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JUMP TO TABLE OF CONTENTS

Barbara MacDonald, ND, LAc
Navigating Cancer Treatment Options

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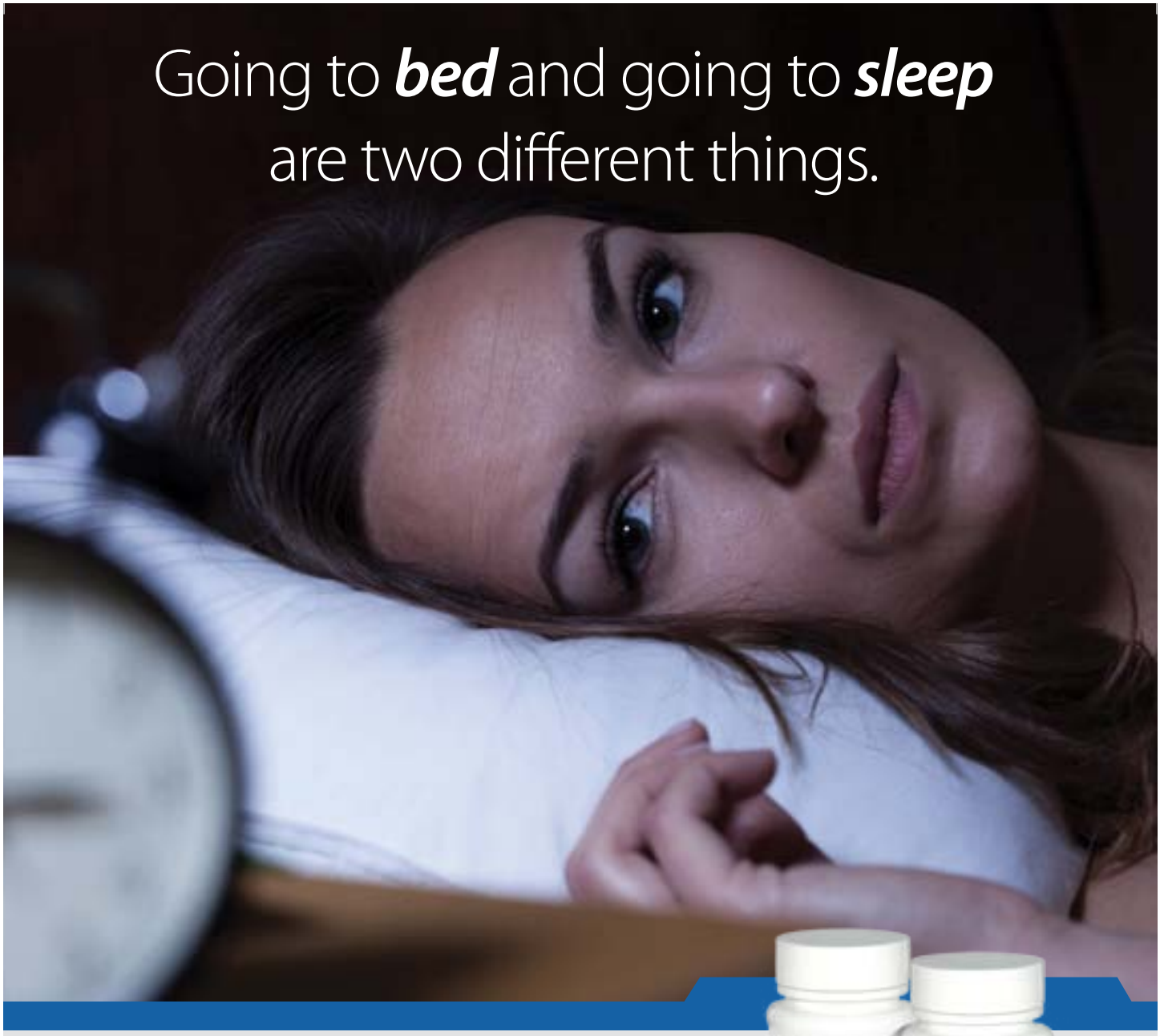

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From the Publisher

My Pick for Summer Beach Reading

This isn't a new book. *Cutting for Stone* by Abraham Verghese was published in 2009 and immediately was a best seller. I just read it this year and the story immediately hooked me. This is a story of doctors, surgeons, trained in India or England in the 1940s, but transplanted to a mission hospital dependent on charitable donations in post-colonial Ethiopia. As one might imagine the facilities are marginal, but the attending doctors are quite resourceful and their attention to patients who travel many miles for care is dedicated and compassionate. But this is a novel, not a documentary, and we are swept up not only by the local color and life in an impoverished country, but also the philosophic and romantic activities of the doctors when they are not in clinic or surgery. The story of a surgeon and a nurse's twin children and their family and household help and living in a house at the Missing Hospital compound is so compelling that it is difficult to stop reading.

continued on page 6 ➤

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➤ *continued from page 4*

This is Abraham Verghese's first novel but not his first book or writing. He is a professor of medicine at Stanford University Medical School. Verghese's prose is the type of writing that is so fluid and descriptive that you feel you are right there in a missionary hospital in the 1950s. It is extraordinary that a doctor could do such an outstanding job in researching the history, geography, and the anthropology of the horn of Africa and India, and be able to craft a story that so cleverly incorporates general surgery and its advances by its protagonists. And the plot works so well, including a very fitting and conclusive ending that does not fail to satisfy. It is not often that I read a novel that delivers at every level.

Is it the Seed or the Soil?

In Lake Michigan an odd phenomenon has been noticed over the past few decades. Barnacle-like shell growths have encrusted the keel, turbine and propeller of vessels, piers, sanitation systems, and waterway navigation channels where there had been no encrusting in previous decades. The culprit: Two mussels, *Dreissena polymorpha* and *Dreissena bugenis*, the zebra mussel and quagga mussel.[1] The mussels have propagated so densely that on certain beaches one walks not on sand but upon a solid layer of shells. The density of mussels has been increasing dramatically, increasing 50% in the past 10 years. Oddly this increased concentration of mussels has created a swimming pool-like clarity in the water because of a decrease in fish and other organisms.

The foremost question is what accounts for the mussels' uncontrolled growth? The usual ecology answer is lack of a predator. Both *Dreissena* mussels originate in the waters in or near the Ukraine. The Dnieper River has been home for the mussels for centuries, yet the mussel population is stable and very low compared to Lake Michigan. There is no dramatic encrusting of vessels, docks, and beaches on the Dnieper or its tributaries. Why not? One cannot identify a specific organism or organisms that are a mussel predator. But from an ecologic viewpoint, the zebra and quagga mussels are not predatory in the Dnieper, sharing its environment or terrain equally with the local flora and fauna. In contrast, there is a distinct difference in the terrain of Lake Michigan, and that difference, not only in flora and fauna but also the water's chemistry, has enabled the mussel population to explode and to continue to do so. In other words, it is not the organism itself, alone, that makes it predatory or pathologic, but it is the environment or terrain that enables the transition from benign to aggressive.[1]

continued on page 9 ➤

An Orthomolecular Approach to Cancer

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Lead-in Workshops

John Parks Trowbridge	MD	"Perspectives on Regenerative Medicine"	17-Oct	9 am – 5 pm	Houston	TX
Paul Anderson	ND	"Clinical Applications of IV Therapies in Oncology"	18-Oct	9 am – 5 pm	Seattle	WA
Virginia Osborne	ND				Cedar Ridge	CA
Oscar Sierra	LAC	"Eclectic Triphasic Medical System: a Wholistic Approach to Cancer Care Rooted in Herbal Medicine"	18-Oct	1 pm – 5 pm	Atlanta	GA

Program Chairman

Jeff Kotulski	DO	"Welcome and Introductions"	19-Oct	8 am – 8:05 am	Minneapolis	MN

The Big Picture

John Richardson		"Legal Considerations to Keep in Mind"	19-Oct	8:05 am – 8:35 am		
Tom Wagner	MD	"A Historical Perspective on the Innate Immune System"	19-Oct	8:35 – 9:35 am	North Ridgeville	OH
Paul Anderson	ND	"Oncology and Orthomolecular Medicine"	19-Oct	10:35 am – 12:30 pm	Seattle	WA
Greg Plotnikoff	MD	"Trust Your Gut"	19-Oct	1:30 pm – 2 pm	Minneapolis	MN

Specific Approaches to Cancer Care

David Brownstein	MD	"Iodine: The Universal Anti-Cancer Therapy"	19-Oct	2 pm – 3 pm	Bloomfield Township	MI
Akbar Khan	MD	"Is Chemotherapy Overrated? Metabolic Therapy with DCA and DMSO as an Alternate Approach"	19-Oct	4 pm – 5 pm	Toronto	ON
Joe Hickey	MD	"Carcinogenic Qualities of Metals"	20-Oct	8 am – 9 am	Hilton Head	SC
Angela Poff	PhD	"Exploiting Cancer Metabolism with Ketosis"	20-Oct	9 am – 10 am	Tampa	FL
Walter Lemmo	ND	"Low-Dose IVC and the Use of DMPS in Platinum Chelation"	20-Oct	11 am – 12 pm	Vancouver	BC
Ron Hunninghake	MD	"RECNAC III - Revisiting the Future"	20-Oct	1:30 pm – 2:30 pm	Wichita	KS

Putting Together a Treatment Plan

Virginia Osborne	ND	"Integrative Integration and the Individual"	20-Oct	2:30 pm – 3:30 pm	Cedar Ridge	CA
Christine Salter	MD	"Integrative Approach to the Patient With Cancer"	20-Oct	4:30 pm – 5:30 pm	St Louis	MO

Prevention

John Parks Trowbridge	MD	"Deep Blood Fungus: Dental and other Connections to Devastating Illnesses"	20-Oct	5:30 pm – 6:30 pm	Humble	TX
Jen Green	ND	"Evaluating & Treating the Oncology Terrain"	21-Oct	9 am – 10 am	Seattle	WA
Aileen Burford-Mason	PhD	"Cancer and Alkaline Diets: Hype or Hope?"	21-Oct	10 am –11 am	Toronto	ON
Greg Plotnikoff	MD	"Microbial Production of Butyrate: Histone Deacetylation and Cancer"	21-Oct	11 am – 12 pm	Minneapolis	MN

➤ *continued from page 6*

How does the Lake Michigan exploding mussel population bear any concern to human medicine? In the September 11, 2017 issue of *The New Yorker,* physician and Pulitzer Prize winning author, Siddhartha Mukherjee, MD, writes that the dilemma we face in treating the cancer patient may be very similar to why the quagga mussel is out of control in Lake Michigan but of no concern in the Dnieper.[1] When a woman develops breast cancer, the usual process is to proceed with a lumpectomy, then offer chemotherapy, radiation, and perhaps other therapies. The assumption is that breast cancer metastasis can be stopped with these measures; and although it may be overkill, both the patient and the oncologist can feel assured that all has been done in the cancer's earlier stages.

But what makes the tumor cell metastasize? In 1889 a British doctor, Stephen Paget, who was son of famed pathologist, James Paget, studied the chart files of 735 women who died from breast cancer. More than 300 of the women had well-defined metastases; 241 were found in the liver, 70 in the lung, and 17 in the spleen. Why does breast cancer metastasize more frequently to certain organs and not others? Paget conjectured that even when breast cancer metastasizes to bone, why aren't all bones subject to metastasis? He stated that one never hears of a metastasis to the hand or foot. Paget was making the argument that breast cancer metastasis may depend on how the tumor cell responds and interacts with distant organ tissues. But medicine largely ignored this question for one hundred years. Siddhartha brings up a medical student mnemonic, "Bacon Lettuce Tomato with Kosher Pickle," which is used to remember that the tumors that invade bone are breast, lung, thyroid, kidney, and prostate. Why do these tumors have a predilection for metastasizing to bone but other tumors don't? Is it dependent on the tumor cell's interaction with the organ's microenvironment? Tumor cells are genetically programmed to metastasize and proliferate; yet some do and some don't. Why?

Siddhartha discusses the intriguing work of cancer researcher Joan Massagué. In 2001 Massagué read a report published in the 1970s from the NIH about a mouse's ovarian pedicle implanted with breast cancer cells forming a small tumor. When the tumor's vein was cannulated, thousands of cancer cells were observed to be emanating from the

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From the Publisher

tumor minute by minute without cessation. Further studies confirmed the natural vascular output of cancer cells from a proliferating tumor. In other words, tumors produce vast quantities of circulating cancer cells but they mostly fail to metastasize. Why? Massagué explained that despite the output of cancer cells there must be a great degree of cell death or cell dormancy, "sleeper" cells. He contends that the majority of cells die and when they do succeed in reaching an organ, the cells face a hostile terrain that will cause them to die leaving only a few surviving cells. The metastasis requires that those surviving cells awaken from their dormancy and multiply in conditions that enable tumor cell growth – tumor cell and tissue terrain compatibility. But what provides the right conditions in the terrain?

For Johns Hopkins oncologist Kenneth Pienta, MD, the Lake Michigan quagga scenario is a perfect comparison to a cancer patient who is experiencing ongoing metastasis. Rather than think that metastasis is based on the pathogenicity of the particular tumor cell, one should think about the terrain instead. What is it about the organ tissue that permits the tumor cell to succeed in its tissue growth? When the cancer cell arrives in its new environment, that organ's microenvironment changes to a milieu conducive for the tumor cell's progressive growth. Pienta explains that we should think not about what the tumor cell is doing to us, but what we are doing to the tumor cell.

But that brings up the awkward and messy issue of ecology – what factors in the terrain enable the quagga mussel or the tumor cell to grow? "Invasion" ecologists, like Anthony Ricciardi, PhD, at McGill University, talk about changes in Lake Michigan's water temperature, salinity, calcium content, and lack of predators (such as fish and ducks), to account for the mussels explosive growth. Ecology studies are difficult and each factor affects the next one, including "nutrition, predation, climate, and topography subject to feedback loops." The 14th century theologian and philosopher, William of Ockham, is famous for his law of parsimony known as Occam's Razor. As a problem-solving technique, Occam's Razor considers the hypothesis with the least number of explanations to have the highest likelihood of being truthful. Occam's Razor frequently is used in science and medicine to explain phenomena and make a diagnosis. But ecological hypotheses are often complex and contextual and multi-equationed and do not work well with Occam's Razor. Such is the case with the quaggas and metastatic tumor cells.

Mina Bissell's work in the 1980s is well known to cancer researchers and also argues for the terrain connection. For many decades it has been known that one could inject a virus into a chick's wing and a tumor would grow within the wing. Bissell demonstrated that if you injured the chick's other wing, a tumor would also grow in that wing, which has not

continued on page 12 ➤

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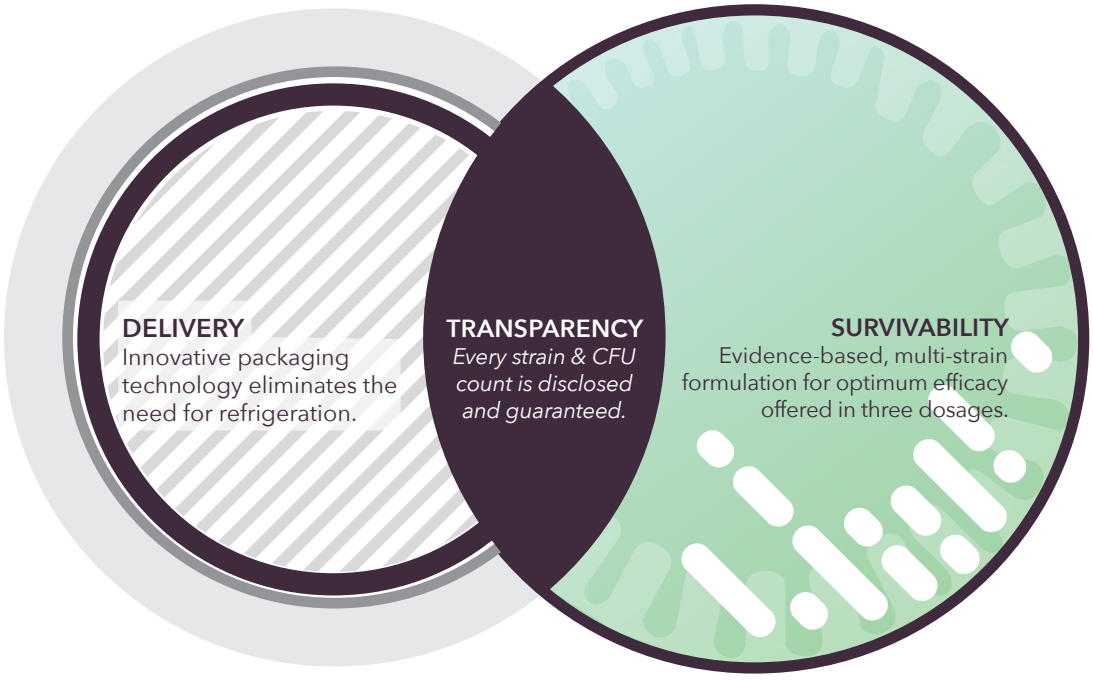

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➤ *continued from page 10*

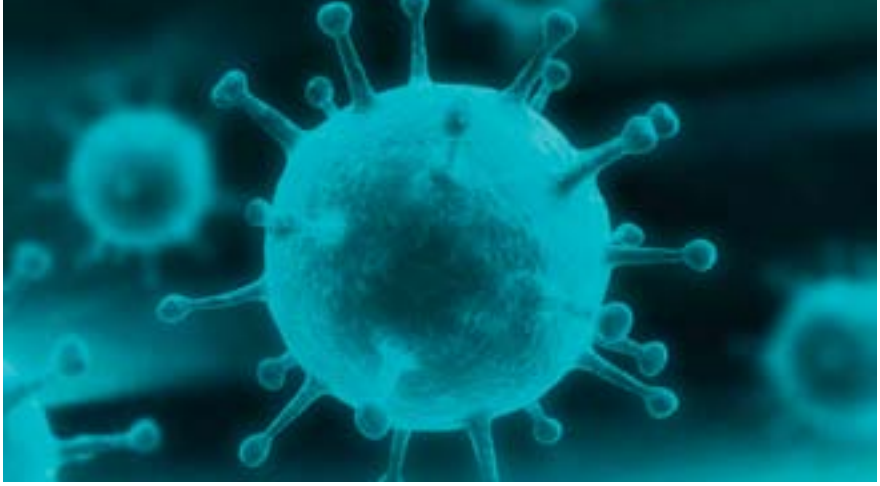
been injected with virus. The strange thing was that if the virus was injected while the chick was only an embryo, no tumor would appear. A different environment determines the tumor cell's existence.

David Adams, PhD, an Australian physiologist and geneticist, tells the story of how his father had a spontaneous regression of melanoma in 1992. The tumor appeared as a lengthy black streak and then within weeks involuted, turning grey, and disappeared never to recur. Years later he died of prostate cancer. What circumstances in the body would make one tumor disappear and another metastasize? Adams, in Siddhartha's *New Yorker* article, discusses an interesting series of melanoma cases involving donated kidneys.[1] In the typical case, a patient is diagnosed with melanoma and treated achieving full remission and no recurrence. That melanoma patient is accepted as a kidney donor years later. Following transplantation, despite being given the typical immunosuppressive therapies, the recipient's kidney rapidly develops multiple black lesions typical of melanoma. The donated kidney is, of course, removed. Of note, the donor remains perfectly healthy with no sign of melanoma. It was the placement of the donated kidney into a new environment, within the patient having chronic kidney disease, which enabled the dormant melanoma cells to metastasize, never having proliferated in the donor's body. Same tumor cells, different terrain!

This work intrigued Adams, and he wanted to explore how the terrain could make a difference in how tumor cells proliferate. Near where Adams now works in England was a research facility that genetically modified mouse strains to determine their physiologic effects on the heart, brain, and other organs. Adams wanted to use these animals for cancer research in a different fashion than had been standardized. For years biologists have been injecting a variety of tumor cell lines into one modified mouse strain to determine whether the tumor would grow and metastasize with certain genetic modifications. Adams wanted to see what would happen if he injected one tumor cell line into a variety of genetically modified mice to see which developed tumors and developed metastases. In other words, instead of testing the tumor cell line's pathogenicity, Adam's wanted to understand how the tumor cell line faired in different environments, different terrains: tumor cell and terrain interaction.

In 2013 Adam's colleague and wife, Louise van der Weyden, PhD, injected mouse melanoma cells into 24 different mouse

continued on page 14 ➤



A New Perspective on Prevention of Viral-Induced Cancers

Living in the modern world constantly challenges an otherwise robust immune system, and if the immune system becomes compromised, we become more vulnerable to pathogens like bacteria and viruses. This is especially true for individuals who may suffer from chronic immune deficiency, the most profound effects of which may be seen in cancer patients. Viruses are among the most common triggers that lead to cancer in susceptible individuals. To maximize the immune system's cancer-fighting powers, it's critical to ensure a well-functioning immune system. And, because immune health is linked with gut health, integrity of the G.I. lining is equally important.

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➤ *continued from page 12*

strains. After a few weeks she studied the mice for metastases in the lungs. The results were startling; there were great differences between the mice that developed metastases. Van der Weyden details that some mice had hundreds of pinprick size metastases, others had fully blackened lungs. In others there were relatively few lesions.

Adams and van der Weyden continued their work and reported in 2015 that after 810 mouse strains were injected with melanoma, many developed metastases. But 15 strains were moderately resistant. They were able to find gene variations in 12 of the 15 strains that were known to impact immunological resistance. One strain was particularly remarkable with hardly any lung metastases developing even after two months. Adams and van der Weyden then tested this highly resistant mouse strain with breast, lung, and colon cancer injections known to generally metastasize in average mice. Again that mouse strain did not develop metastases for each of the tumor types. It was determined that this mouse strain had a gene variant, Spns2, that enables production of natural killer (NK) immune cells. This was the same gene variant that Massagué determined resisted metastases.

In 1962 a British cancer researcher, D.W. Smithers, MD, wrote, "cancer is no more a disease of cells than a traffic jam is a disease of cars." The cars themselves do not cause the traffic jam – it is a myriad of road conditions including weather, traffic lights, number of cars, and car accidents that lead to the jam. Similarly, the cancer cells themselves do not cause cancer metastases. The cells require a cooperative terrain to metastasize. Which leads us, unfortunately, back to Occam's Razor: how do we sort out what factors in the terrain's ecology determine whether the quagga mussels will explode or cancer cells metastasize?

Diet and Risk of Prostate Cancer Recurrence by Jacob Schor, ND

In medical school more than 40 years ago, we were taught that nearly 80% of men who lived to age 80 would acquire prostate cancer but a majority would die of cardiovascular disease or another cause. It is much the same today with more than 90% being diagnosed with localized disease, yet more than 25,000 die because of prostate cancer each year in the US. For many patients with localized disease a recommendation of "watch and wait" is the opted course of action. But would it be prudent for those patients to modify their diet or use supplementation?

