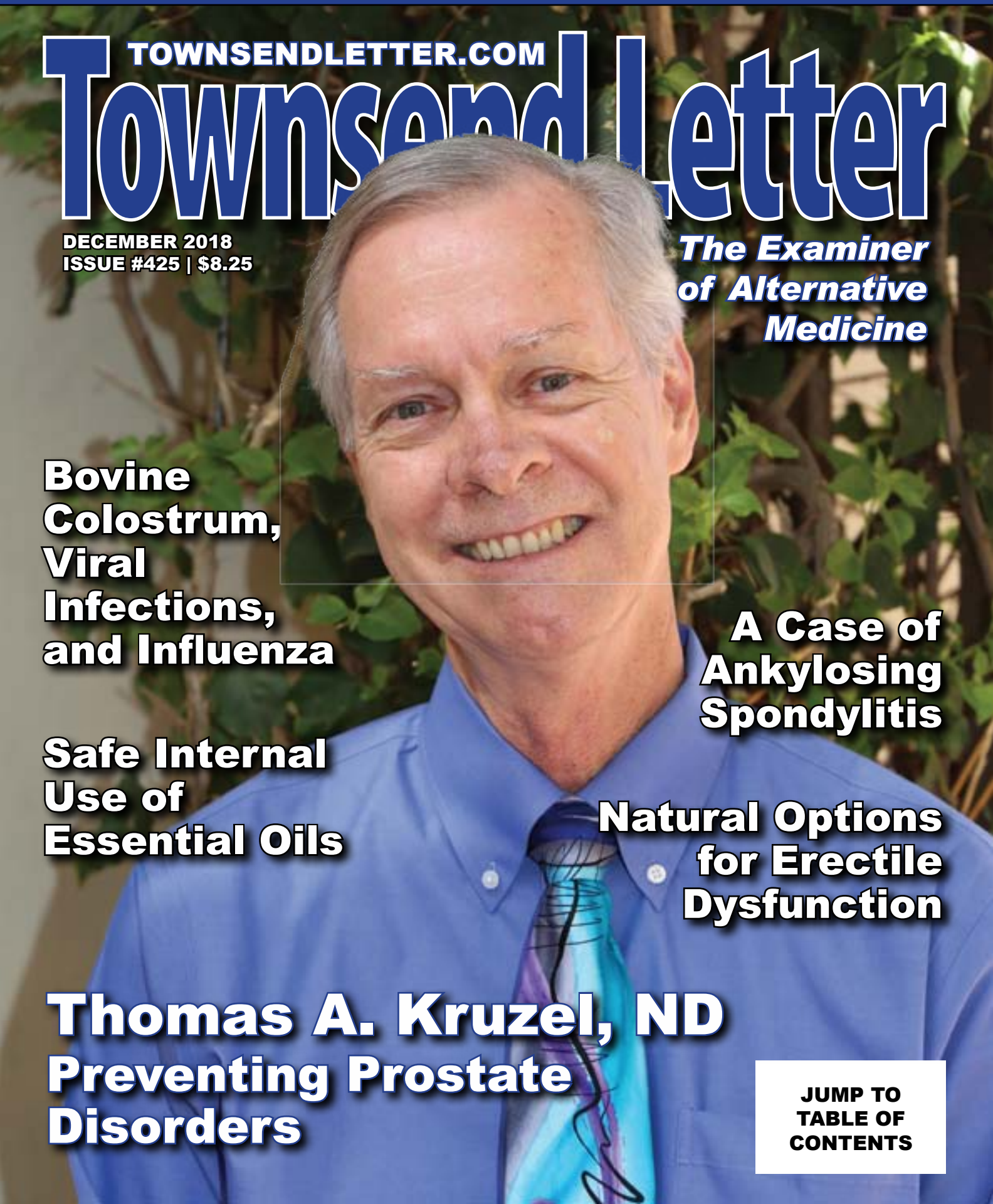
Alternative Medicine & Men's Health



TOWNSENDLETTER.COM

Townsend Letter

DECEMBER 2018
ISSUE #425 | $8.25

The Examiner of Alternative Medicine

Bovine Colostrum, Viral Infections, and Influenza

A Case of Ankylosing Spondylitis

Safe Internal Use of Essential Oils

Natural Options for Erectile Dysfunction

Thomas A. Kruzel, ND

Preventing Prostate Disorders

JUMP TO TABLE OF CONTENTS

Thank you for purchasing this issue of *TOWNSEND LETTER*

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

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

Please don't overlook our advertisers, without their support *Townsend Letter* would not exist. Take the time to discover companies you might not be familiar with, many of whom offer special pricing for *Townsend Letter* subscribers. An advertiser list is printed on page 14 with clickable page numbers that will take you directly to their ad(s).

Subscription Rates and Options

Prices valid through 12/31/2020

Name _____ Email/Phone _____

Address _____

City/State/Zip _____

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

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

Signature _____

Click here to subscribe online

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

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

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

E-Edition Single Issue: $15.00

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

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

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

A4M | MMI

SPRING CONGRESS 2019

MAY 17 – 18th

Pre-Conference MAY 16th

Join us on our journey... Gaylord Palms **Orlando, FL 2019**

We are moving back to Orlando for our **2019 Spring Congress**, taking place at the Gaylord Palms Resort & Convention Center.

We consider this change in location to be an **official upgrade**, given that we **outgrew the last venue** & continue to **expand**, and are excited to further our commitment to **change**, **progress**, and **opening new doors**.

"Life is a journey, not a destination."

—Ralph Waldo Emerson

REGISTER NOW AND SAVE

$100

Use coupon code **townsend19**

Our first keynote presenter

Julielynn Wong, MD, MPH

Technology in the Battle of Addiction.

Our first keynote presenter is **Julielynn Wong**: Harvard-educated physician-scientist, innovator, and educator, whose lifelong pursuit involves the application of cutting-edge, disruptive technology to ultimately greater benefit the world, and whose keynote will address **"Technology in the Battle of Addiction."** Internationally recognized as a global pioneer in digital health, Dr. Wong's work encompasses diverse environments including the solar system & outer space, and remote communities with limited access to healthcare resources.

Touching upon the overarching themes of **empowerment, self-growth**, and **introspective discovery**, this **Spring Congress** returns to our root cause & mission statement—to redefine medicine, and disseminate education surrounding comprehensive, customized healthcare.

Through the annual **Spring Congress** events, our attendees emerged armed with **increased education**, **enhanced insight**, and the **requisite tools** needed to **advance & progress** in the changing field of integrative healthcare. As Dr. Daniel Amen aptly stated at the outset of last year's presentation: "When I attend the American Psychiatry Association, I feel like an outsider. When I come to A4M, I feel like I'm with family."

561.997.0112 | **www.a4m.com**

REGISTER NOW

The First and Only CBD Formula Produced Exclusively for Doctors.

*Douglas Laboratories® is a registered trademark of Atrium Innovations, Inc. and not affiliated with TruGen3®
† This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

Personalized labeling available

- The only hemp oil product in the professional channel lab-tested using ICH standards that support and validate two-year shelf life.
- Exclusive VESIsorb® Technology provides up to 6x more CBD hemp oil bioavailability †
- Solvent-free SMB chromatography extraction for undetectable THC levels (unlike lipid-based and other extraction methods used in substandard CBD products that retain THC).
- 25mg of CBD & 6mg of beta-caryophyllene

Your Patients Deserve the Best.

TruEase® is truly today's best-in-class CBD product for discriminating Health Care Professionals. A TruGen3® exclusive, TruEase® delivers an ideal concentration of CBD, enabling bioactives like betacaryophyllene (BCP) to deliver synergistic interaction between phytocannabinoids and terpenes. This superior ratio of 4:1 (CBD:BCP) supports each other's function perfectly as BCP is directly linked to activating CBD in the body via CB2 receptors. (Beware inferior CBD products with zero levels of BCP and low-potency hemp oil (as little as 5% CBD, compared to 60% found in TruEase®).

TruGen3® continues Douglas Laboratories' family legacy, with our third generation and more than half-century of nutraceutical experience. All TruGen3 products are produced under the highest ethical standards and available only through Health Care Professionals.

Contact us today for FREE SAMPLES and to find out how you can put our innovative, one-of-a-kind products to work for your patients, and your practice, today.

Seeing is Believing

See for Yourself at www.trugen3.com/vesisorb

Patented VESIsorb® technology is clinically proven to provide up to 6X more bioavailability via multiple PK studies measured in human subjects.†

Competing Softgel

Formula does not go into solution; note separation of ingredients.

VESIsorb® Softgel

100% in solution; completely homogenous colloidal solution for optimal absorption.

TruGen3®

Three Generations of Truth in Nutrition

www.trugen3.com 1-844-387-8436

NutriClear® *Plus*

Clearly a superior cleanse program.

NutriClear® *Plus*
15-Day Metabolic Cleanse Program

NutriClear® Plus is a science-based metabolic cleanse program that supports the body's detoxification processes. By supplying key nutrients in a delicious-tasting powder, **NutriClear® Plus** provides the ideal nutritional foundation for those in need of metabolic clearing, while also supporting hepatic function, energy production and intestinal balance. This powerful combination of micronutrients, **NitroGreens®**, fiber, fruit and vegetable extracts supports safe and effective detoxification to start you on a path of lifelong health.

Kit Includes:

- 30 Drink Mix Pouches
- 30 Supplement Packets
- Program Guidebook
- Biotics Research Shaker Cup

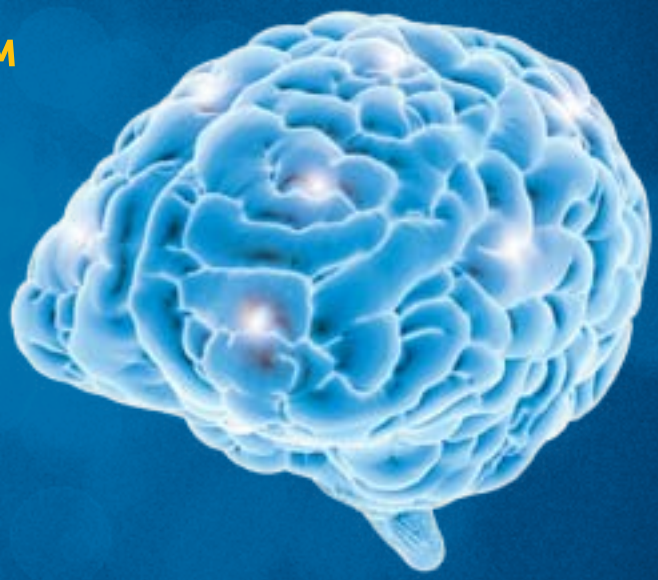
BIOTICS® RESEARCH CORPORATION

800-231-5777 • www.bioticsresearch.com

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.

BDNF Essentials™

Promote Healthy Brain Function



New research demonstrates the adult brain is capable of reorganizing its neural network by forming new connections —— and this is known as neuroplasticity. Neuroplasticity means the brain continues to generate new neurons & synapses throughout life, helping the brain heal from injuries.

KEY ACTIVITIES TO INCREASING NEUROPLASTICITY INCLUDE:

- ✓ Physical Exercise
- ✓ Learning New Skills
- ✓ Increase BDNF (Brain Derived Neurotrophic Factor)
- ✓ Good Nutrition
- ✓ Sleep
- ✓ Intermittent Fasting

Brain Derived Neurotrophic Factor (BDNF) is one of the key proteins that promote the survival, development and function of neurons. BDNF promotes neuroplasticity, the repair and generation of new neurons as well as supporting healthy telomerase activity.

BDNF ESSENTIALS™, formulated to promote healthy BDNF levels, neuroplasticity and healthy cytokine function, includes the following researched-based nutrients:

- ✓ **NeuroCyto Protect™ Blend:**
  Lions Mane Mushroom, Skullcap, Bilberry, Bacopa, Ashwagandha
- ✓ **Cognition Blend:**
  CDP Choline, Phosphatidylserine

Joseph Burrascano Jr., MD

"I am impressed with the formula of BDNF Essentials™ - it has all the things I look for when recommending this type of product."

Researched Nutritionals®
solutions for life

+1.800.755.3402

Tel: 805.693.1802 • Fax: 805.693.1806 • CustomerService@ResearchedNutritionals.com
www.ResearchedNutritionals.com | *Available only through healthcare professionals*

From the Publisher

There's More to Termites Than Damage to Your House

We're all concerned when we discover that termites have been busy destroying the framework – but of 2600 termite species, only some 28 play havoc in our domiciles. The non-invasive termites are crucial for preventing soil from becoming arid as well as digesting decomposing dead plant matter among their many other functions. The September 17th, 2018 issue of *The New Yorker* ran a fascinating article by Amia Srinivasan, "What Termites Can Teach Us." It's always a shocker to realize how an organism that is so seemingly simple is actually very complex; its biology, genetics, microbiology, physiology, and behavior is actively being studied by biologists, chemists, neurophysiologists, computer programmers, physicists, engineers, and architects. The complexity of the termite's digestive process may offer us some clues about how our digestive process dysfunctions.

continued on page 6 ➤

Keep the Lungs Clear This Winter and Beyond*

Fuco-Immune

with Immuno-LP20® & Maritech® Synergy Fucoidan

Item #77150 • 30 vegetarian capsules

Maritech® is a registered trademark of Marinova Pty Ltd Australia.

Immuno-LP20® is a registered trademark of House Foods Group Inc.

- Contains Maritech® Synergy, a fucoidan seaweed extract, and *Lactobacillus plantarum* L-137 (Immuno-LP20®), a stable, heat-treated immunobiotic*
- Supports healthy respiratory function, healthy gut lining and immunity, and antioxidant activity*
- Maritech® Synergy has been shown to increase T-cells and activity of monocytes and granulocytes*
- Immuno-LP20® has been shown in human clinical trials to significantly support respiratory function and shorten recovery time from respiratory immune challenges*

Essential-Biotic™ CHILDREN'S

Pediatric Probiotic UABla-12™ & DDS®-1

Item #77320 • 60 cherry chewable tablets

- Provides two safe, well-studied human strains of probiotics*
- The unique combination of *Bifido-bacterium lactis* UABla-12™ and *Lactobacillus acidophilus* DDS®-1 has been shown to support upper respiratory health and healthy skin in children ages 1 to 12 years*
- In children, UABla-12™ and DDS®-1 have been shown to reduce levels of opportunistic GI bacteria*
- Stable at room temperature, non-dairy, and gluten-free
- 5 billion CFUs per pleasant tasting cherry-flavored chewable tablet

DDS® and all UA-trademarks are trademarks of UAS Laboratories LLC and used under license.

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

AllergyResearchGroup®
Innovative Nutrition

800.545.9960
info@allergyresearchgroup.com
www.allergyresearchgroup.com

NSF GMP Registered

emerson QUALITY PROGRAM

natural partners

From the Publisher

➤ *continued from page 4*

Architectural marvels abound with termites. These creatures don't have brains or organs remotely like a brain. Yet somehow, they are able to construct fantastic cathedral-like structures with rooms and hallways, pillars and columns, staircases and more, but there is no blueprint and no central command. The sheer mass of termite mounds, some as high as 30 feet, overlying a colony one or two meters below, challenges our intelligence. And the mounds are not exhaust stacks; these structures are "lungs" exchanging, like our organs, oxygen and carbon dioxide for the million or more termites working below.

What enables an "unintelligent" insect anatomically related to the cockroach to be able to cooperatively create from mud balls and water such architecturally and physiologically advanced structures? There is no auditory communication. It has been suggested that saliva left on the mud ball provides some signaling for the next termite to act upon. There is some evidence that there may be some cellular intelligence enabling one termite to be a leader and another a follower. But when artificial intelligence scientists attempt to program their behavior as virtual termites, the critters can build only two dimensionally – there are no columns or rooms. A Harvard biophysicist amazed the scientific world in 2014 with the development of robotic termites named TERME. They imitated some of termite behavior but only in a very limited way and in a very simple, non-hostile environment. Termites modify their behavior in nature when faced with obstacles, something TERME could never do. As you might imagine, the military is very interested in the development of termite-like robots and is funding such research.

Perhaps the most interesting aspect of termites, for us, is their gastrointestinal microbiology. Termites have perfected the digestion of plant matter. This is accomplished by microorganisms, 90% of which are only found in the termite's gut and nowhere else on earth. What this means is that it is extremely difficult to culture these organisms on a petri dish. Some of the bacteriology represents a complex community of diverse organisms. To answer what organisms occupy the termite's "gut," geneticists have been doing DNA analyses. The thought would be that if the genome could be laid out, perhaps one could genetically recreate organisms for an artificial termite-like digestive unit, one that could, perhaps, transform grass into "grassoline." However, despite innumerable efforts to create such a synthetic fuel, none has been forthcoming. It seems that termite bacteria aren't really sold on the idea that their job is to make fuel for humans.

Perhaps the key to understanding termites is not designing termite mechanical units but deciphering their cellular intelligence that enables them to digest plant matter and build complex but living architecture.

Essential Oils Use in Pain Management by Sarah LoBisco, ND

Of all the tools one may employ in integrative medicine, essential oils use is largely ignored and not prescribed. This

continued on page 8 ➤

Discover the Dr. Ohhira Difference!™

While many digestive health formulas only contain probiotics, **Dr. Ohhira's Probiotics**® contains all the pieces your patient's need for optimal health, digestion and immune support: **PRE**biotics, **PRO**biotics, and **POST**biotics.* Dr. Ohhira's award-winning, professional strength formula is **fermented for five years** which results in a truly unique probiotic supplement with three advanced components:

PREbiotics—fermented fruits & vegetables that cultivate the existing good bacteria in the gut*

PRObiotics—numerous strains of living probiotics including *Bifidobacterium* and *Lactobacillus* that promote healthy digestion and immune response*

POSTbiotics—amino acids, vitamins, minerals, and natural organic acids that are produced by the fermentation process and are essential for whole health*

Help your patients Discover the Dr. Ohhira Difference!™

ESSENTIAL FORMULAS®
PROFESSIONAL

DISTRIBUTED BY emerson ECOLOGICS®

For More Information visit: www.essentialformulas.com/professionalformula • (972) 255-3918

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

From the Publisher

➤ *continued from page 6*

is a shame because they are easy-to-use, compatible with other integrative modalities, negligible in adverse effects, and inexpensive. However, adequate education in how to use essential oils is difficult as it is taught only briefly as an elective in naturopathic school and not taught at all in medical school. Essential oils are mixed in oils and creams used in massage therapy to relax stiffened muscles. The oils can be diffused to enable direct inhalation, a method frequently employed to support respiratory symptoms. However, essential oils have a wide range of applications that are supportive for immune, endocrine, gastrointestinal, and neurologic functioning that are not employed therapeutically by health professionals. Sarah LoBisco, a naturopathic physician, has dedicated much of her clinical and research work for the past decade to studying essential oils and their medicinal use. In November and December of 2016 she published a two-part "primer" about the use of essential oils in the *Townsend Letter*. We are pleased to publish another two-part article by Dr. Lobisco about the use of essential oils for treatment of digestive tract pain.

Part of the difficulty in using essential oils is determining whether the oil is of excellent quality or synthetic components have been added to the oil. Gas chromatography and mass spectrometry are perhaps the two most important analytic tools employed to ensure purity of the essential oil. Adulterated oils have occasionally caused major adverse effects that have unfortunately been reported as characteristic of all essential oils. LoBisco reviews her concerns for ensuring the use of a high-quality essential oil. More importantly she introduces us to appropriate use of essential oils for treating gastrointestinal pain. Her review of the literature is extensive; unfortunately, due to space limitations we will not be able to print the reference list (please refer to the website for the article with references.)

Fish Oil? Fuhgeddaboudit! by Jacob Schor, ND

There are certain principles in nutritional medicine that are rock solid, truths that we depend upon day-to-day. Avoid excess sugar and carbohydrates, exercise routinely, sleep well, reduce stress, and use fish oil supplementation. Fish oil is an important protectant in cardiovascular disease. It is touted to help in neurologic disease, reducing inflammation, and supporting mental health. In fact, we generally include omega-3 fish oils in most of our patient prescriptions. So how could it be that a Cochrane review of fish found that fish oil offered no benefit in preventing cardiovascular events or disease? Jacob Schor explains the research that upends our firm belief in omega-3 supplementation in his Curmudgeon's Corner.

continued on page 10 ➤

DNA CONNEXIONS

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

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

Visit link below to receive a free Patient Information brochure.

www.DNAConnexions.com/Townsend

From the Publisher

➤ *continued from page 8*

Integrative Oncology Conference Review by Michael Gerber, MD, HMD

One of the tools that integrative oncology practitioners have embraced in cancer care is the so-called "Greek Test." Dr. Ioannis Papasotiriou, MD, PhD, medical director of Research Genetic Cancer Centre and founder of Arzt Genetik Zentrum in Thessaloniki, Greece, has developed blood testing capable of measuring circulating tumor cells (CTCs) and cancer stem cells (CSCs). The advantage of such testing is that tumor progression can be assessed independently of imaging techniques and/or biopsies. Additionally, in those patients with elevated CTCs and CSCs, therapies can be tested to determine efficacy of treatment. Dr. Michael Gerber reviews the Greek test, Poly-MVA, cannabis, ketogenic diet, and Beljanski's cancer theory in his Monthly Miracles column.

Diseases of the Male Genital-Urinary Tract by Thomas Kruzel, ND

Perhaps the most important difference between conventional medical practice and naturopathic/integrative medicine is the former's focus on eradicating the bug and the latter's concern with restoring vitality to the organ tissue. Killing the bacteria enables a battle to be won, but the unhealthy terrain allows the war to persistently smolder with no victory or health. We can look at inflammation as the cause of illness, but it is an adaptive response the body employs to control an unwinnable infection, degeneration, or malignancy. Attending to the health of the terrain, a strategy that is foremost in naturopathic treatment, considers hormone imbalances, nutrient deficiencies, toxin buildup, dietary excesses, and energetic dysfunction, none of which are considered seriously by standard of care medicine. Our cover story for the December issue by Thomas Kruzel, ND, examines these issues of the male patient with genital-urinary tract disease.

Kruzel's review of the prostate considers acute and chronic prostatitis, benign prostate hypertrophy, prostate cancer, and proctalgia fugax, a functional anorectal disorder. We generally confine our thinking about prostate specific antigen (PSA) as a marker for the risk of developing prostate cancer. Kruzel points out that PSA's elevation may be due to non-cancer factors including inflammation from infection, post digital exam irritation, cystitis, injury from catheterization, and even high cholesterol levels. It is not uncommon when a patient has a high PSA to be asked to urgently see the urologist presumably to undergo a biopsy. Kruzel thinks one should always order a comprehensive lab screen to rule out and treat non-cancer inflammation and infection before doing surgery.

Jonathan Collin, MD

designs for health®

Bringing Sexy Back...

Whole Body Collagen

Restoring beauty from the inside out.

Collagen is the most abundant and most important protein in the human body, responsible for the building of skin, hair, joints, bone and muscle, Throughout the aging process we see a decline in the natural production of collagen, directly affecting how we look and feel.

Leading the charge to combat this natural process we bring you Whole Body Collagen, a unique product containing the patented collagen peptide blends FORTIGEL®, VERISOL® and FORTIBONE®. Most closely resembling human collagen, Whole Body Collagen is comprised of 100% bovine-sourced collagen. Backed by clinical research, these patented blends work together to support the health and integrity of skin, joints and bone.

- Offered in an unflavored/unsweetened powder
- Easy to blend; delivers more collagen into your patients' diets
- 100% beef collagen for ease of body's use
- Supports healthy skin, joints and bone

860 623 6314 catalog.designsforhealth.com/wholebodycollagen

Pathways to Healing

by Elaine Zablocki

Everyday Foods Boost the Immune System

Neal Malik, DrPH, MPH, RDN, CHES, ACSM-EP, is specially interested in sharing information about foods that boost the immune system. As a young man, he wasn't particularly interested in public health and nutrition, but today Malik is the chair of the Department of Nutrition and Basic Sciences at Bastyr University's San Diego campus.

Malik studied psychology in college, and worked in various positions after he graduated. "Then I got sick with a chronic disease. It was the worst and the best thing that ever happened to me," he recalls. "I went back to school for a master's in health education because I didn't want anyone else to go through what I had gone through. At that point, my main focus was to help others feel their best. When that's your goal, you naturally discover that you need to learn about nutrition."

We all want to have a strong immune system. When I began asking Malik about this subject, I learned that the immune system actually includes two different systems that need to communicate with each other. "The cell-mediated side of the immune system, which is based on white blood cells, acts quickly," Malik explains. "You have a white blood cell acting directly on a pathogen, so it's local and relatively quick."

In contrast, we look at the humoral aspect of the immune system. "In this situation, humoral refers to the total body, the whole body," Malik says. "In this aspect of the immune system, white blood cells work to create antibodies. That takes time, so it's slower acting, and you end up with antibodies that are present throughout the whole body."

Neal Malik, DrPH, MPH, RDN, CHES, ACSM-EP

Malik teaches his classes and patients about foods that support various aspects of the immune system. He likes to talk about ginger, which can be used in so many ways. We can add ginger to a stir fry, mix it into salad dressing, or simmer fresh ginger for a wonderful tea. "Ginger is by far my favorite plant-based food," Malik says. "I add it to so many dishes. When you don't use the whole root, it freezes quite nicely, so it's available when you need it again."

Ginger has antioxidant and anti-inflammatory effects. Several different ginger components have been studied, and the most potent is called [6]-shogaol. "If you use it as an extract, we're finding that about 3 grams per day is considered safe," Malik says. "It actually works on the communication aspect of the immune response. It helps the process stay in balance, so the immune system has an appropriate response, but not one that is exaggerated.

Cinnamon is another useful food. In the places where cinnamon grows, it has many traditional medicinal uses. A systematic review of research on cinnamon found that it has anti-oxidant, and antimicrobial properties. It seems to lower blood glucose, serum cholesterol and blood pressure, suggesting it has beneficial cardiovascular effects.

"Cinnamon contains essential oils that may help reduce the amount of time we spend getting over a cold or the flu," Malik says. He likes to sprinkle cinnamon onto a cup of black tea, or dust it on applesauce, or use cinnamon as an oatmeal topper. "Just be careful about using cinnamon sugar," he adds. "That isn't the same as pure cinnamon!"

Mushrooms have a long history of use in Oriental medicine, and modern research supports their effectiveness. A 2012 review of mushrooms in cancer treatment said they represent a growing segment of today's pharmaceutical industry, "owing to the plethora of useful bioactive compounds." A 2015 study of dried shiitake mushrooms found evidence suggesting that eating mushrooms lowers inflammation and boosts human immunity.

"Mushrooms seem to have similar effects in that they generally help with antibody production and that of course helps us fight off infection," Malik says. "There is also research suggesting mushrooms help increase the helpful proteins that are involved in cell signaling, thus improving

continued on page 14 ➤

Dry Mouth

NEW Improved Formula with **XYLITOL**

SalivaSure™ Fast relief for dry mouth that's safe, effective and convenient.

- Naturally increases saliva production
- Fresh citrus taste
- Prevents tooth decay
- No interaction with medications
- Safe for diabetics
- Available in convenient flip-top container

Available from major distributors such as *Threshold, Emerson Ecologics, McKesson Corp., and Super Natural.*

Ingredients:
- Xylitol • Citric Acid • Apple Acid
- Sodium Citrate Dihydrate
- Sodium Carboxy Methyl Cellulose
- Dibasic Calcium Phosphate
- Silica Colloidal • Magnesium Stearate
- Stearate Acid.

Scandinavian Formulas

Sellersville, PA 18960 • **P:** 215-453-2507 800-688-2276
F: 215-257-9781 • scandinavianformulas.com

Pathways to Healing

➤*continued from page 12*

communication between the humoral and cell-mediated aspects of the immune system.

"Certain mushrooms have been studied more often than others," Malik comments. One recent meta-analysis "Immune Modulation from Five Major Mushrooms," studied five mushrooms: Agaricus, Reishi, Caterpillar Mushroom, Turkey Tail, and Maitake. This article is available on the Internet, with graphics and charts that make it worth reading even for those of us who don't grasp all the technical details in a standard academic paper.

The authors note that mushrooms stimulate production of cytokines, the "small soluble proteins that act as intracellular mediators in an immune response." The article focuses primarily on cancer treatment, saying "mushrooms show great promise as adjunctive treatment used in conjunction with typical care for patients with cancer, as well as treatment to stimulate the immune response to cancer." They also note that "mushrooms that decrease inflammation may have the added benefit of decreasing fatigue, anxiety, and other symptoms by decreasing inflammatory cytokines.

At this point we don't really have data to tell us what quantity of mushrooms leads to what sort of beneficial effect. "I just recommend that you include mushrooms as part of your regular diet," Malik says. "We think about eating broccoli and carrots and cauliflower, but let's throw mushrooms in there, too. When I cook ground turkey I throw in some chopped mushrooms for texture." He recommends saving the oil or water used to hydrate or cook mushrooms, and incorporating the liquid into the dish.

Personalize Nutrition Advice to Meet Specific Needs

The US Department of Agriculture (USDA) has developed a website called Choose My Plate, offering guidelines for healthy eating patterns for most Americans. It's full of common-sense advice and uses a colorful graphic to show relative amounts of different food groups we should eat. As a practitioner, Malik finds he often needs to personalize nutrition information to meet each person's needs. "MyPlate is a great visual because it shows what your portions should look like. I often use it as a starting point, but then I modify it for each person," he says. "For someone with type 2 diabetes I might say the grain section could be a bit smaller, and you'll do best eating certain types of grain. For someone with a thyroid condition, I'd note that you don't want to consume too much soy or tofu because they could interfere with thyroid medication."

Offering nutritional advice is difficult because so many factors come into play. When we think about butter, for example, we need to ask whether the cow was raised in a pasture or a factory farm. "That will change the composition of the butter," Malik says. "When butter is stored out on the kitchen table, it can become highly oxidized, with the potential to cause cellular damage when it is eaten."

Malik's personal philosophy is to eat "whatever," but in moderation. "I do focus more on whole plant-based foods," he says. "Eating plant-based foods, consumed close to their original or whole state, that's a fairly safe bet."

Resources

Bastyr University (www.bastyr.edu/)
https://bastyr.edu/news/general-news-home-page/2015/09/nutrition-wellness-and-lasting-health-conversation-dr-neal-malik
Journal article, "Immune Modulation From Five Major Mushrooms,"
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4684115/
USDA Choose My Plate https://www.choosemyplate.gov/

Elaine Zablocki is the former editor of CHRF News Files.

◆

Tired of the Roller Coaster?

- ☑ Energy dragging?
- ☑ Sudden mood changes?
- ☑ Trouble concentrating?
- ☑ Sugar cravings?

Take control with SX-Fraction®

SX-Fraction® is a well-researched constituent found in the maitake mushroom that has been shown to support healthy blood sugar and insulin levels already within the normal range.*

Available through your health care professional, distributor or direct.

800-747-7418
Code TL518 – 20% Intro discount

MUSHROOM WISDOM®

emerson ECOLOGICS®

natural partners

SCIENCE COMPLEMENTING ANCIENT WISDOM

* 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.

BioDisrupt™

Triple Action Support

Mechanisms of Action

- Promoting a healthy extracellular matrix*
- Supporting ideal cellular communication*
- Reinforcing normal microbial balance*

BioDisrupt™ supports the healthy immune system's ability to target the sophisticated self-defense mechanisms of unwanted extracellular organisms. These organisms have developed a series of advanced mechanisms which allow them to evade immune detection. As part of this system, these organisms assemble into clusters, surround themselves with protective physical matrices and communicate among themselves.

Each 2 capsule serving contains:

- ✓ **EnzymeDisrupt™** - Lysozyme, Serratiopeptidase, Beta-glucanase, Lipase, Protease, Celllulase, Hemicellulase
- ✓ **HerbDisrupt™** - Cranberry fruit extract, Beberine, Rose-mary extract, Peppermint oil powder
- ✓ **N-acetyl cysteine**

Researched Nutritionals®
solutions for life

+1.800.755.3402

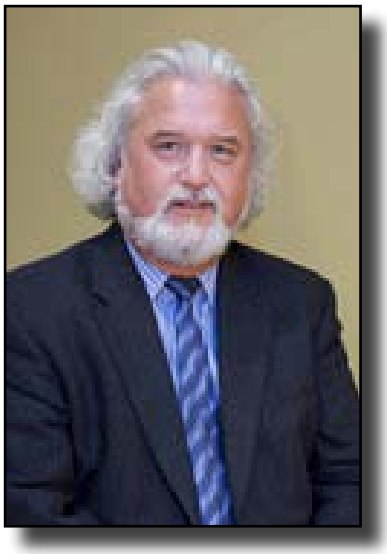
Tel: 805.693.1802 • Fax: 805.693.1806 • CustomerService@ResearchedNutritionals.com
www.ResearchedNutritionals.com | *Available only through healthcare professionals*

In this Issue

December 2018 | #425

Next issue:
Lab Testing & Diagnostics
Detox Protocols
Weight Management

ON THE COVER: Thomas A. Kruzel, ND, – Preventing Prostate Disorders (pg. 37); Bovine Colostrum, Viral Infections, and Influenza (pg. 25); Safe Internal Use of Essential Oils (pg. 56); Natural Options for Erectile Dysfunction (pg. 42); A Case of Ankylosing Spondylitis (pg. 51)



In Memoriam: Mark Gignac

Mark Gignac, ND, LAc, collapsed from a myocardial infarction on Monday September 10, two days after a weekend conference at the Tahoma Clinic hosted by Davis Lamson and the Naturopathic Oncology Council (NOC). He was not expected to survive but somehow rebounded amazingly well and was released from hospital a week later. Mark was doing well, walking about, though still feeling weak. Mark suffered a second MI on Thursday and died at home September 20, 2018.

It is with great sorrow that we share this news with you,

Mark was born June 13, 1957, the son of the late Norman and Elaine (nee Lachance) Gignac of Windsor, Ontario.

His formal education in natural medicine began with a seven-year tutelage under Alma R. Hutchens, author of *Indian Herbology of North America*. He went on to earn a degree in nutritional biochemistry from the University of Ottawa, graduated with a Bachelor of Science in 1987, and then completed one year of graduate studies in nutrition and human physiology before moving to Seattle to begin his study of naturopathic medicine at Bastyr University.

Mark graduated twice from Bastyr University, first in 1992 with a doctorate in naturopathy and again in 1996 with a master's degree in acupuncture.

While completing his studies at Bastyr, he worked for four and half years at Swedish Hospital as a phlebotomist and as a bone marrow biopsy assistant at Fred Hutchinson Cancer Research Center where he worked an additional two years.

He was among the first NDs hired by the Cancer Treatment Centers of America, and he helped to develop the model of care later adopted throughout the CTCA hospital system, leading to an explosion of oncology jobs and residencies for many of our colleagues.

Mark served as Director of Integrative Medicine at Seattle Cancer Treatment and Wellness Center (SCTWC) from 1998 to 2015. This was the first fully integrative oncology practice in the state of Washington and was affiliated with the Cancer Treatment Centers of America.

He worked collaboratively with many oncologists, but none more so than Dr. Nick Chen.

During the years at Seattle Cancer Treatment, Mark and Dr. Chen worked together on-site and in real-time providing integrative and innovative cancer treatment options to their mutual patients. Together, over a period of twenty years, they built a track record of remarkable successes in helping cancer patients thrive for years and even decades past their prognosis.

During those years SCTWC grew from a small operation and moved three times to ever larger facilities to make enough space for the growing number of patients. At their height, there were three MDs, three NDs, an acupuncturist, specialists in mind-body medicine, massage, nurse practitioners, and half a dozen oncology-certified nurses on staff plus assorted support staff. Mark worked at SCTWC until 2015 when CTCA closed the clinic. For the last three and a half years, he worked at the Seattle Integrative Cancer Center, a clinic he opened with Dr. Chen.

Mark was a generous teacher and had a multitude of preceptor students, many of whom later went on to pursue careers in naturopathic oncology. He was an active member of the Oncology Association of Naturopathic Physicians (ONCANP). Mark was one of the first to take the board examinations. In early 2006 he became one of only two naturopathic doctors to be qualified as Fellows of the American Board of Naturopathic Oncology (FABNO) and use the term naturopathic oncologist.

One of Mark's amazing gifts was the ability to blend a deep understanding of biochemistry and physiology with an equally deep understanding of mind-body medicine. He frequently taught us new ways of looking at cases and ways to use the tools of naturopathic medicine to better help our patients. His well-thought-out and in-depth explanations of cases and problems at oncology conferences and study groups left all of us with a lasting impression of brilliance and a desire to learn just a bit of what he knew in order to help our own patients.

Dr. Gignac had a passion for teaching and education. After graduating from Bastyr, he developed the course curriculum and taught the History of Medicine and Naturopathic Philosophy to Bastyr medical students. Then, he continued as a guest lecturer and part-time faculty member. Dr. Gignac was featured many times on Seattle area television and radio shows. In addition, he delivered talks to local groups and spoke at national medical conferences on naturopathic approaches to cancer treatment and management. From the beginning Mark had a burning dedication to learn all he could about standard oncology, naturopathic support, mind-body medicine, and spiritual aspects of dealing with life and death decisions we make daily. He was a lifelong learner and could quote research and philosophy with equal facility. Dr. Gignac devoted the last 35 years of his life to the study of natural medicines.

Because of his deep interest in mind-body medicine and the spiritual and healing practices of indigenous peoples, Dr. Gignac travelled extensively, for the past 16 years, to the Brazilian Amazon to continue learning from traditional healers and further his education.

Mark is survived by his long-time beloved partner Ana Velloso; his sons, Michael and Aaron; brothers, Brian and Jim; and sister Karen. Mark and Ana lived together for about twenty years. Mark and Ana shared a house in Lynnwood and also owned property together in Brazil where she is originally from. They traveled to Brazil regularly.

Mark's compassion and understanding led him to be loved by friends, co-workers, and patients equally. Mark's son, Michael Gignac, offered a suggestion in lieu of sending flowers to, "If you feel moved to express your love for Mark, please do so with an act of compassion, generosity, and kindness for someone in need."

Clearly the apple didn't fall far from the tree, as they say.

I am glad to have known Mark. We worked together for twenty years. I called him a friend and will miss him dearly.

Paul Reilly, ND, FABNO

Tributes to Mark Gignac, ND

Many of our colleagues have written and shared thoughts about Mark. Here are two that stand out.

Michael Uzick, ND, FABNO, of Tucson, Arizona wrote:

"I've always thought of and referred to Mark Gignac as my mentor…. He was very blunt and kind of in my face about only being interested in students with a passion and devotion for oncology. I'm sure he was kind in other ways, but what I will never forget is the high expectation he demanded for this preceptorship.

"Several have described his great breadth of knowledge, which is quite true, but one of the biggest things that stood out for me when shadowing Mark was his devotion to patients and the way he could communicate with those who were given a terminal diagnosis.

