes.com/2013/oct/27/business/la-fi-hiltzik-20131027. Accessed November 15, 2013.

Phone Applications to Monitor Health

Will smartphone applications (apps) become useful tools for personal health care? Spanish researchers are researching smartphone applications designed to encourage physical activity and a Mediterranean diet. The Evident II study will randomize 1215 people under 70 years of age into a control group or an intervention group. Both the control and intervention groups will be instructed in ways to adopt a Mediterranean diet and achieve the physical activity equivalent of 10,000 steps per day.

In addition, the intervention group will learn to use a smartphone app. The app records diet choices and physical activity and analyzes the data in order to give personalized recommendations for reaching diet and exercise goals.

For 3 months, the intervention subjects will select dishes/foods from the app's menu and enter their actual food intake into the smartphone. Subjects will also enter time spent performing physical activity other than walking. The smartphone's accelerometer records the number of steps walked throughout the day. The app provides a daily diet-activity summary and makes recommendations for the next few days.

In addition to testing the app's effect on behavior and lifestyle change, the researchers will look for effects on vascular structure and function. They will assess central arterial pressure, the radial augmentation index, pulse velocity, the cardio-ankle vascular index, and carotid intima-media thickness of all participants at baseline, 3 months, and after 12 months. This double-blind study should provide good information on the app's ability to encourage lifestyle change and the effect of those changes on the cardiovascular system.

Smartphone apps can do more than encourage healthful diet and exercise practices. David Erickson, professor of mechanical and aerospace engineering at Cornell University (Ithaca, New York), is overseeing The PHeNoM (Public Health, Nanotechnology, and Mobility) project. This National Science Foundation-supported project is developing three applications for smartphones: a Stress-Phone for stress management, a Hema-Phone for monitoring viral loads in HIV-positive patients, and a Nutri-Phone for monitoring blood nutritional levels. The Stress-Phone will measure stress levels in the user's voice with the smartphone's microphone. The Nutri-Phone and Hema-Phone will use the smartphone's camera to accurately read test strips. Erickson and colleagues have already developed the vitaAID (vitamin AuNP-based Immunoassay Device) and tested its ability to measure 25-hydroxyvitamin D blood levels. "'Eventually we hope that the Nutri-Phone will measure a multitude of vitamin and micronutrient deficiencies like A, B12 and iron, as well as D and be deployed in the developing world where nutritional deficiencies are most prevalent,'" Erickson said in a Cornell University press release.

Cornell University. Future phones to use blood and speech to monitor HIV, stress, and nutrition [online press release]. August 19, 2014. www.newswise.com/articles/view/622231. Accessed October 8, 2014.

Lee S, Oncescu V, Mancuso M, Mehta S, Erickson D. A smartphone platform for the quantification of vitamin D levels. *Lab Chip.* 2014:14:1437–1442. Available at http://nano.mae.cornell.edu/pubs/Lee_LOAC_2014.pdf. Accessed October 14, 2014.

Recio-Rodriguez JI, Martin-Cantera C, González-Viejo N, et al. Effectiveness of a smartphone application for improving healthy lifestyles, a randomized clinical trial (EVIDENT II): study protocol. *BMC Public Health.* 2014; 14:254. Available at www.BioMedCentral.com/content/pdf/1471-2458-14-254.pdf. Accessed October 14, 2014.

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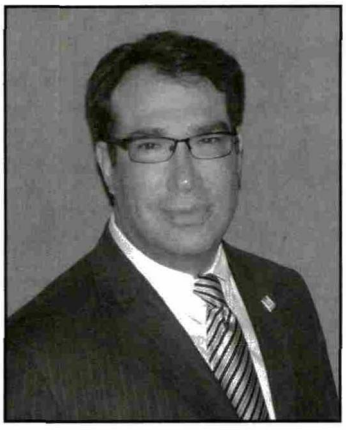
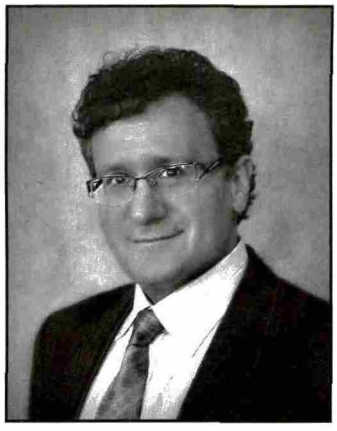


Anti-Aging Medicine

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



Advancements in Diagnostics to Assess Alzheimer's Disease

Alzheimer's Disease International reports that as of 2013, there were an estimated 44.4 million people with dementia worldwide. This number is projected to increase to an estimated 75.6 million in 2030, and 135.5 million in 2050, largely attributable to demographic aging that reflects the successes of improved health care over the last century. Many are now living longer and healthier lives and so the world population has a greater proportion of older people.

There is currently no cure for Alzheimer's disease or for most other causes of dementia. From an anti-aging perspective, at this time it is most essential to ascertain how to prevent the disease from occurring and how to stop its progression. As such, in this article we review recent diagnostic innovations that hold great promise in promoting early detection and prevention of Alzheimer's Disease.

Dementia statistics [Web page]. Alzheimer's Disease International. http://www.alz.co.uk/research/statistics. Accessed 2 Sept. 2014.

Blood Test May Help Assess Memory Loss

Thrombogenic microvesicles are shed by activated platelets in the blood, and higher levels may raise the risk of developing white matter hyperintensities (WMH) in the brain, among postmenopausal women. Mayo Clinic (Minnesota, US) researchers report that they may be an indicator of the risk of developing WMH – small areas of brain damage that have been linked to memory loss. Kejal Kantarci and colleagues analyzed 95 women, average age 53 years, who were a subset of those enrolled in the Mayo Clinic Kronos Early Estrogen Prevention Study, in which magnetic resonance imaging (MRI) was used to measure changes in WMH before randomization and at 18, 36, and 48 months afterward. At the study's start, the researchers measured conventional cardiovascular risk factors, carotid intima-media thickness, coronary arterial calcification, plasma lipids, markers of platelet activation, and numbers of thrombogenic microvesicles. They correlated those with changes in WMH volume, adjusting for a number of factors. On average across the subjects, the volume of WMH rose by 63 mm3 at 18 months, 122 mm3 at 36 months, and 155 mm3 at 48 months. Whereas only the 36- and 48-month levels were significantly different from baseline, these levels were significantly correlated with the numbers of platelet-derived and total thrombogenic microvesicles observed at baseline, and not with the other measured risk factors. The study authors conclude: "Associations of platelet-derived, thrombogenic microvesicles at baseline and increases in [white matter hyperintensities] suggest that in vivo platelet activation may contribute to a cascade of events leading to development of [white matter hyperintensities] in recently menopausal women."

Raz L, Jayachandran M, Tosakulwong N, et al. Thrombogenic microvesicles and white matter hyperintensities in postmenopausal women. *Neurology*. 2013 Feb 13.

New Biomarker of Alzheimer's Disease

Mitochondrial DNA (mtDNA), present in cerebral spinal fluid (CSF), emerges as a novel biomarker of Alzheimer's disease – signaling the disease a decade before symptoms manifest. Ramon Trullas, from the CSIC Institute of Biomedical Research (Spain), and colleagues have discovered that a decrease in the content of mtDNA in CSF may be a preclinical indicator for Alzheimer's disease; furthermore, there may be a directly causative relationship. The team hypothesizes that decreased mtDNA levels in CSF reflect the diminished ability of mitochondria to power the brain's neurons, triggering their death. The decrease in the concentration of mtDNA precedes the appearance of well-known biochemical Alzheimer's biomarkers (the A[beta]1-42, t-tau, and p-tau proteins), suggesting that the pathophysiological process of Alzheimer's disease starts earlier than previously thought. The study authors submit: "These findings support the hypothesis that mtDNA depletion is a characteristic pathophysiological factor of neurodegeneration in [Alzheimer's disease].

Podlesniy P, Figueiro-Silva J, Llado A, et al. Low CSF concentration of mitochondrial DNA in preclinical Alzheimer's disease. *Ann Neurol*. 22 June 2013.

Predictive Blood Test

A blood test, developed and validated by Howard J. Federoff and colleagues from Georgetown University Medical Center (Washington DC, US), may predict with

greater than 90% accuracy if a healthy person will develop mild cognitive impairment or Alzheimer's disease within 3 years. The test identifies 10 lipids in the blood that predict disease onset. The researchers examined if the presence of the APOE4 gene, a known risk factor for developing Alzheimer's disease, would contribute to accurate classification of the groups, but found it was not a significant predictive factor in this study. Writing, "This biomarker panel, reflecting cell membrane integrity, may be sensitive to early neurodegeneration of preclinical Alzheimer's disease," the study authors are optimistic that the test could be ready for use in clinical studies in as few as two years.

Mapstone M, Cheema AK, Fiandaca MS, et al. Plasma phospholipids identify antecedent memory impairment in older adults. Nature Medicine, 9 March 2014. Demographics data via James BD, Leurgans SE, Hebert LE, Scherr PA, Yaffe K, Bennett DA. Contribution of Alzheimer disease to mortality in the United States. *Neurology*. 2014 Mar 5.

DIY Cognitive Screening

A self-administered test may help spot early symptoms of cognitive issues. Researchers at Ohio State University (US) have developed a do-it-yourself test that can help doctors spot early symptoms of cognitive issues in their patients. The Self-Administered Gerocognitive Examination (SAGE test) can also be taken at home by patients, who can then share the results with their physicians to promote early disease detection. Taking less than 15 minutes to complete, Douglas Scharre and colleagues posit that the SAGE test enables doctors to get a baseline of cognitive function in their patients, so they can be followed for a later onset of Alzheimer's disease. As well, the team suggests that the SAGE test could also provide health-care providers and caregivers an earlier indication of life-changing events that could lie ahead. Earlier research by Scharre found that 4 out of 5 people (80%) with mild thinking and memory (cognitive) issues will be detected by this test, and 95% of people without issues will have normal SAGE scores. Observing, "From ... 1,047 individuals over age 50 screened with SAGE ...cognitive impairment was identified in 28%," the study authors submit: "Community cognitive screening using SAGE was found to be feasible and efficient in diverse settings with both small and large groups."

Scharre DW, Chang SI, Nagaraja HN, Yager-Schweller J, Murden RA. Community Cognitive Screening Using the Self-Administered Gerocognitive Examination (SAGE). *J Neuropsychiatry Clin Neurosci*. 2014 Jan 13.

Measuring the Aging Brain

Arterial health in the brain is essential for optimal brain aging and may serve a preventive role against Alzheimer's disease and aging-related cognitive decline. Monica Fabiani and colleagues from the University of Illinois (US) devised a novel optical imaging technique to measure pulse pressure of the brain's cortex. The initial results using this new technique find that arterial stiffness is directly correlated with cardiorespiratory fitness: the more fit people are, the more elastic their arteries. Because arterial stiffening is a cause of reduced brain blood flow, stiff arteries can lead to a faster rate of cognitive decline and an increased chance of stroke, especially in older adults. Studying a group of 53 participants, aged 55 to 87 years, via the new optical imaging technique, the study authors report, "Regional pulse transit time predicts specific neuropsychological performance."

Fabiani M, Low KA, Tan CH, et al. Taking the pulse of aging: Mapping pulse pressure and elasticity in cerebral arteries with optical methods. *Psychophysiology*. 2014 Aug 6.

There are 7.7 million new cases of dementia each year, implying that there is a new case of dementia somewhere in the world every 4 seconds. Thanks to diagnostic advancements such as those profiled above, scientists have state-of-the-art tools to ascertain how to prevent Alzheimer's disease from occurring and how to stop its progression.

To learn of the latest anti-aging diagnostics technologies that may help with the early detection and prevention of Alzheimer's disease, visit the World Health Network (www.worldhealth.net), the official educational website of the A4M and your one-stop resource for authoritative anti-aging information. Be sure to sign up for the free Longevity Magazine e-journal, your weekly health newsletter featuring wellness, prevention, and biotech advancements in longevity. ◆

Environmental Medicine Update

by Marianne Marchese, ND
www.drmarchese.com

Updates to the Fourth Report on Human Exposure to Environmental Chemicals

Introduction

Physicians who treat patients suffering from the health effects of chemicals in the environment are always looking for the most accurate and reliable means of testing for body burden. *Body burden* refers to the amount of chemicals present in one's body at a given point in time. In the past, people were only tested for a chemical in the body when there was suspected poisoning; for example, if a child had ingested a paint chip, a blood test for lead would be sent to a toxicology lab to see if the level was elevated. The reference ranges used by toxicology labs are high because they are typically monitoring patients with high amounts of chemicals in the body, such as poisoning or occupational exposure. In the past two decades, doctors and other professionals have become aware of the health effects of daily low-dose chemical exposure in the general population. Determining the body burden of these individuals has lead to several large national studies.

Body Burden Studies

In March 2001, PBS aired a special revealing the results of journalist Bill Moyer's body burden tests. As part of a study of pollutant loads in the human body sponsored by the Mount Sinai School of Medicine in New York, samples of Bill Moyers's blood and urine were analyzed. Eighty-four distinct chemicals were found, many of which are known to be carcinogenic and hormone disruptors.[1] In 2005, the Environmental Working Group did a body burden test on infants. It found an average of 200 industrial chemicals and pollutants in umbilical cord blood from 10 babies born in August and September 2004 in US hospitals. Tests revealed a total of 287 chemicals in the group.[2] Also in 2005, the Toxic Free Coalition decided to run a body burden study on 10 people living in the state of Washington. They tested the hair, blood, and urine of 10 volunteers who did not have a job exposing them to chemicals. Every person tested had at least 26 and as many as 39 of the toxic chemicals in his or her body. This pollution in people came from everyday activities and products.[3] The chemical industry criticized these studies for their small sample size; inconsistent testing methods, since some used blood, some urine, and some hair; the varying reference ranges used by different labs; and the fact that the tests were performed by environmental special interest groups. But then came the results of body burden tests from the Centers for Disease Control and Prevention (CDC).

NHANES

The National Health and Nutrition Examination Survey (NHANES) is a program of studies designed to assess the health and nutritional status of adults and children in the US. The survey is unique in that it combines interviews and physical examinations. NHANES is a major program of the National Center for Health Statistics (NCHS), which is part of the CDC and has the responsibility for producing vital and health statistics for the nation. The program began in the 1960s as a simple questionnaire; but in 1999, the survey became a continuous program that has a changing focus on a variety of health and nutrition measurements to meet emerging needs. The survey examines a nationally representative sample of about 5000 persons each year in the US. Unbeknownst to many, one of the health measurements being gathered was body burden of chemicals.[4]

The CDC issued the First National Report on Human Exposure to Environmental Chemicals in March 2001. It presented exposure data for 27 chemicals from the 1999 NHANES. The second report, released in January 2003, presented exposure data for 116 environmental chemicals (including the 27 in the first report) for the noninstitutionalized, civilian US population during 1999 and 2000. The third report, released July 2005, lists

148 chemicals measured during 2001–2002, including detection of newer chemicals such as phthalates and lower reference ranges for chemicals. The fourth report was released in 2009 and presents data for 212 chemicals, including 75 previously untested compounds. It includes the findings from nationally representative samples in the US for 1999–2004. The fourth report, for the first time, also includes levels of solvents (30 different compounds) and provides adult values for mercury. In the majority of individuals tested, acrylamides, cotinine, trihalomethanes, bisphenol A, phthalates, chlorinated pesticides, triclosan, organophosphate pesticides, pyrethroids, heavy metals, aromatic hydrocarbons, polybrominated diphenyl ethers, benzophenone from sunscreen, perfluorocarbons from nonstick coatings, and a host of polychlorinated biphenyls and solvents were found.[5]

The goals of the CDC NHANES fourth report is more than establishing that body burden of chemicals exists. It is clear by now that the entire US population has some level of toxic chemicals in their bodies. The most recent report and updates establishes the prevalence of individuals with chemicals in their bodies whose levels exceed the safe limit. It also establishes reference values that can be used by physicians instead of relying on the reference ranges used by a particular laboratory. Proper reference ranges have been the biggest concern when testing patient body burden.

Updates

There have since been several updates to the fourth report, the most recent being August 2014.

This update was released soon after the updated tables for July 2014 because of errors in sampling weights that have recently been discovered by the NCHS in selected data files for NHANES 2011–2012.

Compared with the updated tables for September 2013, the August 2014 tables present data for 35 new chemicals and updates on 16 chemicals. It also has updated tables for 129 chemicals and new tables for 70 chemicals.[6]

Why did the CDC release updated tables? What is new and different? The updated tables include chemicals that have results available from the NHANES survey periods 2007–2008 or 2011–2012. New chemicals measured for the first time include ethyl mercury, methyl mercury, selenium, and manganese in whole blood. Urinary metabolites of several volatile organic compounds and urine manganese, strontium, and tin were measured in a special sample of adult smokers and nonsmokers. Chemicals with updated data in this release are serum cotinine (from cigarette smoke); urinary NNAL (from cigarette smoke); metals in whole blood; and urinary metabolites of pyrethroids, herbicides, and specific organophosphorus pesticides.[7] This gives physicians more accurate reference ranges when testing patients for body burden of chemicals. The new tables also provide blood ranges based on age, ethnicity, and gender. Blood mercury tables differentiate total mercury, inorganic mercury, ethyl, and methyl mercury levels. There are tables for urinary levels of heavy metals as well. Again, these updated tables listed in the full Updates to the fourth report provide excellent references ranges that can be used to interpret testing for body burden. Here is a partial example of the updated table of blood cadmium and blood lead.

Blood Cadmium: Geometric mean and selected percentiles of blood concentrations (in ug/L) for the US population from the NHANES.

Age Group	Survey Years	Geometric Mean (95% conf. interval)	50th	75th	90th	95th	Sample Size
20 Years and Older	99–00	.468	.400	.700	1.10	1.50	4207
	01–02	.425	.400	.600	1.10	1.60	4772
	03–04	.378	.400	.600	1.20	1.80	4525
	05–06	.373	.330	.610	1.17	1.72	4509
	07–08	.376	.330	.600	1.16	1.70	5364
	09–10	.358	.320	.580	1.10	1.55	5765
	11–12	.337	.300	.550	1.14	1.70	5030

Blood Lead: Geometric mean and selected percentiles of blood concentrations (in ug/L) for the US population from the NHANES.

Total	Survey Years	Geometric Mean (95% conf. interval)	50th	75th	90th	95th	Sample Size
	99–00	1.66	1.60	2.50	3.80	5.00	7970
	01–02	1.45	1.40	2.20	3.40	4.50	8945
	03–04	1.43	1.40	2.10	3.20	4.20	8373
	05–06	1.29	1.27	2.01	3.05	3.91	8407
	07–08	1.27	1.22	1.90	2.80	3.70	8266
	09–10	1.12	1.07	1.70	2.58	3.34	8793
	11–12	.973	.930	1.52	2.38	3.16	7920

Summary

The NHANES National Report on Human Exposure to Environmental Chemicals is the largest body burden study on the general US population to date. Four reports have been published so far with the most recent being the fourth report published in 2009. Since the fourth report, there have been several updates to existing tables and new tables added as more and more chemicals are discovered in people in the US. The adverse health effects of these chemicals are clearly documented, and physicians are being asked by patients to test for the presence of these chemicals. The updated tables, some listed here, can provide better reference ranges than the ones used by labs. These guidelines will better detect small amounts of toxicants in the body and help link chemicals to certain health problems.

Dr. Marchese is the author of *8 Weeks to Women's Wellness*. She maintains a private practice in Phoenix, Arizona, and teaches gynecology at Southwest College of Naturopathic Medicine. She was named in *Phoenix Magazine*'s Top Doctor Issue as one of the top naturopathic physicians in Phoenix. Dr. Marchese is currently vice president of the Council on Naturopathic Medical Education and was recently appointed by Arizona Governor Jan Brewer to the State of Arizona Naturopathic Physicians Medical Board.

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6. National Report on Human Exposure to Environmental Chemicals. Op cit.
7. Ibid.

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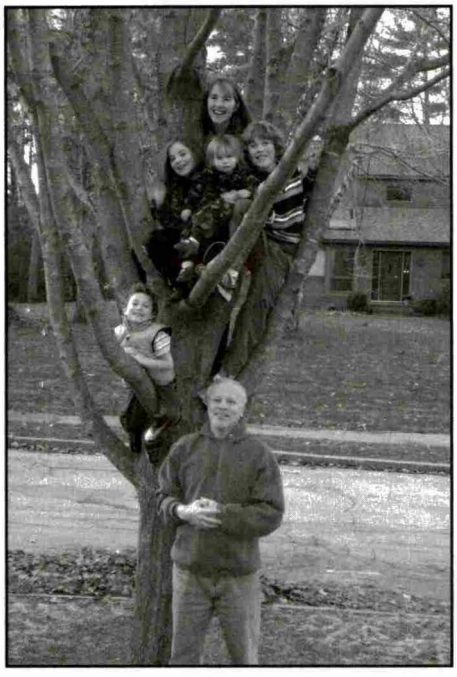

Literature Review & Commentary

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

5-Hydroxytryptophan Effective for Depression

Seventy patients (mean age, 37 years) who were experiencing their first episode of depression were randomly assigned to receive, in double-blind fashion, 5-hydroxytryptophan (5-HTP) or fluoxetine for 8 weeks. The dosage of 5-HTP was 50 mg 3 times per day for 2 weeks, then 100 mg 3 times per day for 2 weeks, then 400 mg per day in 3 divided doses per day. The dosage of fluoxetine was 20 mg per day for 2 weeks, then 30 mg per day for 2 weeks, then 40 mg per day. Beginning in week 2, both groups showed a significant reduction (improvement) in the mean score on the Hamilton Rating Scale for Depression. The improvement was slightly and nonsignificantly greater in the fluoxetine group than in the 5-HTP group. Adverse effects were slightly and nonsignificantly more common in the fluoxetine group than in the 5-HTP group. The most common adverse effects in both groups were nausea, anorexia, and headaches; insomnia was also a common side effect in the fluoxetine group.

Comment: The results of this study suggest that 5-HTP is as effective or nearly as effective as a commonly used selective serotonin-reuptake inhibitor (SSRI). Both 5-HTP and SSRIs work by increasing serotonin activity in the brain: 5-HTP by serving as a precursor for serotonin, and SSRIs by preventing the reuptake of serotonin at nerve synapses. Because 5-HTP and SSRIs both increase serotonin activity, they should not in most circumstances be used together, because combining them could increase the risk of developing serotonin toxicity (serotonin syndrome).

While 5-HTP appears to be an effective and relatively safe treatment for depression, it may be preferable to use L-tryptophan instead to treat depression. Unlike 5-HTP, L-tryptophan is a building block for protein synthesis and is also metabolized to important compounds such as niacin and picolinic acid. Consequently, if a person is deficient in tryptophan, then supplementing with L-tryptophan would provide a broader spectrum of benefits than would treatment with 5-HTP. In addition, 5-HTP bypasses tryptophan hydroxylase (the rate-limiting enzyme involved in serotonin synthesis) and therefore bypasses a potential regulatory mechanism for preventing excessive serotonin production. In my experience, an effective dosage regimen for L-tryptophan is 1000 to 1500 mg twice a day, taken between meals or at bedtime. The addition of niacinamide (500 or 1000 mg with each L-tryptophan dose) appears to enhance the efficacy of L-tryptophan by inhibiting the enzyme tryptophan pyrrolase, which breaks down tryptophan in the liver.

About 25 years ago, L-tryptophan supplements were implicated as the cause of an epidemic of eosinophilia-myalgia syndrome, a serious and sometimes fatal condition. This epidemic was traced to a single manufacturer of L-tryptophan, which had changed its manufacturing process and introduced a contaminant into the product. The manufacturing error was identified and corrected relatively quickly, and there have been no reports of eosinophilia-myalgia syndrome resulting from the use of uncontaminated tryptophan.

Jangid P et al. Comparative study of efficacy of L-5-hydroxytryptophan and fluoxetine in patients presenting with first depressive episode. *Asian J Psychiatr.* 2013;6:29–34.

Green Tea Extract for Uterine Fibroids

Thirty-nine Egyptian women of reproductive age (mean age, 42 years) who had symptomatic uterine fibroids, with at least 1 fibroid lesion 2 cm^3 or larger (confirmed by transvaginal ultrasonography) were randomly assigned to

receive, in double-blind fashion, 800 mg per day of green tea extract (containing 45% EGCG; n = 22) or placebo (n = 17) for 4 months. Thirty-three women completed the trial (22 in the active-treatment group and 11 in the placebo group). The mean total fibroid volume decreased in the EGCG group by 32.6% and increased in the placebo group by 24.3% ($p < 0.001$ for the difference in the change between groups). Compared with placebo, EGCG treatment resulted in a significant improvement in the mean symptom severity score (which measured symptoms such as heavy menstrual bleeding, tightness or pressure in the pelvic area, and feeling fatigued; $p < 0.0001$) and the mean Health-Related Quality of Life score ($p < 0.02$). No adverse effects, endometrial hyperplasia, or other endometrial pathology were observed.

Comment: Uterine fibroids (also called leiomyomas) are benign tumors of the smooth muscle tissue of the uterus (myometrium). They are a common problem among women of reproductive age. Fibroid growth is stimulated by estrogen and progesterone, which explains in part why fibroids occur mainly during the reproductive years. Various medications and surgical procedures are often used to control fibroids or their associated symptoms.

EGCG has been reported to inhibit the proliferation of, and to induce apoptosis in, human leiomyoma cells in experimental animals and in vitro. This effect is thought to be due to the inhibitory effect of EGCG on catechol-O-methyltransferase, an enzyme that appears to play a role in the pathogenesis of uterine fibroids. The results of the present study suggest that a green tea extract containing a high concentration of EGCG was effective in decreasing the size of uterine fibroids and improving their associated symptoms.

Roshdy E et al. Treatment of symptomatic uterine fibroids with green tea extract: a pilot randomized controlled clinical study. *Int J Womens Health*. 2013;5:477–486.

Omega-3 Fatty Acids for Canker Sores

Fifty patients (mean age, 33 years) with recurrent aphthous ulcers were randomly assigned to receive, in double-blind fashion, a capsule containing 300 mg of eicosapentaenoic acid and 200 mg of docosahexaenoic acid 3 times per day or placebo for 6 months. The mean number of ulcers per month, the mean duration of ulcers, and the mean pain level of ulcers all improved progressively in the active-treatment group during the course of the study, whereas no significant changes were seen in the placebo group. In the active-treatment group, the mean number of ulcers per month decreased from 6.4 at baseline to 0.76 after 6 months (88% decrease; $p < 0.001$ for the difference between groups in the last month of the study). Active treatment was also significantly more effective than placebo with respect to duration of ulcers and pain level of ulcers ($p < 0.001$ for each comparison in the last month of the study). The beneficial effect of active treatment over placebo for each of the measured parameters reached statistical significance in the third month.

Comment: In this study, supplementation with moderate amounts of the omega-3 fatty acids present in fish oil decreased both the frequency and severity of recurrent aphthous ulcers. The dosages used are equivalent to about 1.7 g per day of fish oil. The study was conducted in Egypt, where fish consumption is similar to the world average. Other interventions that have been found to be beneficial for preventing recurrences of aphthous ulcers include identifying and avoiding allergenic foods; correcting deficiencies of nutrients such as iron, zinc, and B vitamins; and avoiding toothpastes that contain sodium lauryl sulfate.

El Khouli AM, El-Gendy EA. Efficacy of omega-3 in treatment of recurrent aphthous stomatitis and improvement of quality of life: a randomized, double-blind, placebo-controlled study. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2014;117:191–196.

Vitamin C Prevents Myocardial Injury During Angioplasty

Five hundred thirty-two patients undergoing elective percutaneous coronary intervention were randomly assigned to receive, in double-blind fashion, 3 g of vitamin C intravenously in 250 ml of isotonic saline over 100 minutes, or isotonic saline alone (control group), 2 to 6 hours before the procedure. The primary end point was periprocedural myocardial injury defined as an increase of the troponin I level to more than 5 times the upper limit of normal. The secondary endpoint was periprocedural myocardial injury defined as an increase of the creatine kinase-MB (CK-MB) level to more than 5 times the upper limit of normal. The incidence of periprocedural myocardial injury was significantly lower in the vitamin C group than in the control group, as defined by each method of assessment: (troponin I, 10.9% vs. 18.4%; 41% reduction; $p < 0.02$; CK-MB, 4.2% vs. 8.6%; 51% reduction; $p < 0.04$).

Comment: Percutaneous coronary intervention (commonly known as angioplasty) is a procedure used to open narrowed coronary arteries. Myocardial injury, as demonstrated by elevated levels of troponin I or CK-MB, may occur as a complication of the procedure in up to 30% of cases, and such injury has been associated with an increased risk of later clinical outcomes such as death, myocardial infarction, and need for repeat revascularization procedures. The results of the present study indicate that intravenous administration of vitamin C can decrease the risk of myocardial injury during percutaneous coronary intervention. Vitamin C presumably works by decreasing free radical-induced cell damage.

Wang ZJ et al. The effect of intravenous vitamin C infusion on periprocedural myocardial injury for patients undergoing elective percutaneous coronary intervention. *Can J Cardiol*. 2014;30:96–101.

Melatonin for Endometriosis

Forty women (aged 18–45 years) with endometriosis were randomly assigned to receive, in double-blind fashion, 10 mg of melatonin or placebo once a day at bedtime for 8 weeks. Compared with placebo, melatonin significantly decreased (improved) mean scores for daily pain by 40%,

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dysmenorrhea by 38%, dysuria, and constipation ($p < 0.01$ for all comparisons). Melatonin also improved sleep quality ($p < 0.02$ compared with placebo).

Comment: Endometriosis is characterized by the presence of endometrial tissue at sites outside the uterus. Manifestations include pelvic pain, dysmenorrhea, painful intercourse, and infertility. The cause of endometriosis is unknown. Conventional therapy may include various medications (e.g., gonadotropin-releasing hormone agonists, progestins, or oral contraceptives) and surgical removal of affected tissue. The results of the present study suggest that melatonin is of value for this difficult-to-treat condition. The mechanism of action of melatonin may be related to its analgesic and anti-inflammatory properties.

Schwertner A et al. Efficacy of melatonin in the treatment of endometriosis: a phase II, randomized, double-blind, placebo-controlled trial. *Pain.* 2013;154:874–881.

Chewing Gum Improves Postoperative Recovery

One hundred forty-nine women (mean age, 54 years) undergoing abdominal surgical staging (including total abdominal hysterectomy with pelvic and paraaortic lymphadenectomy) for various gynecological cancers were randomly assigned to a gum-chewing group or a control group. The patients in the gum-chewing group chewed sugarless gum 3 times per day, starting on the first postoperative morning and continuing until the first passage of flatus. Each chewing session lasted 30 minutes. Mean time before passage of flatus (34.0 vs. 43.6 hours; $p<0.001$), mean time until a bowel movement occurred (41.5 vs. 50.1 hours; $p = 0.001$), mean time until the patients tolerated a diet (4.0 vs. 5.0 days; $p < 0.001$), and mean length of hospital stay (5.9 vs. 7.0 days; $p < 0.001$) were significantly shorter in the gum-chewing group than in the control group. Mild ileus symptoms were observed in 36% of patients in the control group and 14.9% of patients in the gum-chewing group ($p = 0.004$).

Comment: This study demonstrated that chewing gum following major abdominal surgery accelerated recovery of bowel function and decreased the length of hospital stay. Previous studies have shown similar results. Gum chewing works by stimulating bowel motility. Use of this simple and inexpensive intervention could decrease surgical complications and reduce the cost of health care.

Ertas IE et al. Influence of gum chewing on postoperative bowel activity after complete staging surgery for gynecological malignancies: a randomized controlled trial. *Gynecol Oncol.* 2013;131:118–122.

Chewing Gum May Cause Headaches in Children

Thirty children and teenagers (aged 6–19 years) with chronic headaches (mostly migrainelike) and excessive gum chewing were asked to stop chewing gum for 1 month, and then to resume the habit. During the period of no gum chewing, 26 of the 30 patients reported significant improvement, and headaches disappeared completely in 19. All 20 patients who resumed gum chewing experienced a return of headaches within days to 1 week. The number of daily hours of chewing had no influence on the response to the intervention.

Comment: These findings suggest that excessive gum chewing can cause headaches in some children and teenagers. The authors of the study hypothesized that overuse of the temporomandibular joint was the cause of the headaches. However, sensitivity to aspartame may have played a role in some cases, as has been reported previously.

Watemberg N et al. The influence of excessive chewing gum use on headache frequency and severity among adolescents. *Pediatr Neurol.* 2014;50:69–72.

N-Acetylcysteine for Gambling Addiction

Twenty-eight individuals with nicotine dependence and pathological gambling who were receiving behavioral therapy (imaginal desensitization) were randomly assigned to receive, in double-blind fashion, N-acetylcysteine (NAC) or placebo for 12 weeks. The initial dosage of NAC was 1200 mg per day; this was increased to a maximum of 3000 mg per day, based on clinical judgment. After 12 weeks, NAC and behavioral therapy were discontinued, and the subjects were reassessed 3 months later. During the 3-month follow-up period, compared with placebo, NAC significantly decreased the severity of problem gambling ($p < 0.05$), as measured by the mean score on the pathological gambling adaptation of the Yale-Brown Obsessive-Compulsive Scale.

Comment: Pathological gambling is an impulse control disorder characterized by persistent and recurrent maladaptive gambling behavior that disrupts relationships and daily activities. There is evidence that a subnormal concentration of glutamate in the nucleus accumbens region of the brain increases compulsive or addictive behaviors. Administration of NAC has been shown to increase glutamate concentrations in the nucleus accumbens. The results of the present study suggest that NAC can enhance the beneficial effects of behavioral therapy in nicotine-dependent pathological gamblers, and that the effect of NAC persists at least 3 months after treatment is discontinued.

Grant JE et al. A randomized, placebo-controlled trial of N-acetylcysteine plus imaginal desensitization for nicotine-dependent pathological gamblers. *J Clin Psychiatry.* 2014;75:39–45.

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Mobilization Tests and Urine Reference Ranges: An Overview

by E. Blaurock-Busch, PhD

Urine is a liquid waste product. This fluid produced by the kidneys consists of excess water and the toxic waste products from food and drink. It normally is a clear, transparent fluid of amber color. The urine of an inadequately hydrated person is more concentrated and darker in color, while the urine of a well-hydrated person is light. The more hydrated a person is, the more watery the appearance of the urine. When taking riboflavin-containing B vitamins, urine turns to dark-yellowish. After the consumption of red beets, urine turns purplish red, because the beet color is not metabolized by the body and thus excreted as is.

The average amount of urine excreted in 24 hours is from 40 to 60 ounces (about 1200 cubic centimeters or 1.2 liters). Chemically, the urine is mainly an aqueous (watery) solution of salts (sodium chloride and other metals), urea, and uric acid. Normally, urine contains about 960 parts of water to 40 parts of solid matter. Abnormally, it may contain sugar (in diabetes), albumen (as in some forms of kidney disease), bile pigments, or abnormal quantities of one or another of its normal components.

Why Test Urine Creatinine?

Creatinine is a breakdown product of creatine, an important part of muscle. Creatinine is removed from the body entirely by the kidneys.

Urine creatinine levels reflect fluid intake and excretion. Therefore, creatinine levels are used as a mathematical factor for determining the urinary metal output. Metal levels based on urine creatinine take into account the fluid volume passing through the kidneys. Laboratories no longer need to ask the patient to provide information regarding urine volume or output.

Urine creatinine results depend on age, sex, and body mass. A high protein intake can result in elevated levels. A high fluid intake causes urine creatinine levels to drop; a reduced fluid intake or kidney stress raises levels.

Urine Creatinine Levels in Baseline Urine

Micro Trace Minerals, Germany, and Trace Minerals International of Boulder, Colorado, statistically evaluated creatinine levels of first morning urines, also called baseline urines. We tested 977 patients of both sexes, 12 years and older. The mean value was 1.1 g/L creatinine. For children under 12 years of age, the statistical evaluation showed a mean value of 0.9 g/L creatinine.

A urine creatinine test is by itself not a reliable indicator of kidney function. Often, abnormal results of urine creatinine are nonspecific, easily influenced by fluid intake (or dehydration). In the presence of abnormal results, check if the following conditions are present:

- glomerulonephritis
- pyelonephritis
- reduced renal blood flow (as in shock or congestive heart failure)
- renal failure
- rhabdomyolysis
- urinary tract obstruction
- muscular dystrophy (late stage)
- myasthenia gravis
- high-meat diet

During chelation, the urine creatinine concentration tends to fall below the baseline value. Kidney stress or dehydration causes the urine creatinine concentration to rise above the baseline level. This indicates a need for blood tests and other means to evaluate kidney function.