Many nutritionists advise cancer patients to avoid red meat. However, as Schor details in his paper in this issue, research reveals that instead of beef, the big concern should focus on poultry and eggs, as their consumption nearly doubled the risk of prostate cancer progression. Additional dietary recommendations that help in preventing cancer relapse include limitation of drinking whole milk, as well as the eating of refined grains, sugars, and high-fat dairy. Studies have also confirmed the benefit of increasing vegetable intake and consuming vegetable fats and less saturated fats. As with most cancers, increased exercise, weight management, and smoking cessation are beneficial. As for supplements it is advised that genetic testing may be in order before recommending vitamin E, selenium, and lycopene.

How to Approach the Cancer Patient by Prof. Serge Jurasunas

While the prognosis for localized cancer is excellent, the same is not true for metastatic disease. The conventional treatment of surgery, chemotherapy, and radiation treatment has a long track record of dismal outcomes for advanced cancer. The recent addition of specialized biological response modifiers (BRM) has offered some hope for prolonging survival but has not turned around the awful odds for cancer that has spread. Jurasunas argues that all patients should avail themselves of a "new paradigm of cancer" that employs informative diagnostic testing to understand tumor functioning as well as nutritional interventions capable of modifying immune and metabolic activity. Restoring mitochondrial functioning and cellular respiration are critical for cancer care.

Jurasunas includes numerous markers to understand cancer activity including P53 gene function. He notes that when the P53 gene is mutated or misfolded it is incapable of expressing anti-tumor activity. Among nutritional supports helpful in restoring normal P53 functioning are rice bran arabinoxylan compound (RBAC), curcumin, enzyme yeast cell preparation, fish peptides, Horvi-enzyme therapy, probiotics, resveratrol, and EGCG.

Jurasunas strongly advocates that cancer patients receive emotional and psychological support without which their cancer protocol may fail.

Cover Story: Cancer Care – Conventional, Complementary, Alternative? by Barbara MacDonald, ND

We all have patients who believe religiously in natural medicine employing naturopathy, food, meditation, prayer,

continued on page 18 ➤

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In this Issue

Aug/Sept. 2018 | #421/422

ON THE COVER: Barbara MacDonald, ND, LAc (pg. 52); Mitochondria and Cancer (pgs. 44, 82) Diet Advice for Men with Prostate Cancer (pg. 58); Hyperthermia Treatment for Cancer (pg. 74); Too Much Cannabis Causes Vomiting (pg. 109)

Don't miss our next issue on Brain Health · Mental Health Neurologic Disease

➤ *continued from page 15*

exercise, and other natural supports to maintain their health and their family's health. Of course, much of their ill health is manageable without allopathic medical intervention. But what about when they are diagnosed with cancer? Unlike many patients who are newly diagnosed with cancer, these individuals shun conventional chemotherapy, radiation, and surgery. Many want to opt for a "natural" medicine approach for their cancer much like they have done all their lives. Is this the wisest course of action?

Barbara MacDonald, ND, a naturopathic physician who has specialized in naturopathic oncology care and is the author of *The Breast Cancer Companion: A Complementary Care Manual* (2016), thinks not. She cites a recent Yale University School of Medicine study comparing those patients who combined conventional and alternative care to those who had only unconventional care, 78% of the former group survived five years compared to only 55% in the latter group.[2] MacDonald proposes that those who are thinking of only employing alternative approaches seriously consider integrating conventional care. Timing is everything – surgery is frequently only available when the disease has not metastasized.

Timing is also vital when undergoing chemotherapy and radiation treatment. Misguided advice by oncologists that naturopathic care will interfere with chemotherapy has led some patients to postpone herbal and nutraceutical supplementation when botanicals and intravenous vitamin C would mitigate adverse effects and maximize chemotherapy benefits. Integrative cancer care, particularly under the direction of an experienced practitioner, offers a better outcome than conventional care alone.

Jonathan Collin, MD

1. Mukherjee S. The invasion equation: Will a tumor spread? That may depend as much on your body as on your cancer. *The New Yorker*. Sept. 11, 2017.
2. Johnson SB, Park HS, Gross CP, Yu JB. Use of alternative medicine for cancer and its impact on survival. *JNCI*. Published online Aug. 10, 2017.

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

Clinical Study #2 (2007)

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

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

Clinical Study #3 (2014)

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

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

Clinical Study #4 (2016)

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

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

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

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Pathways to Healing

by Elaine Zablocki

What Does It Mean to Be a Healer?

Under the USA's current healthcare model, most practitioners are dedicated "work-horses." Clinicians carry out administrative responsibilities, see clients and, in a typical 15-minute visit, generate a diagnosis and treatment. It's unlikely that many practitioners have the luxury of practicing "deep listening" or "mindfulness" during these regimented visits.

Kelly Fitzpatrick, ND

Kelly Fitzpatrick, ND, structures her practice in a very different way. She is a registered nurse with a naturopathic medical degree from Bastyr University, and a diplomate of the Homeopathic Association of Naturopathic Physicians. Her typical intake interview is scheduled for 90 minutes or more, with follow-up visits taking an hour. This gives her an opportunity to check in and explore patient concerns on many related systems in a deeper way.

"In particular it means I can explore the mental and emotional aspects of how people are doing in their lives," she says. "What are their stressors? What are their family patterns of emotional disturbance?" Physical pathology does not arise from purely physical causes, she notes. "Mental, emotional and environmental aspects all contribute to physical symptoms. The most important question is, how does cure occur? The practice of deep listening and mindfulness means that those in our presence can begin to heal."

Fitzpatrick emphasizes that mindfulness is something you practice. "You develop a practice of always turning towards mindfulness and kindness. Of course, we're all going to make mistakes – I do every day. Sometimes you fail, but then you come back and pay attention again." She has learned this practice in several settings, through nonviolence communication training, through mindfulness training, and most recently through training with Thich Nhat Hanh and his Zen Buddhist order of Inter-being.

Fitzpatrick has been able to develop a "deep listening" medical practice in part because of her eclectic background as a healthcare provider, cancer survivor, and Buddhist practitioner. She is self-employed at Sacred Medicine, where 60% of patients are covered by Medicaid and the remaining patients pay out of pocket.

She notes that physicians who practice in crisis situations, such as emergency room and urgent care doctors, are in a different situation. They do need to focus on acute problems. When she describes the benefits of deep listening, she is thinking mostly about family practitioners who see the same patients over many years. "Just remember the tradition established by the old family doctors. They birthed the babies and they buried the dead. They spent so much time with the patient, and with the whole family. That meant they could understand the full range of causes leading to illness and help family members move away from pathology that had developed over many years."

During the process of evaluation and treatment, practitioners have an opportunity to move patients away from their ancestral pathologies. "One might think simply of a family cardiac condition," Fitzpatrick says. "But one could also think in terms of a physical and mental shift away from self-destructive tendencies or addictive potentials that are seen in the family history."

Deep listening means that the practitioner attempts to be fully present, listening to the patient's issues and concerns. This isn't always easy. "It's a skill that requires training," Fitzpatrick says. "We all have our own viewpoint, we may want to comment, instead of actually just being present. How do we make eye contact? How do we acknowledge a person as a person? The mindfulness practice of being present in our day-to-day moments helps us to actually breathe and be present with our patients, each time we come into the room. As we return over and over again to the present moment, we experience the individual in a deep, meaningful way."

This means there's a continual process of being present for one client, and then preparing for the next client. "It's just like washing our hands," Fitzpatrick says. "We make a physical, mental, emotional gesture of transitioning through this act and moving on to be fully present for the next person."

Every human life includes uncertainty and suffering. Deep listening means the practitioner develops the ability to be fully present with patients as they experience life's challenges. "At many times we face opportunities for transformation," Fitzpatrick says. "It happens on the biological level, growing from a toddler to an adolescent to an adult. We also face life's uncertainties: divorce, death, illness, foreclosure. Once we understand that every moment brings uncertainty, what is our response? Are we creating additional suffering for ourselves or finding joy in these precious moments that we experience? As patients, are we able to express this level of reality to our practitioners? As practitioners, are we able to be curious and mindful enough to listen deeply and bring compassion into each moment? That's what we need to be doing right now."

Patients Seek Deep-Listening Practitioners

Fitzpatrick suggests that as a patient, at the start of a new relationship with a practitioner, we have an opportunity to go in and set the stage. "You could explain that you'd like to have a physician who will ask about the stressful conditions that contribute to physical problems...that you are seeking help in dealing with causes as well as symptoms."

When you are seeking a new physician, you might actually say to them, "I would like to be able to bring my deepest concerns into the office with me. I know our time is limited, but are you willing to listen to these concerns in the time we have?"

Patients can express their concerns in a gentle way, not as a criticism or judgment. For example, someone might say "I'm not quite sure we got to the things that I needed to talk about to you today. Do you have a few more minutes?" In addition, we could think of this as a two-way street. Fitzpatrick says. "The patient as well as the physician ideally would come to the encounter in a mindful state of presence, able to make contact with their physician as two open human beings."

Physicians as Change Agents

At one point in our conversation, Fitzpatrick referred to physicians as alchemists. I was surprised and asked her what she meant. "We could describe an alchemist as someone who utilizes raw materials to transform them into riches," she said. "Transformation is happening every day. This is woven into the impermanence of our existence. These are rich opportunities to explore who we are and how our potential is manifesting."

This means we need to think of healthcare practitioners as change agents. "Our goal is to help a patient transform and to be in that path of transformation with them, to go on their journey. Our goal is to appreciate the transitions that occur in every life, to participate in the milestones as alchemists. That's the kind of practitioner you want to become. That's the kind of practitioner that you want to take on the journey with you."

Resources

Kelly Fitzpatrick practices at sacredmedicineclinic.com.

She recommends a book by Pema Chodron, *Living Beautifully with Uncertainty and Change*.

In addition, she recommends online resources:

- Thich Nhat Hanh, Plum Village – https://plumvillage.org
- Julie Wester – https://www.spiritrock.org/2016/the-teachings/article-archive/interview-julie-wester;
- Talks by Julie Wester at http://dharmaseed.org/teacher/98/
- Barbara Secrest – www.sisterssangha.org

Elaine Zablocki is the former editor of CHRF News Files. ◆

Shorts

briefed by Jule Klotter
jule@townsendletter.com

A Laetrile Story

Second Opinion: Laetrile at Sloan-Kettering, a thought-provoking, 2014 documentary written and directed by Eric Merola, tells the story of laetrile through the eyes of science writer Ralph W. Moss, PhD. In the 1970s, thousands of cancer patients – as many as 70,000 per year, according to a 1977 *Newsweek* article – traveled to clinics in Tijuana, Mexico where laetrile was legal. Both Canada and the US had banned laetrile, claiming that it was ineffective; but the ban had not diminished patients' enthusiasm for the "quack" remedy. Bowing to public pressure and desiring "to curb the public's 'false hope,'" Memorial Sloan-Kettering Cancer Center asked Dr. Kanematsu Sugiura, a retired research scientist, to study laetrile. Dr. Sugiura, a co-founder of cancer chemotherapy, had an impeccable reputation as a researcher.

Shortly after joining Sloan-Kettering's public relations department in 1974, Ralph Moss interviewed Dr. Sugiura for a biographical sketch. During that interview, Dr. Sugiura shared his research notes. That data showed that laetrile prevented lung metastasis and improved overall health in a mouse strain that did not respond to chemotherapy. Dr. Sugiura's results "shocked" Moss. He had viewed laetrile's popularity as an example of patients' desperation and gullibility. Moss was asked by superiors to keep them apprised of Dr. Suguira's research. Over time, Moss developed a deep respect for the researcher.

According to Dr. Sugiura's experiments, laetrile did not cure cancer; but it did stop tumor growth for some weeks. Moreover, only 10-20 percent of the mice receiving laetrile injections developed lung metastasis compared to 80-90 percent of the control mice that received saline injections. Leaders of Sloan-Kettering met with medical authorities from the National Cancer Institute, Food and Drug Administration, and American Cancer Society in July 1974, to discuss Sugiura's positive results and to plead for human trials. They planned to collaborate with doctors in Mexico to perform controlled clinical trials.

In March 1975, a higher-level meeting occurred, a meeting that included Daniel Martin, MD, who had developed the mouse strain used by Dr. Sugiura. Dr. Martin was "deeply hostile" to laetrile. The US government declined Sloan-Kettering's request for human clinical trials. Although Moss was unaware of the meeting at that time, he realized that many of Sloan-Kettering's top officials had begun to issue negative statements about laetrile. For Moss, the final straw came in 1975, when Sloan-Kettering vice-president Chester Stock, MD, told *Medical World News* that laetrile was "negative in all animal systems tested." Moss became convinced that Dr. Sugiura's findings were being covered-up.

For months, Moss struggled with his conscience. He wanted to keep his job with Sloan-Kettering. He had a wife and two children to support. Yet, he also wanted to publicize Dr. Sugiura's research and refute the false campaign that was burying a potentially helpful cancer treatment. Eventually, Moss co-founded Second Opinion, a whistleblower group that produced a newsletter in which Sloan-Kettering employees anonymously criticized various aspects of the institution – including the cover-up of Dr. Suguira's work. Ralph Moss finally went public in November 1977, when he represented Second Opinion at a press conference. He was fired the next day. The laetrile experience led him to write his first book, *The Cancer Industry.*

Second Opinion is more complex and less emotionally-charged that Eric Merola's first independent documentary, *Burzynski, the Movie* (2010). On the surface, *Second Opinion* is about laetrile and its cover-up. But the film also raises questions about scientific research and its subversion, about whistleblowers and the stress to their families, about personal integrity, and about the cancer industry. The 75-minute main feature that chronicles Ralph Moss's experience at Sloan-Kettering comprises just half of the DVD. In a dozen short interview segments, totaling another 74 minutes, Ralph Moss provides further information about the discrediting of laetrile. He also discusses promising cancer therapies used in other

countries and Big Pharma's stranglehold on oncology in the United States.

The controversy surrounding laetrile, the emotional debates and battles, have faded over the past 40 years. 'War on Cancer' dynamics, the profit system that underlies medicine, the questions about scientific integrity remain. *Second Opinion* provides a compelling, historical look at an ongoing problem.

Curcumin and HBOT Stabilize Myeloma

For five years, "a heavily pretreated relapsing myeloma patient" has remained stable with daily curcumin supplementation and a once-weekly course of hyperbaric oxygen therapy (HBOT), according to a 2017 article in *BMJ Case Report.* Myeloma, a cancer of the B-cells (lymphocytes produced in bone marrow), has no known cure. Treatment produces a pattern of remission followed by relapse, with each remission lasting for shorter periods. Eventually, the patient no longer responds to treatment. Median overall survival is 5.2 years from diagnosis. Patients with myeloma typically experience bone pain, renal impairment, recurrent infections, and anemia.

The first sign of myeloma for the patient in this study, a 57-year-old woman, was an incidental finding of M-protein (18 g/L) during a consult for hypertension in 2007. M-protein is a monoclonal protein, produced by abnormal or cancerous cells. Fifteen months later, she was diagnosed with stage 3 myeloma. At this point, the M-protein level was 49 g/L, urinary protein was 1.3 g/24-hour, and she was experiencing increasing back pain.

After vertebral collapse at T5 and T12, the patient agreed to chemotherapy with cyclophosphamide, thalidomide, and dexamethasone (CTD). Although the treatment produced a decrease in M-protein (34 g/L), the woman ended up in the hospital with hyponatremia, a fall in albumin, and worsening blood count. Her electrolyte imbalance was corrected, and she received red cell transfusion. Another treatment was tried (bortezomib and dexamethasone), but M-protein level rose to 49 g/L, so doctors discontinued the treatment after three cycles. The woman then underwent stem cell mobilization and 17 cycles of CTD re-treatment with "cautious titration of thalidomide." Attempts to harvest stem cells in 2011 failed. At this point, M-protein was 24 g/L; and the woman was "too neutropenic to be considered for a clinical trial."

The woman began taking an oral curcumin supplement (8 grams) each evening on an empty stomach. The supplement also contained bioperine, a component found in black pepper that aids absorption. After a few months, she added a weekly, 90-minute course of hyperbaric oxygen therapy (2 ATA), "which she has maintained ever since." M-proteins gradually declined to around 13 g/L, and her blood counts improved. Abbas Zaidi and colleagues report:

> Over the last 60 months, her myeloma has remained stable with minimal fluctuation in paraprotein level, her blood counts lie within the normal range and she has maintained good quality of life throughout this period. Repeat bone imaging in 2014 identified multiple lucencies <1 cm in the right hip and degenerative changes in both hips, but these were attributed to osteoarthritis rather than the myeloma. Recent cytogenetic analysis revealed she had no abnormal cytogenetics by fluorescent in situ hybridization.

The authors credit the curcumin supplement for her improvement and call for a clinical trial to investigate curcumin's effect on myeloma patients. Curcumin, a polyphenol found in turmeric (*Curcuma longa*) has antioxidant, anti-inflammatory, antiseptic, and analgesic properties. In addition, laboratory studies have found that curcumin has anti-proliferative effects on several types of cancer cells, including myeloma cells.

It is possible that the consistent weekly use of HBOT is also playing a role. Also, the patient may be doing other dietary and self-help measures, not mentioned, that contribute to her ongoing good quality of life. Whether curcumin is a "magic bullet" or part of a synergistic effect, this case report suggests a possible, new treatment avenue for an untreatable disease.

Zaidi A, Lai M, Cavenagh J. Long-term stabilization of myeloma with Curcumin. *BMJ Case Rep.* 2017.
Raymaakers K. M-Protein Antibodies and Significance in Blood. March 5, 2018. www.verywellhealth.com

HPV-Associated Head and Neck Cancers

Poor oral health, smoking, and alcohol use have been long recognized as risk factors for head and neck cancers. In the past two decades, researchers have been investigating human papillomavirus (HPV) as another risk factor. It is very easy to find internet articles that connect oral cancers to HPV (and possible prevention with an HPV vaccine), but oral health and smoking continue to be major risk factors, according to epidemiological studies.

While there is an association between HPV (especially HPV-16) and oropharyngeal cancer, HPV is not considered a risk factor for cancers of the oral cavity, larynx, and nasopharynx. A 2017 US epidemiological study, led by Carole Fakhry, MD, MPH, looked at the prognostic role of sex, race, and HPV status in 860 patients with oropharyngeal and non-oropharyngeal head and neck squamous cell cancers. Fifty-six percent of the 239 people with oropharynx cancer were HPV-positive. ➤

➤

In comparison, only two percent of 253 patients with oral cavity cancer, five percent of the 243 with larynx cancer, and 10 percent of the 125 with nasopharynx cancer were HPV-positive.

Among patients with non-oropharyngeal cancer, HPV status had no impact on overall survival; and the authors concur with practice guideline organizations like the College of American Pathologists, Cancer Care Ontario, and the Royal College of Pathologists, that have found no reason to test routinely for HPV in patients with non-oropharyngeal cancers. Interestingly, patients with oropharyngeal who were also HPV-positive had a "survival advantage" at follow-up (5 years and 10 years).

Another 2017 epidemiological study, conducted by Angela L. Mazul, PhD, MPH, and colleagues at the University of North Carolina at Chapel Hill, looked at HPV status and oral health. Poor oral health is associated with smoking and alcohol use. The authors report that two earlier studies had found a positive association between periodontitis and HPV-positive oropharyngeal cancer compared with HPV-negative oropharyngeal cancer. Chronic inflammation and bacterial infection, which are characteristic of periodontitis, may "[alter] the natural course of HPV infection," write the authors. In cervical cancer, co-infections with bacteria like *Chlamydia* appear to have a synergistic effect with HPV, increasing cancer risk.

For their study, the UNC researchers enrolled 248 patients with oropharyngeal cancer, 244 with non-oropharyngeal head and neck cancers, and a sex, age, and race frequency-match control group recruited via the NC Department of Motor Vehicle records. Interviews conducted by trained nurses provided data on oral health, dental care, smoking history, demographics, lifestyle, diet, and other risk factors. HPV status was determined with p16 immunocytochemistry evaluation, and clinical information (e.g., tumor site) came from patient records that were reviewed by a pathologist and a head-neck cancer surgeon.

The authors report a strong association between oral health and head and neck squamous cell cancers (HNSCC) – regardless of HPV status. In patients with oropharyngeal cancer, routine dental exams were significantly associated with reduced risk of both HPV-positive (OR, 0.52; 95% CI, 0.25-0.76) and HPV-negative cancer (OR, 0.55; 95% CI, 0.36-0.86) compared with controls.

Smoking a pack of cigarettes a day for ten or more years (≥10-pack years) was significantly associated with increased risk of head and neck cancer of all types. The group with HPV-negative tumors had the greatest percentage of long-term smokers (82.9%), followed by the group with HPV-positive cancer (63.1%) and controls (44.2%).

Taking care of one's oral health and not smoking are self-care measures that reduce the risks of all kinds of illness.

Fakhry C, et al. The Prognostic Role of Sex, Race, and Human Paillomavirus in Oropharyngeal and Nonoropharyngeal head and Neck Squamous Cell Cancer. *Cancer.* May 1, 2017; 123(9): 1566-1575.
Mazul AL, et al. Oral Health and Human Papillomavirus-Associated Head and Neck Squamous Cell Carcinoma. *Cancer.* January 1, 2017.

Intravenous Vitamin C to Support Cancer Patients

An informative, new review article in *Current Oncology* provides the rationale for using intravenous vitamin C (IV C) as a supportive measure for people with cancer and clinical safety considerations. The team of authors, comprised of MDs and NDs led by E. Klimant, say, "Extensive literature demonstrates that cancer patients experience vitamin C deficiency correlated with reduced oral intake, inflammation, infection, disease processes, and treatments such as radiation, chemotherapy, and surgery." IV C decreases inflammation in cancer patients by suppressing cox-2 and nuclear factor κB. Studies with advanced cancer patients have shown reductions in C-reactive protein; interleukins 1α, 2, and 8; tumor necrosis factor α; and eotaxin with IV C therapy. Patients also experience significant improvements in physical, emotional, social, and cognitive functioning. While this article does discuss the use of IV C in patients receiving chemotherapy, it does not discuss its use with radiation therapy nor as a treatment for the cancer itself.

"Giving 5-25 g IV C over a period of 30-120 minutes is safe for cancer-affected adults of any sex and body mass to decrease inflammation...," the authors write. "In addition, 500-4000 mg oral vitamin C daily is safe during the intervals between IV C treatments and could support continued oral repletion, as observed in studies combining oral and IV C in adults with cancer." The authors recommend giving patients oral fluids before and during treatment to prevent the most common side effects reported in clinical trials: nausea, dizziness, dry mouth, perspiration, and weakness.

While IV C is safe for most, it is contraindicated in people with glucose 6 phosphate dehydrogenase deficiency and in people with uncontrolled serum glucose above 300 mg/dL. Caution is advised in people with iron and copper storage diseases, renal failure, history of kidney stones, and pregnancy or lactation.