"Beyond all the details about labs, scans, symptoms and supplements, there was often a devastated human-being in the midst of facing their mortality and everything in their lives being completely turned upside down. To me this is often the great elephant in the room that few want to address and fewer have the ability. Mark could effortlessly speak to their suffering. He could speak to them on a spiritual level that was genuine, full of humility, and without denomination. He could touch their hearts and palpably move them away from a state of turmoil and fear.

"Honor is the truth of it for me. I suppose we must consider ourselves fortunate if we can say there are people in our lives who we revere and honor. When given the chance, through our words, intonation and energy we communicate this appreciation and reverence. Mark was one of those people for me and it was always a pleasure to express it to him in all of those ways…

"When I first met Mark he appeared to me, big and burly and someone that loved nature and who was capable of wrestling grizzly bears. What was clear was his great love for medicine and serving humanity with some smoldering and fierce grizzly power just beneath the surface that you didn't want to mess with. The man was full of intensity and passion like few in this world.

"It is especially our great loss that we will no longer have the opportunity to learn from Mark and to see and speak with him at our future conferences. I'm recalling now, in one of our last conversations at our conference in February, Mark told me he had absolutely no fear of death. That in his spiritual work he had experienced his own death many times. I don't mean to suggest there was some kind of foreshadowing going on, because cancer, death and spirituality were common topics for us for some years now."

Greg Nigh, ND, of Portland, Oregon wrote:

"Mark, perhaps more than anyone I know, was walking within the veil of the temple of Nature…. Mark's breadth of knowledge was quite astounding. He might be talking about the unique aspects of malignant cell biochemistry and metabolism one minute, and a few minutes later the conversation might have moved to the philosophy of science, or consciousness studies, or electric universe cosmology, or any number of other subjects he was fluent in. He would move in and out of these topics in a way that showed how these diverse realms of inquiry were woven into one seamless tapestry in his mind. …. He had a fire in his brain, a passion for learning and synthesis that was intimidating. …

Mark was a generous fountain of both philosophical insights and practical knowledge. I will miss our conversations dearly. We were just getting started."

NUNM President David Schleich Announces Plans to Retire

National University of Natural Medicine (NUNM) President David J. Schleich, PhD, has announced his plans to retire July 1, 2019. During his tenure, NUNM (Portland, Oregon) has undergone a period of growth and transformational change, becoming one of the nation's foremost leaders in integrative natural medicine education, clinical care, and research. The NUNM Board of Directors announced that a search is underway for his successor. It is anticipated that Schleich will assist the new president through the transition.

Appointed president of the institution in April 2007, Schleich took the helm of what was then National College of Natural Medicine (NCNM), a medical school that offered two accredited postgraduate degrees – its flagship programs of naturopathic and classical Chinese medicine. Since then, he has presided over the roll-out of nine more degree programs – including three new undergraduate offerings that have created increased enrollment, while the school has achieved a worldwide reputation for excellence in natural medicine education and research. During Schleich's tenure, NUNM's Helfgott Research Institute has received more than $3.35 million in research grants from the National Institutes of Health.

It was also under Schleich's watch that the institution launched a campus master plan, built the school's first on-campus health clinic, and opened a number of health clinics throughout the Portland metro area. Schleich also helped usher in NUNM's first major donations for capital campaigns and other campus improvements, including those from locally known philanthropists Bob and Charlee Moore of Bob's Red Mill, the Zidell family, and philanthropic foundations such as the MJ Murdock Charitable Trust and Meyer Memorial Trust.

In 2016, Schleich supervised the institution's rebranding as National University of Natural Medicine to reflect its university status.

"David has been instrumental in guiding NUNM to prominence," said NUNM Board of Directors Chair Willow Moore, DC, ND. "He was the perfect leader to propel our institution forward. He has a unique combination of skills and a deep breadth of knowledge that one can only hope to find in its academic leader – he is both an innovator and a scholar. But above all, David is a visionary. And he has been unrelenting in bringing his vision of a world-class university to fruition during his tenure. We will remain forever grateful for his unflagging dedication to NUNM, to the integration of the profession of natural medicine into the broader context of health care, and especially to the continuing success of our students and graduates."

Moore noted that Schleich stepped into his role as president at a particularly tenuous time in the school's history. "The legacy David will leave behind is particularly impressive when we remember that the school had just recently emerged from an extended period of difficulty prior to his appointment as president," she said. The history of NUNM dates back to its founding in 1956 as National College of Naturopathic Medicine – a time when allopathic medicine assumed a primary role in the lives of Americans, supported by the increasing development of pharmaceutical medicine and innovations in healthcare technology. The decline of the naturopathic medicine profession had brought it teetering on the brink of extinction as naturopathic medical schools closed their doors throughout the country. NCNM was the sole hold-out. From its beginning, NCNM had a dedicated cadre of administrators and faculty who were gifted physicians, clinicians and teachers, but inexperienced as college administrators. NCNM had a tumultuous history marked by monetary mismanagement and hardship until the early 2000s when a seasoned college administrator, President Emeritus William J. Keppler, PhD, stabilized NCNM financially and began to turn the tide of fortune in NCNM's favor. The small, private school was still largely unknown. When Keppler retired as NCNM president, he tapped the Canadian-born and bred Schleich as his successor.

A nationally recognized expert in the professional formation of natural medicine, Schleich joined the school after a distinguished career in higher education. Prior to joining NUNM, Schleich was president of Truestar Health in Toronto.

David J. Schleich, PhD

Before that, he served as president and CEO of Canadian College of Naturopathic Medicine (CCNM) in Toronto. Prior to CCNM, he held a series of increasingly significant academic positions: academic vice president of Niagra College (Ontario); administrative and faculty positions at St. Lawrence College (Ontario), Swinburne University (Melbourne, Australia), and the University of Alberta (Canada). His academic career spans more than 40 years in elementary, secondary, college and university settings.

Schleich earned his PhD from the University of Toronto and a master's from the University of Alberta. His doctoral studies focused on higher education, with a special interest in the regulatory and public policy frameworks that affect medical education.

For information about the presidential search, please visit: https://nunm.edu/president.

About NUNM

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

◆

Albion® builds a better chelated mineral

Our unique scientific process turns elemental mineral forms into easily digested and absorbed nutrients

Start with high quality raw materials 1

We use only the best food grade minerals

Select quality organic ligands 2

Our organic glycine ligands have the ideal molecular structure and size

Use patented chelation and bonding technology 3

Our minerals are fully reacted to form the most bioavailable and stable ring structure

We carefully control reaction conditions to ensure each mineral form is fully chelated

Employ proven manufacturing processes 4

We use FT-IR spectroscopy to guarantee each batch has our signature chelate ring structure

Validate structure using FT-IR 5

We dedicate extensive resources to ongoing research and educational efforts

Continue research and development 6

Albion® minerals support heart health:
Our Magnesium Bisglycinate Chelate and Potassium Glycinate Complex support healthy cardiovascular function, proper muscle contraction, and nervous system communications. Our Ferrochel® (iron bisglycinate chelate) increases hemoglobin, which allows more oxygen to be delivered to body tissues per heart contraction, decreasing the heart's work load. These superior minerals chelated with glycine provide essential support for healthy heart function.

ALBION® MINERALS

Human Nutrition

Building a Better Mineral™

www.AlbionMinerals.com
1-800-453-2406

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.

Look for Albion's Gold Medallion to find companies that use Albion chelated minerals in their formulations:

designs for health® Science first. · MOSS NUTRITION · NuMEDICA® ADVANCING NUTRITION · XYMOGEN®

Coffee: An Anti-Aging Superfood

by Steven M. Helschien, DC

"Coffee: An Anti-Aging Superfood" is one in a series of articles, written to educate the healthcare community about the science behind the health benefits of coffee.

Introduction

Coffee is one of the most popular drinks in the world. Studies continue to accumulate, proving that brewed coffee is one of the richest food sources of antioxidants. The phytochemicals and polyphenols in coffee have anti-inflammatory, anti-oxidative, and anti-cancer effects. Coffee has the ability to reduce vascular, digestive and kidney disease, cancer risks, and diabetes/obesity, as well as preserve cognition; thereby increasing longevity and deeming it an anti-aging superfood.

Coffee contains over 1,000 different natural compounds that positively affect cells. One coffee compound in particular, *chlorogenic acid***,** may help reduce inflammation and insulin resistance, and provides a multitude of the benefits. The caffeine in coffee also has positive benefits, improving alertness, concentration and energy, and may also protect against Parkinson's and dementia.

Coffee and Longevity

National Institutes of Health (NIH) and AARP Diet and Health Study, a landmark study published in the *New England Journal of Medicine*, suggests that drinking coffee may add years to your life**.**[1] The study indicated that caffeinated and decaf coffee drinkers were less likely to die from heart disease, respiratory disease, stroke, injuries and accidents, diabetes, and infections.

Dr. Neal Freedman, with the Division of Cancer Epidemiology and Genetics at the NIH National Cancer Institute, explained his study is among the most comprehensive to date on the health benefits of coffee. "Coffee is one of the most widely consumed beverages in America, but the association between coffee consumption and risk of death has been unclear. We found coffee consumption to be associated with lower risk of death overall, and of death from a number of different causes,'' said Freedman.[2]

Researchers tracked half a million men and women, ages 50 to 71 - all members of the American Association of Retired Persons (AARP) - for about 12 years. Freedman and his colleagues examined questionnaires filled out by the AARP members in 1995-1996, which detailed their coffee drinking habits, and then tracked the participants until the date they died or December 31, 2008, whichever occurred first.

The results showed a clear association between coffee and longevity, and also that indicated people who drank the most coffee tended to have the greatest health benefits. This was similar for men and women and tended to get stronger as participants drank more coffee.

A National Cancer Institute and University of Southern California study, "Association of Coffee Consumption with Total and Cause-Specific Mortality Among Nonwhite Populations," examined coffee-drinking habits among more than 180,000 whites, African-Americans, Latinos, Japanese-Americans and native Hawaiians. The study, established between 1993 and 1996, followed participants for an average of 16 years.[3] Coffee consumption had been associated with reduced risk for death in prospective studies; however, data for nonwhites were sparse.

The study found those drinking one cup of coffee daily had a 12 percent lower risk of death from various cases, including cardiovascular disease, cancer, stroke, diabetes, respiratory and kidney disease. For those drinking three cups of coffee a day, the risk reduction rose to 18 percent. The researchers concluded that higher consumption of coffee was associated with lower risk for death in African Americans, Japanese Americans, Latinos, and whites.

The Imperial College London and International Agency for Research on Cancer study, "Coffee Drinking and Mortality in 10 European Countries: A Multinational Cohort Study," examined the coffee-drinking of more than 520,000 adults from 10 European countries.[4] In previous studies, the great majority of those examined were white, meaning that environmental and lifestyle differences among ethnicities could have confounded the results. The researchers wanted to study the relationship between coffee consumption and mortality in diverse European populations.

The study concluded the benefits of coffee occur regardless of the ethnicity studied. It also found a lower death risk from various health conditions, including digestive, circulatory, and liver disease.

The One Coffee Doctors Recommend – Purity

Organic, premium Purity coffee is the only coffee company in the world focused on maximizing health benefits. It is the coffee doctors and their patients choose because they want to improve their health, performance, and longevity. Purity intentionally grows, farms, transports, and roasts their coffee to maximize healthy antioxidants and minimize harmful chemicals.

In three independent laboratory studies, 49 leading coffee brands were tested. In each one, Purity coffee ranked superior to all the other brands. Purity was shown to be free of contaminants and highest in antioxidants.[5]

- Purity coffee is organic (pesticide free).
- It contains zero contaminants; it is tested at every step to ensure there are no molds, toxins, or mycotoxins.

- It is roasted for health. Purity uses a proprietary roasting method that roasts the beans just enough to reduce harmful chemicals, like acrylamide, and prevents over roasting, which risks the development of harmful polycyclic aromatic hydrocarbons (PAHs). This sweet spot, which produces the healthiest beans, is around a medium roast. Light and dark roasts are unhealthy.
- Purity coffee is antioxidant rich. It has up to 10X the antioxidants of other leading brands.
- Due to the quality of Purity coffee, the taste is exceptional. Purity coffee drinkers note hints of cocoa, nuts, and citrus.

Once you have tried freshly roasted Purity coffee, you will notice the difference, not only in how it tastes, but how it makes you feel. Most customers report feeling a sustained, clean energy, without the jitters and upset stomach that can come from ingesting typical commercial coffees.

Supplements for Anti-Aging to Take with Coffee

Supplements that can aid in anti-aging are Level 1 Therapeutics Essential Fatty Acids, Essential Amino Acids, and Jigsaw CoQ10 with SRT.

Level 1 Therapeutics Essential Fatty Acids is a patented essential fatty acid blend supplement that is organic, plant based, non-GMO, and sustainable. It contains flax oil, pumpkin oil, sunflower oil, evening primrose oil, and coconut oil. Level 1 Therapeutics Essential Fatty Acids supplement

- Readily absorbs oxygen and helps transport it to cells;
- Aids all major functions of the body, including physical development, immunity, and brain function;
- Reduces inflammation affiliated with chronic disease; and
- Has been shown to decrease wound-healing time.

Linoleic and alpha linolenic fatty acids, found in Level 1 Therapeutics Essential Fatty Acids, are the building blocks for omega-3 and omega-6 fatty acids. They are considered essential fatty acids, as they must be ingested as food, since the body cannot produce them. They are the "parent" omega-3 and omega-6 oils. You can get essential oils from food, namely fruits and vegetables, nuts and seeds and their oils, and also from supplements.

Fish oil has few critical "parents"; it mainly has "derivatives." Even though fish oils are a popular omega-3 supplement option, studies have shown they are actually highly unstable molecules that tend to decompose and unleash dangerous free radicals.[6]

Level 1 Therapeutics Essential Amino Acids. Much of the human body is made of proteins (muscles, bones, skin, hair, nails, organs, etc). These proteins consist of 22 amino acids, of which 14 of the amino acids are manufactured by the body. The other 8 are called "essentials" and can only be obtained through nutrition or supplements. Food sources supply amino acids in ratios, which are not in balance with what we need. Essential Amino Acids provides the exact proportions needed for maximum utilization by the body, with virtually no waste.

Jigsaw CoQ10 with SRT. The mitochondrial theory of aging suggests that damage to mitochondria and mitochondrial DNA

➤

➤

contributes to the aging process in humans. Oxidative damage is perhaps the biggest contributor to mitochondria damage, causing an imbalance between free radicals and your body's ability to neutralize their damaging effects through antioxidant support. CoQ10 is one of the body's strongest defenses against this damage.

CoQ10 is an antioxidant naturally produced by the body, which powerfully safeguards the mitochondria by protecting cells from oxidative damage and neutralizing the harmful effects of free radicals. CoQ10 levels naturally decline as you age. It has been clinically shown that the supplement Jigsaw CoQ10 with SRT provides superior bioavailability and enhanced absorption.

Conclusion

Studies have found an inverse association between coffee drinking and the risk of death overall, as well as with a number of different health risks. It has been indicated that the more coffee people consume, whether caffeinated or decaf, the less likely they are to die from cardiovascular disease, cancer, stroke, diabetes, respiratory, digestive, and kidney disease, as well as injuries, accidents, and infections. This has been proven to be true regardless of gender or ethnicity.

One coffee that has been shown to be the purest on the market is Purity coffee. It is the only coffee that is toxin free and contains the highest antioxidant levels, making it the healthiest coffee in the world.

References

1. Freedman N, et. al. The association of coffee drinking with total and cause-specific mortality, *NEJM*. May 17, 2012; 366 (20): 1891-1904.
2. National Cancer Institute. NIH study finds that coffee drinkers have lower risk of death. Available at: https://www.cancer.gov/news-events/press-releases/2012/CoffeeProtectiveDCEG. Accessed August 12, 2018.
3. Park S, et. al. Association of coffee consumption with total and cause-specific mortality among nonwhite populations. *Annals of Internal Medicine*. August 15, 2017.
4. Gunter M, et. al. Coffee drinking and mortality in 10 European countries: A multinational cohort study. *Annals of Internal Medicine*. August 15, 2017.
5. Purity Coffee independent laboratory results. Purity Coffee (online). Available at: https://puritycoffee.com/lab-results/. Accessed August 20, 2018.
6. Peskin B. Warning: fish oil contains no true EFAs – physicians may be unknowingly prescribing the wrong substance to patients causing great harm – PEOs solve this problem. Available at: https://brianpeskin.com/publications/. Accessed on July 22, 2018.

◆

Dr. Steven Helschien (a.k.a. Dr. Coffee) is a coffee aficionado and believes that coffee is a powerhouse superfood. He is the founder of Level 1 Diagnostics (a cardiovascular testing program that uses advanced, noninvasive technology to detect and prevent cardiovascular disease), and Level 1 Therapeutics (a health and wellness program dedicated to supporting optimal health). Dr. Helschien is passionate about progressive health issues and encouraging people toward greater health and wellbeing.

Townsend Letter

ISSN 1940-5434

Subscriptions • Editorial • Advertising

360/385-6021

24 Hr. Fax – 360/385-0699

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

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

Columnists & Writers
Majid Ali, MD
Eleonore Blaurock-Busch, PhD
Jim Cross, ND, LAc
Nancy Faass, MSW, MPH
Peter A. Fields, MD, DC
Alan R. Gaby, MD
Michael Gerber, MD, HMD
Robert Goldman, MD, PhD, DO, FAASP
Ira Goodman, MD
Tori Hudson, ND
Ronald Klatz, MD, DO
Ingrid Kohlstadt, MD, MPH, FACN
Sarah A. LoBisco, ND
Marianne Marchese, ND
Alan B. McDaniel, MD
Ralph W. Moss, PhD
Judyth Reichenberg-Ullman, ND
Jacob Schor, ND, FABNO
Pamela Smith, MD
Jacob Teitelbaum, MD
Jade Teta, ND
Keoni Teta, ND
John Trowbridge, MD
Robert Ullman, ND
Rose Marie Williams, MA
Elaine Zablocki

Contributing Writers
Katherine Duff
Bob Frost
Gary Null, PhD

Layout & Design
Barbara Smith/Sign Me Up! Inc.

Design Team
Jonathan Collin
Joy Reuther-Costa
Barbara Smith

Cover Photo Credit
Sue Reddish

Printing
Dartmouth Printing Company

Website Design & Maintenance
Sandy Hershelman Designs

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

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

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

Utilizing Bovine Colostrum to Combat Influenza and Other Viral Infections

by Douglas A. Wyatt

Director, Sovereign Health Initiative

The 2017-18 flu season will be remembered for low vaccine effectiveness, significant incidence of emergency room visits and hospitalizations, and high numbers of influenza-associated pediatric deaths (n=174).[1,2] Of the previous fourteen seasons for which the CDC has been monitoring mortality rates, only 2009-10 witnessed a greater number of pediatric deaths (n=288).[3] With another flu season upon us, healthcare providers and patients alike are asking, *Will it be as severe as the 2017-18 season?* Even if we had a crystal ball, predicting whether forehand knowledge would influence people's healthcare behaviors is difficult to say. And without debating the personal choice to get vaccinated or not, providers should consider bovine colostrum supplementation as either a stand-alone preventative or adjunct to the flu shot.

Prior to the development of modern vaccines and antiviral medications, colostrum and raw milk from domesticated ruminant animals was utilized for centuries by civilizations across the globe. Colostrum and raw milk were and still are today a primary source of nutrition for many rural communities in developing countries. Colostrum and raw milk provide essential nutrition for growth, development, and protection against pathogenic microbes and in turn, better health for survival of the fittest among the population. Colostrum use was determined by experience not by scientific knowledge per say, but today, both play an important role in the resurgence of colostrum supplementation. There is a growing body of research that now offers evidence of colostrum's preventative and therapeutic action.

Researchers concluded … colostrum is at least three times more effective than vaccination alone to prevent seasonal influenza and is simultaneously cost-effective.

Interest in colostrum as an influenza preventative began in the mid-2000s as Italian researchers sought to investigate new, low-cost treatments to better address the virus mutations from season to season. Cesarone et al. evaluated the efficacy of a two-month treatment with oral colostrum in the prevention of flu episodes compared with influenza vaccination and detailed their findings in a 2007 paper.[4] Participants in part 1 of the study included healthy subjects who received either colostrum, colostrum plus vaccination, vaccination alone, or no prophylaxis. After three months of follow-up, the number of flu days was three times higher in the non-colostrum patients. The colostrum-only group had 13 episodes versus 14 in the colostrum plus vaccination group; 57 in vaccination-only group; and 41 in the group without prophylaxis. Part 2 of the study had a similar protocol with sixty-five very high-risk cardiovascular subjects, all of whom had prophylaxis. The incidence of complications and hospital admission was higher in the group that received only a vaccination compared with the colostrum-only and colostrum plus vaccination groups. Researchers concluded that in both healthy subjects and high-risk cardiovascular patients, colostrum is at least three times more effective than vaccination alone to prevent seasonal influenza and is simultaneously cost-effective.

A 2010 study by the same Italian team evaluated the efficacy of a combined oral colostrum and probiotic supplement (collectively referred to as immunomodulators) compared to influenza vaccination in healthy subjects.[5] 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 flu episodes and fewer flu days. Those receiving a vaccination had twice as many flu episodes than those receiving the colostrum and probiotic supplement. Researchers concluded ➤

➤

that using immunomodulators is both effective and practical and exceedingly valuable where the peak of flu activity is reached rapidly and/or there is a need to quickly protect healthcare workers who interact with sick patients.

Immunomodulation can be a significant strategy in the context of today's global virus behavior and the industry's inability to produce vaccines quickly on a massive scale. When combined with aversion to and/or lack of access to vaccination, bovine colostrum should be an acceptable alternative when providers and patients are adequately informed about its health benefits. Bovine colostrum contains a wide variety of bioactive components that have antiviral activity directly or indirectly stimulating the immune system to identify, isolate, and destroy viruses. The majority of colostrum's antiviral activity results from the collective action of its immunoglobulins, antibodies, lactoferrin, lactoperoxidase, and proline-rich polypeptides (PRPs).

Bovine colostrum contains a wide variety of bioactive components that have antiviral activity directly or indirectly stimulating the immune system to identify, isolate, and destroy viruses.

Two primary mechanisms of action are to bind to viral pathogens and destroy their cell membranes or to compete for binding sites on the intestinal wall.[6] Immunoglobulins, or antibodies, are utilized by the immune system to recognize and bind antigens; they identify and mark viral as well as bacterial cells for destruction. Immunoglobulins in bovine colostrum bind to disease-causing pathogens on the mucosal surfaces of the GI tract, thereby preventing them from colonizing and causing infection. Immunoglobulin G (IgG) is the predominant antibody in bovine colostrum, and it is the source of systemic immunity passed from cow to calf and from cow to human via colostrum. More than a dozen specific viral antibodies have been identified in bovine colostrum, including those 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, polio virus, respiratory syncytial virus, rotavirus, St. Louis virus, West Nile virus, and yellow fever virus.[7]

Lactoferrin is an iron-binding glycoprotein belonging to the transferrin family that has anti-bacterial and anti-inflammatory capabilities in addition to being an antiviral powerhouse. All mucous secretions of the human body contain lactoferrin, which acts as a non-specific first line of defense against disease-causing pathogens. Lactoferrin's antiviral activity has been demonstrated with respect to hepatitis B and C viruses, herpes simplex virus-1, HIV, poliovirus, and respiratory syncytial virus.[8] Lactoferrin's direct mechanisms of action in killing pathogens include binding to target cells, and thus preventing the pathogens from binding; binding to the pathogens and causing them to lyse; or inhibiting viral replication once the virus has entered the target cell. The indirect mechanisms are immunomodulatory, including regulating the proliferation and activity of leukocytes, pro-inflammatory cytokines, and natural killer (NK) cells. Lactoferrin administration enhances NK cell activity as well as Th1 cytokine response which results in general protection against viruses that cause influenza and the common cold.[9,10] More specifically, bovine lactoferrin's anti-influenza activity has been observed against influenza A virus H1N1 and H3N2.[11-13]

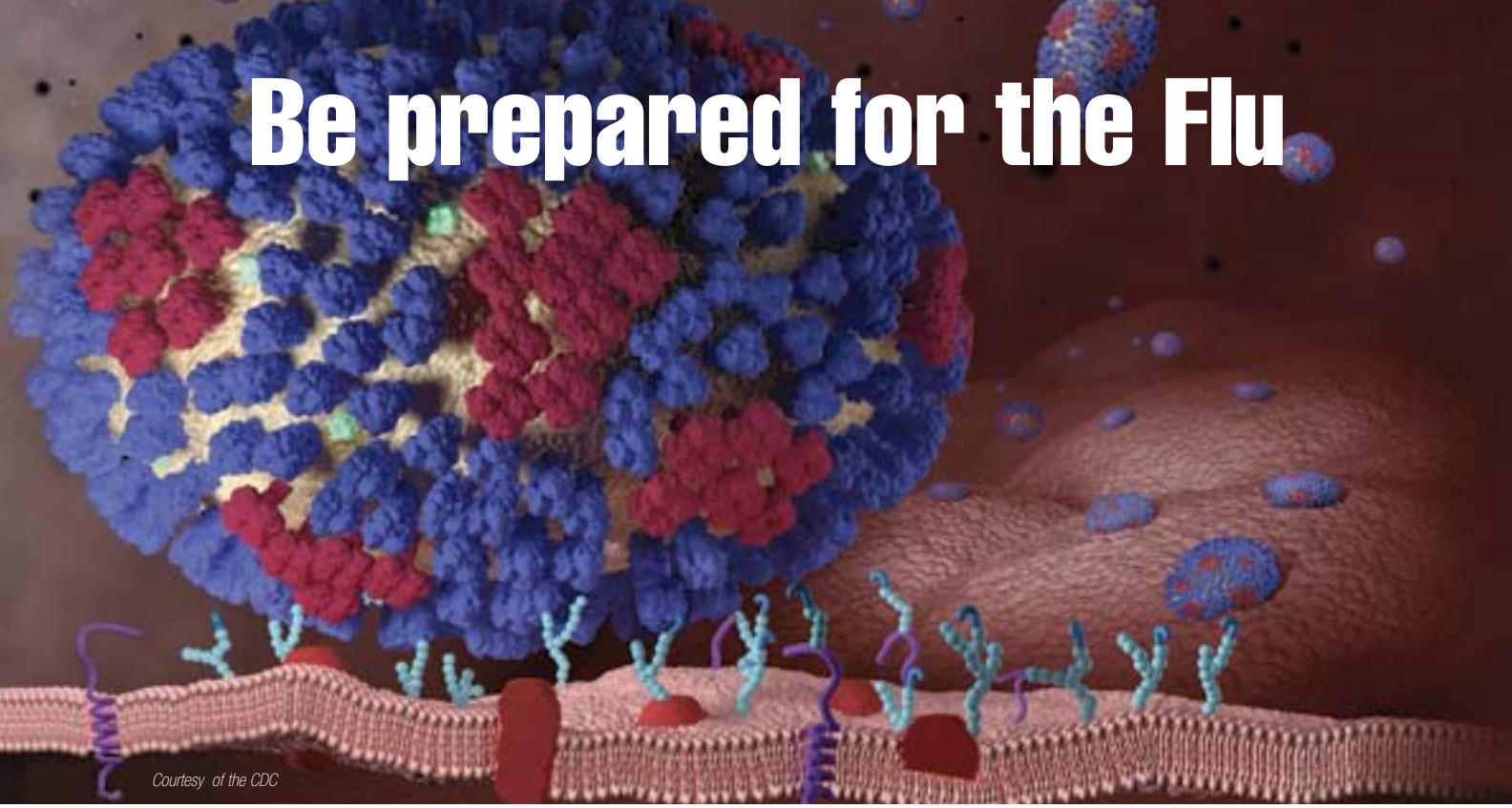
Lactoperoxidse is heme-containing glycoprotein belonging to the mammalian peroxidase family, and similar to lactoferrin, it is found in saliva, tears, airway mucous, milk, colostrum, and other endocrine secretions. When combined with its physiological substrates hydrogen peroxide and thiocyanate, lactoperoxidase achieves widespread antiviral activity; research shows lactoperoxiodase to be particularly effective against HIV, herpes simplex virus-1, respiratory syncytial virus and echovirus.[14,15] Orally-administered lactoperoxidase and lactoferrin in mice infected with influenza A virus H1N1 was found to attenuate pneumonia by suppressing the accumulation of inflammatory cells in lung tissue.[16] Furthermore, lactoperoxidase itself downregulated production of the pro-inflammatory cytokine IL-6 and reduced body weight loss during the infection period.

The proline-rich polypeptides (PRPs), also known as colostrinin, are a collective group of low molecular weight colostrum polypeptides that play a major role in modulating the activity of the immune system by way of the thymus gland. The thymus gland can be considered "central command" for the immune system, and PRPs have significant stimulatory and suppressive effects depending on the body's specific need at any given time. 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 or, in the case of autoimmune conditions, suppresses the inflammation.[17] This dual-purpose intercellular signaling activity is beneficial in achieving the body's ultimate goal of maintaining homeostasis.

With respect to defeating influenza and other viral infections, PRPs act in a multi-pronged approach to create the immune response necessary to

continued on page 28 ➤

Be prepared for the Flu



Courtesy of the CDC

Get to the root of the problem with PRO Colostrum-LD® and PRO Colostrum-IC Spray®

Unlike over-the-counter cold and flu medications, colostrum treats the cause of illnesses, not the symptoms. Colostrum-LD® contains the most current and relevant colostral antibodies because the time from farm to consumer is only six weeks.

Research shows that colostrum is effective in preventing the flu. One study comparing prevention with influenza vaccination and/or colostrum found that the incidence of complications and hospital admission was higher in the group that received only a vaccination compared with the colostrum group. Researchers concluded that colostrum, both in healthy subjects and high-risk cardiovascular patients, is at least three times more effective than vaccination to prevent flu.[i]

In addition to antibodies, bovine colostrum contains proline-rich polypeptides (PRPs) and lactoferrin. In general, the PRPs regulate the immune system, but when there is an infection threat by a viral pathogen, the PRPs stimulate the immune system to isolate and destroy the virus. Lactoferrin's direct mechanisms of action in killing pathogens include binding to target cells, and thus preventing the pathogens from binding; binding to the pathogens and causing them to lyse; or inhibiting viral replication once the virus has entered the target cell. Lactoferrin administration enhances NK cell activity as well as Th1 cytokine response which results in general protection against viruses that cause influenza and the common cold.[ii],[iii] More specifically, bovine lactoferrin's anti-influenza activity has been observed against influenza A virus H1N1 and H3N2.[iv],[v],[vi]

As a healthcare professional, discover how you can become a certified professional at ColostrumTherapy.com/townsend. Consumer products are also available at MySovLabs.com.

[i]Cesarone MR, Belcaro G, Di Renzo A, Dugall M, Cacchio M, Ruffini I, Pellegrini L, Del Boccio G, Fano F, Ledda A, Bottari A, Ricci A, Stuard S, Vinciguerra G. Prevention of influenza episodes with colostrum compared with vaccination in healthy and high-risk cardiovascular subjects: the epidemiologic study in San Valentino. *Clinical and Applied Thrombosis/Hemostasis.* 2007 Apr;13(2):130-136.

[ii] Yamauchi K, Wakabayashi H, Shin K, Takase M. Bovine lactoferrin: benefits and mechanism of action against infections. *Biochem Cell Biol.* 2006 Jun;84(3):291-6. Review.

[iii] Wakabayashi H, Oda H, Yamauchi K, Abe F. Lactoferrin for prevention of common viral infections. *J Infect Chemother.* 2014 Nov;20(11):666-71.

[iv] Pietrantoni A, Dofrelli E, Tinari A, Ammendolia MG, Puzelli S, Fabiani C, Donatelli I, Superti F. Bovine lactoferrin inhibits influenza A virus induced programmed cell death in vitro. *Biometals.* 2010 Jun;23(3):465-75.

[v] Ammendolia MG, Agamennone M, Pietrantoni A, Lannutti F, Siciliano RA, De Giulio B, Amici C, Superti F. Bovine lactoferrin-derived peptides as novel broad-spectrum inhibitors of influenza virus. *Pathog Glob Health.* 2012 Mar;106(1):12-9.

[vi] Scala MC, Sala M, Pietrantoni A, Spensiero A, Di Micco S, Agamennone M, Bertamino A, Novellino E, Bifulco G, Gomez-Monterrey IM, Superti F, Campiglia P. Lactoferrin-derived peptides active towards influenza: identification of three potent tetrapeptide inhibitors. *Sci Rep.* 2017 Sep 6;7(1):10593.

Sovereign Laboratories

➤ *continued from page 26*

destroy pathogens. PRPs do this by stimulating leukocyte production; increasing blood vessel permeability in the skin to permit antibodies and other immunomodulatory cells entry into the tissue to fight infection; increasing production of NK cells and their cytotoxic activity; regulating major pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α) which controls the entire inflammatory cascade of cytokine activity during an infection, and gamma interferon (INF-γ) which interferes with viruses' ability to replicate; and inducing differentiation and maturation of monocytes and macrophages whose job it is to seek out pathogens.[18-22]

Predicting which viruses will be most prevalent in any given flu season is often "best guess" medicine. Some years, scientists and vaccine manufacturers get lucky and the public benefits. Scientific shortcomings are more apparent when young children fall victim to the flu. The fact is that young or old, living in today's world requires a strong, balanced immune system. From stress to poor nutrition to unhealthy behaviors to increasing levels of pollution and environmental toxins, the normally robust immune system becomes compromised and unable to function effectively. And with the significant increase in world travel over the past few decades, it's not surprising that viruses are earning frequent flyer miles too. Daily supplementation with bovine colostrum supports a healthy, balanced immune system that in turn, provides the best prophylaxis against influenza and other dangerous viruses.

Douglas Wyatt is the founder of Sovereign Laboratories, a Sedona, Arizona-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 director of the Sovereign Health Initiative, a 501(c)(3) nonprofit organization dedicated to recognition of personal health sovereignty and the belief that one's commitment is essential to achieving optimal health and well-being. Douglas is a leader in the research and 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 an author, publisher, scientist, and public speaker, Douglas 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 World Health Organization and other internationally recognized research organizations on clinical trials addressing HIV/AIDS, other infectious diseases, autoimmune diseases, and bowel health issues.

References

1. https://www.cdc.gov/flu/weekly/weeklyarchives2017-2018/data/whoAllregt_cl24.html
2. Garten R, et al. Update: influenza vctivity in the United States during the 2017-18 season and composition of the 2018-19 influenza vaccine. *MMWR Morb Mortal Wkly Rep.* 2018 Jun 8;67(22):634-642.
3. https://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html
4. Cesarone MR, et al. Prevention of influenza episodes with colostrum compared with vaccination in healthy and high-risk cardiovascular subjects: the epidemiologic study in San Valentino**.** *Clinical and Applied Thrombosis/Hemostasis*. 2007 Apr;13(2):130-136.
5. Belcaro G, et al. Prevention of flu episodes with colostrum and Bifivir compared with vaccination: an epidemiological, registry study. *Panminerva medica.* 2010 Dec;52(4):269-75.
6. Van Hooijdonk AC, Kussendrager KD, Steijns JM. In vivo antimicrobial and antiviral activity of components in bovine milk and colostrum involved in non-specific defence. *Br J Nutr*. 2000;84 Suppl 1:S127–S134.
7. Keech AM. Peptide Immunotherapy: Colostrum – A Physician's Reference Guide. 2009. AKS Publishing.
8. van der Strate BW, et al. Antiviral activities of lactoferrin. *Antiviral Res*. 2001 Dec;52(3):225-39. Review.
9. Yamauchi K, et al. Bovine lactoferrin: benefits and mechanism of action against infections. *Biochem Cell Biol*. 2006 Jun;84(3):291-6. Review.
10. Wakabayashi H, et al. Lactoferrin for prevention of common viral infections. *J Infect Chemother.* 2014 Nov;20(11):666-71.
11. Pietrantoni A, et al. Bovine lactoferrin inhibits influenza A virus induced programmed cell death in vitro. *Biometals.* 2010 Jun;23(3):465-75.
12. Ammendolia MG, et al. Bovine lactoferrin-derived peptides as novel broad-spectrum inhibitors of influenza virus. *Pathog Glob Health*. 2012 Mar;106(1):12-9.
13. Scala MC, et al. Lactoferrin-derived peptides active towards influenza: identification of three potent tetrapeptide inhibitors. *Sci Rep*. 2017 Sep 6;7(1):10593.
14. Pourtois M, et al. Inhibition of HIV infectivity by lactoperoxidase-produced hypothiocyanite. *J Biol Buccale*. 1990 Dec;18(4):251-3.
15. Mikola H, Waris M, Tenovuo J. Inhibition of herpes simplex virus type 1, respiratory syncytial virus and echovirus type 11 by peroxidase-generated hypothiocyanite. *Antiviral Res*. 1995 Mar;26(2):161-71.
16. Shin K, et al. Effects of orally administered bovine lactoferrin and lactoperoxidase on influenza virus infection in mice. *J Med Microbiol*. 2005 Aug;54(Pt 8):717-23.
17. Rona Z. Bovine colostrum emerges as immunity modulator. *Am J Nat Med.* 1998;5(2):19-23.
18. Kruzel ML, et al. Towards an understanding of biological role of colostrinin peptides. *J Mol Neurosci*. 2001 Dec;17(3):379-89.
19. Janusz M, Lisowski J. Proline-rich polypeptide (PRP)--an immunomodulatory peptide from ovine colostrum. *Arch Immunol Ther Exp (Warsz).* 1993;41(5-6):275-9.
20. See DM, et al. The role of natural killer cells in viral infections. *Scand J Immunol.* 1997 Sep;46(3):217-24. Review.
21. Zabłocka A, et al. Cytokine-inducing activity of a proline-rich polypeptide complex (PRP) from ovine colostrum and its active nonapeptide fragment analogs. *Eur Cytokine Netw.* 2001 Jul-Sep;12(3):462-7.
22. Kubis A, et al. Studies on the mechanism of action of a proline-rich polypeptide complex (PRP): effect on the stage of cell differentiation. *Peptides*. 2005 Nov;26(11):2188-92.

◆

To help support heart healthy cholesterol levels, recommend Pantesin.*

A pure and highly absorbable form of Pantethine (an active form of Vitamin B5) Pantesin® works at the cellular level, enhancing enzyme and metabolic activity to help the body maintain a healthy blood lipid ratio.* A pure, vegetarian, allergen-free ingredient, Pantesin is backed by more than three decades of research showing it to be safe and effective.* Recommend Pantesin with confidence as a smart addition to your patients heart health program.

Pantesin®

For more information visit
www.pantesin.com

Follow Pantesin®

***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.**

Look for Pantesin® Pantethine in these fine brands.

Endurance Products Company · HCP Formulas · Integrative Therapeutics · pure encapsulations — Your Trusted Source — · Protocol for Life Balance · AllergyResearchGroup® · Thorne Research

Professional Quality Far Infrared Sauna

for your home or office

The Relax® Sauna

Only portable sauna using medical grade technology.