A thorough evaluation of kidney function is necessary prior to chelation.

Abnormal urine creatinine results must be confirmed with serum creatinine measurements, creatinine clearance, the GFR, and other kidney function tests.

When abnormal creatinine levels are seen, evaluate the patient's muscle mass and physical exercise. Also check the patient's drug intake.

Urine creatinine levels reflect fluid intake: the greater the fluid consumption, the lower the urine creatinine value. Dehydration causes urine creatinine to rise. Attention to urine creatinine values provides the physician a simple means to evaluate the patient's reaction to chelation, it also provides a means to "view" fluid intake.

A consistent fluid intake during urine collection time will result in comparable urine creatinine values, which allows a direct comparison

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of urine metal output. By following protocols we receive diagnostically and therapeutically significant results.

Baseline Urine

In chelation, we distinguish between a baseline and a challenge test.

After all renal function tests have been completed and before any type of chelation treatment is started, a baseline urine test is recommended. The test is simple and laboratory results are generally inconspicuous. For patients who don't smoke, don't work or live in a contaminated environment, or are not exposed to metals in normal daily life, the test results are generally within the range of an unexposed population.

Baseline urine reference ranges are developed by environmental agencies for common metals such as lead, cadmium, or manganese, for instance. If no ranges are given, laboratories are asked to develop their own, using the same statistical principles of range development. It should be pointed out that baseline urine reference ranges are developed from a so-called healthy population and thus apply to this so-called healthy and nonexposed population, which is in contrast to the ranges used in occupational medicine.

For a so-called nonexposed individual, a urine metal concentration higher than the baseline reference range indicates immediate exposure. The source may be dietary (from arsenic in fish), or medical as in exposure to chemotherapy agents such as platinum, mercury through thimerosal-containing vaccines, or aluminum through thimerosal-free vaccines or other medications such as antacids.

For the physician practicing chelation, the baseline urine test is used to compare the urine metal concentration of the unprovoked or unchallenged (baseline) urine with the metal values of the urine challenge test. The baseline urine should be taken once prior to the start of the chelation treatment. The initial comparison of the baseline urine metal concentration with the first, second, or last urine challenge test result aids patient understanding of the chelation process and helps physicians to set up a realistic treatment schedule. In case of an insurance inquiry, the comparison of urine baseline and challenge test results provides treatment proof.

Baseline Urine Collection Information

- A baseline urine test is generally the first morning specimen. Since the urine is collected in the bladder overnight, it is not important if the sample submitted to the laboratory is a first, or mid- or last stream urine. It is easiest for the patient to collect some urine in a regular urine cup and fill 10 ml of that in the urine tube, provided by the lab.
- To avoid arsenic and mercury contamination, it is advisable that the patient not eat fish for at least one or two days prior to urine sampling. Better would be 3 to 4 days of no fish. Algae products should be avoided for the same duration of time.
- Any type of nutritional supplementation, including vitamin B12, which contains cobalt, should be discontinued at least 24 hours prior to sampling.
- Medicine containing metals such as lithium should be temporarily omitted, unless medically necessary. Read the pharmaceutical's label and discuss this with your physician and pharmacist.
- Smoking should be stopped at least the night before sampling. The longer the better. Smoke contains a number of toxic elements, including arsenic, beryllium, lead, cadmium, and nickel. Hence, the urine of an active smoker automatically shows a higher concentration of potentially toxic metals than the urine of a nonsmoker.
- Provide the laboratory with patient name, date of birth or age, and sex. This information is necessary for the laboratory to make reports based on age and sex-relevant reference ranges. This information is needed to convert mg/l and mcg/L data to mg/g and mcg/g creatinine levels.

The Urine Challenge Test

A chelating agent forces metal binding. Even if a person has a limited detoxification potential due to missing detoxification enzymes, the chelating agent will bind and mobilize metals. For this reason, we cannot compare urine concentrations of a provoked urine with ranges developed for unprovoked urines. First of all, the urine concentrations of the provoked urine would almost always seem high and be cause for alarm. It is exactly this point that opponents of chelation therapy have criticized, and rightly so.

For this reason, we developed chelator-specific ranges, we call them orientation ranges (OR), and this concept is not new to German laboratory medicine. In fact, this logical and analytically correct concept was introduced back in the 1970s by the German toxicologist Dr. Max Daunderer. At that time, he had evaluated hundreds of data sets and concluded that after the intravenous administration of 1 ampoule DMPS, a chelation agent used to detoxify arsenic and mercury, the copper urine concentration can be expected to be above 500 mcg/g creatinine. Our statistical evaluation of over 3000 patients' data treated with 1 ampoule DMPS showed an orientation range (OR) of 700 mcg/g creatinine. The reference range of unprovoked urine is less than 60 mcg/g creatinine, a considerable difference.

Mobilization Tests and Urine Reference Ranges

The following list compares DMPS OR for some elements to reference ranges (RR) of baseline urines in mcg/g creatinine:

Element	Baseline RR	OR
Copper	60	700
Manganese	4.5	10
Arsenic	15	100
Cadmium	0.8	1.5
Mercury	1.0	18

Notes:

- From these data, it is clear that DMPS has a strong affinity to copper, arsenic, and mercury. If, after DMPS administration, the urine excretion shows a concentration above the OR, the patient has a considerable body burden. A test value *higher than the baseline RR and lower than the OR* indicates a low to moderate toxic burden.
- It must be pointed out, however, that the summation of two or more slightly elevated toxic metal levels signals the need to reduce the total body burden.
- The patient's treatment schedule has to take into account patient history, symptoms, test results, and patient response.

Each chelating agent has a specific half-life, which dictates the optimum urine collection time and the chelator's maximum binding capacity. We have developed ORs for DMSA, DMPS, and the EDTAs. In cooperation with IBCMT members, we also participated in the development of specific urine collection protocols. A DMPS protocol follows.

DMPS Urine Challenge Test Protocol

- Prior to administering the chelating agent of choice, the patient must void bladder.
- DMPS is slowly injected intravenously, 1 ml/1–2 min. Do not use metal needles.
- Watch blood pressure. Some patients experience a drop in blood pressure. If that happens, slow down injection or stop.
- After administering the chelating agent, and during the following required collection time of 1 hour, the patient should drink 1–2 glasses of water and refrain from eating, unless clinically necessary.
- It is important that the fluid intake remains the same during this and all other follow-up challenge tests that are followed with a urine collections. This allows the direct correlation of results.

continued on page 39 ➤

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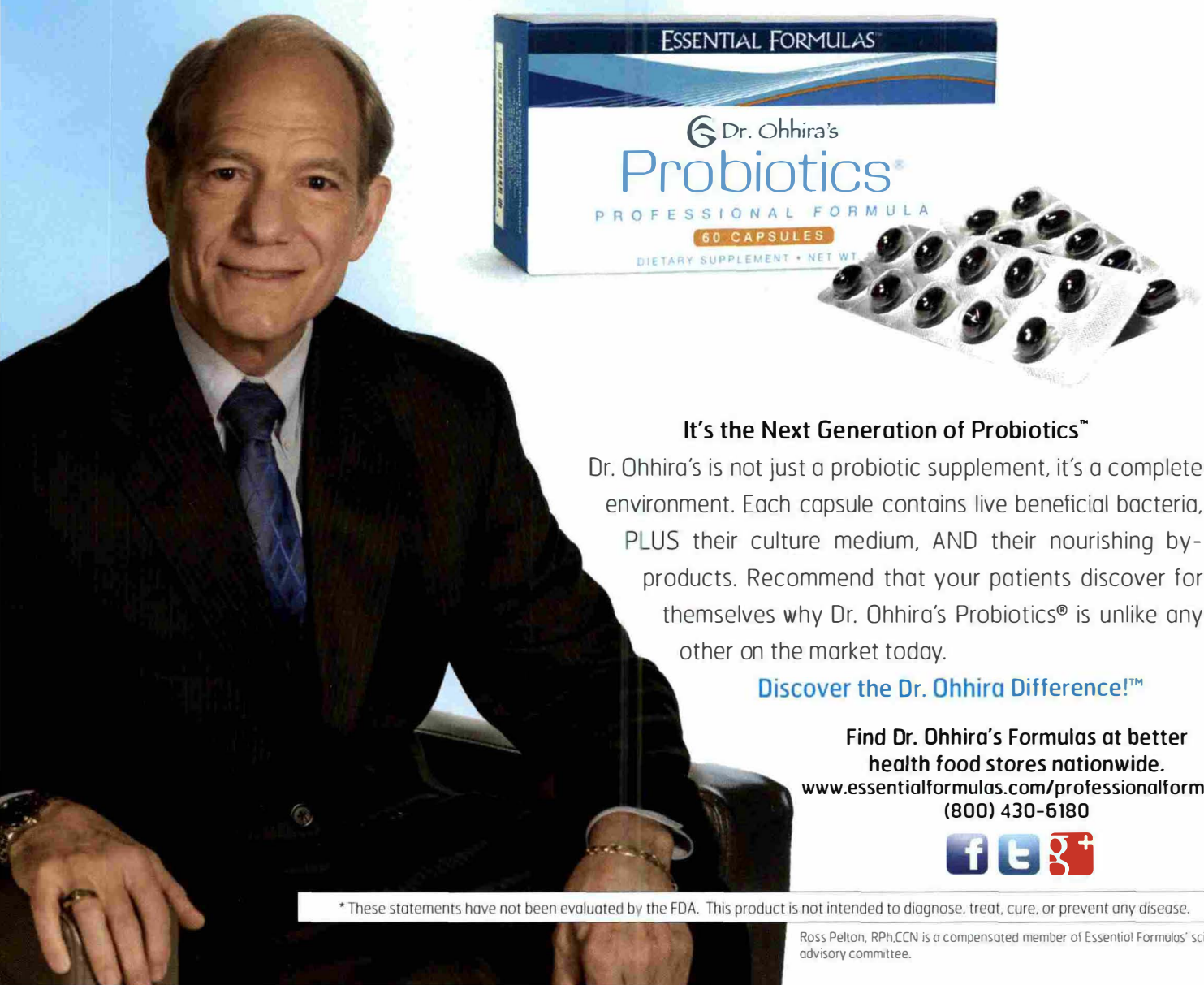

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Ross Pelton, RPh,CCN is a compensated member of Essential Formulas' science advisory committee.

Mobilization Tests and Urine Reference Ranges

➤ *continued from page 35*

- After 1 hour, collect a small portion of urine into a clean urine cup. Of that 10 ml are needed for testing. Do not acidify urine.

Micro Trace Minerals has developed chelator-specific reference ranges for EDTA IV, DMPS IV, and oral DMSA. Logically, the ORs are different for the various elements, and at the same token, urine collections times differ. If we administer 2 g EDTA (NaMgEDTA or CaEDTA) the infusion time is 2 hours, and the urine collection time would be 2 hours plus 45 minutes.

Case History

A male patient suffering from severe muscle and skeletal pain, headaches, and insomnia came to Dr. R. Strey of Germany, who practices internal and occupational medicine. After history taking, a spot urine (unprovoked) was taken. It showed a urine lead level of 7.9 mcg/g crea compared with a reference range of 5 mcg/g crea (again, this range is provided by the German Environmental Agency). Another urine sample was taken after the first NaMgEDTA IV chelation treatment (3 g administered IV in 3 hrs). The lead level of this provocation urine was 456 mcg/g creatinine, and we confirmed this extreme value through multiple testing. Interestingly, after the first treatment and on the following day, the patient was pain free for the first time in a long time. After 20 treatments, he was completely pain free, no longer suffering from insomnia or headaches. The follow-up provocation test showed a urine lead concentration of 32.5 mcg/g crea. This level is still high compared with our chelator-specific range of 22 mcg/g crea, and the patient still receives treatment but more infrequently.

By German medical insurance laws, this patient would have been entitled to free pain medication, sleeping pills, physiotherapy, psychotherapy, and spa visits (up to 6 weeks every other year). I suppose I don't need to explain how insurance companies saved money on this patient.

We know that chelation therapy is a useful and safe therapy. We also know that publishing case histories will help to provide a better understanding within the medical profession and for the people. Therefore we recommend that chelation doctors send us patient histories, similar or complementary to the one above. Be brief and clear, provide history, laboratory results before and after, just as I did above. I will place them into a case history article or book, depending on the response I get, and we will get that published – *because every research article or book published provides important proof.*

Histories may be e-mailed to service@microtrace.de or info@tracemin.com.

E. Blaurock-Busch
Trace Minerals International Laboratory
P.O. Box 4613
Boulder, Colorado 80306-4613

or

Micro Trace Minerals Laboratory
Röhrenstr 20
D-91217 Hersbruck
Germany

◆

E. Blaurock-Busch, PhD, founded the specialty laboratories Micro Trace Minerals of Germany in 1975 and Trace Minerals International of Boulder, Colorado in 1984. Past president of both, she is now their research director and considered an expert on metal toxicology. She has published various books and, in cooperation with universities, important research articles. Her interest and all of her studies focus on the impact of global pollution on human health. Her work demonstrates that early prevention and detoxification treatments can reverse environmental damage to people of all ages. In cooperation with IBCMT (International Board of Clinical Metal Toxicology, Netherlands) and KMT (Ärztegesellschaft für Klinische Metalltoxikologie, Germany) she has developed chelation protocols. She teaches chelation around the world and in her free time studies poetry at Exeter University, Oxford and Edinburgh University. For more information www.tracemin.com, www.microtrace.de, and www.ibcmt.com.

Steroid Hormone Testing in Different Body Fluids

by David T. Zava

Endogenous Steroid Hormone Synthesis and Transport

Steroid hormones are synthesized from cholesterol through a cascade of cytochrome P450 enzymes that oxidize, hydroxylate, and rearrange the cholesterol backbone into specific steroids with unique biological activities. Five categories of steroids are created: estrogens, progestogens, androgens, glucocorticoids, and mineralocorticoids. The most potent of the steroid molecules belonging to each of these categories are estradiol, progesterone, testosterone, cortisol, and aldosterone, respectively. Once synthesized in various glands (ovary, testis, and adrenal) and tissues (liver, adipose), these steroids are released into the bloodstream, where they are rendered more soluble by binding nonspecifically to proteins such as albumin, or more specifically and tightly to sex hormone-binding globulin (binds estrogens and androgens) and cortisol-binding globulin (binds progesterone and cortisol). As the steroid bound to its binding protein percolates through the capillary beds of tissues, a small fraction (about 1%–3%) of the steroid is released into the interstitial tissues and then into target tissues/cells (e.g., estradiol enters the epithelium of the breast and uterus). Whether a steroid has an effect will depend on the presence of specific cellular receptors, which are present in some tissue/cells and not others.

Once the steroid has entered a target cell and the steroid-receptor complex has activated specific gene sites, the complex dissociates and the steroid is available to bind another receptor (recycling) or is metabolized to a weaker steroid (e.g., estradiol to estrone) and/or is released from the target cell back into the intracellular matrix, where it makes its way back to the bloodstream to repeat the cycle or begin the process of elimination.

As the steroid reenters the circulation and passes through the liver, most of it is metabolized via phase I and II enzymes and converted to more water-soluble and inert forms, mostly through sulfation, glucuronidation, and methylation pathways. While these inactive metabolites may continue to circulate in the bloodstream, they can no longer enter target tissues and are eliminated by the kidneys into urine or through bile into the gastrointestinal tract.

Problems and Pitfalls of Testing Sex Hormones in Different Body Fluids Following Different Routes of Exogenous Hormone Supplementation

Testing for sex steroid hormones (estradiol, estriol, estrone, progesterone, and testosterone) is now a mainstay in the clinical evaluation of hormonal imbalances and treatment design for hormone therapy. Steroid hormone levels are most commonly measured in serum/plasma and 24-hour urine collections; however, more biologically relevant and convenient body fluid collections are now available, such as dried capillary blood spots (DBS), saliva, and dried urine.

While most imbalances in endogenous hormones (deficiency and excess) can be detected in any of the four main types of body fluids currently used for testing steroid hormones (i.e., serum, saliva, urine, and DBS), some of these fluids are not appropriate for measuring levels of exogenously delivered steroid hormones, especially those delivered by oral or topical route of administration.

In this mini-review, summarized in Figure 1, I will briefly discuss why some body fluids are not appropriate for testing exogenously delivered hormones, with a focus on the types of tests used and the potential problems following oral steroid administration. More detailed information on the problems with testing in different body fluids with topical hormone administration can be found in the January 2014 issue of *Townsend Letter* and another journal article that I coauthored.[1,2] Therein I elaborate why saliva and DBS, but not venipuncture serum/plasma or urine, are the only way to accurately monitor exogenous topical steroid hormone therapies.

Figure 1

Type of Body Fluid	None Endogenous	Oral Steroids	Topical Steroids	Vaginal Steroids	Troche Steroids	Pellet/IM Steroids
Serum	Yes	Yes[1]	No[2]	No[2]	Yes	Yes
Saliva	Yes	Yes	Yes[3]	Yes	No[4]	Yes
Urine	Yes	Yes[1]	No[2]	No[5]	Yes	Yes
DBS	Yes	Yes[1]	Yes[6]	Yes	Yes	Yes

1. Overestimation: Possible metabolite interference with immunoassays. LC/MS or GC/MS methods OK
2. Underestimation: Not reflective of tissue levels
3. Overestimation: Unless reference ranges reset higher for supplementation
4. Overestimation: Direct contamination of oral mucosa/saliva
5. Overestimation: Direct contamination of urine
6. Overestimation: If hands/fingertips used to apply hormones < 24 hours

I will also not elaborate extensively on other forms of delivery such as vaginal, transdermal patch, subcutaneous injections, pellet inserts, and sublingual delivery systems, other than to say that we see good correlations in hormone levels following these forms of delivery. The exception to this statement is that the hormone administered cannot be accurately measured in these body fluids if it is applied close to the site of fluid collection (e.g., sublingual/troche hormone use or application of topical hormones to the face or neck and saliva testing; vaginal hormone delivery and urine testing; and/or application of topical hormones with the hands prior to blood collection from the fingertip).

Without going into detail here, our experience with testing and comparing these four body fluids is that all (serum/plasma, DBS, saliva, wet/dry urine) can be reliably used to monitor endogenous levels of the primary active steroid hormones, with the caveat that some tests may lack accuracy if the steroid measured is at very low levels (e.g., blood and salivary estradiol and testosterone), as explained in the next section below.

Pros and Cons of Methods Commonly Used to Measure Steroids in Different Body Fluids

The most common methods of steroid analysis include enzyme immunoassays (EIAs), radio immunoassays (RIAs), and mass spectrometry (LC- and GC-MS/MS). Testing of an individual's endogenous sex hormones in serum has been well characterized in the medical literature, but less so in urine, saliva, and capillary whole blood (DBS).[2–10]

Enzyme Immunoassays

EIA is the most widely used method today and is incorporated into autoanalyzers used for routine clinical testing of serum and plasma. FDA-approved autoanalyzers are commercially available and have well established and validated methods for testing the sex hormones produced endogenously.[3–5] However, testing in autoanalyzers lacks sensitivity for body fluids such as saliva, wherein steroid hormone levels fall below the level of the instrument's sensitivity. More recently, FDA-approved 96-well EIA plates have become available specifically for testing the lower concentrations of steroid hormones in saliva. Despite the FDA stamp of approval, these EIA tests are still a challenge for steroid hormones such as estradiol, which are present in only trace amounts in saliva and subject to matrix effects due to mucins, antibodies, and other nonspecific interfering substances that interact with the antibodies used by the EIA, causing false-high values. This can be circumvented by first extracting the saliva, but most labs test saliva directly without first extracting the steroids to remove these interfering components. All published studies showing good correlation of saliva to serum estradiol have used the extraction method prior to analysis. False-high background levels are most problematic for sex steroids present at very low concentrations, such as estradiol, testosterone, and progesterone, and much less so for DHEA-S and cortisol, which are present at higher concentrations and therefore the matrix effect is only a small fraction of the overall hormone concentration so that it doesn't skew the results.

In conclusion, for accurate, reliable, and reproducible saliva test results for steroids present at trace levels, such as estradiol and testosterone, preextraction prior to testing is essential.

Another consideration with exogenous oral dosing of most sex steroids is that the levels of steroid metabolites can potentially interfere with an immunoassay designed to measure a specific steroid hormone, resulting in false-high values.[11] Removing and separating these inert hormone metabolites from the active hormone requires specialized separation techniques such as liquid or solid phase extraction, which is not performed in most commercial diagnostic laboratories prior to serum or saliva testing.[3]

The degree of cross-reactivity, which causes higher levels of "apparent" hormones but actually represents a combination of active hormone and inactive hormone metabolites, will depend on the quality of the antibody used, which varies depending on the commercial source.[3–5]

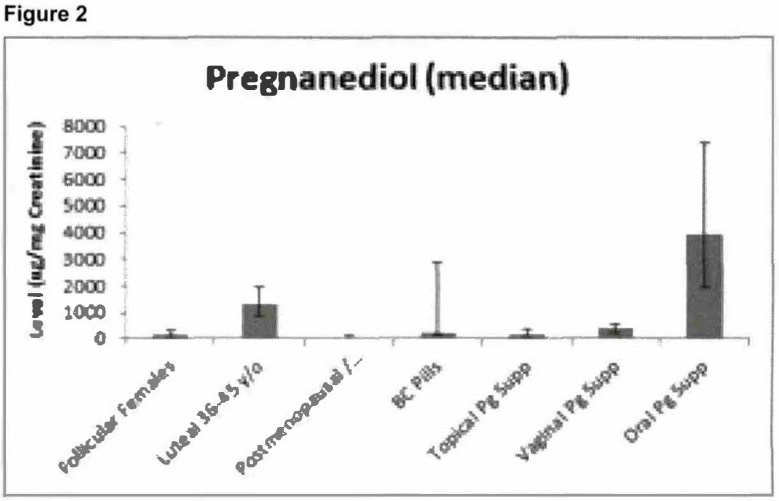
Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) and Gas Chromatography Tandem Mass Spectrometry (GC/MS/MS)

These methods measure the levels of steroids by a physical method of separation (LC or GC), based on molecular size, followed by mass spectrometry (mass/charge analysis).[4,5,12] Because the LC and GC methods separate and differentiate the active steroid from its metabolites, they provide the most accurate and precise assessment of the steroids present in the diagnostic medium. However, such methods require extraction and in some cases derivatization for hormones at low concentration (e.g., estradiol and testosterone).[5,12]

These methods are also time consuming, require high-level technical input, and are cost prohibitive and difficult to automate, which hinders rapid turnaround time and wide-scale application required by most commercial testing laboratories. Also, until recently, LC and GC mass spectrometry methods were not sensitive enough to detect the very low levels of estradiol and testosterone seen in the saliva and serum of some postmenopausal women and men. Significant improvement in sensitivity of these instruments, along with innovations

➤

Figure 2



in methods of derivatization, are rapidly overcoming these hurdles for testing low levels of sex steroids, but such improvements have increased sample processing time and cost, making them still less attractive for broad-scale and cost-effective clinical testing.[12]

Challenges of Using Different Body Fluids Following Oral Hormone Delivery

Serum Testing and Oral Hormone Delivery

Serum is the most well-characterized body fluid for testing endogenously produced sex steroid hormones, but using it to accurately detect hormones following exogenous oral therapy can be problematic.[11] Bioidentical estrogens (estradiol, estriol, estrone), progestogens (progesterone), and androgens (testosterone and DHEA) are all used orally as a form of hormone restoration therapy (HRT) and tested most commonly in serum by FDA-approved automated immunoassays.[3,4]

What is common to all forms of oral replacement therapies, regardless of the hormone, is that about 10× physiological dosing is required to achieve a physiological level of the active hormone in whatever body fluid is used for testing. Most of the parent hormone administered (e.g., progesterone) is converted to inactive metabolites in the gut. For example, oral estradiol and progesterone dosing are usually in the 0.5 to 1 mg and 100 to 300 mg ranges, respectively, but endogenous peak daily ovarian synthesis of these hormones is 0.05 to 0.1 and 10 to 30 mg.[13,14]

Some of the commercially available progesterone immunoassays show significant cross-reactivity with progesterone metabolites following oral progesterone therapy, causing false-high progesterone levels in serum. Studies, comparing conventional commercial immunoassays for progesterone with the "gold-standard" and more precise LC/MS, clearly demonstrate that most commercial serum immunoassays that rely on polyclonal antibodies overestimate the true progesterone levels, especially in women using oral progesterone.[13,14] Therefore, conventional commercial immunoassays will overestimate serum progesterone following oral therapy, unless more sophisticated methods of extraction are used prior to immunoassay, or the serum is tested by GC or LC mass spectrometry.[3–5]

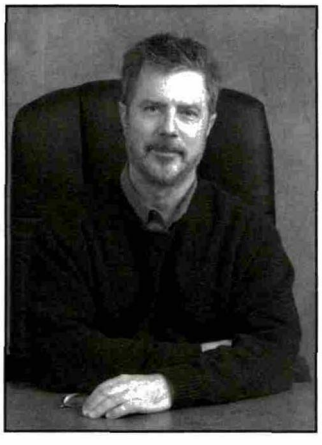
Saliva Testing and Oral Hormone Delivery

When the sex hormones are produced endogenously and released into the bloodstream, or they originate from some form of exogenous delivery (most common are oral, topical, vaginal, troche), most of the active hormones (97–98%) are bound up by specific proteins as mentioned earlier. Only a small fraction (about 2%–3%) of the active hormone is released from these binding components in the capillary beds into the interstitial space and tissues.[16] Saliva is somewhat unique and different from serum in that most of the polar inert metabolites resulting from oral hormone therapy are filtered out by the salivary gland, only allowing the active hormones to enter saliva.[16] Thus, salivary hormones are more representative of not only the amount of the bioactive steroid present in the bloodstream, but also of its bioavailability to target tissues.

Note that while saliva is *an* excellent diagnostic medium to test hormones delivered orally for the reasons mentioned, timing of collection is important for clinically meaningful results. Orally delivered hormones usually peak in the serum and saliva shortly after supplementation (30 min–2 hours) and then drop precipitously over the next 8 to 12 hours to return to baseline levels.[11] Most individuals supplementing with oral progesterone take it twice daily, or only once at night before bed. First morning saliva values are usually at the lower end of the physiological reference range and do not reflect the much higher levels achieved over the first several hours when progesterone would be entering target tissues and binding to and activating cellular receptors. At time points beyond 12 hours, progesterone has usually returned to baseline levels in serum and saliva.[15] Therefore, testing salivary progesterone within an 8- to 12-hour time frame after oral dosing, with an established range for this time course, will provide the most clinically meaningful results.

Urine Testing and Oral Hormone Delivery

Like serum, urine hormone test results can be misleading when hormones are delivered orally. As mentioned above, when a hormone is introduced into the gastrointestinal tract, much of it is metabolized to downstream phase I and II metabolites/conjugates, which are rapidly eliminated in urine.[11,15,17] Urine testing measures the total amount of metabolites that enter urine, which is more reflective of the amount of hormone dosed and not the actual amount of bioactive hormone that enters tissues.



Dr. David Zava has devoted his 40-year professional career to exploring the role of hormones in aging and disease. After completing his PhD in biochemistry at the University of Tennessee in 1974, Dr. Zava spent much of his time researching hormones and breast cancer in Switzerland, Texas, California, and Oregon. In 1998, he established ZRT Laboratory, a CLIA-certified laboratory that is a front-runner in the innovative development of test methods to identify hormonal imbalances that can lead to debilitating symptoms, diminished quality of life, and increased risk for cancers and many of the diseases of aging, such as diabetes, cardiovascular disease, and senile dementia. ZRT Laboratory was one of the first laboratories to develop and commercialize noninvasive saliva and dried urine and semi-invasive dried blood spot methods for testing hormones as an alternative to conventional serum testing. Using these unique methods of body fluid collection, ZRT is actively engaged in hormone research studies with universities, government agencies such as the NIH and CDC, military agencies, private physicians, and professional sports teams.

In addition to his innovations in clinical laboratory testing and development, and numerous scientific publications, Dr. Zava coauthored a landmark book, *What Your Doctor May Not Tell You About Breast Cancer: How Hormone Balance Can Help Save Your Life*. In this book, Dr. Zava and coauthors describe how breast cancer can be caused by hormonal imbalances that occur naturally as we age, but can be prevented if the types of hormonal imbalances are identified with testing and restored to optimal healthy levels with bioidentical hormone replacement therapy and improved lifestyle.

Since it takes about 10× physiological dosing of any orally delivered hormone (e.g., about 100–300 mg of oral progesterone) to get enough of the bioactive hormone into the systemic circulation for a biological effect, this results in very high circulating levels of hormone metabolites, which have no biological effect and are rapidly removed from circulation and excreted into urine.[10,11,15,17]

Figure 2 (determined at ZRT Laboratory using GC/MS/MS; p. 41) shows the median ranges for urinary pregnanediol, a progesterone metabolite commonly used to estimate, indirectly, progesterone levels in urine in premenopausal and postmenopausal women and those supplementing with different forms of progesterone.[10,17] Urinary pregnanediol levels, as expected, are low in premenopausal women during the follicular phase of the menstrual cycle, but increase significantly during the luteal phase, as reported by others.[17] Also as expected, pregnanediol levels are low in postmenopausal women and women using contraceptive synthetic progestins. Women using 10 to 50 mg of topical progesterone or 100 to 300 mg of vaginal progesterone suppositories have little pregnanediol in urine, which is why we do not recommend using urine to monitor any form of topically delivered hormone. Progesterone levels in urine following topical delivery are also low, and urinary progesterone levels with vaginal progesterone fluctuate erratically due to direct contamination of the urine (not shown). Pregnanediol remains low with vaginal delivery, but this is problematic because it does not accurately reflect the tissue distribution of progesterone seen in saliva and DBS assays.

Levels of urinary pregnanediol, following 100 to 300 mg oral dosing, are much higher than levels seen in women during the luteal phase of the menstrual cycle, which taken at face value could be misconstrued as overdosing. This isn't likely for several reasons: first, levels of serum, saliva, and bloodspot are not elevated with oral progesterone dosing; second, clinically, this is an appropriate dose.

Urine testing of the supplemented hormone therefore reveals approximately how much hormone was consumed and eliminated but does not provide insight into how much of the active hormone was present in the systemic circulation or entered target tissues. Therefore, while urine testing is an excellent way to evaluate endogenous production of the sex hormones (Figure 1), it will not likely be useful clinically as a diagnostic fluid for exogenous oral or topical hormone delivery.

Conclusions

In summary, each of the four body fluids can be used as a diagnostic medium when hormones are produced endogenously. With oral administration of the sex hormones, accurate testing of hormones in serum requires extraction and separation of metabolites from the parent steroid. Testing in urine is not recommended unless the range is reestablished for the common dosing (e.g., 100–300 mg oral progesterone) and the range readjusted upwards to reflect the expected level. Serum/plasma and urine are not recommended body fluids for testing steroid hormones delivered by topical route of administration.

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Correlation of Manual Muscle Tests and Salivary Hormone Tests in Adrenal Stress Disorder: A Retrospective Case Series Report

by Scott Cuthbert, DC; Anthony Rosner, PhD, LLC; Trevor Chetcuti, DC, DIBAK; and Steve Gangemi, DC, DIBAK

Abstract

Introduction: The correlations between salivary hormone testing and the manual muscle test have not to our knowledge been reported before. **Methods:** Correlations between manual muscle tests and salivary hormone tests for 110 participants (83 female, 17 male) experiencing adrenal stress disorder (ASD) are described. Saliva samples were collected and screened for cortisol and dehydroepiandrosterone (DHEA). **Results:** We observed that patients with signs and symptoms of ASD and abnormal hormone levels on salivary hormone testing demonstrate distinct neuromuscular impairments that could be detected using the MMT. **Discussion:** Evidence for the linkages between neurohormonal imbalances and muscular imbalances are presented. **Conclusion:** This physical examination procedure, used within a number of health professions, may warrant further investigation given its utility, noninvasiveness, rapidity, and cost-effectiveness as a day-to-day clinical evaluation and management tool in cases of ASD.

Keywords: adrenal insufficiency; stress disorders; salivary hormone test; diagnostic techniques, endocrine; kinesiology, applied

Introduction: Adrenal Stress Disorder and the Manual Muscle Test

Adrenal gland imbalances are one of the most common conditions in the world, and stress-related illnesses are one of the most common conditions faced by functional medical physicians.[1] Serum blood samples and salivary hormone testing are standard diagnostic procedures for patients with "stress-related illnesses"; however, these diagnostic procedures cannot be performed on every patient who may be experiencing adrenal stress disorder (ASD), nor can it affordably be performed repeatedly on established patients or in patients who are undergoing recovery from this condition, due to their cost.[2,3] In these patients with chronic stress, new stressors often arise, and repeating the salivary hormone test during the course of a lifetime of care becomes more and more unwieldy. Additionally, a single serum blood sample or salivary hormone test for ASD is insufficient for treatment; a second and even a third must be performed to determine whether the treatment protocol being used is working.[4]

However, previous research has shown the advantage of salivary cortisol measurements over serum measurements in the management of patients with ASD.[5] The advantages (simplicity, decreased stress during the procedure, convenience, sample mail-in and temperature stability) have been described, and for these reasons this method was chosen in order to compare the physical applied kinesiology manual muscle test (AK MMT) examination with this laboratory test.[6]

Salivary (or serum blood) testing may help guide physicians to the hormonal imbalances present in a patient with ASD, but it will not tell them how to best treat the problem. As an alternative, the manual muscle test identifies a functional disorder (inhibition) of the locomotor system. In the applied kinesiology (AK) evaluation of cases of adrenal stress disorder (ASD), this muscle inhibition occurs in specific muscles that immediately respond to specific adrenal gland nutritional support and/or adrenal gland viscerosomatic reflex stimulation (therapy localization).[7]

For example, a patient with a low DHEA value may need the actual hormone DHEA, or may show a need for a vitamin or mineral supplement that acts as a substrate to synthesize DHEA in order to strengthen the inhibited adrenal-related muscle. The physical examination procedure presented here provides information about the patient with "stress-related illness" that we did not previously know. This functional disorder associated with the adrenal-stress patient (the attendant viscerosomatic muscle inhibition) removes circularity from the AK method of diagnosis; the treatment required to remove this diagnostic finding in the adrenal-

stress patient is what immediately strengthens the muscular inhibition. The corrective approach is thereby contained within the diagnostic procedure.

AK practice and experience has shown that when a substance comes into contact with the tongue, there is immediate change of muscle function as determined by the manual muscle test.[8,9] That is, there is an increased response from the oral chemoreceptors if the papillae are moved in conjunction with the substance tested.[10] The testing of nutrition as advocated by the International College of Applied Kinesiology is a discipline limited to the tested substance stimulating the gustatory or olfactory nerve receptors, combined with accurate and specific muscle testing.[11]

It seems evident that the effect is due to stimulation of the gustatory and olfactory receptors.[10] Certain substances enter the bloodstream almost immediately by oral absorption, such as sodium and sugar. For instance, patients with untreated Addison's disease have increased taste sensitivity, roughly 100 times more acute than that of normal subjects.[12]

The MMT diagnosis of inhibited muscles and their covariance with patients' biochemical dysfunctions tells us something about the status of their condition as well as the responsiveness of this biochemical disorder to nutritional treatment.[7,14–16]

Our approach in this case-series has been to determine the concurrent validity of the AK MMT diagnostic method compared to an established, "gold-standard" biochemical testing method, the salivary hormone test. The usual form for evaluating the concurrent validity of a test is to check any newly developed method of diagnosis against a method which has long been identified as a useful measure or reliable method of diagnosis. Were the AK sensorimotor tests of the biochemical component of ASD consistent with the findings of this laboratory test?

Methods

One hundred and ten subjects were selected over a 2-year period from patients presenting at three participating clinics, in Pueblo, Colorado (US); Chapel Hill, North Carolina (US); and Melbourne (Australia). The clinicians each had over 10 years of experience using the AK MMT. Being able to employ the AK MMT in a manner whose inter- and intraexaminer reliability and construct, concurrent, and predictive validity have all been documented requires considerable training on the part of the examiner.[30] Caruso and Leisman showed that examiners using the MMT with 5 years' experience have virtually perfect correlation with objective measurements by instrumentation for over 700 muscle tests.[31]

Participants were 83 female and 17 male patients between ages 13 and 72 (average age 41.4 years), who met the following inclusion criteria: experiencing self-reported "stress" symptoms and willing and able to undergo both AK chiropractic physical examination and salivary hormone testing (for which the patient paid approximately $300 US). Participants were excluded if they had any contraindications for chiropractic treatment, or if they were currently on any steroid or hormone medication. Participants were then briefed on the AK method of diagnosis and treatment, and the possible benefits and risks of treatment. Both verbal and written informed consent was obtained before assessment and treatment began.