Recognizing "theoretical concerns" that IV C might reduce the effectiveness of chemotherapy treatment, Klimant et al "recommend that clear information be provided to patients that the effects of adding IV C to chemotherapy are unknown with respect to overall efficacy and that vitamin C could potentially decrease treatment efficacy despite any positive effect on symptoms. If the decision is made to provide IV C in supportive care, we recommend that it be given before chemotherapy, followed by a 30- to 60-minute break, or that it be given 12-72 hours after chemotherapy with attention to the half-life and clearance of the chemotherapy."

Klimant E, et al. Intravenous vitamin C in the supportive care of cancer patients: a review and rational approach. *Current Oncology.* April 2018;25(2):139-148.

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Literature Review & Commentary

by Alan R. Gaby, MD
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Treatment of Pancreatic Cancer with Intravenous Vitamin C

A 68-year-old man with stage 4 metastatic pancreatic ductal adenocarcinoma refused conventional treatment and opted for intravenous vitamin C in doses of 75 to 125 g two to three times a week. Prior to receiving vitamin C treatment, he was screened for glucose-6-phosphate dehydrogenase (G6PD) deficiency and abnormal renal function, because high-dose vitamin C is contraindicated in patients with those conditions. He survived nearly four years, during which time he received more than 450 vitamin C infusions and had objective evidence of disease regression. His death was due to sepsis and organ failure from a bowel perforation.

Comment: In the 1970s, Linus Pauling and Ewan Cameron reported that daily administration of 10 g per day of vitamin C increased mean survival time by more than five-fold in patients with terminal cancer. During long-term follow-up, 8 of 100 vitamin C-treated patients were still alive, with a mean survival time of 3.5 years.[1] The study by Pauling and Cameron was not a randomized controlled trial, so its results were met with skepticism. Two subsequent randomized controlled trials conducted at the Mayo Clinic failed to demonstrate any beneficial effect of high-dose vitamin C.[2,3] However, the Mayo Clinic studies had important flaws, including early discontinuation of vitamin C treatment and the likelihood that many patients in the placebo group were surreptitiously taking high-dose vitamin C.[4] Consequently, the question of whether vitamin C is an effective treatment for cancer remained unresolved.

Over the years, there have been sporadic case reports of dramatic responses to high-dose intravenous vitamin C. However, considering the large number of cancer patients that have received this treatment, such dramatic responses are probably uncommon. Nevertheless, vitamin C treatment appears to improve quality of life and may increase survival times. Further controlled trials are warranted to determine what role vitamin C has in the treatment of cancer.

Drisko JA, et al. Treatment of pancreatic cancer with intravenous vitamin C: a case report. *Anticancer Drugs*. 2018;29:373-379.

More on Vitamin C as a Treatment for Cancer

Twenty patients with metastatic adenocarcinoma of the prostate who had not received chemotherapy, who had had disease progression despite ongoing androgen-deprivation therapy, and who did not have glucose-6-phosphate dehydrogenase (G6PD) deficiency were treated with weekly intravenous infusions of vitamin C for 12 weeks (week 1, 5 g; week 2, 30 g; weeks 3 through 12, 60 g). All patients received 500 mg per day of oral vitamin C for 26 weeks. At 12 weeks, the median prostate-specific antigen (PSA) concentration was 17 µg/L higher than before vitamin C administration. Five patients had a lower PSA level at 12 weeks than at baseline, and the maximum reduction was 27%. Three of 16 patients who had serial bone scans showed an improvement in the bone scan index (a measure of the proportion of the body skeleton with bony metastases) and in the number of high-probability bony lesions. No patient achieved the primary endpoint, which was a 50% reduction in the PSA level. Three adverse events were directly related to the treatment, all of which were related to fluid load.

Comment: The authors concluded that this study does not support the use of intravenous vitamin C to treat metastatic prostate cancer because none of the patients achieved a 50% reduction in the PSA level. However, the results are consistent with possible benefit in a substantial minority of patients. Longer-term studies are needed to determine whether vitamin C therapy affects survival times in patients with metastatic prostate cancer.

Nielsen TK, et al. Weekly ascorbic acid infusion in castration-resistant prostate cancer patients: a single-arm phase II trial. *Transl Androl Urol*. 2017;6:517-528.

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Gaby's Literature Review

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Ginger for Chemotherapy-Induced Nausea

Fifty-one patients undergoing chemotherapy for cancer were randomly assigned to receive, in double-blind fashion, 300 mg of a ginger extract (standardized to contain 5% gingerols) or placebo four times per day with meals. Ginger or placebo was given for five days per chemotherapy cycle (beginning on the day of chemotherapy), for a total of three cycles. All patients received standard anti-emetic therapy. In chemotherapy cycle 1, compared with placebo, ginger treatment resulted in significantly better quality of life related to chemotherapy-induced nausea ($p < 0.03$), significantly better overall quality of life ($p < 0.02$), and significantly less fatigue ($p = 0.006$). There were no significant results in cycle 2. In cycle 3, overall quality of life ($p = 0.04$) and fatigue ($p < 0.02$) were significantly better in the ginger group than in the placebo group.

Comment: The results of this study confirm previous research demonstrating that ginger is beneficial for the prevention of chemotherapy-induced nausea. There is no evidence that ginger interferes with the anticancer effects of chemotherapy.

Marx W, et al. The effect of a standardized ginger extract on chemotherapy-induced nausea-related quality of life in patients undergoing moderately or highly emetogenic chemotherapy: a double blind, randomized, placebo controlled trial. *Nutrients*. 2017;9:E867.

Folic Acid and Cancer Risk

In the China Stroke Primary Prevention Trial, 20,702 Chinese hypertensive adults without a history of stroke or myocardial infarction were randomly assigned to receive, in double-blind fashion, a single daily pill containing 10 mg of enalapril and 0.8 mg folic acid or 10 mg of enalapril alone (control group). During a median treatment period of 4.5 years, cancer occurred in 1.12% of participants in the folic acid group and 1.12% of participants in the enalapril group. There was no significant difference between groups for specific types of cancer (esophageal, gastric, breast, lung, colorectal, head and neck, liver, gynecologic, or lymphoma) and there was no difference in cancer mortality between groups. A significant 53% reduction in cancer risk was seen in folic acid-treated participants who had both the methylenetetrahydrofolate reductase (MTHFR) TT genotype and low folate levels (less than 9.0 ng/ml).

Comment: Numerous studies have been conducted on the effect of folic acid on cancer risk. The findings have ranged from a protective effect to no effect to an adverse effect. Some investigators have suggested that, in the short term, folic acid may accelerate the clinical expression of cancers that are already present, but in the long term it may prevent the development of cancer by enhancing immune function and by preventing DNA from mutating.[5] In the present study with a relatively long treatment period, folic acid supplementation had no significant effect on overall cancer incidence or cancer-related mortality, but it appeared to have a protective effect in people with the combination of low folate status and a genetic polymorphism that increases folate requirements.

Qin X, et al. Effect of folic acid supplementation on cancer risk among adults with hypertension in China: A randomized clinical trial. *Int J Cancer*. 2017;141:837-847.

Probiotic for Function Constipation

Fifty-six adults (mean age, 44 years) with functional constipation and normal colonic transit time were randomly assigned to receive, in double-blind fashion, *Lactobacillus reuteri* DSM 17938 or placebo for 15 weeks. The dosage was four tablets per day between meals for 15 days, then two tablets per day between meals for 90 days. Each probiotic tablet contained at least 10^8 colony-forming units. Compared with placebo, the probiotic significantly decreased the mean severity of constipation on day 60 ($p < 0.005$) and day 105 ($p = 0.001$), but not on day 15. The mean improvement at the end of the trial compared with baseline was 41.5% in the probiotic group and 10.2% in the placebo group.

Comment: Functional constipation, also known as chronic idiopathic constipation, is defined as constipation that is not due to an identifiable anatomical abnormality or medical condition. *L. reuteri* DSM 17938 is a probiotic strain originally derived from breast milk. It has been found to be effective for preventing and treating infantile colic, for treating acute gastroenteritis in children, for treating functional abdominal pain in children, and for preventing dental caries. The present study found that this probiotic organism is also an effective treatment for functional constipation in adults. *L. reuteri* DSM 17938 is sold in the United States under the brand name Gerber Soothe Colic Drops.

Riezzo G, et al. Randomised double blind placebo controlled trial on Lactobacillus reuteri DSM 17938: improvement in symptoms and bowel habit in functional constipation. *Benef Microbes*. 2018;9:51-60.

Should *Meso*-Zeaxanthin Be Included in Nutritional Formulas for Eye Health?

One hundred twenty-one patients with non-advanced age-related macular degeneration were randomly assigned to receive daily, in double-blind fashion, the Age-Related Eye Disease Study (AREDS 2) formula with a low dose of zinc (25 mg) or the same formula with the addition of 10 mg of *meso*-zeaxanthin for two years. The AREDS 2 formula provides daily 10 mg of lutein and 2 mg of zeaxanthin. Both groups had significant improvements in contrast sensitivity at six cycles per degree (the primary outcome measure), in other measures of contrast sensitivity and visual function, and in the amount of macular pigment. However, the degree of improvement in the various endpoints did not differ significantly between groups.

Comment: Macular pigment contains three carotenoids: lutein, zeaxanthin, and *meso*-zeaxanthin. These carotenoids filter the phototoxic blue-light portion of the sun's rays, and thereby appear to prevent the development of age-related macular degeneration. *Meso*-zeaxanthin is the main carotenoid at the center of the macula, and it expands the range of blue light filtration over that provided by lutein and zeaxanthin. There is little research on the *meso*-zeaxanthin content of foods, although it has been found in the skin of certain types of seafood. While the typical diet may contain little or no *meso*-zeaxanthin, this carotenoid is believed to be synthesized in the retina from lutein.

In a previous study of patients with early age-related macular degeneration, the addition of *meso*-zeaxanthin to a supplement containing lutein and zeaxanthin improved contrast sensitivity to a greater extent than lutein and zeaxanthin without *meso*-zeaxanthin.[6] However, the beneficial effect of *meso*-zeaxanthin appeared to be modest, and it was not stated whether the difference in the change between treatments was statistically significant. In the new study, the addition of *meso*-zeaxanthin to the AREDS 2 formula with a low dose of zinc did not increase the efficacy of the formula. Therefore, it remains unclear whether *meso*-zeaxanthin should be included in nutrient formulas designed to prevent and treat age-related macular degeneration.

Akuffo KO, et al. The impact of supplemental antioxidants on visual function in nonadvanced age-related macular degeneration: a head-to-head randomized clinical trial. *Invest Ophthalmol Vis Sci*. 2017;58:5347-5360.

Does Bisphenol A Cause Attention Deficit-Hyperactivity Disorder?

Data from the 2007 and 2011/12 National Survey of Children's Health in the United States were used to examine the association between formula feeding and a preschool diagnosis of attention deficit-hyperactivity disorder (ADHD). In the 2007 cross-sectional study of 11,198 children, the prevalence of ADHD was more than five times higher in those who had been formula-fed than in those who had been breastfed (adjusted odds ratio = 5.58; 95% confidence interval [CI], 2.16-14.41). In the 2011/12 cross-sectional study of 12,498 children, there was no significant association between formula feeding and later ADHD (adjusted odds ratio = 1.05; 95% CI, 0.42-2.64).

Comment: Bisphenol A (BPA; a compound with known neurotoxic effects in experimental animals) was widely used in the production of baby bottles and formula cans until around 2008. At that time, many manufacturers stopped using BPA in the production of these products, and many retailers began refusing to sell products that contained BPA. In previous observational studies, breastfeeding during infancy was associated with a lower risk of subsequent ADHD. Although this association was thought to be due at least in part to the nutritional advantages of breast milk, a possible adverse effect of BPA in formula-fed children could not be ruled out. In the present study, formula feeding was associated with an increased risk of subsequent ADHD during the years that BPA was being used, but not after BPA was removed from baby products. That finding suggests that early exposure to BPA may promote the development of ADHD.

Adesman A, et al. Formula feeding as a risk factor for attention-deficit/hyperactivity disorder: is bisphenol A exposure a smoking gun? *J Dev Behav Pediatr*. 2017;38:545-551.

Gluten and Psoriasis

Of 97 Russian patients with psoriasis, 13 (14%) had elevated levels of antigliadin IgA antibodies. In contrast, only 2% of 91 controls had elevated antibodies. All 13 patients with increased antigliadin IgA antibody levels were advised to follow a strict gluten-free diet without any other modifications in their treatment. At 12 months, all patients were improved. The mean degree of improvement was 36% in the patients who had elevated but not greatly elevated antigliadin IgA antibody levels, and the mean degree of improvement was 56% in the five patients who had greatly elevated antibody levels.

Comment: In this study, consumption of a gluten-free diet improved psoriasis in patients who had elevated levels of antigliadin IgA antibodies. The study did not investigate whether patients without increased antigliadin antibody levels would also improve on a gluten-free diet. However, a previous study found that a gluten-free diet improved psoriasis only in patients who had increased levels of IgA and/or IgG antigliadin antibodies.[7]

Kolchak NA, et al. Prevalence of antigliadin IgA antibodies in psoriasis vulgaris and response of seropositive patients to a gluten-free diet. *J Multidiscip Healthc*. 2018;11:13-19.

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COMPOUNDED BIOIDENTICAL HORMONES MAY DISAPPEAR WITHOUT YOUR HELP!

In 2013, Congress passed a law to tighten regulations on compounding pharmacies. As part of the implementation of that law, the FDA began accepting nominations to the "Difficult to Compound List." When finalized, compounding pharmacies will no longer be able to make items that appear on this list. Bioidentical estriol, estradiol, and progesterone are currently nominated for the Difficult to Compound List. In the case of compounded bioidentical hormones not otherwise available as commercial drugs, such as estriol, consumer access would be completely eliminated if the agency places them on the final list.

The Alliance for Natural Health USA is mounting a public campaign to draw attention to this crucial issue, so the FDA hears from the millions of doctors and patients who rely on compounded bioidentical hormones. The FDA must preserve consumer access to these medicines!

Visit the link below to send a message to the FDA and Congress, urging the federal government to retain consumer access to these crucial medications.

SaveBioidenticals.com

alliance for natural health USA

3525 Piedmont Rd, NE, Building 6,
Suite 310, Atlanta, GA 30305
WWW.ANH-USA.ORG

SAVEBIOIDENTICALS.COM

Coffee and the Reduction of Cancer Risks

by Steven M. Helschien, DC

Introduction

Daily intake of coffee may boost your health in a myriad of ways, including by reducing your risk of several types of cancer, heart disease and even early death, according to several studies by the American Institute for Cancer Research, National Institutes of Health, and other major medical institutions.

Antioxidants

Antioxidants, known as "free radical scavengers," are compounds that interact with free radicals and neutralize them, preventing them from causing damage to cells. The body makes some antioxidants, called endogenous antioxidants, that it uses to neutralize free radicals. However, the body relies on external or exogenous antioxidants, obtained primarily through diet, to obtain the rest of the antioxidants it needs. Numerous studies have shown that increased levels of exogenous antioxidants prevent the types of free radical damage that have been associated with cancer development.

According to the American Institute for Cancer Research, the antioxidants, phytochemicals, phenols, and nutrients found in coffee all play an important role in helping reduce the risks of many cancers.

Research has shown that coffee has the richest source of antioxidants of any other food. This is important since antioxidants fight free radicals, which cause cancer. Antioxidants can block carcinogens, reduce cancer cell growth, and promote cancer cell death. Organic coffee that is a premium grade, free of pesticides and chemicals, and that has high standards for roasting are found to be best because they are the richest in antioxidants.

Free Radicals and Cancer Development

Free radicals are highly reactive chemicals in the body that have the potential to harm cells because of their voracious appetite for electrons. They are formed naturally in the body and play an important role in many normal processes. But, at high concentrations, free radicals can be hazardous and damage major components of cells, including DNA, proteins, and cell membranes. According to the National Cancer Institute, the damage to cells, especially the damage to DNA, caused by free radicals, is thought to play a major role in the development of cancer and a host of other chronic conditions.

An Antioxidant Superfood

Coffee has more antioxidants than blueberries, cranberries, and dark chocolate. These super antioxidants can reduce inflammation by neutralizing harmful free radicals, as well as reduce the risk of disease related to inflammation, such as cancer and cardiovascular disease. Some of the main antioxidants in coffee that fight cancer include the following:

- Chlorogenic Acid: A compound that plays an integral role in antioxidant, anti-inflammatory, and anti-bacterial activities in the body.
- Quinine: An antioxidant known for its protective properties.
- Plant Phenols: Responsible for protecting the body from cellular damage and certain types of cancer.
- Cafestol: An anti-inflammatory substance in the brain, and also a modulator for bile acid in the intestines.
- Melanoidins: Compounds that have anti-bacterial and anti-inflammatory properties.
- Trigonelline**:** A compound with anti-bacterial properties.

Coffee Reduces Risk of Several Cancers

According to the American Institute for Cancer Research, the antioxidants, phytochemicals, phenols, and nutrients found in coffee all play an important role in helping reduce the risks of many cancers, including the following:

Breast cancer: Following numerous studies that showed the role of coffee in reducing the risk of breast cancer, researchers at the University of Lund and the Skane University Hospital in Barngaten, Sweden, investigated the effects of coffee in women already diagnosed with the condition.[1] They found, depending on the type of gene a woman has, drinking at least two to three cups of coffee daily can reduce risks for developing breast cancer or possibly delay its onset.

Oral cancer: "Coffee is one of the most widely consumed beverages in the world, and contains a variety of antioxidants, polyphenols, and other biologically active compounds that may ➤

Coffee and Reduction of Cancer Risks

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help to protect against development or progression of cancers," according to the American Cancer Society. The 30-year Cancer Prevention Study by the American Cancer Society found that participants who drank about four cups of coffee per day reduced their risk of oral/pharyngeal cancer by 49 percent, compared to those who drank little or no coffee per day.[2]

Colorectal Cancer: Researchers at the University of Southern California, Norris Comprehensive Cancer Center of Keck Medicine, found that compared with people who did not drink coffee, people who drank one or two cups daily reduced their risk of colon cancer by 22 percent while those who drank three or more cups lowered their risk by 59 percent. Researchers reported that coffee was associated with a lower risk of colorectal cancer, and the more coffee the subjects drank, the lower their risk became.[3]

Liver Cancer: Studies suggest that people who drink at least a cup a day have a lower risk of liver cancer compared to those who only indulge occasionally. Some data indicated that drinking three or more cups daily reduced that risk by more than 50 percent.[4]

Skin Cancer: A large US cohort study by the National Institute of Health and AARP found higher coffee intake reduced the risk of developing melanoma.[5]

Prostate Cancer: Men who drink coffee regularly appear to lower their risk of prostate cancer, especially the lethal form, according to researchers at Harvard School of Public Health. Prostate cancer is the most frequently diagnosed form of cancer and the second leading cause of cancer death among US men.[6]

Uterine Cancer: Studies show there is an association between drinking coffee and lower endometrial cancer risk. The scientists found that coffee is a protective factor for uterine cancer.[7]

California Cancer Warning

A court battle that has been on-going for several years resulted in a California judge ruling that coffee companies, who did not want to settle financially out of court, must post cancer warnings about possible levels of acrylamide. Extreme levels of acrylamide have been shown to increase the risk of cancer in rats, but studies have not shown that acrylamide has caused cancer in humans. Acrylamide is a chemical compound that is contained in a number of plant-based foods and nearly every food that is baked, roasted, or fried. Acrylamide develops during the cooking process.

So, should you stop eating foods with acrylamide? The FDA's recommendation is no, you should not: "FDA's best advice for acrylamide and eating is that consumers adopt a healthy eating plan, consistent with the Dietary Guidelines for Americans (2015-2020)."

Coffee expert Dr. Edward Giovannucci from the Harvard T.H. Chan School of Public Health, spoke out against the cancer warning in a blog for the American Institute of Cancer Research, saying that there is no evidence that acrylamide causes cancer in humans[8]: "On a 'cancer worry' scale from 0 to 10, coffee should be solidly at 0 and smoking at 10; they should not have similar warning labels."

Other experts from the American Institute of Cancer Research also point to over 1,000 studies that have determined coffee's ability to lower the risk of cancer. Dr. Sanjiv Chopra, professor of medicine and former faculty dean for continuing medical education at Harvard Medical School, emphasizes the health benefits of coffee in his book *The Big Five*, and in numerous interviews: "There is no longer any doubt that coffee offers significant health benefits…. Coffee consists of hundreds of component chemicals, among them potassium, magnesium, and vitamin E, and is rich in antioxidants, especially chlorogenic acid." In 2012 the National Institutes of Health released a landmark study demonstrating that coffee drinkers had an overall lower risk of death.[9]

Purity Coffee for Health

Most (if not all) coffee companies do not have a standard for acrylamide and other toxins, to keep levels in check. One company does have a strict standard for acrylamide and other harmful chemicals – Purity coffee.

Purity coffee is an organic premium coffee. Purity intentionally grows, farms, transports, and roasts their coffee to maximize healthy antioxidants and minimize harmful chemicals, such as pesticides, micro-toxins, acrylamides and polycyclic aromatic hydrocarbons (PAHs). To create the healthiest brewed coffee, they test the coffee at every step with strict standards. Purity uses a proprietary roasting method that roasts the beans just enough to reduce the acrylamide to the lowest levels and prevents over roasting, which risks

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.

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.

In three independent laboratory studies, 49 leading coffee brands were tested. In each one, Purity coffee ranked superior to all the other brands.[10] On average, Purity coffee contained over 60% more antioxidants than the other leading organic coffee brands tested; and of all the brands tested for contaminants, over 60% tested positive for mold and the toxin ochratoxin A. Purity contained two times the amount of antioxidants as the other brands and was free of all contaminants. How do they accomplish this? Purity produces coffee for its health benefits. No other coffee company in the world roasts deliberately for health benefits. It is an added benefit that it also tastes great.

Conclusion

Years ago, the medical community thought coffee might be unhealthy. Today that thought has been reversed, as updated research and over 1,000 new studies have shown the health benefits of coffee. Hundreds of these studies have been done on coffee and cancer, and the reports have shown a decrease in cancer risk.

The healthiest coffee you can drink, and therefore the best to aid in fighting cancer, is Purity coffee.

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Monthly Miracles

by Michael Gerber, MD, HMD
Practitioner of Homeopathic Medicine
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Lyme/Colitis

Endless Faces of Lyme and Babesia

It has become my practice to do an EAV, Electroacupuncture by Voll, evaluation of all new patients with chronic illnesses for *Borrelia burgdorferi* (Lyme disease). I love my BioMeridian, EAV computer. More recently, also routinely checking for *Babesia microti*, I am shocked by how frequently they appear; and only about half the patients remember a tick bite. Lyme and Babesia can also be transmitted by mosquitos, mites, fleas, mammals, as well as ticks. Recent studies have found Lyme can be transmitted sexually, transplacentally, and in breast milk. For an extensive review of hosts and transmission, go online to find lymedisease.org.au/transmission/, or google search "Transfer of Lyme Disease." The main article (lymeepidemie.nl/transfer-lyme-disease/?lang=en) has overwhelming data to support its epidemic status.