- **Advanced patented Semi-conductor chip technology**
  Has received many international awards for its technology.
  (4-9 times more Far Infrared than any other Infrared Sauna)
- **Works in 30 seconds. Complete sweat in only 20 min**
- **Easy to use and set up. Fits in carrying bag or suitcase.**
- **20 year track record for effectiveness.**
- **Non-toxic Nylon/Silver Reflecting Tent. Very low EMF.**

Independently controlled radiators to moderate the heat level. Each radiator is the exact same device that is in the far infrared medical unit.

Why many prefer the Relax Sauna

Incredibly effective instant-on treatments !

Advanced technology using semi-conductor chips
30 seconds to preheat 20 minutes for a complete sweat
Manufacturer has been in business for 40 years

We have many safety certificates. (no out-gassing and extremely low emf)

- ***Decreases Pain & Inflammation remarkably fast***
- ***Eliminates of metabolic waste & heavy metals***
- ***Increases core temperature & micro circulation***
- ***Increases metabolism & beautifies skin***
- ***Detoxifies & purifies the body***

We distribute to 100's of doctors around the world and they have had much success in helping their patients.

The Sky Eye Medical Lamp
is used in hospitals & practioner's offices. It is approved by the FDA as a medical device.

(FDA number - 510(K): K053376)
800 watts Medical Lamp - Sugg Retail $1300

One of the most preferred saunas by medical professionals.

Dr. Roger Billica - Tri Life Health Center

Former Chief (10 years) of Medical Operations for NASA personally uses the relax sauna in his home, in his Environmental Health Clinic, and Retreat Center. Hundreds of his patients have benefited from using the Relax Sauna

Dr. Bill Akpinar (M.D., D.S., O.M.D) Center for Healing

Voted Best Cancer Doctor in NY in 2007 and author of "No Sweat?, Know Sweat!" has been using the Relax Sauna for years, and calls it the "Chi Gong" Sauna. None of his (over 100) patients using the Relax Sauna have ever had problems with EMF.

For over 700 Testimonials
search "relax sauna testimonials" on youtube!

www.relaxsaunas.com

CALL 626.200.8454

Customer Service - Tel: 614.262.7087 • Email: moment98@gmail.com
Mention you saw this ad in Townsend to get Professional Prices. Also Ask about Wholesale.

Shorts

briefed by Jule Klotter
jule@townsendletter.com

Autologous Conditioned Serum for Osteoarthritis

Over the past decade, several professional athletes have sought autologous conditioned serum (ACS), known as Orthokine®, provided by German physician Peter Wehling in Düsseldorf, Germany, to treat osteoarthritis (OA). The serum, which is made from the patient's blood, is reportedly more effective than conventional treatments and does not have the side effects of nonsteroidal anti-inflammatory drugs (NSAIDs) and COX-2 inhibitors. Athletes like Kobe Bryant and Alex Rodriguez have credited the treatment with letting them continue their careers. It's easy to find lots of hype about Orthokine and plenty of skeptical blogs too – but few clinical studies. Many stories in mainstream news and online conflate ACS with stem cell therapy or platelet-rich plasma.

As a 2013 review from Spain explains, ACS is designed to inhibit interleukin 1β (IL-1β), the pro-inflammatory cytokine that appears to be responsible for cartilage destruction, characteristic of arthritis. The patient's blood is incubated in a syringe that contains glass beads coated with chromium sulfate at 37˚C for 24 hours. Then, centrifuge produces a serum that has high concentrations of IL-1β receptor antagonist (IL-1βRa), the natural inhibitor of the inflammatory IL-1β. Pro-inflammatory cytokines, including IL-1β and tumor necrosis factor alpha (TNF-α), do not increase during incubation. The serum is injected into the arthritic joint. The authors report, "An increase up to 140 times the concentration of IL-1βRa during incubation for 24 hours can be detected." In their 2016 article for *Cytokine*, Angelique Barreto and Timothy R. Braun in Oklahoma report being able to increase IL-1βRa levels by a 32-fold increase, on average, with just 30 minutes of incubation, making the technique usable as "a novel, on-site, point of service process (Arthrokinex™)."

Animal research indicates that increased IL-1βRa levels can address arthritic pain and joint degeneration, according to the Spanish review. During a 2011 study, for example, researchers induced OA in both temporomandibular joints of rabbits. Animals in the intervention group were then injected with human IL-1βRa in one joint while the controls received a saline injection. Joints injected with IL-1βRa displayed fibrocartilage articular thickening and an increase in chondrocytes (cartilage cells) at 12 and 24 weeks. The untreated side showed marked histological signs of degenerative OA at 24 weeks. TNF- α levels did not differ between the experimental and control groups.

The few clinical studies conducted so far have shown positive, but not stunning, results. A 2009 randomized, double-blind study, conducted by AW Baltzer et al, involved 376 people with knee joint OA. ACS-treated patients reported significant improvements in quality of life compared to those who received hyaluronic acid or saline injections in their joint. Although some patients with severe pain (measured by visual analogue scale) reported positive results, the authors indicate that ACS is most effective for patients with low or medium pain levels. A second clinical study, conducted by KG Yang et al in 2008, also reported better clinical outcomes in patients receiving six injections of ACS compared to those injected with saline placebo; but "the statistical difference is small." In addition, one patient of the ACS-treated group (n=89) had to withdraw due to inflammatory reactions that occurred within hours of being injected, and another developed septic arthritis attributed to injection procedure; there was no evidence that the ACS sample was contaminated.

Dr. Wehling does not view ACS as the magic bullet for OA. In a 2012 *New York Times* article, he is quoted as saying, "'It has to be embedded in a good concept more broadly'...sleep, diet and conditioning are among the important components to go with the injections. 'There's no such thing as the one therapy that fixes everything.'"

Alvarez-Camino J-C, Vazquez-Delgado E, Gay-Escoda C. Use of autologous conditioned serum (Orthokine®) for the treatment of the degenerative osteoarthritis of the temporomandibular joint. Review of the literature. *Med Oral Path Oral Cu Bucal.* May 2013;18(3):e433-8.
Barreto A, Braun TR. A method to induce interleukin-1 Receptor Antagonist Protein from autologous whole blood (abstract) *Cytokine.* 2016;81:137-141.
Kulish N. Novel Blood Treatment Lures Athletes to Germany. *NY Times*. July 10, 2012.

Vitamin C and Respiratory Infections

Respiratory infections and pneumonia are known complications of scurvy, a potentially fatal condition caused by vitamin C deficiency; and research shows that vitamin C supplementation can prevent and treat respiratory infections.

➤

Shorts

➤

Unlike most other animals, humans lack an enzyme that allows them to make their own vitamin C; so we must rely on diet sources, such as citrus fruit and kiwifruit, or supplementation. According to authors of a 2017 review article, humans need at least 100-200 mg of vitamin C each day to prevent infection. (A medium orange contains about 70 mg, according to USDA.) But the authors also state that a body's need for vitamin C increases under diverse conditions, including diabetes, exposure to cigarette smoke and air pollution, and the presence of infection, stress, and aging. Decades of research show that vitamin C is involved in multiple physiological processes, many of which affect the body's ability to fight infections, in addition to maintenance of collagenous structures and wound healing,

Vitamin C is well known as a potent water-soluble antioxidant that not only scavenges reactive oxidants but also regenerates glutathione and vitamin E. It is also a necessary cofactor for the action of several enzymes, including those involved in carnitine biosynthesis (required for transporting fatty acids into energy-producing mitochondria) and synthesis of catecholamine hormones (eg. norepinephrine) and amidated peptide hormones (eg vasopressin). Moreover, vitamin C accumulates in leukocytes and promotes phagocytosis (engulfment of microbes) and generation of reactive oxygen species to kill pathogens. It is also used during the differentiation and maturation of T-cells. Given the many roles that vitamin C has in immune function, it is likely that maintaining adequate levels will lessen the risk of developing serious infections. Research has not, however, shown that vitamin C supplementation prevents colds altogether.

"Treatment of established infections requires significantly higher (gram) doses of the vitamin to compensate for the increased inflammatory response and metabolic demand," according to the review authors. The review authors cite several studies in which vitamin C supplementation reduced symptom severity and lessened the time needed for recovery in elderly people hospitalized with pneumonia, particularly in those with low vitamin C plasma levels.

In a 2016 article, Amanda Bucher and Nicole White, PharmD, recommend starting vitamin C treatment within 24 hours of noticing the first sign of a respiratory infection and *to continue treatment for no less than five days*. They report that higher doses (about 8 g daily according to one study) appear to be more effective than lower.

Too much vitamin C, taken orally, can produce diarrhea, which resolves when dosage is decreased.

Bucher A, White N. Vitamin C in the Prevention and Treatment of the Common Cold. *American Journal of Lifestyle Med.* 2016;10(3): 181-3.
Carr AC, Maggini S. Vitamin C and Immune Function. *Nutrients.* 2017;9:1211.

Play and Aging

Very few studies have looked at the benefits of play and playfulness for adults. Research has shown that playtime is essential for children as a means of developing physically, encouraging a creative and problem-solving state of mind, and helping children learn how to get along with others. While working adults tend to reject play as a waste of time (unless it involves some form of competition), play may be an important key to healthy aging, according to Careen Yarnal and Xinyi Qian. Engaging in playfulness brings joy. It feeds and maintains friendships. It improves cognitive and psychological function and quality of life, all of which support healthy aging.

What constitutes play? Peter Gray, PhD, a research professor at Boston College, says "the characteristics of play all have to do with motivation and mental attitude, not with the overt form of the behavior. Two people might be throwing a ball, or pounding nails, or typing words on a computer, and one might be playing while the other is not." Play is an activity we choose and want to do. Play involves freedom, freedom to engage or to quit, freedom to explore, to try, and to fail. When we engage in play, we agree to the "rules" or required parameters – and quit if the parameters don't meet our needs and bring satisfaction. Dr. Gray says, "...adults who have a great deal of freedom as to how and when to do their work often experience that work as play, even (in fact, especially) when the work is difficult. In contrast, people who must do just what others tell them to do at work rarely experience their work as play."

Play also has to do with enjoying the activity itself rather than wanting a specific outcome. Reading books because you enjoy the topic is play. Reading books simply to pass a test is not. "To the degree that we engage in an activity purely to achieve some end, or goal, which is separate from the activity itself, that activity is not play," says Gray. While activities that involve creating an object, such as knitting an afghan or building a bookcase, do have a desired outcome, "the primary objective in such play is the *creation* of the object, not the *having* of the object." Similarly, when winning a game becomes more important than playing the game – whether soccer, golf, or Monopoly – it begins to feel more like work and less like play.

Because play focuses on means, not outcome, people do not experience the stress of needing to succeed and are not inhibited by fear of failure. Play is, by Dr. Gray's definition, a state in which the mind is active, alert, and not stressed – a state which allows experimentation and exploration. Play engages the imaginative, creative parts of our psyche, removing us from "serious" life and decreasing stress. From Dr. Gray's description, the effects of play sound very like the practice of mindfulness: "The mental state of play is what some researchers call 'flow.' Attention is attuned to the activity itself, and there is reduced consciousness of self and time." This state has physical and mental benefits.

Margarita Tartakovsky, MS, an associate editor at Psych Central, offers some ideas for adding play to your life. She suggests taking a "play history": "What did you do as a child that excited you? Did you engage in those activities alone or with others? Or both? How can you recreate that today?" Did you like dancing or exploring the woods nearby? Did you have fun collecting rocks or drawing pictures? Another way to add play and its benefits to your life is to seek out playful beings. Young children have a gift for having fun, and the enthusiasms of companion animals can often lead their owners to non-stressed opportunities for play.

I never thought of myself as a particularly playful person, but Dr. Gray's essay helped change the way I think about play.

Recognizing that play involves freedom and focusing on process rather than outcome helped me realize how much I blend play with work. How can you add more fun and play to your life?

Gray P. The Value of Play I: The Definition of Play Gives Insights (blog). November 19, 2008. www.psychologytoday.com
Tartakovksy M. The Importance of Play for Adults. No date. https://psychcentral.com/blog/the-importance-of-play-for-adults/
Yarnal C, Qian X. Older-Adult Playfulness – An Innovative Cosntruct and Measurement for Healthy Aging Research. *Amer J Play.* January 2011;4(1):52-79.

Autophagy and Aging

Health and longevity depend upon how well cells can recycle worn-out and malfunctioning cellular parts and organelles in order to generate energy or make new cells. This recycling process is called autophagy. Yoshinori Ohsumi, who received the Nobel prize for medicine in 2016, discovered how certain genes code for proteins used to form autophagosomes. These sack-like structures are used to collect and transport "cellular junk" to lysosomes, where it is broken down into usable components.

Autophagy is imperative for life. It removes dysfunctional mitochondria and other organelles and provides needed components for new cells. Autophagy also increases natural human growth hormone production and helps balance insulin and leptin activity. Poor dietary habits (eg, too many refined carbs), sleep disruption, inactivity, and aging inhibit autophagy. Dysfunctional autophagy is associated with several age-related conditions, including Parkinson's disease, type 2 diabetes, and cancer.

Interestingly, calorie restriction, which is known to increase longevity, is the most effective way to stimulate autophagy. Paul Fassa offers several methods for including fasting in one's lifestyle. The easiest, and probably least disruptive to the system, is to restrict food consumption by eating during just six hours of the day: for example, first meal at noon and last meal ends at six, with no snacking thereafter. (This is not always possible, depending on one's health problems.) Fassa says that coffee and epigallocatechin-3 gallate (EGCG), found in green tea, also stimulate autophagy, according to animal studies.

Tong and Hill say that some compounds, such as spermidine, stimulate autophagy and can "mimic" the longevity effects of calorie restriction. Spermidine, which consists of amino groups, is found in rice bran, soybeans, aged cheese, mushrooms, and broccoli. A 2016 animal study showed that spermidine induces autophagy in cardiac tissue and, thereby, reversed aging-associated heart dysfunction (Eisenberg T, et al. *Nat Med.* 2016:22:1428-1348). Studies like this are encouraging researchers to find ways to promote autophagy and, thereby, reverse age-related conditions.

Devlin H, Sample I. Yoshinori Ohsumi wins Nobel prize in medicine for work on autophagy. *The Guardian.* October 3, 2016.
Fassa P. Autophagy and Intermittent Fasting: Removing Waste from the Body and Cellular Regeneration for Better Health. Health Impact News. July 16, 2018.
Tong D, Hill JA. Spermidine Promotes Cardioprotective Autophagy. *Circ Res.* April 14, 2017;120(8):1229-1231.

◆

Literature Review & Commentary

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

Iron Deficiency and Heart Failure

Iron status was evaluated at hospital discharge in 578 patients with chronic heart failure. Absolute iron deficiency (ID) was defined as serum ferritin less than 100 µg/L, and functional ID was defined as serum ferritin of 100-299 µg/L with transferrin saturation less than 20%. Thirty-two percent of the patients had absolute ID, 15.2% had functional ID, and 52.8% had no evidence of ID. At one year after discharge, after adjustment for age, sex, systolic blood pressure, renal function, anemia, New York Heart Association functional class, and other variables, the incidence of the composite endpoint of all-cause mortality and hospitalization for heart failure was significantly higher by 50% in patients with absolute ID than in those with functional ID or no ID ($p = 0.04$). Similar results were seen in the unadjusted analysis and in the analysis adjusted only for age and sex. In contrast, the incidence of the composite endpoint was not higher in patients with functional ID than in those without ID.

Comment: Iron is a component of hemoglobin, which delivers oxygen to the tissues. In addition, iron is a cofactor for the enzyme, cytochrome oxidase, which plays a role in mitochondrial ATP production through the electron-transport chain. ATP is essential for the pumping action of the heart; therefore, ID could exacerbate heart failure whether or not a person is anemic.

Patients with heart failure are considered to have absolute ID if their serum ferritin level is below 100 µg/L. This cut-off level is well above that used to diagnose ID in healthy individuals. The higher cut-off point takes into account the fact that heart failure is associated with chronic inflammation, and that serum ferritin levels rise in response to inflammation. Functional ID is defined as impaired delivery of iron to metabolically active cells despite the presence of normal or even increased iron stores. Heart failure patients are thought to have functional ID if their serum ferritin level is between 100 and 300 µg/L (which is frequently seen in patients with chronic inflammatory diseases) and their transferrin saturation is below 20%.

In previous observational studies, the presence of absolute or functional ID was associated with increased mortality. In randomized controlled trials that enrolled patients with either absolute or functional ID, intravenous administration of iron improved functional status and decreased hospitalizations due to worsening heart failure. None of these previous studies stratified patients according to whether their ID was absolute or functional. In the new study, only absolute ID (not functional ID) was associated with adverse outcomes. Although observational studies do not prove causation, the findings from this study suggest that heart failure patients with functional ID should not receive iron supplements. That conclusion, while preliminary, is somewhat of a relief, since iron overload can cause many adverse effects, and there is something unsettling about the idea of giving an iron supplement to people whose ferritin level is over 100 µg/L, even if their transferrin saturation is low.

Nakano H, et al. Impact of iron deficiency on long-term clinical outcomes of hospitalized patients with heart failure. *Int J Cardiol*. 2018;261:114-118.

Omega-3 Fatty Acids for Psoriatic Arthritis

One hundred forty-five patients (mean age, 52 years) in Denmark with psoriatic arthritis were randomly assigned to receive, in double-blind fashion, 3 g per day of omega-3 fatty acids (50% eicosapentaenoic acid [EPA] and 50%

docosahexaenoic acid [DHA]) or placebo (olive oil) for 24 weeks. At 24 weeks, there was an 8.6% reduction in mean disease activity in the EPA/DHA group ($p < 0.05$ compared with baseline) and a 1.8% reduction in the placebo group ($p = 0.2$ for the difference in the change between groups). The mean intake of nonsteroidal anti-inflammatory drugs (NSAIDs) decreased by 58% and the mean intake of acetaminophen decreased by 55% in the EPA/DHA group. These decreases were significantly greater than the respective decreases in the placebo group (30% for each; $p = 0.04$ for both comparisons).

Comment: EPA, the main fatty acid in fish oil, has anti-inflammatory activity and has been shown in numerous clinical trials to be moderately effective as a treatment for rheumatoid arthritis. DHA is also present in fish oil, although it does not appear to have anti-inflammatory activity. The results of the present study suggest that fish oil or the omega-3 fatty acids present in fish oil may decrease the need for anti-inflammatory medications and analgesics in patients with psoriatic arthritis. A reduction in the dosage of these medications may reduce the risk of adverse effects, such as gastroduodenal ulcers and renal damage from NSAIDs and hepatotoxicity from acetaminophen.

Kristensen S, et al. Beneficial effect of n-3 polyunsaturated fatty acids on inflammation and analgesic use in psoriatic arthritis: a randomized, double blind, placebo-controlled trial. *Scand J Rheumatol*. 2018;47:27-36.

Chondroitin Sulfate for Osteoarthritis

Six hundred four patients (mean age, 65 years) in five European countries with osteoarthritis of the knee were randomly assigned to receive, in double-blind fashion, 800 mg per day of chondroitin sulfate (CS), 200 mg per day of celecoxib (a nonsteroidal anti-inflammatory drug), or placebo for six months. The mean reduction in pain on a 100-point visual analogue scale was 42.6 with CS, 39.5 with celecoxib, and 33.3 with placebo ($p = 0.001$ for CS vs. placebo). This represented improvements of 59.8%, 56.4%, and 47.6% with CS, celecoxib, and placebo, respectively. There was no significant difference in pain reduction between CS and celecoxib. The mean improvement in the Lequesne Index (a measure of disease severity) was 39.8% with CS, 39.7% with celecoxib, and 32.2% with placebo ($p < 0.05$ for CS vs. placebo at 3 and 6 months).

Comment: CS is one of the components of proteoglycans, the macromolecules that contribute to the structural and functional properties of joint cartilage. CS stimulates the synthesis of proteoglycans by chondrocytes (cartilage cells) and also has anti-inflammatory activity. Most, but not all, previous clinical trials found that CS decreased symptoms, slowed disease progression, or both, in patients with osteoarthritis of the knees, hips, or hands. The present study, which is one of the largest clinical trials to date, found that CS is as effective as celecoxib in patients with osteoarthritis of the knees.

Reginster JY, et al. Pharmaceutical-grade Chondroitin sulfate is as effective as celecoxib and superior to placebo in symptomatic knee osteoarthritis: the ChONdroitin versus CElecoxib versus Placebo Trial (CONCEPT). *Ann Rheum Dis*. 2017;76:1537-1543.

Does Eating Nuts and Seeds Increase Longevity?

The association between consumption of nuts and seeds and the length of telomeres in the DNA of leukocytes (a biomarker of biologic aging) was examined in a cross-sectional study of 5,582 randomly selected men and women participating in the National Health and Nutrition Examination Survey, 1999-2002. Telomere length was assessed using the quantitative polymerase chain reaction method. Consumption of nuts and seeds was estimated by 24-hour dietary recall. Intake of nuts and seeds was positively and linearly associated with telomere length. For each 1% of total energy derived from nuts and seeds, telomere length was 5 base pairs longer ($p < 0.007$). This translated to about 1.5 years of reduced cell aging for a person who consumed 5% of their total energy from nuts and seeds.

Comment: In this study, consumption of nuts and seeds was associated with clinically important increases in leukocyte telomere length, which suggests less biologic aging. This finding supports the recommendations of the 2015-2020 Dietary Guidelines for Americans, which encourage the consumption of nuts and seeds as part of a healthful diet. Nuts and seeds are good sources of protein, fiber, essential fatty acids, magnesium, and other nutrients.

Tucker LA. Consumption of nuts and seeds and telomere length in 5,582 men and women of the National Health and Nutrition Examination Survey (NHANES). *J Nutr Health Aging*. 2017;21:233-240.

Can Lowering Homocysteine Levels Prevent Deep Vein Thrombosis?

Ninety Chinese patients with deep vein thrombosis and an elevated plasma homocysteine concentration were randomly assigned to receive daily 5 mg of folic acid and 250 µg of vitamin B_{12} or to a control group that did not receive these vitamins for three months. The mean plasma homocysteine concentration decreased significantly in the vitamin group and did not change in the control group. The recurrence rate of deep vein thrombosis was significantly lower in the vitamin group than in the control group (4.4% vs. 28.9%; $p < 0.05$).

Comment: The possibility that homocysteine promotes thrombosis is suggested by the fact that thromboembolic disorders are common among individuals with the genetic disorder, homocystinuria. Furthermore, an elevated plasma homocysteine concentration has been found in observational studies to be a risk factor for venous thrombosis. In the present study, supplementation with folic acid and vitamin B_{12} for the purpose of decreasing elevated homocysteine levels reduced the recurrence rate of deep vein thrombosis. In previous studies, B-vitamin supplementation did not significantly decrease the incidence or recurrence rate of deep vein thrombosis compared with placebo, although these vitamins did significantly decrease the incidence of thrombotic episodes in soldiers stationed at high altitudes.

B vitamins might be more effective if given along with magnesium than if used alone. Circumstantial evidence suggests that supplementation with vitamin B_6 could deplete magnesium, an effect that might negate some of the beneficial effects of homocysteine-lowering.[1] In addition, it is possible that including betaine in a homocysteine-lowering regimen would improve clinical outcomes. Betaine appears to be particularly effective at lowering postprandial homocysteine levels, and there is evidence that the adverse effects of homocysteine are related more to peak (i.e., postprandial) than to fasting concentrations. The homocysteine-lowering

➤

➤

effect of betaine is dose-related over a dosage range of 500 mg per day to 2,000 mg three times per day.

Shu XJ, et al. Effects of folic acid combined with vitamin B12 on DVT in patients with homocysteine cerebral infarction. *Eur Rev Med Pharmacol Sci*. 2017;21:2538-2544.

Iodine Deficiency and Infertility

In a prospective cohort study of 501 women in the United States who had discontinued contraception during the previous two months in order to become pregnant, urinary iodine concentrations were sufficient (100 µg/L or higher) in 55.7%, mildly deficient (50-99 µg/L) in 21.8%, moderately deficient (20-49 µg/L) in 20.8%, and severely deficient (less than 20 µg/L) in 1.7% (total number deficient, 44.3%). Women whose iodine-to-creatinine ratios were below 50 µg/g were 46% less likely to become pregnant in each menstrual cycle then were women with higher ratios ($p < 0.03$).

Comment: Thyroid hormone plays a key role in reproduction, and even subtle hypothyroidism can lead to decreased fertility. Adequate iodine intake is essential for normal thyroid function. In the present study, 44.3% of US women trying to become pregnant had suboptimal or low iodine intake, and low iodine status was associated with a decreased probability of becoming pregnant. Dietary iodine intake should therefore be assessed in women planning to become pregnant, and those whose intake is inadequate should take a multivitamin that provides 150 µg per day of iodine. Doses much larger than that are not recommended during pregnancy, because excessive iodine intake can lead to congenital hypothyroidism in the fetus and infant.

Good food sources of iodine include milk, cheese, meat, fish, poultry, eggs, kelp and other seaweeds, and iodized salt. Cooking of food to which iodized salt has been added results in a loss of approximately 70% of the iodine. Therefore, individuals at risk for iodine deficiency should add salt to food after it is cooked, rather than during cooking.

Mills JL, et al. Delayed conception in women with low-urinary iodine concentrations: a population-based prospective cohort study. *Hum Reprod*. 2018;33:426-433.

Gluten-Free Diet for Tourette Syndrome

Twenty-six children and eight adults with Tourette syndrome were advised to follow a gluten-free diet for one year. Twenty-three children and six adults adhered to the diet. At the beginning of the study, 69% of the children and 100% of the adults had associated obsessive-compulsive disorder (OCD). After one year on the diet, compared with baseline, the mean severity of tics (as measured by the Yale Global Tics Severity Scale) decreased significantly by 50% in the children and by 63% in the adults. Compared with baseline, the mean severity of OCD (as measured by the Yale-Brown Obsessive-Compulsive Scale Self Report or the Children's Yale-Brown Obsessive-Compulsive Scale Self Report) decreased significantly by 65% in the children and by 70% in the adults. In the children, significant decreases were seen in the mean frequency or severity of respiratory tract infections, headaches, musculoskeletal symptoms, dermatitis, sleep disorders, and behavioral disorders. Similar degrees of improvement were seen in the adults, but (presumably because of the smaller sample size) the decreases were significant only for musculoskeletal symptoms, dermatitis, sleep disorders, and behavioral disorders.

Comment: Tourette syndrome is a neurological condition characterized by motor and vocal tics. It typically begins during childhood and improves spontaneously when the child becomes an adult, although in some cases the symptoms persist. People with Tourette syndrome also frequently suffer from OCD and attention deficit disorder. The cause of Tourette syndrome is unknown. Conventional therapy includes neuroleptic drugs such as haloperidol or pimozide.

In the present study, consumption of a gluten-free diet resulted in a marked reduction in tics and OCD, as well as an improvement in a wide range of other symptoms, in both children and adults. A trial of a gluten-free diet should therefore be considered for patients with Tourette syndrome, particularly if they have other symptoms that could be due to food sensitivity, such as irritable bowel syndrome, migraines, asthma, or unexplained fatigue. An elimination diet followed by individual food challenges should also be considered, because other common allergens (such as dairy products, corn, or eggs) might also be involved in some cases.

Rodrigo L, et al. Efficacy of a gluten-free diet in the Gilles de la Tourette syndrome: a pilot study. *Nutrients*. 2018;10:E573.

Vitamin B_{12} Decreases Side Effects of Aromatase Inhibitors

Forty-one women taking an aromatase inhibitor for breast cancer who were experiencing significant musculoskeletal symptoms (apparently as a side effect of the drug) received, in open-label fashion, 2,500 µg per day of vitamin B_{12} sublingually for 90 days. Compared with baseline, the mean pain score improved significantly by 34% after 90 days ($p < 0.0001$).

Comment: Aromatase inhibitors block the production of estrogen, and have been shown to prevent recurrences in women with hormone receptor-positive breast cancer. Aromatase inhibitors are more effective for preventing recurrences than tamoxifen (an estrogen receptor modulator), and they have become a mainstay of treatment for hormone receptor-positive breast cancer. However, as many as 50% of women who take an aromatase inhibitor experience side effects including joint pain and musculoskeletal symptoms, which often lead to discontinuation of treatment. In the present study, supplementation with vitamin B_{12} decreased aromatase inhibitor-induced musculoskeletal symptoms by about one-third. Placebo-controlled trials are needed to confirm this finding. The mechanism of action of vitamin B_{12} is not known. In previous studies, vitamin D also decreased the side effects of aromatase inhibitors. Additional research is needed to determine whether the effects of these vitamins are additive.

Campbell A, et al. Single arm phase II study of oral vitamin B_{12} for the treatment of musculoskeletal symptoms associated with aromatase inhibitors in women with early stage breast cancer. *Breast J*. 2018;24:260-268.

Reference

1. Gaby AR. Thrombophlebitis. In Gaby AR. *Nutritional Medicine*, 2nd edition. Concord, NH, 2017, www.doctorgaby.com, chapter 92.

◆

On the cover

Diseases of the Male Genital-Urinary Tract – Prevention Is the Best Cure

by Thomas A. Kruzel, ND

Men begin to experience diseases of the prostate beginning with the onset of puberty and the physical, hormonal and biochemical maturation of the organs of reproduction. This trend continues throughout the rest of our lives, even into old age when our reproductive capacities have declined. Depending upon a variety of factors, such as genetic makeup, overall health and potential exposures, each man will experience different challenges when it comes to disease exposure and development of symptoms, as we are unique and complex individuals.

The conventional medical approach to men's health in general has been to utilize suppressive therapies to allow for a quick resolution of symptoms. The theory is that if there are no symptoms, the disease must no longer be present. This approach overlooks the effects of any disease process on the entire organism in contradistinction to the naturopathic model of looking for the root cause of the disorder and treating it holistically. In the conventional medical paradigm, it has long been postulated that it is the organism or offending agent that is the cause of the disease and once eradicated, the disease has been eliminated. In the naturopathic/holistic view it is rather the soil or internal environment that contributes to whether the person develops an infection or other malady, as while we all are exposed to various organisms or the conditions that predispose one to developing a disease, not everyone will do so.

The prostate is a fibro muscular and glandular organ comprised of five lobes weighing about 20 grams. The urethra passes through the prostate where it connects with the ejaculatory ducts for delivery of sperm with ejaculation. The prostate gland because of its biochemical makeup and location is in essence the guard gate (from Ancient Greek *prostates*, which means "one who stands before," "protector," "guardian")[1] to the male reproductive system and as such its overall health is important to decreasing the risk of developing the various prostate diseases and afflictions that affect men during their lifetime. The prostate gland is high in enzymes, prostatic specific antigen, prostatic acid phosphatase, beta-microseminoprotein, zinc and citric acid or vitamin C, the combination of which makes prostate fluid slightly acidic. The concentration of zinc in the prostate is estimated to be 500 to 1000 times greater than blood levels as it is essential for the prevention of prostatic hypertrophy, functions as an immune modulator, and protects against the effects of heavy metals such as cadmium and lead. Addition of fluid from the seminal vesicles during ejaculation causes the solution to become more alkaline in order to survive the acidic vaginal environment. Prostatic specific antigen plays a role in liquefying seminal fluid ejaculate to allow sperm to migrate easily.

The view can be taken that the prostate gland is a dynamically functioning organ, which like all organ systems, is responsive to the environment in which it exists. An example would be its response to an exposure to an infective agent, during which there is an intense tissue inflammatory reaction resulting in hyperplasia and destruction of tissues as well as a proliferation of white blood cells. Acute reactions with proper treatment usually resolve but may leave behind some fibrous scarring. If incompletely treated however, the excretory ducts are unable to clear the tissue debris contributing to a state of chronic inflammation characterized by aggregates of lymphocytes, plasma cells, and macrophages within the gland. These same changes are also found with normal changes of aging but to a lesser degree. Repeated prostate infections contribute over time to additional pathological changes making the likelihood of developing prostatic hypertrophy and repeated infections greater.

Disease of the prostate follows essentially the same pattern of inflammation in general where inflammation is seen as an adaptation, a coordinated and protective response as well as a

➤

➤

period of recovery once the initial insult has been eliminated. Acute inflammation may be triggered by exogenous sources such as microbes or allergens as well as endogenous sources such as oxidative stress from advanced glycan end products (AGE's), lipoproteins or glycosylation.[2]

Essentially every disease process has a beginning, middle, end and recovery period, all of which are crucial to restoration of cellular and organ homeostasis. If any one of these are disrupted or circumvented, then an environment that fosters chronic disease remains and symptoms continue, even after the "causative agent" has been eliminated.

The PSA is a nonspecific test of prostate function that can be elevated for any number of reasons….

In patients with diabetes or hyperlipidemia, it becomes much harder for there to be a return to normal function because the environment or soil is compromised. Therefore, the prostate gland becomes much more susceptible to developing disease and takes longer to recover once it does. Often, the condition cannot be entirely eliminated until blood glucose and/or lipid levels are normalized.

Early in life our homeostasis set point margins are able to adapt to insults and often recover on their own, returning to optimal levels. This is because our auto-regulating system (ARS), a complex cybernetic system that merges and integrates control and corrective feedback mechanisms in order to maintain optimal homeostasis, functions at a much higher level. As we age however, this ability wanes resulting in more pronounced and longer lasting symptomology. This especially can occur if symptoms have been suppressed through various drug therapies that disrupt this complex mechanism, ultimately leading to chronic disease.[3] Along with the normal changes of aging, this is one of the reasons it takes longer to recover from any disease process the older we get.

Despite the fact that bacteria are only found with 5% to 10% of prostate infections, antibiotics are routinely prescribed and are often accompanied by NSAIDS or other anti-inflammatory medicines to treat the symptoms. Frequently, after the course of therapy is finished, the initial symptoms return with the same or similar therapeutic regimen prescribed. Often this regimen is repeated multiple times, further adding to the likelihood of developing a chronic condition because the healing process has not been able to complete its cycle.

While there is temporary relief from the symptoms of inflammation, inflammation is of itself a homeostatic mechanism employed by the body to eliminate the offending agent and should be viewed as a cleansing process. Under normal conditions, the interstitial fluid environment is alkaline but becomes acidic due to the accumulated excess wastes from the inflammation. With repeated suppression, the system has difficulty eliminating or can no longer excrete the acidic waste materials. When allowed to complete its action, the body's healing process generally does so in a timely and thorough manner, but when cut short by NSAIDS and repeated courses of antibiotics, a chronic disease cycle ensues.

Prostatic Specific Antigen

Prostatic specific antigen (PSA) is a serine protease produced almost exclusively by the prostate gland. PSA has little diurnal variation and thus samples obtained at varying times of the day will provide an accurate measure.[4] Variations in PSA values are often seen when samples are performed in different laboratories due to different methodologies. The PSA is a nonspecific test of prostate function that can be elevated for any number of reasons but has been largely used as a measure for detection of prostate cancer. PSA can be elevated due to inflammation from infection, following ejaculation or digital rectal exam, benign prostatic hypertrophy, urinary tract infection, aging, high cholesterol levels[5,6] prostate cancer and trauma such as catheterization or biopsy.[4] More controversial is whether bicycle riding affects a rise in PSA.

More recently, use of PSA as a marker for disease, especially prostate cancer (CAP), has been questioned as increased use has resulted in more diagnostic procedures and treatment for CAP than was previously seen.[7,8] About 40% of men with organ confined CAP will have a normal PSA[9] and autopsy studies show that 30% of men over age 50 who have no clinical evidence of CAP have cancer foci present.[10]

Use of total and free PSA provides a better evaluation for prostate cancer, but should be used in conjunction with other testing such as prostate cancer antigen-3 (PCA-3), a measure of the probability CAP will be found on biopsy, and the TMPRSS2-ERG, which predicts tumor aggression level. Additional testing such as color Doppler ultrasound provides information on tumor size, density, location and vascularity, while the 3Tesla MRI can be used for high resolution imaging of suspect lesions.

Many of the patients that I see with elevated PSA's often show up because they wish to avoid a biopsy, something that is more often than not the first procedure offered by their urologist. Before I refer for color Doppler, I will perform a few additional blood tests such as fasting chemistry screen and lipid panel, CCRP, and a CBC to look for inflammation, infection, or any other organ system disease and elevated cholesterol. I perform either a 2 or 3 glass urinalysis following prostate massage to look for infection.

Urethritis

While the prostate gland is considered to be the first line of defense against infection to the male genital-urinary tract, it is the urethra that is first exposed to potential infecting organisms. Non-gonococcal urethritis due to *Chlamydia trachomatis* and *Ureaplasma urealyticum* are found in up to 50% of the cases, but other organisms such as *Mycoplasma hominis*, *Candida albicans*, and Trichomonas are also found.[11,12] With the exception of Trichomonas, the other organisms are often found on routine culture of the perineal area of men and vaginal tract of women and do not cause symptoms of infection. This is because the environment is not conducive to allowing the organisms to set up "housekeeping," and the organism and host remain in a symbiotic relationship.

Because of the biphasic life cycle of Chlamydia, Ureaplasmin and Mycoplasma, infestation in the male genital urinary tract often produces no symptomology. This biphasic lifestyle pattern also makes it more difficult to eradicate an infection with antibiotics once it occurs, often leading to a return of symptoms following treatment. Urethritis in men usually presents with a purulent (gonococcal) discharge or a whitish mucoid (non-gonococcal) discharge, which is the body's attempt to eradicate the infection.

Prostatitis and Chronic Prostatitis

Acute bacterial prostatitis is as previously mentioned, only found about 5% to 10% of the time and is accompanied by fever, chills, low back and perineal pain. Affected individuals usually have problems with urination including frequency, urgency, and difficulty initiating urine flow and pain with urinating along with frequent urination at night. Digital rectal examination shows a swollen, tender and indurated gland. There may be a urethral discharge present, but this is more often seen with chronic prostatitis.[13]

Chronic prostatitis can occur following an incompletely treated acute prostatitis when the healing reaction has not had a chance to go to completion. Bacteria may be found but more often other agents such as Chlamydia, Ureaplasmin, Mycoplasma, Trichomonas or allergens contribute. Signs and symptoms are similar to that found with acute onset prostatitis but usually are experienced to a lesser degree. Men will complain that they experience exacerbations and remissions of symptoms but that they never fully go away. Sometimes this condition can last for years and is almost always exacerbated by stress.

Most of the men I see have had numerous courses of antibiotics and anti-inflammatories as well as numerous tests, none of which has resolved their symptoms or provided a definitive diagnosis.

Benign Prostatic Hypertrophy

Enlargement of the prostate gland is caused by an abnormal over-growth or swelling of tissue, termed hyperplasia. The increase in size is felt to occur because of an alteration in the testosterone/estrogen ratio and the effects of estrogen upon accumulation of androgens in the prostate.[14] As the central sulcus surrounding the urethra is higher in estrogen receptors, hypertrophy occurs resulting in urinary obstruction associated with BPH. Urinary obstruction can occur with little overall glandular enlargement but with time the prostate gland can become quite enlarged resulting in urinary obstruction to the point that bladder capacity and function are affected. This ultimately may result in permanent indwelling catheterization. Nodular hyperplasia is differentiated on the basis of whether the nodularity is due to granular proliferation or dilation or to fibrous or muscular proliferation of the stroma.[14] Additionally, because of the close proximity of the bladder sphincter to the prostate, symptoms of frequency and urgency to urinate will occur due to prostatic irritation and enlargement.