For each participant in this case-series report, the focus was upon the Adrenal Salivary Index (ASI). The ASI offers the clinician and the patient an evaluation of the cortisol levels at various times of the day and a reading of the DHEA levels. It also offers a rating of overall adrenal function from normal to failure. A number of research studies have validated saliva as a diagnostic medium to measure the unbound, biologically active fraction of steroid hormones in the bloodstream. Saliva is a natural ultrafiltrate of blood, and steroids not bound by carrier proteins in the blood freely diffuse into saliva.

Intervention

The protocol in this study was as follows:

1. A complete patient history was taken.
2. In the initial examination, each patient's blood pressure was tested in three positions (supine, seated, then standing), in addition to pupillary reflexes, Rogoff's sign, heart sounds, and ligament stretch reaction. (These physical tests are additional physical signs in AK examination regimen of adrenal gland dysfunctions.)[17]
3. The patient was physically examined with the focus upon the symptom history, particularly upon the function of muscles and joints and reflexes related in applied kinesiology to the adrenal gland (Figure 1, p. 46).
4. These muscles are the sartorius, gracilis, or posterior tibialis (Figures 2–4, p. 46).[13]
5. If these muscles were initially strong, then the sensorimotor stimulation (therapy localization in AK) of the adrenal glands' viscerosomatic reflexes (i.e., Chapman's and Bennett's and acupuncture meridian points) was implemented during the MMT (Figures 1, 5–7).[7,13] If change in strength of the muscle occurred, this was noted (Table 1, p. 48).
6. After the assessment, the subject was given verbal and written instructions on how to perform the salivary hormone test correctly. The subject took the test kit home and collected samples of their saliva in collection tubes in the morning, at noon, in the afternoon, and at bedtime. These were placed in a plastic, resealable bag and immediately sent to the laboratory via the postal service. The hormones evaluated by the laboratories in this study were cortisol (diurnal, 4

➤

times daily), and DHEA. These saliva tests used an enzyme-immunoassay, but to solve the problem of the matrix effect for hormones at very low concentrations in saliva, an extraction step was used. This removed the contaminants that may interfere with the assay and yielded results comparable with those seen in published studies where highly sensitive assays have been used.[18]

Therapy localization to these reflexes in patients with adrenal gland dysfunction (suggested by symptomatology, history, and AK physical assessments, and confirmed by the salivary hormone tests) produced changes in strength of the adrenal-related muscles during MMT (Table 1).

Results

In each of these 110 cases with ASD, musculoskeletal pain was one of the reported symptoms.

In 38 of these cases, psychosocial disturbance was a reported symptom, encompassing anxiety, depression, decreased mental clarity, foggy thinking, nervousness, emotional irritability, and impaired memory.

In 33 of these cases, fatigue was a reported symptom.

In 31 of these cases, disturbances in the reproductive system were reported, including amenorrhea, pre-menstrual syndrome, night sweats, vaginal dryness, and a loss of libido.

In 7 of these cases, insomnia was a reported symptom.

In 3 of these cases, headache was present (two tension-type headaches and one case of migraine).

(See Table 1 in the online version of this article for the individual patient profiles documenting the correlations between manual muscle testing and laboratory diagnosis and primary complaints in 110 patients.)

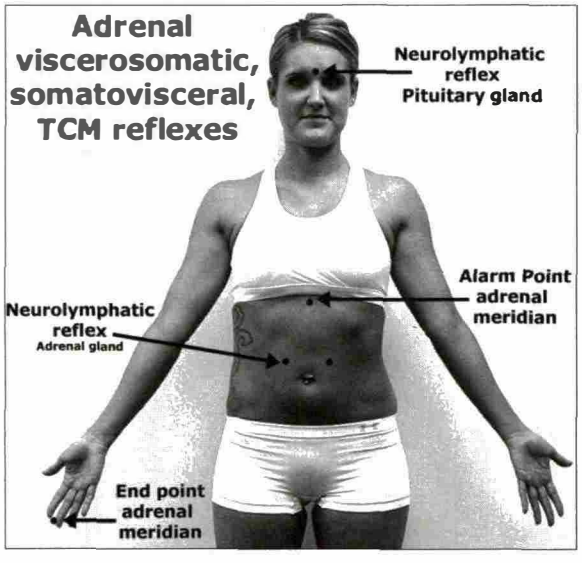


Figure 1: Viscerosomatic reflexes related to the adrenal glands. Participants touch these specific areas while the MMT is performed; if immediate muscle strength changes result, it is considered a positive test.

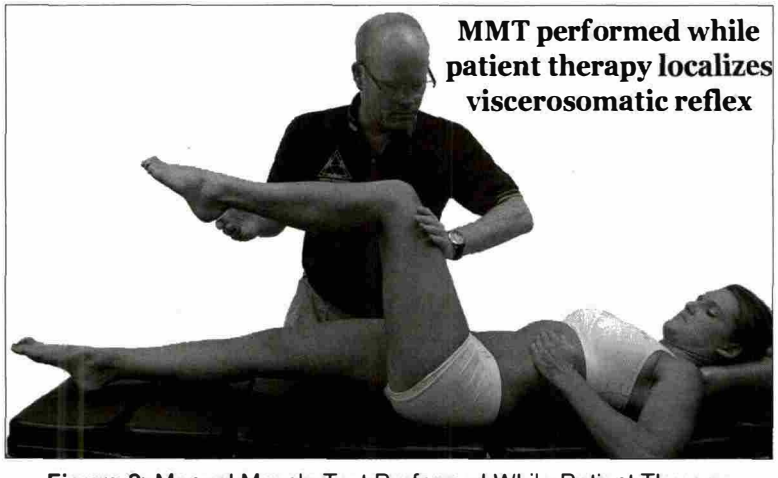


Figure 2: Manual Muscle Test Performed While Patient Therapy Localizes to Viscerosomatic Reflex of the Involved Organ

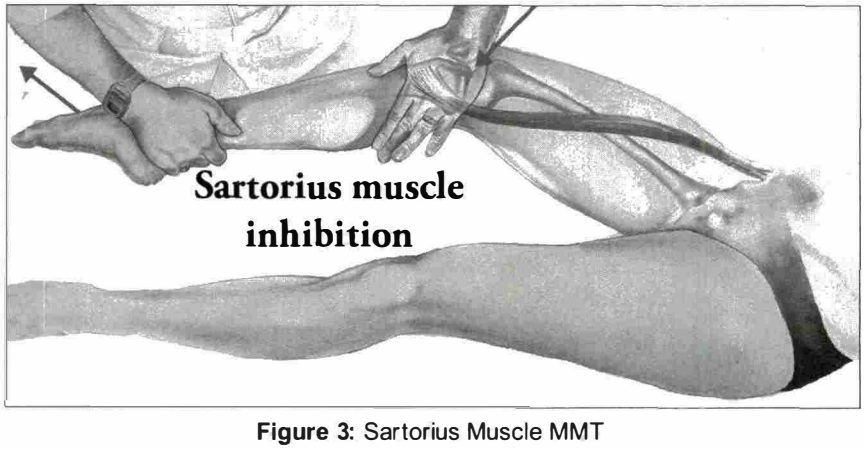


Figure 3: Sartorius Muscle MMT

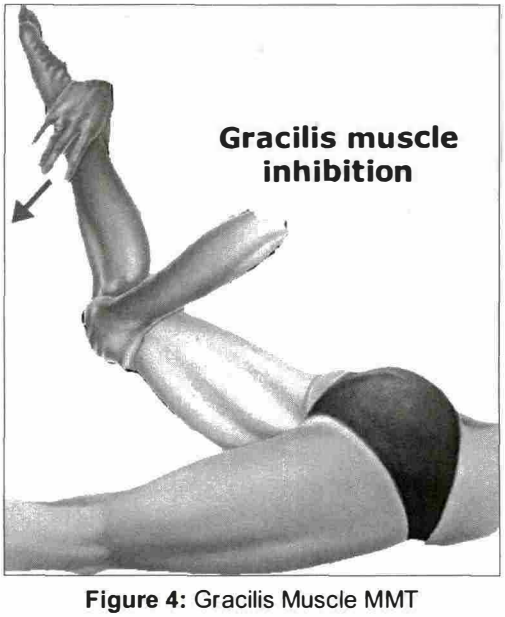


Figure 4: Gracilis Muscle MMT

Discussion

This cohort showed a 100% correlation of the AK MMT with the presence of ASD (as measured by the ASI), confirming the hypothesis that distinct neuromuscular impairments (associated with the adrenal glands in AK) could be detected using the MMT. Every subject of this study who had positive AK MMT findings showing ASD had abnormal cortisol values (91%) and/or abnormal cortisol/DHEA ratios (59%). It must be remarked that because a relatively large number of viscerosomatic reflexes relating to the adrenal gland were tested, the detection of the physical manifestation of ASD using the MMT as described here was more likely. In the clinical setting, as distinguished from the research setting wherein a more limited number of variables are permitted, multiple manual muscle tests are performed in a series or parallel manner before any diagnosis is ever made.

The prevalence of psychosocial complaints (n = 38) in this cohort might be explained by the fact that low cortisol indicates adrenal fatigue, which is usually caused by chronic, unresolved stress (biochemical/emotional/physical). To treat the various forms of the condition called *anxiety* on a symptomatic level, Western medicine uses a variety of drugs such as benzodiazepines, buspirone, antidepressants, beta-blocking agents, and antipsychotics.[19] However, recent data reveal that a large number of patients either fail to respond or remain with clinically significant residual symptoms after this treatment. Statistics show that 1 out of 3 patients does not sufficiently improve on these standardized Western treatments.[20]

Disturbances in the reproductive system were reported (n = 31). Applied kinesiology methods for detecting and normalizing adrenal function, as well as identifying food allergies, and decreasing mechanical stress to the reproductive organs, have shown promise in managing cases of menopause and perimenopause, dysmenorrhea, and infertility.[8,21–24] Reproductive steroid levels may also influence the stress response, such that future work in this area is warranted.

Insomnia was reported as well (n = 7).[25] Cortisol affects melatonin levels. In this report, we saw an inverse relationship between cortisol and insomnia. As cortisol levels became abnormal (as is common with those under chronic stress or with blood sugar handling problems) melatonin levels drop.[26] Recent studies have also shown that disrupted circadian rhythms (indicated in 101 of the patients in this cohort) may be an early indicator of increased risk for Alzheimer's disease.[27]

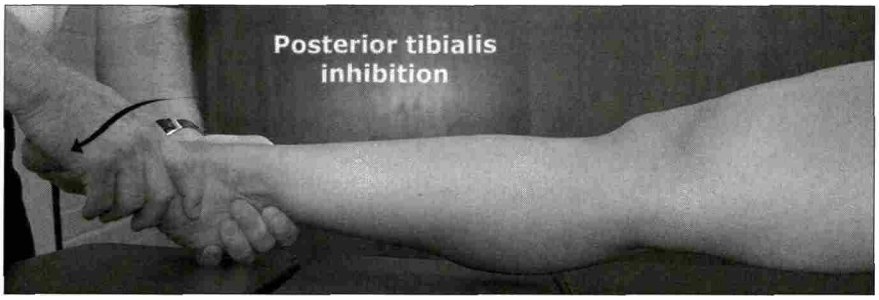


Figure 5: Posterior Tibialis Muscle MMT

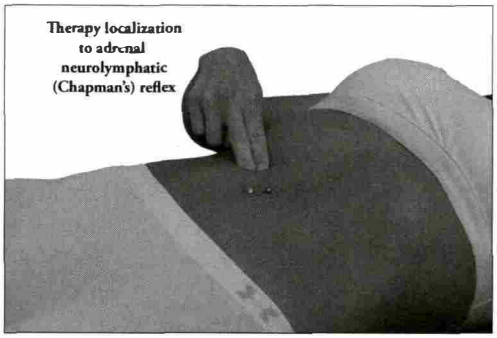


Figure 6

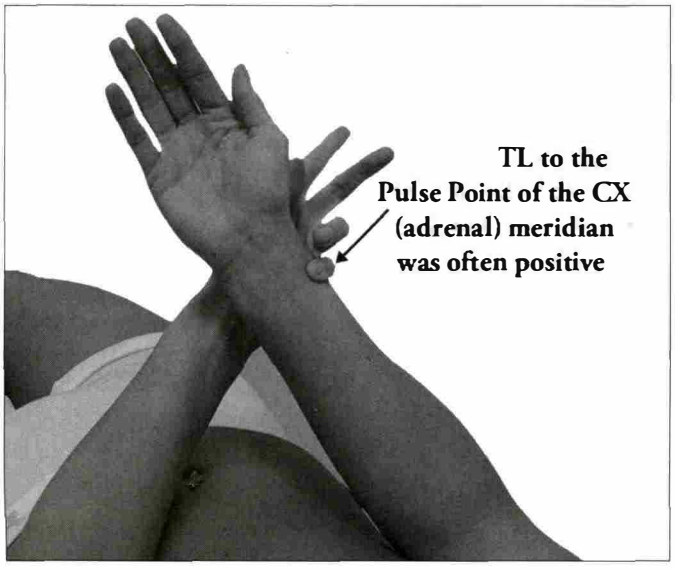


Figure 7: Therapy Localization to Pulse Point of the Circulation Sex Meridian

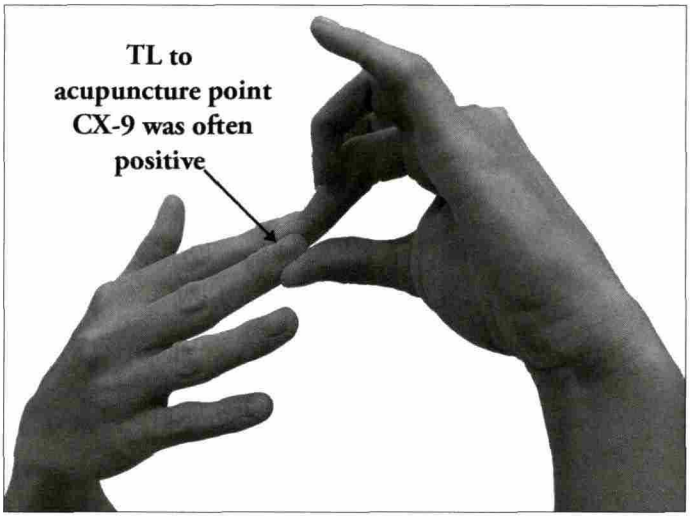


Figure 8: Therapy Localization to the "Ending Point" of the Circulation Sex Meridian

Fatigue was reported (n = 33), and lower cortisol values predicted fatigue in a large prospective cohort, suggesting that it may be of pathophysiological significance.[28]

Finally, headache was reported (n = 3). Elevated plasma cortisol has also been reported in migraine, and a trend towards higher cortisol has been reported in tension-type headaches.[29] Menstrual headaches have been successfully treated with applied kinesiology protocols that include craniosacral and chiropractic manipulative therapies that included support of adrenal function, clinical nutrition, avoidance of aspartame, and food-combining principles.[30,31]

Salivary Hormone Tests for Adrenal Stress Disorder

It is accepted that blood cortisol levels rise in response to physical, chemical, psychological, and thermal stressors, and that there is a reliable direct correlation between blood cortisol and salivary cortisol levels.[3,32] It is worth noting that the World Health Organization uses saliva testing to study human hormone levels around the world.[4,17]

We found that testing hormones in saliva was convenient, painless, and therefore less stressful and less expensive than blood tests. More importantly, saliva contains the free, "bioavailable" fraction of steroid hormones that have moved out of the bloodstream and into the tissues. Furthermore, the stress caused by a conventional blood draw can alter test results. For salivary hormone determinations, the home collection kit allows for optimal collection times.

Can Internal Medicine and Physical Medicine Interact In This Way?

Exposure to taste elicits a variety of immediate neurological, digestive, endocrine, circulatory, and renal responses throughout the body and has been called the cephalic, or preabsorptive, response.[33] Of key importance are the skeletal muscles, which are affected through the action of foods upon the taste receptors.[34] The large mass of skeletal muscle in the body (60% of the body's weight) plays an integral role in blood sugar and insulin metabolism, with the latter disposing of approximately 50% of the increased postprandial blood glucose into muscle cells for use as energy, and up to 10% for conversion to glycogen.[35]

The sensory receptors embedded in lingual epithelium are used to distinguish chemical compounds that are potentially nutritive (e.g., salts, sugars, proteins, carbohydrates, fats, and so forth) from those that are potentially harmful (e.g., bitter-tasting plant alkaloids, allergens, toxins, etc.).[10]

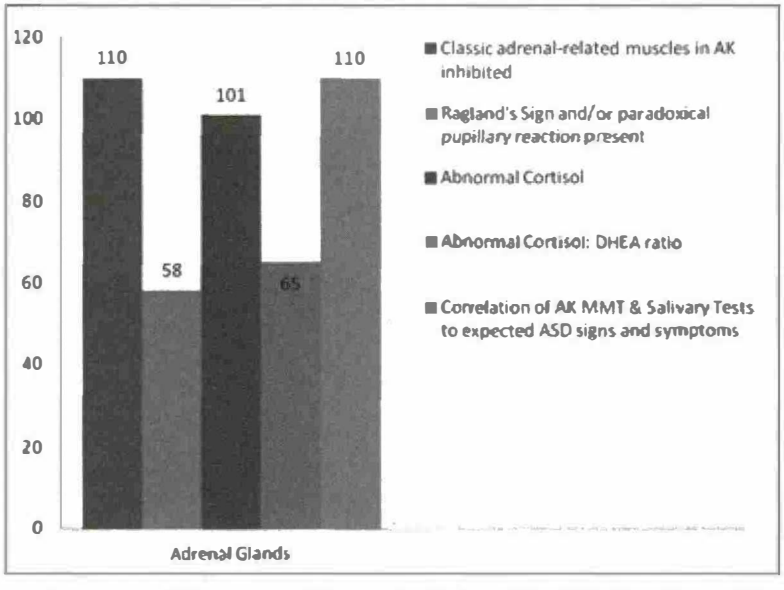
The taste buds also have an effect upon blood sugar levels and insulin, which also influences a variety of other body functions through neurological mechanisms.[33] Chambers et al. showed that sweet taste in the mouth affects muscle function as measured by both exercise performance and brain activity. [36] They used both a 1-hour cycling test, which showed improved performance just by tasting, and functional magnetic resonance imaging (fMRI) to demonstrate that there are specific areas in the cortex associated with oral receptor stimulation. The authors state that the underlying mechanisms for this performance-enhancing effect do not appear to be metabolic but rather neurological, *with afferent signals modifying motor output.* That changes in motor function occur as a consequence of gustatory stimulation is evident from common examples such as with the administration of syrup of ipecac, which induces immediate vomiting. Jeukendrup and Chambers believe that the immediate changes in muscle function due to sweet taste are associated with specialized receptors in the oral cavity that have not yet been identified.[37]

The search to better understand the receptors for taste that affect muscle function is growing.[10] Goodheart first made the clinical observation in 1968 that taste stimulation affected muscle function,

Table 1: Patient Findings (Physical and Biochemical Correlations of ASD in 110 Patients Found During AK MMT Examination)

Correlations Found in Adrenal Stress Disorder	
# MMT Correlations (adrenal-related muscle found inhibited)	110
# of Patients with Ragland's Sign/Paradoxical Pupillary Reaction	58
# of Patients with Abnormal Cortisol	101
# of Patients with Abnormal Cortisol: DHEA Ratio	65
# of Patients with Blood Sugar Handling Disturbance as Primary Complaint	20
# of Patients with Psychosocial Primary Complaints	38
# of Patients with Reproductive System Abnormalities	31
# of Patients with Insomnia as Primary Complaint	7
# of Patients with Fatigue as Primary Complaint	33
# of Patients with Headache as Primary Complaint	3

Table 2



observations that are discussed elsewhere.[7,9,14,38] As a result of Goodheart's original finding, many health-care professionals in various disciplines worldwide have since used this clinical tool (gustatory receptor stimulation then manual muscle testing) as an adjunct for both assessment and treatment.[7,39]

Controversy

The AK MMT system of biochemical evaluation is controversial. One reason for this is that there have been many modifications of Goodheart's original description. The applied kinesiologist uses the MMT to evaluate nutrition as an adjunct to standard laboratory, nutritional, and physical diagnostic methods. All factors of the examination should correlate, or something is being missed. Research sponsored by the International College of Applied Kinesiology points out that the use of the AK MMT to evaluate nutrition is not a viable approach in and of itself.[40] Some researchers, rather than have the participants stimulate the gustatory receptors with the substance being tested, have the individual handhold the substance or lay it on the belly; some even have the patient hold a bottle containing the substance to be tested. These modified systems are frequently taught to laypeople, who often do not have the anatomical knowledge necessary for accurate muscle testing nor a sufficient background in nutrition or general diagnostic ability.[41–44]

While our understandings of the neurological pathways that produce changes in muscle function remain incomplete, there is definite evidence in the literature of efferent response throughout the body resulting from stimulation of the gustatory and olfactory receptors.[33–36] Some of the observed reactions to lingual stimulation have included, for example: (1) exercise performance and brain activity, (2) canine pancreatic secretion, and (3) altered plasma levels of estrone, follicle stimulating hormone, and luteinizing hormone.[36,45,46] Despite the complexity of factors involved, this evaluation may become a useful adjunct to the standard methods used in determining a patient's nutritional and hormonal status and needs.[8,9,47]

AK MMT Examinations and Laboratory Tests: Concurrent Validity Review

(See the online version of this article for the literature review of the correlations found between manual muscle testing and laboratory diagnosis in previous reports, as well as an expanded discussion of the biological plausibility and physiological rationale for the MMT in the assessment of biochemical disturbances.)

This notion has some predictive implications. It might be possible, perhaps early in life, to identify individuals with reduced glucocorticoid metabolism who are at increased risk of stress-related illness and related disorders on exposure to trauma later in life. To test this, it will be helpful prospectively to follow cohorts such as the offspring of women with significant ASD during their pregnancy. It also implies that use of adrenal gland nutritional support during the early phase of development of symptoms may aid in the reversal of this condition in vulnerable individuals and their children. Recent clinical evidence suggests that this might be the case.[48]

Because muscle dysfunction frequently reflects biochemical dysfunction, the use of the AK MMT may expedite the broad-scope discovery of the causes of biochemical disorders.[49] Goodheart originally observed, "The opportunity to use the body as an instrument of laboratory analysis is unparalleled in modern therapy; if one approaches the problem correctly, making the proper and adequate diagnosis and treatment, the response is satisfactory to both the doctor and the patient."[47] If it proves to be the case that the AK MMT is sensitive and selective to ASD, then the factors that correct the muscle inhibitions found related to the adrenal gland may become an important guide in the selection of treatment modalities and nutritional elements in these cases.

Limitations

A primary limitation of this study was that it did not include patients without ASD; as a retrospective case-series report on patients with ASD, patients who undergo salivary assays usually have some form of ASD. Controls without this condition presenting to the clinician's practices were not common enough to create a control group.

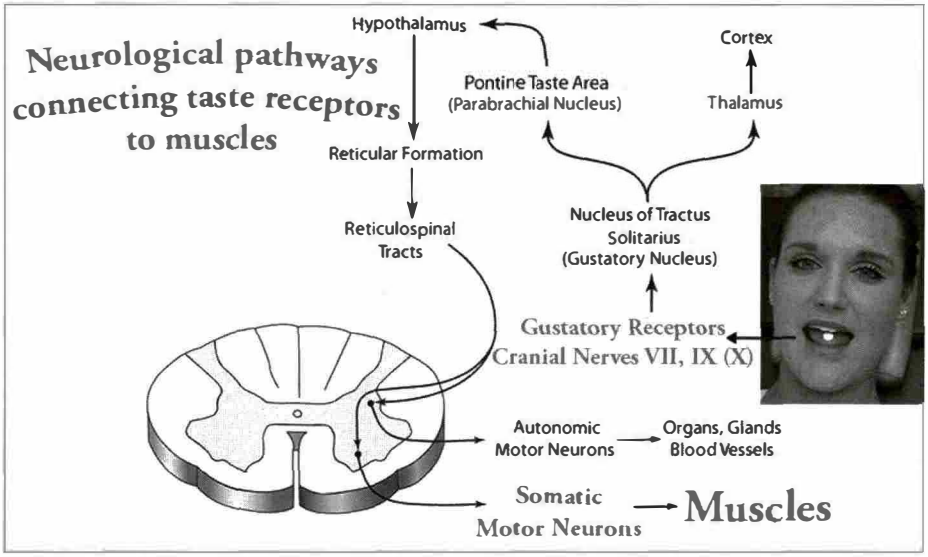


Figure 9: Proposed Pathways of Muscle Response to Gustatory Receptor Stimulation

The next steps of objectifying possible measurable muscle impairments associated with ASDs are to increase the sample size, to study patients in other situations involving physical, biochemical, and psychosocial imbalances resulting in stress-related symptoms, to develop an appropriate control intervention, to solve the problem of blinding and double-blinding, to find additional steroid hormone disturbances that may be assessed by the AK MMT, and to compare the treatment effects of AK with other methods that ameliorate the symptoms of adrenal stress disorder.

Finally, the effectiveness of the manual muscle test for diagnosis in this arena can only be established following a full-scale, randomized, controlled clinical trial with adequate follow-up and homogenized samples. A follow-up study showing the effect of AK treatment upon abnormal salivary cortisol values is currently under way.

Conclusion

This study supports a number of previous reports, showing that gustatory receptor-based sensorimotor challenges like the ones used here may permit the clinician to assess the impact of biochemical substances on patient neurophysiology and muscle function. This approach may afford clinicians the use of an interactive means by which to predict the clinical utility of a given substance for a given patient with ASD. If true, this would represent a significant conceptual expansion of the standard nutritional examination process.

We believe that the correlations obtained between AK MMT findings and salivary hormone tests in cases with ASD are a first step in suggesting that MMT is a potentially useful, inexpensive, noninvasive tool in the assessment of a primary endocrine dysfunction in the general population.

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Corresponding Author
Scott Cuthbert, DC
cranialdc@hotmail.com
Chiropractic Health Center, PC
255 West Abriendo Avenue
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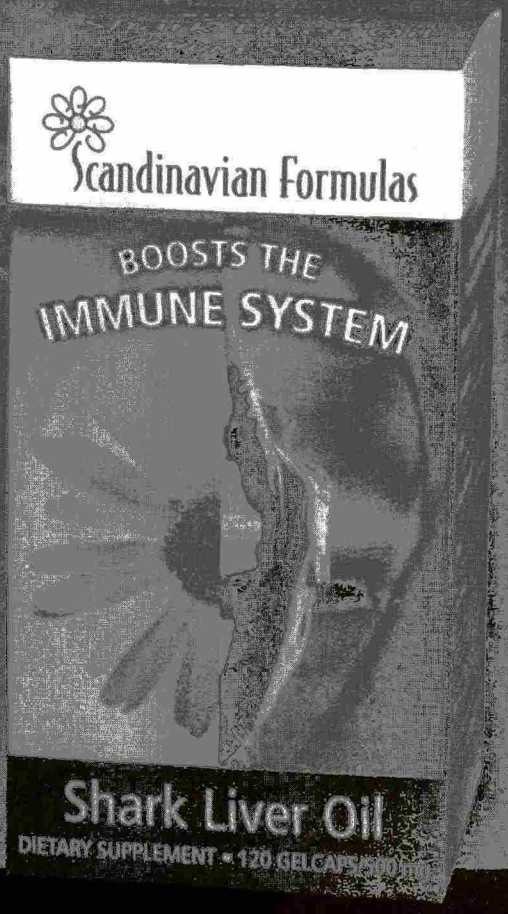

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The Green Smoothie Fad: This Road to Health Hell is Paved with Toxic Oxalate Crystals

by William Shaw, PhD

Internet news this past fall indicated the conviction of an oncologist who attempted to kill her boyfriend who was involved with another woman. The weapon of choice was ethylene glycol, popularly known as antifreeze, which had been placed in his coffee. Although emergency measures saved his life, extensive deposits of oxalate crystals, the main toxic metabolite of ethylene glycol, had caused extensive kidney and liver damage, reducing the man's lifespan by about half.

Similar results in sabotaging your own health can occur through the regular consumption of a popular concoction called a "green smoothie." A recent Google search for "green smoothie" yielded 609,000 hits. In addition, a recent "improving your diet" seminar that I attended promoted this same idea. Interestingly, on the same day, I reviewed test results of a urine organic acid test of a woman with oxalate values 3 times the upper limit of normal. A conversation with the patient indicated that she had recently turned to consuming daily "green smoothies" to "clean up her diet." The most common "green" components of the most popular green smoothies are spinach, kale, Swiss chard, and arugula. Each of these greens is loaded with oxalates. A typical Internet recipe advises that 2 cups of packed raw spinach leaves is a good starting point for a smoothie. In addition to the high oxalate greens added to the blender, green smoothie proponents frequently recommend adding a variety of berries or almonds, also containing high oxalate amounts. Similar high urine oxalate results were found in organic acid tests of a number of patients with kidney stones who had decided to eat large spinach salads daily as a "move to clean up my unhealthy diet." Unfortunately, kidney stones are not the only health problems that people who regularly consume green smoothies and large spinach salads will experience with their new "clean" diet.

Seventy-five years ago, a food scientist of the Campbell Soup Company reported:

> Only a few foods, notably spinach, Swiss Chard, New Zealand spinach, beet tops, lamb's quarter, poke, purslane, and rhubarb have high oxalate content. In them, expressed as anhydrous oxalic acid, it is often considerably over 10% on a dry basis. In fifty-three samples, including practically all commercial and many experimental varieties grown in California and in Maryland as well as those shipped from Texas, Florida and Carolina, the average anhydrous oxalic acid content was 9.02% on the dry basis (maximum 12.6, minimum 4.5). Whereas spinach greatly increases the calcium content of the low calcium but well performing basal diet, it decidedly interferes with both growth and bone formation. If to a diet of meat, peas, carrots and sweet potatoes, relatively low in calcium but permitting good though not maximum growth and bone formation, spinach is added to the extent of about 8% to supply 60% of the calcium, a high percentage of deaths occurs among rats fed between the age of 21 and 90 days. Reproduction is impossible. The bones are extremely low in calcium, tooth structure is disorganized and dentine poorly calcified. Spinach not only supplies no available calcium but renders unavailable a considerable amount of the calcium in the other foods. Considerable amounts of the oxalate appear in the urine, much more in the feces.[1]

The author also discovered that in addition to leading to excessive death and defective reproduction in the rats, high oxalate foods also cause soft and pliable bones and defective teeth.

Oxalate and its acid form oxalic acid are organic acids that come from three sources: the diet, fungus infections such as *Aspergillus* and *Penicillium* and possibly *Candida*, and also human metabolism.[2-11]

Oxalic acid is the most acidic organic acid in body fluids and is used commercially to remove rust from car radiators. Antifreeze (ethylene glycol) is toxic primarily because it is converted to oxalate. Two different types of genetic diseases are known in which oxalates are high in the urine. The genetic types of hyperoxaluria (type I and type II) can be determined from the organic acid test done at the Great Plains Laboratory. Foods especially high in oxalates include spinach and similar leafy vegetables, beets, chocolate, soy, peanuts, wheat

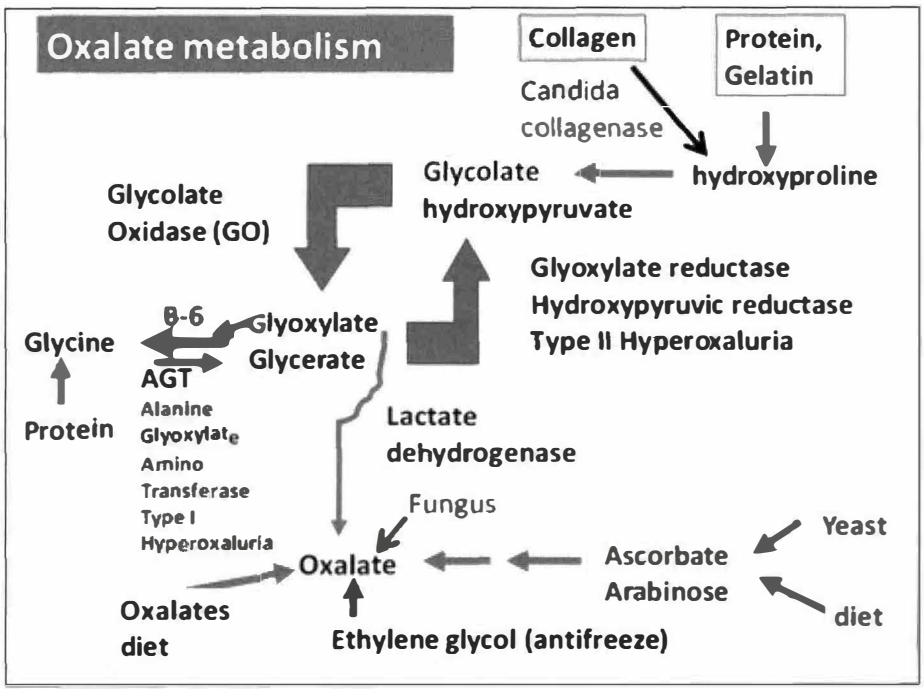
bran, tea, cashews, pecans, almonds, berries, and many others. Oxalates are not found in meat or fish at significant concentrations. Daily adult oxalate intake is usually 80 to 120 mg/d, but it can range from 44 to 1000 mg/d in individuals who eat a typical Western diet. I estimate that the person who consumes a green smoothie with 2 cups (about 150 grams) of spinach leaves is consuming about 15 grams (15,000 mg) of oxalates, or about 150 times the average daily oxalate intake. A complete list of high-oxalate foods is available on the Internet at http://www.upmc.com/patients-visitors/education/nutrition/pages/low-oxalate-diet.aspx.

High oxalate in urine and plasma was first found in people who were susceptible to kidney stones. Most kidney stones are composed of calcium oxalate. Stones can range in size from the diameter of a grain of rice to the width of a golf ball. It is estimated that 10% of males may have kidney stones some time in their lives. Because many kidney stones contain calcium, some people with kidney stones think that they should avoid calcium supplements. However, the opposite is true. When calcium and magnesium are taken with foods high in oxalates, oxalic acid in the intestine combines with these minerals to form insoluble calcium and magnesium oxalate crystals that are eliminated in the stool. These forms of oxalate cannot be absorbed into the body. When calcium and/or magnesium are low in the diet, oxalic acid is soluble in the liquid portion of the contents of the intestine (called chyme) and is readily absorbed from the intestine into the bloodstream. If oxalic acid is very high in the blood being filtered by the kidney, it may combine with calcium and other metals, including heavy metals such as lead and mercury, to form crystals that may block urine flow, damage the kidney, and cause severe pain.

These oxalate crystals can also form in the bones, skin, joints, eyes, thyroid gland, blood vessels, lungs, and even the brain.[11-14] Oxalate crystals in the bone may crowd out the bone marrow cells, leading to anemia and immunosuppression.[14] In addition to individuals with autism and kidney disease, individuals with fibromyalgia and women with vulvar pain (vulvodynia) may also suffer from the effects of excess oxalates.[15-18]

Recent evidence also points to the involvement of oxalates in stroke, atherosclerosis, and endothelial cell dysfunction.[19-21] High amounts of oxalates were found concentrated in atherosclerotic lesions of the aortas and coronary arteries of a number of individuals at autopsy. These individuals did not have oxalate deposits in the kidney but did have oxalate deposits in other organs such as the thyroid gland and testes. Since the stains used by most pathologists examining atherosclerotic lesions cannot readily determine the presence of oxalates in diseased arteries, it seems possible that this cause of atherosclerosis may be much more common than previously realized. I suspect that oxalates are a much more common cause of atherosclerosis than high cholesterol. Furthermore, since ethylenediaminetetraacetic acid (EDTA) is effective in the removal of oxalate crystals deposited in the tissues, the benefits of intravenous EDTA in the treatment of cardiovascular disease may be ➤

Figure 1: Summary of Oxalate Sources. *Candida albicans* can produce an enzyme called collagenase that breaks down collagen, a major human body protein that makes up 30% of our proteins. In addition, ethylene glycol (antifreeze) is converted to oxalate by human enzymes. Many fungi, including those that infect humans, also produce oxalates directly, and oxalate stones may be found in tissues such as the lung and sinuses that are fungi infected. Vitamin C (ascorbic acid), especially at doses of more than 2000 mg per day, can break down to form oxalates, and certain fungi can convert the *Candida* byproduct arabinose to oxalate. Collagenase breaks down collagen to form hydroxyproline, one of collagen's major amino acids. Hydroxyproline is also a major constituent of gelatin, a popular dessert. Hydroxyproline can then be converted to glycolate and glyoxylate by a series of reactions in the human body. Further metabolism of glyoxylate is at a critical junction. If adequate amounts of vitamin B6 are available, the enzyme AGT converts glyoxylate to the amino acid glycine. If vitamin B6 is deficient, glyoxylate is increasingly converted to oxalate by lactate dehydrogenase, although some of it is converted back to glycolate, which is again susceptible to forming additional oxalate.