Antibody testing for Lyme is notorious for false negatives. It eats the antibodies. PCR evaluation, polymerase chain reaction, may be more accurate, especially after deep connective tissue massage. Klinghardt feels Lyme resides in connective tissue, and flushing the bacteria into the system allows more accurate urine PCR evaluation of the infection.

continued on page 38 ➤

COWDEN SUPPORT PROGRAM

"Most people take 3-4 products and think they are on the Cowden Support Program. But they are not! It's vital to follow the entire program as designed. Each of the 14 products serves an essential purpose. I've seen an over 80% success rate with my patients when they follow the entire program."

-Wm. Lee Cowden, MD, MD (H)

NutraMedix

Providing Quality Natural Products Since 1993

Monthly Miracles

➤ *continued from page 36*

Eosinophilic Colitis

DL, a 67-year-old male diagnosed with eosinophilic colitis for 16 years, had symptoms of severe abdominal cramps, bleeding in stools, nausea, hypertension, and dizziness. His medications included oxycodone (four to six per day) for pain, lorazepam (2 mg twice per day) for anxiety and pain, and gabapentin (twice per day) for pain. Laboratory testing showed high triglycerides, very low testosterone, and high homocysteine. Initially, I supported him with dietary suggestions, basic nutrients, bioidentical hormone replacement, and *Colocynthis* 200C, a great remedy for abdominal pain. After one month he was worse.

Reflexively, I checked him for Borrelia, which was positive. Azithromycin tested well for him, and he started 250 mg daily for 30 days. Adjunctive therapy has always been very positive for our patients. NutraMedix tinctures of Samento (Cat's claw) and Cumanda as antimicrobials with Burbur, a drainage remedy, have been very successful for us over the years. NutraMedix has other tinctures that are also very beneficial, a la Lee Cowden, MD. We also continued thyroid hormone and testosterone cream, and within one month his pain was markedly reduced, and by month two he had no pain and discontinued all his pain medications and his stools were normal. He was overjoyed.

We recommend combining the Samento and Cumanda in three or four ounces of pure water starting with one drop of each, allowing it to stand for one minute before drinking and working up to 15 drops of each, two or three times per day, with 12 days on and two days off to allow for the pleomorphic nature of the Babesia to open to disruption. Reduce the dose if die off is occurring. Die off, also called the Jarisch-Herkheimer reaction, stems back to the 1840s in Germany and Austria where two doctors treated syphilis, the scourge of millennia, also a spirochete like Lyme, with mercury. It worked very well to kill all the billions of syphilis bacteria all at once, and the patients would have a Jarisch-Herxheimer reaction with 106- and 107-degree fevers for three or four days with racking pains, chills, and hallucinations, usually treated with opiates. Additionally, patients experienced, hypotension, headache, tachycardia, hyperventilation, vasodilation with flushing, myalgia, exacerbation of skin lesions, and anxiety.

Killing Lyme is usually not this brutal, depending on the vitality of the patient. Supporting adrenal and thyroid functioning along with glutathione, vitamin C, magnesium, and antioxidants is important. Reducing the herbal tincture drops is frequently necessary to get through die off (Herxing). Increasing the Burbur frequency, glutathione (some authors feel they increase glutathione from 400% to 600%), vitamin C (IV nutrient drips with vitamin C five to 25 grams or more), coffee enemas, ozone IV's bubbled in saline, major autohemotherapy with ultraviolet light and ozone, EDTA for heavy metal chelation and bio-film disruption, far infrared saunas, colon hydrotherapy, and the whole panoply of herbal and homeopathic detox are also helpful.

Dr. Nicola Ducharme's article, "'Lyme Brain': Causes and Solutions," in *TL* October 2015 was brilliant. I hand out copies to all my Lyme patients. We see all these symptoms repeatedly and have consistently good results with bipolar illness, anxiety, severe insomnia, brain fog, depression, overwhelming fatigue, not to mention arthritis (even RA), fibromyalgia, and asthma by treating Lyme.

***Babesia microti* - A Tough Hombre**

Lyme is tough enough by itself, but the many co-infections of Borrelia can be very challenging. Babesia is a parasite, also tick-borne, and may be asymptomatic for years. It is more common in the elderly, splenectomy patients. The parasite infects red blood cells and causes hemolytic anemia, high fevers, jaundice, and kidney failure. For those of us who use live blood analysis, watch exploding, ghosting RBCs, which if occurring almost immediately after taking the specimen is a tipoff to check for Babesia. If it also occurs with kidney failure, it is even more compelling to treat. I wonder if a compensatory polycythemia may occur in some patents especially with very low iron values.

Traditional treatment includes high-dose azithromycin with atovaquone, which is frequently prohibitively expensive. Clindamycin in high dosage with quinine is also recommended. Silver treatment may also be beneficial. Testing these agents with EAV or ART is helpful to select the least toxic approach. The NutraMedix tinctures are also helpful in combination with the drugs. Probiotics are always important to include in the regimen ◆

Metabolic Therapies in Advanced "Salvage" Cancer Cases

by Dr. Paul S. Anderson, NMD

An excellent example of true therapeutic synergy was discovered in the earlier days of my IV research (under the NIH-funded Bastyr Integrative Oncology Research Center) in the combination therapy using Poly-MVA and dichloroacetate (DCA) for both IV and oral use. We will describe the basis of the synergy and the initial case series that was followed.

Before discussing the combined metabolic therapy we developed, it would be useful to discuss the components separately in regard to their use in cancer. Those components are DCA, retinol, hyperbaric oxygen, and finally Poly-MVA versus alpha lipoic acid.

DCA

DCA is a relatively small molecule, which has been used as treatment for lactic acidosis. It inhibits lactate formation and releases pyruvate dehydrogenase kinase from negative regulation, thus promoting pyruvate entry into the TCA cycle. This increases oxygen consumption and reactive oxygen species (ROS) formation while glycolysis and lactate formation are repressed.[1] Non-cancerous human cells prefer this aerobic pathway for energy formation via the electron transport chain (ETC) use. Cancerous cells experience the Warburg Effect where most glucose is converted to lactate regardless of oxygen availability.[2] Forcing a cancerous cell into TCA/ETC use thereby increases ROS formation and oxygen consumption.[3]

Cancers targeted in the published data included glioblastoma and are targeted due to their reliance on glucose metabolism, as well as the ability of DCA to cross the blood brain barrier.[4] Other cancer cell types which have shown sensitivity are breast, prostate, colorectal, pancreatic and endometrial cancers.[5]

The most common toxicity is a dose dependent reversible peripheral neuropathy. Other reactions appear to be mediated by a slowing of glutathione activity via the GSTz pathway: "From the Abstract: Dichloroacetate (DCA) inhibits its own metabolism and is converted to glyoxylate by glutathione S-transferase zeta (GSTz). … Moreover, DCA-induced inhibition of tyrosine catabolism may account for the toxicity of this xenobiotic in humans and other species."[6] As, clinically, most toxicity effects appear to be mitigated either by slowing infusion, adding glutathione and nutrient support, or both, the use of such additional measures is indicated.

Retinoids

Retinoids (i.e., vitamin A, all-trans retinoic acid, and related signaling molecules) induce the differentiation of various types of stem cells. Nuclear retinoic acid receptors mediate most but not all the effects of retinoids. Retinoid signaling is often compromised early in carcinogenesis, which suggests that a reduction in retinoid signaling may be required for tumor development. Retinoids interact with other signaling pathways, including estrogen signaling in breast cancer. Retinoids are used to treat cancer, in part because of their ability to induce differentiation and arrest proliferation. "Retinoid research benefits both cancer prevention and cancer treatment."[7] Retinoic acid has been investigated extensively for its use in treating different forms of cancer not only in prevention but also in treatment: "Under normal circumstances in the body, retinoic acid does preventive work against cancer formation. After cancer formation, retinoic acid becomes an attacker to cancer cells, one that blocks their growth and division and also triggers their differentiation and death through specific pathways."[8]

> Since 2014, we have treated many Stage-4 cancer patients with the combined metabolic therapy …. It has been safe and overall very effective in slowing disease, causing regression or stabilizing advanced cancer.

Hyperbaric Oxygen Therapy (HBOT)

HBOT is widely used as an adjunctive treatment for various pathological states, predominantly related to hypoxic and/or ischemic conditions. It also holds promise as an approach to overcoming the problem of oxygen deficiency in the poorly oxygenated regions of the neoplastic tissue. Occurrence of local hypoxia within the central areas of solid tumors is one of the major issues contributing to ineffective medical treatment. HBOT alone offers limited curative effect and is typically not used as monotherapy. In most oncology settings HBOT is used as a treatment along with other therapeutic modalities. An excellent review published in 2016 by Ostrowski et.al discusses the recent data regarding safety, efficacy and potential uses of HBOT in oncology and is a highly recommended resource.[9]

➤

Poly-MVA

Poly-MVA is a redox molecule that facilitates energy charge transfer at the cellular level with regards to the mitochondrial respiratory chain; it can therefore protect (by accepting a radical electron) and provide energy (by increasing mitochondrial activity). Poly-MVA (also referred to as Pd-LA) is a polymer (liquid crystal) rather than a single molecule. It differs from free radical scavengers (e.g. alpha-lipoic acid) since there is no free lipoic acid or nutrients as they are irreversibly bound together in a polymer resulting in a molecule that is both fat- and water-soluble. Therefore, the polymer provides a unified redox reaction. In summary it is an extremely effective energy transferring molecule. Poly-MVA has been shown to be neuroprotective and helpful in supporting the mitochondrial complex.[10-13]

One reason to consider Poly-MVA in a combined therapy is mitochondrial support as this has the potential to aid metabolic therapies by strengthening normal cells and potentially weakening cancer cell metabolism. A study[14] looking at the effects of Poly-MVA on mitochondrial dynamics revealed:

> The level of GSH was also significantly improved and the level of lipid peroxidation was decreased significantly ($p<0.05$) by POLY-MVA. The results indicate that POLY-MVA is effective to protect the age-linked decline of myocardial mitochondrial antioxidant status. The findings suggest the use of this formulation against myocardial aging.

Alpha Lipoic Acid (ALA)

ALA has been used for many years in various cancer therapies. In a 2012 paper,[15] the authors looked at neuroblastoma cells and potential for metabolic effect from both DCA and ALA. Their conclusions are revealing as to one potential mechanism by which ALA can have an anti-cancer effect:

> These data suggests that LPA [ALA] can reduce (1) cell viability/proliferation, (2) uptake of [18F]-FDG and (3) lactate production and increase apoptosis in all investigated cell lines. In contrast, DCA was almost ineffective. In the mouse xenograft model with s.c. SkBr3 cells, daily treatment with LPA retarded tumor progression. Therefore, LPA seems to be a promising compound for cancer treatment.

The question arises: "Why consider Poly-MVA over ALA in a metabolic therapy?" In the past, our experience was to use ALA with DCA as well as other support nutrients. This strategy was typically able to mitigate the DCA side effects. The down sides of the combination therapy however were that it required multiple supplements and, in the IV form, required slower dose escalation of ALA due to potential side effects. Additionally, while ALA has some cancer metabolism effect, based on the data presented elsewhere in this paper and multiple patient responses, ALA did not have either the same level of synergy with DCA (as Poly-MVA) nor the potential metabolic benefits of Poly-MVA in combination with DCA. This led us to choose Poly-MVA as the neuroprotective and mitochondrial agent over ALA and support nutrients.

Why Combined Therapies?

The potential side effects of DCA (which can include neurological toxicity) and a deeper look into the mechanism by which DCA works led myself and Dr. Gurdev Parmar to postulate that Poly-MVA and DCA could have two areas of synergy if used together: One being a mutual anti-cancer benefit and the other to improve the safety and tolerance of the DCA. The first step after looking at the chemistry was to have a cell line study done to see if the synergy we saw "on paper" translated to cancer cell death. The short story is that both Poly-MVA and DCA had tumor kill but together they had additive benefit, and less DCA could be used with the same tumor kill.[16] This was the best of both worlds with regard to a potential synergistic combination.

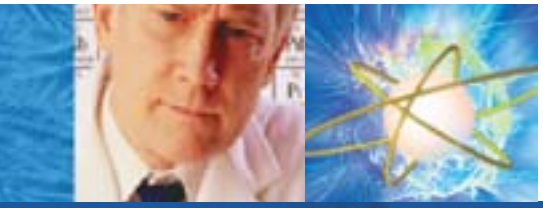
As we all know, what works on paper does not always work in the petri dish, and what works there doesn't always translate to animal or human use. Because of this I (from prior use of DCA and Poly-MVA) knew how to administer both agents safely so I knew that I could provide the therapy without any risk other than risks common to other IV therapies. I did however have to select a group of people with advanced cancer that had failed all therapies (standard oncology therapies and natural therapies) and consented to this as a trial of unknown outcome (in oncology research a "salvage therapy trial").

We began with a small group of patients, acquiring them one by one based on the above criteria, and over the course of two years implemented the therapy. The original case series is summarized in the table (left) and was part of the original study, but has not been published separately since reported (in the context of the whole trial outcomes) at the Society of Integrative Oncology.[17] For reference, many times things discovered in studies take years to be published, if at all.

N (number of patients = 9)	Disease Progression	Stable Disease	Improved Quality of Life	Disease Regression
66 YO Male NHL				XXX
5 YO Female Mixed Acute Leukemia (MLL+)				XXX
71 YO Female Multiple Myeloma				XXX
68 YO Female Multiple Myeloma				XXX
72 YO Female CLL			XXX	
65 YO Male Metastatic Melanoma	XXX			
3 patients with GBM (high grade brain tumor) Post Surgery			XXX	

The basis of the therapy is outlined in the DCA and Poly-MVA sections above, but essentially the goal is to attack the cancer cell where it is weakest via its unique (but impaired) metabolism relative to normal human cells.[18-24] I and colleagues have used this therapy, and the newer versions of it, many times

continued on page 42 ➤



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- **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.

Oncologist Dr. James W. Forsythe's 3 different LAMC outcome studies:

- **225 Patients 6-yr Overall Survival Rate of 32% 2004-2010**
- **500 Patients 5-yr Overall Survival Rate of 39% 2005-2010**
- **1000 Patients 7-yr Overall Survival Rate of 64% 2010-2017**

"In Stage IV adult cancers of any origin, improvement in quality of life issues is directly proportional to improvement to overall response rate. Even stable disease can be tolerated and changed into a chronic livable condition."
- James W Forsythe, MD. , HMD

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- Dr. James Forsythe, Oncologist

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Metabolic Therapies

➤ *continued from page 40*

in the years since and have had similar results. Of course, nothing works for everyone, but this combination has certainly improved overall cancer outcomes in our clinical experience. It should be noted the original protocol involved dietary changes (to a low carbohydrate or ketogenic diet) and a small group of oral supplements.

It should be of significant note that the only difference in the "disease regression" group and the other groups in the table above was that the "disease regression" group were the most stringent on their diet changes. This became a reason to increase the focus on the dietary portion of the intervention in future patients.

I had never seen these results when using DCA alone, so in my opinion the synergy seen is the petri dish worked in humans. Additionally, the rate of side effects from the DCA was drastically reduced, such that nobody since has had to drop out of the therapy due to DCA-related side effects. Overall, this is one of the truly big advances in integrative cancer therapies in the past twenty years.

In moving this therapy forward, I encountered the work that Dominic D'Agostino (of the University Of South Florida School of Medicine) was doing on metabolic oncology therapies in 2014 at the International Hyperbaric Medical Association.[25] His work with animals and mine in humans had many crossover points. The main addition when I looked at both protocols was to combine hyperbaric oxygen therapy (HBOT) and exogenous ketones with my protocol.

Since 2014, we have treated many Stage-4 cancer patients with the combined metabolic therapy mentioned below. It has been safe and overall very effective in slowing disease, causing regression or stabilizing advanced cancer.

I believe based on the experiences of the past seven years with this evolving therapy that it holds a significant place as an effective intervention in advanced cancers. And while nothing certainly works universally in advanced cancer, a combined metabolic protocol should be considered as a potential therapy in all cases.

Combined Metabolic Oncology Therapy

Protocol Overview:

1. Dietary Intervention
2. Use of supplemental retinol
3. Use of intravenous Poly-MVA and DCA
4. Addition of hyperbaric oxygen therapy (HBOT)

Specific Protocol:

1. Dietary Intervention:
   - Patients are on a ketogenic or (at least) low carbohydrate diet.
     - When calculating carbohydrates use ONLY the "net carbohydrate" values (Net carbohydrate is [Total Carbohydrate – Fiber]). Ultimate ketone goal in blood is over 3.0 millimolar.
     - In either diet the patient needs to consume high-fiber vegetables.
     - Most juices and smoothies have too much sugar and cannot be used.
   - Oral ketone supplements starting at 2.5 grams BID and increasing to 5 grams BID as tolerated. [35 – 70 mg/Kg pediatric dose BID]
   - Daily intermittent fasting should be followed with the last meal ending at 7:00 PM and the first meal at 8:00 AM or after.
   - If patients are losing weight/cachexic, have them consume 10-20 mL of MCT [1-5 mL pediatric] oil every 1 to 2 hours. They may need bile salts as support. Then look at their caloric macronutrient levels and adjust the fat up and potentially some increase in protein.
   - Note that too much protein will trigger glucogenic amino acid conversion and so this should be avoided.
2. Retinol Rx: Patients are given vitamin A: 25,000 IU Retinol [350 IU/Kg pediatric] in a fat soluble (not carotenoid) form orally once daily. If patient has AST/ALT over 300, decrease to 5000 IU daily.
3. Administration of Poly-MVA and DCA intravenously as outlined below. The Poly-MVA IV is always first then the DCA IV follows directly after the Poly-MVA.

   The first IV is a test dose:
   - Poly-MVA 10 mL in 500 mL Normal Saline [0.1 mL/Kg for pediatric – in 100 mL NS] and then DCA 10 mg/kG in 500 mL Normal Saline [100 -250 mL in pediatric]
   - Note: For both above, you may substitute 0.45 saline in dehydrated patients.

   The following IV's are at full dose:
   - Poly-MVA 25 mL in 500 mL Normal Saline [0.5 mL/Kg for pediatric – in 100 mL NS] and then DCA 20 mg/kG in 500 mL Normal Saline [100-250 mL pediatric]

- Note: For both above, you may substitute 0.45 saline in dehydrated patients.
- In aggressive cases, doses of Poly-MVA may be titrated up to 40 mL [0.5 mL/Kg] and DCA may be titrated up to 30-40 mg/Kg – if tolerated.

4. Use of concurrent HBOT:
   - We begin with a 1.3 to 1.5 ATA trial, bottom time 60 minutes with O2 by mask. Dive may be increased to 1.5 ATA X 60 minutes. At higher ATA air breaks are required: Once at depth use O2 by mask for 15 minutes then 10 minutes air break then 15 minutes O2 by mask.
   - SCHEDULE: Minutes 1-15 with mask; Minutes 15-25 without mask; minutes 25 to 40 with mask minutes 40 to 50 without mask and minutes 50-60 with mask.
   - With the full protocol above, **two** HBOT dives per week are optimal.
5. Lab testing:
   - Baseline standard labs including chemistries with eGFR and ALT, AST and CBC. Other labs as indicated for the patient.
   - *Draw all follow up eGFR and liver functions on Sunday or Monday AM before any IV's are done.* If not, the renal functions can be falsely altered.
6. Duration and frequency of therapy:
   - In the case series mentioned above and patients since, we have noted a variety of response patterns and a variety of treatment duration requirements.
   - Frequency of treatment:
     - If using the IV protocol, we administer the Poly-DCA twice to three times weekly.
     - If using the oral protocol, we have the patient administer the Poly-DCA four days weekly.
     - Supplements and diet changes are daily, unless noted above.
   - Duration of treatment:
     - The first re-assessment is normally completed at eight weeks unless there is an objective test (PET etc.) within 12 weeks and then it is extended to 12 weeks.
     - Assessment includes any disease specific markers, physical exam, general and quality of life symptoms, non-specific markers (e.g. HsCRP), imaging if indicated and any patient specific finding or marker indicated.
     - Re-assessment includes any pertinent positive findings in the above list.
     - If therapy is improving quality-of-life measures and/or any of the above clinical markers, we recommend continuing in one of the following ways:
       - If disease is stable and clinical indicators dictate, a maintenance schedule is designed. This is typically two to three days weekly oral Poly-DCA protocol with all supplements and diet changes continuing daily.
       - If improvements are positive but the underlying disease is aggressive, we will recommend continuing the primary therapy schedule above and re-assessing in 8-12 weeks.
   - Continued dietary alterations:
     - As the dietary alterations were key to success in the original case series of patient response, we advise patients to continue the diet changes long term.
     - Same recommendation for the supplements.

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The Link Between Cancer and Mitochondria: Restoring Mitochondrial Function to Fight Cancer

by Michael Karlfeldt, ND, PhD

The role of mitochondria in the initiation and progression of cancer has long been debated, but it is generally accepted that mitochondria play an important role in cancer through replication and energy production. Identifying the important roles that mitochondria play in cancer development and progression can possibly help identify ways in which repairing mitochondrial function may be used for therapeutic benefit. Many cancer researchers tend to seek a reductionist approach in their research: the theory that condenses complex biological phenomena into their many parts, so we can understand a single cause and devise a cure. However, once reduction is done, there may be incentive for unification of theories to create a more holistic approach to cancer treatment. The mitochondria may be the gateway for this alternative approach.

This article will review the history of mitochondrial-cancer research as well as various, promising, non-toxic approaches to altering mitochondrial function in cancer cells, such as low-carbohydrate diet and fermented wheat germ extract nutrition.

The Mitochondria

The mitochondria, home of the Krebs cycle or tricarboxylic acid cycle (TCA), are maternally-inherited, cytoplasmic organelles having evolved from symbiotic bacteria.[1] Containing only 37 genes, they are known as the powerhouse of the cell for their role in producing chemical energy or adenosine triphosphate (ATP). By oxidizing (losing an electron) the fat, protein, and carbohydrates we consume through food and drink, they create energy-abundant molecules for the cell. These biochemical processes are known as cellular respiration. Within the TCA, substrates such as oxygen and glucose are converted, through enzymatic processes, first into pyruvate, then acetyl-CoA and ultimately lead to the production of an ATP molecule, water, and carbon dioxide.