On autopsy BPH is found in more than 70% to 75% of men who are age 60 or older. Of these only about 25% exhibit symptoms, which has led some to question whether the variable nature of BPH is a normal part of the aging process.[9,15]

Men may also develop corpora amylacea or "prostatic concretions" a dense accumulation of calcified proteinaceous material that becomes lodged in the gland. While prostatic calcification is relatively common, their presence may result in symptoms that resemble chronic prostatitis, BPH, chronic pelvic pain syndrome, and urinary tract infection. With time, the concretion becomes a breeding ground for infection as it becomes difficult to eradicate due to poor circulation.

Prostate Cancer

A number of factors play a role in the development of prostate cancer (CAP) such as age, race, environmental exposures to toxins, diet and nutrition, endocrine system dysregulation, and genetics. The risk of prostate cancer increases steadily after age 40 until a peak incidence is reached about age 80. Pre-malignant changes seen in younger men often do not become apparent until much later in life, thus contributing to the increasing incidence seen with aging. As there are a number of factors involved with the development of CAP, aging alone does not necessarily mean that one will develop the disease.

Most prostate cancers arise in the peripheral zone away from the urethra and therefore symptoms of urinary obstruction develop later on. If the symptoms of obstruction are due to cancer of the prostate, it generally means that there is a significant amount present.

Approximately 20% of all prostate enlargements are the result of cancer. About 80% of these cancers are of the slow growing variety, do not metastasize readily and often cause little if any problem. A smaller percentage of these cancers may spread quickly depending upon the type and location of the lesion.

Populations with diets high in animal fats and refined sugar and lower in fiber and vegetable intake have much higher incidences of cancer of the prostate. High animal fat intakes, as well as the development of obesity, has been shown to have one of the strongest associations with prostate cancer. Men from cultures traditionally with low incidences of CAP, who migrate to the United States, develop the cancer at rates comparable to those of their American counterparts. If however, they retain their native diets, the incidence does not increase as much. As a number of studies have shown, with all other contributing factors being equal, diets high in fiber, fruits and vegetables result in a lower incidence of prostate as well as other cancers.

Environmental factors play a variety of roles in the development of CAP. Often there are several factors which contribute over a period of time, but some seem to play a greater role than others. It has been noted that there are higher rates of prostatic cancer in males who are exposed to chemical toxins. Occupations in industries such as petrochemical, rubber and textile are among the highest in number of CAP cases. Urban, as opposed to rural areas, have higher incidences of CAP, which is felt to be due to air and other pollutants.

Cadmium has also been implicated in cancer of the prostate as a much higher incidence is found in men who work with

➤

➤

batteries. Zinc is normally found in high concentrations in the prostate gland and will be displaced by cadmium.

Allergies

Allergies of the genital urinary tract (GU) are an often unrecognized and under-diagnosed condition that can be the cause of considerable discomfort. More often than not symptoms are associated with an infection for which antibiotics are prescribed that ultimately have no effect. There are generally three areas of allergic reactions associated with the GU tract: Contact dermatitis involving the penis and scrotum in men and labia, vagina and perineum in women; the lower urinary tract, involving the urethra and bladder in women, and urethra, bladder and prostate in men; and the kidneys and ureters.

A reasonable approach to treating male genital urinary tract disease is preventing them before they even start.

Signs and symptoms include edema, swelling, inflammation, and itching during an acute episode, often with no fever present. Swelling can be severe. There is often frequency, urgency, dysuria, nocturia, and a dull, suprapubic ache that accompany lower urinary tract allergic reactions. Often there is no fever or pyuria present; but flank pain, gross hematuria, and occasional urinary retention may be present.

Frequent urination at night or bedwetting is one of the most commonly encountered conditions associated with food allergy. Patients with asthma, hay fever, migraine, and urticaria are also frequently found to have urinary symptoms related to allergies as well.[16-18]

Proctalgia Fugax

Proctalgia fugax is a functional anorectal disorder that occurs due to muscle spasm and cramping of the rectal musculature. The patient experiences a severe and often debilitating pain for which a triggering event or agent may or may not be identified. A comparable condition due to spasm of the levator ani also produces similar symptomology. Often this occurs at night when the person is recumbent and more relaxed and is generally intermittent in nature.

I mention these conditions because often men believe that they have chronic prostatitis because some of the symptoms such as difficulty with urination, burning of the perineum, and pain with urination occur. Other contributing conditions such as anal fissure, hemorrhoids, or injury to the coccyx need to be considered.

Prevention the Best Cure

A reasonable approach to treating male genital urinary tract disease is preventing them before they even start. While this seems to be a reasonable approach, men's illnesses in American culture are often viewed as a weakness, and therefore symptoms are frequently ignored or dismissed. Men more often than not are seen when their diseases are in advanced stages making it more difficult to treat. Conventional medical treatments as mentioned previously, are designed to suppress symptoms so that the patient can quickly get back to work or their careers, which ultimately leads to chronicity of the disease.

Some things to consider when developing preventive treatment plans are educating men about diet and nutrition, supplementation, herbal medicines for urinary tract health and lifestyle changes. Developing strategies for prevention of any disease should also provide for screening exams and lab studies so that they can be recognized early on. These can include periodic urinalysis, PSA, fasting chemistry screen and lipid panels, and inflammatory markers such as CCRP, and ferritin.

Diet and Nutrition.

As mentioned previously, populations with diets high in animal fats and refined sugar and lower in fiber and vegetable intake have much higher incidences of cancer of the prostate while those that are higher in fruits and vegetables generally do not.[19-21]

Overall, I recommend a balanced diet that is high in protein and vegetables, lower in carbohydrates and very low in fat. I also utilize diets based upon the patient's blood type in order to decrease the effects of dietary lectins in the development of disease and in particular, allergic reactions.[22]

I also counsel men about their drinking habits, especially beer. Most men do not realize that in order to lower the calories in light beers so they supposedly will not put on weight, the hops content is increased to add flavor. Hops are highly estrogenic which will affect estrogen receptors in the prostate as well as around our midsections. No wonder some men have trouble urinating and can no longer see their shoes!

Antioxidants such as vitamin C, E, resveratrol, and green tea are helpful in eliminating free radical formation while enhancing cellular oxidation. These support the inflammatory process as well, allowing it to complete its work in a timely manner to restore normal homeostasis. Other supplementation with zinc, magnesium and B complex, especially B6, also provides benefit; and these are often part of prostate health formulas.[23]

Identifying Potential Toxic Exposures.

Environmental factors also play a variety of roles in the development of prostate disease but especially CAP. Often it is several factors which contribute over a period of time, but some seem to play a greater role than others. It has been noted that there are higher rates of prostatic cancer in males who are exposed to chemical toxins. Occupations in industries such as petrochemical, rubber and textile are among the highest in number of CAP cases. Urban, as opposed to rural areas, have higher incidences of CAP which is felt to be due to greater exposure to industrial pollutants. Higher rates of CAP are seen in smokers as well as exposure to arsenic.[24] As previously mentioned, cadmium which displaces zinc, has also been implicated in cancer of the prostate as a much higher incidence is found in men who work with batteries.

Most of the adverse effects of heavy metals and persistent organic pollutants such as PCBs, phthalates, pesticides, polychlorinated biphenyls (PCB), chlorinated compounds and heavy metals are found to affect fertility by lowering sperm counts while fostering the production of abnormal sperm. Erectile dysfunction due to lower testosterone levels is also found. In particular, phthalates, PCBs, perfluorocarbons and bisphenol A contribute to lower testosterone levels and hypogonadism.[24]

Assessing Genetic Risk Factors

A family history of prostate cancer increases the likelihood of developing CAP. Men, who have a past history of frequent or chronic prostatitis, also are at somewhat of an increased risk for CAP. Genetic factors seem to play a role, as there are higher incidences of CAP in some families than others, especially if there is a father or brother with the disease. An early onset of the disease, in males less than 55 years old, suggests a familial predisposition. Black American males show a 50% higher incidence than whites.

Certain blood types such as Type A and AB show higher incidences of CAP than their O and B counterparts. Non-secretors also appear to be at higher risk. Urinary tract infections, including cystitis, are found to be higher in blood group B and AB types with O and A types having lower rates.[25] These are because proteins on certain bacteria and cancer cells are similar to those of the host, and as such are not as easily identified by the immune system.[26]

More recently genetic testing has become better able to predict the possibility of developing certain diseases and can be used to help develop individualized prevention strategies.

Lifestyle Modifications

There are many over-the-counter prostate supplements that are used by men for BPH, prostatitis, CAP and to promote prostate health. While these do provide some benefit when treating various male GU diseases, their real value is in their use as a preventive as they provide what is needed to keep the prostate healthy. I begin to talk with men in their late 30s about using prostate formulas as a preventive against the effects of aging.

Some other things to consider are to keep the interstitial fluid environment pH from becoming acidic by encouraging men to eat the requisite amounts of fresh fruits and vegetables. And yes, they can drink alkaline water to do this, but fresh fruits and vegetables contain far more nutrients and minerals that are needed to decrease inflammation. Keeping systemic inflammatory processes low for any condition is important not only for prostate health but for health in general. Use of anti-inflammatories to accomplish this is somewhat counterproductive, and identification and removal of the cause is preferable.

Promoting pelvic blood and lymph flow through the use of hydrotherapy and exercise is beneficial to maintain health of the male genital-urinary tract. This can be accomplished with a variety of natural therapies and exercise programs. Urinating following intercourse and ejaculation cuts down on the potential for exposure to microorganisms from the vaginal tract.

Reducing chronic stress[27,28] and finding one's spiritual center are important to help balance our bodies, minds, and spirits as well as pursuing those things we love to do to make our lives fulfilling and rewarding. Talking to our male patients early on about recognition and prevention of disease in general but prostate disease in particular will help decrease the incidence of male genital urinary morbidities.

References

1. Harper D. Prostate. *Online Etymology Dictionary*. Retrieved 8/ 2018.
2. Pizzorno J, Katzinger J. *Clinical Pathophysiology A Functional Perspective*. Coquitlam, BC, Canada: Mind Publishing; 2012.
3. Smit A, et al. *Introduction to Bioregulatory Medicine*. Stuttgart: Thieme; 2009.
4. Jacobs D, Demott W, Oxley D. Laboratory Test Handbook (5th ed). Cleveland, Ohio: Lexi-Comp, Inc; 2001.
5. Schieszer J. Study Links PSA Levels, Cholesterol. September 2, 2008. https://www.renalandurologynews.com/news/study-links-psa-levels-cholesterol/article/116183/
6. Zapata D, et al. Is PSA related to serum cholesterol and does the relationship differ between black and white men? *Prostate*. December 2015;75(16):1877-85.
7. Stamey T, et al. Prostate Specific Antigen as a serum marker for Adenocarcinoma of the prostate. *NEJM*. October 8, 1987; 317(15).
8. Modica P. Routine Prostate Screening Rejected. *Medical Tribune*. April 1997; 38 (7).
9. Yoshikawa T, Cobbs E, Brummel-Smith K. *Ambulatory Geriatric Care*. St. Louis: Mosby; 1993.
10. Garraway M (ed). *Epidemiology of Prostate Disease*. Berlin: Springer; 1995.
11. Tanagho E, McAninch J (eds). *Smith's General Urology* (14th ed). Norwalk, CT: Appleton & Lange; 1995.
12. Brunwalk E, et al (eds). *Harrison's Principals of Internal Medicine* (15th ed). New York: McGraw-Hill; 2001.
13. Robbins, Cotran, Kumar. *Pathologic Basis of Disease*. Philadelphia: W B Saunders Co; 1984.
14. Berger R, Hanno P. A spectrum of prostatitis syndromes. *Patient Care*. May 1990.
15. Stieglitz E (ed). *Geriatric Medicine Medical Care of Late Maturity* (3rd ed). Philadelphia:J B Lippincott Co; 1954.
16. Pastinskzy I. The Allergic Diseases of the Male Genitourinary Tract with Special Reference to Allergic Urethritis and Cystitis. *J Urol*. 1959; 9: 288-305.
17. Powell N. Allergies of the Genito-Urinary Tract. *Annals of Allergy*. September 1961;19.
18. Powell N, et al. Allergy of the Lower Urinary Tract. *J Urology*. April 1971; 7.
19. Kristal AR, et al. Dietary patterns, supplement use, and the risk of symptomatic benign prostatic hyperplasia: results from the prostate cancer prevention trial. *Am. J. Epidemiol.* 2008; 167 (8): 925-34.
20. Giovannucci E, et al. A Prospective Study of Dietary Fat and Risk of Prostate Cancer. *J Nat Can Inst*. 1993; 85:1571-9.
21. Granberg H, et al. Total food consumption and body mass index in relation to prostate cancer risk: a case-control study in Sweden with prospectively collected exposure data. *J Urol*. March 1996; 155 (3): 969-74.
22. Kruzel T. The Role of Lectins in the Formation of Disease and Their Potential Use in Treatment. *J of Naturopathic Med* Vol 8, No 2 1998
23. Halliwell B, et al. Lipid peroxidation, oxygen radicals cell damage, and antioxidant therapy. *Lancet*. 1984; 1396.
24. Crinnion W, Pizzorno J. *Clinical Environmental Medicine – Identification and Natural Treatment of Disease Caused by Common Pollutants*.
25. D'Adamo P. *Eat Right for Your Type Complete Blood Type Encyclopedia*. New York: Riverhead Books; 2002.
26. Drachenberg C, Papadimitriou J. Aberrant pattern of lectin binding in low and high grade prostatic intraepithelial neoplasia. *Cancer*. May 1995; 75(10): 2539-44.
27. Roth A, Passik S. Anxiety in Men with Prostate Cancer. *Primary Care & Cancer*. Nov/Dec 1996; 16 (10).
28. Watts S, et al. Depression and anxiety in prostate cancer: a systematic review and meta-analysis of prevalence rates. *BMJ Open*. March 13, 2014; 4(3):e003901.

◆

Thomas A. Kruzel, ND, received a BA in biology from the California State University at Northridge, and his Doctorate of Naturopathic Medicine from the National College of Naturopathic Medicine. He is the author of the *Homeopathic Emergency Guide – A Quick Reference Handbook to Effective Homeopathic Care,* published by North Atlantic Books and Haug Publishers Germany, and *Natural Medicine Pediatric Home Health Advisor*. He has also published numerous articles in *The Journal of Naturopathic Medicine* as well as other publications, been a member of the *Alternative Medicine Review* editorial review board since 1997, and editor of the clinical medicine section of the *Foundations of Naturopathic Medicine Project* textbook. A past president of the American Association of Naturopathic Physicians, Dr. Kruzel was selected as Physician of the Year by the AANP in 2000 and Physician of the Year by the Arizona Naturopathic Medical Association in 2003.

Dr. Kruzel is in private practice at the Rockwood Natural Medicine Clinic in Scottsdale, Arizona (www.rockwoodnaturalmedicine.com) and can be contacted at rnmc9755@gmail.com.

Erectile Dysfunction: An Integrative Approach to Making it Work

by Dr. Geo Espinosa, ND, LAc, IFMCP, CNS

The definition of erectile dysfunction (ED) is the inability to obtain or maintain an erection firm enough for sexual intercourse. Historically, admitting to having ED was considered taboo and downright embarrassing until the advent of sildenafil citrate (Viagra) in 1998. Sildenafil liberated men from the stigma of having ED, and it opened a conversation about a problem that has existed for centuries. Up to 10% of men younger than forty suffer from ED and upwards of 60% by age 69.[1]

The Physiology of an Erection

To learn how to treat erectile dysfunction, it is useful to understand how normal pelvic functioning works. Penile engorgement (tumescence) is a neurovascular event influenced by psychological and hormonal factors.

During sexual stimulation, sexual thoughts, or nocturnal erections, the neurotransmitter nitric oxide (NO) is released from the endothelial cells and the parasympathetic nerve terminal causing relaxation of two cylinder-like muscles called the corpora carvenosum. Nitric oxide influences an increase in concentrations of cyclic guanosine monophosphate (cGMP), which after numerous pathways triggers smooth muscle relaxation, and simultaneous closing of small veins traps blood in the cavernosal muscles, keeping blood in the cavernosal tissues that cause and maintain an erection.

Detumescence or a flaccid penis after ejaculation occurs from two events: a sympathetic effect during ejaculation inducing a breakdown of cGMP by the enzyme phosphodiesterase-5 and opening of the venous channels, thereby, expelling blood out of the carvenosum muscles, restoring flaccidity.[2]

The bottom line is that for penile erections to occur, there needs to be smooth and unobstructed transmission of nerve impulses and blood through the penile vessels

What Are the Major Causes of ED?

ED is caused by vascular, hormonal, neurogenic, pharmacological, or psychogenic factors. Performance anxiety where the person fears failing in a sexual scenario is a common psychogenic cause for ED.[3] Neurogenic causes are related to diseases like Alzheimer's, Parkinson's, stroke or spinal cord injuries. Radical removal of the prostate (also called prostatectomy) is the cause of nerve-related ED as nerve injury is possible despite advances in surgical methods.[4]

Testosterone (T) has an indirect influence on penile function. While the connection between T and erectile dysfunction is not linear, the master androgen is still significantly involved in penile function in adults. T supports the integrity of the corpus carvenosum and the vasculature that feeds the penis.

Nitric oxide (NO) is the key mediator for erectile function. NO is synthesized by the enzyme NO synthase (NOS), which is produced by endothelial cells (eNOS) and non-adrenergic/non-cholinergic (NANC) nerves (nNOS). Both eNOS and nNOS have been shown to be up-regulated by T.[5]

Lastly, T regulates the enzyme PDE5, which underlies the molecular mechanism that leads to the conclusion of an erection.[6]

Drug-Induced Erectile Dysfunction

Antidepressants, including selective serotonin reuptake inhibitors drugs and antihypertensives, are among the most common drug classes involved in the development of erectile dysfunction.[7]

Thiazides, followed by β blockers, are the most common groups of antihypertensive drugs that cause erectile dysfunction, whereas α blockers, angiotensin-converting enzyme inhibitors, and angiotensin receptor blockers are the least likely of these drugs to cause erectile dysfunction.[8]

Opioids are used for chronic pain or for recreational use, and there is currently an epidemic of opioid addiction in the United States. Opioids induce ED by inhibiting gonadotropin-releasing hormone (GnRH), which leads to a decrease in the production of luteinizing hormone (LH). Decreased levels of LH, in turn, inhibit production of testosterone, which – in both men and women – can cause depression and sexual dysfunction.[9]

Pharmaceutical Treatment for ED

The first line medical treatment for ED is phosphodiesterase inhibitors-5 (PDE-5) like sildenafil (Viagra; USA), tadanafil (Cialis; USA), verdenafil (Levitra; USA), udenafil (Zydena; South Korea), and mirodenafil (Mvix; South Korea).

These drugs facilitate erection by inhibiting the PDE5 enzyme, by blocking the degradation of cyclic guanosine monophosphate (cGMP) in the cavernous smooth muscles. This inhibition results in the prolonged activity of cGMP, which further decreases intracellular calcium concentrations, maintains smooth muscle relaxation and, hence, results in rigid penile erections.

Numerous placebo-controlled studies have shown that the number of erections and rates of penile rigidity, orgasmic function, and overall satisfaction improved with sildenafil more than placebo.

The most common adverse events associated with all of the PDE-5 inhibitors[10] are headaches in 16% of men; flushing in 10% of men; dyspepsia (7%); nasal congestion (4%), and visual disturbances/color sensitivity in about 3%. Tadalafil distinguishes itself from vardenafil and sildenafil by the relative lack of visual side effects. It does, however, have an additional possible adverse effect, which is back pain and/or myalgia.[11]

A clinical observation by the author is penile desensitization, where a numbing-like effect on the organ occurs. Patients would often say, "I feel like my penis is detached from my body" or "I am getting an erection, but I am not enjoying it."

Also, delayed ejaculation is another complaint clinically observed in men using PDE-5 inhibitors where the man is unable to reach orgasm. This is a frustrating scenario for men that can lead to less sexual desire.

Metabolic Syndrome

Persons with metabolic syndrome can be identified by a distinct pattern of abdominal obesity (waist circumference >40 inches in men), atherogenic dyslipidemia (triglycerides ≥150 mg per 100 ml, HDL <40 mg per 100 ml, small LDL particles and normal or slightly elevated LDL), hypertension (≥130/85 mm Hg), insulin resistance (fasting blood glucose ≥10 0 mg per 100 ml), and elevated levels of prothrombotic and proinflammatory markers. Metabolic syndrome and insulin resistance are closely linked to ED. In one recently conducted study of 120 men with ED and no evidence of diabetes, 40% of patients fulfilled strict criteria for metabolic syndrome, and 73% were insulin resistant.[12]

Strong Cardiovascular-Penile Connection

There is a significant correlation between ED and cardiovascular disease (CDV).

In a meta-analysis of 12 prospective cohort studies, strong evidence showed that erectile dysfunction is indeed significantly and independently associated with an increased risk of not only CVD but also coronary heart disease, stroke, and all-cause mortality.[13]

Diagnosis

The main goals of assessment of erectile dysfunction are the following:

1. Establish whether the patient truly has erectile dysfunction;
2. Identify the cause of the disorder;
3. Evaluate risk factors and potentially life-threatening comorbid disorders associated with erectile dysfunction.

The diagnosis of erectile dysfunction requires a comprehensive sexual and medical history that include a validated questionnaire, the Sexual Health Inventory for Men (SHIM), and asking if they experience a rigid erection at night, in the morning, or during masturbatory approaches. The presence of rigid morning or night erections, or rigid erections at any sexual thought suggests a mainly psychogenic cause. Conversely, erectile dysfunction with a gradual onset, progressive course, or long duration suggests a predominantly organic cause.

Laboratory testing should include the following:

- Fasting blood glucose
- Hemoglobin A1c
- Total and Free Testosterone
- Luteinizing hormone (LH)
- DHEA -S
- Prolactin
- Lipid profile
- C-Reactive Protein
- Endothelin-1

Natural Treatment

The role of the practitioner providing a naturopathic treatment plan is to first identify the cause of the individual's ED. If the cause is psychogenic (i.e. performance anxiety, depression, relationship problems), referral to a psychotherapist should be considered. Organic causes like metabolic syndrome, insulin resistance, or diabetes type II can be properly treated with lifestyle medicine and other numerous nutritional prescriptions beyond the scope of this article to discuss.

Hormonal causes should be treated with natural, lifestyle methods to help increase testosterone levels before prescribing supplemental, exogenous testosterone therapy. If DHEA-S levels are low, supplement with 50 mg of DHEA.

Lifestyle Measures

A sedentary lifestyle, smoking, alcohol or drug misuse, sleep disorders, obesity, and metabolic syndromes have all been associated with erectile dysfunction.[14]

Intensive lifestyle changes that include a Mediterranean type diet, circuit-type resistance training, with 15- to 60-second rest between sessions has shown to improve erectile score in a randomized trial. Men in the intervention group had a significant decrease in glucose, insulin, low-density lipoprotein cholesterol, triglycerides, and blood pressure, and a substantial increase in HDL cholesterol.[15]

Botanical and Natural Support for ED

Adaptogens are nontoxic agents that increase resistance to stressors and prevent fatigue. There are well-documented adverse effects of stress on libido and sexual function to suggest that adaptogens might have a role in counteracting stress-induced sexual dysfunction. In my clinical experience, adaptogens are the primary botanical approach in treating ED.

Panax or Asian ginseng (also known as Korean or Chinese ginseng) is considered a "heating" or stimulating herb in Chinese traditional medicine, though the degree to which it is energizing vs. calming (as a result of counteracting the harmful effects of stress) appears to have been lost in translation as Asian ginseng moved from traditional Chinese medicine to being a Western commodity, according to Dr. Eric Yarnell in the book, *Integrative Sexual Health*.[16]

A meta-analysis of seven clinical trials using steamed, dried roots of four-year-old Asian ginseng roots (known as red ginseng or hóng shēn) in men with ED of various types found that overall red ginseng was effective compared to placebo. Doses ranged from 1,000 mg daily to 600 mg tid.[16]

Withania somnifera (ashwagandha) root, a member of the Solanaceae family, also has a long history of use and would be considered an adaptogen. As its Latin binomial suggests (somnifera coming from the Latin word for sleep), it is more clearly a calming or relaxing agent. It has a strong history of use as a sexual tonic, particularly for men, despite the fact that in a randomized, single-blind trial, crude root powder 2 g tid was not superior to placebo at improving psychogenic ED in 86 men, The short duration of this trial of 60 days was probably a major limiting factor as adaptogens typically take more than three months to start to have noticeable effects.[17] A good dose ranges from 500 mg

➤

➤

two times a day to 2 grams three times a day for at least three months.

Rhodiola rosea, like ginseng, is another popular research-supported adaptogen used for centuries to increase physical endurance and longevity, as well as to manage fatigue, depression, and impotence. A multitude of published clinical studies supports rhodiola's well-known and established benefits to energy levels, stress management, immune function, and cellular health, as well as its role as a potent antioxidant. Given the strong connection between stress and increased sexual dissatisfaction, supplementation with this botanical becomes all the more important.

In one study, rhodiola was given to 56 young physicians on night call, when there is typically a significant decrease in physical and mental performance. At the conclusion of the study, the researchers found a statistically significant reduction of stress-induced fatigue after just two weeks of supplementation with rhodiola. No side effects of rhodiola were reported.[18]

Another well-designed study evaluated the one-time use of the same rhodiola in 161 male military cadets undergoing sleep deprivation and stress. The results showed that rhodiola was more effective than placebo in fighting the effects of fatigue.[21]

The dose for rhodiola is 500 mg once to two times a day.

Epimedium or Horny goat weed and icarrin, a flavonoid found in it, have been repeatedly shown in preclinical trials to act as phosphodiesterase-5 inhibitors with similar mechanisms of action to the pharmaceuticals sildenafil, tadalafil, and vardenafil.[20]

Epimedium should be considered a long-term tonic medicine for men with erectile dysfunction and low libido. It takes one to three months to start to take effect and gets stronger with long-term use in most cases. A typical dose would be 1-2 g three times daily.

L-citrulline (L-Cit) is known to increase nitric oxide (NO) production via the increase of L-arginine (L-Arg) concentration in the blood and improve endothelial dysfunction in cardiovascular diseases. A small study of 24 patients reported improvement in the erection hardness score in the L-citrulline group compared to the placebo arm. All patients reporting an erection hardness score improvement from 3 to 4 reported being very satisfied.[21] The dosage for L-citrulline is 750 mg, once to two times a day.

Resveratrol is a natural antioxidant with benefits for a variety of age-related challenges, including circulatory and sexual health concerns. Studies indicate that resveratrol supplementation may help to ward off atherosclerotic changes associated with imbalanced cholesterol while enhancing nitric oxide circulation, erection quality, blood testosterone levels, and sperm count and motility. The result is safe support for superior erectile function and endothelial health.[22]

Pomegranate. The analysis shows that pomegranate is abundant in the antioxidant anthocyanin, a flavonoid that enhances erection-stimulating nitric oxide bioavailability while promoting arterial health and optimal penile blood flow. As a result, controlled trials have revealed that supplementation with pomegranate may be able to facilitate firm erections and enhanced sexual performance in men with both cardiovascular and erectile function concerns – two challenges that often present simultaneously.[23] The dosage for pomegranate extract is 300 mg once or twice a day.

Dehydroepiandrosterone (DHEA). In a randomized clinical trial, men in the DHEA arm experienced significant improvement compared to placebo participants whose results were unchanged or worse. There was no change in testosterone or the serum biomarker PSA. Mean prostate size decreased slightly in the DHEA arm and increased in placebo.[24] The dosage for DHEA is 50 to 100 mg once a day.

Dr. Geo Espinosa is a naturopathic doctor, licensed acupuncturist and certified functional medicine practitioner recognized as an authority in holistic urology and men's health. He is faculty and holistic clinician in Urology at New York University Langone Medical Center and faculty at the Institute for Functional Medicine (IFM). As an avid researcher and writer, Dr. Geo has authored numerous scientific papers and books including co-editing the Integrative Sexual Health book, Oxford University Press, and author of the best selling prostate cancer book: Thrive, Don't Only Survive. Dr. Geo is the Chief Medical Officer (CMO) and formulator at XY Wellness, LLC and lectures internationally on the application of science-based holistic treatments in urological clinics. On his free time, he enjoys writing on his popular blog, DrGeo.com, spending time with his wife and three kids and practicing the Israeli martial art, Krav Maga.

References

1. Lewis RW, et al. Definitions/epidemiology/risk factors for sexual dysfunction. *J Sex Med*. 2010; 7: 1598-1607.
2. Shamloul R, Ghanem H. *Erectile Dyfunction*. *The Lancet*. 2013: 381 (9861):153 – 165.
3. Carson C, Dean J, Wylie M. Management of erectile dysfunction in clinical practice. Springer Medical Publishing, New York (2006)
4. Mulhall JP. Penile rehabilitation following radical prostatectomy. *Curr Opin Urol*. 2008; 18: 613-620
5. Park KH, et al. Effects of androgens on the expression of nitric oxide synthase mRNAs in rat corpus cavernosum. *BJU Int.* 1999;83: 327-333
6 Traish AM, et al. Effects of medical or surgical castration on erectile function in an animal model. *J Androl*. 2003;24:381-387
7. Aversa A, et al. Early endothelial dysfunction as a marker of vasculogenic erectile dysfunction in young habitual cannabis users. *Int J Impot Res*. 2008;20: 566-573
8. Thomas A, et al. Urologic complications of nonurologic medications. *Urol Clin North Am.* 2003;30:123-131
9. Ajo R et al. Erectile dysfunction in patients with chronic pain treated with opioids. *Med Clin* (Barc). 2017 Jul 21;149(2):49-54.
10. Morales A, et al. Clinical safety of oral sildenafil citrate (VIAGRA) in the treatment of erectile dysfunction. *Int J Impot Res*. 1998;10(2):69-73; discussion 73-4.
11. Padma-Nathan H. Efficacy and tolerability of tadalafil, a novel phosphodiesterase 5 inhibitor, in treatment of erectile dysfunction. *Am J Cardiol*. 2003;92(9A):19M-25M.
12. Bansal C, et al. Incidence of metabolic syndrome and insulin resistance in a population with organic erectile dysfunction. *J Sex Med*. 2005; 2: 96–103.
13. Dong JY, et al. Erectile dysfunction and risk of cardiovascular disease: meta-analysis of prospective cohort studies. *J Am Coll Cardiol*. 2011;58:1378-1385
14. Gatti A, et al. Metabolic syndrome and erectile dysfunction among obese non-diabetic subjects. *J Endocrin Investigation.* June 2009;32(6):542-545.
15. Esposito K, et al. Effects of intensive lifestyle changes on erectile dysfunction in men. *J Sex Med*. 2009 Jan;6(1):243-50.
16. Bartlik B, Espinosa G, Mindes J (eds.). *Integrative Sexual Health*. Oxford University Press. 2018.
17. Mamidi P, Thakar AB. Efficacy of ashwagandha (Withania somnifera Dunal Linn) in the management of psychogenic erectile dysfunction. *Ayu*. 2011; 32(3):322-8.
18. Darbinyan V, et al. Rhodiola rosea in stress induced fatigue – a double blind cross-over study of a standardized extract SHR-5 with a repeated low-dose regimen on the mental performance of healthy physicians during night duty. *Phytomedicine*. 2000;7:365-371.
19. Shevtsov VA, et al. A randomized trial of two different doses of a SHR-5 rhodiola rosea extract versus placebo and control of capacity for mental work. *Phytomedicine*. 2003;10:95-105.
20. Chiu JH, et al. Epimedium brevicornum Maxim extract relaxes rabbit corpus cavernosum through multitargets on nitric oxide/cyclic guanosine monophosphate signaling pathway. *Int J Impot Res*. 2006;18:335-342.
21. Cormio L, et al. Oral L-citrulline supplementation improves erection hardness in men with mild erectile dysfunction. *Urology*. 2011;77 (1):119 -22
22. Fukuhara S et al. Vardenafil and resveratrol synergistically enhance the nitric oxide/cyclic guanosine monophosphate pathway in corpus cavernosal smooth muscle cells and its therapeutic potential for erectile dysfunction in the streptozotocin-induced diabetic rat: preliminary findings. *J Sex Med*. 2011 Apr;8(4):1061-71.
23. Forest CP, Padma-Nathan H, Liker HR. Efficacy and safety of pomegranate juice on improvement of erectile dysfunction in male patients with mild to moderate erectile dysfunction: a randomized, placebo-controlled, double-blind, crossover study. *Int J Impot Res*. 2007 Nov-Dec;19(6):564-7.
24. Reiter WJ, et al. Dehydroepiandrosterone in the treatment of erectile dysfunction: a prospective, double-blind, randomized, placebo-controlled study. *Urology*. 1999 Mar;53(3):590-4; discussion 594-5.

◆

The Pot Calling the Kettle Black: The Death of Angioplasty in Stable Coronary Disease

by Dr. Douglas Lobay, BSc, ND

I was reading the February 12, 2018 online edition of the *New York Times* when I stumbled across the article "Heart Stents are Useless for Most Stable Patients. They're Still Widely Used."[1] I fervently read the article with incredulous disbelief. Here was an expose about the use of percutaneous coronary angioplasty in stable patients with cardiovascular disease. The article highlighted a double-blind placebo-controlled study published in the January 2018 edition of *The Lancet*, which concluded that percutaneous coronary intervention or angioplasty, was no better than placebo in relieving symptoms associated with coronary artery disease. The study showed that optimizing medical treatment through medication was just as effective in relieving symptoms in patients with stable coronary artery disease. I couldn't believe what I was reading. Here was a cornerstone of modern cardiology, performed on millions of patients, by thousands of cardiologists. Now new evidence shows that it is basically no better than placebo. Wow!!! This is a classic case of the proverbial idiom "the pot calling the kettle black."

As an alternative medical practitioner, I have constantly endured the wrath and scorn of the mainstream medical establishment with many procedures and treatments that I have used to treat cardiovascular disease. I am a practicing naturopathic physician who graduated from Bastyr College (now Bastyr University) in Seattle in 1991. I have utilized alternative procedures and treatments to try to help patients with cardiovascular disease for over 25 years. Some of these treatments include natural supplements and chelation therapy, in addition to diet and lifestyle modification. Medical practitioners who ardently adhere to the dogma of the mainstream medical establishment would frequently rebuff alternative and natural therapies. A constant retort would be that "there is no scientific evidence that it works." Now here is a prime example of blatant hypocrisy in the mainstream medical establishment. How can they criticize alternative treatments when their own treatment doesn't really work? After reading this article, the hypocrisy is almost laughable. This reminds me of the biblical hypocrite who worries about a speck of dust in their friend's eye when they have a log in their own eye. It is time to take the blinders off.

Of course, if you think linearly and within the box, it makes sense. Coronary arteries supply blood to the heart muscle. When they become clogged with cholesterol and plaque, blood flow is reduced. Angina or chest pain in the heart occurs because of this reduced blood flow. The more clogged the artery was, the more negative symptoms the patient would have. If you perform a delicate surgical procedure whereby you remove the atherosclerotic buildup, you restore blood flow. The patient feels better, and the angina goes away. Sounds like a fairy tale story, except now it is more like fable that is not true in patients with stable coronary artery disease.

ORBITA or percutaneous coronary intervention in stable angina; a double blind placebo controlled trial was a multicentre, randomized double-blinded placebo-controlled trial done at five study sites in the UK between January 2014 and August 2017. Two hundred patients were selected who had at least one coronary vessel with at least 70% atherosclerotic blockage and angina symptoms with exertion. All patients were evaluated at the beginning of the study with exercise stress testing, symptom questionnaire and Doppler echocardiography. All patients had what was called "optimised medical therapy" before the study was started that included anti-anginal drugs, anti-platelet medication, beta-blockers, calcium channel antagonists and lipid lowering medicine; 105 patients underwent percutaneous coronary angioplasty with drug eluting stents being placed and 95 patients underwent a sham surgery. The control group was anesthetized and had catheters inserted in their arteries like the treatment group but had no angioplasty procedure at all. They simply laid on the surgical table unconscious for approximately 15 minutes and had no medical intervention. All patients were evaluated six weeks post operation and repeated the stress testing, symptom questionnaire, and echocardiography. The end points of the study were to evaluate whether there was a difference in subjective symptoms of chest pain, quality of life symptoms and aforementioned objective stress echocardiography measurements. The data showed there was no statistically significant difference in measureable end points between the placebo and treated groups. There was no significant difference in terms of exercise time on the treadmill, time for 1 mm ST segment depression on EKG, peak oxygen uptake, or Seattle anginal questionnaire symptoms. The only demonstrable difference was better peak heart wall motion index score in the PCI treated group. The authors

➤

concluded that although symptomatic relief is the primary goal of percutaneous coronary intervention in stable angina and is commonly observed clinically, there is no evidence from blinded, placebo-controlled randomized trials to show its efficacy. In this watershed study, percutaneous angioplasty showed that it was no better than placebo in relieving symptoms in patients with stable coronary artery disease.[2,3]

A 2007 study reported in *The New England Journal of Medicine* examined the difference between optimal medical therapy with or without percutaneous coronary intervention for stable coronary artery disease. Between 1999 and 2004 at 50 US and Canadian centers, 2287 patients with myocardial ischemia and significant coronary artery disease were involved in a randomized controlled trial; 1149 patients had PCI surgery plus optimal drug therapy, and 1138 patients had optimal drug therapy alone. The primary endpoints of the study were to evaluate differences in non-fatal myocardial infarctions and patient death. The patients were followed for between 2.5 and 7 years. There were 211 events in the PCI treated group and 202 events in the medical therapy group. This translated to a 19.0% event rate in the PCI treated group and an 18.5% event rate in the medical therapy group. The researchers observed there was no statistically significant difference between the PCI group and the drug therapy alone group in terms of non-fatal MIs, stroke and death. The authors concluded the percutaneous angioplasty did not reduce the risk of death, myocardial infarction, or other major cardiovascular events when added to optimal therapy alone.[4]

The authors further hypothesized that different plaque morphology and blood vessel vasculature accounted for the apparent differences in atherosclerosis and atheroma formation. Vulnerable plaque was more likely to be involved in a cardiovascular event than stable or non-vulnerable plaque. Vulnerable plaque had a thin fibrous cap, large lipid core, fewer smooth muscles, more macrophages and decreased collagen when compared to stable plaque. Also vulnerable plaque was more involved in outward blood vessel expansion and had less remodeling at the arterial wall causing less stenosis inwardly. Vulnerable plaque did not cause significant stenosis before rupture causing a cardiovascular event.[4]

A 2012 review article in *JAMA* or the *Journal of the American Medical Association*, evaluated coronary stent implantation with medical therapy versus medical therapy alone for stable coronary artery disease.[5] This meta-analysis searched Medline databases between 1976 and 2011 for randomized controlled trials. A total of eight trials with 7229 patients were identified in this analysis. The researchers discovered that coronary stent implantation with medical therapy coronary artery disease was not associated with any significant reduction in mortality compared with medical therapy alone. The authors further concluded that the failure of stent implantation to reduce deaths due to myocardial infarction reinforces the underlying pathophysiology of plaque formation with different arterial inflammation that gives rise to vulnerable plaque.