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mediated largely by the removal of oxalate crystals and their associated heavy metals from the tissues in which they are deposited.[22,23]

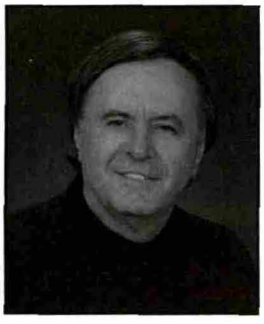
Oxalate crystals may cause damage to various tissues due to their sharp physical structure and they may increase inflammation. Iron oxalate crystals may also cause significant oxidative damage and diminish iron stores needed for red blood cell formation.[11] Oxalates may also function as chelating agents and may chelate many toxic metals such as mercury and lead. However, unlike common chelating agents such as EDTA and DMSA that cause metals to be excreted, a reaction of oxalate with heavy metals such as mercury and lead leads to the precipitation of the heavy metal oxalate complex in the tissues, increasing the toxicity of heavy metals by delaying their excretion.[24]

What steps can be taken to control excessive oxalates?

- Use antifungal drugs to reduce yeast and fungi that may be causing high oxalates. Children with autism frequently require years of antifungal treatment. I have noticed that arabinose, a marker indicating yeast/fungal overgrowth on the organic acid test at the Great Plains Laboratory, is correlated with high amounts of oxalates (Figure 1). *Candida albicans* produces high amounts of the enzyme collagenase, which breaks down collagen in the gastrointestinal tract to form the amino acid hydroxyproline, which in a series of reactions is converted to oxalates, especially in people with low vitamin B6.[25] Candida organisms have also been found surrounding oxalate stones in the kidney.[10]
- Give supplements of calcium citrate and magnesium citrate to reduce oxalate absorption from the intestine. Citrate is the preferred calcium form to reduce oxalate because citrate also inhibits oxalate absorption from the intestinal tract. The best way to administer calcium citrate would be to give it with each meal. Children over age 2 need about 1000 mg of calcium per day. Of course, calcium supplementation may need to be increased if the child is on a milk-free diet. The most serious error in adopting the gluten-free, casein-free diet is the failure to adequately supplement with calcium.
- Give chondroitin sulfate to prevent the formation of calcium oxalate crystals.[26]
- Vitamin B6 is a cofactor for one of the enzymes that degrades oxalate in the body and has been shown to reduce oxalate production.[27]
- Increase water intake to help eliminate oxalates.
- Consume a low-oxalate diet, avoiding high-oxalate foods such as leafy greens, beans, berries, nuts, tea, chocolate, wheat germ, and soy. Dr. Clare Morrison, a general pratitioner from the UK who has fibromyalgia, found relief from symptoms after changing to a low-oxalate diet. In a 2012 article in the *Daily Mail*, she said, "I cut these out of my diet and overnight my symptoms disappeared – the disabling muscle pains, tingling legs, fatigue and inability to concentrate all went."[28]

Table 1: Factors that Affect Oxalate Metabolism that Are Covered in the Urine Organic Acid Test

Metabolites	Significance
Oxalic acid	Extremely acidic organic acid that traps heavy metals and deposits in a variety of tissues throughout the body.
Pyridoxic acid	Major metabolite of vitamin B6 – high amounts of vitamin B6 shunt oxalate precursors to the formation of glycine instead of oxalic acid.
Glycolic acid	Byproduct of *Candida* produced when *Candida* enzyme collagenase converts hydroxyproline to glycolic acid. It is found elevated in the genetic hyperoxaluria type I.
Glyceric acid	Found elevated in the genetic hyperoxaluria type II.
Arabinose, tartaric acid	Candida markers.
5-hydroxy-methyl-furoic acid, 2,5-furandicarboxylic acid	Metabolites of fungi such as *Aspergillus* that may produce oxalates directly.
Ascorbic acid	High oral or intravenous intake may lead to excessive oxalate production.



William Shaw, PhD, is board certified in the fields of clinical chemistry and toxicology by the American Board of Clinical Chemistry. Before he founded the Great Plains Laboratory Inc., Dr. Shaw worked for the Centers for Disease Control and Prevention (CDC), Children's Mercy Hospital, University of Missouri at Kansas City School of Medicine, and Smith Kline Laboratories. He is the author of *Biological Treatments for Autism and PDD*, originally published in 1998, and *Autism: Beyond the Basics*, published in 2009. He is also a frequent speaker at conferences worldwide.

He is the stepfather of a child with autism and has helped thousands of patients and medical practitioners to successfully improve the lives of people with autism, AD(H)D, Alzheimer's disease, arthritis, bipolar disorder, chronic fatigue, depression, fibromyalgia, immune deficiencies, multiple sclerosis, OCD, Parkinson's disease, seizure disorders, tic disorders, Tourette syndrome, and other serious conditions.

Measuring Oxalate Toxicity

The organic acid test (Table 1) is one of the best measures for determination of both genetic and nutritional factors that lead to toxic oxalates. The organic acid test includes two additional markers, glycolic and glyceric acids, that are markedly elevated in genetic causes of excessive oxalate, the

hyperoxalurias I and II. In addition, the organic acid test includes factors such as high fungal and *Candida* markers that make oxalate (fungus) or their precursors (*Candida*). Finally, although vitamin C poses little risk of excess oxalates at doses up to 2000 mg per day, I have measured marked increases in oxalates (more than 10 times the upper limit of normal) in a child with impaired kidney function after a 50,000 mg intravenous vitamin C megadose. The organic acid test also includes the main vitamin B6 metabolite pyridoxic acid, which diminishes the body's own production of oxalates.

Notes

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An Innovative Option for Diagnosing Lyme: Pharmasan Labs' iSpot Lyme

by Bradley Bush, ND

Lyme disease is the most prevalent tick-borne disease in the US. The Centers for Disease Control and Prevention (CDC) reported nearly 32,500 new cases in 2011, though it is estimated that the actual number could be up to 10-fold higher, making Lyme disease an epidemic larger than AIDS, West Nile virus, and Avian flu combined.[1-5]

Unfortunately, only a fraction of these cases are being treated due to equivocal clinical manifestations, inaccurate tests, and underreporting.[2] Patients not receiving adequate treatment may develop chronic infection or late-stage Lyme diseases such as chronic Lyme arthritis or chronic Lyme neuroborreliosis, which can be devastating in some cases.[6]

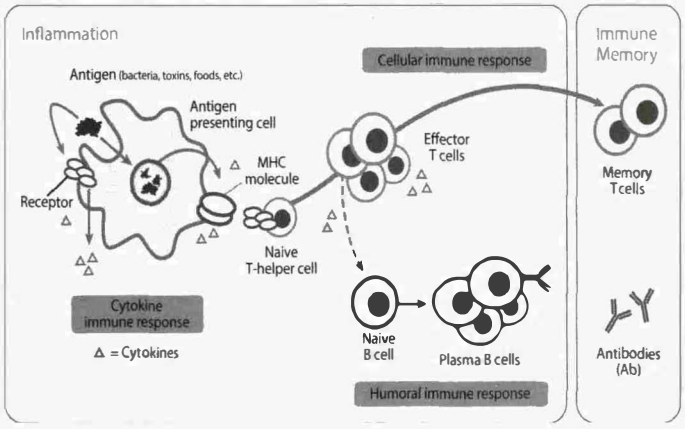

Figure 1: Inflammatory immune response: Individuals who have been infected with *B. burgdorferi* harbor *B. burgdorferi*-specific immune cells (T cells) in their bloodstream. Typically, these T cells can be detected before an antibody response.

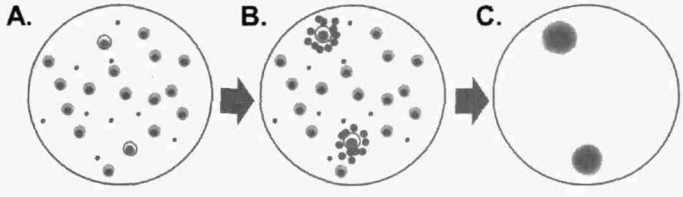

Figure 2: When peripheral blood mononuclear cells (PBMCs) from a *B. burgdorferi*-infected patient are exposed to *B. burgdorferi* protein antigens (A), *B. burgdorferi*-specific T cells are activated and secrete small proteins called cytokines (B). T cells that are not specific for *B. burgdorferi* do not become activated. iSpot Lyme measures the cytokine IFN-g secreted by the patient's T cells. Cytokine proteins (IFN-g) are captured near the cells that secreted them, and are then detected using a color reagent (C).

The current CDC-recommended evaluation for diagnosis is a two-tier test, including ELISA and western blot analyses. These tests are serological assays that detect antibodies to *B. burgdorferi*. The low sensitivity of the two-tier tests (about 30% in early Lyme disease and 50% in late Lyme disease) and the significant seronegativity of Lyme patients (as many as 30% to 50% of cases) suggests that more sensitive T cell-based laboratory tests should also be developed.[7] A thorough evaluation for Lyme requires testing for a humoral *and* a cellular immune response. This is done by measuring both antibodies (humoral/WB) and T cell activity (cell-mediated/ELISPOT).

Enzyme-linked immunosorbent spot (ELISPOT) is an effective method for assessment of the magnitude and the quality of T cell immunity by measuring stimulated antigen-specific T cells.[8,9] This method and over 100 tests that measure nervous-, endocrine-, and immune-system

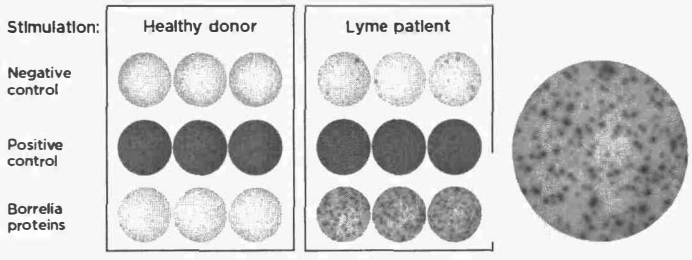

Figure 3: The resulting spot forming units (SFUs) represent individual *B. burgdorferi*-reactive T cells that are counted to determine a positive or negative test result.

Lyme disease is caused by *Borrelia burgdorferi*, a bacterium of the spirochete class. Lyme disease is a zoonotic, vector-borne disease transmitted by the *Ixodes* (blacklegged) tick. Symptoms may include observed tick bite, a "bulls-eye" rash, flu-like symptoms, joint pain, neurological symptoms, heart palpitations, and severe fatigue.

markers are performed by Pharmasan Labs in a state-of-the-art, CLIA-certified specialty reference laboratory with 12 PhDs on staff. Combined with NeuroScience's custom health solutions, Pharmasan Labs offers natural practitioners turnkey solutions to effectively address the root causes of patients' conditions.

Clinical Relevance

The ELISPOT method utilized in iSpot Lyme is a highly sensitive technique for detecting immune cells that secrete signature proteins (such as a given cytokine). It is the only available technology that accurately detects, measures, and performs functional analysis of low-frequency immune cells. The sensitivity of ELISPOT is much higher than that of ELISA and the flow cytometry-based intracellular cytokine staining method.[10] iSpot Lyme has a sensitivity of 84% and specificity of 94%.

The iSpot Lyme test detects a cellular immune response against Lyme antigens, which appears earlier in the disease process than the antibody response detected by the traditional western blot test.[11] More importantly, iSpot Lyme can detect antigen-specific T cell responses in seronegative patients.[12] Therefore, the Lyme ELISPOT test can be used to provide information regarding the current immune status of a Lyme disease patient.

iSpot Lyme Test

The iSpot Lyme test detects *B. burgdorferi*-specific T cell responses in patients who have been exposed to *B. burgdorferi* spirochetes. Individuals who have been infected with *B. burgdorferi* harbor *B. burgdorferi*-specific immune cells (T cells) in their bloodstream. Typically, these T cells can be detected before an antibody response.

The result is produced by measuring IFN-g secreted by T cells in response to stimulation by the *B. burgdorferi* antigens DbpA, OspC, p100, and VisE-1. This test measures frequency of antigen-specific T cells by measuring T cells that are specific for Lyme antigens. This is indicative of exposure to Lyme. A single result is provided on the report.

Methodology

The immune response to infection with *B. burgdorferi* includes both B cell and T cell activation.[13,14] T cells are sensitized to *B. burgdorferi* antigens and the activated effector T cells produce the cytokine interferon gamma (IFN-γ) when stimulated by these antigens. The iSpot Lyme test counts *B. burgdorferi*-sensitized T cells by capturing interferon-gamma (IFN-γ) secreted by these T cells. More specifically, when IFN-γ is released a "spot" of insoluble precipitate is formed at the site of the reaction. Evaluating the number of spot forming units (SFUs) provides a measurement of *B. burgdorferi*-sensitive effector/memory T cells in the peripheral blood. The SFU count correlates to a patient's T cell reaction to *B. burgdorferi*.

Conclusion

Lyme disease is an increasingly common condition that has varying stages of severity. A comprehensive approach to diagnosis will lead to better treatments and outcomes. Pharmasan Labs' iSpot Lyme test is a highly sensitive test to identify *B. burgdorferi* infection, aiding health-care professionals to better diagnoses of their patients.

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Bradley Bush, ND

Dr. Bush's background provides insightful understanding of the natural health marketplace. His experience includes licensed naturopathic doctor, marketing director, salesperson, and health-care consultant for the nutritional supplement and laboratory testing industries. Currently in private practice in Stillwater, Minnesota, Dr. Bush formerly served as director of clinician affairs for NeuroScience Inc. Committed to advancing education in the natural health sciences, Dr. Bush is a sought-after author and presenter on naturopathic and integrative medicine topics.

Bleach and Biome: Mice Studies Prove Interesting

by Jacob Schor, ND, FABNO

It has become customary among our colleagues to discount clinical research performed on mice and only place value on human clinical trials. This has advanced to the point that one of the journals which I occasionally submit articles to now asks that I avoid any citations of animal studies.

Nevertheless, several recent animal studies strike me as being particularly relevant to our clinical practices and worthy of discussion despite the fact that the participants were mice. While the studies are on wildly different topics, their common denominator is that they turn our current understanding of things upside down.

One study suggests that exposure to dilute laundry bleach may protect cancer patients against radiation dermatitis. Two other studies suggest that creating a "leaky gut" is necessary for certain cancer chemotherapy drugs to be effective.

These studies have interesting implications, and it would be a shame to ignore them until human trials confirm their conclusions. Let's start with the bleach one first.

Thomas Leung, a dermatologist at Stanford University, conducted a pair of experiments with mice, bathing them in diluted bleach (hypochlorite). Diluted bleach has been used for years to treat eczema, without anyone's really knowing why it works. One theory was that bleach, being antimicrobial, killed off bacteria that were triggering the skin reaction. While this sounds plausible, the dilutions used were too weak to have antibacterial effect, so Leung looked elsewhere for an explanation. The bleach concentration used to treat eczema, 0.005%, is more dilute than that found in a swimming pool. The authors examined how bleach affects inflammation. Eczema, after all, is inflammation spun out of control.

They looked at nuclear factor-kappaB (NF-kB), as this signaling protein triggers the recruitment of inflammatory cells to sites of infection. Leung's team exposed human skin cells to the bleach dilution used to treat eczema for an hour and reported that this blocked NF-kB signaling. The bleach oxidizes the molecule that activates NF-kB, and by blocking this activator, the bleach completely inhibits the NF-kB inflammatory pathway.

This is more than a little relevant. NF-kB is kind of the common denominator of all bad things; it "regulates cellular responses to inflammation and aging, and alterations in NF-kB signaling underlie the pathogenesis of multiple human diseases."

The researchers then tried this dilute bleach solution in mice that were then exposed to radiation to see if it changed the expected burnlike irritation which this treatment normally causes. They also tested bleach on healthy old mice with aging skin.

In the radiation experiment, the mice were placed in either a dilute bleach bath or a water bath for 30 minutes daily for 10 days prior to radiation treatment. The radiation burns on these "bleached" mice were milder and healed faster than those on the mice that had only been exposed to water baths.

Similar benefits were seen in the old mice. Daily bleach baths "... increased skin cell production resulting in thicker, younger-looking skin than old mice that took plain water baths. In addition, they had lower expression of two genes classically associated with ageing. The effect was short lived, however. The rejuvenated skin returned to its elderly look after about two weeks because the action of bleach on NF-kB is mild, and diminishes with time."[1,2]

This simple treatment could provide a means to reduce radiation dermatitis. Skin reactions can delay treatment and reduce effectiveness. Preventing them could have a positive impact on long-term statistics. While Leung experimented on mice, not humans, what is the risk in our patients' trying this? Sure, it may not work; but it seems unlikely to hurt, as people spend more time in swimming pools without ill effect.

It is not just reducing radiation dermatitis wherein bleach could play a role in cancer treatment. NF-kB "plays a critical role in cancer development and progression" and is a "a key pathway in activation of immune responses" and this "activation may also affect the cancer's response to therapy, making it less susceptive to radio and chemo treatment."[3] Many of the supplements that we encourage our cancer patients to take lower NF-kB. These include green tea, curcumin, quercetin,

Nigella sativa, resveratrol and other polyphenols.[4-11] A daily bleach dip could help cancer patients in ways other than simply reducing injury from radiation therapy.

This study questions our near worship of antioxidants; bleach, after all, is the poster child of oxidizing chemicals. Many will find the very idea that an oxidant has beneficial action difficult to accept. This is backwards. Bleach should hurt, not help.

While this may make little sense to some of us, it made perfect sense to Edward Calabrese, the University of Massachusetts toxicologist who researches hormesis. You may recall that he spoke at the AANP conference at Keystone, Colorado, in the summer of 2013.

In toxicology, *hormesis* refers to the phenomenon exhibited by some substances in which a graph of their toxic effects takes on a J- or U-shaped curve. Low doses may produce the opposite effect of higher doses. Think of the law of similars in homeopathy but leaving out the infinitesimal dilutions. Concentrated bleach will burn the dickens out of your skin, but in small amounts will protect and heal it. The skin cells respond to the bleach, even in low doses, by turning on adaptive mechanisms to protect themselves from damage, and these same mechanisms once triggered protect against the oxidative damage caused by the radiation treatments.

When I shared this article with Calabrese, he responded, "It looks like yet another example of preconditioning hormesis. I suspect that if it would be studied in a detailed dose-response fashion, it would reveal the classic biphasic dose response."

Understanding hormesis may be key to our understanding many of the therapies that we regularly employ in practice. Plant biologists tell us that many of the phytochemicals which we value are actually produced by the plants to serve as protective toxins. Curcumin, resveratrol, quercetin, and the like are actually insecticides, antifungals, and neurotoxins that the plants make to ward off predators and infectious microrganisms. We take advantage of their hormetic actions. Exposure to these agents triggers an adaptive response in the human body, recruiting resources to neutralize potential injury.

Equally surprising to me as this bleach business is the role that the intestinal biome may play in cancer treatment. Two papers in *Science* (November 22, 2013) suggested that bacteria living in our intestines play an active role in the action of at least three chemotherapy treatments used by cancer patients. The papers actually suggest that (in mice) gut bacteria are necessary for chemotherapy to work. Cancer patients are often given antibiotics, and this may reduce the benefit of their subsequent chemotherapy.

Laurence Zitvogel is behind one paper. She reported that the chemotherapy drug cyclophosphamide requires translocation of intestinal bacteria out of the gut and into the spleen. In the spleen, these bacteria trigger Th17/Th1 production. Germ-free or antibiotic-treated mice have a weaker response to cyclophosphamide.[12] In the second paper, Dzutsev et al. suggest that gut bacteria are necessary for platinum drugs to work. Pretreatment of mice with antibiotics lessens this drug's action against implanted tumors.[13]

Patients given cyclophosphamide frequently develop digestive problems, and closer examination reveals that the drug has increased small intestine permeability, what we would call "leaky gut." This leakiness allows bacteria, in particular several kinds of gram-positive bacteria, to translocate and settle in the spleen and lymph tissue of treated mice. This translocation is key to the drug's potency. The bacteria trigger immature T cells to turn into Th17 cells, some of which then transform into memory cells, allowing a prolonged immune response against the tumor. In mice that were either bred to be germ free or treated with antibiotics that eliminate gram-positive bacteria, cyclophosphamide worked poorly; it no longer increased Th17 cells and treatment no longer shrank implanted tumors.

Dzutsev's team also treated cancer-implanted mice, first testing an immunotherapy treatment and then oxaliplatin. Pretreating mice with antibiotics to eliminate any microbial populations again limited the effectiveness of the chemotherapy treatments. The mice ceased production of tumor necrosis factor and the tumors did not shrink.

They next tested oxaliplatin. This drug increases reactive oxygen species (ROS), which leads to cancer cell apoptosis. In a study of mice implanted with various cancers, the researchers treated half with antibiotics before administering chemo. Within 3 weeks, 80% of the

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antibiotic treated mice had died. The mice not given antibiotics that still had normal intestinal flora fared far better; 80% were still alive.

In mice, at least, it appears that intestinal bacteria are necessary for certain types of chemotherapy to work. The researchers seem shocked to the extent that gut flora are necessary. Domino Trincheiri, one of the authors, is quoted: "We suspected that platinum therapy may involve some immune pathway on which the gut microbiota could have a modulating effect, but we were surprised by the extent to which inflammatory cell reactive oxygen species production was strictly dependent on the presence of gut microbiota."

These two studies certainly should bring caution to the routine, prophylactic, and almost cavalier use of antibiotics before or during chemotherapy, in particular with oxaliplatin or cyclophosphamide. These studies should also bring caution to our routine use of probiotics or therapies that reduce intestinal permeability. The specific types of bacteria that these researchers suspect are important in triggering these immune responses are not found in probiotic supplements. The probiotic products in common use are designed to lower immune responses, to calm the immune system; they lower TNF expression. Perhaps we should be using "nastier" bacteria, of the sort that we associate with triggering immune reactions?

If a "leaky gut" is necessary for these chemotherapy drugs to work, certain therapies that we have thought useful in the past may need to be evaluated afresh. Using L-glutamine and melatonin, which both help prevent or heal leaky gut, may impede the anticancer action of these drugs.[14]

On the other hand, supplements or treatments that increase intestinal permeability or worsen leaky gut, such as piperine or fasting, might help increase the cytotoxic effect of chemotherapy.[15,16] This is totally the opposite of what we have tried to do. Up until now, reducing gut permeability and bacterial translocation has been the goal.[17] (Carbohydrate feeding, by the way, decreases bacterial translocation.)[18]

Many chemotherapy drugs cause bacterial migration, so perhaps this issue extends beyond oxaliplatin and cyclophosphamide.[19]

Bleach is good and probiotics are bad. If this doesn't give you pause, you are not paying attention. These are important ideas with potentially significant implications for our clinical practices. Granted that the studies were done on mice, and humans do not always copy what mice do; that is, human studies do not confirm the findings in studies on mice. Yet these studies may warn us of things to come, and we would be negligent to ignore their results.

Jacob Schor, ND, FABNO, has practiced as a naturopathic physician in Denver, Colorado, with his wife, Rena Bloom, ND, since they graduated from National College of Naturopathic Medicine in 1991. He was humbled in 2008 when presented with the Vis Award by the American Association of Naturopathic Physicians (AANP). He has had the honor of serving the members of the Oncology Association of Naturopathic Physicians as a board member and currently as president. Dr. Schor began a term on the AANP's board of directors in January 2012. He is a frequent contributor to, and associate editor of, the *Natural Medicine Journal*.

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Early Detection of Insulin Resistance for Improved Patient Outcomes

by Pushpa Larsen, ND

Twenty years and more ago, when many of the practitioners reading this article were in medical school, we were taught that a fasting blood glucose measurement was an adequate screen for blood sugar issues. As long as it was below 100, it was considered normal and therefore of no consequence. Even those who practiced more proactively often considered fasting glucose a reliable indicator of glucose regulation, although perhaps levels above 90 would raise red flags. Glucose levels higher than 100 might trigger further evaluation with an oral glucose tolerance test (OGTT). Hemoglobin A1c (glycosylated hemoglobin) was then considered only for use in patients already diagnosed as diabetic. The focus was entirely on blood glucose. Insulin was rarely measured.

The limitation of relying entirely on these measurements is that, in the insulin-resistant individual, rising insulin levels may well keep blood sugar at normal, even optimal, levels for years, while elevated circulating insulin damages blood vessels and contributes to central weight gain. By the time the overworked pancreatic cells begin to decrease production of insulin and blood glucose levels skyrocket, the damage has been done. The road back to optimal blood sugar control is much more difficult at this point. Typically, patients go on blood–sugar lowering pharmaceuticals and remain on them the rest of their lives, even if they make changes in their dietary and exercise habits.

Today, of course, the phenomenon of insulin resistance is widely recognized, but the tests commonly used for screening may be missing a great number of patients who could benefit earlier detection and intervention. Let's look at the available tests.

Fasting Glucose

Fasting glucose, as noted above, doesn't really test for insulin resistance, but is important because it is commonly included in a comprehensive metabolic panel or other health screening panel and therefore *may* be the first sign that there is a problem. Optimal for fasting glucose is probably in the mid-80s, but this level should not be interpreted as a sign that insulin resistance is absent.

Oral Glucose Tolerance Test (OGTT)

The classic OGTT was done over a period of 2 to 3 hours with draws done at fasting, and 30, 60, 90, and 120 minutes after a 75 to 100 gram glucose challenge. Sometimes a 3-hour (180 minute) draw was also done. Over time, the number of draws was reduced and the glucose challenge was standardized. The current recommendation of the World Health Organization is a 75gm glucose challenge for adults.[1] A standard OGTT now consists of a baseline (fasting) draw and a 2-hour post-challenge draw (Table 1).[2]

Table 1
American Diabetes Association OGTT Levels

	Fasting	2-hour Post Glucose Challenge
Normal	<100	<140
Pre-diabetic	100-125	140-199
Diabetic	>125	>199

The shortcoming of the standard OGTT is that it is entirely possible to have fasting and 2-hour glucose levels in the normal range and still have elevated insulin values, a sign that insulin sensitivity is diminishing and that ever-increasing levels of insulin are required to maintain glucose regulation.

Hemoglobin A1c/Fructosamine

Hemoglobin A1c (also known as glycosylated or glycated hemoglobin) measures the degree to which hemoglobin molecules in red blood cells have been glycated or have had sugar molecules attached to them. Because red blood cells have a life span of around 120 days, this measurement allows us to assess average blood sugar levels over the past 3 to 4 months. Once used only for monitoring blood sugar in diabetics, HgbA1c is now routinely used by integrative and mainstream practitioners as a screening and monitoring tool (Table 2). The optimal level for HgbA1c used by many functional medicine practitioners is ≤5.4%

Fructosamine measures glycated serum proteins, particularly albumin, which suggests average blood sugar over the previous 2 to 3 weeks. It has much more limited utility, and

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Table 2
American Diabetes Association Hemoglobin A1C Levels

Normal	<5.7
Pre-diabetic	5.7–6.4
Diabetic	>6.4

values between labs can vary due to differences in methodology. Patient age, gender, and other factors can also affect fructosamine values. It is most useful for monitoring efficacy of treatment that might be expected to show results rather quickly. It is also used in place of HcbA1c in individuals with disorders that affect red blood cells, such as sickle cell disease and hemolytic anemia.

Fasting Insulin

Fasting insulin measurements started being used about 15 years ago by practitioners looking for a way of assessing insulin resistance. Normal values for fasting insulin are anywhere from <30 to <20, depending on the laboratory. However, optimal fasting insulin is considerably lower, usually considered to be ≤ 10. Many practitioners consider optimal to be closer to ≤ 6. Using fasting insulin to assess insulin resistance can be misleading, as it is quite possible to have a fasting insulin of <10 and still have insulin resistance. This can be seen clearly in the graphs of patient results later in this article.

In short, we have very well-established methods for assessing glucose regulation, allowing us to easily diagnose patients as nondiabetic, prediabetic, or diabetic. What has been missing is a reliable way to detect insulin resistance in those years when insulin levels are rising but still keeping blood sugar levels down. This need is answered by the glucose tolerance/insulin response test.

Glucose Tolerance/Insulin Response (GTIR)

The glucose tolerance/insulin response test is based on a classic OGTT, with measurements made at baseline (fasting) and at multiple points after a glucose challenge. At each point, both glucose and insulin are measured. The results are graphed and the insulin response is classified according to patterns. These patterns describe a progression of insulin response from completely normal to the flat curve seen with islet cell exhaustion. Patterns early in the progression can detect insulin resistance even when fasting and 2-hour glucose and fasting insulin are at optimal levels. This allows for much earlier intervention, which can halt the progression of insulin resistance.

The GTIR test is based on the research of Dr. Joseph Kraft, a clinical pathologist, who has been studying insulin response and diabetes since the 1970s. Kraft (MD, MS, FCAP) was chairman of the Department of Pathology and Nuclear Medicine at St. Joseph Hospital in Chicago from 1972 to 1998. His paper, "Detection of Diabetes Mellitus *In Situ* (Occult Diabetes)," was originally published in *Laboratory Medicine* in 1975.[3] This study included 3650 patients who had been referred for a glucose tolerance test to rule out (or in) diabetes mellitus. Patients had a fasting blood draw and then received a 100 gram glucose challenge, followed by blood draws at 30 minutes, and at hours 1 through 4 after consumption of the glucose drink.

Based on the glucose tolerance test alone, 1937 patients (53%) were diagnosed as having DM; 1713 patients (47%) were determined to be normal (Figure 1, p. 64). But Dr. Kraft had tested insulin for these patients at the same time, and analysis of the insulin values revealed a different story for the "normal" group. Of the normal group, 565 patients (33%) were still deemed normal after analyzing insulin response. 862 patients (50%) were determined to have what Dr. Kraft characterized as "diabetes in situ," a term that he adopted *"because it embodies the concept of disease detection at its earliest identifiable point."* Another 240 patients (14% of the "normal" group) were found to be borderline. 43 patients (~3%) had a flat insulin curve suggestive of islet cells that were no longer producing adequate insulin (Figure 2, p. 64).

Looking at it another way, we could say that of the original 3650 patients who were administered the OGTT, only 15% (not 53%) were truly normal. Nearly one-third of these patients had an abnormal insulin response that went undetected when looking only at glucose values (Figure 3, p. 64). If this seems high, we should remember that these were patients referred for OGTT because of a suspicion of DM. Since this original study, Kraft has continued to investigate insulin response as a marker for early detection of developing diabetes. His evaluations of more than 14,000 OGTTs with insulin assays have substantiated his early findings.[4]

GTIR Insulin Response Patterns

Kraft distinguished five patterns of insulin response. One of these, Pattern III, has two variations. The progression of these patterns depicts the progression of glucose/insulin dysregulation from its earliest stages to full-blown diabetes and insulin dependence. The graphs illustrating these patterns are drawn from actual patient results.

Pattern I

Pattern I represents normal glucose tolerance and insulin response (Figure 4, p. 64). Fasting insulin is normal at between 0 and 10. Insulin peaks at 30 minutes or 1 hour and is <50 by the second hour. Third-hour insulin is lower than the second hour, and second plus third hour total is <60. Subsequent hour insulin values are back at the fasting range (0–10).

Pattern II

Pattern II starts out looking normal but shows evidence of beginning insulin resistance as the test progresses (Figure 5, p. 66). As in Pattern I, fasting insulin is between 0 and 10 and insulin peaks at 30 minutes or 1 hour. The

Dr. Pushpa Larsen graduated from Bastyr University with a doctorate in naturopathic medicine and certificates in naturopathic midwifery and spirituality, health and medicine. She has worked as a research clinician for the Bastyr University Research Institute and as affiliate clinical faculty for Bastyr University, training students in her clinic. She was in private practice in Seattle for 10 years before joining Meridian Valley Lab as a consulting physician, and maintains a small private practice primarily focused on bioidentical hormone therapy. She consults with hundreds of doctors every year on the use and interpretation of 24-hour urine hormone profiles, as well as other tests offered by Meridian Valley Lab. She has previously published and presented on the use of carotid intima-media thickness (CIMT) scanning in primary-care settings for early detection of cardiovascular disease. She can be reached at plarsen@meridianvalleylab.com or at 425-271-8689.

second hour plus third hour total is more than 60. If the total is between 60 and 100, the test is considered borderline for insulin resistance. If the total is more than 100, the test is considered confirmatory for insulin resistance.

Pattern III

Pattern III shows a delayed insulin peak and a much greater area under the curve. Fasting insulin is between 0 and 10. Pattern III-A insulin peaks at 2 hours. Two-hour glucose levels may be within normal limits, as can be seen in the example in Figure 6 (p. 66). Pattern III-B insulin peaks at 3 hours (Figure 7, p. 66). Two-hour glucose levels are generally higher although may fall within normal limits. The area under the curve for both insulin and glucose is much greater. Both variants are diagnostic for insulin resistance.

Pattern IV

Pattern IV is characterized by fasting insulin >10 (Figure 8, p. 66). Elevated fasting insulin is diagnostic for insulin resistance regardless of other values. Glucose values are often in diabetic ranges and insulin levels are dramatically high, typically peaking at the third hour. The area under the curve is quite large. The example in Figure 8 shows a Pattern IV result in which extremely high insulin levels functioned to keep all blood glucose levels within normal levels. This would have been completely missed on a standard OGTT.

Pattern V

Pattern V displays a flattened insulin curve, with all insulin values being less than 30 (Figure 9, p. 67). This is considered to be an inadequate insulin response to the glucose challenge and suggests exhaustion of pancreatic islet cells. This might be seen in someone who has been hyperinsulinemic for an extended period of time and now has a decreased capacity to respond. Typically, glucose values will be in diabetic ranges if not otherwise controlled.

In a few cases, Pattern V insulin response will be seen in conjunction with normal glucose levels. This may be due to a low-carbohydrate diet that has resulted in a downregulated insulin response.

GTIR Pattern Progression

Putting the insulin curves for the different patterns into a single graph illustrates a distinct progression of insulin resistance from normal to insulinopenic (Figure 10, p. 67). With this test, nascent insulin resistance can be detected long before blood glucose values might start to sound alarm bells. The import of this is magnified when one considers that diabetes has both individual and societal costs, and that it can largely be prevented or reversed with earlier detection, lifestyle changes, and treatment.

Case Study

The value of the GTIR for early detection and treatment cannot be overstated. The case of G. J. is a compelling example of this. G. J. is a 38-year-old woman who came into our clinic with a chief complaint of easy weight gain and fatigue. She is 5'4" tall and weighed 174 pounds at the initial visit. BMI was 29.9. Her pulse and respirations were normal

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and her BP was 107/76. She had a history of gestational diabetes and a family history of type 2 diabetes. Fasting blood sugar was elevated at 111, but HgbA1c was only 5.3. Because of the family and personal history, a 4-hour GTIR test was run. On the test, fasting and 2-hour glucose were 83 and 113, respectively, both well within the limits of normal based on American Diabetes Association criteria. Fasting insulin was above 10 (11.80) and peaked in the second hour at 93.20. This is a Pattern IV insulin response (Figure 11A, p. 67).

G.J. was put on berberine, 500mg t.i.d., and counseled about diet and exercise. She was highly motivated because of her Pattern IV GTIR result. At her 6-month follow-up visit, she had lost 9 pounds and her BMI had decreased to 28.3. Her HgbA1c was also improved at 5.1. Her GTIR test demonstrated a dramatic reversal from the original Pattern IV result to a completely normal Pattern I result (Figure 11B, p. 67).

A New Method of GTIR Testing

Up until now, the GTIR test has required the capacity to do multiple venipunctures over an extended period of time, whether in the practitioner's office or at a lab draw station. Now a new finger-stick version of the test is being introduced, making early detection of insulin resistance accessible to those practitioners who do not draw blood in their offices. Finger-stick blood sugar measurements have been around for decades, of course, and finger-stick testing of insulin is not new. However, inherent differences between venous blood and capillary blood in both sugar and insulin levels require careful calibration of reference ranges to allow accurate identification of the Kraft patterns of insulin response. The new blood-spot GTIR test is the result of extended testing and verification to authenticate these patterns.