Researchers at the United Mitochondrial Disease Foundation have reported that only three percent of genetic material per mitochondrion (one hundred in every three thousand) is required to produce up to 90% of the body's ATP.[2] This efficiency apportions more than ninety-five percent of the mitochondrion to play other roles in regulating metabolic pathways. The mitochondria are genetically independent from the nucleus of the cell and communicate via nuclear transport and messenger proteins. Mitochondria are responsible for building and encoding nucleic acids and proteins responsible for cellular respiration, communicating with the nucleus, causing the cell to grow, function, and recycle its molecular building blocks through regulation of apoptosis pathways.[3]

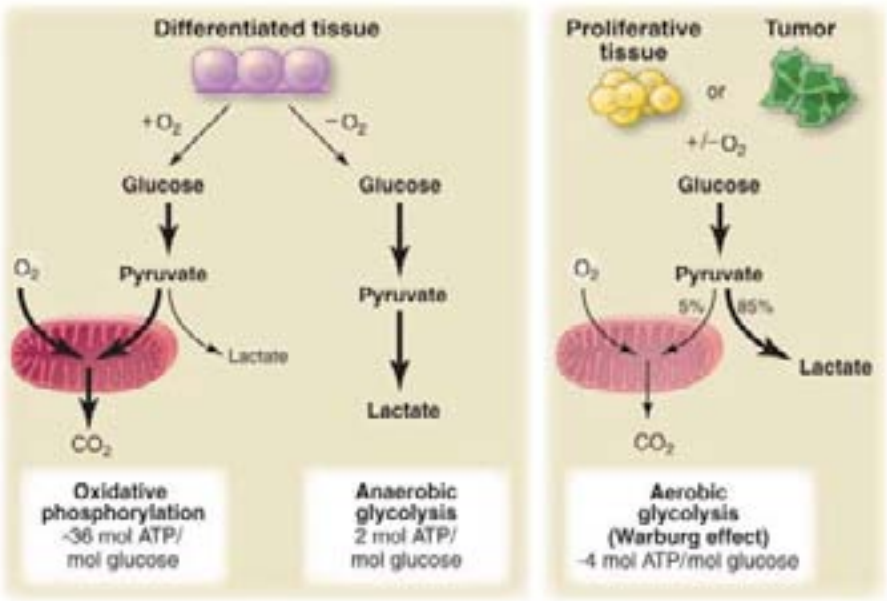

Figure 1: Vander Heider MG et al. Understanding the Warburg effect: The metabolic requirements of cell proliferation. *Science*. 2009. 324(5930):1029–1033.[6] This image shows normal cell respiration via OXPHOS, Anaerobic glycolysis, when oxygen is not available, and the cancer cell's energy cycle termed as the Warburg effect or 'Aerobic glycolysis'.

Mitochondria and the Warburg Effect

Normal cells produce energy through mitochondrial oxidative phosphorylation (OXPHOS). When oxygen is not available, they produce energy via the less efficient

route of anaerobic glycolysis. In the 1920s, Otto Warburg observed that cancer cells do not produce energy in the efficient way that normal cells do. Rather, cancer cells produce most of their energy through an inefficient, high rate of glycolysis and glutaminolysis[4] followed by fermentation of lactate into lactic acid. Glucose and glutamine metabolites are then diverted from producing ATP to a process to promote cell proliferation. This process was coined by Warburg himself as aerobic fermentation, which has been adapted to 'aerobic glycolysis', and commonly known as the *Warburg Effect*. Since lactate production is considered an indicator of respiratory insufficiency in biological systems,[5] Warburg assessed aerobic production of lactate in cancer cells as a gauge of respiratory insufficiency. (Differentiated cells produce large amounts of lactate only under anaerobic conditions.) This observation, as we will see is a controversial one, not so much as to the involvement of the mitochondria in cancer, but at what point they become involved in the process, and whether they are functioning.

Biology professor, contemporary Warburg devotee, and cancer researcher, Dr. Thomas Seyfried outlines the key points of Warburg very well when he states that (i) insufficient respiration initiates tumorigenesis and ultimately cancer, (ii) energy through glycolysis gradually compensates for insufficient energy through respiration, (iii) cancer cells continue to ferment lactate in the presence of oxygen and (iv) respiratory insufficiency eventually becomes irreversible.[5]

Mitochondria and Cancer

Given the complexity of a disease, such as cancer, medical science might consider withholding its insistence on reductionism. With cancer, seeking out a single cure may be an over-simplification, as may claiming it to be one disease, or that there is only one cause. Depending on one's point of reference, cancer types differ broadly in such ways as the primary site, histopathology of cells, solid or liquid, genes involved, staging criteria, level of evidence, and perhaps, at what point the mitochondria become involved.[7-14] Despite inconsistencies in the understanding of biochemical processes, cancer has been hailed for decades and supported by thousands of clinical trials by the somatic mutation theory (SMT), which cites that the initiating disease process is the result of nuclear mutations in oncogenes and tumor suppressor gene.[9,15] This view is responsible for the ongoing development of cancer drugs that block specific genetic mutations, with some promise that one day a single drug could potentially treat all tumor types that share the same mutation.[10]

The mitochondrion theory appears to be the only cancer initiation theory that relates to all cancers, which, up to recently, has generally been explained in contrast with the SMT. Even genetics researchers Hanselmann and Welter, who wrote the highly cited paper *Origin of Cancer: An Information, Energy, and Matter Disease*,[7] have been gathering evidence for and against alternative cancer etiology theories. In addition to the 1) SMT, these other theories are 2) microenvironment, 3) mitochondrion, and 4) aneuploidy categories, characterized by Hanselmann and Welter as each having 'supporting' and 'contradicting' evidence for the validity of the category itself. The *Warburg Effect is detectable in* ***all*** *tumors*, whereas the research shows that *the microenvironment can cause cancer,* or *most cancer cells show mutations* and *most tumors show aneuploidy.*[7] However, this article will not debate reductionist theories and pit them against one another as the issue may not be in choosing the right one but in unifying them properly.[5]

All evidence supports the Warburg effect - whether causal or not - as constant in the initiation and/or progression of cancer. Some research argues against a reductionist model, while still upholding the majority view that cancer begins with the SMT, progresses to the microenvironment and then to the mitochondrion.[9] It has been elucidated that cancer will select against the genes with the highest consumption of free energy. An alternate holistic model suggests that the underlying mechanisms of deregulated cellular metabolism are associated with, but not necessarily caused by, mitochondrial dysfunction, and that mitochondrial dysfunction can promote cancer progression to an apoptosis-resistant or invasive phenotype through a variety of mechanisms.[12] Seyfried's holistic model is in accordance with the somatic mutation as an event that follows mitochondrion disruption. This research allows him to conclude that respiratory insufficiency is the origin of cancer, and that the other initiation theories, including the SMT, arise either directly or indirectly from insufficient respiration.[12] In later research Seyfried postulates that a major weakness in the effort to cure cancer is due to the confusion surrounding the initiation theories. He believes that without a unifying agreement of how cancer arises, it becomes difficult to formulate a successful plan for effective treatment and prevention.[5] Considering the aforementioned statistic of cancer initiation, from a reductionist perspective, it would be most appropriate to address the mitochondrion theory.

The mitochondrion theory appears to be the only cancer initiation theory that relates to all cancers….

Mechanisms of Mitochondrial Disruption Provide Therapeutic Opportunities

Many vital cellular parameters are controlled by mitochondria. These include regulation of energy production, modulation of oxidation–reduction (redox) status, generation of reactive oxygen species (ROS), contribution to cytosolic biosynthetic precursors such as acetyl-CoA and pyrimidines, and initiation of apoptosis through the activation of the mitochondrial permeability transition pore and Cytochrome C. Changes in these parameters can shift the cell from a dormant state of differentiation to a proliferation state.[1] Below, the mitochondrial disruptions are categorized but bear in mind that they overlap and should be considered a locus in the greater process or state

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of cancer initiation. There are many thorough investigations and positions on the role of mitochondrial dysfunction in cancer[1,10,11,16,17] and following is a summary.

Genetic Mutations. Cancer cells have been shown to display genetic and epigenetic mutations that activate irregular programs that are important in development, stress response, wound healing and nutritional status.[2] Cancer cells optimize the cancer cell environment by reprogramming adjacent cells for their benefit, using retrograde signaling.[1] Some research claims that functional mitochondria are essential for the cancer cell.[1,8,9] When mutations in mitochondrial genes are present, which is often in cancer cells, they alter the mitochondrial bioenergetic (i.e. oxygen rate and extracellular acidification rate) and biosynthetic state (i.e. cell proliferation), rather than inactivating mitochondrial energy metabolism (i.e. glycolysis, glutaminolysis, ATP).

Mitochondria regulate the transcription factor Hypoxia-Inducible Factor 1 (HIF-1), which induces glycolysis under hypoxic conditions allowing cancer to thrive. HIF-1 is increasingly studied because it allows for survival and proliferation of cancerous cells due to its angiogenic properties thus inhibition of HIF-1 potentially could prevent the spread of cancer.[1,4]

Enzyme Defects. Cancer cells require altered metabolism to efficiently incorporate nutrients into biomass and support abnormal proliferation. In addition, the survival of tumor cells outside of normal tissue context requires adaptation of metabolism to different microenvironments. Warburg theorized that to treat cancer is not to target mutated genes but enzymes that cancer cells depend upon more than normal cells for tumor cell growth, survival and proliferation. They are present in virtually all cancers.[18] There are several metabolic enzyme defects that give way to some existing treatments targeting these enzymes.[13] However, long-term success with this approach may depend on understanding why specific metabolic pathways are important for cancer cells and which patients are likely to respond.[19]

Redox Reactions and Glycolysis. Reactions involving electron transfers are known as oxidation-reduction reactions or redox reactions for which OXPHOS is the metabolic pathway. A redox reaction occurs as a result of two smaller reactions; one molecule loses one or more electrons, and simultaneously gains an oxygen atom, to become oxidized and another molecule gains an electron and loses an oxygen atom to become reduced. Cancer cells have an amazing tendency to reprogram their metabolic capability by inhibiting OXPHOS to elevate glycolytic metabolism. There is a therapeutic opportunity for inhibiting glycolysis to shift cellular metabolism to OXPHOS[20] oxidizing NADH to ATP instead.

Reactive Oxygen Species and Antioxidants. The increase of ROS in cancer cells is linked to many irregularities in cellular functions such as cell proliferation, migration, differentiation and apoptosis.[21] The increased promotion of ROS in tumor cells with mitochondrial dysfunction may make them more liable to further oxidative stress, compared to normal cells with lower ROS yield. High production of mitochondrial ROS in hypoxic cells has been shown to link cancer to ischemic disorders.[21]

NADPH is required for the reduction of hydroperoxides by glutathione and glutathione peroxidases by the mitochondria. When mitochondrial ROS production is too high, it is toxic to the cell and can induce apoptosis or necrosis as well as contribute to new abnormal tissue. The tumor suppressor p53 can arrest growth and initiate apoptosis. Inactivation of p53 should decrease OXPHOS in favor of glycolysis, increase ROS production and inhibit apoptosis. In other contexts, p53 activation can also induce cellular deterioration. Excessive shortening of chromosomal telomeres activates p53, which results in mitochondrial dysfunction, increased ROS levels, and deterioration.[1]

Lactic Acid and the Microenvironment. It has been debated whether cancer cells opt for fermentation to proliferate, or if they must choose this path over cellular respiration due to mitochondrial damage.[8,12] In fact, some researchers state that the Warburg effect is common to all cancers,[7,9,12] and that regardless of the availability of oxygen, the cancer cells convert most glucose to lactic acid. Studies have shown that lactic acid is not merely a byproduct but that it informs a predictive role in the proliferation of cancerous cells, metastasis of cancer and patient survival. Acidosis generated from lactic acid impedes the function of normal immune cells, including loss of T-cell function, thereby suppressing the anti-cancer immune response and enhancing tumor cell survival.[4]

Cytochrome C and Apoptosis. Just as mitochondria are descendants of bacteria, cytochrome c molecules in human, yeast, and plant cells cannot be distinguished from one another. In normal cells and in the presence of oxygen, Cytochrome C acts like a shuttle to move electrons from glucose to ATP production. Cytochrome C also plays the opposite function signaling the cell to begin the process of apoptosis or programmed cell death. When there is a bad climate for the cell, Cytochrome C initiates one or more cascades of signaling proteins that spread the message through the cell and ultimately self-destruct. While apoptosis is part of healthy growth and development, if the system is malfunctioning the growth of cancers can be propagated and the system corrupted causing calamitous results, leading to degenerative diseases when overactive and allowing the growth of cancers when obstructed.[22]

Expanding Opportunities for Nutrition Treatment

Cancer is a genetic disorder and yet the common denominator may be controlled by mitochondria function.[5] Since the mitochondria have so few parts to them, are such a major role in tumorigenesis or so scientists believe, they are an obvious target for therapeutic opportunities. New drugs are being developed to inhibit mitochondrial respiration of cancer cells and induce mitochondrial structural damage.[13] Nutrition may offer a successful holistic therapeutic opportunity for cancer

continued on page 49 ➤

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treatment by 1) providing targeted TCA cycle intermediates, 2) affecting whole body biochemistry and improving quality of life, 3) offering more than one mechanism of action or 4) acting as adjuvants for medical treatments. By focusing on the needs of the mitochondria to regulate energy production by oxidizing the fats, carbohydrates and proteins we consume, nutrients may recreate the therapeutic energy required to inhibit cancer proliferation. In many cancers the damage on normal cells seems irreversible, but there may be a nutritional vista to advance cancer treatments by rescuing the mitochondrial function of cancer cells.

Ketogenic Diet (KD). In 1921, Dr. R.M. Wilder at the Mayo Clinic initially proposed a diet in which most calories were derived from fat to mimic the biochemical effects of fasting.[23] The now popular KD is to swap one's intake of carbohydrates with fat, as the main source of fuel and push the whole-body metabolism into ketosis, thereby avoid fueling the cancer cells with available glucose. Some research has suggested taking a broader view of the overall organism in which cancer growth and progression can be managed by following an individualized nutritional protocol, so the TCA cycle will shift the whole body from fermentable metabolites, mostly glucose and glutamine, to respiratory metabolites, primarily ketones. A pilot study has shown that it is safe even for late stage cancer patients.[14]

It has been proposed that the KD may be supportive to first line cancer treatments by two different mechanisms that both increase the oxidative stress inside cancer cells. The first is that lipid metabolism obliges the cells to generate energy from mitochondrial metabolism instead of anaerobic glycolysis as the glucose is not available for that process. This reduction in the availability of glucose, limits glycolysis, and controls the formation of pyruvate which can form the NADPH. Because dysfunctional mitochondria lead to ROS production, cancer cells will be selected relative to normal cells to experience oxidative stress, when glucose metabolism is restricted. Protein metabolism may not lead to the same levels of increased cancer cell oxidative stress as fat metabolism because energy production from proteins and amino acids may undergo gluconeogenesis to produce NADPH.[23]

In 2017, a systematic review was done on the KD in animal models. Of 13 articles included in the study, all articles indicated that KD had an inhibitory effect on tumor growth and nine articles expressed that KD could enhance survival time.[24] There are over 11 trials assessing ketogenic diets as an adjuvant cancer therapy. In the University of Würzburg, Germany, patients having failed traditional cancer therapy and who were able to continue the ketogenic diet therapy for over three months showed improvement with a stable physical condition, tumor shrinkage, or slowed growth.[23] It is recommended to eat broccoli family vegetables when following the KD because they are low in carbohydrate value but there is an additional reason. A beneficial compound found in cruciferous vegetables called phenethyl isothiocyanate (PI) has been shown to exhibit a potent anticancer ability to disable the glutathione antioxidant system, which results in severe ROS accumulation in cancer cells. Consequently, the oxidative damage initiates death of the cancer cell.[23] Ketogenic diets could be rapidly implemented to correct inherent oxidative metabolic differences between cancer cells and normal cells and to improve standard therapeutic outcomes by selectively enhancing oxidative stress and ROS in cancer cells.[23] Studies of ketogenic diets in adults show a small percentage experiencing minor adverse effects including 1) an increase in low-density lipoprotein (LDL) cholesterol levels, shakiness, and uneasiness 2) kidney stones. While the potential exists for ketoacidosis, it has not occurred in study patients to date.[23]

Fermented Wheat Germ Extract (FWGE). Nobel laureate Dr. Albert Szent-Györgyi initially proposed that the use of FWGE as an anticancer agent could address cellular metabolism.[25] Szent-Györgyi hypothesized that halting replication of cancer cells may be possible with high redox potential quinones naturally occurring in wheat germ.[25] Results from more than two dozen in vitro and in vivo studies show that FWGE has strong anticancer, anti-metastatic, and immunomodulatory effects, including tumor-inhibiting effects in human breast adenocarcinoma cells equal to or better than tamoxifen,[26] exhibited significant antiproliferative effects against 12 human OVCA cell lines, and potentiated cisplatin-induced apoptosis.[27]

Ketogenic diets could be rapidly implemented to correct inherent oxidative metabolic differences between cancer cells and normal cells and to improve standard therapeutic outcomes.

In the *Townsend Letter*, Aug/Sept 2016 edition, Dr. Greg Nigh details several potential mechanisms of action for FWGE's anticancer ability, as well as expands clinical research.[25] To review, early evidence shows that FWGE is a holistic and available natural therapeutic with an abundance of mechanisms. FWGE *promotes apoptosis* directly by increasing levels of Cytochrome C as well as indirectly by cleaving PARP, a family of proteins, which prevent cancer cells from repairing DNA. Second, FWGE influences cancer cell proliferation by *inhibiting glycolysis*. These metabolic modifications promote cell differentiation to normal cell phenotypes in some cells, whereas in others, promotes apoptosis. FWGE also inhibits the enzyme glucose-6-phosphate dehydrogenase, a metabolic enzyme essential for using glucose carbons to make ribose through the pentose phosphate pathway mentioned above. FWGE may virtually eliminate cancer cell proliferation through inhibition of both

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major and minor pathways of cancer cell synthesis of ribose. Lastly, FWGE rescues mitochondria, via apoptosis.

The inhibitory effects on glycolysis from FWGE can probably be explained by looking at the effects that FWGE has on mitochondrial function. As with other metabolic therapies, FWGE induces cancer cells to engage in mitochondrial OXPHOS so they produce energy like a normal cell.[25] Additionally, FWGE delays cell formation and growth associated with impaired glucose utilization, which leads to autophagy, a normal process whereby cancer cell components die in favor of healthy cell formation. During cellular stress the process of autophagy is significantly increased, a discovery that may provide an additional mechanism into the potential therapeutics of FWGE on cancer cell metabolism.[28] FWGE may show even further therapeutic potential by decreasing lactic acid, increasing oxygen consumption rate, and increasing Cytochrome C disbursement from the cancer cell, leading to apoptosis.

In addition to more than two dozen in vitro and in vivo studies showing that FWGE has anticancer, anti-metastatic, and immunomodulatory effects,[29] data from several human clinical studies indicate its role in improving quality of life as well as playing a further beneficial role in patients with various forms of cancer, such as:

- Colorectal cancer – 82% reduction in tumor recurrences, a 67% reduction in metastasis and a 62% reduction in deaths as opposed to those who just received conventional therapy[30];
- Oral cavity cancer – reduced the overall progression of the cancer by 85%[31];
- Melanoma – 50% increase in overall survival as compared to the control for stage III patients[32];
- Reducing treatment-associated febrile neutropenia in pediatric cancer patients[29];
- Breast cancer - FWGE was shown to enhance efficacy of tamoxifen in estrogen receptor positive breast cancer[26];
- Ovarian cancer - enhance cisplatin effectiveness in ovarian cancer cell lines[27]; and
- Non-Hodgkins Lymphoma – FWGE reduced tumor growth by 50% when used alone and when used in combination with RCHOP, tumor growth was inhibited 100%.[33]

Mitochondria have been an underestimated player in the initiation and progression of cancer, but it is generally accepted that mitochondria play an important role in cancer through macromolecular synthesis and energy production. As indicated in this article, first by acknowledging then identifying the important function that mitochondria play in cancer development and progression, we can discover holistic ways in which repairing mitochondrial function may be used for therapeutic benefit. Two strong nutrition therapies, the ketogenic diet and fermented wheat germ extract were highlighted.

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On the cover

Cancer Care: Conventional, Complementary, Alternative?

by Barbara MacDonald, ND, LAc

Dr. Barbara MacDonald has twenty-years-experience as a licensed naturopathic physician working in the field of complementary cancer care. She treats patients using a combination of naturopathic medicine, acupuncture, CranioSacral therapy and Qi Gong describing herself as comfortable in both conventional, research-based sciences and the most esoteric healing arts. She practices in Camden, Maine and is the author of *The Breast Cancer Companion: A Complementary Care Manual (3rd ed. 2016)*.

Dr. MacDonald was invited to share how she counsels cancer patients faced with the dilemma of choosing to combine or replace conventional treatment with natural medicine. These are her opinions, to date, and are not intended as medical advice. She is open to learning from those with different experiences even if they kindly disagree with her. "By having integrity with oneself, we make choices that are aligned with our higher purpose."

Putting Things in Context

In 2017, there were approximately 1.7 million Americans diagnosed with cancer.[1] In the last decade, it is estimated that between 40-90% of them utilized some form of complementary alternative medicine (CAM).[2-4] This is a significant increase from the 1990s when it was estimated that only 18% of cancer patients used CAM.[5] The term CAM is broad and includes many therapies (massage, acupuncture, etc.), natural products (vitamins, minerals, herbs, nutraceuticals) and practices (meditation, yoga, etc.) that are either added to conventional treatment (complementary or integrative) or done in lieu of them (alternative). Some cancer patients use CAM during treatment but most afterward.[6]

One concern about relying on research studies is that one person's CAM is doing breathing exercises while another's is following a comprehensive integrative protocol. The category of CAM that represents the greatest number of users was those who reported having taken "natural products and herbs." Even though 17% of cancer patients used this type of CAM,[7] those who simply took echinacea to prevent a cold were lumped in with those who had comprehensive integrative treatment plan prescribed by a licensed CAM healthcare provider. Because the term CAM is so broad, the reliance on research studies to determine its success and failures is flawed. Not all CAM is the same.

There is a decent body of evidence regarding the safety of herbal and nutraceutical medicines and their interactions with surgery, chemotherapy, radiotherapy and oral medication. I feel confident that licensed naturopathic physicians and many of our medical colleagues trained in functional medicine are versed in guiding patients to avoid things that are unsafe and encourage them to complement their allopathic treatments with natural therapies that often improve their experience and maybe their outcomes. This is very different than patients taking products they read about online without sufficient training to know how to determine quality, safety, or optimal dosing.

What is less known is if natural medicine can replace some or all conventional medical treatment for cancer. Our patients, especially those who are 'naturally minded,' rightly ask us if we can offer them a natural-only cure. I know some holistic practitioners who, I'll call traditional, perhaps even radical and certainly the most risk-tolerant among us, comfortably answer that question with a yes. I, and most of the naturopathic oncology colleagues I consulted for this article, rarely do. I

generally discourage the alternative-medicine-only option around 85% of the time.