Douglas G. Lobay is a practicing naturopathic physician in Kelowna, British Columbia. Dr. Lobay graduated with a bachelor of science degree from the University of British Columbia in 1987. He then attended Bastyr College of Health Sciences in Seattle, Washington, and graduated with a doctorate of naturopathic medicine in 1991. While attending Bastyr College, he began researching the scientific information on the use of food, nutrition, and natural healing. Dr. Lobay enjoys research, writing, and teaching others about good health and good nutrition. He is the author of four books and numerous articles in magazines. He also enjoys hockey, skiing, hiking, tennis, and playing guitar.

It is time for a paradigm shift that includes the alternative ideas of atherosclerosis and an integrative approach to heart disease treatment. These ideas would include the difference between stable and unstable vulnerable plaque, arterial inflammation, and intimal and lipid oxidation. This would also include a holistic treatment incorporating diet and lifestyle factors, stress reduction, optimal nutritional supplementation, blood pressure and lipid management, and perhaps chelation therapy. I believe that alternative natural therapies coupled with conventional therapies would provide additional benefit in reducing the rate of cardiovascular events in individuals with stable coronary artery disease.

Cigarette smoking has been shown to be directly related to an increased risk of coronary heart disease. Compared to non-smokers, daily smokers had a 60% increased risk of developing heart disease. Decreasing the number of cigarettes smoked and smoking cessation dramatically decreased these risk factors.[6]

A healthy diet rich in whole, unprocessed foods, fruits and vegetables, whole grains, fish and dairy products coupled with other lifestyle factors including no smoking, regular moderate exercise and keeping weight at a favorable body mass index, reduced the incidence of coronary heart disease by at least 46%, especially in higher risk patients. A healthy diet involved avoiding processed grains, processed meats, unprocessed red meat, sugar-sweetened beverages, trans fats and sodium.[7]

Emotional stress has long been associated with an increased risk of cardiovascular events. Perceived emotional stress increases the incidence of cardiovascular disease and coronary events. Stress was perceived to increase arterial inflammation and c-reactive protein levels.[8,9]

Regular moderate aerobic exercise has been associated with a decreased risk of cardiovascular disease and coronary events. Benefits of regular exercise include improved physical function and well being, lessening of cardiovascular symptoms, enhanced quality of life, improved coronary risk profile, improved muscle and aerobic fitness, and overall less mortality.[10]

A meta-analysis of 10 randomized controlled trials with 14,727 patients

showed that fish oils reduced the incidence of myocardial infarction by 24% and all causes of mortality by 16%. Fish oils decreased cholesterol and triglyceride levels, decreased inflammation, increased endothelial function and increased vasodilation, decreased platelet aggregation, and improved blood rheology.[11] Experts recommend consuming fish at least twice per week or taking a fish oil supplement. It is noted that this has been shown to have minimal adverse effects and is a safe adjunct to lipid lowering medicine.[12,13]

Garlic has been show to lower blood pressure, reduce cholesterol and triglyceride levels, inhibit platelet aggregation, increase fibrinolytic activity and prevent the formation of atherosclerosis.[14]

Polyphenols such as resveratrol, epigallocatechin, and curcumin have been acknowledged to have beneficial effects in cardiovascular health. The consumption of dark berries, which contained these flavonoids, and wine, particularly red wine, are believed to lower the risk of cardiovascular disease.[15]

Capsaicinoids from a variety of different pepper plants including cayenne pepper have been shown to improve cardiovascular parameters. Some of these effects include decreased oxidative stress, decreased inflammation, improved endothelial function, decreased blood pressure, decreased endothelial cytokines, decreased cholesterol, decreased blood sugar, and decreased LDL oxidation.[16]

A high-dose multivitamin and mineral supplement helped to decrease cardiovascular events in stable, post myocardial infarction patients not taking statin medicine.[17]

Selenium and co-enzyme Q10 have shown to lower the risk of cardiovascular disease. A Swedish study of 443 elderly citizens showed that selenium and CoQ10 supplementation significantly reduced the risk of cardiovascular mortality in this group.[18]

Vitamin E has shown some observational benefits when used as a supplement.[19] Other studies with vitamin E, vitamin C and both vitamin E and C together have been less encouraging.[20.21]

Intravenous chelation therapy has shown some modest benefit in preventing cardiovascular events in patients with previous myocardial infarction. The Trial to Assess Chelation Therapy (TACT) was a double-blind, placebo-controlled randomized trial at 134 US and Canadian Sites involving 1708 patients conducted from 2003 to 2010. Patients were randomized to receive 40 intravenous infusions of EDTA or placebo over a concurrent period of time. The primary end points of the study were all cause mortality, myocardial infarction, stroke, coronary revascularization, and hospitalization for angina. The study showed a cumulative decrease of 18% in the EDTA treated group compared to placebo. The effects appeared to be more pronounced in the diabetic sub-group of the treated population.[22,23]

The use of percutaneous coronary intervention or angioplasty in patients with stable coronary artery disease appears to be no better than placebo and optimal medical drug therapy alone. In other severe cases of unstable angina, however, it can be lifesaving. However, for most people with stable disease it appears to be useless. The use of conventional medical drug therapy can improve symptoms and decrease cardiovascular events. The addition of alternative therapies in the form of diet and lifestyle changes, stress reduction, exercise, nutritional supplementation, and possibly chelation therapy may provide added benefit. These natural therapies appear to be safe and effective.

References

1. Carroll AE. Heart Stents are Useless for Most Stable Patients. They're Still Widely Used. *The New York Times*. The Upshot. Online edition. Feb 12, 2018.
2. Rasha Al-L et al. Percutaneous Coronary Intervention in stable angina (ORBITA): a double-blind, randomized controlled trial. *The Lancet*. January 6-12, 2018; 391 (10115): 31-40.
3. Brown DL, Redberg RF. Last Nail in the coffin for PCI in stable angina. *The Lancet*. January 6-12, 2018; 391 (10115):3-4.
4. Boden WE, et al. Optimal Medical Therapy with or without PCI for Stable Coronary Disease. *N Engl J Med*. 2007;356:1503-1516.
5. Stergiopoulos K, Brown DL. Initial Coronary Stent Implantation With Medical Therapy vs Medical Therapy Alone for Stable Coronary Artery Disease. Meta-analysis of Randomized Controlled Trials. *JAMA Int Med*. 2012 Feb 27;172(4):312-9.
6. Sheilds M, Wilkins K. Smoking, smoking cessation and heart disease risk: A 16 year follow-up study. *Health Rep*. 2013 Feb;24(2):12-22.
7. Khera AV, et al. Genetic Risk, Adherence to a Healthy Lifestyle and Coronary Disease. *N Engl J Med*. 2016; 375:2349-2358.
8. Tawakol A, et al. Relation between resting amygdala activity and cardiovascular events: a longitudinal and cohort study. *The Lancet*. February 25, 2017; 389 (10071): 834-845.
9. Dimsdale JE. Psychological Stress and Cardiovascular Disease. *J Am Coll Cardiol*. 2008 Apr. 1;51(13):1237-1246.
10. Briffa TG, et al. Physical activity for people with cardiovascular disease: recommendations of the National Heart Foundation of Australia. *Med J Aust*. 2006 Jan 16;184(2):71-75.
11. Yzebe D, Lievre M. Fish oils in the care of coronary heart disease patients: a met-analysis of randomized controlled trials. *Fundam Clin Pharmacol*. 2004 Oct;18(5):581-92.
12. Kromhout D, et al. Fish oil and omega-3 fatty acids in cardiovascular disease: do they really work. *Eur Heart J*. 2012 Feb;33(4): 436-443.
13. Weitz D, et al. Fish Oil for the Treatment of Cardiovascular Disease. *Cardiol Rev*. 2010 Sept-Oct 18(5):258-263.
14. Bayan L, et al. Garlic: a review of potential therapeutic effects. *Avicenna J Phytomed*. 2014. Jan-Feb;4(1):1-14.
15. Khurana S, et al. Polyphenols: Benefits to the Cardiovascular System in Health and Aging. *Nutrients*. 2013 Oct;5(10):3779-3827.
16. Vijaya J. Capsinoids Modulatiing Cardiometabolic Syndrome Risk Factors: Current Perspectives. *J Nutr Metab*. May 23, 2016.
17. Issa OM, et al. Effect of high dose oral multivitamin and mineral in participants not treated with statins in the randomized trial to assess chelation therapy (TACT). *Am Heart J*. 2018. Jan;195:70-77.
18. Alehagen U, et al. Selenium and Co-enzyme Q10 for Four Years: Follow-up Results of a Prospective Randomized Double Blind Placebo-Controlled Trial in Elderly Citizens. *PLOS One*. 2015;10(12): e0141641.
19. Dietrich M, et al. Vitamin E Supplement Use and the Incidence of Cardiovascular Disease and All-Cause Mortality in the Framingham Heart Study: Does the Underlying Health Status Play a Role? *Atherosclerosis*. 2009 Aug: 205(2):549-553.
20. Sesso HD, et al. Vitamin E and C in the Prevention of Cardiovascular Disease in Men: The Physicians Health Study II Randomized Trial. *JAMA*. 2008 Nov 12:300(18):2123-2133.
21. Khudairy Al, et al. Vitamin C supplementation for the primary prevention of cardiovascular disease. *Cochrane Database Syst Rev*. 2017 Mar. 16:3; cd 011114.
22. Lamas GA, et al. Effect of disodium EDTA chelation regimen on cardiovascular events in patients with previous myocardial infarction: the TACT randomized trial. *JAMA*. 2013 Mar 27; 309(12):1241-1250.
23. Lamas GE, et al. Design and Methodology of the Trial to Assess Chelation Therapy (TACT). *Am Heart J*. 2012 Jan; 163(1):7–12.

◆

Natural Aromatic Oils Effectively Inhibit Microbial Proliferation and Human Body Odor

by Bill Misner, PhD

Body Odor Increases by Microbial-Proliferation

Body odor is an unpleasant odor emanating from the skin in warm, moist, dark, clothed, recessed areas such as the axillae (armpits) when unexposed to evaporative cooling and light. Body odor occurs as a result of chemical waste products (such as 2-methyl-2-hexenoic acid) produced by detrimental bacteria after these bacteria (which reside on the skin) interact with secretions from the apocrine sweat glands that are located in clothed, enclosed regions of the body. Sweat alone is odorless in humans. Human eccrine and apocrine sweat glands profusely sweat in order to reduce excessive internal body core heat temperatures. Eccrine sweat consists largely of water. However, apocrine sweat contains proteins, minerals, pheromones, and urea that tend to accumulate in clothed, recessed areas of the body such as the armpit, groin, genital, feet, anus, and behind the ears. A variety of microbial organisms living on all skin surfaces are particularly attracted to apocrine sweat, which they consume and break down into acids resulting in offensive body odor. In fact, humans have difficulty smelling their own body odor, yet they can detect even the slightest hint of body odor originating from others.

A variety of bacteria, mold, yeast, and fungi colonies rapidly proliferate in an enclosed space where evaporation is further restricted by clothing. One of the worst pungent offenders is *Staphylococcus hominis* found in the armpit, emitting pungent odor-producing thioalcohols. Some researchers have listed both genetics and sex as exacerbating the level of body odor produced. Dietary choices, like plant foods from the Allium genus (onions, garlic) and Brassica genus (broccoli, cabbage, cauliflower), profoundly increase body odor due to their sulphur content. Excessive consumption of dietary fat and protein also increases the rate of proliferation of detrimental bacteria within the digestive tract, immediately increasing body odor. Detrimental bacteria in the digestive tract produce hydrogen sulfide and sulfur dioxide, which are absorbed into the bloodstream and excreted from the skin and lungs. Once the large intestine digests excess choline, it is converted to trimethylamine (TMA), which generates a very unpleasant "fishy" body odor.

Antiperspirant Issues

Antiperspirants mask body odor temporarily and then only to a limited degree. Some antiperspirants ingredients are smeared on skin surfaces killing the least odor-causing species, while increasing uninhibited proliferation of odor-producing microbes. Commercial antiperspirants further contribute to body odor by clogging up the pores of the skin. Exley et al, wrote, "Aluminum salts are the major constituent of many widely used antiperspirant products. The use of such antiperspirants has been linked with the systemic accumulation of aluminum and an increased risk of Alzheimer's disease."[1] Graves' epidemiological study[2] linked the use of aluminum-containing antiperspirants to Alzheimer's disease. Werbach concluded:

> Drinking water should be low in aluminum. Some bottled-water companies provide an analysis of the aluminum content of their water. You might also find out from your public water company what the aluminum level is in the local drinking water. Aluminum-containing antiperspirants may easily be avoided, as can aluminum utensils and even, to play it safe, aluminum-containing antacids. Commercially processed foods such as cake and pancake mixes, frozen doughs and self-rising flour are sources of dietary aluminum, hence their ingestion should be minimized. Watch for and avoid sodium aluminum phosphate, an ingredient in baking powder. Pickles and cheese aluminum content should also be avoided.[3]

There is a close relationship between silicon and aluminum in Alzheimer brain lesions, as the two substances bind together to form aluminosilicates.[4] High levels of silica in drinking water in the form of silicic acid appear to protect against the adverse effects of aluminum ingestion, plus silicic acid ingestion increases urinary aluminum excretion.[5,6] However, whether silica supplements

protect against the development of dementia has yet to be determined, but this is a small sample of research[1-6] that conclusively supports avoiding the use of any product containing aluminum, including antiperspirants, for reducing perspiration-induced body odors. If you apply anything to the skin, keep in mind there is no liver organ to filter, metabolize, and convert harmful substances to a less toxic form.

Methods

A natural aromatic oils compound has been shown to effectively inhibit aerobic bacteria, fungi, yeasts, and mold spores, located in dark, moist, human-body recesses where odor-causing microbes tend to proliferate rapidly.[7] This same formulation was converted to NEU-STIC Neutralizing Deodorant, a solid-stick to safely deliver these natural aromatic oils substances to the axillae skin surface. This product was selected to measure the combined efficacy for suppressing odor-causing aerobic bacteria and fungi/yeast cultures proliferating inside the warm, dark, moist, confined (clothed) surfaces of human axillae (armpits). A male (age 78y) athlete submitted swab samples, for counts per square inch of commensurable microbes, collected during seven test periods:

1. BASE swab sample was taken immediately after a shower, using hot water and plain soap (with no antiperspirants or antibacterial substances).
2. BASE swab sample was taken immediately after hot water shower with plain soap (with no antiperspirants nor antibacterial substances and application of NEU-STIC Neutralizing Deodorant).
3. Swab sample was taken four hours after application of NEU-STIC Neutralizing Deodorant.
4. Swab sample was taken eight hours after application of NEU-STIC Neutralizing Deodorant.
5. Swab sample was taken **24-hours** after the subject did not exercise, did not sweat, used no soap, and took no shower.
6. Swab sample was taken from the subject immediately after a **one-hour, strenuous indoor treadmill run with profuse sweating.**
7. Swab sample was taken from the subject eight hours after the subject finished the above indoor one-hour indoor strenuous treadmill run.

All of the following-swab samples were incubated 24-hours at 25-30º C to determine aerobic bacteria count/inch^2 and/or incubated 72-hours 25-30º C to determine yeast-mold-fungi count/inch^2.

Results

The first base swab surface sample extracted from axillae of the subject immediately after subject showered using plain soap (no antiperspirants nor antibacterial substances) and hot water showed 100 aerobic bacteria count/inch^2 and 10 yeast-mold-fungi count/inch^2. The same aerobic bacteria were detected in first base test as in the second base tests, following application of plain soap (no antiperspirants nor antibacterial substances), hot water both with or without NEU-STIC Neutralizing Deodorant; however, application of the NEU-STIC reduced yeast-fungi-mold counts from 10 Yeast-mold-fungi count/inch^2 to 1-3 Yeast-mold-fungi count/inch^2.

The third swab surface sample was extracted from axillae of the same subject four hours after application of NEU-STIC, which also showed 100 aerobic bacteria count/inch^2 and 1-3 ➤

Table I. *NEU-STIC Neutralizing* Deodorant Inhibits Aerobic Bacteria Yeast-Mold-Fungi incubation count/inch^2

Key: AB (Aerobic Bacteria) YMF (Yeast/Mold/Fungi)

Swab Test Sample Taken	Aerobic Bacteria (AB) Count Swab Sample @ 25-30º C 24-Hours Incubation	Yeast/Mold/Fungi YMF count/inch^2 Swab Sample @ 25-30º C 72-Hours Incubation
After plain soap (no antiperspirants nor antibacterial substances), hot water shower, no deodorant.	100 AB count/inch^2	10 YMF count/inch^2
After plain soap (no antiperspirants nor antibacterial substances), hot water, shower, with application of NEU-STIC Neutralizing Deodorant	100 AB count/inch^2	1-3 YMF count/inch^2
Four-hours after application of NEU-STIC Neutralizing Deodorant	100 AB count/inch^2	1-3 YMF count/inch^2
Eight-hours after application of NEU-STIC Neutralizing Deodorant	10 count/inch^2	10 YMF count/inch^2
After 24 hours, no deodorant, no soap, no shower, sedentary, no sweating	1000 AB count/inch^2	100 YMF count/inch^2
After one-hour strenuous indoor treadmill running with profuse sweating	100,000 AB count/inch^2	100 YMF count/inch^2
Eight hours following the above strenuous one-hour indoor treadmill running session, profuse sweating, no deodorant, no soap, no shower	100,000 AB count/inch^2	100 YMF count/inch^2

➤

yeast-mold-fungi count/inch^2. Then the fourth swab surface extracted from axillae of the same subject eight hours after Neu-STIC application showed a significant reduction in aerobic bacteria from 100 to only 10 count/inch^2, but the 10 yeast-mold-fungi count/inch^2 remained the same.

A fifth swab surface from axillae 24 hours following no exercise, no soap, and no shower showed 1000 aerobic bacteria count/inch^2 and 100 yeast-mold-fungi count/inch^2.

Now, this raises a question as to how much sweat alone raises aerobic bacteria count/inch^2 and yeast-mold-fungi count/inch^2. A sixth swab extracted immediately finishing a one-hour strenuous run (profuse sweating) on an indoor treadmill resulted in 100,000 aerobic bacteria count/inch^2 and 100 yeast-mold-fungi count/inch^2. What then happens to these counts when exercise-induced profuse sweating stops? Do the counts continue to increase, multiply at a reduced rate, or simply stop when the microbial population count/inch^2 peaks? A seventh swab surface sample was extracted eight hours after the subject stopped sweating. The original values of 100,000 aerobic bacteria count/inch^2 and 100 yeast-mold-fungi count/inch^2 produced during his run neither increased nor decreased.

Conclusion

Application of NEU-STIC Neutralizing Deodorant to this subject's axillae inhibited overgrowth of both aerobic bacteria and yeast-fungi-mold immediately and continued to limit projected microbial proliferation for up to eight hours for aerobic bacteria and up to four hours for yeast-mold-fungi after deodorant application. Whether topical application of this compound prevents body odor associated with microbial proliferation in larger populations is unknown, nor is it here shown. This calls for more research collected from larger multiple populations exposed to a variety of elements that may increase their microbial-proliferation resulting in offensive body odor.

Competing Interests

All work has been completed in accordance with guidelines governing such work with no financial relationships (including grants, honorarium, stipends, patents or patents pending, royalty agreements, board memberships) related to these findings, and the author has no remunerative nor competing interests nor any commercial interests in this product. Collected data from a single subject case report is conclusively relevant in only the single subject participant in this study. The results reported describe what occurred in this single subject, and, therefore, may not reoccur in a larger cross population of subjects.

Acknowledgements

The author expresses appreciation to Cozy Bear Natural Products, PO Box 1105, Chewelah, Washington 99109, 509.937.2699 or 877-663-2699, for their generous donation of NEU-STIC – Neutralizing *Deodorant,* a natural aromatic oils compound (consisting of arrowroot, coconut oil, baking soda, cocoa butter, shea butter, beeswax, candellia wax, essential oils (sweet orange, pink grapefruit seed, lime, basil, bay, sage, tea tree, and clove) for this project.

References

1. Exley C., et al. Does antiperspirant use increase the risk of aluminum-related disease, including Alzheimer's disease? *Mol Med Today*. 1998;4(3):107-109.
2. Graves AB, et al. The association between aluminum containing products and Alzheimer's disease. *J Clin Epidemiol*. 1990;43(1):35-44.
3. Werbach MR. Can aluminum cause Alzheimer's disease? *Health & Nutrition Breakthroughs*. March 1998.
4. Candy JM, et al. Aluminosilicates and senile plaque formation in Alzheimer's disease. *Lancet*. 1986;i: 354-57.
5. Jacqmin-Gadda H et al. Silica and aluminum in drinking water and cognitive impairment in the elderly. *Epidemiology*. 1996;7(3): 281-85.
6. Bellia JP, et al. The role of silicic acid in the renal excretion of aluminium. *Ann Clin Lab Sci*. 1996;26: 227-33.
7. Misner BD. A novel aromatic oil compound inhibits microbial overgrowth on feet: a case study. *J Int Soc Sports Nutr*. 2007: 4:3. PMCID: PMC1997117

◆

Bill Misner graduated from Indiana University, and later completed both his MS and PhD at the American Holistic College of Nutrition. He is an AAMA board-certified alternative medicine practitioner. He published papers in the American College for Advancement in Medicine (ACAM) journal, *Journal of the International Society of Sports Nutrition* (JISSN), and seven original research papers in past issues of the *Townsend Letter*. Misner wrote *Endurance Nutrition – Finding Another Gear,* Editions I and II of *What Should I Eat? A Food Endowed Prescription for Well Being*, and *Phytonutrition: Finding Fitness for Life!* Misner, age 78, continues to run races from one mile up to 13.1 miles to demonstrate "Practice (what he preaches) really works!"

Bastyr University San Diego Clinic: Student Case Reports

edited by Baljit Khamba, ND, MPH

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

Vitamin D and Its Role in Autoimmunity: A Case Report

by Alexandra Carlton, ND

Abstract

Ankylosing spondylitis (AS) is a type of inflammatory arthritis that affects the spine. It is a very rare disease that causes inflammation of the spinal joints leading to severe, chronic pain. The hallmark feature of AS is the involvement of the sacroiliac joints during the progression of the disease. We will investigate treatments for autoimmune conditions, specifically related to ankylosing spondylitis.

Vitamin D plays an important role in autoimmunity since there is a correlation between vitamin D deficiency and an increased risk for autoimmunity. Being deficient in vitamin D is a global epidemic that has been linked to numerous diseases. Vitamin D is an endocrine hormone known for its important role in regulating calcium and phosphorus metabolism as well as proper bone formation. Nevertheless, vitamin D is a vital modulator of our immune system. Vitamin D deficiency has been associated with increased risk of cancer, diabetes, and cardiovascular disease.

Is vitamin D an effective treatment for autoimmune diseases? Given the research, there appears to be a significant correlation between vitamin D deficiency and an increased risk of autoimmunity. Increasing this patient's serum vitamin D levels correlates with her overall improvement. Ultimately, the need for increased research interest on the role of vitamin D in autoimmune disease is warranted.

Introduction

Although the exact cause of AS is unknown, researchers believe that genetics play a key role in this disease. Around ninety percent of individuals with AS have a genetic marker called HLA-B27. This gene, however, does not need to be positive to have AS. Analogously, one who has this genetic marker, may not develop AS during their lifetime. Researchers believe that this genetic marker might have an influence on one's microbiome. There is a strong association with intestinal dysbiosis and AS patients.

Scientists suspect that other genes along with a triggering environmental exposure such as an infection are necessary to activate AS in susceptible people. Researchers have found over sixty genes that are associated with this disease such as ERAP 1, IL-12, IL-17, and IL-23. Scientists also have found that complications of autoimmune patients stem from the gastrointestinal system when the defense mechanisms and barriers of the intestines are disrupted, allowing bacteria to pass through the bloodstream. This immune dysregulation leads to changes in the microbiome, resulting in alterations in the immune response. Microbial peptides trigger HLA-B27 to start an autoimmune response through molecular

➤

➤

mimicry. Inflammation eventually leads to triggering new bone formation and fusion of spinal joints.

Ankylosing spondylitis is diagnosed under these parameters: pain persisting for more than three months, back pain with stiffness that worsens with immobility and that occurs especially at night and early morning. The onset of this disease usually begins under forty-five years of age. Upon physical examination, there will be inflammation and pain along the back, pelvic bones, sacroiliac joints, chest, and heels. There can also be decreased spinal mobility in all directions and chest expansion restriction.

Case Description

A.Z, a 20-year-old Hispanic female, presented to Bastyr University Clinic in San Diego seeking treatment for her diagnosis of ankylosing spondylitis. Her chief complaints of sacroiliac pain, joint pain, fatigue, insomnia, anxiety, and depression have significantly impacted her quality of life. She was diagnosed in 2016 with being HLA-B27 positive. Imaging revealed inflammation, but no spinal fusion. Her MRI without contrast showed mild erosions of the upper aspect of the left sacroiliac joint, associated with patchy bone marrow edema involving both the adjacent sacrum and iliac wing. There was small joint effusion with no osteonecrosis present. Pain is better with movement, worse in the morning and night. Starting at our clinic, her pain was 7/10 persistent pain (10/10 being extreme pain, needing to present to emergency room), with 9/10 severe pain on occasions.

Objective

Her review of systems is positive for fatigue, palpitations, constipation, muscle pain, joint pain, stiffness, back pain, dizziness, nervousness, anxiety, and full of despair. Her family history is pertinent for arthritis, anxiety, hypertension, heart failure, Alzheimer's disease, COPD, diabetes, thyroid disease, and cancer. On physical examination, her blood pressure was 100/58, pulse 85 bpm, respiratory rate 14 bpm, oxygen saturation of 98%, weight: 125.5 lbs, height 5 feet 6 inches, and BMI: 20.21. Patient was in no apparent distress and dressed appropriately for time and place. Her head is normocephalic; atraumatic, slightly tachycardia. All lung fields clear to auscultation with effort and breath sounds normal. Abdominal exam revealed bowel sounds in all four quadrants with no tenderness or masses on light and deep palpitation. No hepatosplenomegaly was present. Positive for back and joint pain, with swelling and pain on palpation on left iliosacral junction.

Her labs were positive for ANA, MTHFR A1298C heterozygous genotype mutation. Her homocysteine is slightly elevated, high globulin, elevated liver enzymes, and low vitamin D levels. Her stool analysis reports high beta glucuronidase and high *E. coli* with low diversity of bacteria in her stool. Since then, her liver enzymes have normalized, sufficient vitamin D levels, and her non-specific inflammatory markers such as CRP and ESR have decreased.

Her current treatment protocol is as followed. She is now fully compliant with the autoimmune paleo diet (no gluten, no processed food or food additives, grains, dairy, nightshades, sugar or artificial sweeteners, coffee, alcohol, eggs, soy, nuts). Her medications include Motrin 600mg/ES Tylenol PRN for migraines, Escitalopram (SSRI) 40 mg/day for depression and anxiety short term, Spironolactone (diuretic) 50 mg for *Propionibacterium acnes*, Buspirone 10 mg PRN for anxiety, Meloxicam (NSAID) 15 mg for rheumatoid arthritis. Supplements are listed in Table 1.

From the patient's timeline, she has been exposed to many viruses and bacteria throughout her life. She has taken numerous rounds of antibiotics and medications. This is shown through her gastrointestinal dysbiosis. The root cause of many imbalances can be healed by fixing digestive dysfunction. Our ideal focus for her is to heal her gastrointestinal system as well as control and manage her pain since that is affecting her quality of life.

We also recommended increasing acupuncture from every other week to every week since it seems to be benefiting her and helping with her inflammatory flare-ups. The supplements that have most benefited her and notably made the most difference with pain relief were vitamin D, omega-3, and Boswellia extract. We also gave her a support network to connect with others that are in similar situations. In addition, since there is such a mental-emotional component with autoimmunity, we made sure to address this by finding sweetness in her life. We encouraged a gratitude journal, which brought her much joy. In addition, adding stress management techniques such as breath work and meditation were pertinent.

Results

She has improved drastically since starting at our clinic in October 2016. When she first started treatment with us, she walked with a cane and occasionally needed a walker. As

Table 1: Supplements

Supplements	Dosage
BCQ by Vital Nutrients	2-3 capsules TID
Bio-Gest Digestive Enzyme by Thorne	1-2 capsules QD with meals
Pro Omega by Nordic Naturals	3 capsules QD
Vitamin D by Genestra	10,000 IU QD
Added Supplements	
Boswellia Extract	450 mg TID
Calcium-D-Glucarate by Pure Encapsulations	500 mg QD
Mediclear Protein Plus by Thorne	2 scoops QD
Active B Complex	1 capsule QD
SPM Active by Metagenics	2 capsules QD
Castor oil packs with arnica essential oil	PRN on flare-ups
Candibactin BR by Metagenics	2 capsules BID
HPA Axis: Daytime Maintenance by Gaia Herbs	2 capsules BID

treatment progressed, she walked without a cane, only using the cane twice during the treatment period for severe local inflammatory flare ups, with ultimately not needing a cane and walking extensively every day. Her recent labs, such as CRP and sedimentation rate, indicate less inflammatory cascades happening in her body. She reports 1/10 everyday pain and 2-3/10 pain occasionally when stressed, since it is a trigger for her. Patient has tapered off all medications with a conventional doctor, with only taking Tylenol PRN and Meloxicam as a backup when in pain. She also has less overall inflammation and pain to palpation. She is now able to swim for twenty minutes weekly, has gained more endurance overall, and recently has joined a sports league.

Discussion

Her diagnosis of ankylosing spondylitis showed us that not only does she have an inflammatory arthritis affecting her spine, but also has chronic inflammation throughout her body. Patient was born premature which may have contributed to the formation of the immature immune system and possible dysbiosis. Her current medication, escitalopram (a selective serotonin reuptake inhibitor), can also be contributory to the dysregulation of the gut motility. Her current NSAID regiment may also be causing gastrointestinal mucosa inflammation contributing to a possible intestinal permeability. Patient's exposure to antibiotics and current symptoms of bloating and gas during the menstrual cycle suggests dysbiosis. Patient has been exposed to a high toxic burden with environmental factors, such as personal care items and polypharmacy at a young age, which may further dysregulate the immune system and the microbiome. Furthermore, the patient's diet of gluten and processed foods may exacerbate the inflammatory process. Additionally, being HLA-B27 positive is associated with certain autoimmune and immune-mediated diseases, suggesting a predisposition to ankylosing spondylitis. She also has been receiving steroid injections every couple of months from her conventional physician, which suppresses immunity and inflammation acutely; however these can increase susceptibility to infections, decrease productions of hormones, and increase risk of heart disease with chronic use, especially at a young age. Her high beta-glucuronidase in the stool is shown to predispose someone to autoimmunity.

Her blood lab results show MTHFR heterozygous gene mutation, functionally high homocysteine, and high globulin levels. We explained that this mutation deceases the active form of folate and can cause a buildup of homocysteine levels. Excess homocysteine can be harmful to our bodies, increasing inflammation, becoming more susceptible to certain cancers, increasing risk of cardiovascular disease, as well as affecting immunity. Her globulin levels can be high due to chronic inflammatory conditions, autoimmunity, or poor digestion and absorption, which is all indicated for this patient.

In my research, vitamin D plays a crucial role in autoimmune patients. Serum vitamin D deficiency is considered a risk factor for several chronic inflammatory or autoimmune conditions, including infectious diseases, type 1 diabetes, multiple sclerosis, and especially autoimmune rheumatic diseases, AS being one of these. Vitamin D deficiency seems to play a role in increasing autoantibody production by B cells, with seasonal vitamin D declines triggering flares in autoimmune rheumatic diseases. A severe serum vitamin D deficiency in genetically predisposed subjects can compromise immune responses by dysregulating dendritic cells and T and B cell functions. Optimal levels of vitamin D regulates both innate and adaptive immunity, allowing our immunity to decrease antigen presentation. Furthermore, serum vitamin D deficiency involves decreased immunity and increased inflammation in patients with rheumatic disease. This study noted that with vitamin D supplementation, there was major improvement with inflammation symptoms and suppressed immunity (Cutolo, 2014). ➤

➤

Studies have shown that vitamin D has immunologic activity. This fat-soluble vitamin has immunosuppressant effects in patients with autoimmunity. Therefore, this justifies why increased vitamin D intake is associated with a lower risk of autoimmune disease (Natural Medicines Databases, 2017).

In a meta-analysis, results suggest that vitamin D plays a protective role in AS. This study concluded that higher levels of serum vitamin D are associated with a decreased risk of AS. Inadequate vitamin D levels can cause imbalances in bone density and dysregulation of calcium resorption, which makes sense when you look at the physiology, that osteoporosis is a complication of AS. This also indicates that parathyroid hormone levels are linked, with high levels of PTH increasing activity of osteoclasts and serum calcium levels. In this study, it showed that PTH levels in AS patients are lower than the healthy controls, therefore warranting more studies between the correlation of PTH and vitamin D (Guoqi, 2015).

One study compared patients with AS versus healthy controls, concluding that vitamin D levels were significantly higher in the healthy control group ($P < 0.01$) and patients with AS have lower vitamin D levels. Another stimulating topic discussed how tumor necrosis factor alpha plays a role in chronic inflammation and inhibits the binding of vitamin D receptors. There is some discussion that systemic inflammation can lower vitamin D serum levels. Vitamin D can inhibit the expression of TNF-alpha, concluding that being deficient in vitamin D can cause the cascade of inflammation (Pokhai, 2014).

Another study showed that chronic vitamin D deficiency can result in a permanently altered intestinal environment that no longer favors the healthy bacteria in our gut. Many articles link vitamin D to the normal function of the immune system. In this scientific article, it stated that sustained deficiency of both vitamin D as well as pantothenic acid (B5), since it is needed to produce cortisol, can result in an abnormal pro-inflammatory state (Gominak, 2016).

Not only does vitamin D play an important role in ankylosing spondylitis, it plays an important role in all autoimmune diseases, such as Hashimoto's thyroiditis, systemic lupus erythematosus, rheumatoid arthritis, type 1 diabetes, and irritable bowel disease. Studies have shown that low vitamin D levels contribute to the development of autoimmune thyroid diseases. Furthermore, this article shows that vitamin D reduces levels of thyroid antibodies and suppresses autoimmune reaction. In this study, by doing a vitamin D replacement therapy, thyroid antibody titers decreased (Yasin, 2016). These studies on adequate vitamin D levels and decreased risk of autoimmunity seems to be promising for autoimmune conditions.

There is much research regarding serum vitamin D deficiency and its role in autoimmunity. Further studies are warranted to investigate the link between vitamin D levels and disease activity in AS patients. There is much research with preventing AS, however further research is indicated to understand how to decrease pain and symptoms when being diagnosed with AS. Future research should make an effort towards well-designed larger experimental groups as opposed to smaller sample sizes. Ultimately, research about the association of vitamin D receptor defects and AS susceptibility is warranted.

Conclusion

The use of vitamin D supplementation is vital for its role in autoimmunity, showing effectiveness in decreasing the risk of developing an autoimmune condition, such as ankylosing spondylitis. Vitamin D is shown to play a protective role in AS, signifying that without vitamin D, there can be permanent alterations of intestinal microbiota, causing inflammation. These results are favorable in treating this rare autoimmune condition, however more studies are warranted. We must note that the patient was on other medications and supplements. Future plan is to continue monitoring and increasing her quality of life and social abilities by keeping inflammation and pain under control, reintroducing foods that had been limited, and retesting labs to make sure we have stabilized her deficiencies and eradicating infections.

Alexandra Carlton is a naturopathic doctor and medical resident at the Susan Samueli Center for Integrative Medicine, University of California- Irvine. She received her Doctorate in Naturopathic Medicine from Bastyr University, California, and her bachelor of science at the University of Southern California in human physiology. Her passions include autoimmune diseases, mental health, women's health, and pediatrics. She is a conduit for healing by educating and inspiring optimal health through highly individualized and dedicated patient care. She enjoys hiking, dancing, cooking, is a travel enthusiast, and sports fanatic.

References

"About Spondylitis." Spondylitis Association of America, SSA, www.spondylitis.org/Ankylosing-Spondylitis/Diagnosis.

Agmon-Levin N, et al. Vitamin D in systemic and organ-specific autoimmune diseases. *Clin Rev Allergy Immunol.* October 2013.

Costello ME, et al. Brief Report: Intestinal Dysbiosis in Ankylosing Spondylitis. *Arthritis Rheumatol.* 2015;67(3):686-691.

Cutolo, M, et al. Vitamin D, Steroid Hormones, and Autoimmunity. *New York Academy of Sciences.* 16 Apr. 2014.

Dankers W, et al. Vitamin D in Autoimmunity: Molecular Mechanisms and Therapeutic Potential. *Frontier Immunol.* January 2017.

Gominak SC. Vitamin D Deficiency Changes the Intestinal Microbiome Reducing B Vitamin Production in the Gut. The Resulting Lack of Pantothenic Acid Adversely Affects the Immune System, Producing a "pro-Inflammatory" State Associated with Atherosclerosis and Autoimmunity. *Clinical Key*. 1 Sept. 2016.

Guoqi CG. Vitamin D in Ankylosing Spondylitis: Review and Meta-Analysis. *Science Direct*. Jan. 2015.

Pokhai GG, et al. Vitamin D Levels in Ankylosing Spondylitis: Does Deficiency Correspond to Disease Activity? *Rev Bras Rheumatol.* 2014; 54 (4): 330–334.

Vitamin D Monograph. Natural Medicines. 20 May 2017, natural medicinestherapeuticresearch-com.buproxy.bastyr.edu/databases/food-herbs supplements/mechanismofaction.

Yasin S, et al. Effects of Vitamin D treatment on thyroid autoimmunity. *J Res Med Sci.* June 2016.

Yu D. Assessment and Treatment of Ankylosing Spondylitis in Adults, UpToDate, July 2017.

◆

Still the Best

A Must Have for Kidney Function Support!

CORDIMMUNE™

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

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

Immune Support Beyond Just Polysaccharides!