The Cost of Ignorance

It is indisputable that rising costs have the US health-care system teetering on the edge of catastrophe. It can certainly be argued that this is in large part because of the focus on "disease management" rather than actual "health care" or prevention. With any condition, early detection allows

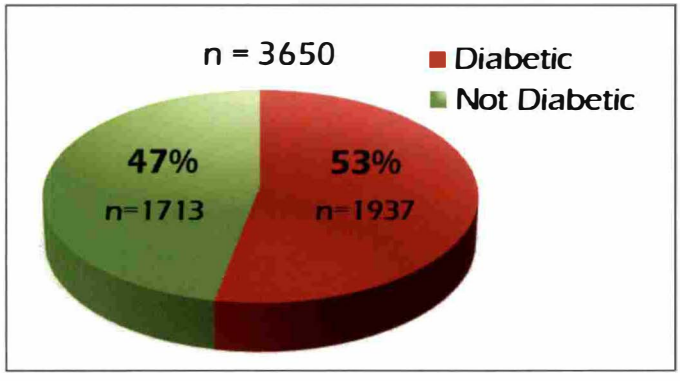

Figure 1: Out of a total of 3650 patients referred for an oral glucose tolerance test because of suspected diabetes mellitus, 1713 (47%) were determined to be normal based on the results of the OGTT.

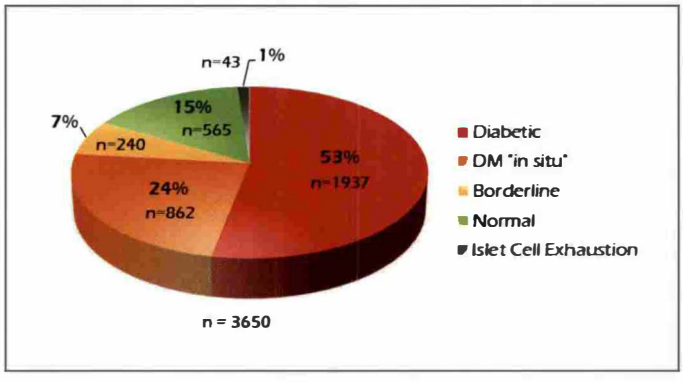

Figure 3: In looking again at the 3650 patients referred for OGTT, only 15% were considered normal after taking into account insulin response.

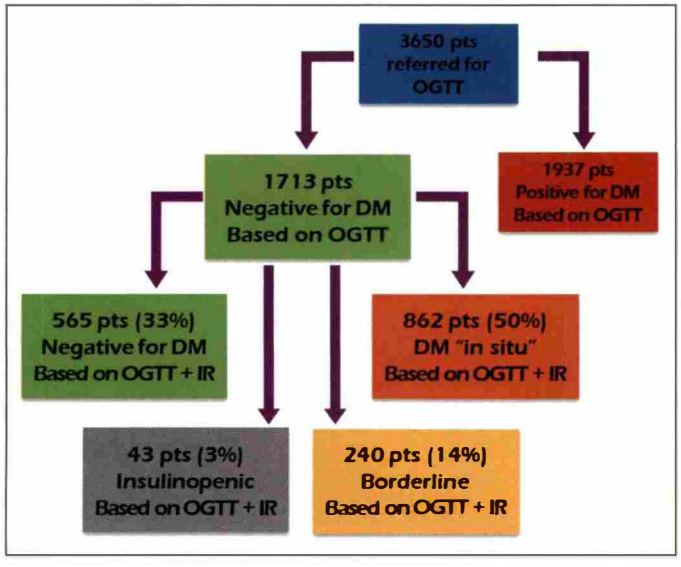

Figure 2: Of the 1713 determined to be normal based on OGTT alone, two-thirds were determined to have an abnormal insulin response.

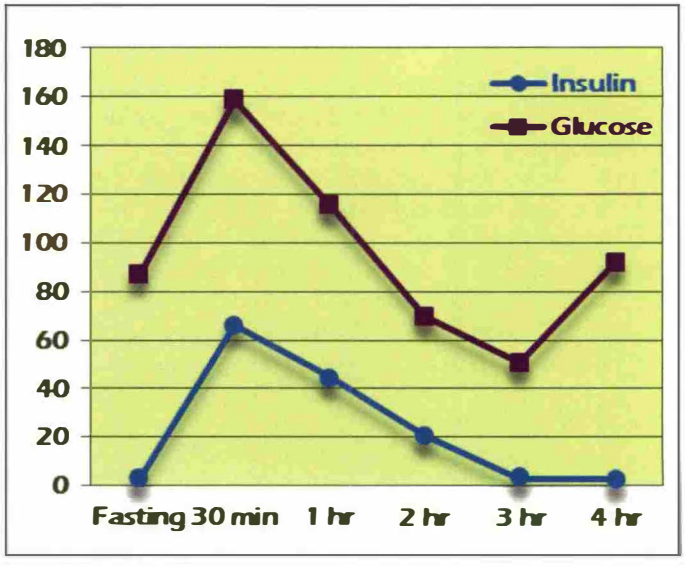

Figure 4: Pattern I. 37-year-old female patient with normal insulin and glucose response on glucose tolerance/insulin response test (GTIR).

for early intervention. The earlier the intervention, the fewer drastic measures are needed and the better the chances for a return to health. In the US, 21 million adults have been diagnosed with diabetes and another 8.1 million have diabetes and are undiagnosed. In addition, it is estimated that 86 million Americans over age 20 have prediabetes, based on fasting glucose or HgbA1c levels.[5] Yet as we have seen in the case of G. J. and other examples shown in the graphs presented, these parameters miss people who show signs of growing glucose/insulin dysregulation if the insulin response is taken into account. What is the price of this ignorance?

The total estimated cost of diabetes in the US in 2012 was $245 billion. That figure includes direct medical costs as well as indirect costs such as disability and loss of income due to missed work.[5] If we extend those costs to the 86 million with prediabetes, we are looking at more than $700 billion in *additional* future costs. This does not include those with insulin resistance who slip under the ADA radar.

After adjusting for age and sex differences, the average medical expenses among people diagnosed with diabetes was 2.3 times higher than those without diabetes.[5] If we could prevent only those 86 million with prediabetes from progressing to diabetes (and perhaps even reverse their condition), that would translate into nearly half a billion additional dollars that these individuals could use in more productive ways. These numbers also do not account for the more human costs, in decreased function, enjoyment of life, and ability to contribute to one's community, that accompany chronic disease.

Current thinking about reducing health-care costs in the US focuses on reducing testing (deemed "unnecessary" testing). There is evidence that this may also be the case in Canada. This is a penny-wise, pound-foolish approach. It saves money now, but at the cost of billions of dollars of future health-care expenses. To truly reduce health-care costs requires preventing chronic diseases from developing in the first place. Diabetes is one such disease wherein the natural progression of the disease is clear enough to make early detection too valuable a tool to omit.

Who Should Be Tested?

The National Diabetes Education Program recommends that anyone with risk factors be evaluated for diabetes. Besides the obvious risk factors, such as family history, gestational diabetes, lipid abnormalities, or elevated blood pressure, the NDEP also recommends including African American, Hispanic/Latino, American Indian, Asian American, or Pacific Islander ethnicity as triggers for increased vigilance. A BMI of >25 (>23 for Asian, >26 for Pacific Islander) is also a reason for further evaluation. Simply being 45 years or older warrants increased surveillance. Also on the NDEP risk factor list are PCOS, acanthosis nigricans, history of giving birth to a baby of 9 pounds or more, and being physically active less than 3 times a week.[6]

Not on the NDEP list but worthy of consideration in this context are tinnitus, sugar cravings, symptoms of hypoglycemia, sleep disturbances (including in those who are shift workers and others with disrupted sleep patterns), skin tags, osteoarthritis prior to age 50, Peyronie's disease, DuPuytren's contracture, recurrent yeast/fungal infections, changes in vision, gum disease, and low testosterone in men. All of these conditions or symptoms have been associated with changes in blood sugar and insulin regulation.[7–19]

It is also worth noting that patients with an optimal BMI may still exhibit central weight gain. Thin patients who

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also have "love handles" or a "muffin top" may be showing signs of insulin resistance (which may be well disguised by their clothing). Certainly any weight gain beyond normal growth in a child or adolescent should raise red flags.

Beyond the more familiar laboratory markers discussed earlier, a number of other less than optimal results point to insulin resistance. In a 24-hour urine hormone profile, elevated 5a-reductase, a testosterone:estrogen ratio of <4 (in men), an elevated cortisol/cortisone ratio, and elevated cortisol metabolites all suggest further evaluation for insulin resistance. Hyperviscosity on a blood viscosity panel may also have insulin resistance as an underlying etiology.

For an individual with a healthful lifestyle and no other risk factors, a baseline GTIR at 45 years of age would be prudent, with follow-up testing every 3 to 5 years if no signs of insulin resistance become apparent.

There is no question that the problem of type 2 diabetes has reached epidemic proportions. This disease takes a great toll, both personal and societal, and reducing the incidence of diabetes would provide wide-ranging benefits. The best way to do this is by preventing the development of the disease in its earliest stages, long before it actually

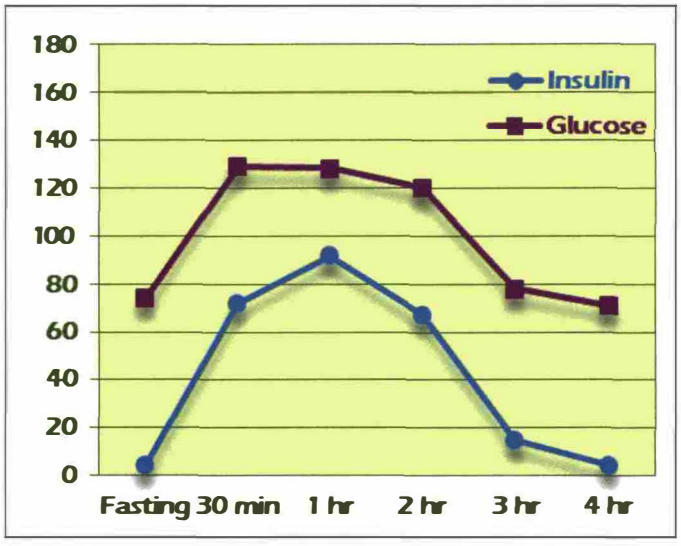

Figure 5: Pattern II. 19-year-old female patient with normal fasting insulin and glucose and normal 2-hour glucose. 2nd-hour insulin >50. 2nd- and 3rd-hour insulin total >60 but <100. This is considered borderline insulin resistance.

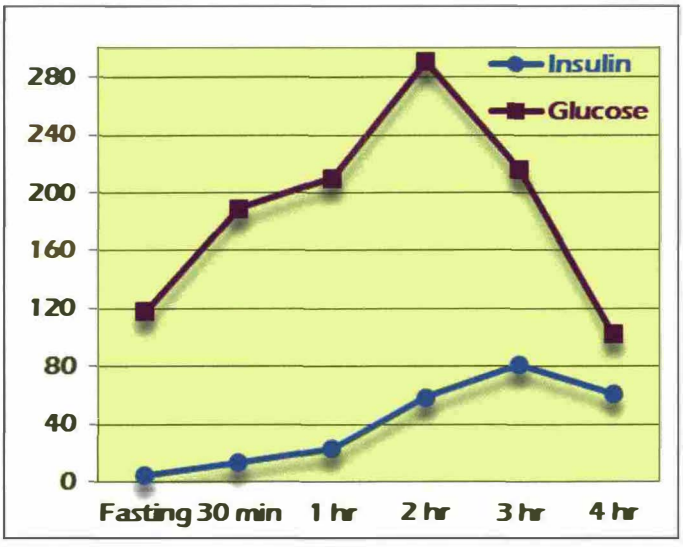

Figure 7: Pattern III-B. 76-year-old female patient with abnormal fasting and 2-hour glucose. Insulin peak is at 3 hours, indicating a prolonged rise in insulin as the body tries to deal with the glucose challenge. Insulin is still elevated at 4 hours postchallenge.

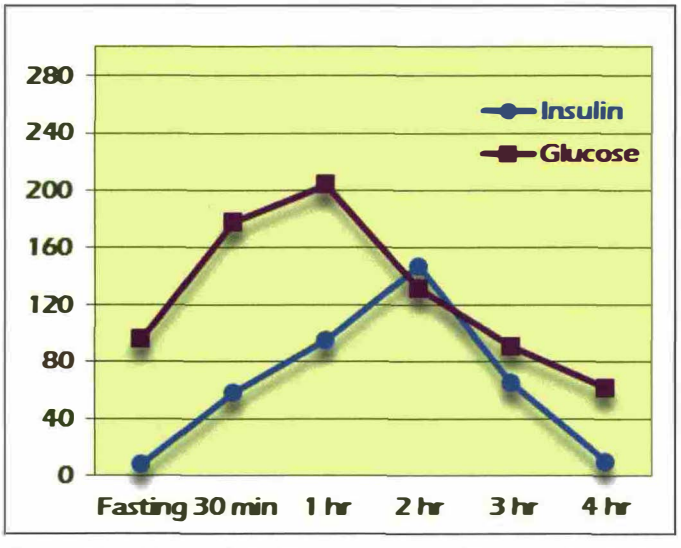

Figure 6: Pattern III-A. 70-year-old female patient. Fasting insulin and glucose and 2-hour glucose are all within normal limits and she would be classified as normal on OGTT alone. Insulin peak at 147 in the 2nd hour reveals well-established insulin resistance. Scale is changed from Figures 4 and 5 to accommodate higher blood sugar levels.

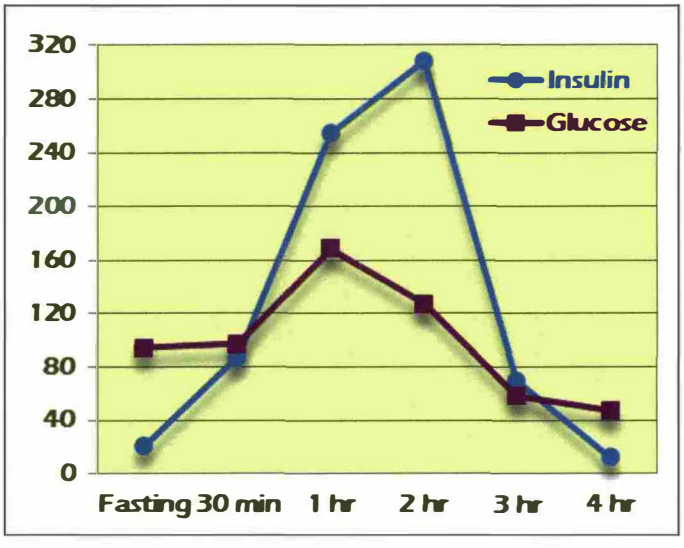

Figure 8: Pattern IV. 67-year-old female patient with normal fasting and 2-hour glucose. Fasting insulin is >10 but still within most standard lab reference ranges. Notice how high her insulin rises in order to keep blood sugar normal. Scale is changed from Figures 6 and 7 to accommodate higher insulin and blood sugar levels.

becomes diabetes. Traditional methods of detection are good but miss many people in the early stages of insulin resistance. The glucose tolerance/ insulin response test offers a way to improve our ability to intervene earlier, when it can make the most difference.

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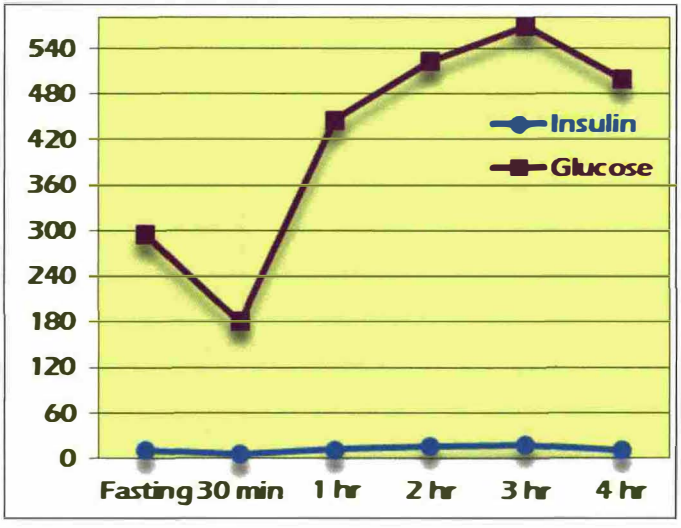


Figure 9: Pattern V. 63-year-old male patient with diabetes. Suppressed insulin response explains why his antiglycemic drugs were not keeping his blood sugar levels under control. This patient needed to go on insulin.

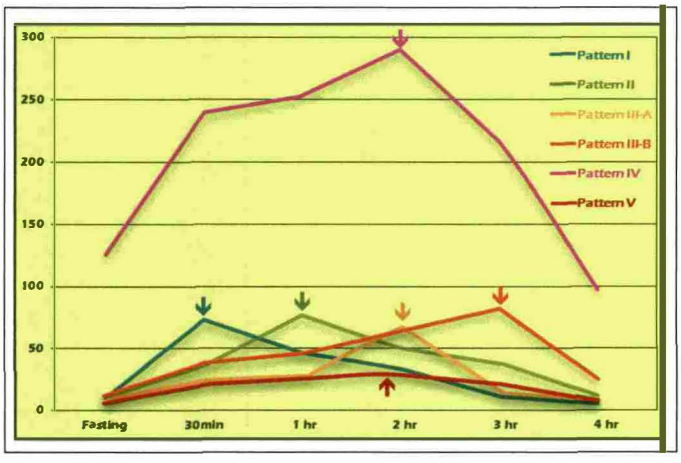


Figure 10: Progression of Insulin Resistance. Insulin peak is delayed further into the testing period as insulin response becomes more abnormal (Patterns I through III-B). Pattern IV demonstrates prolonged exposure to very high insulin levels. Pattern V demonstrates flattened insulin response.

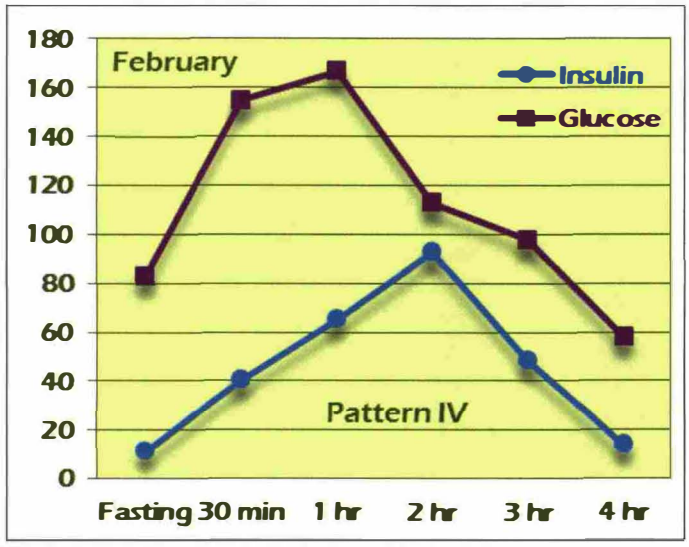


Figure 11A: Case Study. Insulin resistance in a 38-year-old female, as evidenced by Pattern IV GTIR test results. Fasting insulin is >10, peaks at 2 hours, and remains >10 by the 4-hour measurement.

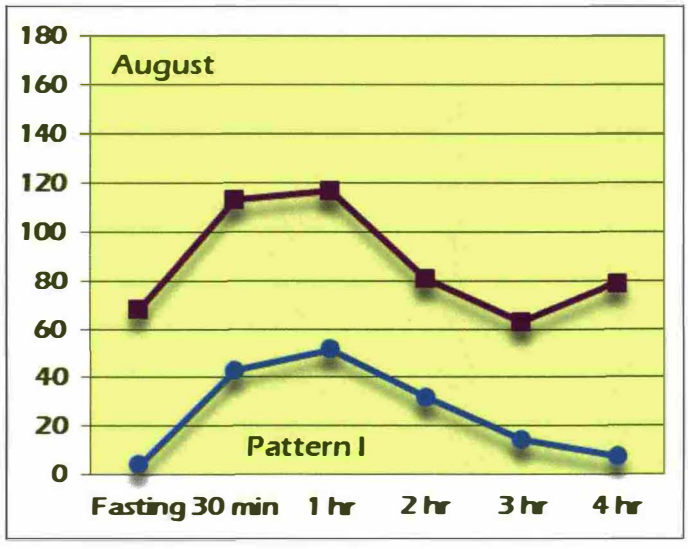
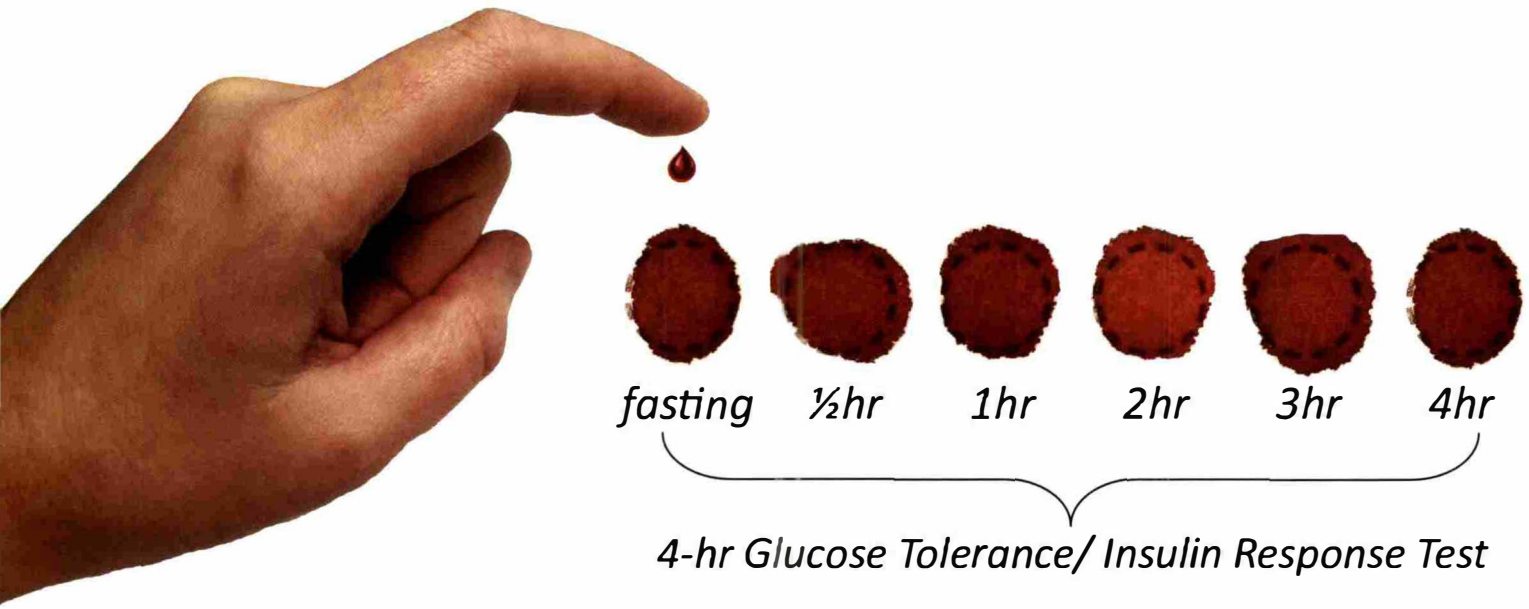


Figure 11B: A second test in the same patient 6 months later shows a complete reversal of insulin insensitivity. This test had a normal Pattern I result.

Testing for insulin resistance just got a whole lot easier.



It's about time.

By the time diabetes is diagnosed using conventional laboratory methods, patients may already have significant cardiovascular disease. Meridian Valley Lab is proud to offer one of the most sensitive assessments of glucose control, the Glucose Tolerance/Insulin Response test. This test allows for much earlier detection of insulin resistance than traditional tests, with the potential to arrest the development of diabetes and cardiovascular disease.

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Bovine Colostrum and Immune Modulation: Managing Viral Threats with PRPs

by Douglas A. Wyatt
Director, Center for Nutritional Research

Immune modulation is the most significant factor in whether a patient recovers from a life-threatening viral infection. Simply put, an individual's immune system, when functioning optimally, has the ability to fight off infection(s). From influenza to HIV/AIDS to hemorrhagic fevers, the active components in bovine colostrum possess real promise in the fight against these and other viral infections. Colostrum's antiviral activity is due to its antibodies, lactoferrin, lactoperoxidase, lysozyme, and other immune factors which bind to pathogens and destroy their cell membranes or compete for binding sites on the intestinal wall.[1,2] Even more significant are the proline-rich polypeptides (PRPs), which play a major role by modulating the activity of the immune system. PRPs stimulate immune system activity when needed to fight off an infection or quell its activity to prevent tissue damage once the infection has been defeated.[3–5]

Lactoferrin Peptides

Lactoferrin is an iron-binding protein with many functions and is part of the body's innate, nonspecific immune system that helps the body combat pathogens of all varieties. Lactoferrin's primary mechanism is blocking the entry of viruses into target cells by competing for binding sites on the cells or by binding to viral proteins to inactivate them so that macrophages and other scavenger cells can dispose of them. It also acts as an immune modulator to help stimulate the immune system to respond to infections.

Proline-Rich Polypeptides (PRPs)

PRPs are small chains of 10 amino acids or fewer, notably proline, that enhance the ability of the thymus gland to release factors that help regulate immune functions in the body. Specifically, certain T-cells, called TH1 helper cells, are antagonistic to the activity of TH2 helper cells that promote certain functions of B lymphocytes. PRPs can induce a shift from a predominantly humeral immune response to a more protective cellular response described as a "TH2 to TH1 shift."[6] In doing so, the immune system becomes more effective in fighting viral infections. Whole bovine colostrum and specifically PRPs have been shown to have antiviral activity against adenovirus, alphavirus, dengue virus, echovirus, Epstein-Barr virus, enterovirus 71, hantavirus, hepatitis C virus, herpes viruses, HIV-1, human papilloma virus, influenza, Japanese encephalitis, measles, poliovirus, respiratory syncytial virus, rotavirus, St. Louis virus, West Nile virus, and yellow fever virus.[6]

PRPs can be classified into three distinct classes, of which the PRP-2s and PRP-3s are the most immunologically active. They induce the growth and differentiation of B-cells; increase the permeability of the blood vessels in the skin to allow killer cells to move into the tissues; and induce leukocyte proliferation. PRPs also induce the differentiation and maturation of monocytes and macrophages, cells which penetrate the connective tissue outside the blood vessels in search of pathogens. The mechanism by which PRPs act includes the stimulation of immune cells to produce various pro- and anti-inflammatory cytokines which control the immune response. PRPs can stimulate the production of tumor necrosis factor-alpha (TNF-α), which is the cytokine that controls the entire inflammatory cascade of cytokines that are secreted when the immune system is mobilized to fight infection, and gamma interferon (INF-γ), another major cytokine that interferes with the ability of pathogens, especially viruses, to replicate. PRPs have been shown to stimulate the production of INF-γ in white blood cells, peritoneal cells, and cells of the placenta and amniotic membrane. The so-called immune cascade is a complex series of chemical events that mobilize immune cells to move to the site of the infection and attack any pathogens that they encounter.

Clinical Studies of Colostrum and Colostrum-Derived PRPs

Clinical application using PRPs to treat infectious diseases has been limited, yet data from the trials with HIV/AIDS patients in Africa and influenza patients in Italy have been

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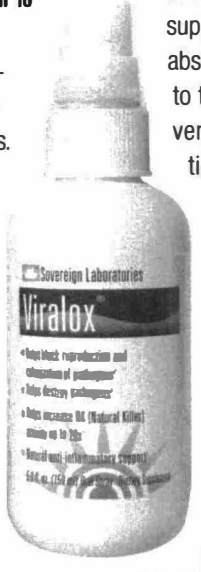
Living in Today's World Requires a Strong Immune System

Without a doubt, a strong immune system is vital to surviving the onslaught of new and more virulent pathogens which have successfully adapted to resist our current drugs or for which no vaccine exists. Stress, poor nutrition, unhealthy behaviors, and increasing levels of pollution and toxins in the environment weaken the immune system, thereby making humans more susceptible to pathogens. An unbalanced immune system is a green light for infection and disease. On the other hand, a healthy, balanced immune system provides the best prophylaxis against these invaders. Proline-rich polypeptides derived from bovine colostrum and lactoferrin are essential to immune modulation and managing viral threats.

Viralox® is a Natural Solution which is Safe & Easy to Use

The active ingredient in Viralox, Lactopeptide, is a proprietary combination of PRPs and lactoferrin peptides. This unique bioactive combination of PRP-2 peptides and lactoferrin has been clinically proven to eliminate infections, especially viral infections. The antimicrobial PRP-2s stimulate the immune system to fight off viral infections and lactoferrin blocks the viruses from entering healthy cells.



Viralox has been clinically shown to be effective against a wide range of viruses including Herpes, Influenza, Human Papilloma, Rotavirus, Polio, Adenovirus, Hepatitis C, Hanta, Respiratory Syncytial, Alpha viruses such as Semliki Forest and Sindbis, and Enteroviruses such as Enterovirus-71, EpsteinBar, and Cytomegalovirus. Viralox is effective against a broad range of other pathogens including bacteria, yeast, and fungi.

Viralox helps:

- Block viruses from binding to healthy cells, thereby preventing infection and reducing viral replication.
- Increase Natural Killer (NK) cell activity which removes infected and abnormal cells.
- Regulate cytokine production to suppress an overactive immune system or stimulate an underactive immune system
- Increase T-cell production
- Produce immunity to viruses and activate memory cells to shorten response time, if a future viral attack occurs
- Assist the immune system to adapt to viral mutations

Viralox is made from the highest quality colostrum. It is produced year-round from pasture-fed cows in the Southwest United States, and the colostrum is processed at the only processing plant specifically designed and built to process colostrum. Viralox is supplied as a liquid spray which is readily absorbed in the bloodstream with 3 sprays to the back of the throat. Viralox is convenient to use and safe for all ages. Additionally, Viralox is easy and fun for children to use with no pills or bad tasting liquid to swallow. Since it is a nutritional supplement, no prescription is required.

Daily supplementation with Viralox can help modulate or balance the immune system to help individuals better deal with challenges that disrupt the homeostasis of the immune system. Viralox provides the unique support needed to survive viral and other infections for which there is no other effective defense. It helps the body heal itself by supporting its own natural defenses. The effectiveness of its active compounds has been proven in hundreds of clinical and scientific studies and published in peer reviewed journals.

Professional information and clinical references available at ColostrumTherapy.com. Consumer library of information available at the CenterforNutritionalResearch.org.

According to renowned holistic chiropractor, Dr. Bruce West: "Viruses and parasites can cause anything."

He recommends treating patients with a serious or life threatening condition as one caused by either a virus or parasite. Dr. West always uses an anti-viral or anti-parasitic protocol when treating his own patients.

These conditions include:

1) Viral infection of any kind: HIV, Hepatitis, Colds, Flu, Herpes I and II, cytomegalovirus, hantavirus, etc.
2) Problems of the cervix, genital warts, or cervical dysplasia.
3) All cancers, especially leukemia, bone marrow cancer, prostate cancer, cervical, ovarian and uterine cancer.
4) Chronic Fatigue Syndrome, fibromyalgia, and mononucleosis.
5) Intestinal problems, including colitis, Crohn's disease and colon cancer.
6) Heart disease caused by infection.
7) Sudden and difficult arthritis cases, especially psoriatic and rheumatoid arthritis.
8) Parkinson's, where doctors are not 100% sure of the diagnosis, since viruses can mimic Parkinson's nearly identically.
9) Any undiagnosed infectious condition, particularly one that is resistant to treatment.

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extraordinary. Several independent trials utilizing a concentrated oral PRP and lactoferrin mouth spray (Viralox) tested the effectiveness in HIV/AIDS patients, particularly people living in areas of the world where antiretroviral treatments are unavailable.[7] Preliminary phase I studies at the Infectious Disease Clinic in Dayton, Ohio, showed promise in increasing or normalizing CD4+ T-cell counts. Phase II studies were conducted in Kenya and Nigeria with larger patient groups. Patients took three sprays (2 ml total) every 4 hours. Results showed increases in CD4+ T-cell counts to normal or near normal levels; reduction in viral loads; and the remission of HIV/AIDS-related physical symptoms (nausea, vomiting, and diarrhea) in most patients. Within days, there was a reduction of clinical symptoms, and within 6 to 12 weeks of treatment, there were significant weight gains (up to 5%). Patients taking Viralox performed much better in terms of quality of life than patients on antiretroviral drugs. Phase III studies are ongoing in India.

The HIV/AIDS studies suggest that even in the "worst of the worst" viral infections, PRPs could return the human immune system to normal functioning, such that it is able to successfully fight off viral invaders. The ability of PRPs to stimulate an otherwise insufficient immune response by inducing the production of new helper T-cells appears to enable an HIV/AIDS patient's immune system to recover sufficiently so that it can fight HIV on its own. Researchers concluded that an oral PRP spray treatment could either be an alternative treatment or adjunct treatment in HIV/AIDS patients. The benefits of PRPs in oral spray form include convenience, easy administration, low cost, no side effects, and safety for all ages.

An epidemiological study in San Valentino, Italy, investigated the effectiveness of 2 months of oral whole colostrum supplementation on the incidence of seasonal influenza in both healthy and high-risk cardiovascular individuals.[8] After 3 months of follow-up, the incidence of complications and hospital admission from influenza was higher in the group that received only a vaccination compared with the groups that received either colostrum or colostrum plus vaccination. Individuals who did not receive colostrum also experienced three times more days of flu symptoms. Researchers concluded that colostrum, both in healthy subjects and high-risk cardiovascular patients, provided at least three times more protection against the flu than vaccination. A later study evaluated the efficacy of oral colostrum and a probiotic supplement in the prevention of influenza compared with vaccination. Similar results were obtained. Individuals receiving either colostrum plus probiotics or colostrum plus probiotics plus vaccination fared better than those receiving vaccination alone or no treatment at all. They experienced fewer incidences of flu and fewer flu days. Those receiving a vaccination had twice as many episodes of flu than those receiving the colostrum and probiotic supplement.

The influenza studies suggest that whole colostrum has activity against the numerous viruses that cause seasonal influenza. This is good news for individuals who oppose vaccination. Another added benefit is that supplementing with whole colostrum is cost effective, particularly when considering the financial cost of decreased workplace productivity and lost wages.

Use of Colostrum and Colostrum-Derived PRPs in Medical Practice

We have just finished a review of our first 12 months' pediatric experience with PRP spray (Viralox®) and the review confirms our initial feelings. Eighty-eight children who used PRP daily at

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the recommended doses for six or more months were compared to the same aged and same sexed children who did not use PRP, and their illness and antibiotic use were compared. We found in this retrospective study a 74% reduction in reported illness and an 84% reduction in antibiotic use. Using any measure, these are very significant results. No untoward reactions were reported. We have started to review the costs of the illness/antibiotic saved by the use of PRP. Initial results indicate over $25,000 saved in the user group in medical care, office visits, and drug costs. Again, these results are of major consequence and show the use of PRPs not only improves the quality of life for the child and his/her family, it makes sense economically.

~ David M. Markowitz, MD, Pediatrician

Viralox's PRPs is being heralded as the most exciting discovery in immunology to come along in decades. Taking PRPs is like downloading immune information directly from the cow's immune system to ours. It gives our immune army generals' classified information about the invading enemy. It's completely different from any mineral, vitamin or herb; it's immune intelligence. As a physician, it is easy to tell my colleagues about this product that is scientifically based and so effective. There are hundreds of scientific studies backing up the scores of personal experiences about PRPs. I believe PRPs are, without a doubt, the greatest discovery of the century in supporting and modulating the immune system. I believe a strengthened immune system will be the primary way to stay well in the future. This nutrient can affect the immune system like nothing else can.

~ Robert Robertson, MD

The use of a general PRPs preparation is well justified for preventative use. Much of what we have seen in the cases of AIDS and even the flu is that it is not the primary infection that kills, but rather the secondary, opportunistic infections that destroy the weakened individual.

~ William Hennen, MD

Protecting Health-Care Providers

By virtue of their professions, health-care providers are bombarded by infectious agents, and among the many pathogens that pose the biggest threat to well-being, viruses are preeminent. Antibiotics and antiparasitics are effective against their respective pathogens, but most viruses have no known treatment, except for allowing the human body to fight them off. Compounding the problem is that many health-care providers come to work when they are ill, despite knowing the well-established link between sick health-care workers and the patients whom they care for. As many as 80% of physicians and 70% of medical residents report going to work ill.[9]

Additionally, in the emerging Ebola crisis, it appears that the immune system is no match for the virus. Ebola is a high-mortality disease, depending on where a patient lives, according to the World Health Organization.[10] In the absence of a widely available or proven Ebola vaccine, bovine colostrum with liposomal delivery and a concentrated PRP spray are the best defense to stay healthy naturally, for who will take care of patients if health-care providers are too ill themselves?