Only recently have outcome studies compared the use of alternative medicines to allopathic. In a case-control, retrospective study published in August 2017, in the *Journal of the National Cancer Institute*, it was found that those who did alternative-treatment-methods-only were more than twice as likely to die compared to those who chose conventional treatments.[8] Conducted at Yale University School of Medicine, 281 cases were identified where patients with colon, breast, prostate and colorectal cancers responded that they had chosen "other-unproven cancer treatments" instead of allopathic medicine. Their outcomes were compared to those with similar cancers, stages, etc. In one article about this study the authors stated, "Overall, 78% of people having conventional treatment for cancer survived at least five years, compared to only 55% of people having alternative treatment alone. The difference was biggest for breast cancer, where people who chose alternative therapies were more than five times as likely to die within five years as those who chose conventional treatments."[9] This is concerning. Yet again, the study doesn't discern between those who had a comprehensive, practitioner-prescribed treatment plan from those who directed their own care. The patients could have taken one capsules of curcumin or they could have engaged in a long-term, individualized, holistic approach including diet, fitness, meditation, acupuncture, hyperbaric, intravenous medicine, herbal therapy, etc. Not all CAM is the same and well-designed alternative medicine studies are non-existent.

In 1997, I graduated with a four-year doctoral degree in naturopathic medicine and, in 2003, a master's degree in classical Chinese medicine. I then had the privilege of practicing for thirteen years, mentored by women's natural health expert Dr. Tori Hudson and Chinese herbalist Dr. Menge Kou. In the early years, I believed that by eating well, taking natural medicines and addressing mental, emotional, and energetic imbalances, one could cure their cancer. I believed in the theory that our body, restored to balance, would recognize unhealthy mutations and direct the immune system to do what it knows to do – stop cancer cells from replicating and bring them back from the 'dark side' to being productive members of the community of cells working toward the greater good within each of us.

I still believe this in theory. I was raised by a now-retired osteopathic physician, who instilled in me a belief in the healing power of our inner physician. Through my own failures and those of my most respected colleagues, I have learned that theory isn't enough. The practice of knowing which combination of natural therapeutics, lifestyle changes, and mental-emotional shifts to recommend for each person's unique situation, at a pace to turn the tides of cancer has, so far, been like using a sailboat to chase a speed boat. I have met individuals who had all the factors in alignment to achieve this. Unfortunately, they are not the norm. They are the miracles. I say this not to squelch the faith of those who believe that natural-only can work. I realize that, for some, it will, and I have the deepest respect for patient choice. I and my dedicated colleagues have, however, attended too many funerals held in honor of beloved patients who were clinging to the faith that the natural-only option would save them while denying potentially life-prolonging conventional medical treatments. Therapies that might have given the natural options more time to work. On the other hand, patients have suffered, and some have died due to side effects from unnecessary surgeries and drug treatments. It is all about timing and balance.

I am however, very confident in the use of well-designed complementary or integrative approaches that pair the best of both worlds. These would include properly timed, natural medicines used in therapeutic dosages along with individually chosen diet therapies, mental-emotional healing, stress management, and energetic balancing to work in tandem toward a cure with carefully chosen and safely dosed conventional allopathic procedures and medicines. The success at facilitating remission is especially high, in my observations, under the care of our medical colleagues who use methods that reach beyond what is possible in our country today. In Europe, some oncologists are individualizing treatments using a host of conventional and natural methods combined. They are, however, not yet approved by the FDA to be used in this country.

> While waiting too long may be a risk, only in dire cases can a recently diagnosed person not wait a few weeks to feel 'right' about their treatment decisions.

After all these years, I am not confident in the success rates among those who forgo all forms of conventional medicine. What I feel deflated by is that we do not yet have reproduceable natural treatment protocols to offer as an alternative to conventional medical treatment. This is due, in part, to the limitations placed on medical and naturopathic physicians in our county. We don't have a body of research that proves our methods work, nor do we know when to use which form of natural medicine. Reading about those who claim to have better success than the MD-only options, I react with a blend of healthy skepticism and hope. I realize I may be scorned by my own people here: colleagues who may have a patient or perhaps several, who, under their care, found a cure or extension of life with a natural-only approach. I pray that you succeed, but to date, this is where I believe we are. Without repeatable and trainable methods, we are left to advise patients to find the balance between conventional and natural. Perhaps the burgeoning science of immunotherapy is what we've been waiting for – using the healing power of our own immune system with help from sophisticated science, and yes, the capitalist-driven machine of conventional medicine, to bring about a much-needed cure for cancer that works with our body's wisdom. I could get on board with that. But, then again, I was raised by folks who believe in unicorns and won't give up looking for the natural-only holistic approach that works.

I am proud of the state of my profession's offerings in complementary treatment during conventional cancer

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therapies. I strongly recommend that patients seek this form of care and wish patients had more access to holistic care at their cancer clinics. But, while we are getting closer every year to the alternative, natural-only options that we desperately want to provide, I encourage patients to think carefully before embarking on that journey.

Decision Making

If you are among those recently diagnosed with cancer, your thoughts and feelings, questions and concerns, your left brain, your right, your logic and your intuition all matter. While this will affect those who love you, it is your experience, no one else's. You get to call the shots even if it might not feel that way.

The rest of this article is intended to help you navigate cancer treatment decisions if you are considering the addition of natural medicine along with conventional medical treatment or instead of it. That defines the difference between complementary (a.k.a. integrative) vs. alternative medicine. Even though you are likely mentally and emotionally overwhelmed by your recent diagnosis and conventional treatment options, the goal is to feel confident about the forms of natural medicines their dosage, timing and sources you choose.

So, how do you find confidence in your plan when you are new at this and the stakes are high? Finding answers to the following questions, may help you organize your thoughts.

- First, how much time do you have to make an informed decision?
- Second, what choices do you have?
- Third, if you choose a complementary or alternative path, where will you get the expertise you need to guide you?
- Fourth, if you choose a complementary path, what type of natural medicine is best for you?
- Fifth, if you are leaning toward an alternative path, what should you be thinking about?
- Lastly, how can you comfortably work within the conventional medical system even if you choose CAM?

How Much Time Do I Have Before I Have to Do Something?

After a diagnosis of cancer, the conventional treatment 'system' efficiently whisks patients into a well-meaning river of action that requires that you trust, not in yourself, but in the experience of others. For many, this may be your first time having to use conventional medicine. Patients are often paddled along by supportive loved-ones who fear losing them. Many patients, however, especially those who think of themselves as 'natural,' are compelled to swim against the establishment current as fast as they can or at least tread water a while.

I advise you to take your time making your treatment choices. While waiting too long may be a risk, only in dire cases can a recently diagnosed person not wait a few weeks to feel 'right' about their treatment decisions. If you are not sure, ask the surgeon or oncologist, "how many days or weeks do you think I have to safely make an informed decision about your recommendations?" With that in mind, the next step is *to organize the decisions that must be made now, and the ones that can wait a while.* As the Tao de Jing advises: there are times to move forward, times to pause, and times to retreat.

How do you know how much time you have to pause or retreat and try natural methods? This depends on the type of cancer, stage, location, how aggressive it is, and how successful conventional treatments are at leading to remission or cure. These criteria are also the same ones that may lead you to choose the amount of conventional medicine you find necessary. An oncologist can help you answer these questions and give you some insight into what you are facing. Often the surgeon is the first person you will meet, however. You are encouraged to consider speaking to an oncologist (doctor who specializes in cancer) before deciding on surgery, if there is time to do so. This conversation is especially important these days as new forms of cancer treatment and clinical trials may offer pre-surgical options that were not available even a few years ago. Don't be afraid to ask for a second opinion from a surgeon or oncologist at an unaffiliated hospital too.

To get the most out of your oncology visit, you may want to ask the difficult questions such as:

- How common is this form of cancer?
- Is my situation quite typical of those with this form of cancer or are there factors that make my situation unique?
- How aggressive is this form of cancer?
- Help me understand what stage it is.
- If untreated, will the tumor soon inhibit organ function?
- What are the five- and ten-year survival rates for people who have been studied with this specific type of cancer using your suggested treatment method?
- If I did no conventional treatment at all, how long do you think I'd have to live?
- If I only do part of what you recommend, how does that affect long-term survival outcomes?
- Be honest, if you were me, and you were in my exact shoes, would you do the treatment that you are recommending to me?
- If you were discussing my case with other physicians, what would you describe as my biggest challenge?

Knowing what's next is also dependent on knowing yourself. Are you a person who needs to list all the pro's and con's? Are you one to listen to your gut? Do you usually play it safe and do what doctors recommend? Do you run screaming at the thought of doing anything an allopathic doctor recommends? Think about how you have successfully thought your way through other challenging decisions and start there. Also, be honest with yourself about when your blinders might be on. Don't confuse wishful or magical thinking for truly discerned inner wisdom.

In some cases, having a conventional treatment now, while debating the other decisions, is necessary. A few examples include a) there is a narrow window of time that surgery is an option b) a tumor is invading an essential organ that can't

function without its removal c) starting chemotherapy before other treatments is advised to shrink a large tumor d) the cancer is so aggressive and rapidly replicating that no form of natural medicine could possibly outpace it.

For example, if a patient has been told that they have an aggressive cancer (for example small-cell lung cancer) that has been diagnosed after a biopsy, and it is currently operable, my advice would be to have the surgery ASAP and then consider natural options later because they are lucky to have found it at an operable stage. However, if a person was diagnosed with a common small, stage I breast cancer which has good outcomes with conventional treatment, but she is riddled with anxiety having never even taken antibiotics in her life, perhaps she can pause for a week while gathering information.

Lastly, and most challenging, perhaps, is the person told that they have six months to live with metastatic cancer. Some might choose to fight with all forms of medicine, others to pause a while to decide and some to do nothing and enjoy the time they have without enduring side effects of treatment in what is likely their last months of life. In that case, it is more about how you make decisions because whether natural or conventional or a mix, no one can promise a cure, but some find one.

What Are My Choices?

The next step is formulating the right questions, which means knowing your options.

- Should I follow the conventionally advised course of treatment only? (A: Conventional Medical Only Option)
- Should I follow only part of it? (B: Individualized Medical Option)
- Should I follow part or all of it and add natural medicine to it? (C: Conventional and Complementary Medicine Option = Integrative Option)
- Should I do the course of advised medical treatment and then try to prevent recurrence with natural medicine? (D: Conventional Then Natural Medicine Option)
- Should I forgo conventional advice and do only natural medicine? (E: Alternative Medicine Option)

If you choose C, D, or E, then there are even more questions to answer. If I do any natural therapies, which ones do I choose? Do I stay local or travel to a comprehensive integrative cancer clinic or a natural only one in the US or abroad? Do I work with a licensed naturopathic oncologist, licensed ND with cancer treatment experience, a holistic DO/MD, other natural practitioner or create my own treatment plan from my online reading?

As you are likely gathering from this long list of important questions, you could spend years trying to figure these things out. Chances are you are mentally and emotionally doe-eyed by now and are feeling pressured by others and are rightly confused and overwhelmed. While you may have more time than you were led to believe to make treatment decisions, don't let your need to have all the answers right now get in your way of taking one wise action step.

Who Are Reliable Experts in Complementary and Alternative Medicine?

Without a licensed naturopathic physician in most oncology clinics, it is up to the individual to find a well-trained, licensed, natural medicine provider with extensive cancer care experience whose practice philosophy is up your alley. My recommendation is to choose a licensed naturopathic physician/doctor (ND). Unlike unlicensed naturopaths with an online certificate, a licensed ND is trained in four-year graduate level naturopathic medical schools. We are primary care physicians in many states and specialists in others and are not licensed in some. Licensed NDs are uniquely trained in both conventional science-based medicine and the art and science of healing by treating the whole person, using the healing power of nature and avoiding the obstacles to a cure. We all must pass national basic science and clinical licensing exams that include competency in pharmaceutical and naturopathic medicines. In many states, we have DEA licenses and full prescriptive rights like MDs and DOs where even intravenous vitamins and botanicals are administered. In other states the drug formulary is limited or nonexistent. Most are members of the Oncology Association of Naturopathic Physicians (OncAnp.org).

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A licensed naturopath who focuses their practice in oncology is not bound by a standard of care like medical oncologists are. There are no protocols that we must follow. This is great for individualized care, but it also puts the onus on patients to discern which ND is the best fit for them.

My experience tells me that most often, if you said you'd ever be willing, and it is logical to those who know the details of your case, do the conventional medicine sooner rather than later. It is an issue of timing.

Just like you might consider getting more than one medical oncologist or surgeon opinion, I recommend that you interview a few licensed NDs before choosing one to guide you. Some of us are more classical in our approach and use 'nature-cure' methods while others use a more science-based approach or both. Many offer a free 15-minute meet-and-greet visit to see if you are compatible. Good questions to ask would be how much of your practice is oncology? How long have you practiced? What forms of natural medicine do you most often use? What are your opinions about complementary vs. alternative medicine? What are your opinions about conventional allopathic treatments? How do you avoid giving things that might negatively interact with conventional therapies?

Some licensed naturopathic physicians have taken a special board exam to become a fellow of the American Board of Naturopathic Oncology (FABNO). They are referred to as naturopathic oncologists. Many have or do work at Cancer Treatment Centers of America where they learn expertise in complementary oncology limited to natural medicines that can be proven with peer-reviewed studies. They are the perfect choice for a person who prefers an evidence-based approach. You can find a list of FABNO's at http://fabno.org/membership.html.

There are osteopathic and medical doctors with training in complementary cancer care who learned from integrative or functional medicine courses. Some have cancer clinics that offer simply relaxation techniques. Others direct comprehensive clinics offering everything from intravenous vitamins to hyperthermia and hyperbaric medicine. To my knowledge, there is no national certification for allopathic doctors in CAM therapies. Many allopathic physicians practicing integrative oncology are members of the Society for Integrative Oncology (SIO at integrativeonc.org.)

Finally, there are cancer clinics that patients travel to for treatment. It is vital to discern sham clinics from those with well-trained oncologists who had to leave the US to provide a combination of conventional and natural treatments without waiting for FDA approval. The only resource that I am aware of when considering foreign clinics is Ralph Moss, PhD's Cancerdecisions.com. Many providers and CAM clinics around the world provide often life-saving methods. Others advertise much more than they deliver at great financial expense to people who are most vulnerable with little time to research whom to trust. So, my next piece of advice is to thoroughly consider who you will work with to guide your CAM plan.

Fourth, What Type of Natural Medicine Is Best for You?

Once you have decided what conventional therapies you will or will not choose to do and you have decided to take a complementary or integrative route and found a practitioner you trust, next you need to decide which natural therapies are best for you. This is often based on your personal situation and the prescribing CAM physician. In most therapeutic settings, you will likely be offered complementary treatment plans that help you avoid side effects and optimize conventional treatments like surgery, chemotherapy, radiation, oral medications, and immunotherapy. In some cases, if the cancer you are working to heal from is aggressive or later stage, you may be adding natural therapies that have independent anti-cancer benefits.

CAM or integrative medicines include so many possibilities that this article cannot cover them all. A new book may shed more light on this subject, however: *Outside the Box Cancer Therapies* by Stengler and Anderson (Hay House Publishing, 2018).

Some therapies that are reputable include combinations of botanical medicine from various traditions or standardized extracts of single plants such as curcumin, artemisinin, berberine and mushroom extracts. Vitamins, minerals, amino acids, essential fatty acids, homeopathic remedies are often included. There are treatments that holistic practitioners may offer such as acupuncture, mind-body therapies or you may be referred to classes in meditation, yoga, Qi Gong, or invited to join a fitness program for those with cancer such as the YMCA's free Livestrong program. Most practitioners will likely discuss what you eat, drink, your fitness, and stress management regimens. Some with additional training might recommend intravenous vitamins and amino acids, and a few are trained in administering IV botanicals. Low-dose medicinal cannabis may treat side effects while higher dosages, with an aim to treat cancer, need the guidance of an experienced practitioner. In addition, European therapies are coming to the United States such as mistletoe injections, hyperthermia, and hyperbaric.

I encourage you to avoid doing therapies that are recommended online until you have found a practitioner with expertise to help you discriminate the ones that have merit from those that will cost you hundreds of dollars a month and do you no good at all.

What Should You Consider?

"Do I go against everything I believe about living a healthy life and do what these doctors, who don't even know me, tell me are my only choices: surgery, chemotherapy and/or radiation?" Many patients have shared this inner struggle with their naturopath. It makes sense to most of us, and it is likely how we'd feel in your shoes (and many NDs have been cancer patients as well.) You might be thinking, I'll eat even healthier,

do cleansing and detoxification, take herbs and mushroom extracts, medical marijuana, cottage cheese and flax seeds. Maybe even do hyperbaric and IV-vitamins, supplements, acupuncture and herbal medicines or the other dozens of possible natural therapies.

How can you discern between fear of conventional treatment and your inner-wisdom that says I know this isn't right for me? Is now the time to do what feels right and forgo convention? Each situation is unique. Consider the risks and the benefits of both, what you know about yourself, perhaps get the opinions of experts in natural medicine for your personal situation and then ask yourself: "Will I ever be willing to do any form of conventional medicine?" Often patients want to try natural medicine first, saving chemotherapy or surgery if that fails. My experience tells me that most often, if you said you'd ever be willing, and it is logical to those who know the details of your case, do the conventional medicine sooner rather than later. It is an issue of timing. If you knew you'd have the perfect combination of natural factors for that sailboat to catch up to the speedboat, you'd do it. But, if you have a form of cancer that 'can't wait' to try natural-only methods, you will likely be encouraged to compromise your health-related beliefs in the short term, undergo a medical treatment you dread, and follow that up with the best of natural medicine.

If you do use complementary natural medicine during conventional medical cancer treatment, it is strongly advised that you a) use a licensed naturopathic physician or other integrative doctor who has expertise in the type of CAM you are choosing b) inform your oncologist about what you are taking c) use high quality products that can provide a certificate of analysis proving that they are tested for purity and contamination d) take therapeutic doses of well-researched natural medicines instead of a smattering of a lot of things you read about online e) make sure that you and your natural practitioner are watching out for negative interactions with other medications or conditions and f) if you are using alternative methods, choose a treatment facility or practitioner that is well-vetted by an objective source such as cancerdecisions.com to avoid shams.

Summary

In conclusion, nearly 1.1 million Americans will use complementary and/or alternative medicine during or after going through conventional medical cancer treatment. We don't know how many patients choose to forgo these allopathic treatments and instead seek natural cures. The types of complementary natural medicine chosen during conventional cancer treatment vary greatly from taking a yoga class to travelling to comprehensive integrative cancer clinics in Europe or Mexico. While the body of research on the safety of complementary cancer care is growing rapidly, there are little data on success and failure rates of alternative protocols. This dearth of research leaves patients who are instinctively drawn to natural medicine to create their own plan of action with insufficient confidence in either system. Some gather all their financial resources to go abroad to be treated by those with excellent training in both conventional and alternatives. Some find the cure they were hoping for. For some, the timing, training, or resources have failed them. Those without financial resources or who are more comfortable being treated near home may seek guidance from local licensed holistic health providers with enough experience in oncology to give them great advice.

It is my belief that we, as practitioners of natural medicine, are obliged to counsel cancer patients in an individualized manner based on their goals, the type and stage of their cancer, the success rates of conventional therapies, and potential conventional clinical trials for which they may meet the criteria. We owe patients the truth about our current limitations, balanced with the hopes of our powerful medicines, and proper counsel to help them make an informed decision about when, how much, and what type of natural medicines create a plan that they will feel confident in.

There is a time to move forward, a time to pause and a time to retreat. Knowing oneself and being educated in your choices will help you to know what is next for you. In the long run, this is your experience to direct in any way that you feel is right for you. If you aren't sure what to do next, take one step and perhaps you will discover more options than you could see before. This is an incredible time in the field of oncology. While I wish no one had cancer, I have more hope than I ever did before – in both conventional and natural treatments used hand-in-hand.

What Could Be Next?

My wish list includes a survey of natural oncology practitioners to identify who has had success and with what methods. Next, a case conference to share experiences combined with roundtable discussions. Finally, a privately or institutionally funded not-for-profit research institute to explore the possibilities of both alternative and complementary natural approaches dedicated to individualized cancer treatment and transparency.

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Diet and Risk of Prostate Cancer Recurrence

by Jacob Schor, ND, FABNO

Abstract

Prostate cancer is the most common non-skin malignancy and the third leading cause of cancer death among men in the United States. The American Cancer Society estimated that in 2017, 161,360 men would be diagnosed with, and 26,730 would die from, prostate cancer. The majority of these men, about 92%, were diagnosed with low-grade, localized disease. Globally prostate cancer incidence varies 60-fold suggesting that lifestyle and dietary factors may have a large impact.[1]

We frequently see these men in practice at some point after diagnosis when they come seeking advice on how to reduce risk of recurrence. In the last ten years or so significant strides have been made that suggest a number of dietary characteristics are associated with significant impacts on recurrence risk. This article will review some of the more significant data that should now inform the advice we give to patients who have been diagnosed with prostate cancer.

Eggs and Chicken

In 2010, a paper by Erin Richman was among the first to catch our attention. Richman prospectively tracked consumption of processed and unprocessed red meat, fish, poultry, and eggs to see whether risk of prostate cancer recurrence or progression was affected by eating these foods. Her initial assumption was that processed and red meat, then assumed to increase initial diagnosis, would be the culprits that increased risk of recurrence as well. Chicken and eggs were tracked only because it was thought they were safe and would have no effect. Richman and colleagues followed 1,294 men diagnosed with prostate cancer for an average of 2 years. Though a short trial, their data added up to 2,610 person-years during which time 127 events occurred, defined as either prostate cancer death, metastasis, elevated prostate-specific antigen (PSA) or secondary treatment.

The results surprised us (and we assume Richman et al as well). Men who ate the most eggs or poultry with skin were at double the risk of recurrence or progression during the trial compared to men who ate smaller amounts. For eggs, comparing the highest and lowest quartiles of consumption, or an average of 5.5 eggs per week against, 0.4 eggs, the hazard ratio was 2.02 [95% CI: 1.10, 3.72; P for trend = 0.05]. Comparing highest and lowest quartiles of poultry consumption yielded a non-significant hazard ratio of 1.55. A comparison, though, between the upper and lower tertiles of those eating poultry with skin on yielded a statistically significant hazard ratio of 2.26. (95% CI: 1.36, 3.76; P for trend = 0.003). Men with higher prognostic risk and a high poultry intake had a four-fold increase in risk compared with men with low/intermediate prognostic risk and a low poultry intake (P for interaction = 0.003). Eating processed or unprocessed red meat, fish, or skinless poultry was not associated with prostate cancer recurrence or progression; it was only consumption of eggs and poultry with skin that significantly increased risk.