CORIO PSP™

The most clinically researched mushroom in Japan and China

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

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

CRNA

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

1-866-287-4986

Exploring the Complexities and Caveats of Safe Internal Use of Essential Oils for Pain: Highlighting Intestinal Discomfort, Part 1

by Sarah A. LoBisco, ND, IFMCP

An Overview

Last year, I had the privilege to write a two-part article series for *Townsend Letter*, "Sniffing Out Pain."[1-2] In Part I, "Olfaction's Complex Connections of Emotions, Memory, and Pain Perception," I explained how the sense of smell can induce powerful affective experiences due to the intricate neuroanatomy of olfaction.[3-4] Unlike other senses, smell has reciprocal axonal connections with the primary emotion areas: the amygdala, hippocampus, and orbitofrontal cortex (OFC). This means olfactory stimulation can bypass the primary olfactory cortex and directly activate the amygdala at the secondary olfactory cortex.[3-4]

How the brain determines and translates odors is individualized and extremely complex. The exact mechanisms of this still have not been fully elucidated.[1] As a result, an aroma can alter emotional response, perception, and pain sensation based on an individual's past experiences of it.[1-4] In fact, there is even evidence of epigenetic behavioral imprinting and physiological transmissions of emotions triggered by an odor based on an offspring's mother's prenatal association with it.[1]

In Part II, "The Multimodal Actions of Essential Oils on Pain Perception and Pain Relief," I provided evidence that essential oils' pleasant aromas are combined with their powerful secondary metabolites to entice a simultaneous physiological and psychological relaxation response as they modify pain perception. They have been shown in clinical trials to alter pain acuity by modulating one's emotional response and nervous system tone. Furthermore, in vivo and clinical trials have reported specific actions of certain essential oils and their constituents on cellular receptors for nociception. Due to their biochemical profile, and the influence of manufacturing practices on the presence and integrity of these delicate constituents, it is imperative to use quality, therapeutic essential oils for these desired therapeutic outcomes.[2]

I have been requested to write a follow up to these articles on the "nitty gritty" of putting this knowledge of essential oils to clinical use. With any medical intervention, physicians in training must first build on basic principles and understand contradictions, precautions, and side effects to be competent in prescribing and avoid harm.

Due to the complexity and caveats that exist about essential oils, I have divided the present article into segments and have narrowed my focus to their internal application for intestinal pain. This is because ingestion is the most controversial and misunderstood topic within aromatherapy and gastrointestinal concerns are common in integrative medicine practices, even if not the chief complaint. This also has been the area I see rapid, consistent results in my GI clients over the past eleven years.

First, I provide an overview of essential oils, including modes of application; details on liver biotransformation, metabolism, and excretion throughout the body; medication interactions; and the controversies and inconsistencies regarding various subtopics in aromatherapy.

Next, I review all the considerations for oral administration of selected essential oils for intestinal discomfort. In this portion, I discuss what the research states about their mechanisms of actions (including their effects on the microbiome) and dosages reported in clinical trials, if available.

I have also included a table that can be used as a dilution guide and for conversions of measurements to accurately dose essential oils. It is applicable for all modes of administration. Finally, I provide insight on how I use them with my clients.

After understanding all the complexities of prescribing essential oils using this example, doctors can apply this knowledge and find information for selecting specific essential oils for other areas of pain relief within Part II of my first series.

The Art and Science of Aromatherapy- Considerations, Caveats, and Controversies

Precise dosages, applications, and safe use of essential oils are unfamiliar to many practitioners. To complicate matters, they are also controversial among aromatherapists trained in different schools of applications. This is due to differences in training and licensing requirements for aromatherapy certifications. [5-9]

Currently, there is no international standardization for aromatherapists. The National Association for Holistic Aromatherapy and Alliance of International Aromatherapists are two well-known professional organizations.[5-8]

To compound matters of confusion, there have been several misleading headlines in the media on the actions of essential

oils.[10-13] These have often been based on extrapolations from in vitro or in vivo studies that assess only one or two constituents that are found within them. These same experiments also often dose at much higher levels than would be administered therapeutically of an essential oil.[10-26]

This has led many busy physicians and intelligent scientists to falsely equate the same mechanism of action of an essential oil's isolated compounds to the oil itself. Unfortunately, these assumptions have resulted in physicians believing that some essential oils are risky and unsafe for their patients.[10-14] The most recent flashy lead story, "Will Essential Oils Like Lavender and Tea Tree Make Your Breasts Larger?" is an example of this hype.[11]

Below are evidence-based reasons why one should remove these biases and not make this error of comparison. Rather, one should consider the synergistic effects of an essential oil, which is comprised of hundreds of different compounds and their total effect in humans,[15-26] not a single component's effect in petri dishes or rats.

1. Petri dish studies have been inconclusive in outcomes[-16] and have questionable validity due to the use of plasticizers, which can interfere with the test results.[15-16, 20-21]
2. Toxicology reports are often based on in vivo studies using isolated compounds and nonapplicable methods of administration for humans (e.g., gastric lavage). Furthermore, rodents' metabolism of various substances differs from people.[17-19,23]
3. The property of synergism of essential oils modulates the actions of all the compounds present and may impact a human's metabolome in individualized ways.[24-26]

It is imperative that one understands these points when considering the use of essential oils to real world applications.

Factors Related to Safe Use of Essential Oils

The three most common and routine routes of administration include the following:

1. Inhalation, including direct inhalation, palm inhalation, diffusion, steam inhalation, and spritzers;
2. Topical application, including massage, body oil, lotions, creams, baths, and use in dressings; and
3. Ingestion (oral).[5,7-9]

Other applications, rectal and intravenous, have been reported in the literature. These are not often used or recommended by most schools of aromatherapy.[27-28]

Whichever method used, safety is always the first consideration. This is based on several factors. According to the National Association for Holistic Aromatherapy (NAHA), these are quality, quantity, chemical composition of the oil, integrity of the skin, and age of the individual.[29]

I believe that the safe application method and dosage of essential oils should also be based on the user's knowledge, experience, preference, and comfort level. It is also important to consider the essential oil being prescribed and the synergistic, epigenetic, and biotransformation properties of both the essential oil and the individual. Therefore, my additions to the list of safety factors include (1) understanding essential oil mechanisms of actions and their metabolism and (2) medication and lifestyle factors (epigenetics) that influence essential oils' effects.

Integrity of the skin and age of the individual are self-explanatory and should already be familiar with the practitioner. Although a full review of all these other factors is beyond the scope of the article, I will briefly touch upon them.

Quality and Standards

In discussing quality and standards of essential oils, it is important to denote the difference between them and risk association. For example, although the FDA regulates prescription drugs' standards and quality, even correct dosage can lead to medical errors, side effects, and various toxicities.[30-35]

For essential oils, the agencies of ISO (International Organization for Standardization) and the Association Française de Normalisation (AFNOR) are recognized by most aromatherapists for regulation, setting standards, and certifications. As with their standards across the market, those for essential oils are based on consensus and this means they have caveats and biases.[38-41]

ISO standards exist for approximately 50 essential oils.[39,41] As noted on the ISO website: "ISO is an independent, non-governmental international organization with a membership of 161 national standards bodies. Through its members, it brings together experts to share knowledge and develop voluntary, consensus-based, market relevant International Standards that support innovation and provide solutions to global challenges."[38]

AFNOR is a member of ISO and develops their international standardization activities, information provision, certification, and training through a network of members of its own association.[39-41] AFNOR also does not claim to seek to ensure quality in their recommendations.*

In an email exchange between myself and a chemist from a well-known essential oil company, it was explained to me that the ISO standards for essential oils were created, in most cases, because an AFNOR standard existed. He stated that if an ISO/AFNOR standard is met, it will probably be a high-quality oil; however, this is not always the case.*

These standards of essential oils are related to the relative percentage of certain constituents found within the essential oils that are deemed to be the most relevant for its effects. The values are usually determined from an analysis using a Gas Chromatology/Mass Spectrometry (GC/MS).[36-44] This method does not distinguish between natural or synthetic constituents; therefore, it cannot determine if there has been "spiking" of these substances with manipulated compounds or adulterants to reach accepted standardized levels.[42-44]

The Caveats to Consider When Using GC/MS and Certificates of Analyses (CAs) to Verify Quality

Essential oil marketers may claim superiority of their essential oils based on GC/MC analysis and their verifications of analysis (CAs) that match ISO/AFNOR standards. Not being aware of the factors regarding GC/MS with essential oils, practitioners may make the false assumption that a CA for an essential oil provides a similar assurance of quality as their favorite brand of nutraceuticals.

Below is a summary of considerations regarding CAs of essential oils that highlights why relying on them to determine quality is incomplete.

➤

*Due to FDA regulations, my affiliations, and legalities, I am unable to make specific references or recommendations of brands.

➤

- Not all essential oil manufacturers agree on the standardized percentage of active constituents to achieve therapeutic benefits. Therefore, a physician must be aware of the effects they wish to deem from the selected essential oil and its chemotype. These various populations within the same species produce differing plant secondary metabolites with distinct effects.[2]

  Oftentimes the genus and species will be labeled on the bottle and its "active" compounds are revealed in the product description. Otherwise, the chemotype is labeled as "ct" followed by the predominant constituent.
- As previously discussed, if a constituent is present on the CA, it does not ensure that it hasn't been adulterated or synthetically spiked to achieve the standardized level.

  Other companies with different constituents present on a CA could still be producing high quality essential oils. I will review some verification testing that companies may use to determine quality in the next section.**
- Plants will produce different percentages of compounds based on external pressures, their environment, the season, temperature, and climate. This means that there will be natural variations of components within the same chemotypes of essential oils. These cyclical changes in amounts of constituents on CAs does not necessarily indicate manipulation and adulteration of essential components.[45-47] Conversely, they are often a welcome pattern.
- Unavailability of CAs of competitor brands of essential oils does not necessarily mean that they are "hiding something." Rather, they may be "protecting something." Legalities regarding propriety blends and differing quality standards of several popular essential oil companies is making it more difficult to obtain some CAs.

Verification Testing for Quality Essential Oils

Companies that produce quality essential oils ensure impeccable sourcing of raw materials, optimal distillation techniques, verification of active compounds, testing for contaminants, efficient manufacturing procedures, and prioritizing sustainability. It is important to do your research on companies and find a supplier you trust for obtaining essential oils. I have made the effort to visit one company's farms and witness their harvesting, sourcing, verification tests, manufacturing, and distribution to validate their integrity and authenticity.

Due to the complexity of essential oils, your company should use more than one verification test. As I've made evident, an online GC/MS of CAs will only get you so far. Make sure you understand and can verify which quality control methods a manufacturer uses. Below is an example of testing methods used, based on a popular essential oil brand (Young Living Essential Oils):[48]

- Densitometry
- Viscometry
- Refractometry
- Polarimetry
- Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
- Inductively Coupled Plasma-Atomic Optical Emission Spectrometry (ICP-OES)
- Gas Chromatography (GC)
- High Performance Liquid Chromatography (HPLC)
- Fourier Transform Infrared Spectroscopy
- Automated Micro-Enumeration
- Disintegration
- pH
- Microscopy
- Combustibility
- Flash Point
- Gas Chromatography Mass Spectrometry (GC/MS)
- Chiral Chromatography
- Isotope Ratio Mass Spectrometry (IRMS)[48]

Quantity and Dosage Considerations for Essential Oils

Most health care providers have the "five rights" for the administration of drugs drilled into their heads from medical training. These are the right patient, the right drug, the right time, the right dose, and the right route.[49-51] This checklist may appear to make the administration of treatment less comprehensive and detailed than it truly is.[52-54] Within these parameters, most practitioners will consider the following influences more thoroughly:[52-59]

- Mechanisms of action of the drug(s) and/or substance(s),
- Weight of the individual,
- Kidney and liver health,
- Most effective route,
- Allergies,
- The patient's age,[52-54]
- Relevant polymorphisms in biotransformation pathways,[53]
- The patient's current health conditions,[56] and
- Nutrient-drug and other interactions.[53, 57-58]

Metabolism and Biotransformation of Essential Oils: Taking a Walk Down CYP450 Lane

We now have an awareness that quality and factors of quantity, including consideration of biochemical individuality and drug metabolism, are important for prescribing the safest dose of any medicine, natural or otherwise.

I will now focus on the liver biotransformation of some common essential oils and their metabolites indicated for pain and digestion. I will also further explain synergism and how this needs to be considered for essential oils' metabolism and potential interactions. These aspects will help to guide the practitioner in deciphering how essential oils will be processed in each unique patient and their potential interactions with current supplements, nutraceuticals, and/or medications.

Chamomile Compounds

German chamomile (*Matricaria recutita* L.) herb and essential oil are both indicated for anxiety, irritation, inflammation, intestinal spasm/colic, and sedation.[60-63] According to *Alternative Medicine Review,*[61] and verified in several sources:[60,62-63]

> German chamomile flowers contain 0.24- to 2.0-percent volatile oil that is blue in color. The two key constituents, (-)-alpha-bisabolol and chamazulene, account for 50-65 percent of total volatile oil content. Other components of the oil include (-)-alpha-bisabolol oxide A and B, (-)-alpha-

**There is one branded essential oil company with approval for internal ingestion from the FDA. It is the only dietary supplement line of essential oils.

bisabolone oxide A, spiroethers (cis- and trans- en-yn-dicycloether), sesquiterpenes (anthecotulid), cadinene, farnesene, furfural, spathulenol, and proazulene (matricarin and matricin). Chamazulene is formed from matricin during steam distillation of the oil. Yield varies depending on the origin and age of the flowers. European Pharmacopoeia recommends chamomile contain no less than 4 mL/kg of blue essential oil.[61]

It is important to know the species and chemotype of German chamomile oil when using it in clinical practice. Although similar, it cannot be blindly interchanged for Roman chamomile essential oil due to their different biochemical makeup. Notably, for those on anticoagulants, there are levels of coumarins in Roman chamomile oil. As stated in one review:

> Roman chamomile contains up to 0.6% of sesquiterpene lactones of the germacranolide type, mainly nobilin and 3-epinobilin. Both α-bisabolol, bisabolol oxides A and B and chamazulene or azulenesse, farnesene and spiro-ether quiterpene lactones, glycosides, hydroxycoumarins, flavanoids (apigenin, luteolin, patuletin, and quercetin), coumarins (herniarin and umbelliferone), terpenoids, and mucilage are considered to be the major bio-active ingredients.[62]

The evidence for interactions with liver enzymes is not conclusive. One in vitro study of German chamomile tested its effects on four selected human cytochrome P450 enzymes (CYP1A2, CYP2C9, CYP2D6 and CYP3A4). The researchers' conclusions were based on increasing concentrations of major constituents incubated with recombinant CYP isoforms. They reported the following:

1. CYP1A2 was most inhibited by chamazulene (IC50 = 4.41 microM), cis-spiroether (IC50 = 2.01 microM) and trans-spiroether (IC50 = 0.47 microM) and active towards CYP3A4.
2. CYP2C9 and CYP2D6 were less inhibited, only chamazulene (IC50 = 1.06 microM) and alpha-bisabolol (IC50 = 2.18 microM) revealed a significant inhibition by the latter.[64]

There are several caveats with these conclusions that were discussed above. It is biased to base effects on isolated compounds in petri dishes to actions of the essential oil in humans.

Natural Medicines rates German chamomile's evidence for inhibition of liver enzymes as "D" level, an anecdotal and minor interaction. It does report a potential moderate interaction in combination with two medication classes, sedatives and oral contraceptives. Although this is also based on anecdotal evidence, it is rated "moderate" because the effect can result in a more severe impact.[63]

Regarding safety, German chamomile herb is generally regarded as non-toxic[60-63] and has evidence of beneficial use in human trials.[63] *Natural Medicines* reported the following for German chamomile essential oil: "Six drops of oil infused with German chamomile flower has been safely applied nightly for up to 6 weeks in children 6-18 years-old (98621)."

There is one report of a woman who was on warfarin and after taking chamomile herb concurrently experienced hemorrhaging. A review on this plant states that the small amounts of coumarin content present in German chamomile likely would not have contributed to this.[61] This holds for the essential oil of Roman chamomile as well.[61] It could be that the tea was Roman chamomile, which as previously stated does contain coumarins. This is not verifiable by the review.

A contraindication of using German chamomile is that those with allergies to the Asteraceae/Compositae family (ragweed, chrysanthemum, marigold, daisy, etc.) may experience cross-over hypersensitivity reactions to chamomile [60-64] and the essential oil.

Citrus Oils Constituents – First the Furanocoumarins

Citrus oils are common essential oils and have a high percentage of limonene content,[65] a compound often used for relief of heartburn, dissolving cholesterol-containing gallstones, and as a chemopreventive.[66] Components in the essential oil differ from citrus fruits, pulps, or juices. The volatiles make up 85-99% of total weight. These include limonene (a monoterpene), terpenoids, aldehyde, alcohols, esters, acids, and trace levels of sulfur and nitrogen compounds. Non-volatiles (PMF, furanocoumarin) make up the remaining amount of the essential oil.[65]

Due to the small amount of furanocoumarin present in the essential oil of citrus oils, the well-known interaction between grapefruit juice and the CYP34A enzyme is unlikely and less of a concern.[65-68] I will still always suggest monitoring by the prescribing physician with any new intervention. I personally am especially vigilant if clients are of the "sensitive type," on several medications, herbs, and/or supplements, and/or has clinically relevant genetic variances.

Citrus Oils Constituents and Biotransformation

A thesis to determine the extent of inhibition of nine citrus essential oils on three CYP450 enzymes is often referenced to provide "evidence" of citrus oils impacting liver biotransformation. Although the author proved that limonene alone, the most abundant constituent did not have an influence on biotransformation, different citrus oils tested had differing outcomes in this in vitro study. The author concludes:

> The results for CYP2E1 concluded that Citrus tangerine, tangerine, was the most potent inhibitor and inhibited through competitive inhibition. The results for CYP3A6 concluded that none of the nine citrus essential oils inhibited the activity of CYP3A6 at a good quality concentration. Lastly, the results for CYP2A6 concluded that both Citrus bergamia, bergamot, and Citrus aurantifolia, lime, were strong potent competitive inhibitors at low concentrations with a KI of 0.878 µg/mL and a KI of 0.045 µg/mL. The inhibition of CYP 2A6 has recently been identified as a possible therapeutic approach to smoking cessation, therefore giving significant importance to bergamot and lime oils and the compounds found in them.[69]

It's important to note that this thesis was done on rat liver microbiomes and the assays themselves may have altered the constituents in the essential oils.[69] This petri dish study once again makes the accuracy in findings to essential oils and human metabolism very questionable.

Citrus Oils and Limonene Metabolism

Although biases do exist on isolated constituents' actions being extrapolated to an essential oil's effects, the mechanisms for metabolism of citrus oils in human trials are lacking. Therefore, it may be somewhat appropriate to consider how limonene undergoes biotransformation and is metabolized, given that

➤

➤

citrus oils are mostly limonene by weight. The popularity of the limonene supplement has made the study of this in vivo and in human trials more readily accessible.[66, 70-76] According to a review in *Examine*:

> Limonene is rapidly and almost wholly absorbed in the GI tract after ingestion, and then gets divided to various body tissues after first pass metabolism in the liver where it may be subject to metabolism into carveol metabolites or perillyl metabolites by CYP2C enzymes of which inter-species differences exist.[71]
>
> After a 1.6g dose, between 52-83% of the dose is excreted in 48 hours and no build up of the compound is seen 21 days after cessation. The half-life of D-limonene in humans is estimated to be between 12 and 24 hours.
>
> The primary metabolites of limonene in humans are perillic acid, dihydroperillic acid, and limonene-1,2-diol. These metabolites are glucuronidated by the liver and excreted via the urine.[71]

The supplement is generally considered safe in humans, though reports of toxicity exist in vitro and in vivo.[66,70-71] The IARC monograph on limonene reports that rodents' metabolic processing of this compound are unlikely to be correlated to human effects:

> Limonene is metabolized in humans and experimental animals to a variety of metabolites, including perillic acid and d-limonene-1,2-diol. Although deemed nephrotoxic in rats, this monograph reviewed in detail the difference between the metabolites interaction with proteins formed in rats versus with human urine protein content.[70]

The *Alternative Medicine Review* validated these conclusions and further expanded on its distribution and safety profile.[66] Limonene is reported to be rapidly distributed to tissues in the body, and its metabolites are detectible in the blood, liver, lung, kidney, with the highest amount found in fatty tissue. No accumulation of the metabolites was found in 21 days of repetitive dosing in one study.[66,70]

In summary, the safety of limonene has been validated; however, it is important to note that it is metabolized by CYP2C enzymes and is glucuronidated. This could impact other medications.[70-71] Natural Medicines reports the evidence for inhibition as "D" level evidence, anecdotal and preliminary.[76]

Table 1: Essential Oils Conversion and Measurement Chart

1 oz. = 30 ml
1 oz. = 600 drops essential oils
1 oz. = 2 Tbsp. or 6 tsp.

Using these conversions:
6 drops of EO per oz. of carrier oil = 1% dilution (1% of 600 drops)
3 drops of EO per Tbsp. or 3 tsp. = 1% dilution (1% of 300 drops)
1 drop of EO per tsp. = 1% dilution
1 drop of essential oil = approximately 0.02 to 0.03 grams = 20-30 milligrams = 20000 micrograms (µg)
30 mg = approximately 1 drop*

*Compiled from references 117-121 (found on TownsendLetter.com)

How Synergy in Essential Oils Impacts Their Effects

Now that we understand the complexity of determining the exact mechanisms of essential oil biotransformation in studies based on single constituents, I want to further discuss the topic of synergism and essential oils. As already stated, extrapolation of mechanisms from their isolates is just that, an assumption based on the trend of behavior of one compound. These actions will likely not correlate or fully represent how unaltered essential oils behave as a synergistic symphony within humans' complex systems.

Although essential oils contain different constituents at a higher potency than extracts and herbals, The School for Aromatic Studies provides a wonderful definition of this concept of synergy used herbal medicine:

> Many herbalists acknowledge that one of the main differences between whole herbs and traditional extracts on the one hand, versus individual vitamins, minerals, isolated phytochemicals, or conventional single – molecule drugs on the other hand, is the principle of synergy.
>
> Synergy can be defined in a number of ways, but the underlying idea is that complex interactions among the many constituents of an herb give rise to its unique characteristics, personality, and healing properties. To borrow a concept from physics, the very complexity of a living plant – which contains perhaps thousands of interacting chemicals – gives rise to emergent behavior: activities and effects which could not have been predicted from what is known about the individual components of the system. In other words, the whole herb is far more than the sum of its constituents.
>
> – Lisa Ganora *'Herbal Constituents'*[77]

A 2014 article titled, "Essential Oils, A New Horizon in Combating Bacterial Antibiotic Resistance," discusses how synergism is related to essential oils' actions in combination with antibiotics. The researchers noted that essential oils have multifactorial effects based on these complex molecular properties in combination with their aromatic influences. Furthermore, they are lipid soluble, which improves their bioavailability.[78] This should be noted when comparing an essential oil compound found in a capsule or tablet to ingesting the unaltered essential oil. The authors stated:

> It is likely that several components in essential oils play a role in characterizing the fragrance, the density, the texture, the color, ability in cell penetration, lipophilicity, fixation on cell walls, and most importantly the bioavailability. Considering that a vast range of different groups of chemical compounds are present in one essential oil, it is most likely that antibacterial activities cannot be attributed to one specific mechanism or component; and hence, there may be several targets in a cell which result in the potentiating influence. Thus, it is more meaningful and rational to study the whole essential oil rather than some of its components as whether concept of synergism truly exists between the components in essential oils.[78]

The Isolates vs. the Oil – Metabolism and Medications

To contrast studies on their isolates, *Examine* compiled a synthesis of research on the essential oils of lavender and peppermint. Silexan, a proprietary lavender essential oil preparation that is standardized for 20-45% linalool and 25-46% linalyl acetate was reported to have no significant effect on CYP450 enzymes:

> Oral ingestion of Lavender oil at 160mg (as the brand name product Silexan) in otherwise healthy persons over 11 days had no significant effect on CYP1A2, CYP2C9, CYP2D6, and CYP3A4 as assessed by drug pharmacokinetics relative to placebo, while the influence on CYP2C19 appeared to be affected but was not deemed to be clinically relevant.[79]

In the review of peppermint, *Examine* reported that menthol may effect CYP2D6 due to its inhibition of coumarin 7-hydroxylation, which may account for how peppermint tea was reported to affect drug levels of nicotine. However, compared to its isolate on CYP3A4, peppermint oil had a different dosage level of interaction and a reversable effect. The website states:[80]

> Menthol has been confirmed to inhibit coumarin 7-hydroxylation (CYP2D6 mediated) with an IC_{50} of 70.49µM (the (-)-menthol isomer) or 37.77µM (the (+)-menthol isomer) which is thought to underlie the increased ratio of nicotine to cotinine seen with coingestion of peppermint tea with nicotine, as nicotine is converted to cotinine by two enzymes (one of which is CYP2D6[29]).
>
> Peppermint also appears to inhibit CYP3A4 in a reversible manner, which was thought to be due to the menthol content; peppermint oil had a K_i of 35.9+/-3.3µg/mL and menthol a K_i of 87.0+/-7.0nM/mL. This was confirmed to increase the AUC of felodipine by 140%, which underperformed relative to grapefruit juice as a reference (173%).[80]

I cross-referenced the cited reference in the above excerpt and found it was a two-part study. The first part was an in vitro experiment using human liver microsome cells to assess this inhibitory effect on CYP enzymes. The second part of the experiment was a randomized four-way crossover study on oral pharmacodynamics in 12 volunteers. The interventions consisted of administration of 10-mg ER felodipine tablet in combination with either grapefruit juice (300 mL), peppermint oil (600 mg), ascorbyl palmitate (500 mg), or water.[80-81]

The conclusions were more nuanced in the referenced study. The authors reported that peppermint oil was a moderately potent reversible inhibitor of *in vitro* CYP34A activity and the results of the human trial were inconclusive:[81]

> Peppermint oil, menthol, menthyl acetate, and ascorbyl palmitate were moderately potent reversible inhibitors of in vitro CYP3A4 activity. Grapefruit juice increased the oral bioavailability of felodipine by inhibition of CYP3A4-mediated presystemic drug metabolism. Peppermint oil may also have acted by this mechanism. However, this requires further investigation. Ascorbyl palmitate did not inhibit CYP3A4 activity in vivo.[81]

Liver's Darling Defense and Essential Oils – Glutathione and Phase II Metabolism

Another contention between essential oil users, aromatherapists, researchers, and the media is the topic of liver damage. Some claim they harm this precious organ while others deem they protect it.[81-82] There are several aspects to consider with this, and the most pertinent is its link to phase II metabolism and glutathione.

First, due to the need to be metabolized, any external foreign compound at the right dosage could potentially damage the liver. This is related to the production of excess electrophiles. The liver is usually able to neutralize these "free radicals" through a multiplicity of glutathione enzymes and by a nonenzymic conjugation with glutathione (GSH). However, when these systems are overwhelmed, damage can ensue.[81-87]

It's important to realize that essential oils act synergistically; and along with compounds that may modulate biotransformation, many are antioxidants.[82,88-96] In fact, some constituents and essential oils (e.g., lemongrass and rare citral containing oils,[88] black cumin,[93] cumin, fennel, and clove[94]) have been found to increase glutathione in vitro and in vivo.[87, 92-94] For example, fennel and thyme oil have protected against damage to the liver from carbon tetrachloride.[82] Therefore, a blanket statement of an essential oil causing liver damage is radically unfounded.

Glucuronidation and Essential Oils

Oils that contain phenols, such as carvacrol found in oregano, methyl salicylate in wintergreen, eugenol in clove, and thymol in thyme, go through glucuronidation. This is something to consider if one has a single nucleotide polymorphism (SNP) in this enzyme or using medications that are cleared by this pathway. Drugs to be aware of when using these essential oils include aspirin, propofol, acetaminophen, and carprofen. Those with a phenol sulfur-transferase (PST) SNP may also want to be cautious of oils high in phenols.[97-99]

A little note for animal lovers and their cats on this topic. Unlike humans, kitties lack the phenol UDP-glucuronosyltransferase (UGT) enzymes, including UGT1A6 and UGT1A9; therefore, one

➤

➤

may want to be cautious with these oils around their furry friends as well.[100]

The Medication-Essential Oil Interaction Effect Summary for the Clinician

Although experimental and clinical trials can be helpful in determining general responses for a single intervention in an overall population, it is important to remember that due to epigenetic factors, individual responses to any modality will differ. As integrative medicine practitioners, we often get the "outliers," with whom unexpected outcomes from common interventions occur. This consideration is not only important in deciding which essential oils to choose, but how to use them with other health modalities.

As with any new intervention to err on the side of caution is warranted. I always start with one essential oil at a time until I know the client's response. I will also monitor responses and dosages throughout use. I only introduce additional therapies sequentially, as needed, after the half-life of the modality and the body has time to respond.

I have covered a lot of details, therefore, my key points to remember for potential interactions of essential oils with drugs and for any intervention are listed below. These are based on my experience with clients and from my review of the literature above.

1. Natural does not mean inert. Any supplement, herb, essential oil, nutraceutical, or drug will impact the organs of elimination and excretion because they all need to be processed by the body. Interactions with them can occur with nutrients, foods, and between modalities.
2. Everyone is different, with different detoxification capacities and abilities to metabolize drugs, supplements, and nutrients. This can result in "unusual" effects for some people. Therefore, it is often helpful to check clinically relevant detoxification SNPs in sensitive patients and to not dismiss them as "head cases" when they report strange responses to any intervention.
3. For those on medications that must be dosed and kept within narrow ranges of blood values, allow at least 2-3 hours between taking them and using essential oils. Monitor responses more frequently and during the introduction of the essential oil or additional intervention.

   If one is on anticoagulants, such as heparin or warfarin, and/ or antiplatelet drugs, such as aspirin, only introduce the use of essential oils if "clotting time" is being monitored. This includes prothrombin time (PT) and international normalized ratio (INR). Some essential oils that may present with the highest risk with these medications include:
   - Birch (Sweet) (*Betula lenta)*
   - Garlic (*Allium sativum*)
   - Oregano (*Origanum onites* as well as the following synonyms *Origanum smyrnaeum, Origanum vulgare, Origanum compactum, Origanum hurtum, Thymbra capitata, Thymus capitatus,Coridothymus capitatus, Satureja capitate*)
   - Tarragon (*Artemisia dracunculus*)
   - Wintergreen (*Gaultheria fragrantissima*)[43,101]
4. According to *Therapeutic Benefits of Essential Oils, Nutrition, Well-Being and Health*, most components of essential oils are taken in then metabolized by limited phase I, followed by glucuronidation and sulfation through the kidneys as polar compounds or exhaled through the lungs as CO2.[101]

   This means that if a person has reported drug and supplement effects in alignment with "sensitive" types, SNPs in phase II metabolism should be considered. Those with compromised kidney health and lung capacity should also be monitored closely. The practitioner should evaluate kidney and lung function in these patients, as they would any intervention.

   Overall, there is small risk for accumulation due to their short half-life and fast metabolism.[82, 101]
5. Most studies that have reported liver toxicity with essential oils involve ingesting more than 5ml of essential oils at a time.[19,102-104] Considering the appropriate dosage should be one to two drops, these reports are not really "toxicity" issues, rather they are overdosages. Furthermore, trials in vitro and in vivo have provided evidence that some essential oils can induce glutathione and act as antioxidants, protecting the liver.
6. After over eleven years of using essential oils with my clients and seventeen years of personal use, I have found that some of the earliest signs of inappropriate dosage of essential oils can be complaints of headaches and/or frequent urination.

   I have noticed that headaches are usually a result of their aroma, causing overstimulation of easily excitable neurons at a low threshold. This usually occurs in "sensitive patients" that note they commonly react to smell and generally have a high body burden of toxicants. Usually, after supporting their biotransformation pathways with nutrients and herbals and/or supporting functional neurology factors (e.g., oxygenation, blood sugar, mitochondrial and neurological stimulation through exercise), these clients can then introduce essential oils into their protocol. This most often occurs with inhalation methods versus ingestion.

   If one is using excessively high dosages, it can overwhelm a compromised metabolic pathway in the liver and kidneys. Due to the fact the kidney is responsible for glucuronidation and sulfation of some essential oils constituents, urination may increase as the body tries to metabolize them. Therefore, be extra cautious with proper dosage and use in those with liver and kidney compromise and/ or with multiple sensitivities.

Sarah LoBisco, ND, is a graduate of the University of Bridgeport's College of Naturopathic Medicine (UBCNM). She is licensed in Vermont as a naturopathic doctor and holds a bachelor of psychology degree from State University of New York at Geneseo. Dr. LoBisco is a speaker on integrative health, has several publications, and has earned her certification in functional medicine. Dr. LoBisco currently incorporates her training as a naturopathic doctor and functional medicine practitioner through writing, researching, private practice, and her independent contracting work for companies regarding supplements, nutraceuticals, essential oils, and medical foods. Dr. LoBisco also enjoys continuing to educate and empower her readers through her blogs and social media. Her recent blog can be found at www.dr-lobisco.com.

7. Children and those on many medications should use three-quarters to half potency when using essential oils topically and internally. Infants should not use topical or oral routes for essential oils, unless caregivers are well-versed in diluting essential oils. (Specific dosage charts exist for pediatrics and are available online.) I have found many adult clients need less medication, and some even discontinue medications with time, if their prescribing physician works with us and is open-minded and integrative.
8. Within the literature, aromatherapy is deemed overall safe and beneficial when used properly and safely.[105-108]

If you'd like additional details on essential oils, medication interactions, and safety on my essential oils, please visit my essential oils database under the category "children and safety" found at http://dr-lobisco.com/essential-oils-database/.

Internal Usage of Essential Oils: Controversy, Scare Tactics, and Bad Science

Now that we have knowledge of the basic overview of application of essentials and have safety information regarding their biotransformation and metabolism, it is time to discuss how to use them orally. First, let's consider the hesitancy that may be present in a practitioner.

As stated above, this is the most debated method of aromatherapists in the United States. However, this is not the case in France and Germany.[5-8, 109] The National Cancer Institute states:

> Although essential oils are given orally or internally by aromatherapists in France and Germany, use is generally limited to inhalation or topical application in the United Kingdom and United States. Nonmedical use of essential oils is common in the flavoring and fragrance industries. Most essential oils have been classified as GRAS (generally recognized as safe), at specified concentration limits, by the U.S. Food and Drug Administration (FDA). (Refer to the International Federation of Aromatherapists website [www.ifaroma.org/] for a list of international aromatherapy programs.)

What many may not realize is that ingesting essential oils has been practiced worldwide for years via their use as flavoring agents. Currently, many are listed under the Substances Generally Recognized As Safe (GRAS) by the FDA (available at: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=182.20.)

Furthermore, Germany has a history of their internal use and has guidelines issued by The Commission E for their indications.[9] For example, fennel essential oil has been used orally for a wide array of intestinal issues.[9,110-114] According to the Expanded German E Commission by the American Botanical Council, this essential oil has vast applications and specific dosages of administration:

> The Commission E approved the internal use of fennel oil preparations for peptic discomforts, such as mild, spastic disorders of the gastrointestinal tract, feeling of fullness, and flatulence; and also for catarrhs of the upper respiratory tract. Fennel honey was recommended for catarrhs of the upper respiratory tract in children. ESCOP approves the use of fennel syrup or fennel honey for catarrh of the upper respiratory tract in children (ESCOP, 1997).
>
> In Germany, fennel seed is licensed as a standard medicinal tea for dyspepsia. It is also used in cough syrups and honeys (antitussives and expectorants), and stomach and bowel remedies, especially in pediatrics, as aqueous infusion, water (Aqua Foeniculi), drage (lozenge), juice, and syrup. It is often used in combination with aniseed (Leung and Foster, 1996; Wichtl and Bisset, 1994). In the United States, it is also used as a component of galactagogue preparations. Indications for use of fennel oil are similar to those for fennel seed. In Germany and the United States, fennel oil is used as an expectorant component of cough remedies, and also as a carminative component of stomach and bowel remedies in dosage forms including honey and syrup. Traditionally, it is combined with laxative or purgative herbs to counteract or modify their harsh griping effects in the bowels (ESCOP, 1997; Leung and Foster, 1996; Nadkarni, 1976; Wichtl and Bisset, 1994). The Commission E limits the use of fennel seed and fennel oil for up to two weeks and then recommends consulting a physician.[111]

Although the European Union is currently replacing the German E Monographs by EMA Community Monographs, they are still considered an authoritative reference, according to Mark Blumenthal, the founder and director of the American Botanical Council (ABC).[115,116]

I believe that this oil is a perfect example of scare tactics regarding ingestion of essential oils. Many proclaim that this essential oil is toxic, dismissing Germany's history of use and its presence in the food supply. This is mostly based on toxicology studies of one of its isolated compounds, estragole, from in vivo and in vitro trials. These are unfounded extrapolations as a 2012 review published in *Evidence-based Complementary and Alternative Medicine* provides evidence for. The authors state the following reasons for this:

- Studies do not assess quality of the whole fennel oil.
- Metabolism and biotransformation differences in humans and rodents.
  - It was reported that human liver cells have a high level of an enzyme that provides protection against the harmful reactants resulting from estragole metabolization in rodents that produce negative effects. (Allylic epoxide hydrolase activity is seven to 10 times higher than that seen in rat liver).
- Synergy
  - The article states, "In humans estragole usually enters the body as a component of fennel tea, or as a food that has been seasoned with herb that contains many other substances like nevadensin, epigallocatechine, other flavonoids, and anethole [in essential oil], that have a protective role and so counterbalance to the possible effect of pure estragole."[19]

The authors of this review conclude, "Consideration of these issues (dose, administration form, and differences in metabolism between species) raises doubts about the conclusion that fennel seed can be 'reasonably anticipated to be a human carcinogen.' It is clear that human and animal metabolism cannot be directly compared but we think data should deserve attention."

These three main points of quality, differences in metabolism and biotransformation, and essential oil synergy should be kept in mind by practitioners when determining the safety and application of essential oils. Furthermore, one should always be cautious to not take at face value headlines and hype that are aimed to produce fear of natural substances. ◆

Article and full reference list will be provided on our website TownsendLetter.com

The Mitochondrial Theory of Aging

by Lee Know, ND

Lee Know, ND, is a licensed naturopathic doctor based in Toronto and is the author of *Mitochondria and the Future of Medicine: The Key to Understanding Disease, Chronic Illness, Aging, and Life Itself* (Chelsea Green, 2018). The following excerpt is adapted from his new book and is reprinted with permission from the publisher.

A modern version of the Mitochondrial Theory of Aging was initially put forth by Anthony Linnane, an Australian professor and scientist, back in the late 1980s. The theory has gone through some further modifications since then, but its main point remains that the mitochondria are the body's main source of free radicals that are linked to aging.