Conclusion

Living in today's world requires a strong immune system. In the third millennium, medicine is confronted by new and more virulent pathogens either that have adapted to resist our current drugs or for which no vaccine exists. Stress, poor nutrition, unhealthy behaviors, and increasing levels of pollution and toxins in the environment weaken the immune system, thereby making humans less effective to defend against them. When the immune system becomes unbalanced, infection and disease get the green light. On the other hand, a healthy, balanced immune system provides the best prophylaxis against illness. Bovine colostrum and the proline-rich polypeptides derived from it are essential to good health in today's world. PRPs are an alternative to conventional pharmaceutical drug-based medicine and provide hope in the face of conditions that are either untreatable or difficult to treat.[6]

Professional information and clinical references available at ColostrumTherapy.com. Consumer library of information available at the CenterforNutritionalResearch.org.

Douglas Wyatt is the founder of Sovereign Laboratories LLC, a Sedona-based company dedicated to developing natural products that provide the public with the best solutions for optimal health. He is honored to be listed as the leading expert in colostrum and is credited with reintroducing bovine colostrum into human use. Additionally, he serves as the research director of the International Center of Nutritional Research, a not-for-profit institute dedicated to nutritional health, and is one of the leading figures in the natural products Industry. Doug is a leader in the research and a proponent of colostrum's unique and powerful healing components that show incredible promise for turning the tide on the prevention and treatment of the world's increasing chronic disease endemic. As a publisher, author, writer, scientist, and public speaker, Doug has appeared nationwide on television and radio shows and at health conventions worldwide. He is dedicated to the prevention of chronic disease through natural nutritional intervention and is working with the WHO (World Health Organization) and other internationally recognized research organizations on clinical trials on HIV/AIDS, other infectious disease, autoimmune disease, and bowel health issues.

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The Antimicrobial Activity of Selected Silver Products

by Robert Rowen, MD; Dennis Harper, DC; and Richard Robison, PhD

The antimicrobial activity of a group of silver-based products was assessed by comparing their ability to kill MRSA (methicillin-resistant *Staphylococcus aureus*). Silver has been used for decades for its known antimicrobial effects.[1-4] Since many silver-based products have made claims of superiority over other brands, two eminent oxidation therapy specialists, Dr. Dennis Harper and Dr. Robert Rowen, recognized the value of conducting an independent and unbiased study that would definitively assess the antimicrobial efficacy of several well-recognized silver products. To this end, they contacted Dr. Richard Robison, a microbiologist with many years of experience in disinfection and infection control. The product identities were not disclosed prior to testing.

Purpose: The core purpose of every silver-based health product is to kill pathogenic microorganisms. In this initial study conducted at a major university laboratory, the kill rates of five silver-based products on a common and feared microorganism, MRSA, a deadly pathogen responsible for killing thousands of people each year worldwide, were determined.

Methods: Rowen and Harper acquired five silver-based products by purchase through normal retail channels. Harper's acquisitions were shipped to Rowen, who then blinded all five original bottles and randomly labeled each with letters A through E. Rowen alone kept key codes for identifying the products. He sent the blinded products directly to the microbiology lab. Neither Harper nor Rowen was informed of the antimicrobial testing results. The test results were sent directly from the microbiology lab to George Gaboury, president of the San Francisco Tesla Institute, a grassroots organization that promotes the advancement and greater public awareness of science. After receiving the test results, Gaboury was independently sent the key codes by Rowen. Gaboury then matched the lab results to the specific products A through E, in public at a scheduled meeting of the Tesla society. The actual lab test results were reported to the group by Gaboury in an unaltered format.

Each product was evaluated on the same day, by the same technician, using the same test organism suspension. A suspension test was used, similar to that described by March et al.[5] Briefly, the test suspension was prepared by growing a 5 ml culture of MRSA organisms, ATCC 43300, in nutrient broth at 37 °C for 24 hours. The 5 ml culture was pelleted by centrifugation, washed with 5 ml sterile 18 MΩ purified water, centrifuged again, and resuspended in a final volume of 1 ml sterile purified water. This produced a suspension containing about 2.97 billion organisms/ml. A 9.9 ml aliquot of each test product was added to a 50 ml polypropylene sterile centrifuge tube. Tubes were equilibrated in a 20 °C water bath. Then, 0.1 ml of the MRSA test suspension was added to each tube at time 0. After a 2-minute contact time, 1 ml of this disinfectant/MRSA mixture was added to 9 ml of neutralizer solution. The tube was mixed thoroughly and allowed to sit for 2 minutes. The neutralized suspension was then serially diluted in 9 ml blanks of physiological saline solution (PSS). The number of viable organisms in selected dilution tubes was assayed by membrane filtration. One ml aliquots were plated in triplicate. The membranes were washed with about 100 ml of sterile PSS and removed to Columbia Agar plates. The plates were incubated at 37 °C for 24 and 48 hours. The number of colonies on each filter was counted, and log reduction and percent kill values for each product were computed. Titers of the MRSA test suspension were computed and appropriate neutralizer and sterility controls were performed.

Results: There was a highly significant difference between the five formulations, in their ability to kill MRSA in 2 minutes. Log reduction [$(-\text{Log}(S/S_0)$; where S = concentration of viable organisms after the specified contact time; and S_0 = the initial concentration of viable organisms at time 0] and percent kill [$(1-(S/S_0)) \times 100$] values can be seen in Table 1 (p. 74). One silver product, Solution C, was found to be approximately 4000 times more effective in antimicrobial activity than the second most effective silver-based product, Solution A, and approximately 1,000,000 times more powerful in antimicrobial activity than Solutions B, D, and E.

The complete study, including testing methods and results, can be requested by e-mail; contact information is listed at the end of this report.

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Discussion: Dennis Harper, DC, ND, and founder of O3 Medical Services, specialist in ozone and vitamin treatment, stated: "ACS 200 Extra Strength could change the landscape in significantly strengthening antibiotics for fighting bacterial infections quickly and effectively. I was challenged by my fellow peers to find the best silver product, and up until now, no one had independently tested the comparative bacterial kill rates on a range of silver-based solutions. These results could pave the way for more effective patient treatment."

Rowen and Harper have taught at ACAM's oxidation workshop, where many questions arose regarding conflicting data from various silver companies. These questions led to performing this independent study. Rowen says, "Until now it was a difficult process sorting out information attached to various silver products. We [Harper and Rowen] consulted with Dr. Richard Robison (professor of microbiology) about designing a valid test. He advised, "'You are attempting to kill microorganisms with silver, so keep it simple with a standard kill test performed in an identical manner on the various products, a test which will demonstrate if the products actually do what you desire them to do.'"

The kill rate effectiveness was assessed with a contact time of 2 minutes and the results are expressed as both log reductions and percent kill. For accuracy, plating on each dilution was performed in triplicate. Rowen says, "For the layman, who might not understand the significance of logarithmic reduction, consider the Richter scale of earthquake magnitude, which is expressed in a log format. A 7.0 earthquake is 10 times more powerful than a 6.0. A 6.0 earthquake is 1000 times more powerful than a 3.0. As revealed in this study, Solution C (ACS 200 Extra Strength) had a log reduction of 6.35, compared with that of the second best product at 2.74. Solution C (ACS 200 Extra Strength) had greater than 3.61 log kill over the closest competitor, representing a 4,000 times greater kill than Solution A. Solution C (ACS 200 Extra Strength) had a percent kill rate of 99.999955%, which was close to complete kill of the test suspension (over 20 million MRSA organisms) within 2 minutes."

How does this research affect you and me? Harper added, "We cannot make broad-stroke conclusions about any particular product based on the results of a single study, and believe it would be inappropriate to do so. In partnership, we will continue to fund further independent studies to reinforce the consistency of these truly amazing results. At the present, we have identified a highly effective silver-based solution which, when administered with antibiotics, should provide far superior patient outcomes. These test results are readily available to anyone who wants to contact me and find out more."

Rowen commented, "One must appreciate the log scale. Let's start with 2,970,000,000 (2.97 billion) organisms. The initial dilution caused by mixing the organism with the disinfectant, gives us 29.7 million organisms/ml at time zero. Exposure to the second best product caused a 2.74 log reduction (a 99.82% kill) in viable organisms, leaving over 10,000 living MRSA organisms. The product that caused a 6.35 log reduction (99.999955% kill) left less than 3 viable organisms. The other three products left over 2.5 million living MRSA organisms, in the given time period of exposure. This is simply too huge a difference to ignore, and begs that follow-up studies be conducted. This may be a huge breakthrough in the management of infection, especially in the light that silver is synergistic with oxidation therapy."

Rowen has been intensely involved as a clinician in oxidation therapy since 1986. He currently serves as ACAM's oxidation workshop chairman and teaches oxidation therapy seminars. He practices in Santa Rosa, California. Harper has been practicing ozone therapy for many years and practices in Orofino, Idaho. He recently joined the ACAM oxidative workshop teaching staff.

For more information on data and medical issues please contact:

Dennis Harper, DC, ND
O3 Medical Services
10620 Highway 12
Orofino, Idaho 83544
drharperoz1@gmail.com

Robert Rowen, MD
200 County Center Dr. Ste C
Santa Rosa, California 95472
drrowen@att.net

Richard A. Robison, PhD
Professor and Chair, Department of Microbiology and Molecular Biology
4007-B LSB
Brigham Young University
Provo, Utah 84602
Office: 801-422-2416

Test Solution	Product	Contact Time	Log Reduction (LR)*	Percent Kill (PK)
Solution A		2 min	2.74	99.82%
Solution B		2 min	Approx. 0.28	Approx. 47.1%
Solution C	**ACS 200 Extra Strength**	**2 min**	**6.35**	**99.999955%**
Solution D		2 min	Approx. 0.38	Approx. 58.3%
Solution E		2 min	Approx. 0.22	Approx. 39.7%

*Largest number is best

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Food Fascists: GMO and Pesticide Manufacturers Down and Dirty

by Richard Gale, and Gary Null, PhD
Progressive Radio Network

After decades of rearing hogs, Danish farmer Ib Borup Pedersen was alarmed at the growing incidence of malformations and biological defects among his newborn piglets. Deformities included gaps in piglets' skulls, deformed bones, missing limbs, and even a female piglet with testicles. Never having witnessed such large numbers of deformed pigs before, Pedersen realized that it was after switching three years earlier to Monsanto's GMO feed – which had been grown with glyphosate – that these birth defects began to appear. Pedersen had the piglets' bodies sent to a Danish laboratory for analysis. The results were clear; there were high concentrations of Monsanto's glyphosate pesticide, commonly known as Roundup, in the piglets' organs.[1] The analyses' findings were subsequently published in a recent *Journal of Environmental and Analytical Toxicology*.[2]

Pedersen's experience is another blow against Monsanto's public relations campaign to convince governments, farmers, and consumers that Roundup is one of the world's safest pesticides and poses no risk to animal and human health. For many years Monsanto has stood by this myth with fanatical religious fervor, against all existing independent evidence to the contrary.

While there are an increasing number of studies in the scientific literature identifying the health risks associated with GMO consumption and glyphosate independently, no research has yet been conducted to assess the combined synergistic adverse effects of GMOs and pesticides in animal models and humans. The original foundation of agricultural biotechnology was to advance sales of pesticides by engineering crops to become immune to toxic spraying. While weeds and insect pests would be eradicated, targeted crops would be spared, thereby allowing farmers to spray massive amounts of chemicals on soy, corn, cotton, sugar beets, and other agricultural foods without injury. This was the assumption that led to the agrogenetic revolution. Only during the past decade with more and more GM products in our diets, and more and more farm acreage being sprayed with glyphosate and other toxic pesticides and herbicides, are the long-term health risks to animals, humans, and the environment being more fully recognized within the scientific community.

Annual runoffs of pesticides into rivers, streams, and reservoirs have complicated the extent to which humans are being exposed to life-threatening chemicals on a daily basis. It was never the mission of Monsanto and the cartel of agrochemical seed companies to increase yields and produce drought-resilient crops. The evidence of higher GM crop yields was an aftereffect. However, data are now coming in from the independent agroscience community showing that the years of higher GM yields are short lived and drop dramatically thereafter to levels far below those yields harvested from traditional, organic farming methods.

Glyphosate's adverse effects on Pedersen's piglets is only one example of the pesticide's health risks. In a major paper published by Earth Open Source, "GMO Myths and Truths: An Evidence-Based Examination of the Claims Made for the Safety and Efficacy of Genetically Modified Crops," Kings College molecular geneticist Michael Antoniou, molecular biologist John Fagan, and GM Watch's Claire Robinson outline the known health risks now shown to be associated with glyphosate:

- DNA damage
- Premature births and miscarriages
- Birth defects including neural tube defects and anencephaly (absence of large parts of the brain and skull)
- Multiple myeloma
- Non-Hodgkin's lymphoma
- Disruption of neurobehavioral development in children, including attention deficit disorder and attention deficit hyperactivity disorder[3]

Since the release of the study in the journal *Entropy*, a researcher at MIT and a member of the Union of Concerned Scientists have discovered that glyphosate is in fact taken up by plants from the soil and found in our food – an accusation that Monsanto continues to deny. The study says that the negative impact of glyphosate accumulation "is insidious and manifests slowly over time as inflammation damages cellular systems throughout the body." In addition to being linked with problems ranging from cancer to infertility, a connection may also be made to the rising number of adults acquiring Parkinson's disease.[4] A couple of earlier studies on individual cases found a correspondence between

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glyphosate exposure and the onset of Parkinson's.[5] There are now growing concerns that glyphosate consumed by mothers and infants in GM-tainted foods might be giving rise to the autism epidemic that continues to worsen each year and now stands at almost 1 in 50 children.

With each passing year, the body of scientific data challenging the safety of glyphosate expands. In several peer-reviewed studies conducted by researcher Andres Carrasco of the University of Buenos Aires, glyphosate was observed to cause teratogenic impairment of neural signaling and microcephaly, leading to craniofacial malformations.[6]

In early 2014, the *International Journal of Environmental Research and Public Health* published a study linking glyphosate runoff in Sri Lanka's water systems to an epidemic rise in a fatal unknown chronic kidney disease, or CKDu. Until recently, scientists could not offer up evidence of what has been causing this new form of illness affecting the kidneys. Similar observations have been made in El Salvador and Nicaragua, where more men die of CKDu than AIDS, diabetes, and leukemia. However, in each regional population studied, Roundup exposure is rampant. Sri Lankan scientists hypothesize that glyphosate, originally discovered to act as a chelating chemical in 1964, takes up toxic heavy metals and binds them in the kidney without the body's detection. According to the researchers, the buildup of these heavy metals ultimately leads to kidney failure and death.[7]

In early 2014, the Ministry of Health in Cordoba, Argentina, noted a dramatic rise in deaths from cancerous tumors – twice the national average. It just so happens that the elevated rates of malignancies were being reported in those regions where GM crops and toxic agrochemicals are most readily used.[8]

GMOs' health risks to animals and humans are also being reported more frequently in the scientific literature. Corporate agro studies claiming GMOs are safe will generally rely upon a research methodology that employs a variety of "reference" diets to the animals under investigation. These convoluted studies are designed intentionally to produce an abundance of data without any standard reference control group. This enables corporate scientists to conflate and distort results. This common industry practice was recently exposed by Claire Robinson at GM Watch regarding a published DuPont study on the safety of Roundup Ready Canola. Robinson points out that "poor experimental design" is intentionally utilized to cover over toxic effects.

A new study in rats conducted by Dr. Gilles-Eric Seralini at the University of Caen identified changes in gene expression in sperm cells capable of altering androgen and estrogen sex hormones. The study suggests that glyphosate may be altering human reproduction. The rate of male fertility in the US has been dropping steadily since GM foods started to saturate the average American diet. Today, according to the American Pregnancy Association, 1 out of every 6 men in couples is infertile.[9]

Another major blow against Monsanto has been the republication of Seralini's earlier paper showing a correlation between severe kidney and liver damage, advanced tumors and premature death in rats fed Monsanto's NK603 maize in the peer-reviewed journal *Environmental Sciences Europe*. Seralini's paper has undergone more scientific review and scrutiny than any other study either proving or disproving GMO safety. With its republication, the paper should officially replace Monsanto's flawed study purporting the health safety of its NK603 corn.[10]

Monsanto must rely on a veil of secrecy, claiming to protect its proprietary information, in order to avoid revealing to the public its actual data about GMO safety. In the absence of credible science to engage in an honest debate with the scientific community opposing the proliferation of GMOs, the company must resort to the lowest and most vicious tactics. Attacking the integrity of scientists, launching smear campaigns against GMO labeling advocates and organic farmers, cyber attacks on anti-GMO organizations, and threats of lawsuits against state governments and media outlets advocating or even suggesting mandatory labeling are becoming more frequent. For example, supporters of GMOs have recently pressured Reuters to fire veteran journalist Carey Gillam for reporting fairly on GMOs.[11] With approximately 50% of its revenues generated from the sale of GM seeds, it is highly unlikely that Monsanto will ever admit defeat. Rather it will use whatever means necessary, except acknowledging scientific evidence, to silence its enemies. Today Monsanto is scared to death over its future. Like any psychopathological madman or Wall Street banker, it will use whatever means available to preserve and expand its revenue markets, even if it means inflicting pain, suffering, and even death upon Indian and Filipino farmers, rather than acknowledge that its technology is a curse to humanity and the environment.

Fortunately, during the past year there has been a dramatic turning of the tide against Monsanto and other GM seed companies. Around the world, the Big Ag giant is recognized as the most dangerous, most hated corporation on the planet. The good news is that Big Agriculture's imperial strategy for global food domination has been hit with setback after setback as national and local governments realize that GM foods pose serious dangers to human and environmental health as well as national food security. Local populations and farmers who switched to GM seeds are becoming more vocal about the failure of GM promises and want to hold these private companies accountable. Already 90% of UN member nations, including most of Europe, either require GM labeling or have banned GM crops. Hungary officially prohibits GMOs in its national constitution. In Brazil, the world's largest producer of GM soy, the country's leading conglomerate of soy traders, the Association of

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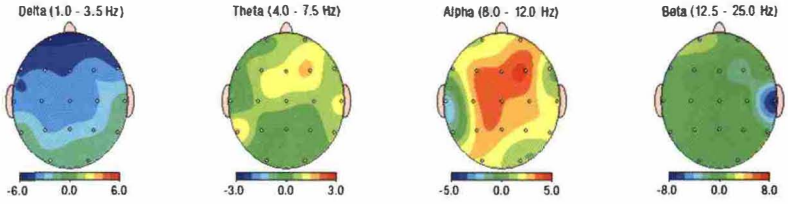

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predisposing them to less serious pests. India is also witnessing record numbers of cattle die-offs after cows graze on post-harvest cotton plants. Regions with higher proportions of Bt cotton farming are confronting grim water futures because GM agriculture requires more irrigation than traditional farming methods. Last March the Indian state of Karnataka banned Bt cotton seeds following pervasive crop failures.[16]

One of the most massive GMO failures, spanning a decade, has been the deplorable collapse of the introduction of GM corn in the Philippines. The decimation of Filipino corn farmers came to world attention following the release of the film *Ten Years of Failure*, which follows the lives of farmers whose families fell into debt and poverty after the introduction of GM corn by the Philippine government in cooperation with the US government and Monsanto.[17] Intent on avoiding a similar fate for Brazilian corn farmers, a Brazilian court banned the release of Bayer's GM corn. The ruling now establishes a new precedent that will make the approval of future GMOs in that country more difficult.[18] And China's recent rejection of GMO corn importation has agrogiants further worried as one of their largest potential markets takes a step back to reevaluate the safety and environmental impact of GMOs.

An association between the rapid demise of bee populations and the neonicotinoid class of pesticides has already been proved in the scientific literature. European nations are now banning the use of neonicotinoids to protect domestic bee and other pollinator populations. Recent studies reveal that Monsanto's Roundup herbicide is likewise contributing to the decline of honeybee populations. During the first week of August 2014, Mexican beekeepers in the state of Yucatan won a victory to halt Monsanto's plans to plant thousands of acres of Roundup Ready soybeans. After a careful review of the science, a Mexican judge ruled that GMO soy agriculture is an economic threat and incompatible with the state's honey production, home to 25,000 families involved in producing 40% of Mexico's honey exports. The ruling is having a ripple effect across other Mexican states involved in honey production.[19]

Big Ag's only response to the failures of its genetic experimentation has been to increase the development of new GM seeds to compensate for the failures of the old ones. In addition to genetically engineering seeds to withstand ever higher levels of pesticides, new traits are being genetically engineered to withstand other toxic chemicals. In the US, millions of acres of farmland growing GM corn, cotton, and soy are experiencing invasions of super-weeds resistant to pesticide overuse. As pesticide use increases, soil quality is further depleted and yield per acre drops dramatically. The economic costs to farmers are becoming unsustainable as expenditures to fight pests and weeds increase and harvests diminish. A recent trend among farmers to revert to traditional or organic methods is gradually taking hold. This aligns well with the last UN Commission on Trade and Development report warning against corporate-dominated monoculture farming methods and promoting farm diversity and small-scale organic farming as the most sustainable way to feed the world's population.[20]

Aside from glyphosate, other pesticides are being genetically engineered into new lines of GM seeds. New varieties of GM cotton and soy are in Monsanto's pipeline and will likely pass with minimal review through the USDA and FDA. These new GM strains now include resistant genes to the pesticide dicamba. In addition to glyphosate's long list of human health risks, dicamba, a known neurotoxin, has been linked to adverse reproductive and mental development effects. Against strong public opposition, the US government will also likely approve Dow Agroscience's new Enlist corn and soy strains, a toxic cocktail of glyphosate and the herbicide 2-4 D, best known as a major toxic ingredient in Agent Orange that "has been linked to cancer, reproductive effects, neurotoxicity, kidney/liver damage and birth and developmental effects."[21] Agent Orange contamination has resulted in genetic abnormalities and the deaths of hundreds of thousands of people. Its use as a bioweapon in Vietnam, Cambodia, and Laos is a sad reminder of the extremes that the US is willing to take at the cost of innocent lives to reach its foreign-policy objectives. And now, out of desperation to preserve agrochemical agriculture and the GM corporations' revenues, the US government will resurrect one of the most toxic agrochemicals known and introduce it into America's food supply.

American acceptance of GMOs has been based upon the unproven hypothesis of "substantial equivalence" for over two decades. This ruling by the USDA during the early years of the Clinton administration gave GM seed companies a free pass to avoid submitting evidence proving GM food safety. Since the ruling claims that GMOs are identical to non-GMOs, no compliance of safety regulations would apply. Therefore Big Ag firms do not have to worry over strict regulatory hurdles, which apply to other products such as pharmaceutical drugs, processed foods, pesticides, cosmetics, and chemical additives. However, a recent flurry of research is now showing that "substantial equivalence" is patently false. Alexandria University in Egypt, the Permaculture Research Institute, and the Norwegian Center for Biosafety each found GMO crops to be fundamentally different from their natural counterpart. In addition, new studies are also showing that nutrient levels in traditional and organically raised crops are substantially higher than GM varieties.

Aside from the scientific evidence and popular blowback condemning GMOs, the agrochemical industry is facing other challenges. If the US government cannot assume a leading role in the endeavor to save American agriculture from a major systemic collapse, nor support the agricultural

sustainability and food security in other regions of the world, perhaps other nations will.

In recent months, Russia has assumed an international leadership role to confront the remaining uncertainties in the debate over GMO safety. Russia has already placed a 3-year moratorium ban on GMO imports. Prime Minister Medvedev is on record stating that Russia can be "self sufficient" with only organic farming. The government is now requesting that the UN General Assembly create an international GMO watchdog organization to monitor Big Agriculture's activities to influence other nations to accept GM seeds and support independent research into the long-term impacts of GMOs. Unlike the US, the Russian government values the voice of its people, with over 75% of Russians preferring organic produce.[22] On the other hand, over 90% of Americans support GMO labeling, yet Washington prefers to protect corporate interests.

However, the most important initiative that Russia plans to undertake is the creation of an international and independent team of researchers from the US, UK, France, China, and Russia to conduct long-term studies to determine once and for all GMO risks to human health, and whether or not GMO crops might be used as genetically engineered bioweapons to destroy ecosystems and threaten the lives of populations. The project is being launched by a Russian NGO, Genetic Safety Public Association, after it noted that a 2004 meeting of the NATO Committee on the Challenges to Modern Society discussed the topic of GMOs' potential use as "genetic weapons." If properly funded, this would be the most thorough international effort, without support from Big Ag corporations, to provide transparent, publicly available data to settle the question over GM safety.[23]

In conclusion, the good news is that GMO propaganda is increasingly being exposed as fallacious. As time passes, more and more research will inevitably emerge to further damn Monsanto and the GM experiment. It is only a matter of time before the false promises of GMOs will be exposed as orchestrated by Big Ag and the US government to control the world's food supply.

This is not to suggest that GM foods will disappear. Rather, we can expect an increase in a new volley of propaganda coming from private industry and the US government claiming GM industrial agriculture is an urgent solution to combat climate change and global warming, a global threat worrying national economies throughout the world. We can expect to hear more scientific denialism and junk science promulgated by the White House, the small gangs of scientific determinists funded by Big Ag and the pharmaceutical industry, and major media presstitutes. We can expect to hear ever wilder and more irrational claims about how GMO-based agriculture might reduce CO2 greenhouse pollution and save humanity. In fact this was Secretary of State John Kerry's recent drivel at the US-African Leaders Summit in August 2014, urging African nations to "concentrate on existing farmlands to make them more productive" rather than expanding and developing new lands for agriculture. Kerry, who has repeatedly proved to be a worthy successor to Monsanto's former mouthpiece Hillary Clinton, frequently regurgitates Monsanto propaganda during his foreign policy circus road shows. And expect new trade agreements, written by corporations such as Monsanto, to be rammed through the international community by the US and its allies that espouse the Washington Consensus to enforce international acceptance of GMOs.

In short, out of desperation to reach global food dominance, the agrochemical industry and the US government will be declaring a full food war against the peoples of the world.

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Richard Gale is the executive producer of the Progressive Radio Network and a former senior research analyst in the biotechnology and genomic industries. Gary Null, PhD, is the host of the nation's longest-running public radio program on nutrition and natural health and a multi-award-winning director of progressive documentary films, including *Seeds of Death: Unveiling the Lies of GMOs*, which is available for free viewing at https://www.youtube.com/watch?v=eUd9rRSLY4A#t=24.

Letters to the Editor

Is There a Native Botanical Treatment for Ebola?

On June 22, 2014, the Associated Press wrote "Doctors Without Borders: Ebola 'Out of Control.'"

Of possible relevance: A weed that grows in the US has been used successfully to treat some viral conditions:

- Smallpox: Native Americans used *Plantago lanceolata* ("lanceleaf plantain") to successfully treat smallpox many years ago.
- AIDS: Patients used *Plantago lanceolata* to keep AIDS virus dormant – symptom free.

Method: fresh green leaves of *P. lanceolata* were gently boiled in clean water to create a tea. A good swallow 2 or 3 times a day seemed to keep AIDS patients symptom-free. *But* since *P. lanceolata* can cause kidney stress, after each dosage with its tea one should swallow a tea made from chickweed (*Stellaria media*), which will prevent kidney stress.

Also, garlic powder (small doses taken once a day) help the body resist viral infections when taken daily.

Question: is there a plant in Africa with properties similar to *Plantago lanceolata*?

Maria Abdin

Kudos to Authors of Ebola Article

I was pleased to see the excellent article "Can Vitamin C Cure Ebola?" by Steve Hickey PhD; Hilary Roberts, PhD; and Damien Downing, MBBS, MSB. The information is concise and timely. It's helpful to have explanations, protocols, interactions, and contraindications spelled out so clearly.

Norene Wedam

Potassium to Cure RA

It is my contention that rheumatoid arthritis is either caused by a potassium deficiency or greatly enabled by one.[1-3] Dr. Reza Rastmanesh has performed a clinical trial that establishes this.[4]

Potassium should be automatically prescribed for rheumatoid arthritis because getting potassium up to normal from the low values in all RA patients is slow, even with a high unprocessed vegetable diet.[5,6] There are tasty foods that are especially rich in potassium.[7] However, it is important that thiamine (vitamin B1) be adequate when supplementing with potassium because heart disease can not materialize when both are deficient, but will show up if only one of those is deficient.[8] This is probably the primary reason why heart disease is a main cause of death in rheumatoid arthritis patients.

In view of the fact that this is not considered by current rheumatologists, it would be very valuable for you to bring it into your future research. It is not only that potassium is not considered by physicians in regard to RA; most of them do not even believe that a potassium deficiency is likely. This even though many of them prescribe what are actually supplements, but prescribed under euphemistic terms such as salt substitutes, sodium free baking powder, ORT salts (oral rehydration therapy for diarrhea), polarizing solutions, GIK (glucose, insulin, potassium) salts, vegetables, or glucosamine. A deficiency is further defined out of existence by defining the blood serum content normal as 4.2 when the actual figure is 4.8.

Charles Weber

P.S.: You may find interesting an article that presents the history of arthritis research at these links: http://charles_w.tripod.com/arthritis2.html and http://charles_w.tripod.com/arthritis3.html.

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Slow Medicine Is the Best Quick Fix for Your Health

Slow Medicine: Hope and Healing for Chronic Illness, by Michael Finkelstein, MD
William Morrow Paperbacks
© 2015; paperback; 368 pp.

Following the industrial and technological revolutions, our society became obsessed with speed and began demanding instant gratification in all our affairs. From fast cars to fast food to a barrage of fast information from our televisions, computers, cell phones, and more, we now live in sympathetic overdrive, our flight-or-fight mechanisms perpetually locked in the "on" position. The medical industry is similarly caught up in the mindset of speedy delivery. To this end, doctors typically spend 15 minutes with each patient – insufficient time to do more than scratch the surface of any given health problem. Without adequate time to identify and resolve the core, unique, and often complex issues behind most health problems, doctors fall back on generic quick fixes, such as pharmaceuticals and surgery – masking symptoms instead of eliminating them at the root.

Michael Finkelstein, MD, was one such doctor. Trained at top institutes for conventional medicine, he was a dutiful soldier – diagnosing symptoms, prescribing medications, and referring patients to surgical specialists, in the heartfelt interest of helping people get and stay well. Over the years, however, Finkelstein realized that the tools he had been given were ineffective in addressing all the needs of his patients, especially those with chronic illness. In the best-case scenarios, relief was only temporary. In the worst-case scenarios, the initial health problems were complicated by side effects from and/or dependency on medication, and surgery resulted in pain and disability that had not existed before.

Patients commonly bounced around from doctor to doctor, with some exploring alternative modalities in a desperate pursuit of relief. There was, however, no integration of the modalities. In addition, there was no way for patients to make sense of their health challenges, so as to recover not only in the body but also in the spirit of life – which often gets stripped away in the process of illness. Finkelstein wanted to do better.

Haunted by the sense that his medical practice was eroding his personal integrity, Finkelstein began seeking out his own "alternative" – a quest that ultimately led him to enroll in Dr. Andrew Weil's two-year integrative medicine program at the University of Arizona. From there, Finkelstein continued to evolve both professionally and personally, incorporating Eastern philosophies and ancient medical practices into the development of an approach that he ultimately called "Slow Medicine." This approach is laid out in Finkelstein's book, *Slow Medicine: Hope and Healing for Chronic Illness*, available this month.

The central principle of this book is that everything is interconnected and interdependent – body, mind, heart, and spirit, as well as individual, community, society, and planet – and that each connecting thread has an effect on the other. To achieve and sustain optimal health, we therefore need perspective that goes beyond the obvious symptoms. We need to become aware of each area of our lives and explore how to optimize our wellness, not only *within* each of these areas, such as through whole foods, creative self-expression, nurturing relationships, and so on, but also through their harmonious *integration*.

Insomnia, for example, may be caused by any number of factors that operate simultaneously and exacerbate the symptom – a poor diet, insufficient physical activity, dissatisfaction with work, stressful relationships, and so on. Certainly, we can take sleeping pills or herbal remedies that overpower our internal mechanisms and, in doing so, bring us a certain amount of rest. By overlooking the root causes of our insomnia, however, we not only will fail to remedy it but also miss critical opportunities to improve our lives and to benefit in a chain reaction of useful and healthful ways.

For this reason, *Slow Medicine* "prescribes" a series of questions that help optimize wellness at the core, regardless of ailment. Here are some examples:

- Do you take walks, garden, or have other regular contact with nature?
- Are creative activities a part of your work or leisure time?
- Do you confide in or speak openly with one or more close friends?
- Are you grateful for the blessings in your life?
- Do you observe a day of rest completely away from work, dedicated to nurturing yourself and your family?

Utilizing anecdotes from his Slow Medicine practice and from his personal life, Finkelstein reveals why each question is important to our health. He then offers detailed guidance on how to go about answering each question, how to understand the implications of each answer, and how to turn each answer into an action step that is integrated into the reader's life, over the course of several months or even several years.

Ultimately, *Slow Medicine* helps readers find greater balance, by shifting from the high-speed sympathetic nervous system (the flight-or-fight mode) to the slower parasympathetic nervous system (the rest-and-digest mode), which in turn activates the body's internal healing response mechanisms, effectively catalyzing a domino effect of wellness in every area of one's life. In this way, the book approaches symptom relief as a byproduct instead of a goal in itself; and in doing so, it reframes health challenges, presenting them not as obstacles, but rather as opportunities. "Along the way, as you embark on this journey of discovery, you'll find treasure on the side of the path," Finkelstein says in the book's introduction. "Are you ready to begin?" ◆

The Benefits of Ketones

review by Jule Klotter

The Coconut Ketogenic Diet by Dr. Bruce Fife
Piccadilly Books Ltd., P.O. Box 25203, Colorado Springs, Colorado 80936
© 2014; softcover; $16.95; 316 pp.

Stop Autism Now! by Dr. Bruce Fife.
Piccadilly Books Ltd., P.O. Box 25203, Colorado Springs, Colorado 80936
© 2012; softcover; $17.95; 302 pp.

A ketogenic diet, which consists of high amounts of fats, moderate protein, and minimal carbohydrates, has been used since the 1920s to treat epilepsy. The diet forces the body to use ketones (made from fatty acids) for fuel instead of glucose. Ketones are "superfuel for the brain," according to NIH researcher Richard Veech, MD. In addition, ketones enhance heart function and reduce inflammation. Interest in the ketogenic diet has surged in recent years. Research and case reports indicate benefits for people with neurodegenerative illness, diabetes, and cancer.

> "There are many overweight people who are gaining weight on starvation diets. Obviously, there is something very wrong with the calories in versus calories out formula."
>
> Bruce Fife

In *The Coconut Ketogenic Diet*, Bruce Fife, ND, explains how a high-fat ketogenic diet, using primarily coconut oil, promotes weight loss and increases metabolism. Eat fat to lose weight? Fat has more calories, gram for gram, than either carbohydrates or protein – which has led many weight-conscious folk to avoid it. Fife explains, in lay-friendly language, that weight loss is not "simply a problem of calorie consumption." The body needs dietary fat. Every cell membrane consists of fat. The brain is 60% fat and cholesterol. Fats are used to make hormones and prostaglandins that regulate bodily functions. Immune system function depends upon the availability of good fats. Whereas the body uses fat – high calories and all – for multiple purposes, carbohydrate is simply fuel. The body stores excess carbohydrate – particularly low-fiber carbohydrates that break down rapidly – as body fat and glycogen. "Carbohydrate is not an essential nutrient," says Fife. "If there were no source of carbohydrate in your diet, your body would utilize fat and protein to satisfy all its energy needs."

In addition to educating readers about fats, carbohydrates, and ketones, Fife provides specific instructions for using the ketogenic diet to lose weight and how to ease into diet changes. He recommends using coconut oil as the main dietary fat because of its high medium-chain triglyceride (MCT) content. MCTs are the easiest fat for the body to convert into ketones. In addition, coconut oil increases metabolism and appears to normalize low thyroid function, making it easier for the body to burn stored fat. Several patients have reported the need to reduce or discontinue thyroid medication after including coconut oil in their diet.

To achieve the desired state of mild ketosis, people who want to lose weight need to eat less than 50 grams from

carbohydrates during the day, which means keeping track of carbohydrate calorie consumption. The book includes an extensive list that gives carbohydrate, fat, protein, and calorie content for various foods. In addition to restricting carbohydrates, Fife recommends gradually including 3 tablespoons or more of oil (primarily coconut oil) with each meal. Coconut oil consumption is cut to 1 tablespoon per meal when the weight loss goal is achieved. Fife also recommends a short list of supplements, drinking sufficient water, and regular exercise. *The Coconut Ketogenic Diet* provides an alternative to the low-fat paradigm for losing weight.