This was not what we would have guessed, and our focus on shifting men away from eating red meat and processed meat suddenly seemed trivial compared to reducing consumption of eggs and chicken skin.[2]

Erin Richman has gone on, in the years since, to author a number of important research studies on the impact diet and lifestyle have on prostate cancer recurrence. During the intervening years she has gotten married, and her recent work is published under her married name, Erin L. Van Blarigan

Richman's chicken and egg study was something of a turning point. Prior to its publication, we had scant data about primary prevention and assumed that after diagnosis we should tell men pretty much the same things we told them before they were diagnosed. We typically suggested that a, "… diet low in fat, high in vegetables and fruits, …. avoiding high energy intake, excessive meat, excessive dairy products and calcium intake, … [would be] possibly effective in preventing PC."[3]

The factors that cause prostate cancer do not necessarily promote recurrence or progression.

Richman's chicken and egg results were important because men with prostate cancer in their attempts to follow a 'healthier diet' often decrease red meat and increase egg and poultry consumption to compensate for a reduction in protein. Richman turned what we thought was a smart plan into a dumb plan.

It is worth noting that eggs and poultry do not increase risk of getting prostate cancer.[4] Harvard researchers Willard, Giovannucci, Liu et al (who would later mentor Richman) had suggested that different factors promote prostate cancer progression after diagnosis in contrast to those that initiate the cancer. Still other factors may increase how aggressive the cancer is. [The same Giovannucci

paper reported that increased levels of alpha-linolenic acid were associated with higher risk of prostate progression, a troubling thought for adherents of the Budwig diet] [5]

Erin's 2010 paper was not the first to associate poultry with prostate cancer. A 2001 paper by Michaud et al reported an association between poultry skin and metastatic prostate cancer risk.[6] The American Institute of Cancer Research suggested a possible association between total poultry and prostate cancer in their 2007 report.[7]

So how have we explained this link between chicken, eggs and prostate cancer? In hindsight it seems obvious. With the chicken, it's probably the heterocyclic amines, the same family of chemicals blamed for why high meat consumption increases prostate cancer risk.[8] Cooked poultry skin contains more heterocyclic amines (HCA) than any other type of cooked meat; crispy chicken skin contains more HCA than barbecued beef or even fried bacon. Eggs contain the highest amount of choline of any food; choline, it seems, strongly promotes prostate cancer growth. There is a risk of being perceived as racist for quoting Bogen and Keating, who suggested in 2001 that African American men were at higher risk of prostate cancer simply because of their higher chicken consumption:

> [Heterocyclic amine]...intakes were estimated to be greatest for African American males, who were estimated to consume approximately 2- and approximately 3-fold more [heterocyclic amines] than white males.... This difference...may at least partly explain why prostate cancer (PC) kills approximately 2-fold more African American than white men....[9]

Eating eggs raises serum choline levels. Johansson et al reported in 2009 that high plasma choline is associated with greater risk of prostate cancer.[10] Prostate cancer cells take up far more choline than healthy prostate cells.[11] In fact, radio-labeled choline is used for PET scan imaging of prostate tumors rather than the radioactive glucose used in standard PET scans.[12] Prostate cancers eat up choline with a passion. Erin, as Richman, reported in 2012 that dietary choline was correlated with risk of prostate cancer death.[13]

Fats

Van Blarigan was lead author of a 2015 study that compared consumption of saturated fat versus vegetable fats after prostate cancer diagnosis with the risk of dying from prostate cancer. This was a prospective study (n=926) of men diagnosed with prostate cancer from the Physicians' Health Study. During follow-up, 333 deaths (56 prostate cancer deaths) occurred. Even slight shifts in type of fat and percentage of calories sourced from fats and carbohydrates made significant differences. Men who obtained five percent more of their daily calories from saturated fat and five percent less of their daily calories from carbohydrate after diagnosis had a 1.8-fold increased risk of all-cause mortality (HR 1.81; 95 % CI 1.20, 2.74; p= 0.005) and a 2.8-fold increased risk of prostate cancer-specific mortality (HR 2.78; 95 % CI 1.01, 7.64; p= 0.05). Men who obtained ten percent more of their daily calories from vegetable fats and ten percent less of their daily calories from carbohydrates had a 33 % lower risk of all-cause mortality (HR 0.67; 95 % CI 0.47, 0.96; p=0.03). Saturated fat intake may increase risk of death, and vegetable fat intake may lower risk of death.[14]

Milk and Dairy Foods

The paper that alerted me to the name change was published in January 2018.[15] Erin Van Blarigan and colleagues had conducted a prospective study comparing consumption of dairy foods with prostate cancer recurrence, following 1,334 men with non-metastatic prostate cancer who were part of the CAPSURE cohort. The men were followed for a mean of eight years starting about two years after diagnosis.

Men who consumed more than four servings of whole milk per week compared to those who consumed 0-3 servings per month had a 73% increased risk of recurrence of prostate cancer (HR: 1.73; 95%CI: 1.00, 2.98; p=0.04). Higher body mass index (BMI) tended to worsen the association (p=0.01). For men with a BMI ≥27, making the same comparison of >4 servings/week versus 0-3 servings/month of whole milk, tripled risk of reoccurrence (HR: 2.96; 95%CI: 1.58, 5.54; p≤ 0.001). Whole milk consumption was not associated with increased risk in men with BMI of less than 27.

There is little new about the idea that milk might be a problem. A number (but not all) studies published over the years have suggested that dairy products increase risk of prostate cancer.[16-24]

Yet data about dairy consumption after diagnosis has been limited. The authors of this current study, Van Blarigan and her coauthors, reported in 2012 that among the 3,918 men in the Health Professionals Follow-up Study, those who consumed whole milk more than four times per week after diagnosis had double the risk of dying from prostate cancer and a 51% increased risk of prostate cancer recurrence compared to those drinking whole milk less than three times per month.[25]

These same authors also analyzed data from the 926 men in the Physicians Health Study and reported in 2015 that consuming more than three servings a day of dairy products was associated with a 2.4-fold increased risk of prostate cancer specific mortality compared to men consuming less than one serving per day.[26]

A 2017 Swedish study by Downer et al, looked at dairy consumption among 230 men diagnosed with localized prostate cancer. Drinking 3 or more servings per day of high fat milk increased prostate cancer mortality 6.1-fold over men who drank less than 1 serving per day.[27]

The bottom line is that consuming dairy, in particular whole milk, puts men at greater risk of recurrence. We should assume that men who have chosen a wait and watch approach rather than treatment, should be even more concerned about dairy consumption. This current study suggests that we may be able to segregate those most at risk by BMI.

The factors that cause prostate cancer do not necessarily promote recurrence or progression.

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Several possible mechanisms have been suggested why milk is a problem:

- High calcium intake decreases vitamin D[28];
- Milk proteins increase igf-1[29];
- Fluctuating phosphorous levels modify vitamin D concentration[30];
- Elevated saturated fat may modulate immune responses.[31]

As mentioned, Erin and her colleagues have already reported that saturated fat intake is associated with increased risk of prostate cancer mortality; and now this data, that whole milk has a greater effect, suggests that the fat content of whole milk increases risk.[32] This clearly should raise concern about other high-fat dairy products such as half & half, cream, butter, and especially that glorious triple-cream brie sold at Costco.

Several other earlier studies have looked at whole milk and prostate cancer recurrence. Pettersson et al reported that men who had the highest whole milk intake (>4 servings/week) had about a two-fold increased risk of prostate cancer mortality (HR: 2.15; 95%CI: 1.28, 3.60; P-trend) compared to men with low intake (0-3 servings /month). In their study there was no association between total dairy consumption and risk of lethal prostate cancer, biochemical or clinical recurrence.[33]

We should add whole milk and probably other high-fat dairy products to our lists of foods that men with a history of prostate cancer should avoid. I've often joked about how patients lump all foods found in the dairy case of the grocery store into one category so that when you tell them to avoid "dairy foods," they ask if that "means eggs?" My response has been, "Do cows lay eggs?" In a way though these people are right. For men who have had prostate cancer, both eggs and dairy increase risk dramatically.

BMI

This BMI information from the new milk study puts something of a new twist into the story. Up until this study we were not thinking that the impact of foods would vary significantly with BMI. Van Blarigan was part of a team that reported in 2015 that pre-diagnostic obesity was associated with shorter telomere lengths in prostate stroma cells and overweight (n=596) had higher Gleason scores. Telomere length also varied with physical activity; more active men had significantly longer telomeres in their prostate cells and the least active men tended toward shorter lengths.[34]

Whether a man is overweight also affects prostate cancer prognosis. If he is overweight, we want him to lose weight. In a study of 2,546 men with localized prostate cancer in the Physician's Health Study (PHS), a one-unit higher BMI before cancer diagnosis was associated with about a 10% increase in the risk of prostate cancer specific mortality. A BMI of ≥30 kg/m2 was associated with nearly double the risk of prostate cancer death compared to normal weight men.[35]

Men who gain >2.2 Kg between five years before to one year after prostate cancer surgery have a 94% increased risk of recurrence.[36] Gaining weight after diagnosis is associated with increased risk of biochemical recurrence and prostate cancer specific mortality.[37] Metabolic syndrome is strongly associated with "increased risk of high-grade and advanced prostate cancer."[38,39]

Exercise

Prospective cohort studies suggest that vigorous exercise is associated with lower risk of prostate cancer specific mortality. This means doing things that make the heart pound, the lungs breath hard, and the skin sweat. If you think in terms of metabolic equivalent task (MET) values, this means MET >6. In simpler terms, we are talking about jogging, biking, or swimming or exercise of similar intensity. After analyzing data from the Health Professionals Follow-up (HPFS) (n=2705), Kenfield and other Harvard researchers reported in 2011 that men who performed 3+ hours/week of vigorous activity had a 61% lower risk of dying from prostate cancer when compared to men who exercised less than one hour per week.[40]

Erin Richman, working with this Harvard team, reported similar results in 2011 after analyzing data from the CAPSURE cohort: men who walked briskly (≥3 mph) three or more hours per week had a 57% lower risk of prostate cancer recurrence compared with men who walked less than three hours a week at a easy pace (< 2 mph).[41]

Bonn reported similar effects on prognosis in 2015 from a cohort of 4,623 men with localized prostate cancer. Men who either walked or biked ≥20 min/day versus doing either for less than 20 minutes a day was associated with a 36% decrease in prostate cancer mortality.[42]

In a 2015 paper, again with this Harvard group, Erin (as Van Blarigan) explained in part why exercise might be so beneficial in prostate cancer. Exercise affects tumor morphology, it literally changes the architecture of the tumors, leading to more regularly shaped blood vessels in the tumors. Microvessel morphology was examined in men with prostate cancer and compared to activity levels (n=571). Vigorous walking was associated with "… larger, more regularly shaped blood vessels compared with those of men who walked at a less than brisk pace."[43]

Smoking

While not smoking might seem to be a no-brainer, many men who have had prostate cancer live in denial and find reasons to rationalize continuing to smoke. Smoking increases prostate cancer aggressiveness and the risk of dying from prostate cancer. For smokers every aspect of prostate cancer prognosis is worse. They have a higher risk of progression, including biochemical recurrence, metastasis, and development of hormone resistant disease.[44,45]

In the first of these two studies, 5,366 men with prostate cancer, those who smoked prior to diagnosis had a 61% higher risk of biochemical recurrence. Risk decreased in men who stopped smoking for ten or more years to about the same level as those who had never smoked. In the second study (n=6538) current smokers had a 80% higher risk of biochemical recurrence compared with non-smokers [HR 1.80, 95% CI 1.45-2.24; p<0.001)]. Former smokers had a 63% increased risk [HR 1.63, [CI] 1.30-2.04; p<0.001)].

Fish

In some studies men who eat more fish have lower risk of death from prostate cancer than men who eat little fish. While some meta-analyses have not found significant associations, others have. A 2010 pooled analysis of four cohort studies by Szymanski reported a significant 63% reduction in prostate cancer mortality among the fish eaters (n = 49,661), RR: 0.37; 95% CI: 0.18, 0.74].[46]

It is thought that oily fish that are high in omega-3 fatty acids, such as salmon, sardines, mackerel and herring may have the most benefit. Yet there are some discrepancies. Brasky reported in 2013 that men with higher omega-3 blood levels are actually at higher risk of being diagnosed with prostate cancer by PSA testing.[47]

Coffee Is Good

Several observational studies report that coffee consumption pre-diagnosis is associated with less lethal prostate cancer and reduced risk of recurrence. Wilson et al in 2011 seems to be the largest of these studies.[48] In 47,911 men in the Health Professionals Follow-up Study, 5,035 cases of prostate cancer were diagnosed, 642 of which proved lethal. Men who drank six or more cups of coffee per day compared with nondrinkers had an 18% lower risk of prostate cancer RR = 0.82, 95% [CI] = 0.68 to 0.98, P= .10) [note p-value. These were non-significant results]. The association was stronger and significant for lethal prostate cancer (consumers of more than six cups of coffee per day [RR = 0.40, 95% CI = 0.22 to 0.75, P(trend) = .03)].

Geybels et al reported in 2013 that in a group of 630 men treated for prostate cancer, drinking four or more cups per day pre-diagnosis versus one or less was associated with a 59% reduced risk of recurrence or progression (HR 0.41, 95 % CI 0.20–0.81; P for trend = 0.01). It didn't matter if they were drinking caffeinated coffee or de-cafe.[49] At this point we have not seen any research about starting to drink coffee post-diagnosis.

Cruciferous Vegetables

Everyone has heard that cruciferous vegetables contain chemicals whose metabolites stop cancer cells from growing and encourage apoptosis. Consuming these vegetables is associated with lower risk of developing advanced prostate cancer, stage III and IV disease. Eating more than one serving of broccoli per week versus less than one serving per month was associated with a 45% decrease in risk (RR = 0.55, 95% CI = 0.34 to 0.89, P(trend) = .02). The same frequency of consumption for cauliflower was associated with a 52% drop in risk [RR = 0.48, 95% CI = 0.25 to 0.89] P(trend) = .03).[50]

A 2012 paper by Erin Richman's group looked at cruciferous consumption after diagnosis.[51] Erin and colleagues examined whether intake of vegetables,

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in particular cruciferous vegetables, tomato sauce, and beans after diagnosis would shift prostate cancer progression in 1,560 men diagnosed with non-metastatic prostate cancer.

They reported that men in the highest quartile of cruciferous vegetable intake, who were eating almost six servings per day, after diagnosis had a 59% lower risk of progression compared with men in the lowest quartile. Consumption of other vegetable groups was not associated with risk. Trends toward lower risk associated with consumption of other cruciferous vegetable types did not reach statistical significance. No benefit was seen in this particular study for tomato sauce. Six servings a day though seems like a lot to eat.

We assume the data for soy and prostate is strong in support, but actually it is relatively weak.

Soy

Laboratory and epidemiology research suggests soy isoflavones may inhibit prostate cancer growth. A 2009 meta-analysis looking at soy and prostate cancer risk reported findings that should trouble us. The studies on soy intake yielded a combined relative risk that was 26% lower in men who ate soy [RR= 0.74 (95% CI: 0.63, 0.89; P = 0.01)]. That is good news but when the data was separated between those eating non-fermented versus fermented soy foods, the benefit was solely from the non-fermented soy. Non-fermented soy foods lowered risk of prostate cancer by 30% [RR/OR of 0.70 (95% CI: 0.56, 0.88; P = 0.01)]. Fermented soy food consumption had no significant effect [1.02 (95% CI: 0.73, 1.42; P = 0.92)].[52] We assume the data for soy and prostate is strong in support, but actually it is relatively weak.

Tomato

Studies have associated consumption of cooked tomatoes and tomato-based products with reduction in risk of lethal prostate cancer; it is unclear whether these same foods offer benefit post-diagnosis. Two studies have looked at tomato products and prostate cancer progression, and results are not consistent. One suggested a benefit. Chan et al reported an inverse linear relationship for tomato sauce and risk of progression for those consuming two-servings/week increase in tomato sauce.[53] The second, a 2009 review concluded that the data examined in their "… systematic review do not provide sufficient evidence to recommend the use of lycopene supplements in routine clinical practice for patients diagnosed with prostate cancer, although the studies do indicate that lycopene is unlikely to be harmful to such patients. However, no study has been conducted with an adequately sound methodology."[54]

Mediterranean Diet

In another 2014 paper published with former associates from Harvard, Erin (still Richman) reported that although closer adherence to a Mediterranean diet did not lower risk of dying from prostate cancer, it did lower overall mortality risk. Erin et al had prospectively followed 47,867 men from 1986 to 2010. This included 4,538 men diagnosed with non-metastatic prostate cancer, followed from diagnosis to lethal outcome or to January 2010. During that time, 6,220 prostate cancer cases were confirmed. The Mediterranean diet was not associated with risk of advanced or lethal prostate cancer. However, there was a 22% lower risk of overall mortality (hazard ratio: 0.78; 95% confidence interval, 0.67-0.90; p=0.0007) among men with greater adherence to the Med-Diet after diagnosis.[55]

Vitamin E

Observational studies initially suggested an inverse association exists between vitamin E and risk of prostate cancer, leading to vitamin E frequently being suggested as treatment. Three large randomized controlled trials reported conflicting results, that is higher vitamin E was associated with worse disease risk. In 2013 Richman was part of the group that sorted out and possibly explained this vitamin E phenomenon.

They measured circulating α- and γ-tocopherol and genotyped 30 SNPs among 573 men with prostate cancer. They compared circulating vitamin E, genotypes, and risk of high-grade prostate cancer, and risk of recurrence (56 events; 3.7 years median follow-up). Circulating γ-tocopherol was associated with an 87% increase in risk of high-grade prostate cancer (Q4 v. Q1 odds ratio [OR] = 1.87; [CI]: 0.97-3.58; p=0.02). The less common allele in SOD3 rs699473 was associated with an increased risk of high-grade disease (T > C: OR = 1.40, 95% CI: 1.04-1.89). However, two independent SNPs in SOD1 were inversely associated with prostate cancer recurrence (rs17884057 hazard ratio [HR] = 0.49, 95%CI: 0.25-0.96; rs9967983 HR = 0.62, 95% CI: 0.40-0.95). Genetic variation in SOD may be associated with risk of high-grade disease at diagnosis and disease recurrence. Circulating γ-tocopherol levels may also be associated with an increased risk of high-grade disease. This in effect should put an end to across the board recommendations that men with prostate cancer should take vitamin E.[56]

In 2014 as lead author and under her new name, Erin Van Blarigan pursued these genetic variations a step further. Circulating pre-diagnostic α-tocopherol, γ-tocopherol, and lycopene were analyzed along with various SNPs and the risk of lethal prostate cancer in 2,439 men with prostate cancer in the Health Professionals Follow-up Study and Physicians' Health Study.

They observed 223 events over 10 years of follow-up. Risks varied with different alleles. High α-tocopherol levels were in general associated with lower risk of lethal prostate. Men homozygous for the less common allele [rs3746165 in GPX4] had a 35% lower risk of lethal prostate cancer compared with men homozygous for the more common allele. However, men who were homozygous for the less common allele in rs3746165, and who had high γ-tocopherol levels were at 3.5-fold increased risk of lethal

prostate. Thus it looks like we should be testing genetic snps prior to using vitamin E supplements.[57]

Selenium

Selenium is another supplement that was commonly suggested to men with a history of prostate cancer that has been questioned by prospective human trials. Recall the 2003 van den Brandt study that associated low toenail selenium levels with higher risk of prostate cancer.[58] Even Hurst's 2012 meta-analysis furthered this belief.[59] Yet this notion was countered by the results reported in the SELECT cohort that found supplementation with selenium had no significant impact on disease risk.[60]

Van Blarigan and colleagues reported in 2014 after following 4,459 men diagnosed with prostate cancer for 22 years that those who took selenium supplements had a higher risk of dying from prostate cancer. During 7.8 years of follow up, recurrence rates were 5.6/1000 person-years for those not taking selenium supplements and 10.5/1000 person-years for those who took 140 µg/day or more. Rates of biochemical recurrence were 28.4 vs. 29.3/1000 person-years comparing non-selenium users with users. Risk of dying from prostate cancer increased with selenium doses. Men consuming low-dose selenium (1 to 24 µg/day of selenium) had an 18% higher risk than non-users. Those consuming 25 to 139 µg/day had a 33% increased risk and those taking 140 or more had a 2.60-fold greater risk of prostate cancer mortality. This clearly contradicted the general belief that every man who had prostate cancer should take 200 mcg or more of selenium per day.[61]

In a 2015 Van Blarigan was part of a team that identified specific polymorphisms in selenoprotein coding genes that were associated with higher-grade disease that might affect prostate cancer recurrence.[62]

Folate

In 2014 Richman had an important paper on folate published. She prospectively examined the association between post-diagnostic folate consumption and the risk of prostate cancer recurrence after radical prostatectomy, external beam radiation therapy, and brachytherapy. Prior to starting this study, a randomized, placebo controlled clinical trial of folic acid supplementation for the chemoprevention of colorectal adenoma had revealed an increased incidence of prostate cancer in the treatment group. Erin's study was done with 1,153 men who had been treated with radical prostatectomy, external beam radiation therapy and brachytherapy and participated in the CaPSURE Diet and Lifestyle study.

Prostate cancer progressed in 101 men (8.76%) during a mean 34-month follow-up. Though initially no evidence of folate intake and recurrence was seen, on secondary analysis by treatment type, after radical prostatectomy, patients in the lowest decile of dietary folate intake had a 2.6-fold increase in the risk of recurrence (HR 2.56, 95% CI 1.23-5.29, p = 0.01). In patients treated with external beam radiation and brachytherapy, no evidence of an association between prostate cancer progression and increased folate intake was seen.

Though it is rare to see low folate levels in patients, this paper would suggest we should not worry about folate supplementation in men who have had prostate cancer, in fact we should consider supplementation if a man's levels are low post initial treatment with surgery.[63]

Multivitamins

Taking a multivitamin is safe and probably useful. The Physicians Health Study randomized trial of a regular multivitamin reported a modest but significant (8%) reduction in total cancer incidence in men (HR, 0.92; 95% CI, 0.86-0.998; P=.04). The men with a history of prior cancer had a 27% reduction in total cancer during the study (HR, 0.73; 95% CI, 0.56-0.96; p=0.02). There was no significant affect on risk of prostate cancer.[64] There is still no strong evidence that any single supplement offers protection against prostate cancer (neither development nor progression).

Carotenoids

In a 2016 paper, Nordström, Van Blarigan, Ngo, et al reported that circulating carotenoids, "were inversely associated with the risk of high-grade prostate cancer…odds ratios (OR)… highest versus lowest quartiles were: 0.34 (95% CI: 0.18-0.66) for α-carotene, 0.31 (95% CI: 0.15-0.63) for β-carotene, 0.55 (0.28-1.08) for lycopene and 0.37 (0.18-0.75) for total carotenoids." Once again, these effects were modified by various SNPs. Thus, the argument that we should be doing genetic testing in prostate cancer patients continues to strengthen.[65]

So, what is the current bottom line for men diagnosed with prostate cancer?