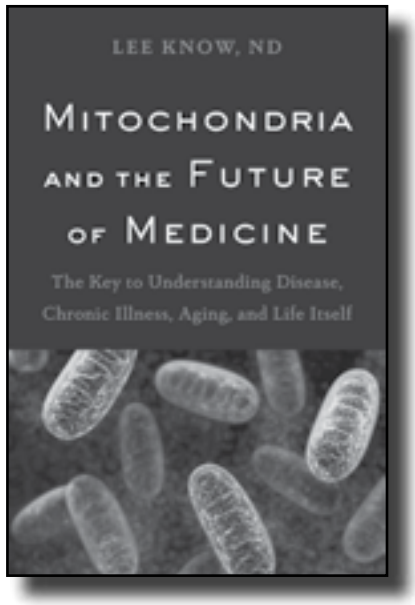
Free radicals don't damage the cell as much as we think. We produce a number of antioxidant enzymes that mop them up, and if a cell does get damaged, there are repair mechanisms constantly at work. But the free radicals linked to aging do specifically damage the mitochondria, and especially their vulnerable DNA, which doesn't have the repair mechanisms the rest of the cell has. When the damage accumulates faster than a mitochondrion can repair itself, it becomes dysfunctional, the first step in aging. In essence, this theory says the mitochondria are the "biological clock." As the mitochondria start to weaken and eventually die, the functioning and viability of the cell as a whole declines. As cells lose their ability to produce energy, they commit apoptosis – that is, they die – which then compromises the functioning and viability of the tissue or organ.

As random mutations in mitochondria accumulate, a *bioenergetic mosaic* develops – where cells all produce a drastically differing amount of energy, depending upon their degree of mitochondrial damage. In a healthy toddler, we do not see this mosaic because energy production is high in nearly all cells. However a noticeable *mosaic effect* develops after about age forty.

Linnane's theory holds that this mutation-driven bioenergetic decline is a major factor in the degenerative diseases and general frailty of old age. Recent research from numerous disciplines has converged on the mitochondria as the center of cellular aging, giving more weight to the theory, and enhancing it. If the Mitochondrial Theory of Aging is correct, the foundation of cellular vitality lies in the mitochondria.

Moving Forward to Beat Disease (and Even Death?)

The pharmaceutical industry spends many billions of dollars annually for research, but nothing more than symptom management comes of it. The paradigm under which that industry operates is likely one of its many problems. Drugs are almost exclusively used after a disease has manifested its physical symptoms; they are rarely, if ever, used to prevent diseases in the first place. If it's true that the quality of our mitochondria is the single most important factor in aging and degenerative diseases – and if we can't turn back the clock on our mitochondria – prevention should start in childhood.



Even the dietary supplements industry is on the wrong path with all its marketing of antioxidants. The antioxidant craze promotes these supplements as the cure for most ailments; and although it seems to be losing some steam, "antioxidant" is still a buzzword thrown around excessively to hopeful consumers. Also as mentioned earlier, while antioxidants do have some benefits in certain diseases according to *some* studies, other studies have found that large amounts can potentially do some harm. Just because they're marketed as natural and healthy, this doesn't mean it's good for you to use them indiscriminately or in excessive amounts. If you mess with the mitochondrial thermostat, the cell can't calibrate its response to stress appropriately. In the long run this can't be good, and it undermines Nature's protective processes. This mitochondrial thermostat also explains why while antioxidants might extend life in a sick population (relative to people with the same condition who are not receiving antioxidants), they fail to extend the maximum life-span potential of a species. Antioxidants are likely beneficial to extracellular components, at membrane surfaces, and maybe even in the cytoplasm of our cells; but it is highly unlikely they will be able the quench the free radicals leaking into the mitochondrial matrix.

Yet all the expanding knowledge about mitochondria gives us new hope and insight for treating illnesses. If all the genetic and environmental factors that lead to age-related degenerative diseases converge at the mitochondria, we just need to focus on one organelle. While newer research is revealing the intricate interaction between mitochondria and other organelles, such as peroxisomes and endoplasmic reticulum, we seem to be one big step closer to targeting the underlying mechanism behind many diseases, and even death itself.

Lee Know, ND, is a licensed naturopathic doctor based out of Canada, and the recipient of several awards. Known by his peers to be a strategic and forward-thinking entrepreneur and researcher, he has held positions as medical advisor, scientific evaluator, and director of research and development for major organizations. Besides managing scientific affairs for his own company, he also currently serves as a consultant to the natural-health-products and dietary-supplements industries and serves on the editorial advisory board for Canada's most-read natural health magazine. He calls the Greater Toronto Area home, where he lives with his common-law partner and their two sons, and has a particular interest in promoting natural health and environmental stewardship.

◆

Bringing Mitochondrial Care to Clinical Practice

review by Dr. Nasha Winters, ND, FABNO
www.terrain10.com and drnasha@torus.ventures

Mitochondria in Health and Disease: The Key to Understanding Disease, Chronic Illness, Aging, and Life Itself by Ray Griffiths
Singing Dragon Publishing; https://singingdragon.com
2018; 336 pp; $45.00 (US)

"Mitochondrial Functions: The Doorway to Understanding the Body as a Whole"--not a bad Part I title as Ray Griffiths, MSc, MBANT, registered nutritionist and lecturer takes a deep dive into this historically misunderstood and under-rated organelle. As someone who has been on a 25-plus year journey exploring the nuances of the mighty mitochondria, I was thrilled to see another wonderful addition to our reference library.

Though several integrative-minded colleagues have written about and commented on this topic (Pizzorno, Mitochondria---Fundamental to Life and Health*. IMJC*; 2014 Apr; 13(2): 8–15, and Know, *Mitochondria and the Future of Medicine,* Chelsea Green Publishing, 2018*),* it is only in the last few years that this topic has reached more mainstream (Picard, et al. An Energetic View of Stress: Focus on Mitochondria. *Frontiers in Neuroendocrinology*. 2018;49:72-85). Ray Griffiths' book is not only a "why" but a "how" to combine functional testing, diet and lifestyle interventions, and ability to articulate these concepts in a compelling and supportive way to our patients.

Derived from Greek 'mitos' (thread) and 'chondros' (granule), first noted in 1898 by microbiologist Carl Benda, these dynamic, motile, shape-shifters are highly adaptive and flexible to the needs of a cell (when working properly). When their job is complete, and they are tired out, they undergo mitophagy (removal of these retired specialized cells) to make room for mitogenesis (creation of new mitochondria) – all in an efficient, quality-controlled process that keep up with our energy needs. The raw material (aka: our food) is what enables or disables this flexibility and adaptability. It should come as no surprise, that the changes made to our modern way of growing, cultivating, and processing food, in addition to shifting to a carbohydrate-dense diet over the past 150-200 years since we began milling sugar and flour, has greatly impacted the metabolic behavior of these organelles.

With the introduction of antibiotics (directly through medical interventions and indirectly through farming, ranching and residue in ground water), these original bacteria are hypersensitive and vulnerable to the devastating impact that can alter their number and function. That, along with overfeeding, inflammation, excessive cellular calcium and iron, high blood glucose, blue light exposure (he doesn't cover but evidence is mounting on the ill effect of screen time/technology on mitochondrial disease), lack of exercise, and chronic stress response, it is clear that our modern lifestyle is instrumental in driving disease today.

As stated in the opening of this book, modern medicine has attempted to compartmentalize disease processes, whereas understanding disease from mitochondrial function serves to thread the common theme of the ailments plaguing us today – loss of metabolic flexibility and adaptation. Ray Griffith's book offers solutions, most of which are unique to a vitalistic, comprehensive, whole person, health-centric approach versus a reductionistic symptom-treating one.

With nearly 10 percent of our total body weight comprised of the 10 million billion mitochondria, with the two highest energy demanding organs being the brain and heart, it is no wonder the number one cause of death is heart disease and the fastest growing chronic illness in modern societies today is neurological disorders. Yet little, if any, attention is given to these energy-pumping stations as the source of illness or wellness.

Beyond energy production, which mitochondria are most known for, Ray Griffiths takes us through the history and origin (from bacterial, parasitic invaders, to allies that have co-evolved), mitochondrial dynamics (how they sustain efficiency and mobility), their ability to be a hybrid engine when presented with fats or carbohydrates, ketone metabolism, immune regulation, calcium storage and regulation, control center for apoptosis, heme production, kidney detoxification and hormone synthesis, and their need for a touch of hormesis (biphasic dose response to a toxicant) in order to improve form and function. This goes way beyond what we were taught in school.

At the end of each of these engaging chapters, Ray offers key points for practitioners, the bench to bedside practical information needed to better serve our patients and to deepen our own clinical understanding. He doesn't stop there. He offers an overview of specific dietary interventions shown to support mitochondrial function and recommends laboratory tests and biomarkers to monitor and remove obstacles to cure and measure progress. He then dives into condition-specific processes (like diabetes, heart disease, autoimmunity, neurodegeneration, cancer, autism and more) highlighting their unique mitochondrial patterns. And finally, he offers the reader research-supported supplements, herbs and lifestyle recommendations that enhance and energize the mitochondria.

At the end of this well-written and accessible book, Ray Griffiths makes a point of celebrating the move towards personalized nutrition and precision medicine despite the slow adoption by standard of care and leaves on a hopeful and optimistic note that minding our mitochondria is where we will see the most benefit to our own health and that of those we serve.

◆

Functional Gastroenterology Bolus

by Steven Sandberg-Lewis, ND, DHANP

Early Life and GI Flora

Two early life history questions that I ask every new patient are the following:

1) Were you born vaginally or by Cesarean section?
2) Were you fed formula or breastfed and if breastfed for how long?

These factors have impact on the gut microbiota.

Transmission of Gastrointestinal Flora Through Birth Mode

Prenatal life is not sterile, and bacteria are found in meconium, amniotic fluid and the placenta.[1] Several studies have found Escherichia, Leuconostoc, Enterococcus, and Lactococcus in meconium.[2] During the birth process, microflora are initially passed from mother to child during passage through the vaginal canal followed by breastfeeding and skin to skin contact. In addition to bacteria and archaea there is evidence that parasites are a salutary factor in the health of human microbial flora.[3] The human virome is just beginning to be studied and may turn out to be much larger than the bacterial flora.[4] Additional changes to the flora occur with Cesarean birth and formula feeding.

The newborn acquires additional flora from vaginal and fecal flora. On the first day of life a full-term infant's flora includes *E. coli*, Enterococci, Enterobacteria, Strep, and Staph. Breastfeeding adds Bifidobacteria, which predominate by the end of the first week. A systematic review points to higher Firmicutes and lower numbers and diversity of Actinobacteria and Bacteroidetes in newborns born by Cesarean vs. vaginal routes.[5] Cesarean delivery has significant effects on the viral makeup of the flora as well.[4] Other studies fail to show a significant difference in flora based on mode of delivery.[6]

The first organisms to colonize the newborn gastrointestinal tract have profound effects on lifelong immunity. The flora create a two-way cross talk with the mucosa, influencing induction of gene expression which controls immunity and mucosal epithelial function.[7-9] There are at least 100 times more bacterial genes than human genes and the combination of these is termed the "holobiome." It's unlikely that anyone in the developed world has the diverse, full spectrum of flora that humans have carried through evolutionary time. The average North American is treated with an average of seventeen courses of antibiotics by age 20 and thirty courses by age 40. Four generations have had exposure to potent broad-spectrum antibiotics. Women of childbearing age likely no longer have full diversified microbiota to pass on to their newborns, but it the best we have to offer.

Transmission of Flora and Immunity by Neonatal Feeding Mode

It is an understatement to say that breastfeeding provides the ideal nutrition for the newborn. The volume of the thymus in exclusively breastfed infants is over twice that of formula-fed infants by four months of age.[10] Human milk contains active macrophages and neutrophils, which phagocytize bacteria-IgA complexes and activated T cells.[11] Human whey protein contains lactoferrin, lysozyme and immunoglobulins IgA, IgE, IgG and IgM.[12,13] Lactoferrin is one of the more important factors providing anti-inflammatory and anti-microbial activity.[14] As mentioned above, human milk is the predominant source of Bifidobacteria for the infant, yet this essential micro-organism is also found in bottle-fed children, but in lower amounts.[15] The prevalence is 3:1 in the breastfed neonate.[16]

The mode of delivery, birth weight and gestational age, home vs hospital birth and antibiotic use all affect the infant's flora. A Danish study using modern polymerase chain reaction-based assays determined that "term infants who were born vaginally at home and were breastfed exclusively seemed to have the most 'beneficial' gut microbiota (highest numbers of Bifidobacteria and lowest numbers of C difficile and E coli)."[17]

Knowing more about the origins of my patient's gut flora gives me a perspective about their constitutional state and prognosis for their gastrointestinal presenting diseases. I am more patient and expect treatment to be more complicated or lengthy if they were born by Cesarean and formula-fed. If things respond quickly and well, we have even more reason to rejoice, but if not – our expectations are tempered.

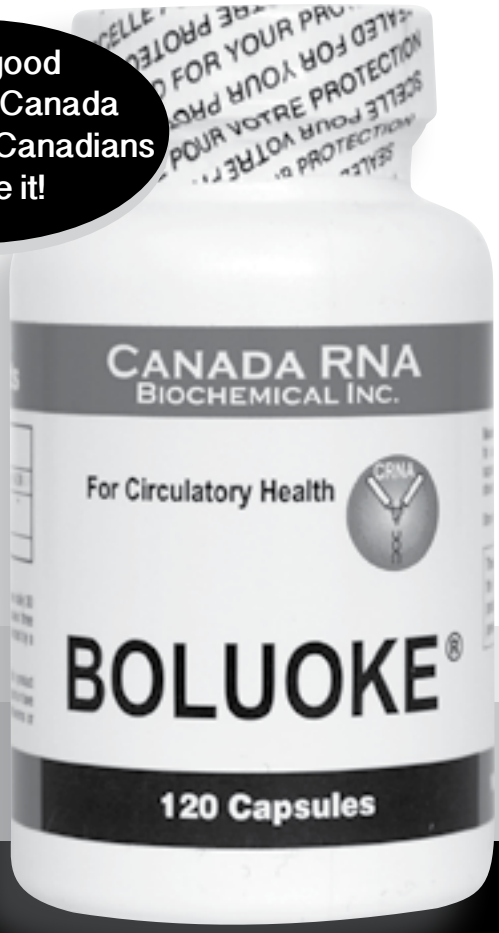
References

1. Chong CYL. Factors Affecting Gastrointestinal Microbiome Development in Neonates. *Nutrients*. 2018 Feb 28;10(3).
2. Koleva PT. Microbial programming of health and disease starts during fetal life. *Birth Defects Res C Embryo Today*. 2015 Dec;105(4):265-77.
3. Krogsgaard LR. Characteristics of the bacterial microbiome in association with common intestinal parasites in irritable bowel syndrome. *Clin Trans Gastroenterol*. 2018 Jun 19;9(6):161.
4. McCann A. Viromes of one year old infants reveal the impact of birth mode on microbiome diversity. *Peer J*. 2018 May 7;6:e4694.
5. Rutayisire E. The mode of delivery affects the diversity and colonization pattern of the gut microbiota during the first year of infants' life: a systematic review. *BMC Gastroenterol*. 2016 Jul 30;16(1):86.
6. Chu DM. Maturation of the infant microbiome community structure and function across multiple body sites and in relation to mode of delivery. *Nat Med*. 2017 Mar;23(3):314-326.
7. Hooper LV. Commensal host-bacterial relationships in the gut. *Science*. 2001 May 11;292(5519):1115-8.
8. Sonnenburg JL. Getting a grip on things: how do communities of bacterial symbionts become established in our intestine? Nat Immunol. 2004 Jun;5(6):569-73.
9. Xu J, Honor thy symbionts. *Proc Natl Acad Sci U S A*. 2003 Sep 2;100(18):10452-9.
10. Hasselbalch H. Decreased thymus size in formula-fed infants compared with breastfed infants. *Acta Paediatr*. 1996 Sep;85(9):1029-32.
11. Field CJ. The immunological components of human milk and their effect on immune development in infants. *J Nutr*. 2005 Jan;135(1):1-4.
12. Magrone T. Antimicrobial Peptides: Phylogenic Sources and Biological Activities. First of Two Parts. *Curr Pharm Des.* 2018;24(10):1043-1053.
13. Smith-Norowitz TA. Detection of IgE anti-parvovirus antibodies in human breast milk. *Ann Clin Lab Sc*i. 2008 Spring;38(2):168-73.
14. Raoof NA. Comparison of lactoferrin activity in fresh and stored human milk. *J Perinatol*. 2016 Mar;36(3):207-9.
15. Benno Y. The intestinal microflora of infants: composition of fecal flora in breast-fed and bottle-fed infants. *Microbiol Immunol*. 1984;28(9):975-86
16. Ruvaltelli FF. Intestinal flora in breast- and bottle-fed infants. *J Perinat Med*. 1998;26(3):186-91.
17. Penders J. Factors influencing the composition of the intestinal microbiota in early infancy. *Pediatrics.* 2006 Aug;118(2):511-21.

◆

HYPERCOAGULATION

It's so good that Health Canada doesn't want Canadians to have it!



A central issue in:

- conditions with a poor circulation
- growth and spread of malignant cells
- chronic infections with biofilm
- poor tissue healing due to hypoxia

Boluoke® (lumbrokinase), simply the best in:

- Enzymatic strength
- Research data
- Quality, safety, and efficacy

Your Patients. Your Reputation.

TRUST NOTHING LESS!

Boluoke® is also available through

Researched Nutritionals® solutions for life

BIORESOURCE INC

antiaging-systems.com

return 2 health

MP Mountain States Health Products, Inc.

Pro Health Network

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

CRNA

1-866-287-4986

www.canadaRNA.com

Calendar

Please submit an announcement of your event 90 days in advance.
Event publication must be limited to 25 words or less. Multiple event listings require paid advertising.
Contact calendar@townsendletter.com for details.

NOVEMBER 31-DECEMBER 2: **KLINGHARDT APPLIED PSYCHO NEUROBIOLOGY – Emotional Unblocking** @ Bastyr University in Kenmore, Washington (near Seattle). CONTACT: 908-414-0769; info@klinghardtacademy.com; www.klinghardtacademy.com

DECEMBER 1: RUBIMED THERAPIST TRAINING LEVEL 1 in Vancouver, Washington. CONTACT: https://biomedicine.com/education/all-event-listings

DECEMBER 13-15: A4M WORLD CONGRESS 2018 in Las Vegas, Nevada. CONTACT: 561-997-0113; https://www.a4m.com/

JANUARY 9-13, 2019: 16th ANNUAL NATURAL SUPPLEMENTS: AN EVIDENCE-BASED UPDATE in San Diego, California. CEs available. CONTACT: http://www.scripps.org/naturalsupplements

JANUARY 24-27: HAWAII DOC TALKS 2019 in Kona Beach, Hawaii. CEs available. CONTACT: https://www.events.syncopatemeetings.com/hawaii-doc-talks/

JANUARY 25: RUBIMED THERAPIST TRAINING LEVEL 1 in Toronto, Ontario. Also, **APRIL** in Los Angeles, California. CONTACT: https://biomedicine.com/education/all-event-listings

JANUARY 25-FEBRUARY 8: INTENSIVE CLINICAL TRAINING in India. 200+ live cases demonstrated to show homeopathy in gross pathologies. CONTACT: http://www.homeopathy-course.com/index.php/training-courses/india-homoeopathy-training/2-week-clinical-training-in-calcutta

JANUARY 26-27: RUBIMED THERAPIST TRAINING LEVEL 2 in Toronto, Ontario. Also, **APRIL** in Los Angeles, California. CONTACT: https://biomedicine.com/education/all-event-listings

FEBRUARY 8-9: CONTROVERSIES IN INTEGRATIVE THERAPIES in Costa Mesa, California. CEs applied for NDs. CONTACT: http://www.events.syncopatemeetings.com/cit/

FEBRUARY 8-10: GREAT PLAINS LABORATORY ACADEMY PRACTITIONER WORKSHOPS – Organic Acids Testing & Environmental Toxins Testing in St. Petersburg, Florida. Also, **FEBRUARY 22-24** in Scottsdale, Arizona; **APRIL 26-27** in San Fransciso, California. CONTACT: http://www.GPLWorkshops.com

FEBRUARY 15-17: 8th ANNUAL OncANP NATUROPATHIC ONCOLOGY CONFERENCE in San Diego, California. CONTACT: https://oncanp.org/conferences/

FEBRUARY 15-17: FLORIDA HOMEOPATHIC SOCIETY 2019 ANNUAL CONFERENCE – Homeopathy for Women's Health with Gabrielle Traub in Orlando, Florida. CONTACT: cicamp7@gmail.com; http://www.floridahomeopathicsociety.org/

MARCH 1-3: CALIFORNIA NATUROPATHIC DOCTORS ASSOCIATION 21st MERGING MEDICINE CONFERENCE – Autoimmunity in Palm Springs, California. CONTACT: https://www.calnd.org/ce-events

MARCH 7-9: THE FORUM FOR INTEGRATIVE MEDICINE "Exploring Practical Solutions for Complex Conditions" in Seattle, Washington. CONTACT: https://forumforintegrativemedicine.org/

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

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

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

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

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

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

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

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

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

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

◆

Letter to the Editor

More on Stress and Cancer

I had been the family doctor for Kenneth, age 41, his wife, Karen, a registered nurse, and their three girls. I had seen Kenneth infrequently, however, and never for anything major. He had not taken the time for a complete physical examination, and indeed it took considerable urging by his wife to see a doctor at all. When I did see him, he seemed introverted, didn't talk much, and manifested a flattened emotional expression as if depression might be lurking beneath the surface.

At his appointment, he removed his shirt and revealed an ugly-looking skin tumor about two-thirds of the size of a dime on the right upper chest. He had noticed it about a month before and thought that it had grown. It was slightly raised and faintly reddish-purple. Because of its ominous appearance as a malignant melanoma, I took the time during that appointment to remove it with a generous surgical margin.

As I was injecting the local anesthetic and performing the excision, Kenneth talked about what was going on in his life. He had lost his sales job about 15 months before when the company for which he worked was acquired by another firm. He described his loss of self-esteem, and feelings of shame and worthlessness as his family went through a financial crisis. He felt badly about becoming totally dependent on his wife›s income and exhausting much of their savings. As he repeatedly failed to land another job, self-loathing mounted, overlain with anxiety over the likelihood of having to take a significant cut in pay to work at all.

The pathology report returned three days later and confirmed that the tumor was a "Clark's Level 3 malignant melanoma with aggressive characteristics." This classification meant his cancer was rated a three on a scale of four for severity. His wound healed well, and there was no evidence that the tumor had spread into the regional lymph glands in the armpit or beyond. As I removed his sutures ten days later, I was struck by his bright demeanor and his upbeat conversation. He had found a new job in the meantime and was scheduled to start work the following Monday. I did suggest that he consult an oncologist, and later confirmed that he had declined in spite of his wife›s urging.

Kenneth, however, remained well and over the years showed no signs of recurrence of his melanoma. I rarely saw him, but on numerous occasions inquired of his status on seeing his wife and children in my office.

To my surprise, nearly ten years later, he came to the office with two hard lymph nodes in his right armpit. On biopsy they proved to be a recurrence of his malignant melanoma. I learned that about fifteen months before this cancer recurrence, he had lost the job which he had secured at the time of the original surgery. He again appeared morose, withdrawn, defeated, and depressed. His description of the recent recurrence was very difficult for him to express. He had discovered the lumps four months before and had done nothing about them. He refused all treatment and died quickly about four months later.

I had to ask myself, "What was the malignant melanoma doing for nearly ten years?" I had to logically assume that, following the original surgery, there must have been residual cancer in the tissues. I could only conclude that his immune system had held the cancer at bay for over nine years while he was earning a living and felt happy and relatively good about himself. With the loss of his job since I saw him last, hopelessness and helplessness had again set in, causing his immune defenses to be compromised by the stress of being unemployed.

Kenneth's experience highlighted for me the relationship of stress and depression to the onset of disease including cancer and cancer recurrence. His story prompted me to pay much greater attention to the presence of stress in the lives of my patients, acknowledge it, and take steps to help them neutralize its devastating effects.

Commonly held opinions in medical cancer literature still hold that stress is an unproven factor in cancer or its recurrence. Kenneth's story, however, with his death at age 51, told me that in some instances, the influence of stress is a major factor. Perhaps the best confirmation for the relationship of stress to the onset of threatening illness comes from the recognized increase in several degenerative diseases, including cancer, in elderly surviving widows and widowers. Compared to those whose spouses are living, the death rate of widows and widowers is significantly greater during the 18-month window of time following the death of the spouse.

The timing of Kenneth's stressful job losses to the original appearance and later the recurrence of his malignant melanoma seems too obvious to ignore. In retrospect I had some regret for not making the connection more quickly and helping him address the issues underlying his stress. The lesson may be for all of us to pay attention to the impact of stress in our own lives and take steps to neutralize its effects. Medical evidence now clearly demonstrates that most persons can, with or without professional help, greatly limit the toxic effects of stress.

Bob Anderson, MD

◆

Curmudgeon's Corner

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

A Cochrane Review of Fish Oil: A Whopper of a Disappointment

The earliest reference I have found to fish oil having a protective effect against cardiovascular disease is Bang and Dyerberg's 1971 paper.[1] This perturbs me as I clearly recall my tenth grade biology teacher mentioning this Eskimo and fish business a few years earlier. Suffice to say the idea that fish oil offers protection against heart disease has been around for about half a century. Recall in the late 1960s, heart disease was supposedly linked to high animal fat diets. Yet Eskimos didn't seem to have the predicted risk. The explanation was that the high fish oil in their diet was somehow protective.

We've swallowed this idea, hook, line and sinker, if you can tolerate the fishing expression. It's only recently that this common assumption is being questioned. Most of us have strenuously made excuses and rationalized why these contrary studies didn't find cardiovascular benefit to supplementing with fish oil or consuming more fish.

The strongest argument against our fish oil belief was published in mid-July on the Cochrane Database and at this point we're left with a pretty kettle of fish.[2] Abdelhamid and colleagues performed the most comprehensive meta-analysis we've seen to date.

Being a Cochrane Review they did a meticulous job. The authors searched CENTRAL, MEDLINE, and Embase up until April 2017. Studies were compiled for meta-analysis. The authors included randomized controlled trials (RCTs) that lasted at least 12 months and compared supplementation and/or advice to increase omega-3 polyunsaturated fatty acids from oily fish [long-chain omega-3 (LCn3) or alpha-linolenic acid (ALA)] intake versus usual or lower intake.

Their literature search yielded 79 randomized controlled trials (RCTs) with a total of 112,059 participants.

Two review authors independently assessed studies for inclusion, extracted data and assessed validity. The authors performed separate random-effects meta-analysis for ALA and LCn3 interventions and assessed dose-response relationships through meta-regression.

Trials were of 12 to 72 months' duration and included adults at varying cardiovascular risk, mainly in high-income countries. Most studies assessed LCn3 supplementation with capsules, but some used LCn3- or ALA-rich or enriched foods or dietary advice compared to placebo or usual diet.

The authors did everything right. We will have a hard time finding fault with their methodology. They didn't bother looking at blood markers associated with CVD, instead they looked at bottom line measures that included all-cause mortality, cardiovascular mortality, cardiovascular events, arrhythmia, stroke, bleeding, and coronary heart disease. These are what we really care about when it comes right down to it.

The conclusion of this large meta-analysis was that increasing fish oil consumption either as oil supplements or by eating more fish had no effect on all-cause mortality, cardiovascular mortality, cardiovascular events, coronary heart disease (CHD) mortality, stroke or arrhythmia.

Increasing ALA didn't have much more benefit. It was not associated with any significant change in all-cause mortality or congestive heart disease events. Increasing ALA did, however, was associated with a non-significant reduction in cardiovascular events from 4.8% to 4.7%[RR 0.95, 95% CI 0.83 to 1.07, 19,327 participants; 884 CVD events, 5 RCTs, low-quality evidence), and probably reduces risk of CHD mortality (1.1% to 1.0%, RR 0.95, 95% CI 0.72 to 1.26, 18,353 participants]. Mind you these benefits were not statistically significant. Not even close, but I'm trying to lessen the shock of these outcomes.

The only statistically significant benefit to show up in the data was for congestive heart disease. Fish oil was associated with a 7% drop in risk. Well, it was until the researchers performed a sensitivity analysis and the benefit disappeared. Still it's better than nothing.

These data suggest some potential risks of morbidity from things we had assumed fish oil would lower risk of. One of those conditions is stroke, that there was a slight uptick in stroke in the fish oil groups. This uptick in strokes was not statistically significant and it was super small. Still that should give us pause as we were considering multiple numbers that were not statistically significant. It kind of works both ways. This does go contrary to the common belief that fish oil is an anticoagulant and so decreases the risk of ischemic strokes. Bleeding also is a potential risk of fish oil, and we saw that there was no difference in either group with increased risk of bleeding We aren't very certain of this, but this again argues that fish oil probably isn't an adequate anticoagulant to prevent strokes and this is further evidenced by the fact that it doesn't increase bleeds. If something is going to prevent strokes because it's an anticoagulant, it should also increase bleeds because that's one of the downsides of anticoagulant therapy.

There are many of us who will be unhappy with these results. We have been advising patients to take fish oil for so long it will be hard to change our thinking.

This isn't the first large study that has called the fish 'myth' into question. In September 2012, *JAMA* published as systematic review by Rizos et al that also assessed the effect of fish oil supplementation on cardiovascular events.[3] Data from twenty studies that included 68,680 patients were analyzed. Their conclusions were similar to what we see in the current Cochrane Review: "Overall, omega-3 PUFA supplementation was not associated with a lower risk of all-cause mortality, cardiac death, sudden death, myocardial infarction, or stroke based on relative and absolute measures of association."

A Korean meta-analysis also published in 2012 failed to find any benefit of fish oil supplementation in people with a history of heart disease. This study analyzed data from 14 randomized, double-blind, placebo-controlled trials involving 20,485 patients with a CVD history.[4]

In 2013, *NEJM* published the results of a clinical trial giving fish oil to patients with multiple CVD risk factors. Patients had multiple CVD risk factors but had not had a myocardial infarct yet. 12,513 patients enrolled, 6244 were assigned to n-3 fatty acids and 6269 to placebo, which we should mention was olive oil. After a median time of five years, 11.7% of those taking fish oil and 11.9% of those receiving placebo had died or had a non-fatal MI or stroke. There is no significant difference between these two rates.[5]

It feels like these data snuck up on us in a way. A 2004 meta-analysis did suggest fish oil was doing what we thought it should. Yzebe and Lievre searched the medical literature published from 1966 to 2003 and selected ten randomized controlled trials looking at omega-3 fatty acids use by adults with recent acute myocardial infarction (MI) or angina. A total of 14,727 patients were included. Daily intake of omega-3 supplements for a mean of 37 months decreased all causes of mortality by 16% and death due to MI by 24%.[6] The new Cochrane Review with 112,059 patients had data from seven times as many patients. It's more believable. It makes me wonder, though, whether fish oil did more good years ago when the only fish we ate was an occasional whopper or canned tuna? Per capita fish consumption was 16.6 pounds in 2004 down to 14.9 pounds in 2016.[7]

Another possible explanation might be that there is a sweet spot for omega-3 oils, a little bit helps but more than that and ➤

➤

fish oil benefits decrease? If so, fish oil wouldn't be the first 'supplement' to display a hormetic effect. Past research has suggested that fish oil's effects on mood might display this sort of u-shaped curve.[8]

A 2014 paper published in the *Canadian Journal of Car diology* took a second look at the original Bang and Dyerberg paper that started this whole fish thing off. They reviewed the literature and reported that risk of cardiac arterial diseases among both the Greenland Eskimo and Alaskan Inuit never did differ from other populations and that the original basis for the "Eskimo diet" never existed. Bang and Dyerberg never studied native populations directly; they used death reports and hospital admission figures to make their calculations. It turns out that CVD is common in the Inuit and curiously rates may decrease as people are 'Westernized." [9-11]

There is a new trial scheduled to be published at the end of this year. The trial ended last year. This trial is a large trial with 25,000 participants, and it has examined the effect of vitamin D and omega-3s on the primary prevention of cardiovascular disease over a five-year period. This is the largest study to ever be done on this topic. It looks at long-term supplementation of fish oil and is robustly designed.[12] It may overturn other things we thought we know about fish oil and cardiovascular disease. It will have the statistical power to question these current Cochrane Review findings, that is if they disagree.

Another interesting study will have been published by the time this issue of the *Townsend Letter* is printed and be generating media coverage. Results of a five-year clinical trial using Vascepa will be presented at the American Heart Association's November 10 meeting in Chicago. Vascepa is one of four prescription forms of fish oil that have been approved by the FDA for treating high triglycerides. The FDA approved Lovaza in 2004, Vascepa in 2012, and Epanova and Omtryg in 2014. Vascepa stands out as being pure EPA with no DHA in the product; the other three are combinations of EPA and DHA. While all of these products lower triglyceride levels, all but Vascepa raise LDL levels at the same time.[13]

This Vascepa study is getting attention from investors who are hoping widespread adoption will lead to profits. Stock prices tripled in the days after early results were released.[14] According to Amarin, the manufacturer, "Vascepa lowered the risk of heart attacks and strokes in patients with very high levels of triglycerides… and whose cholesterol levels were already held in check by drugs called statins. Patients on Vascepa had a 25% reduction in the relative risk of a heart attack, stroke, cardiovascular death, or hospitalization for unstable angina or bypass surgery after a median of 4.9 years of treatment, compared to those on statins and a placebo."[15] Patients received 4 grams of EPA per day. The patients were type-2 diabetics with high triglyceride levels (>500 mg/dL). We should delay further interpretation until the full details are made public. Yet we must admit that prescription fish oils may be a different story from eating more fish.

How could we be so far off with this? Science isn't perfect and the idea that dietary interventions might have a large impact on disease prevention is attractive to practitioners, manufacturers and consumers alike. The idea took on a life of its own. Let's return to Greenland for a moment. A paper published in 1992 offered an alternative explanation for why Eskimos have such good lipid profiles. Eskimos have significantly lower lipoprotein(a) [Lp(a)] and this is apparently do to their genetics rather than diet. [16] We were too caught up with the fish business to notice this and other early reports.

Note parts of this article are from an online lecture given by Drs. Andrew Day and Joshua Goldenberg as part of their Doctors Journal Club.

References

1. Bang HO, Dyerberg J, Nielsen AB. Plasma lipid and lipoprotein pattern in Greenlandic West-coast Eskimos. *Lancet*. 1971 Jun 5;1(7710):1143-5.
2. Abdelhamid AS, et al. Omega-3 fatty acids for the primary and secondary prevention of cardiovascular disease. *Cochrane Database Syst Rev*. 2018 Jul 18;7:CD003177.
3. Rizos EC, et al. Association Between Omega-3 Fatty Acid Supplementation and Risk of Major Cardiovascular Disease Events A Systematic Review and Meta-analysis. *JAMA*. 2012;308(10):1024-1033.
4. Kwak SM1, et al. Efficacy of omega-3 fatty acid supplements (eicosapentaenoic acid and docosahexaenoic acid) in the secondary prevention of cardiovascular disease: a meta-analysis of randomized, double-blind, placebo-controlled trials. *Arch Intern Med*. 2012 May 14;172(9):686-94.
5. Risk and Prevention Study Collaborative Group, Roncaglioni MC, et al. n-3 fatty acids in patients with multiple cardiovascular risk factors. *N Engl J Med*. 2013 May 9;368(19):1800-8.
6. Yzebe D1, Lievre M. Fish oils in the care of coronary heart disease patients: a meta-analysis of randomized controlled trials. *Fundam Clin Pharmacol*. 2004 Oct;18(5):581-92.
7. https://www.seafoodhealthfacts.org/seafood-choices/overview-us-seafood-supply
8. Arnold LE, et al. Omega-3 Fatty Acid Plasma Levels Before and After Supplementation: Correlations with Mood and Clinical Outcomes in the Omega-3 and Therapy Studies. *J Child Adolesc Psychopharmacol*. 2017 Apr;27(3):223-233.
9. Howard BV, Comuzzie A, Devereux RB. Cardiovascular disease prevalence and its relation to risk factors in Alaska Eskimos. *Nutr Metab Cardiovasc Dis*. 2010 Jun;20(5):350-8.
10. Bjerregaard P1, Young TK, Hegele RA. Low incidence of cardiovascular disease among the Inuit--what is the evidence? *Atherosclerosis*. 2003 Feb;166(2):351-7.
11. Fodor JG, et al. "Fishing" for the origins of the "Eskimos and heart disease" story: facts or wishful thinking? *Can J Cardiol*. 2014 Aug;30(8):864-8.
12. Vitamin D and Omega-3 Trial (VITAL) ClinicalTrials.gov Identifier: NCT01169259
13. Ito MK. A Comparative Overview of Prescription Omega-3 Fatty Acid Products. *P.T.* 2015 Dec; 40(12): 826-836, 857.
14. The Motley Fool Staff. How Big Could Amarin's Vascepa Be? September 30, 2018.
15. Amarin Corp. INVESTOR RELATIONS / REDUCE-IT™ CARDIOVASCULAR OUTCOMES STUDY OF VASCEPA® (ICOSAPENT ETHYL) CAPSULES MET PRIMARY ENDPOINT. Sep 24, 2018. https://investor.amarincorp.com/news-releases/news-release-details/reduce-ittm-cardiovascular-outcomes-study-vascepar-icosapent. [accessed 10-11-2018]
16. Klausen IC, et al. Differences in apolipoprotein (a) polymorphism in west Greenland Eskimos and Caucasian Danes. *Hum Genet*. 1992 Jun;89(4):384-8.

◆

Women's Health Update

by Tori Hudson, ND
womanstime@aol.com

Pain Conditions in Women

Select Pain Relief Strategies for Osteoarthritis and Fibromyalgia.

Women's health can be defined as problems that occur only in women, more often in women, or a medical problem that manifests in a unique and different clinical presentation in women. According to that definition, osteoarthritis and fibromyalgia are important primary care women's health conditions.

The incidence of osteoarthritis increases with age in both men and women, but in women, it is rare before the age of 45 years and then the incidence increases after menopause. Osteoarthritis, particularly of the hands and knees, is about twice as common in women than in men. It appears that there is a hormonal influence, especially of estrogens, on cartilage, especially since there are estrogen receptors in the cartilage. The studies on this topic are conflicting, but some do indicate that estrogen increases the volume of joint cartilage while others indicate that lower estrogen levels may even be protective. Studies of estrogen replacement therapy in postmenopausal women are also inconsistent as to their protective effect against incidence or progression of osteoarthrtis in women. Subjectively, many women do feel less joint pains when they are on estrogen replacement vs when they are off, but this is variable and individual.

Fibromyalgia affects at least 5 million adults in the US, and 80-90% of these cases are women. In that regard, it too is a women's health problem.

Three Trials of Maritime Pine Bark Extract in Osteoarthritis

The anti-inflammatory properties of plant phenols, including pine bark extract, have been of great interest in addressing the inflammation and pain of osteoarthritis. Three trials of a proprietary product, Pycnogenol, were reviewed on this topic.

Pycnogenol contains active compounds that are anti-inflammatory polyphenols, and metabolites of these polyphenol compounds are also produced in vivo due to Pycnogenol. Some of these metabolites appear in the serum within 30 minutes of ingestion, and others appear hours later, often after 14 hours. This has clinical meaning, because it means individuals might be able to get rather quick pain relief as well as sustained for many hours. Plant polyphenols and metabolites have also been detected in cartilage of the knee and in synovial fluid. Plant polyphenols reduce chronic inflammation and inhibit the enzymes that degrade cartilage.