In another book, *Stop Autism Now,* Fife looks at the many factors that can contribute to autism spectrum disorders and provides prevention and treatment plans. He says, "When the brain is plagued with chronic inflammation, irritation, and immune over-activation, as is seen in all autistic children, brain cells have difficulty processing glucose. The lack of sufficient fuel causes the brain to downshift into a lower rate of performance. Normal growth and development are stifled and learned skills may become lost as the brain's cells are starved for energy and struggle for survival." He advocates a ketogenic eating plan that includes coconut oil as the foundation for helping the brain heal. In addition to being brain superfood, ketones activate brain-derived neurotrophic factors, proteins involved in brain cell maintenance, repair, and protection. Like *The Coconut Ketogenic Diet, Stop Autism Now* is packed with research-based information.

> "Ketones are a superfuel for the brain."
>
> Richard Veech, MD, National Institutes of Health

No clinical studies to evaluate the possible benefits of coconut oil and a ketogenic diet for treating children with autism have taken place at this point. Yet the benefits of medium-chain triglycerides (MCTs) on the brain have been known since the 1960s. Also, decades of use have asserted the effectiveness and safety of a low-carb, high-fat diet to treat epilepsy. Might it help children with autism? I found a recent case report of a child with autism and epilepsy that credits a gluten-free, casein-free ketogenic diet using MCTs (instead of butter and cream for fat) with resolving seizures, obesity, and autistic symptoms. The child's autism rating scale fell from 49 points (severe autism) to 17 (nonautistic), and her IQ increased 70 points.[1] For parents and doctors looking for options, *Stop Autism Now* is well worth reading.

Notes

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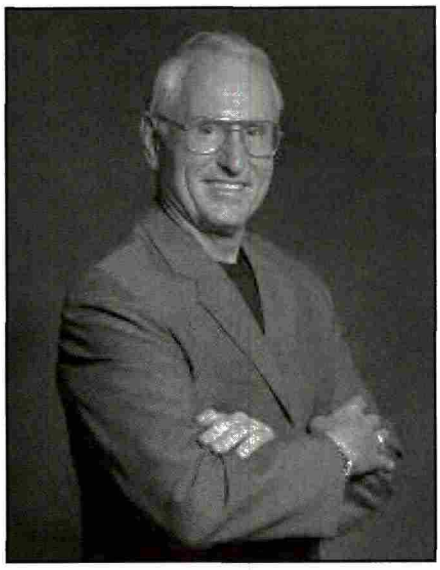

F.A.C.T. – Just the Facts

by Dr. Garry F. Gordon, MD, DO, MD(H)
Gordon Research Institute

Cancer Screening Tests: More Harm Than Good?

There has been a lot of discussion recently about whether to change the names of certain types of cancer-related conditions, to ease people's fears about following less aggressive therapies.

Patients hearing the word *cancer* are too inclined to undertake needless aggressive treatment including surgery, chemo, and/or radiation.

Officials at the National Cancer Institute (NCI) state that overdiagnosis of cancer is a "major public health concern and a priority of the agency." The agency director, Dr. Harold Varmus, says that many findings on mammography, PSA tests, and other cancer screens are not always malignancies, in the classical sense that they will kill you. But as soon as some hear the word *cancer*, they fear the worst and immediately think of surgery and chemo or radiation, when they might not even need it.

It's a tough situation, knowing when to use the most aggressive forms of treatment; as Dr. Norton, medical director at Sloan-Kettering, says, many doctors opt for the more aggressive therapies because they cannot tell patients with certainty which cancers are slow growing, which will or will not progress, and which will kill them. One of the most overdiagnosed conditions that often results in surgery is ductal carcinoma in situ, but according to Dr. Esserman, professor at UCSF, it's not even a "cancer," so why are we calling it that?

If we change the name, or simply remove the word *cancer* from a diagnosis – as was done in the past with early-stage urinary tract lesions renamed "papillary urothelial neoplasia of low malignant potential," or when in the past a particular change on pap smears was reclassified to a "low-grade lesion" – people are not as frightened and are more willing to submit to observation or watchful waiting.

I strongly believe that early cancer-screening tests are an invaluable tool in the fight to eliminate cancer. But some strong voices are calling for less screening, and I believe that they are right if we fail to adopt the current research that clearly proves that *Cancer is a Metabolic Disease*, as the book by Thomas Seyfried, PhD, reveals. If you choose to review his text and carefully consider the hundreds of references he supplies, I believe that many will agree with me that we need to change our approach to treating cancer. Doing so will largely eliminate the stress and fear that the *word* has engendered in the public.

People will soon realize that it is nonsense to spend $100,000 or more just to "live" an additional month. I can assure you that in my 56 years of practice, virtually any unapproved cancer treatment anywhere can beat the results that Big Pharma is getting in gouging the American public with its "approved" cancer treatments. If you already have metastatic cancer by the time you become concerned enough to consult a physician, and are in an "approved" medical facility in the US, your published chance of a 5-year survival is invariably well under 5%. Once people learn that fact, then I believe there will be a demand to offer the advanced early cancer screening tests available today, and the talk about discontinuing cancer screening tests will be seen as it really is: another scare tactic in trying to maintain the status quo a little longer for the failing conventional approaches.

The problem is not what we call the abnormal test result, whether or not it contains the word *cancer* in it; the issue is to change what mainstream medicine advises patients to *do* about abnormal test results. In order to provide a true informed consent, it is necessary to mention that in some instances, left untreated, their abnormal test result may lead to the development of clinical cancer, where there will be a detectable lump or bump – which is the unsophisticated, failing approach to managing cancer that we have relied on now for far too long. I have had extensive experience

with most forms of cancer testing. I've studied radiology, and later I became involved with thermography. Most importantly, I have worked with simple blood tests that are now increasingly available around the world and are able to detect cancer years before the clinical lump or bump stage of cancer has developed.

An excellent, inexpensive test that I have used for many years now, offered through American Metabolic Labs, is called the Cancer Profile test and costs less than $400. This test has not failed to catch any and all cancer related lesions in their earliest and more curable stages. The Cancer Profile panel includes the PHI test (phosphohexose isomerase), which reflects the levels of anaerobic metabolites in the body, along with ultrasensitive HCG done three different ways. I have had a Mayo Clinic test wherein my patient's HCG value was negative, but due to a suspicious thermograph result, I then repeated the test using the Cancer Profile the very next week and found that it was really elevated using their special techniques. There is another test that has been developed at Purdue called the ONCOblot test (oncoblotlabs.com), and this test is believed to find every cancer but not until it is on average 2-plus mm in size. That makes the Cancer Profile test clearly more sensitive. Even so, the value of all of these tests is that by finding these elevated levels, they help patients begin to take their health more seriously, motivating them to make the necessary changes in diet and environment.

Dr. Tsuneo Kobayashi in Tokyo did a multiyear study involving thousands of subjects which clearly showed that annual testing in an asymptomatic population could be used to motivate subjects to follow simple health-promoting strategies that can virtually eliminate all cancers! It made no difference what gene testing revealed, or how many family members had cancer. In all cases, the extensive $500 panel of blood tests accurately identified those whose total body burden of cancer was becoming increased. Then following through with simple strategies including daily exercise, diet change, elimination of sugar and smoking, and detoxification with FIR sauna and herbal immune support (initiated long before the detectable lump stage of cancer had developed) permitted the cancer–screening test abnormalities to revert to safe, healthy levels. The Kobayashi study data prove that early sensitive cancer marker testing is a valuable tool that can help get the body back to safe levels every time, regardless of family history or having a gene such as BRCA or the gastric carcinoma gene. Once we have the early cancer panel indicating some marginal results, we can motivate the patient not to try removing tissues or using chemo but to focus more on the problem, by using my F.I.G.H.T. program. We might find that there are mercury issues in the mouth or other toxic exposures or excessive stress, parasites, sleep apnea, and so on, that can be leading to respiratory insufficiency, anaerobic metabolism, low membrane potential, or low ATP levels.

I have tried to help in every way possible to spread the message about the exciting proof that using early cancer screening tests, in combination with a wellness promoting program, could almost eliminate nearly all cancers. I am certain the current attacks regarding the value of cancer screening tests are because the tests being used are not those I am advocating, and the approaches being used to deal with abnormal results are too invasive and totally ignore the power of the body to heal itself given the support it needs.

Here are a few examples of questions and additional alternative protocols, as discussed by our F.A.C.T. forum participants (names and responses redacted to protect member confidentiality).

Q: Breast lobular carcinoma in-situ?

Hello, I have a 40-year-old female friend who was just diagnosed with right breast lobular carcinoma in-situ via biopsy. She is otherwise healthy and would like to avoid mastectomy and chemo meds. What do you suggest she do in order to successfully avoid this process and prevent full-blown cancer? She is very open to nutritional therapy and supplementation. Please keep in mind that money is an issue for her, although she is willing to find a physician in the Philadelphia area who can support her on her journey to greater health.

Thank you ~ R. S.

A1: Dear R. S.
First, let's understand that LCIS, like DCIS (Ductal Carcinoma in-situ), is NOT a true Cancer. It is just a pre-cancer condition and, as such, these patients do NOT NEED radical surgery, chemo, or radiation.

➤

Just the Facts

➤

LCIS Defined (Mayo Clinic): Lobular carcinoma in situ (LCIS) is an uncommon condition in which abnormal cells form in the lobules or milk glands in the breast. LCIS isn't cancer. But being diagnosed with LCIS indicates that you have an increased risk of developing breast cancer. LCIS usually doesn't show up on mammograms. The condition is most often discovered as a result of a biopsy done for another reason, such as a suspicious breast lump or an abnormal mammogram.

My suggestion is to get a baseline breast thermograph now, and then another in 6 months, and if all is clear just repeat thermograph annually after that for monitoring. Do not use MAMMOGRAMS! I also suggest these patients to have an annual cancer screening blood test, with a company like American Metabolic Labs in Hollywood, Florida. If the test shows a little too much cancer developing in the body, we know to add more immune enhancing and detoxification steps to their basic program. For more info on AM Labs Caprofile screen, visit www.americanmetaboliclaboratories.net.

A2: May I suggest your patient review the information on www.thenewmedicine.info, where she will find an enormous amount of information about the causes and management of breast cancer. ~P. K.

A3: Dear R.S, you may consider "Lifeone" cancer therapy, which is an all natural approach that heals malignancies. ~D. J.

A4: I would recommend that she, and you, and indeed all of The Group, read Tom Tam's books, especially *Tong Ren Therapy: Beyond Acupuncture* and *Tong Ren for Cancer*. I wish I had known about it 20 plus years ago when I was faced with Stage IIB breast cancer with 10/32 positive lymph nodes. Since those days I have followed alternative approaches with great interest (Indeed I did well over 30 alternative modalities from diet to healers and shamans to nutrients to sound and more.) He feels that breast cancer is one of the easiest to treat, so given its prevalence we all need to learn about his approach. It is painless, non-toxic, and can be combined with diet and other nutritional approaches, or used along with mainstream therapies. After reading his books she might like to consult with him since he is close – in Boston. Best regards. ~asw

A5: Cancer Treatment Centers of America has a location in Philadelphia. They use a team approach that may be useful. http://www.cancercenter.com/ Phone: 888-712-2165. In 1996 I cured a breast lump on my left breast the size of an egg using a low complete protein diet and calcium carbonate, 2 TUMS, dissolved on the roof of my mouth daily. The diet also contained other nutrients now known to combat cancer. The lump became a dent. A mammogram six years later showed no sign of cancer. ~L. M.

A6: R. S, It would be helpful if HER2 and estrogen receptors were done at the time of biopsy, I would recommend doing her urinary estrogen metabolites to see whether her metabolic profile is anti- or procancerous. Also do her estrogen and progesterone levels, Exclude heavy metals/underlying infections e.g. candida/periodontal disease as well as root canals. There are specific IV protocols. Her immune system function needs looking at – including giving her low dose naltrexone and Metformin to kill breast stem cells that caused initial cancer growth. High dose enzymes + B17 (apricot kernels) and diet and water consumption around keeping body alkaline. There are a host of supplements that are anti-cancerous e.g., green tea extract/turmeric or curcumin/quercetin/betulinic acid – if you want the whole enchilada, you will need to e-mail me. Diet – stay away from inflammatory foods/sugar/ refined carbs, and include asparagus (glutathione), raspberries (ellagic acid), apple skins (in juicing – break down catechin bridges between cancer cells, and rind of citrus esp light skinned (limonene). ~G.A.

A7: I recommend obtaining a report from *Cancer Decisions* by Ralph Moss, PhD. It has the most up to date info for every type of cancer. ~M. L.

The Gordon Research Institute's F.A.C.T. forum is a dynamic online community of health-care practitioners who include physicians, dentists, chiropractors, nurses, dieticians, psychologists, physical therapists, and many others licensed within the health-care field. The F.A.C.T. group, or "Forum for Anti-aging and Chelation Therapies," originated as a way to help doctors learn about and facilitate the use of the latest alternative therapies and nutritional supplement protocols in managing their patients.

Over the years, F.A.C.T. has grown to a membership of over 4000 practitioners from 68 countries around the world. F.A.C.T. membership is free to qualified practitioners, and as members, they can discreetly consult on and discuss cases with one another, learn about new treatments and protocols, share their success stories, and gain access to an extensive catalog of information gathered from 55 years of ongoing research, conferences, and lectures on the latest developments in natural and alternative health.

For more information about F.A.C.T. and how to apply for free membership, visit the Gordon Research Institute website at www.gordonresearch.com. ◆

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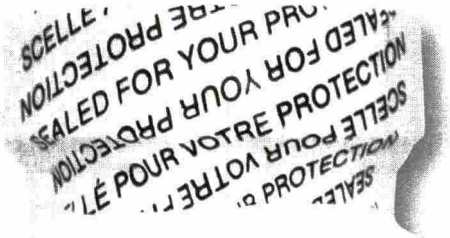

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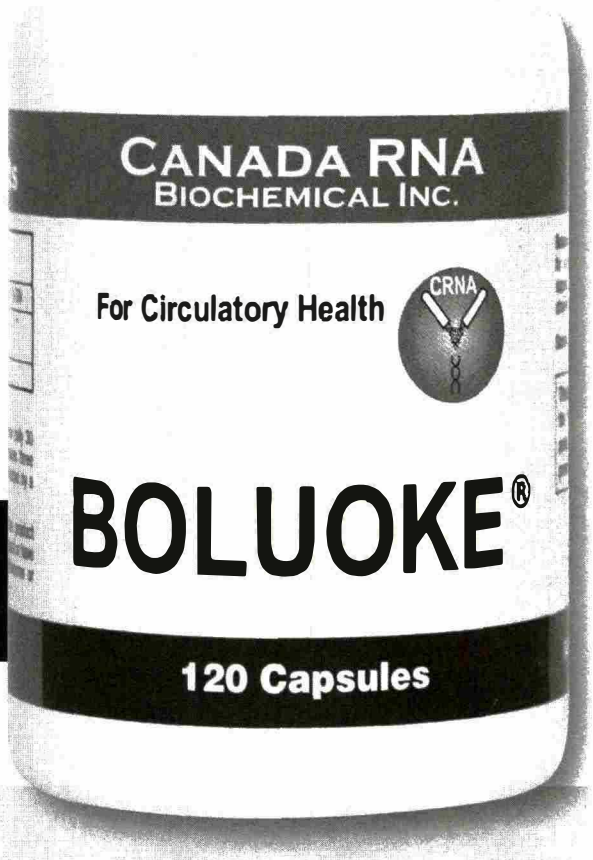
- ✔ Decreases microbial resistance: breaks down biofilm
- ✔ No significant effect on INR or PTT



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Optimizing Metabolism

by Ingrid Kohlstadt MD, MPH
www.INGRIDients.com

Bee Informed of the Health Benefits of Bee Gardens and Propolis

Introduction

The current plight of the honeybees doesn't reflect well on the health of humans dependent on the same environment. What are meaningful actions that we can take? How does bee health affect the quality and human health benefits of honey, venom, pollen, wax, royal jelly, and propolis? In this *Townsend Letter* issue focused on laboratory testing, my column views the benefits of bee gardens, propolis, and "bio" from a scientific testing perspective.

Counting on Wild Bees to Boost Your Backyard Vegetable Harvest

Amidst the elegance of modern science, one of the most important tests remains "the count." Whether they are quantifying organisms on a microscope slide, gauze used in surgery, or people who ate the potato salad at the church picnic, numbers often make decisions. Entomologists are counting bees using sentinel hives across Maryland. Of note, the effort is crowd funded. With 30% annual livestock losses of any other kind, the government would be taking leadership. Dennis vanEngelsdorp will tell you more through his informative TED talk.[1] Dead bees aren't only livestock losses, they are a pollinating force. For some crops such as California almonds, growers are counting on bees because the nonnative trees have become dependent on nonnative honeybees to pollinate them. Soybean farmers are counting, too. Even though their crop is technically self-pollinating, their harvest is more bountiful with bees.

However, honeybees are not likely to be the primary pollinators of your backyard garden. More crucial than butterflies, hummingbirds, and bats are native bees (400 of the 2000 known species of which are in my state of Maryland). Native bees are likely threatened, too. But how do we count them, since they are mostly solitary and ground dwelling? Under development is a lab test of soil to analyze bee DNA. For now, however, the most high tech analysis remains "the count." There's not even an app.

To increase your garden's pollinating workforce, try the following:

- Create meadow with native wild plants or simply "no mow" lawn.
- Native bees, of course, like native blossoms that they can see. Their spectrum is from ultraviolet (which looks white to us) to orange. Bees can't see red, which is probably how red became butterfly and hummingbird territory.
- Bees need sand or some sandy dirt for nesting. My best backyard bee finds turned up in the children's sandbox. There were no incidents, since most native bees don't sting: they are vegetarian, in contrast with hornets, and have no hives to defend, in contrast with honeybees.
- Avoiding pesticides that would harm bees tends to improve both the soil and the nutritional merits of its produce. In general, the higher the concentration of microbes and bee DNA fragments, the better the soil quality.

Let bees inspire your backyard gardening – that's a health benefit, too. Look at this amazing slide show prepared by Sam Droege of the US Geological Survey.[2] Sam is supported by Uncle Sam: tax dollars for bee tax-onomy. North America has an estimated 1000 native bee species yet to be classified. So you might get to name a new bee species – imagine that, right in your backyard!

Microbiome Benefits from Propolis

Microbes that inhabit the human gut, skin, and respiratory tract are for the most part established early in life. But the relatively small changes in the human microbiome promoted by the environment around us and our food hold sway over our health. If I were invited to study the human microbiome, I'd implement a randomized clinical trial of bee propolis. My hypothesis is that the propolis used by colony-dwelling bees worldwide to protect honey and brood from harmful microbes can do the same for humans.

So I've consumed and tested propolis in any form that I could. First I put a wad between my cheek and gums just like the seasoned beekeepers. Then I moved to the more conventional: tinctures, extracts, candy, chewing gum, gumdrops, lozenges, cream, lip balm, throat spray, oral

spray, nasal spray, mouthwash, body powder, toothpaste, and airborne diffusion. So what didn't I try? I could only think of two, deodorant and natural hair coloring along the lines of henna but for those with blond hair. Here are the five products that have impressed me to include in that clinical trial:

1. Gumdrops
   Propolia brand Gommes de Propolis, honey-vanilla flavor, are medicinal and delicious. Use them as a lozenge or chew them like a low-sugar gummy bear that isn't so sticky for teeth. A pack of "gommes" goes in my carry-on luggage as part of my stay-healthy air travel package and are also a handy desk-drawer snack.
2. Oral spray
   I keep the propolis oral spray in my briefcase as a breath freshener and I use it before public speaking to help my voice stay strong. My favorite is Propolia's oral spray with propolis, aloe, and orange.
3. Diffusers
   Aerosolized propolis is a welcome addition to apitherapy that I detailed in my June 2014 *Townsend Letter* column. I continue to recommend its bedtime use as a first line of defense for mold sensitivity, seasonal allergies, sinus congestion, and upper respiratory conditions.
4. Cream
   Propolia Active organic body balm with propolis, shea butter, and honey has earned the rank of first place in my topical applications for eczema (atopic dermatitis) in children and adults. Also keep it in mind for skin rashes associated with yeast infection, even athlete's foot. Begin by applying the cream daily at bedtime. The nutrients that confer propolis's healing properties stain yellow, which has been no more than a minor drawback. The Propolia brand lip balm can double as a cream to break the scratch/itch cycle. It's easy to transport, and since it contains less propolis, it doesn't stain.
5. Extracts
   Extracts can serve as an antioxidant dietary supplement. They contain either sugar or alcohol, but so do other treatments for cold symptoms, often without the benefits of propolis. The three in my medicine cabinet are organic propolis extract 20% and Propolia organic propolis extract 20% without alcohol for children over 3 years old, both distributed in the US by Bee Healthy Farms. I also stock Brazilian green propolis herbal tincture made by BioPure. Add the extracts to tea for a hot toddy or use the no-alcohol extract to sooth a child's sore throat. Avoid taking the extracts at the same time as a prescription medication, since propolis, as a direct result of its health merits, can change how chemicals are absorbed.

Good Reasons to Choose 'Bio'

As bees gather pollen, they concentrate pesticides. The pesticide levels of pollen are not publically known. Silence should not be equated with safety, especially with US dietary supplements, generally considered to be a "buyer beware" industry.

Choose organic when possible for all bee products. In Europe, "organic" is called "bio" and held to criteria generally considered more stringent than those for "organic" in the US. One example is that in Europe, the wax for the combs is made by the bees. This is high energy output for bees, so farmers choosing the more economical route would give bees wax to reuse. The wax then accumulates the pesticides with each subsequent use.

Conclusion

Create some native bee habitat near your vegetable garden. Consider the benefits of incorporating propolis into your health plan; and when it comes to any bee products, choose organic or, better yet, use the European standard of "bio."

Disclosure

Dr. Kohlstadt is the President of INGRIDients Inc., a consulting service for healthful nutrition. Among its clients are Bee Healthy Farms, whose products are included here.

Acknowledgements

Bee expert Sam Droege of the USGS, who spoke at the Natural Resources Group of the Cosmos Club in Washington, D.C., and apiarist Dennis vanEngelsdorp, who lectured at Johns Hopkins Bloomberg School of Public Health.

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

Notes

1. VanEngelsdorp D. A plea for bees [online video]. https://www.ted.com/speakers/dennis_vanengelsdorp.
2. USGS Bee Inventory and Monitoring Lab [online photo album]. Flicker.com. https://www.flickr.com/photos/usgsbiml.

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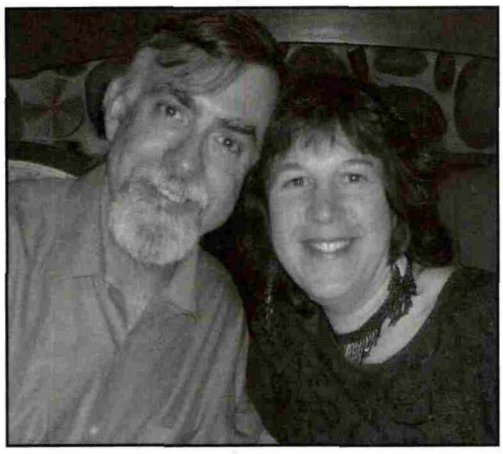

Healing with Homeopathy

by Judyth Reichenberg-Ullman, ND, DHANP, LCSW, and Robert Ullman, ND

www.healthyhomeopathy.com

The Long-Term Benefits of Homeopathic Care

Continuity Over More Than 30 Years

The two of us have been in practice for 30 and 32 years, respectively. That adds up to 62 years, but we have never combined the years of our two careers – perhaps because that makes us seem *really* old! In any case, 30-plus years as naturopathic and homeopathic physicians has given us an appreciation of longevity of treatment. We have a handful of patients who have been with us since our days as student clinicians! I, Judyth, remember well that previous Bastyr teaching clinic at the corner of 45th and University in the U District of Seattle! I had worked there years before as a psychiatric social worker when it was an outpatient mental health clinic. Bob sometimes jokes, when we present cases of long-term patients: "They've stuck with us for 30 years and they are still not better?" In fact, they are much better, and they, like wine, mellow with age. We treasure the patients whom we have known so intimately for one, two, and three decades. These include young adults, now graduating from college and being launched creatively in the world, whom we first treated as innocent, curious, screaming toddlers. Now it is they who will carry forward and change our world with the tools and healing they have received! We will never forget the confidence, compassion, and deep peace exuded by Dr. John Bastyr. Nor how beautifully and gracefully he aged over decades in practice. It is a profound privilege to have earned the trust and confidence of our long-term patients. This is especially true at a time when old-style GPs have all but disappeared, health-care plans are continually changing, primary-care physicians are moving from plan to plan, and it is very difficult, if not impossible, to continue with the same doctor over the years.

Your Homeopath Will Know You Inside and Out!

Constitutional homeopathy treats *all* of you – not only all of your physical body, but the entirety of your physical, mental, and emotional complaints. Every detail of what ails you, and is out of balance, is of relevance and interest to your homeopath. It is not enough to know that you are suffering from headaches; we want to know everything possible about those headaches: where you feel them, the precise sensation(s) associated with them, any other (concomitant) symptoms that happen to occur at the same time, time of day, triggers, what makes those headaches better or worse. Also when those headaches first began, if and how they have changed over time, and what they are like at their worst. Such is the case with every one of your significant physical complaints. You will be asked what was going on in your life just before those headaches originally began. The sensation, or exact feeling or experience, of the headaches, for example, is essential in finding your medicine (remedy). A headache that comes on suddenly and violently and is quite affected by the sun will lead to a very different prescription than one that is persistent, anxiety-induced, and related to familial stress.

In any case, you can count on the homeopath, whom you have seen over the years, to know you quite well and, from an objective point of view, perhaps even better than you know yourself.

An Institutional Memory

We have medical charts, of course, and lists of medicines prescribed, going back to the very first appointment. So our memories of what our patient needed in 1986 when she was hit with that full-blown hay fever attack are much better than hers. We can look back in the chart quite easily and quickly to see if that annoying hay fever is the same as it was back then, in which case, if a medicine helped back then, it likely will again. It is a big relief for many of our patients to know that someone is keeping that close track of them over the years. If, on the other hand, it is a *different* hay fever or flu, then we can see that a different homeopathic medicine will be needed. This is far better than wasting time, energy, and money taking something that will not work. Of course, there are patients whom we cannot help and who do best to find a different homeopath

who can grasp their needs in a fresh, clear way. But in most cases, continuing with the care that works over the years works out quite well.

Your Homeopath Will Not Be in a Hurry

You have surely experienced, or heard about, the typical doctor in the white coat with his hand on the knob of the consulting room door, average visit time of five minutes, too busy to really listen or answer your questions, and certainly not knowing who you really are. Homeopathic patients know that they will be asked to delve deeply into their complaints, to recount everything in detail. The initial visit takes a minimum of 90 minutes, more if the prescription is not clear. During the course of long-term homeopathic care, if a patient no longer responds to a particular treatment, we again bring him in to see us for an hour or hour and a half to reevaluate the picture and understand what needs to be adjusted.

Persisting to Find The Thread of Your Case

Homeopaths like ourselves who use the sensation method developed by Dr. Rajan Sankaran of Mumbai are searching for the common sensation that ties together *all* of your experiences of all of the unique symptoms that you may have. You may be under the impression that your asthma is quite separate from your herpes and a totally different entity from your arthritis. But that is not possible for a homeopath practicing this method. We know that the same sensation, or experience, of one body part runs through the others as well. The key is to understand or identify that unifying thread. It is fascinating, and deeply therapeutic, to find a medicine that is the very same one you needed as a child. This can lead to profound healing.

Making Sense of Nonsense

When our patients get to the point in the interview that they appear confused and begin to make comments like, "I have no idea why I said that," or "This makes no sense at all," then we know we are reaching into the experience level and that important information about what to prescribe is about to reveal itself. What appears to be illogical and nonsensical unfolds into a beautiful and coherent picture of experience that corresponds to a particular homeopathic medicine from the mineral, animal, or plant kingdom. Our new patients sometimes ask us how best to prepare for the initial interview. We respond: "Leave your mind outside the door. Just come in empty and not knowing anything."

First Aid, Acute, Chronic: Just Ask Your Homeopath!

We very much enjoy helping our patients find immediate natural relief for their colds, flu, bladder infections, contusions or concussions after a car accident, burns, acute hepatitis, chronic eczema. Remember that homeopathy treats the whole person, so unless you need the services of an emergency room, just contact your homeopath. It is quite a relief to be able to consult the same doctor, who has known you for years, for advice about a toothache, profound grief following a loss, or a severe allergic reaction. Even cancer. You may well need conventional care, but how reassuring to know that you can call your homeopath to help sort out what seems unfathomable or incomprehensible.

Preventive Effects

Our long-term homeopathic patients have also enjoyed the benefits of a healthful diet, lifestyle, and nutritional supplements, in addition to the homeopathic medicines. Aging is inevitable; however, we are pleasantly surprised at how healthy the majority of our patients remain compared with the general population. The simillimum (homeopathic medicine that best fits each individual) brings the vital force into balance in a profound way, conferring positive overall health benefits. Although we have not done research, it is our observation that our long-term patients experience less mental and emotional illness and a lower incidence of cancer and chronic disease, and are overall happier and healthier. If and when they do need surgery or conventional interventions, the naturopathic, nutritional, and homeopathic support allows them to recover much more quickly and fully.

Minimal Pharmaceuticals

We have found consistently that patients who are faithful to homeopathic care need many fewer conventional medications. One patient with seizures, who has been with us for 22 years, has been able to avoid antiseizure medications successfully. Only a handful of our patients take cardiac medications. It is common to avoid the need for thyroid medications with the help of homeopathy. Hormones are an individual choice but can also often be avoided with homeopathic medicines to deal with the hot flashes, and with nutritional supplementation and lifestyle recommendations to prevent bone disease. A woman whom we have helped for 32 years is finally on medication for glaucoma and had recent cataract surgery. Understandably, as we and our patients move into our 70s and beyond, the need for prescription medications will arise for some of us, yet it is gratifying to avoid or minimize it for as long as possible.

Lifelong Connections and Trust

We experience profound gratitude for the trust that our patients place in us. We will never forget the moment when one patient called on the verge of a stroke and followed our insistence to call 911 (she was hospitalized, survived, is walking and talking well, and is still on medications). Or the regular stream of e-mails from a patient of 17 years' duration who recently caught an early, nonmetastatic colon cancer. His gratitude, wonderful web of support, and loving partner touched us deeply. We were so grateful to be part of his loving and caring team. Though we travel frequently

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and live on two continents, we are just an e-mail message or Skype call away, except on infrequent backpacking or kayaking trips. The bond of trust that we and other homeopaths have with our patients and their families, over decades, is highly gratifying and the reason that we continue to practice. We know that, in most cases, we can provide help quickly. This is true with other homeopaths as well. Some even delivered their patients' babies, often at home! Homeopathic medicines can be shipped overnight to most places and to nearly anywhere in the world in a matter of days.

Cost-Benefit Ratio of Homeopathy

Homeopathic care is far less expensive than conventional medicine or even other complementary medical care. During the first year, we suggest budgeting approximately $1500. In subsequent years, the highest number of appointments would be eight annually, at a cost of roughly $1300 per year including homeopathic medicines (but excluding optional nutritional supplements). Patients who become adept at homeopathic self-treatment can make use of home medicine kits with contents that can last for decades. Homeopathy, compared even with other forms of natural medicine, is a bargain.

Benefits for the Whole Family

You can trust homeopathy to be safe even for newborns, pregnant women, the elderly, and your family pets. We have treated babies from the age of 1 day, still enjoy helping a number of young adults whom we began treating in infancy or as toddlers, and can assure you that homeopathy is the safest medicine that you will ever find, short-term or long-term. It has been especially gratifying to work with large numbers of youngsters with behavioral, learning, and developmental problems and to witness their remarkable progress over the months and years.

Judyth Reichenberg-Ullman and Robert Ullman are licensed naturopathic physicians, board certified in homeopathy. *Their latest book,* published June 2014, is *The Savvy Traveler's Guide to Homeopathy and Natural Medicine: Tips to Stay Healthy Wherever You Go!* Their previous books include *Homeopathic Self-Care, The Homeopathic Treatment of Depression, Anxiety and Bipolar Disorder, Whole Woman Homeopathy, Ritalin-Free Kids, Rage-Free Kids, A Drug-Free Approach to Asperger Syndrome and Autism, The Patient's Guide to Homeopathic Medicine,* and *Mystics, Masters, Saints and Sages: Stories of Enlightenment.* New editions of *Ritalin-Free, Whole Woman Homeopathy,* and *Homeopathic Self-Care* are available now or very soon, as well as electronic and free miniversions of all of the books. The doctors live on Whidbey Island, Washington, and in Pucón, Chile, and practice at the Northwest Center for Homeopathic Medicine in Edmonds, Washington. They treat patients by phone and videoconference as well as in person. They can be reached at 425-774-5599, drreichenberg@gmail.com, or drbobullman@gmail.com. Their website is www.healthyhomeopathy.com.

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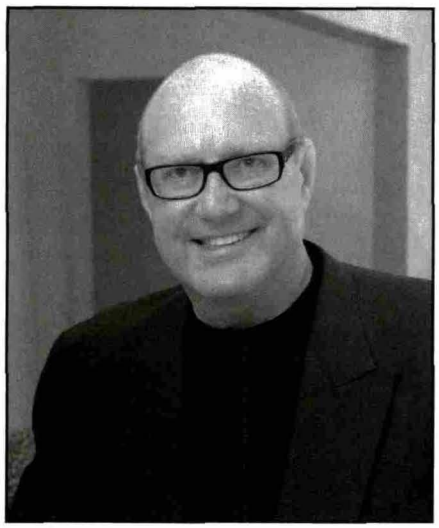

Monthly Miracles

by Michael Gerber, MD, HMD
contact@gerbermedical.com

EAV: The Physician's Guide

What would you think if you could diagnose viruses, bacteria, fungi, parasites, mold, all allergens, homeopathic remedies with proper dilution, toxic chemicals, heavy metals, sick teeth, radiation, damaged vertebrae, drug and supplement compatibility, organ weakness, disease presence, pharmaceuticals, hormones, vaccinations, water contaminants, foods, implant materials, dental materials, habit drugs, Bach Flower Remedies, and much more using an EAV (electroacupuncture according to Voll) device in a few minutes? You might say, "Bah, humbug!" as I did when I first saw Yiwen Tang, MD, utilize the Dermatron in San Francisco in 1975. He was a student of Bill Kho, MD, from Las Vegas, who was a student of Reinhold Voll, developer of the technology in Germany in the late 1940s. This technology is also called transdermal screening or MSA (meridian stress assessment).

I was slow to learn the technology until I was exposed to the Vega device in the late 1980s by Scott Moyer of Santa Rosa, California; it wasn't until I met Andreas Marx, an acupuncturist and naturopath from Germany in a seminar in Denver in 1989, that I could begin getting yes/no answers from the Vega using a Kramer probe. Dr. Kramer also developed EAV. Marx taught for Voll and Kramer. The probe has a small dot in the middle and for me it was like learning to ride a bicycle: I could do it immediately.

The probe is placed on acupuncture points on the fingers and toes and can test their strengths and weakness. At first, testing of remedies was done by placing vials of homeopathic remedies, Sanum isopathic remedies, herbals, vitamins, and nutrients in wells on the Vega machine. Vega is manufactured in the Black Forest in Germany. Before computers, complex wells of testing banks could be mechanically linked for ease of testing.

BioMeridian Computerized EAV

In the 1990s, I was introduced to the BioMeridian MSAS (meridian stress assessment system) by Duane Davis. At first I just used it for remedy compatibility testing. I say "just" because it has taken me all these years to become comfortable with the vast array of testing topics available on the computer. Not to denigrate remedy compatibility testing, because those of us who treat the very sensitive, highly allergic, multiple chemical sensitivity, paradoxical reactors need some kind of testing, be it EAV or muscle testing to determine what these patients can tolerate without severe reactions. Some of my doctor friends say, "I don't need to do any of that kind of testing; my clinical judgment is good enough." I can tell you that it is not good enough. Blowing up a sensitive patient – or any patient – is poor medicine. Even great therapies such as chelation, IV vitamin C, or ozone therapy are not tolerated by all patients. If you don't test, you don't know. I test every patient on every new treatment every visit, and I am often surprised. Even with good compatibility testing, a patient's body can decide that it doesn't like something 4 or 5 days into therapy. It pays to be extremely flexible.