In the current publication, the author (who is a former director of R&D for Horphag Research Ltd., makers of Pycnogenol), reviewed three randomized, double-blind, placebo-controlled clinical trials. Two hundred ninety-one patients, between the ages of 48 and 54, who had mild OA, received 50 mg of Pycnogenol or a placebo three times a day for three months in two of the studies. The third study used 100 mg/day or placebo. Pycnogenol or placebo was taken in addition to any non-steroidal anti-inflammatory drug (NSAID) they were already taking. Standard measurements of pain, stiffness, and physical function were assessed using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).

All three trials reported reductions in pain and stiffness, as well as improvements to function and the overall WOMAC score. All three studies showed improvements with Pycnogenol compared to placebo, but the third study was the most significant in results with scores for pain, stiffness and physical function dropping by nearly 50%. When the details of the WOMAC scores were analyzed in more detail, patients using Pycnogenol reported significantly greater reduction in nighttime pain, pain during climbing stairs, daytime joint stiffness, improvements in rising from sitting and walking, and increased walking distance.

In addition, patients taking Pycnogenol were able to reduce their use of NSAIDS; while in the placebo groups, use slightly increased. In the third study, other factors related to NSAID use were analyzed with not only a decline of 58% use in the Pycnogenol group, but reduction in gastrointestinal complications and hospitals days. There were no adverse events due to Pycnogenol.

Commentary: Health care providers, as well as individuals seeking self-treatment might be overlooking Pycnogenol for the pain of osteoarthritis. Reducing pain and improving stiffness, mobility, and function are a priority; but we also want

➤

➤

to be mindful of the possibility of therapies that can reduce progression, and even better yet, stimulate regeneration of joint cartilage.

Rohdewald PJ. Review on sustained relief of osteoarthritis symptoms with a proprietary extract from pine bark, Pycnogenol. *J Med Food*. January 2018;21(1):1-4.

Curcumin Improves Symptoms of Rheumatoid Arthritis

Curcumin, a constituent from turmeric rhizome is well known for its anti-inflammatory properties. One of the obstacles to efficacy for curcumin is its poor intestinal absorption, rapid metabolism, and limited bioavailability systemically. There are numerous methodologies that are used to overcome these issues. In this study, the researchers used a polar-nonpolar-sandwich technology in which the curcuminoids are protected inside the matrix. This randomized, double-blind, three-arm pilot study was conducted to evaluate the efficacy and safety of this specific new technology in this specific curcumin product called Acumin, from India, in individuals with rheumatoid arthritis (RA).

Thirty-six men and women in India, with a mean age of 38.2 years participated in this study. There were specific entrance criteria and scores of their RA that included functionality, joint swelling, joint tenderness, C-reactive protein (CRP), and erythrocyte sedimentation rates (ESR); and all had to meet the American College of Rheumatology criteria for a diagnosis of RA. Patients were excluded if they required disease-modifying antirheumatic drugs (DMARDs) or nonsteroidal anti-inflammatory drugs (NSAIDs), had RA with significant secondary involvement of any organ, an inflammatory joint disease other than RA, a different systemic autoimmune disorder, or any surgical procedure within 12 weeks prior to the start of the study.

Drugs that might interfere with the study were not permitted for two or four weeks, depending on the drug. Patients were treated with either 250 mg twice per day with Acumin, 500 mg at two/day, or placebo for three months.

Both the lower and higher doses of the proprietary curcumin product demonstrated improvement in the differential ability scales (DAS) with a 52.6% improvement with the lower dose and 66.0% improvement with the higher, compared to baseline. On the visual analogue scale (VAS) assessment, both the lower and the higher curcumin groups had significant 62.5% and 72.3% improvement, respectively, compared with baseline. Both the DAS and VAS for the placebo group had minimal changes. On the ESR assessment, both the lower and higher dose groups had 88.1 and 88.6% decrease in the ESR, with the placebo group only 29.6%. The lower dose had a 29.9% decrease in the CRP and the higher a 51.2% decrease. The placebo group, only 11.3%.

The total swollen joints assessment improved in both groups; the 250 mg/day and the 500 mg/day groups had significant 80.4% and 84.4% improvement respectively, and only 3.7% in the placebo group. Similar results were seen for the total tender joints assessment.

Commentary: Both doses of the proprietary product, Acumin, at 250 mg twice daily or 500 mg twice daily significantly improved symptoms and laboratory measures of RA with the higher dose being slightly better. The study was small, and four of the seven authors were employees of Aurea Biolabs which funded the study. I have no experience using this specific product, but I have many years of experience using all the different options of curcumin products from the simple powdered rhizome, to one of the high-tech products and everything in between. I have yet to identify if there is one preparation of curcumin that is best. I think they all have merit, and I suspect that in time, the clinical and research community might be able to clarify that one form/delivery may be used most effectively in one clinical condition, say rheumatoid arthritis, while another may be more effective in a cancer, or in depression.

Amalraj A, et al. A novel highly bioavailable curcumin formulation improves symptoms and diagnostic indicators in rheumatoid arthritis patients: a randomized, double-blind, placebo-controlled, two-dose, three-arm, and parallel-group study. *J Med Food*. 2017;20(10):1022-1030

Vitamin D and Fibromyalgia

Vitamin D deficiency and insufficiency have been suspects in fibromyalgia. The current small study, hoped to test whether vitamin D supplementation might be effective in improving symptoms of fibromyalgia. This study involved 11 adult women who had been diagnosed with fibromyalgia according to the American College of Rheumatology (ACR) criteria and had widespread pain in at least three quadrants of their body lasting for more than three months with a minimum of 11 of 18 tender points.

Patients had a serum vitamin D level of 30 ng/ml or less and received 50,000 IU of oral vitamin D once every week for three months. After three months, the vitamin D level increased significantly from 15.5-25.8 ng/ml to 28-58 ng/ml. An improvement in the visual analogue scale scores was observed at three months from 90 to 30. Eight women responded very significant improvement in symptoms and a trend for reduction in the number of tender points.

Commentary: Previous studies have demonstrated an association between fibromyalgia and vitamin D deficiency or insufficiency, while others have not. In one study of 30 Arab women with fibromyalgia, hypovitaminosis D was associated with widespread pain, and an improvement in pain and fatigue was seen after two months of just one dose of vitamin D. (Abokrysha N. Vitamin D deficiency in women with fibromyalgia in Saudi Arabia. *Pain Med*. 2012,13:7)

This study was small, lacked a control group, and did not consider other factors such as sun exposure and sunscreen; but as a pilot study, and given the lack of good data on successful treatment options for these folks, this approach of once weekly doses of 50,000 IU of vitamin D for three months, for those with vitamin D deficiency or insufficiency, is an appealing option.

Friere de Carvalho J, et al. Vitamin D supplementation seems to improve fibromyalgia symptoms: Preliminary results. *Israel Medical Association Journal*. 2018;20:379-381.

◆

Monthly Miracles

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

16th International Integrative Oncology Conference – "Cancer, Cannabis & Keto," Day 2

Annie Brandt, founder of the International Organization of Integrative Cancer Physicians (IOICP), the Best Answer for Cancer Foundation, and 18-year survivor of breast cancer, brought a great selection of speakers and exhibitors for her 16th annual conference in Orlando, Florida, on May 17-19, 2018. A summary of Day 1 appeared in the August-September 2018 issue. This article covers Day 2.

The "Greek Test"

Dr. Ioannis Papasotiriou, MD, PhD, hails from Munich, Germany, and graduated from medical school in Greece with specialties in human genetics, hematology/oncology, and molecular biology. He is the founder of Arzt Genetik Zentrum in Thessaloniki. He is the medical director of RGCCSA, where the major field of expertise is molecular oncology and a main interest is the entity of cancer stem cells.

His presentation focused on the contribution of liquid biopsy in cancer diagnosis, prognosis and treatment and included cancer physiology, diagnosis, treatment decisions, cancer tumor cells (CTCs), cancer stem cells (CSCs), Df (tumor) DNA, technical issues, utility, clinical application and future perspectives.

Current dogma includes positions on DNA mutations, RNAi, RNA misfolding, proteins and reverse transcription and retro transposition. He reviewed steps in carcinogenesis such as initiation, promotion and progression of cancer and the Vogelstein Model of developing colon cancer. With the current cancer therapy plan, the rate of success for adjuvant chemotherapy for the five major types of malignancy varies from 2.1% to 2.3 % in five years.[1] For curative stage of disease, the success rate varies between 5 to 7.5% for the same five types of malignancies.

Dr. Papasotiriou presents a very detailed methodology for culturing CTCs with the many difficulties due to their instability and heterogenicity. In the end he gets multimodal data not only in a genomic level but also in epigenetic (gene expression), proteomics and glucoproteomics. One of the subpopulations he studies is the progenitor of a tumor and the generator of metastases. This population is known as cancer stem cell-like cells. He also deeply explores tumor physiology and several methods for isolating the tumor cells, microscopy and gradient based methods. Technical issues such as sample transportation and stability are addressed. Short tandem repeats verify accuracy of cell assessments. Flow cytometry with fluorescence is used to detect multiple antigens inside each cell.

Conclusion: Liquid biopsy offers the ability for prognosis, diagnosis and treatment decisions in the cancer patient: questions@rgcc-international.com ; www.rgcc-group.com.

Cannabis and Cancer: Practical Steps for Symptom Relief and Anti-Cancer Effects

Jessica McCain, MD, presented this session for Dustin Sulak, DO.

Cannabinoids (CB), treat cancer symptoms, ameliorate and prevent cancer treatment side effects, have antineoplastic properties, enhance efficacy of conventional cancer treatments, and provide palliation in end of life care.

Dr. McCain presented safety concerns, drug interactions, adverse effects and dosing delivery strategies. Health conditions influenced by cannabinoids include the following: ADD/ADHD, ALS, Alzheimer's, anorexia, anxiety, asthma, ataxia, bipolar disorder, cachexia, cancer, chronic fatigue, chronic pain cramps, Crohn's, diabetes, depression epilepsy, fever, fibromyalgia, glaucoma, hepatitis, HIV, AIDS, incontinence, insomnia, migraine, MRSA, multiple sclerosis, nausea, neuralgia, neuropathy, Parkinson's, PMS, PTSK, rheumatoid arthritis, seizure disorders, sickle cell anemia, spasms, spinal injury, stroke, Tourette's and vomiting.

Endocannabinioid synthesis is an adaptive response to cellular stress, aimed at re-establishing cellular homeostasis. Pubmed search results for "endocannabinoid" found 10 citations in 1993 and 7,899 citations in 2016. CB receptors evolved 600 million years ago and are found in all species from the fruit fly up to man.

Two subsets of receptors exist in humans, CB1 found mostly in the human brain and CB2 found in the peripheral body

➤

➤

including WBCs. Humans manufacture our own endogenous cannabinoid ligands: the endocannabinoids, anandamide (AEA) and 2-arachidonoylglycerol (2-AG).

Cannabis can be a safe, effective treatment for cancer patients with nausea and vomiting, chronic pain, and insomnia; and it potentiates analgesia and prevents opioid tolerance and dose escalation. The FDA approved Dronabinol, a synthetic THC, as a schedule II drug in 1986 and was moved to schedule III in 1999. Nabilone, a THC analog, was approved by the FDA in 1985 but not marketed until 2006. Both are indicated for chemotherapy induced nausea/vomiting and as an appetite stimulant for AIDs patients.

Cannabis can help patients tolerate conventional cancer treatment, such a chemotherapy and radiation with a low likelihood of drug interactions. For terminal cancer patients, cannabis offers numerous benefits in palliative care at the end of life. Cannabinoids prevent and treat chemotherapy-induced neuropathy. Dr. McCain cited numerous positive clinical trials.

Dr. McCain reviewed its antineoplastic effects and preclinical trials. Cannabinoids inhibit tumor growth in multiple cell lines including biliary, breast, cervical, colorectal, gastric, glioma and other CNS tumors, hepatocellular, leukemia, lung, lymphoma, melanoma, oral cancer, pancreatic, prostate, skin, thyroid and uterine cancers. These effects are caused by inducing autophagy and apoptosis; cannabinoids suppress tumor angiogenesis, inhibit cancer adhesion and migration, and don't injure healthy cells.

Phytocannabinoids include cannabidiol (CBD), delta-9-tetrahycrocannabinol (THC), cannabigerol (CBG) and cannabinol (CBN), CBDA, THCA (are unheated versions). Terpenoids and flavonoids also have therapeutic properties. CBD has a very low affinity for CB1 and CB2 receptors and antagonizes undesirable effects of THC such as intoxication, sedation and tachycardia. It enhances the analgesic anti-emetic and carcinogenic properties of THC.

Side effects include dizziness, dry mouth, nausea, fatigue, sleepiness, euphoria, depression, vomiting diarrhea, disorientation, anxiety, confusion, impaired balance, hallucination and paranoia. Withdrawal symptoms include anger or aggression, decreased appetite or weight loss, irritability, nervousness, anxiety, restlessness, sleep difficulties including strange dreams. Symptoms appear one to two days after cessation and resolve in one to two weeks.

Oral dosing range effective in Dr. Sulak's practice are 0.015mg/kg/day- 30 mg/kg/day. Always start with low-dose treatment 0.1-1mg/kg/day for cannabis-naïve patients. Gently build tolerance to common initial side effects. Use CBD dominant strain during the daytime to reduce psychoactivity, if aligned with patient preference, and use THC dominant in the evening. The goal is 5-25mg/kg/day total cannabinoids, titration phase 1-4 weeks followed by a maintenance phase.

Why the Story Matters: Discovering Emotional Roots in Brain Cancers

Michelle LaMasa-Schrader, PhD, MSc, MA, provided a brief explanation of Recall Healing (RH), illustrating the importance of uncovering the emotional underpinnings of all cancers in facilitation and supporting individuals on their health journey. She highlighted various forms of brain tumors and detail case studies, utilizing RH in working with individuals diagnosed with brain tumors.

Recall Healing is an adjunct therapy that can be supplemental to any healing modality including traditional allopathic medicine. It does not replace any intervention utilized to aid in healing, but rather, adds awareness, insight, and tools for dealing with life's challenges and a means to recognize the mind-body connection.

Dr. LaMasa-Schrader reviewed Dr. Ryke Geerd Hamer's work of finding a "Hamer Focus" in the brain that relates to distance tumors and conflicts related to brain tumors. There is a notion of urgency, rush and necessity to perform quickly, desire to be recognized by the father, to meet his expectation and to perform intellectually above one's capacity in these individuals.

The tumor results from a violent emotional shock, deep remorse, repressed emotions and past sufferings that the patient turns against themselves. Many of these shocks can occur when the child is in utero. She discussed the importance of genetic baggage and that our children carry our unfinished business. She gave many case studies. For more information, see www.recallhealing.com.

Cancer, Conflict, and Corruption

Negative emotions create negative results. Bad moods create bad foods, bad foods create bad bacteria, bad bacteria create bad chemicals, bad chemicals create inflammation and inflammation creates scar tissue.

This is the domino effect of unconscious living, according to Darrell Wolfe, Ac, PhD, DNM, DHS. Government, corporations, media, and the psycho elite attack and control the psyche through conflict, anxiety, and panic. Their corruption contaminates and manipulates the mind of the masses on a subconscious level and create emotional chaos and dysfunctional belief systems. Keep the people distracted and disrupted so that they only focus on the physical body. Adulterated doctors degrade and bully and employ toxic pills and treatments. Barbaric health care has nothing to do with love, life, integrity or humanity – money before people. Welcome to planet Earth, a fun-filled, life-threatening adventure if you know the name of the game.

He said functional beliefs include self-love, unconditional love, self-value, self-realization, self-actualization (Brave Heart Oath), at ease and at peace in the midst of chaos and alignment with heart/brain connection. Dysfunction beliefs include self-hate, conditional love, self-depreciation, self-denial, self-destruction, and chaos creating conflict, shock, panic, dis-ease, and premature death.

Wolfe's Brave Heart Oath: "Today and every day I promise to trust, honor, respect, protect, forgive, and love myself, first

and foremost, before anyone else or anything else on this planet, so help me God! Because I am. I Can."

Exploiting Cancer Metabolism with Ketosis

Angela Poff, PhD, Research Associate, Department of Molecular Pharmacology and Physiology, Morsani College of Medicine, University of South Florida, discussed cancer metabolism, the Warburg Effect, and the ketogenic diet.

Otto Warburg, MD, PhD, won the Noble Prize in 1925 for proving that cancer cells used only anaerobic, fermentation metabolism which relied on glucose to provide only 2 ATP per glucose molecule versus mitochondrial oxidative phosphorylation which manufactures 36 ATP's per glucose molecule.

The Warburg Effect is a common feature of cancers and serves as the basis for one of the most important diagnostic tools in cancer treatment. Radioactively-labeled glucose is quickly taken up by cancer cells and lights up tumors throughout the body. Dr. Poff reviewed studies that associated dietary glucose load, cancer risk, and poor clinical prognosis. In mice studies blood glucose level is directly correlated to tumor growth.

A diet of 75%-90% fat (coconut oil, butter, olive oil, nuts, fatty fish, medium chain triglycerides) with 5-15% protein (fatty animal meats and fish, cheese) and 5-10% carbohydrates, (green leafy plants, high fiber) induces a physiological state of ketosis. B-hydroxybutyrate and acetoacetate are water-soluble fat molecules that serve as alternate energy sources for tissues, including brain and replace glucose as a primary fuel for brain during fasting or starvation. The ketogenic diet has been used historically to inhibit seizures. Ketones appear to have direct anti-cancer effects in some models and inhibit cancer cell proliferation independently of glucose restriction in lymphoma, melanoma, brain, kidney, cervical, colon, and breast cancer cell lines.

Poff offered a sizeable list of potential mechanisms and reviewed an enormous volume of medical literature including signaling molecules, lowering of blood glucose and insulin levels, inhibiting glycolytic enzymes, reducing basal oxidative stress, endogenous histone deacetylase inhibition, altered gene expression, inhibition of inflammation and peritumoral edema, enhanced anti-tumor immunity and muscle sparing.

The ketogenic diet is an effective adjuvant to radiation therapy for the treatment of malignant glioma in mice. It is synergistic with other metabolic therapies, including hyperbaric oxygen therapy, prolonging survival in mice with systemic metastatic cancer.

Human trials are limited with slow mainstream acceptance, funding, compliance, and feasibility (more complicated than taking a pill). Currently, the human literature largely consists

➤

➤

of case reports and small safety and feasibility trials. In a pilot study of 16 patients with advanced cancer it was concluded the KD was safe and feasible. Of the five patients that completed the whole 3-month treatment period, none experienced further tumor progression while on the diet. Side effects were temporary constipation, fatigue with no adverse effects of blood parameters or lipids. Quality of life assessments revealed improved emotional function with less insomnia.

Ten patients with advanced, incurable progressive metastatic disease, breast, fallopian tube, colorectal, lung, esophageal and ovarian cancers were treated with the KD. Six out of 10 had stable disease or partial remission by FDG-PET, and the outcome was strongly correlated to relative ketosis. Several human studies show mixed to limited results, and a handful of pre-clinical studies that showed the ketosis and the KD promote tumor growth need close attention.

Contradictions include the following: carnitine deficiency, carnitine palmitoyltransferase I or II deficiency, carnitine translocase deficiency, B-oxidation defects, medium chain acyl dehydrogenase deficiency, long-chain acyl dehydrogenase deficiency, short chain acyl dehydrogenase deficiency, long chain 3-hydroxacyl-CoA deficiency, medium chain 3-hydroxyacyl-CoA deficiency, pyruvate carboxylase deficiency, and porphyria.

Relative contraindications include inability to maintain adequate nutrition, parent or caregiver noncompliance, liver disorder, including liver cancer, pancreatitis, gall bladder disease and kidney disorders. Other side effects of the ketogenic diet are constipation due to reduced bulk and fiber consumption; addition of fibrous vegetables or MCT oil and laxatives are helpful. Gastroesophageal reflux, changes in weight, and hunger typically go away after several weeks. Vitamin and mineral deficiency including calcium selenium, zinc, copper, vitamin D and others may occur. Potassium citrate reduces the risk of kidney stones. High cholesterol and other lipid abnormalities are typically transient. Carnitine deficiency may require supplementation; bone metabolism (especially in children) and growth retardation in children must be noted.

Ketosis targets nearly all hallmarks of cancer. The ketogenic diet has extremely encouraging preliminary results as a potential new cancer therapy. More animal work and human clinical trials are crucial to determine its place in the treatment of cancer. Her talk was extensively documented.

Anti-Cancer Plant Extracts, and Anti-Cancer Green Teas

John Hall, PhD, Senior Scientific Advisor, The Beljanski Foundation, discussed Beljanski's Theory of Cancer and two plant extracts with anti-cancer properties. Beljanski's theory is that cancer DNA differs from normal DNA in its secondary structure, rather than only its primary structure and causes mutations in one or more nucleotides. Mirko Beljanski thought that if nature created carcinogens, nature had also created anti-carcinogenic molecules, that would prevent the duplication process of destabilized DNA.

Pao pereira and *Rauwolfia vomitoria* exhibited anti-cancer activity in a human thyroid carcinoma cell lines and human liver and human breast cell lines (ZR-75-1). They also suppressed growth in a mouse model of prostate cancer. In vitro studies of *Pao pereira* and *Rauwolfia vomitoria* inhibited ovarian cancer stem cells and pancreatic cancer stem cells. Tea extracts had a beneficial effect on breast cancer cells. (Contact john@beljanski.org.)

Kansas University Medical Center's Dr. Jeanne Drisko, MD, Director, KU Integrative Medicine, Riordan Endowed Professor of Orthomolecular Medicine, and Dr. Qi Chen, assistant professor, noted that Rauwolfia significantly reduces ovarian cancers by inducing apoptosis. It was also synergistic with gemcitabine treatment and reduced tumor burden and metastatic potential in the gemcitabine non-responsive tumors. It was synergistic with multiple chemotherapy drugs.

Overcoming Myths and Pitfalls of Implementing the Ketogenic Diet

Dr. Nasha Winters, ND, LAc, Dipl.OM, FABNO, reviewed our human diet from the hunter/gatherer realm to Neolithic farming, modern human nutrition, and post-modern human nutrition. Three major factors have disrupted our internal and external environment over the last 50 years. They are the addition of large quantities of highly refined sugar to our diet, changes in methods of farming and raising animals, and exposure to a large number of chemical products that didn't exist before 1940.

Food = Love. Our first taste is of sweet and releases endorphins and oxytocin. Dr. Winters reviews the cultural connection and the impact of sugar on dopamine release, opiates in gluten and dairy, food as reward and addiction.

Cancer stem cells result from mitochondrial toxins, sugar, stress and mitochondrial poisons. Restoring mitochondrial function includes intermittent fasting, CoQ10, and high-intensity interval training (HIIT) exercise.

Nutritional levels of blood ketones (BHB) are 0.5-3.0 mmol/L versus therapeutic levels of BHB are 3.0-7 mmol/L. The glucose ketone index necessitates a calculator. These are available for blood, urine, and breath.

This diet restores normal apoptosis in cancer cells and lowers angiogenesis, destabilizes tumor tissue DNA, reduces tumor size over time, is an HDAC inhibitor, enhances mitochondrial biogenesis, lowers inflammation via autophagy, reduces levels of insulin and IGF-1 and mTOR. It upregulates SIRT1 and AMPK and enhances action of standard treatments while reducing common side effects.

Dr. Winters has great, innovative Keto formulas for feeding tubes. Her first name rhymes with echinacea or *Ignatia*. Contact her at optimalterrainconsulting.com or info@optimalterrainconsulting.com.

continued on page 80 ➤

➤ *continued from page 80*

region. Water copper concentrations in Vancouver are frequently greater than 1 mg/L, presumably because of the use of copper pipes. The Vancouver practitioner noted that more than 50% of the patients in his practice had elevated hair copper levels. Copper present in water is known to bind to hair when the hair is washed. The high hair copper levels may have been due primarily to such binding, and may not have been indicative of a high body burden of copper.

Second, in addition to chelating copper, penicillamine chelates mercury and lead and removes them from the body. Both mercury and lead have been implicated as causative factors in neuropsychiatric illness. Therefore, the symptomatic improvement seen after a course of penicillamine therapy may not have been due to the removal of copper.

Third, serum copper levels rise in response to inflammation, and elevated serum copper levels (as seen in the neuropsychiatric conditions mentioned above) are usually not indicative of copper toxicity. Thus, the evidence supporting the existence of a syndrome of chronic low-level copper toxicity is currently unconvincing.

Does Low-Level Copper Toxicity Cause Alzheimer's Disease?

Some researchers have hypothesized that excessive copper intake could increase the risk of developing Alzheimer's disease.[3] This hypothesis is based in part on studies in rabbits, dogs, and mice, in which the addition of a small amount of copper (0.12 mg/L) to distilled drinking water resulted in the accumulation of amyloid beta protein in the brain.[4,5] Amyloid beta protein is thought to be involved in the pathogenesis of Alzheimer's disease.

In contrast to these findings, copper supplementation prevented premature death in transgenic APP23 mice, which are genetically programmed to overproduce amyloid beta precursor protein.[6] That study suggests that copper might decrease, rather than increase, the risk of developing Alzheimer's disease. In a double-blind trial, supplementation with 8 mg per day of copper for 12 months had no significant effect on cognitive function, compared with placebo, in patients with mild Alzheimer's disease, and there was no trend suggesting an adverse effect of copper.[7]

In a more recent study,[8] the concentrations of eight essential minerals were measured postmortem in seven brain regions of nine people with Alzheimer's disease and 13 controls who had no evidence of brain disease. In the Alzheimer's cases, for the seven minerals other than copper, abnormalities were seen in only a few regions of the brain. In those regions, some of the mineral levels were higher and some were lower than those of controls. In contrast, copper levels were decreased in all Alzheimer's-related brain regions, to about 50-70% of the levels seen in the controls. These low copper concentrations were similar to those seen in Menkes' disease, which is a genetic disorder in which brain-copper deficiency is the accepted cause of severe brain damage.

Thus, there is at present no convincing evidence that limiting copper intake would be useful for preventing or treating Alzheimer's disease.

Dietary Copper Intake Has Decreased

The copper content of many modern diets may be substantially lower than that of diets consumed in the past. The average copper content of fruits and vegetables declined by 81% between the years 1940 and 2000,[9] presumably because of changes in farming methods that decreased the availability of copper in the soil.[10] In addition, 68% of the copper is lost when whole wheat flour is refined to white flour.[11] Nearly one-third of the diets consumed in the United States, Canada, and England provide less than 1 mg of copper per day.[12] One study found that copper intake of adults ranged from 0.58 mg to 2.03 mg per day.[13] Thus, a substantial minority of people may be failing to meet the Recommended Dietary Allowance for copper (0.9 mg per day for adults).

Importance of Copper

Copper is an essential cofactor for many enzymes, and there is evidence that inadequate copper intake can promote the development of cardiovascular disease, glucose intolerance, osteoporosis, and other chronic illnesses.[14] Because the copper content of the typical Western diet appears to be lower than it was in the past, and because the evidence supporting the existence of a syndrome of chronic low-level copper toxicity is unconvincing, it has been my practice not to recommend copper-free multivitamin-multimineral products in most cases. However, the use of copper-free products would seem to be appropriate for people who drink tap water that contains large amounts of copper, as would be suggested by the presence of light-blue stains in the sink or bathtub.

Good food sources of copper include fish, meat, poultry, eggs, nuts, legumes, whole grains, vegetables, and fruits. About two-thirds of the copper is lost when whole wheat flour is refined to white flour.

Alan R. Gaby , MD

References

1. Nolan KR. Copper toxicity syndrome. *J Orthomolec Psychiatry*. 1983;12:270-282.
2. Pfeiffer CC, Mailloux R. Excess copper as a factor in human diseases. *J Orthomolec Med*. 1987;2:171-182.
3. Brewer GJ. Copper excess, zinc deficiency, and cognition loss in Alzheimer's disease. *Biofactors*. 2012;38:107-113.
4. Sparks DL, Schreurs BG. Trace amounts of copper in water induce beta-amyloid plaques and learning deficits in a rabbit model of Alzheimer's disease. *Proc Natl Acad Sci*. 2003;100:11065-11069.
5. Sparks DL, et al. Trace copper levels in the drinking water, but not zinc or aluminum influence CNS Alzheimer-like pathology. *J Nutr Health Aging*. 2006;10:247-254.
6. Bayer TA, et al. Dietary Cu stabilizes brain superoxide dismutase 1 activity and reduces amyloid Abeta production in APP23 transgenic mice. *Proc Natl Acad Sci*. 2003;100:14187-14192.
7. Kessler H, et al. Intake of copper has no effect on cognition in patients with mild Alzheimer's disease: a pilot phase 2 clinical trial. *J Neural Transm*. 2008;115:1181-1187.
8. Xu J, et al. Evidence for widespread, severe brain copper deficiency in Alzheimer's dementia. *Metallomics*. 2017;9:1106-1119.
9. Worthington V. Nutritional quality of organic versus conventional fruits, vegetables, and grains. *J Altern Complement Med*. 2001;7:161-173.
10. Miller L, Mitchell HS. Correlation of copper and manganese content of plants and mineral additions to the soil. *J Am Diet Assoc*. 1931-2;7:252-257.
11. chroeder HA. Losses of vitamins and trace minerals resulting from processing and preservation of foods. *Am J Clin Nutr*. 1971;24:562-573.
12. Baker DH. Cupric oxide should not be used as a copper supplement for either animals or humans. *J Nutr*. 1999;129:2278-2279.
13. Wolf WR, et al. Daily intake of zinc and copper from self selected diets. *Fed Proc*. 1977;36:1175.
14. Gaby AR. Copper. In Gaby AR. *Nutritional Medicine*, 2nd Edition. Concord, NH, 2017, www.doctorgaby.com, chapter 32.

◆

Is There a Low-Level Copper-Toxicity Syndrome?

In 1983, a practitioner in Vancouver, British Columbia, described a syndrome that was purported to be due to chronic copper toxicity. Symptoms varied but included one or more of the following: rapid thought patterns, insomn2ia, depression, memory loss, hallucinations, paranoia, and occasionally obsessive-compulsive disorder. The diagnosis of copper overload was based on an elevated hair copper concentration, increased 24-hour urinary copper excretion following a challenge with penicillamine (a copper-chelating agent), and symptomatic improvement after a course of penicillamine therapy.[1] Other investigators have reported that some patients with schizophrenia, depression, autism, tardive dyskinesia, or memory loss have elevated serum copper levels.[2] Because of these observations, some practitioners recommend that patients with various neuropsychiatric symptoms avoid copper supplements, and a number of nutritional supplement companies offer copper-free multivitamin-multimineral products.

Weaknesses of the Copper-Toxicity Theory

The concept that chronic low-level copper toxicity is a cause of neuropsychiatric symptoms has a number of important weaknesses. First, the elevated hair and post-penicillamine-challenge urinary copper levels observed in Vancouver may have been nonspecific findings related to the relatively high copper content of the tap water in this

continued on page 79 ➤

Monthly Miracles

➤ *continued from page 78*

Poly-MVA Energy to Get the Job Done

The PowerPoint for this presentation by Al Sanchez is at doctors@polymva.com. NF-kB influences about 24 different pro-inflammatory damage pathways in cancer initiation and progression. He reviews anaerobic metabolism of cancer cells and oxidative phosphorylation. Hypoxia is always associated with neoplastic disease and with the degree of anaplasia. The hypoxia inducible factor (HIF-1) alters the cancer cell environment and upregulates genes for vascular endothelial growth factor (VEGF), responsible for angiogenesis. Adaptive responses include glucose transporter 1 (GLUT1) which facilitates anaerobic respiration, glycolytic enzymes, and is responsible for anaerobic respiration and carbonic anhydrase 9, which results in a pH disruption within the cell.

Lipoic acid and thiamine are involved with cellular energy production and act as co-factors for the oxidation of pyruvate to acetyl co-A. Bonding of electron donating mineral (palladium) to alpha-lipoic acid and thiamine (B1) resulted in the creation of a novel complex, LAMC. Poly MVA has a very high ORAC value about five-fold stronger than vitamin C.

POLY-MVA is a lipoic acid mineral complex with molybdenum, rhodium, ruthenium, vitamins B1, B2, B12, amino acids, n-acetyl cysteine and formyl methionine and is designed to support and promote cellular energy production. This preparation was designed and researched by Dr. Merrill Garnett at the State University of New York, Stony Brook.

It is complementary with CoQ10, D-ribose, carnitine, magnesium, vitamins C, A, K and D. It is also complementary with Shikonin, metformin, DCA, Salicinium, artesunate, ketogenic diet, curcumin, Sono Photo Therapy, mistletoe, naltrexone (LDN), oxaloacetate, (NAD), vitamin C, glutathione and phosphatidylcholine.

Vitamin A works synergistically with Poly-MVA. Poly-PLUS adds vitamin A and increases its ability to potentiate oxygen delivery to the aerobic cascade. Vitamin A facilitates iron mobilization to form hemoglobin in red blood cells, reducing anemia and improving ATP production for aerobic respiration. It also enhances DNA repair, attenuated radiation-induced weight loss, repairs radiation-induced mitochondria, enhances chemotherapy, enhances the visual system, and benefits skin aging, acne, and dryness.

References

1. Royal North Shore Hospital Clin Oncol (R Coll Radiol) 2005 Jun; 17 (4): 294

◆

POLY-MVA™

A POWERFUL DIETARY SUPPLEMENT THAT PROVIDES SUPERIOR NUTRITIONAL SUPPORT FOR OPTIMUM HEALTH

Poly-MVA is created through an innovative process whereby the mineral palladium is bound to alpha lipoic acid and vitamin B1 (thiamine). When alpha lipoic acid, a unique and powerful antioxidant with multiple health benefits, is connected to an electrically charged mineral (palladium) and joined with thiamin (B1), the resulting complex is both water and fat soluble, dramatically increasing absorption for the entire body at the cellular level.* With vitamins B1, B2 and B12, specific trace minerals and amino acids, this unique complex and formulation creates a synergy, action and function not found in any other supplement. It is designed to provide energy for the body's systems as well as protect cells from oxidation through its proprietary and patented formulation. Poly-MVA was formulated by Dr. Merrill Garnett, who over the past 48 years has conducted research on the actions of DNA within normal and abnormal cells. His studies focus on the intersection between biochemistry, physics and what Dr. Garnett calls "electrogenetics," the action of electrons and their energy transfer mechanism in relation to gene expression and proper metabolism. This product not only protects but supports cellular function which gives it properties like no other product in the world; this is why it can assist in so many situations.

- **Superior antioxidant and free radical protection ***
- **Fast acting, easy to use and quick results ***
- **Supports energy production at the mitochondrial level ***
- **Enhances quality of life ***
- **May replace specific nutrients that may be depleted during certain therapies ***

■ Studies evaluated the effects of LAMC and radiation in various animal models. Whole-body gamma radiation exposure once a week for 2 weeks and daily after 4 Gy of irradiation protected DNA damage in the peripheral blood. It also rendered protection against radiation-induced lowering of platelet count and appears to be responsible for its radio sensitizing and protective effects while supporting mitochondrial remodeling.

■ Dr. Paul S. Anderson has worked with LAMC in various clinical settings (neuro-degenerative illnesses, chronic fatigue/fibromyalgia and mitochondrial dysfunction) and has documented the following:

- Poly-MVA shows consistent safety and efficacy in all its uses
- Poly-MVA improved quality of life in the oncology population
- Poly-MVA added to multi-agent therapies for chronically ill patients led to improved outcomes, positive responses and quality of life.

■ Dr. Paul S. Anderson, NMD has shown the clinical synergy between LAMC and DCA; LAMC is neuroprotective and uniquely supportive in mitochondrial upregulation.
■ Ischemia studies demonstrated improvement and protection.
■ Phase One human safety trials in hypertension completed.
■ A 1000-patient oncological animal study resulted in an 86% improved quality of life.

Neuroscientist Dr. Frank Antonawich notes:

■ **This complex enhances the enzymatic activities of multiple Krebs cycle enzymes while upregulating mitochondrial function at complex I-IV.**

■ **With its powerful antioxidant properties, such as scavenging of free radicals, lowering lipid peroxidation, increasing the levels of glutathione, glutathione peroxidase, manganese superoxide dismutase, and catalase, it gives us a powerful complex to combat fatigue associated with numerous mitochondrial abnormalities.**

■ **The complex also modulates mitochondrial dysfunction, acts as a prophylactic for neuronal and radio protection, supports DNA repair, and improves the quality of life.**

"The therapeutic function /potential of this complex can be utilized in the various applications for supporting neurological injury resulting from TBI's, transient ischemic attack, death of neurons and other progressive loss of structure or function of neurons associated with any neurological event." - Dr. Paul S. Anderson, AMSA Clinic

"THE POSITIVE IMPACT WE HAVE SEEN IN OUR CLINIC OVER 15 YEARS IS ASTOUNDING."
- Dr. James Forsythe, Oncologist

AMARC ENTERPRISES

WWW.POLYMVA.COM
866-765-9682

The most powerful and revolutionary dietary supplement available today, Poly-MVA is designed to increase energy, reduce fatigue, enhance optimum health, protect from radical damage and provide nutritional support for those undergoing chemotherapy or radiation. This patented formulation has a synergy, action and function not found in any other supplement.

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

Jarrow FORMULAS®

Clinically Tested & Patent Protected Strains of the Predominant Vaginal Microflora

1. *L. crispatus* LbV 88
2. *L. jensenii* LbV 116
3. *L. gasseri* LbV 150N
4. *L. rhamnosus* LbV 96

Unlike the intestinal flora, the predominant vaginal microbiome are confined to much fewer species. Accordingly, only a few such vaginal specific *Lactobacillus* strains have been clinically tested for their ability to support vaginal health.*

Jarro-Dophilus® Women contains the four predominant *Lactobacillus* strains of the healthy vaginal tract known as the "Astarte" strains. All four Astarte strains were originally isolated from the vaginal tracts of young, healthy women in their third month of pregnancy. The samples were enumerated for the predominant strains and then screened for efficacy. The Astarte strains have been clinically documented to promote vaginal microflora and urinary tract health.*

Clinical Study #1 (1999)

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

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

Clinical Study #2 (2007)

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

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

Clinical Study #3 (2014)

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

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

Clinical Study #4 (2016)

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

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

ASTARTE

Protected by U.S. Patent 8,846,027 and European Patent 2,509,610, which are owned by HSO Health Care GmbH, Vienna, Austria, and licensed in the U.S. to Jarrow Formulas, Inc. Other international patents pending. Sold worldwide as Astarte.

Health care practitioners, please find Jarrow Formulas' products at:

emerson ECOLOGICS delivering to improve health™ — **emersonecologics.com**

natural partners — **naturalpartners.com**

***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.**

Visit us at www.jarrow.com for more product information.