Homeopathic Remedy Selection

The BioMeridian has all of classical homeopathy on it. Some would say that you are manipulating the machine with your mind. I think it is important to think about the remedy when you are testing it and I am corrected in my choice of remedy frequently. For example, when the high-strung, adrenal-burnout female presents to me, I might think, a-ha, she is Argentum nitricum – and it tests negatively. Then I think for sure she must be Arsenicum album, and again it tests negatively. Well, then, she is very sympathetic; let's try Causticum, and the computer agrees. Then how should we dose her? Try the 6C; no, 12C; no, 30C; no, 200C; yes. In a month she may test for 1M or be done with the remedy.

When I test for homeopathics, I look for an indicator drop that gives the correct remedy. When the proper

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dilution is found, the indicator tests strong and resonates well with the patient with no indicator drop. I can't imagine practicing homeopathy without some kind of feedback regarding the correct remedy and the correct dose.

I only use three acupuncture *ting* points: on the lateral aspect of the ring finger (triple warmer), middle finger (allergy), and index finger (autonomic nervous system). All of the meridians can be tested, of course, but I find that using the three points works well for me and is much quicker. I take the indicator up to 50 and wait for the indicator drop, which indicates weakness. There are many other ways to use EAV.

Lyme, Viruses, Bacteria

Many believe that Lyme (*Borrelia burgdorferi*) is much more common than usually thought, and I agree. When patients present with a plethora of symptoms and negative lab values and radiology, I frequently find *Borrelia* on my BioMeridian. After many years of testing, I have great trust in it. Lyme is notoriously false negative to lab testing. I treat it with antibiotics and herbs after Lee Cowden, MD. We clear Lyme in about 1 month if it is not too deeply entrenched. Viruses turn up frequently, as do bacteria. I can ask whether it is staph or strep and treat accordingly with drugs or Sanum isopathic remedies and IVs of C or ozone.

Parasites

It seems that lab evaluation of parasites has deteriorated. We send stool samples to reputable labs, and the results come back, "Parasites found, taxonomy unknown." Don't you love it? I find that amoebae, *Ascaris lumbricoides*, cestodes (tapeworms), pork worms (*Trichinella spiralis*), and others turn up very frequently on the BioMeridian. With therapy, I test on the machine whether the patient responds to tinidazole, Alinia, albendazole, other antiparasitical drugs, or herbal preparations. After treatment, the patient responds negatively to testing or needs another parasite medication to clear them.

Teeth

Of all the hidden causes of pathology in humans, bad teeth are very common. The German biological dentistry people can give you reams of information about toxic, infected root canals (corpse in the attic, the tooth is dead and frequently infected giving off many biological poisons interfering with cellular metabolism) and improperly removed wisdom teeth: dentists sometimes neglect to remove the periodontal ligament that holds the tooth to the bone; the bone then thinks that the tooth is still there and doesn't heal the cavity where the missing tooth was, which can create a chronic infection whose toxins permeates the whole body. If you haven't seen how the teeth are related to distant sites in the body, it is important to look at these relationships in a German tooth chart. Many chronic disabilities, including hypertension, cancer, and prostate disease, are related to bad teeth. Unfortunately, these tooth issues frequently don't show up on routine dental X-rays and can be found with CT scans of the maxilla and mandible and by Cavitat, an ultrasound evaluation of bone, which is an excellent test but hard to find.

When I first started measuring teeth on the BioMeridian, I was my usual skeptical self. However, I started asking the patients about root canalled teeth, and sure enough they tested negatively. Also when I looked in the computer for dental nosodes, chronic bacterial ostitis appeared. We treat the bad teeth with ozonized coconut oil swabs next to the infected teeth 20 minutes per day in the buccal gutter next to the tooth. I also inject neural therapy procaine with Arthrokelan A and Pleo Not (*Penicillium notatum*) into the buccal membrane next to the infected teeth followed by ozone, 9 gamma, about 15 minutes later so as to not undo the good isopathics. This is done weekly if possible until the signs of tooth infection go negative. Treating infected teeth and maxillary/mandibular-infected bone is one of the great frontiers in medicine that the Germans figured out a long time ago.

Remember the EKG

Can you imagine diagnosing heart disease by taping electrodes on the skin to monitor electrical changes in the heart? Electrical monitoring of mammalian heart impulses dates back to 1668 when Dutchman Jan Swammerdam first demonstrated electrical nerve conduction. Einthoven coined the term *electrocardiogram* in 1893. Surely, over 100 years later, it is not too much of stretch for our intellects to detect multiple abnormalities of the human condition via EAV. There are many other machines which measure skin resistance/capacitance. LSA (Limbic System Analysis), Zyto, Vega, Avatar, and other machines use this technology.

Most medical licensing boards frown on this technology. We are blessed in Nevada and Arizona to have our state boards of homeopathic medical examiners, which have these technologies registered and approved in our state laws. Do some kind of testing if you can. The human organism is most complex and wonderful! We are blessed to work with these advanced technologies.

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Calendar

JANUARY 9-12: THE BENGSTON ENERGY HEALING METHOD® WORKSHOP with Dr. William Bengston in San Diego, CA. Contact: 312-786-1882, www.equilibrium-e3.com

JANUARY 15-18: 12th ANNUAL NATURAL SUPPLEMENTS – AN EVIDENCE BASED UPDATE in San Diego, California. CONTACT: www.scripps.org/events/12th-annual-natural-supplements-january-15-2015

JANUARY 15-18: ANNUAL UPDATES IN ENVIRONMENTAL MEDICINE CONFERENCE – Environmental Impact on Stem Cells, Aging, and Chronic Illness in St. Pete Beach, Florida. CONTACT: www.sync-opate.com/events/spiritmed/

JANUARY 17-18: NEUROLOGY & BIOCHEMISTRY CONFERENCE-A HOLISTIC APPROACH TO THE BRAIN AND MENTAL HEALTH @ National College of Natural Medicine in Portland, Oregon. CONTACT: www.ncnm.edu/alumni-ce/continuing-education/neurology-and-biochemistry-conference-2015.php

JANUARY 23-25: 4TH ANNUAL INTEGRATIVE THERAPIES INSTITUTE CONFERENCE & EXPO – Methylation, Genomic Medicine, & its Relationship to Testing, Assessment, and Clinical Practice in San Diego, California. CONTACT: www.iti2015.com/

JANUARY 24-25: NATIONAL UNIVERSITY OF HEALTH SCIENCES presents SOOJI CHIM KOREAN HAND ACUPUNCTURE in Lombard, Illinois. CONTACT: www.nuhs.edu/extras/postgrad/SooJi_Chim_Korean_Hand_Acupuncture_Outline_-_2015-01.pdf

JANUARY 30-FEBRUARY 1: MASTERING THE PROTOCOLS FOR OPTIMIZATION OF HORMONE REPLACEMENT THERAPY in Salt Lake City, Utah. Up to 18.5 CME hrs. CONTACT: Worldlink Medica, 888-222-2966; www.worldlinkmedical.com/live-cme-courses/part-1/

JANUARY 30-FEBRUARY 1: INTEGRATIVE PEDIATRIC MEDICINE in Portland, Oregon. CEUs. CONTACT: instituteofwomenshealth.com/our-next-conference/

FEBRUARY 13-15: ONCOLOGY ASSOCIATION OF NATUROPATHIC PHYSICIANS 4th ANNUAL CONFERENCE in Phoenix, Arizona. CONTACT: www.oncanp.org/2015conference.html

FEBRUARY 19: THE NEUROENDOCRINE IMMUNOLOGY OF SMALL INTESTINAL BACTERIAL OVERGROWTH in Tampa, Florida. CONTACT: 800-736-4381.info@apexseminars.com

FEBRUARY 19-21: INTEGRATIVE HEALTHCARE SYMPOSIUM in New York, New York. CEs for MDs, RNs, DCs, NDs, L.Ac. CONTACT: www.ihsymposium.com/annual-conference/

FEBRUARY 21: ORGANIC ACIDS TESTING: AN INVALUABLE TOOL FOR DISCOVERING THE UNDERLYING CAUSES OF CHRONIC ILLNESS WORKSHOP in San Diego, California. Presented by The Great Plains Laboratory, Inc. CONTACT: www.GPL4U.com/workshops

FEBRUARY 21-22: NATIONAL UNIVERSITY OF HEALTH SCIENCES presents ADVANCED TOPICS IN EVIDENCE BASED CLINICAL NUTRITION in Lombard, Illinois. CEs for DCs & NDs. CONTACT: events.r20.constantcontact.com/register/event?oeidk=a07e9slcocld10aed22&llr=e9rlipdab

FEBRUARY 21-22: BASTYR UNIVERSITY presents IMMUNOLOGICAL & AUTOIMMUNE DISORDERS WITH REFERENCE TO AYURVEDA with Vasant Lad in Kenmore, Washington (near Seattle). CONTACT: 425-602-3152; www.bastyr.edu/continuing-education

FEBRUARY 21-22: NATIONAL COLLEGE OF NATURAL MEDICINE presents 3rd ANNUAL WOMEN'S HEALTH SYMPOSIUM in Portland, Oregon. CONTACT: womeninbalance.org/woocommerce/3rd-annual-womens-health-symposium/

FEBRUARY 25-28: PREVENTIVE MEDICINE 2015 – Annual Meeting of the American College of Preventive Medicine in Atlanta, Georgia. CONTACT: www.preventivemedicine2015.org/

FEBRUARY 25-28: A4M SPRING BHRT SYMPOSIUM in Los Angeles, California. CONTACT: www.a4m.com/anti-aging-conference-2015-02-la-bhrt.html

FEBRUARY 28: BASTYR UNIVERSITY presents CHINESE NUTRITION FOR MENTAL HEALTH in Kenmore, Washington (near Seattle). CONTACT: 425-602-3152; www.bastyr.edu/continuing-education

FEBRUARY 28-MARCH 1: MASTERING FUNCTIONAL BLOOD CHEMISTRY in Dallas, Texas. CONTACT: (800) 736-4381. info@apexseminars.com

MARCH 5-7: INTERNATIONAL ACADEMY OF ORAL MEDICINE & TOXICOLOGY (IAOMT) SPRING MEETING in Rio Grande, Puerto Rico. CONTACT: iaomt.org/conference/conference_agend/

MARCH 18: WISDOM DAY SEMINAR (before Psychotherapy Networker Symposium) in Washington, DC. CONTACT: www.dcnn.pro/WisdomDay2015.en.html

MARCH 21: PATH FOUNDATION presents THE SECRET WEAPON & THE WAR ON DRUGS: BRAIN RESEARCH in New York City, New York. CONTACT: 646-367-7411; www.pathfoundationny.org

Calendar

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MARCH 22: BASTYR UNIVERSITY presents ARE THE DRUGS MAKING YOUR PATIENTS SICK? A LOOK AT THE TRIAD OF HYPERTENSION, DYSLIPIDEMIA & TYPE II DIABETES in Kenmore, Washington (near Seattle). CONTACT: 425-602-3152; www.bastyr.edu/continuing-education

MARCH 23-27: APPLYING FUNCTIONAL MEDICINE IN CLINICAL PRACTICE in Tucson, Arizona. CONTACT: 800-228-0622; functionalmedicine.org/AFMCP

MARCH 26-29: PSYCHOTHERAPY NETWORKER SYMPOSIUM in Washington, DC. CONTACT: www.psychotherapynetworker.org/symposium/2014/

MARCH 28-29: NATIONAL COLLEGE OF NATURAL MEDICINE presents FOOD AS MEDICINE SYMPOSIUM-NOURISHING PRESCRIPTIONS in Portland, Oregon. CONTACT: foodasmedicineinstitute.com/food-as-medicine-symposium-nourishing-prescriptions-2/

APRIL 9-12: NATIONAL AYURVEDIC MEDICAL ASSOCIATION 15th ANNUAL CONFERENCE in Newport Beach, California. CONTACT: www.ayurvedanama.org/page/NAMA15Anniversary/?

APRIL 11: BASTYR UNIVERSITY presents NW HOMEOPATH'S CURED CASE CONFERENCE – MANY PATHS, ONE SIMILLIMUM in Kenmore, Washington. CONTACT: 425-602-3152; bastyr.edu/continuing-education

APRIL 18-19: CALIFORNIA NATUROPATHIC DOCTORS ASSOCIATION SPRING MEETING in Marina del Ray, California. CONTACT: www.calnd.org/

APRIL 23-26: AMERICAN ACADEMY OF ENVIRONMENTAL MEDICINE INSTRUCTIONAL COURSES in Dallas, Texas. CMEs. CONTACT: aaemconference.com/index.html

APRIL 23-26: AMERICAN ACADEMY OF MEDICAL ACUPUNCTURE 27th ANNUAL SYMPOSIUM in St. Louis, Missouri. CMEs. CONTACT: www.medicalacupuncture.org/ForPhysicians/Symposium.aspx

APRIL 25-MAY 2: PHYSICIANS' ASSOCIATION FOR ANTHROPOSOPHIC MEDICINE INTERNATIONAL POST GRADUATE MEDICAL TRAINING in Fair Oaks, California. CONTACT: www.paam.net/training/event-detail/article/2015-ipmt-notice-52.html

APRIL 27-MAY 1: MINDFUL PRACTICE ADVANCED WORKSHOP : ENHANCING QUALITY OF CARE, QUALITY OF CARING, AND RESILIENCE in Batavia, New York. For healthcare practitioners. Also, **OCTOBER 14-17**. CONTACT: www.urmc.rochester.edu/family-medicine/mindful-practice/presentations-workshops.aspx

APRIL 30-MAY 2: 13TH ANNUAL INTERNATIONAL IPT/IPTLD INTEGRATIVE ONCOLOGY in Reno, Nevada. CONTACT: 954-540-1896; bestanswerforcancer.org; Sharon@bestanswerforcancer.org

APRIL 30-MAY 3: NATIONAL ASSOCIATION FOR NUTRITION PROFESSIONALS 10TH ANNUAL CONFERENCE & EXPO in St. Paul, Minnesota. CEUs for NDs and nutrionists. CONTACT: www.nanp.org/conference/

MAY 1-3: 59TH ANNUAL NORTHWEST NATUROPATHIC PHYSICIANS CONVENTION – Wisdom of our Elders in SeaTac, Washington. CONTACT: www.nwnpc.com/

MAY 4-6: 12TH ANNUAL NUTRITION & HEALTH CONFERENCE @ Arizona Center for Integrative Medicine in Phoenix, Arizona. CONTACT: nutritionandhealthconf.org/

MAY 6-9: 23RD ANNUAL WORLD CONGRESS ON ANTI-AGING MEDICINE in Hollywood, Florida. CONTACT: www.a4m.com/anti-aging-conference-2015-hollywood.html

MAY 8-10: ICMART XVII WORLD CONGRESS ON MEDICAL ACUPUNCTURE in Bali, Indonesia. CONTACT: www.icmart.org/files/flyer_icmart2015_1.pdf

MAY 8-10: JOINT AMERICAN HOMEOPATHIC CONFERENCE in Philadelphia, Pennsylvania. CONTACT: www.homeopathycenter.org/2015-joint-american-homeopathic-conference/

MAY 13-15: 10th INTERNATIONAL CONGRESS ON COMPLEMENTARY MEDICINE RESEARCH in Jeju, Korea. CONTACT: www.iccmr2015.org/

MAY 28-30: INSTITUTE FOR FUNCTIONAL MEDICINE ANNUAL CONFERENCE in Austin, Texas. CONTACT: https://www.functionalmedicine.org/conference.aspx?id=2858&cid=35&section=t433

JUNE 5-7: HOMEOPATHY RESEARCH INSTITUTE 2015 CONFERENCE – Cutting Edge Research in Homeopathy in Rome, Italy. CONTACT: www.HRIRome2015.org

JUNE 25-26: SopMED (Society of Oxidative and Photonic Medicine) INAUGURAL TRAINING AND CONFERENCE in Salt Lake City, Utah. Ozone/UBI training and business workshops. Limited enrollment. CONTACT: 517-202-5959; www.sopmed.org; info@sopmed.org

JUNE 25-28: HEALTH FUSION- CANADIAN ASSOCIATION OF NATUROPATHIC DOCTORS NATIONAL CONFERENCE in Calvary, Alberta, Canada. CONTACT: ndnr.com/

AUGUST 3-5: 3RD INTERNATIONAL CONFERENCE & EXHIBITION ON TRADITIONAL AND ALTERNATIVE MEDICINE in Birmingham, United Kingdom. CONTACT: traditionalmedicine.conferenceseries.com/

AUGUST 5-8: AMERICAN ASSOCIATION OF NATUROPATHIC PHYSICIANS 30TH ANNIVERSARY CONFERENCE in Oakland, California. CONTACT: www.naturopathic.org/aanp2015

AUGUST 21-23: 21ST ANNUAL INTERNATIONAL INTEGRATIVE MEDICINE CONFERENCE Melbourne, Australia. CONTACT: https://www.aima.net.au/21st-annual-international-integrative-medicine-conference/

AUGUST 28-30: NATURAL ADDICTION CONFERENCE in Myrtle Beach, South Carolina. CONTACT: Sharon Phillips, 954-540-1896; Sharon@fmi-marketing.com

SEPTEMBER 17-20: AMERICAN ACADEMY OF PAIN MANAGEMENT 26TH ANNUAL CLINICAL MEETING in Washington, D.C. CONTACT: www.aapainmanage.org/annual-clinical-meeting/

SEPTEMBER 25-27: 3rd ANNUAL LIFESTYLE MEDICINE SUMMIT in Phoenix, Arizona. CONTACT: https://www.metagenics.com/events/2015_lifestyle_medicine_summit

SEPTEMBER 26-27: WORLD FEDERATION OF ACUPUNCTURE-MOXIBUSTION SOCIETIES INTERNATIONAL CONFERENCE in Toronto, Ontario, Canada. CONTACT: wfastoronto2015.com/

OCTOBER 1-4: 13TH ANNUAL RESTORATIVE MEDICINE CONFERENCE in Blaine, Washington. CONTACT: restorativemedicine.org/conference/2015/

OCTOBER 23-24: CONCORDIA 2015 in Santa Barbara, California. CONTACT: www.physicaenergetics.com/index.php?target=pages&page_id=annualconferences

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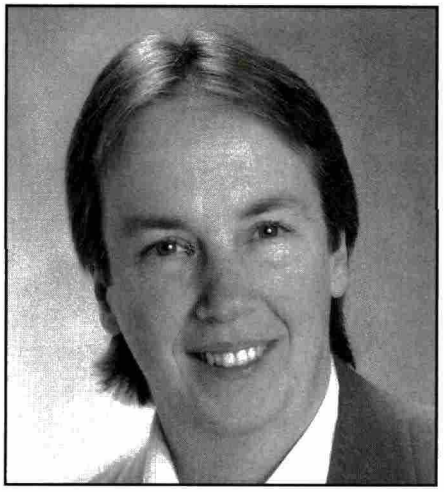

Women's Health Update

by Tori Hudson, ND
womanstime@aol.com

Important Evaluations in Women's Health

The Need for the Routine Pelvic Exam

In early July 2014, the American College of Physicians (ACP) issued guidelines advising against bimanual pelvic exams and speculum exams for the detection of pathological conditions in asymptomatic adult women who are not pregnant. The ACP reviewed the evidence and concluded that the routine pelvic examination is not useful in screening for malignancies other than cervical cancer, and can lead to unnecessary evaluation and surgery, while also often causing discomfort and embarrassment and even actually deterring some women from seeking gynecological care. Their recommendations are summarized as follows:

- Routine pelvic exam is not recommended in asymptomatic nonpregnant adult women.
- This recommendation does not apply to the timing and need for cervical cancer screening.
- The cervical cancer screening tests – Pap smears, liquid-based Paps, and/or human papillomavirus (HPV) testing – should include a vaginal speculum exam while visualizing the cervix and collection of samples, but does not need to include bimanual examination.
- Screening for chlamydia and gonorrhea can be done with urine tests or vaginal swabs.

The advisory from ACP has generated significant conversation, editorials, and commentary, particularly from ob/gyns. If you haven't already noticed amongst your patient population, many women have heard these news reports, assume that they are well accepted, and thus no longer seek annual pelvic exams. With the changes in Pap smear/HPV testing frequency, these ACP recommendations on annual pelvic exams, and the controversies on frequency of screening mammography, many women will conclude that they no longer need to see a physician annually for routine screening and health care. The ACP guidelines are thought by many to now add one more barrier to providing appropriate preventive health care to adult women.

In attempting to understand the pros and cons of these guidelines, it is important to look at the details of the study. This study was a literature review conducted by the Minneapolis Veterans Affairs Health Care System's Evidenced-based Synthesis Program Center. The authors were looking to assess the accuracy, benefits, and harms of screening pelvic exams; they defined a pelvic exam as a combination of speculum and bimanual exam, not including screening for HPV or cervical dysplasias/cervical cancer.

A Medline search was conducted for relevant articles published from 1946 to 2014. Their findings caused them to strongly recommend "against performing screening pelvic exams in asymptomatic, non-pregnant, adult women." The recommendations were based on moderate-quality evidence. In addition, they defined potential harm as unnecessary laparoscopies or laparotomies, fear, embarrassment, anxiety, pain or discomfort, and avoidance of necessary care. Due to the "moderate-quality evidence," some studious critics point out that this study was not a comprehensive data-analysis with strong statistical support. In this Medline search, the authors focused on ovarian cancer and bacterial vaginosis due to the fact that these were the only conditions that had sufficient published data from which to draw some of their conclusions. This resulted in not addressing and analyzing the numerous other reasons that we carry out bimanual exams; for example, detection of myomas, urinary incontinence, pelvic floor support or lack thereof, cervical polyps, vaginal wall growths, and adnexal pain and masses with the potential of indicating pelvic inflammatory disease, endometriosis, and ovarian cysts. Unfortunately, and admitted by the study authors, no studies actually directly assess the value of pelvic exams for any of these conditions. In addition, no studies have evaluated the potential benefit of annual pelvic exams in asymptomatic women on morbidity and mortality related to

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nonovarian and noncervical cancer. Another lacking area of published studies is the potential benefit of annual pelvic exams as the reason why women obtain care and then might thus receive other access to health-care services, including contraception, screening for sexually transmitted infections, and the vast array of nongynecological health-care needs that women have. In addition, no studies address the potential harms such as false reassurance, overdiagnosis, overtreatment, and harms related to diagnostic procedures. This was a particularly odd admission on the part of the authors in that these were the reasons that they actually recommended against routine pelvic examinations. While the authors concluded that current evidence shows that harms outweigh benefits associated with screening pelvic exams, the studies examining pain, embarrassment, and fear are of low quality.

Comment: As a naturopathic physician women's health practitioner, I think that these recommendations from the ACP are worrisome for women, and so does the American College of Obstetricians and Gynecologists (ACOG), which in 2012 reaffirmed that the speculum and bimanual examination is a part of annual well-women visits in women aged 21 years and older; that is what I practice as well.

Routine annual pelvic exams (yes, still annually, even when it is not the year to collect the Pap smear), including visualizing the external genitalia, inserting the speculum and visualizing the cervix and vaginal walls, and a bimanual exam provide a wealth of important information even in women who do not have any symptoms as stated above. Many women have bacterial vaginosis or some other vaginal or cervical infection; severe vulvovaginal atrophy; pelvic floor problems, including urinary incontinence; cervical polyps; vaginal wall cysts and growths; uterine fibroids; adnexal/ovarian enlargement for noncancerous reasons; and/or vulvar skin disorders. Any of these can occur without symptoms, and the only way that we would know it is if the full exam is performed. The asymptomatic woman is indeed the woman who might benefit most from the routine annual pelvic exam. It has been hard enough to communicate to women the need for continued annual exams (which also include height, weight, blood pressure, temperature, pulse, breast exam, thyroid exam, heart/lung/abdominal exam, and more) even when they don't need a Pap smear or HPV test that year. Too many women have ceased seeing their health-care providers every year and only come every 3 years after they reach the age at which they no longer need an annual Pap smear.

In addition, as a naturopathic physician, I use the annual visit to check in on nutrition, alcohol, nicotine, recreational and prescription drugs, stressors, exercise, sleep, dietary supplements, other health issues, changes in their health including weight gain or weight loss, an eye toward prevention of diseases based on family history, aging, habits, and select routines or specific testing.

With these ACP recommendations (which I will ignore), I am certain that we can predict that even fewer women will seek annual visits with their health-care providers. I will encourage my patients to seek annual visits and be clear in communicating the value of each exam and each test if/when needed; and then as a result of that discussion, they can of course choose their course of action.

Bloomfield H et al. Screening pelvic examinations in asymptomatic, average-risk adult women: An evidence report or a clinical practice guideline from the American College of Physicians. *Ann Intern Med*. 2014 Jul 1;161:46

Lockwood C. Whither the bimanual examination? *Contemp Ob Gyn*. 2014;5–8.

Waseem A, Humphrey L, Harris R, Starkey M, Denberg T. Clinical Guidelines Committee of the American College of Physicians. Screening pelvic examination in adult women: a clinical practice guideline from the American College of Physicians. *Ann Intern Med*. 2014;161(1):67–72.

Chronic Insomnia Evaluation

The etiologies for problematic sleep include primary sleep disorders such as sleep apnea, insomnia, and restless

leg syndrome; midlife and aging; hormonal changes of perimenopause; medical conditions such as depression, thyroid disease, anxiety, gastroesophageal reflux, arthritis, lung disease, cancer and more; medications such as decongestants, weight-loss products, some antidepressants, blood pressure medications, steroids and diuretics; caffeine, nicotine, and alcohol; travel or work schedules; stressors; and poor sleep habits.

Determining the chief sleep symptom is the first step in the evaluation process of insomnia. The main symptoms of the insomnia may be difficulty in falling asleep, early awakening, and/or frequent nighttime awakenings. A sleep diary can be useful in identifying the sleep problems. The diary should indicate bedtimes; awakening times; timing and quantity of meals; use of alcohol, caffeine, drugs, and medications; exercise and its timing; duration of sleep; and rating of sleep quality (bed partners may help by reporting snoring). The diary should be kept daily for at least several weeks or even months in order to properly assess sleep patterns.

Specific testing might also be appropriate. Examples would include a polysomnogram, thyroid testing, ferritin (a value less than 50 might be relevant), CBC (for restless leg syndrome), endoscopy, joint imaging, and pulmonary function testing and/or chest imaging. For women of perimenopausal or menopausal age, other laboratory tests to consider, but not as a given, include follicle stimulating hormone (FSH; if menses are irregular and you are not sure of the etiology), or even serum progesterone if perimenopause is not otherwise evident from symptoms. One might also consider testing for vitamin D and MTHFR defects, which can be correlated with depression and insomnia. Progressive naturopathic testing might also include a four-point salivary cortisol test to determine cortisol dysregulation, and assessing neurochemistry with analysis of urinary neurotransmitters or their metabolites.

Ancoli-Israel S et al. Insomnia in special populations: effects of aging, menopause, chronic pain, and depression. *Postgrad Med*. 2004 Dec;116(6 Suppl Insomnia):33–47.

Kravitz HM. Sleep disturbance during the menopausal transition in a multi-ethnic community sample of women. *Sleep*. 2008 Jul;31(7):979–990.

Pavlova M, Sheikh LS. Sleep in women. *Semin Neurol*. 2011 Sep;31(4):397–403. doi:10.1055/s-0031-1293539.

Dr. Tori Hudson graduated from the National College of Naturopathic Medicine (NCNM) in 1984 and has served the college in many capacities over the last 28 years. She is currently a clinical professor at NCNM and Bastyr University; has been in practice for over 28 years; and is the medical director of the clinic A Woman's Time in Portland, Oregon, and director of research and development for Vitanica, a supplement company for women. She is also a nationally recognized author, speaker, educator, researcher, and clinician.

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Looking for a soy free, gluten free krill oil that even the pickiest patients will love? DaVinci Laboratories' newest formula, Krill+ with SUPERCRITICAL FISH OIL and Supercritical extracted Astaxanthin, is the clear choice. Krill+ features higher levels of phospholipids, DHA, EPA, astaxanthin, and specified omega-3s, and is IFOS and IKOS certified. Third-party accreditation, comprehensive cardiovascular, joint and cognitive support – and a new, improved formula make this our best Krill ever.*

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

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Essential Formulas' New State-of-the-Art Interactive Booth Proved a Sensation at Expo EAST 2014

Essential Formulas Incorporated (EFI), the company with the foresight to introduce Dr. Ohhira's Probiotics to the US 15 years ago, is now raising industry standards with the introduction of a technologically advanced trade show booth enhanced in both design and function.

The interactive booth is a first for marketing and design company, Skyline Sector 5, known for producing innovative and creative experimental trade show environments. The sophisticated display serves as a custom, interactive, radio-frequency identification (RFID) module. "The extremely advanced technology assures the execution is seamless, while conveying an almost 'magical' quality," said Chelsea Byers, exhibit designer.

The booth design consists of large kiosks branded with the three Essential Formulas lines, Dr. Ohhira's Probiotic Supplements, Dr. Ohhira's Skin Care, and CHIA Omega Formulations. Each kiosk is a glowing cube housing products along with interactive countertops and a video display. Placing a product on the countertop logo instructs the video screen to present pertinent information on the specific formulation.

"EFI is a company built on the philosophy of exceptional customer care in the use and efficacy of our products," said William Schoor, executive vice president at EFI. "This progressive booth design serves as another dynamic tool in which we can showcase our products and educate our retailers, all of whom enthusiastically embraced the remarkable design and technology."

EFI also hosted Muneaki Takahata, PhD, and Ross Pelton, RPh, CNN, at the booth's inaugural presentation, where they were available to answer questions and discuss the science and research behind EFI's respected formulations. Takahata, a microbiologist and Dr. Ohhira's protégé, traveled from Okayama, Japan. Pelton, a respected natural health practitioner and author, was recently appointed EFI's scientific director.

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New Clinical Research: Nutrient Supplement Enhances Natural Killer Cell Function*

New research shows that the nutritional supplement Transfer Factor Multi-Immune (Researched Nutritionals, Los Olivos, California) increased natural killer (NK) cell function by a median of 247% in immune-compromised patients.

The study, conducted at the Tustin Longevity Center on previously diagnosed chronic fatigue syndrome and fibromyalgia patients, utilized ViraCor-IBT Laboratories' Natural Killer Cell Functional Assay to measure the immune impact of this protocol. NK cells protect against and target tumor cells and a wide variety of infectious microbes, particularly virus-infected cells. NK cell counts in the high normal range are beneficial for long-term health. Studies have found that those with genetic polymorphisms (classical type) that result in deficient NK cells have increased incidence of some cancers and greater susceptibility to herpes family viral infections (EBV, CMV, HPV, HSV). Furthermore, some preliminary cancer therapies exploit NK cells to decrease tumor size and improve survival.[1] NK cell deficiency is a consistent finding in ME/CFS patients.

Notes

1. Campbell KS, Hasegawa J. Natural killer cell biology: an update and future directions. *J Allergy Clin Immunol.* 2013;132(3):536–544. Epub 2013 Jul 30.1.

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

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Rejuvila Introduces Youth Protect with Setria Glutathione

Rejuvila has created a trifecta of free-radical defense with Youth Protect. A combination of Setria glutathione, GliSODin SOD – a free radical fighter – and organic kale and watercress, Youth Protect is designed to promote healthy aging.*

As the body ages, its stores of antioxidant defenses naturally decline. Eating, exercising, and even breathing create free radicals, imbalanced molecules that attack at the cellular level. This constant siege can affect overall health and wellness – and how quickly a person ages. Antioxidants, such as those found in Youth Protect, are vital to getting the body back in balance.*

Setria glutathione** – a brand of glutathione, nature's "master antioxidant" – replenishes the body's stores while also protecting cells from oxidative stress and harmful toxins. Setria glutathione has also been shown to extend the life of other antioxidants in the body, such as vitamins E and C. GliSODin SOD has been shown to be the only oral product to effectively deliver SOD (superoxide dismutase orgotein) as it is bound with gluten-free gliadin from wheat that protects the inherently fragile SOD molecule from stomach acids. Together with the kale and watercress in Youth Protect, the ingredients create a powerful protector as we age.*

"Both kale and watercress are high in sulfur, a precursor to glutathione, which helps boost the effect of Setria Glutathione,"* said Myra Michelle Mesko Eby, Rejuvila chief executive officer. "These plants also contain gluconasturtin, which has been shown to inhibit carcinogens*, as well as valuable nutrients such as vitamin A, vitamin C, and calcium."

For more information about Rejuvila Youth Protect, visit http://nutristore.myshopify.com/collections/all/products/youth-protect.

Notes

1. Richie JP Jr, Nichenametla S, Neidig W, et al. Randomized controlled trial of oral glutathione supplementation on body stores of glutathione. *Eur J Nutr.* May 2014. doi:10.1007/s00394-014-0706-z

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

** Setria is a registered trademark of Kyowa Hakko Bio Co. Ltd.

About Rejuvila

At Rejuvila, we believe in the human body and have tremendous respect for the complex processes that it needs to perform each day – and we try to support our bodies in the best possible way. As business leaders, athletes, passionate family members, and stewards of the land, we know that staying healthy is key. We live in an age where everyone is overextended and striking a balanced life is challenging. We've created formulas for vibrant aging. Formulas with purpose that support the body and promote optimal living. Formulas that give the body the respect it deserves. Formulas for us. Formulas for you. Choices that we make today affect tomorrow.

We source the best ingredients, always non-GMO, from suppliers who are industry leaders in pure, potent, and unadulterated raw materials. *Quality* isn't a word that we toss around lightly; our mothers, fathers, sisters, brothers, husbands, partners, and children are taking these formulas as well. We inspect and analyze every batch to confirm identity and bioactive constituents. All of our ingredients are third-party tested to ensure the absence of heavy metal toxicity, chemical contaminants, and pesticides, as well as salmonella, *E. coli*, mold, yeast, and additional microbial contaminants. We use only clinically researched, efficacious dosing. All of our products are produced at a top-of-the-line GMP, FDA-approved and QAI Organic Certified facility.

For more information, visit www.rejuvila.com.

About Setria Glutathione

Setria glutathione, manufactured by Kyowa Hakko USA, is a clinically studied form of glutathione that, when taken orally, has been shown to replenish the body's reserves, which may be depleted as a result of poor lifestyle choices, stress, or natural aging.[1] Called the "master antioxidant," glutathione helps protect cells in the body from the damaging effects of oxidative stress and toxins. Setria glutathione is manufactured through a patented fermentation and patent pending for increasing natural killer (NK) cell activity, is pure, vegetarian, and allergen free. For more information about Setria glutathione, visit www.setriaglutathione.com.

About Kyowa Hakko USA

Kyowa Hakko USA is the North American sales office for Kyowa Hakko Bio Co. Ltd., an international health ingredients manufacturer and world leader in the development, manufacturing, and marketing of pharmaceuticals, nutraceuticals, and food products. Kyowa is the maker of branded ingredients including Cognizin Citicoline, Lumistor L-Hydroxyproline, Pantesin Pantethine, and Setria Glutathione, as well as Sustamine L-Alanyl-L-Glutamine. For more information, visit http://www.kyowa-usa.com.

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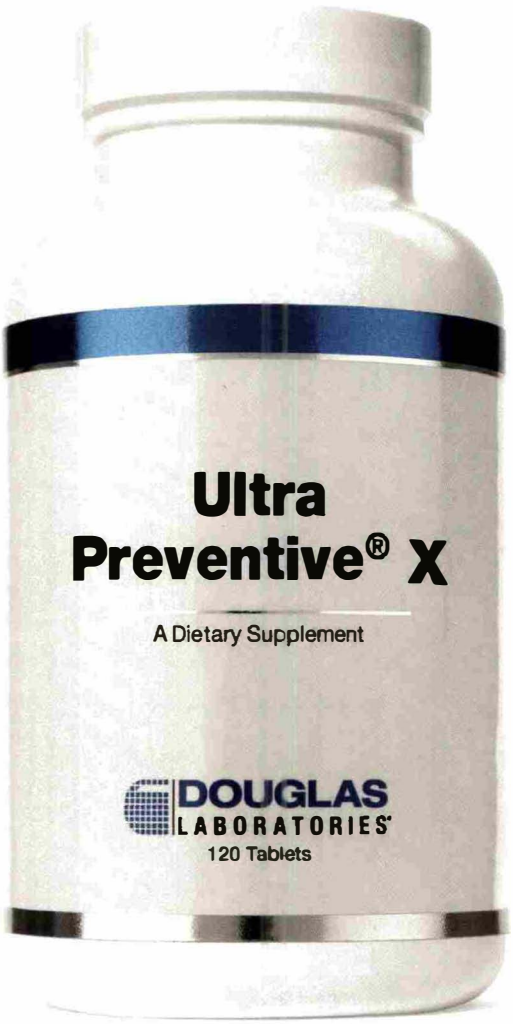

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