1. No smoking;
2. If BMI is 27 or higher, lose weight;
3. Exercise rigorously, do something to sweat;
4. Eat lots of vegetables (particularly tomato sauce and cruciferous vegetables);
5. Eat more vegetable fats (i.e. fish, nuts, vegetable oils, soybeans, avocados, and flaxseed) and fewer saturated fats. Eat less carbohydrates;
6. Drink coffee – regular or de-cafe doesn't seem to matter;
7. Limit eggs and poultry with skin on;
8. Limit whole milk if your BMI is high, probably should even if it isn't; and
9. Limit refined grains, sugars, processed meat, and high-fat dairy.[66,67]

We should probably be testing SNPs before making suggestions for vitamin E, selenium or lycopene.

Granted at this point we do not have the sort of randomized human clinical trials implementing these recommendations that we would prefer. Still this is a great deal more information than we had just a few years ago. A good bit of it is the result of Erin Van Blarigan's research. Hopefully at some future date she will be able to link the earlier research published under her maiden name to her current list. We'll keep our fingers crossed that she keeps this married name for a long, long time and does so with much happiness. Congratulations Erin!

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Diet and Prostate Cancer

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Dr Jacob Schor, ND, FABNO has practiced as a naturopathic doctor in Denver, Colorado since 1991. He is past president of the Colorado's professional association for naturopathic doctors (CoAND) and the Oncology Association of Naturopathic Doctors. He is a frequent contributor to the *Townsend Letter*.

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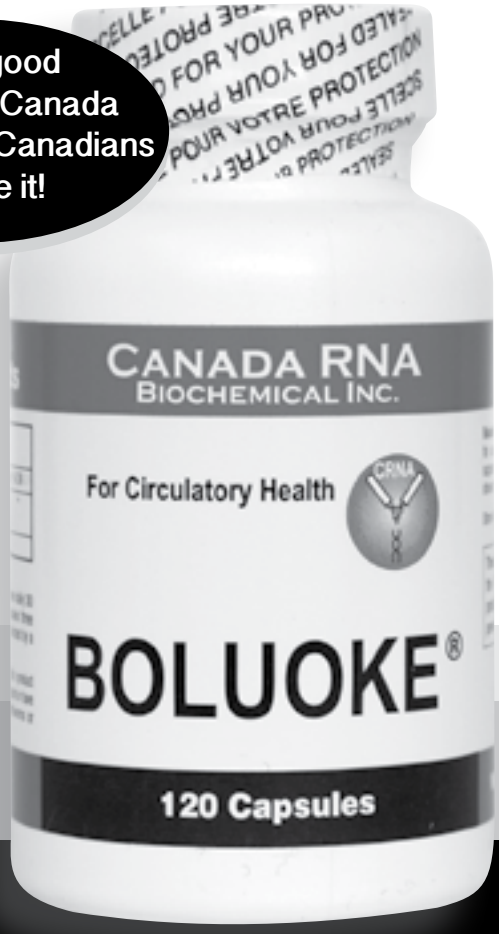

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How to Approach the Cancer Patient, Diagnosis, and Treatment

by Prof. Serge Jurasunas, MD(hom), ND

Introduction

Over the past several decades, I have been deeply involved in the research and treatment of cancer and have developed innovative therapies that unfortunately today don't exist anymore because of European regulations that have banished a number of herbs, compounds, and other substances that I had combined in innovative formulations for anticancer therapy. During that time, it gave me the opportunity to treat thousands of cancer patients who benefited with longer survival; many are still alive today. The oldest one is now 87 years old, and many others have had from 15 to 35 years of remission. I have also treated many juveniles with brain cancer, leukemia, and Wilms cancer (having also used organic germanium; the reader of *Townsend Letter* probably saw one of my last articles on germanium). Today, most are still alive, have a family, and still come in for consultation with their own children. Currently, however, we have other compounds at our disposal to combine and use in what we call our protocol of cancer, which I am going to address in this paper.

New Paradigm of Cancer

Eighteen years ago, we entered into a new century, the 21st century, with the emergence of new ideas, new theories, new discoveries where cancer cure should be a main challenge. By applying these new theories using non-toxic and less expensive treatments, cancer disease will no longer just be seen as a market for profit. Today science is able to send a robot to the planet Mars, that can analyze data and send extraordinary photos back to Earth, yet cancer disease is not yet fully understood; and treatment essentially remains the same as 70 years ago. Chemotherapy remains the cornerstone of research and treatment, despite cancer mortality being about the same as 50 years ago.[1] Also, oncology is focusing only on the tumor and does not consider the patient who is certainly associated with the disease itself. Consider that each patient is an individual with a different genetic profile and therefore requires a customized approach.

Domination of the Cancer Paradigm by Conventional Oncology	**Versus**	New Paradigm Elaborated from New Emerging Theories of Research

Cellular DNA mutation can be caused by exposure to a carcinogen. The altered cells develop a focal proliferation that leads to progressive malignancy by failure or loss of differentiation, loss of apoptosis, and disruption of the cell cycle. When initiated by a group of cancer cells, the tumor starts to grow invading surrounding tissue. Some cancer cells called metastasis can detach from the mother tumor by loss of adhesion, migrate, penetrate into blood\lymphatic systems, travel, and may colonize other organs and again start another tumor. Treatment developed during the early 1950s by conventional medicine was based upon the observation of nitrogen mustard gas, a weapon rather than a medicine. This gave birth to the idea of using a therapy to destroy the tumor or cancer cells by means of highly toxic agents called chemotherapy. Curative surgery, followed by chemotherapy and radiation, became well known as the historical approach to cancer.

We know that the chemotherapy regimen is not selective and triggers some adverse effects from medium to strong. This includes the death of patients which probably is one of the main obstacles to chemotherapy, together with the resistance of cancer cells to chemo-radiation and its failure to prevent cancer recurrence, which remains too high. Metastatic cancer is responsible for 90% of deaths. In fact, chemotherapy is not always effective because anticancer drugs are active only when tumor cells are rapidly multiplying. This is why chemotherapy is ineffective for lung tumors with a slow growth speed. Also, in a tumor some cancer cells are apoptotic and others non-apoptotic, some are destroyed by chemotherapy while others are resistant. A new breakthrough in cancer today is emerging concerning the importance of the patient's immune system in destroying cancer cells.[2]

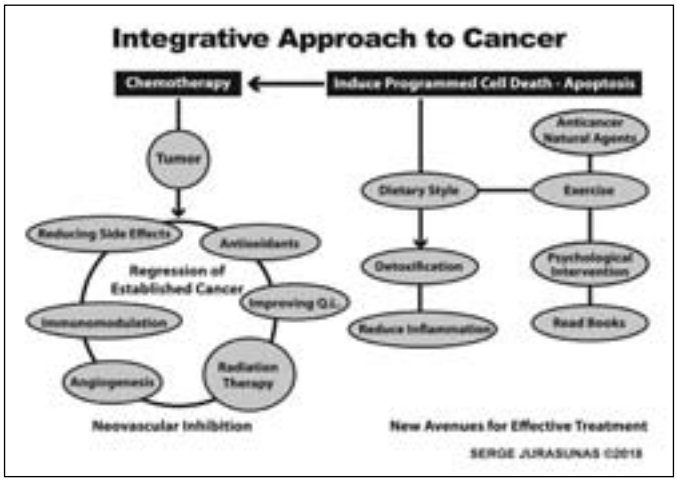
Biological Response Modifiers (BRMs) have now evolved as the fourth method of cancer treatment in addition to surgery, radiotherapy, and chemotherapy. We will see later about BRMs since, for over the past several decades, it has been an integral part of my unique and elaborate protocols.

Stopping Disease Progression vs. Curing Cancer

Nobody is currently mentioning the cure for cancer since preventing the progression of the cancerous tumor with chemotherapy, even without a decrease in size, is considered

a success – simply because it prolongs the patient's life. In complementary and alternative medicine, this definition has been used for a long time; and we know that some protocol or some selected natural compound can prolong the life of cancer patients with better quality of life. In truth, only a small fraction of cancer patients are cured by chemotherapy; and according to French oncologist, Laurent Schwartz, chemotherapy is effective in only 15% of cancer patients. A 14-year study, published in the *Journal of Clinical Oncology* in December 2004, called the contribution of cytotoxic chemotherapy up to a 5-year survival in adult malignancies, marginal. The study showed that this overall contribution of curative and adjuvant chemotherapy in adults was estimated to be only 2.3% in Australia and 2.1% in the US, emphasizing the urgent need to approach other methods to treat or cure cancer.[3]

New Approach to Cancer



For a long time now, we have developed some additional new theories and approaches to cancer disease since we already knew from observation and experience that the cancer patient was not a healthy person with intact functional bodily organs. In my first *Townsend Letter* article of February\March 1999 ("Orthomolecular Treatment of Cancer"), I described the percentage of chronic organic dysfunctions that accompany the malignancy process in cancer patients, which included the intestine, liver, nervous system, lymphatic disorder, thyroid dysfunction, blood toxemia, and the presence of pathogenic bacteria in the blood.

The correlation between intoxication of the bowel and cancer already had been investigated by early researchers. Dr. C. Kousmine, a Russian immigrant doctor from Switzerland that I knew personally, made significant steps by discovering bacteria in tumor tissue which usually live in the intestine such the colibacillus. Both Dr. Kousmine and I also found this bacteria in the blood during our independent research. (For more information about the work of Dr. Kousmine and figures of intestinal bacteria circulating in the blood, see my book, *Health and Disease Begin in the Colon*.) Today the theory of the intestinal microbiome is an emerging subject in hundreds of papers so far, opening a new door to approach cancer with more efficacy. I was probably one of the first to suggest the theory of intestinal bacteria found in the blood being associated with the stimulation of the immune system. Based on a survey I have done with over 1000 cases, the evidence confirms that cancer patients are not healthy patients. We may assume that between 50 to 75% of their health status is lost, that 50% of their total body cells are not functioning properly. Of course, today science is shedding more light on the intestinal microbiome and the impact on our immune system which is now seen as a new approach and support to chemotherapy effectiveness.[4,5]

In this article, I will also describe the importance of the restoration of mitochondrial function and cellular respiration being included in a comprehensive cancer treatment. Clearly the mitochondria are key to the function of both normal and malignant cells since they play a central role in the regulation of cellular function, cellular differentiation, metabolism, and cell death in cancer cells.

Mitochondria are fewer in cancer cells, which generate much lower ATP production. Chemotherapy affects mitochondria inducing more mutation[6] and destruction of mitochondria, which each time leaves fewer mitochondria,[7] therefore with less possibility to win the battle. We also have to remember that apoptosis is triggered by mitochondria (and not the cellular DNA itself) when Bax makes a pore in the membrane to penetrate and induce the release of the cytochrome enzyme that in turn activates the caspases proteins as the final mechanism that leads to the death of abnormal or cancer cells. In 1924, Otto Warburg postulated that cancer and tumor growth in part was caused by a change in the way the cells generate the energy necessary for all cellular function.

The New Approach to Cancer

On the cellular level, the new approach to cancer seeks to do the following:

1. Induce cell cycle arrest (P53 mutation and other tumor suppressor genes) and increase apoptosis events. Most cancers are caused by the inactivation of tumor suppressors.
2. Suppress angiogenesis (one of the most important main events in cancer).
3. Suppress pro-inflammatory mediators (NF-KB, COX2), preventing excessive free radical activity and oxidative events.
4. Restore mitochondria function and the processes of cellular respiration, increasing ATP production.
5. Activate the immune defense and especially the NK cell activity, which represents our main immune defense against cancer. NK cells can attack cancer cells in several ways either through P53 dependent apoptotic pathways or independent pathways and also produce cytokines that activate other immune cells, such as macrophages, and mature dendritic cells. Also, NK cells produce cytokines that block angiogenesis, which is an important channel used by cancer cells.

On the organic level, the new approach to cancer seeks to do the following:

1. Detoxification.
2. Strengthen the nervous system to increase the healing process and body's function.
3. Restore the intestinal microbiome, which is associated with our immune defense mechanism.

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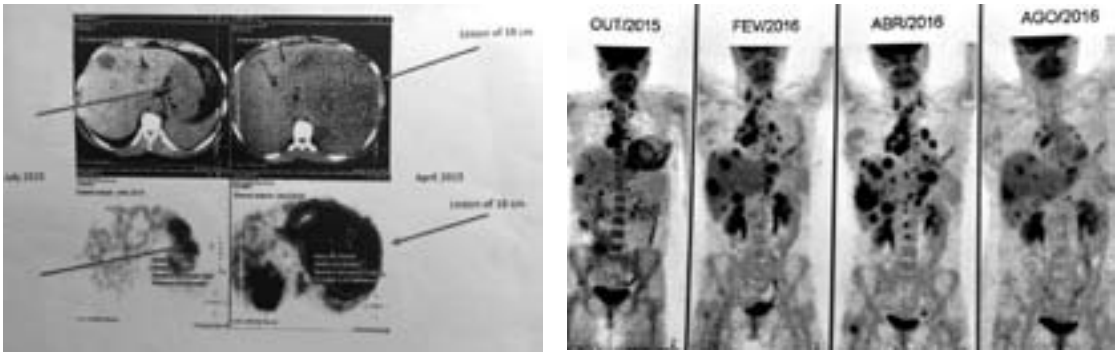
Our bodies can become intoxicated by failure of the detoxification organs such as the liver, kidney, colon, and lymphatic system. Toxins can produce severe cellular dysfunction, decrease immune response, disrupt hormone function, damage mitochondria, decrease the patient's energy level, and increase oxidative stress and inflammation. From my years of observation and testing using the Vega computerized device for obtaining a patient energy profile, a toxic colon correlates with lower brain energy especially in breast cancer patients and often leads to a state of nervous dysfunction.

Before & After My Treatment

Treatment Progress: 18 cm Stomach | Tumor from April – July 2015 | Result: Tumor Reduction
Breast Cancer w/Metastases to Ganglion – From October 2015 – August 2016 – RBAC & Curcumin



2 Cases – Before and After Treatment

Left figure: Case of stomach cancer tumor. Right figure: Breast cancer; October 2015: start of chemotherapy; February 2016: Patient is worse; April 2016: More metastases and nodules in ganglions, lungs, and abdomen. Patient initiates treatment 3 gr, RBAC daily plus curcumin, 4500 mg per day; August 2016: Major improvement and elimination of secondary nodules.

Approaching Cancer Patients

Now we may have in hand a complete puzzle of what is cancer and a protocol strategy to approach the physical disease, although cancer patients with the same diagnostic have radically different genes and may require a personalized treatment. We also have to know how to approach the patient in front of us with warmth, understanding and compassion. We have to take into consideration the physical condition of our patients, the age, family background, and see how they react after having been diagnosed.

Women, for instance, and particularly breast cancer patients are usually more stressed; a large number come in with anxiety, depression, and often are in mortal fear of dying. Yet so many of them will meekly accept any conventional therapy without questions or consideration of the consequences. With such patients, only offering a treatment protocol is far from being enough since the patient more than often needs personal counseling with emotional and psychological support. It is imperative that we speak to them, taking the time to influence them positively, so they can be more confident in understanding the issues they face. They have to understand how to be the winner, not a loser, and receive education about nutrition and lifestyle. But this requires life experience, experience with patients that you may develop over a period of years of practice. Heavy stress and nerve dysfunction is associated with metastasis diffusion since cancer cells are attracted by neurotransmitters[8] while stress decreases the activity of NK cells. Many women are desperate but ignorant about what cancer is and why they have cancer. We have even seen male patients desperate, losing interest in life and even crying.

The other day two sisters came in my clinic that I hadn't seen for the past 24 years. I had treated one for breast cancer and she is still in remission; but the other sister came in for consultation also with a diagnosis of breast cancer. In the past she had always come in with her sister for consultation but had never done anything; and of course, she was in shock after having been diagnosed with cancer. She was very anxious and afraid of the issue; so, in such a case as this, the protocol was just not enough for her. I spent time with her and told her how she must best react, how she must change and have a different and more positive attitude.

A few days ago, a woman came from Switzerland to my clinic with her husband. In 2017 she was diagnosed with lymph metastasis, and her doctor diagnosed a lymphoma while later on they also found a primary stomach cancer. After chemotherapy she developed very severe anemia, but the worst was the metastasis had spread to her bones and liver. The patient was in a real state of anxiety since she received no real answer about the issue of her disease and fell into a deep depression. You may imagine my work explaining to her and her husband what I could do for her and giving her some hope and more confidence. But her issues unfortunately were quite uncertain. But it takes time and experience before you have the knowledge of how to change the outlook of your patients.

I have had desperate patients coming in, even having the idea or intention of committing suicide; so, you really have to know how to deal with this situation. They also have to understand that food/diet is part of their medicine and important in the treatment. Many patients are unable to make a good decision. Some remain skeptical about our treatment since for the past decades they have been told that only chemotherapy can CURE their cancer. Often, I ask them, "Now explain me how chemotherapy kills the tumor?" Others are influenced by their oncologists who told them that no supplementation can be taken during chemotherapy since it may decrease its

efficiency. So here we have to show the patient that, on the contrary, our treatment with selected natural compounds will increase the effectiveness of chemotherapy. I personally have shown them on my computer examples with scientific fact. Lately I am working on a new book on immuno-oncology and describe with scientific evidence how some compounds such as curcumin and rice bran arabinoxylan compound work in synergy with chemotherapy increasing its effectiveness.

Most cancer patients and especially breast cancer patients coming to my clinic have disease recurrence and metastasis spread to bone, lung, liver, and brain. This is another story; to me, both medical doctors and the patients themselves are responsible for not adopting a better way of living and especially a better diet. Evidence has repeatedly shown today that stimulation of immune surveillance prevents breast cancer recurrence.

Alternative Diagnosis

Usually the patient comes in with a regular hospital diagnosis that includes blood parameters, anti-gene tumor markers, cytology, and a PET scan, which offers a complete picture of the cancer itself. However, the patient may, more than likely, need a complementary profile – a view of organic dysfunction, the level of oxidative stress, the condition of the nervous system, and other information that may underline the damaging effect of chemotherapy. This can be observed, for example, with live blood analysis (LBA) and also more empirically with the oxidative dried blood test. The LBA and dried blood analysis provide a full range of valuable information about the condition of the patient that cannot be found in hospital check-ups.

The oxidative dried blood test is, to me, important for profiling the stage of oxidative stress, the inflammatory process associated with the disease and, especially, the damage from chemotherapy. It permits us also to follow the stage of the disease and, by using the best available treatment, reverse the process to a more normal blood pattern. I have been using this test since 1979 and have made many improvements which I explain in my book, *Health and Disease Begin in the Colon*, and also in my last article for *Townsend Letter*, "Oxidative Dried Blood Test in the Assessment of Metabolic Dysfunction and Inflammatory Conditions," (June 2018).

The other important approach is the molecular markers testing that I frequently presented in some of my articles in *Townsend Letter*. No two patients have the same P53 gene expression either with Bax or BcL2, and the profile between pro-apoptotic and anti-apoptotic genes is probably the main key to understanding chemotherapy response. Furthermore, no two cancer patients have the same BcL2\Bax ratio or even the same level of survivin, an inhibitor of apoptosis. A report published by the *British Journal of Cancer* shows that BcL2 overexpression retains the ability to predict whether chemotherapy will be beneficial in the case of breast cancer patients.[9] BcL2 provides important additional prognostic information whether or not chemotherapy can be efficient. It may also predict cancer recurrence, as I have often observed patients after remission exhibiting a high BcL2 gene expression. This is what I have been working on for the past 10 years.

Survivin (under the control of P53) is a bad gene that when activated inhibits the induction of the proteins caspases 3,7, the final step to activate the destruction of abnormal\cancer cells. With intact P53 gene expression, chemotherapy damages cancer cells, stopping the cellular cycle and then P53 starts to activate, producing P53 protein inducing apoptosis and the destruction of cancer cells, thus increasing chemotherapy effectiveness. Misfolded or mutated P53 proteins induce blocking of the apoptosis mechanism, and chemotherapy will not be effective but only damage cells without killing them; they keep multiplying, increasing metastasis evasion. A misfolded P53 protein has lost its anti-tumor capabilities while mutated P53 protein gains an oncogenic function and contributes to cancer growth and metastasis. P53 mutation is associated with exposure to radiation, tobacco smoking, oxidative stress, and bacteria, which I often observe in the blood of breast cancer patients having P53 mutation.

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Therefore, with such information, we can select some specific compounds that may reverse P53 mutation that in turn lead to the self-destruction of cancer cells and tumor regression as can be seen with the result of the blood testing.[10] Blood testing produces an individual profile of effective chemotherapy drugs and also works as a diagnosis and prognosis to follow up as well as documenting treatment outcome. Importantly this testing can detect early signs of developing cancer and offer a better understanding about the existing cancer. But also, the test helps to prevent a cancer recurrence since a hospital check-up can only detect a recurrence but not prevent; unfortunately, too many women with breast cancer remission limit themselves to hospital check-ups.

Not long ago a middle-age woman came from England to see me during her pregnancy. She was diagnosed with an aggressive triple negative breast cancer, accepting a double mastectomy (known as the Angelina Jolie effect, 2013), which I did not agree with, followed by chemotherapy. She gave birth to twins, but a little later she was diagnosed with bone metastasis and started to worry about her condition even further. Immediately I had told her to take the blood testing, she agreed and the result (before starting the treatment) indicated a problem. The tests had shown mutated P53 protein, activated BcL2 and low Bax activity so the ratio was bad (0.7). Both BcL2 and Bax gene expression are regulated by the tumor suppressor P53.[11] Survivin was overexpressed and P21 very low so the ratio was 0/2. Her testing also included telomerase activity gene expression and tumor necrosis factor alpha gene expression, so we could have a complete profile of the pro-tumor activities and how to approach her case with a personalized treatment. But this is only to show an example of how we can follow a cancer patient or, after remission, to prevent a recurrence. If you are seriously treating cancer, this type of information is crucial; it represents the future of oncology because today reversing mutant P53 is already considered an anticancer therapy.[12,13] But to my surprise, it's not only oncologists who do not understand about these approaches but also many naturopathic doctors. Here we have a scientific approach of cancer that should concern everyone who works with cancer disease.

Iridology Examination

In the January 2017 *Townsend Letter*, I wrote an article about iridology, "Health and Disease by Iridology Examination," where I ask if we may wonder if iridology is still reliable and keeps a place in patient diagnosis, especially if we can use some very modern devices found both in conventional medicine and alternative medicine. I believe the answer is yes since for the past 50 years I have always used iridology even if we have other types of modern equipment at our disposal. It is one of the most interesting ways to profile the patient body's organ condition and the genetic and hereditary profile. When observing cancer patients and especially those with breast cancer, most of the time it shows you why they are so nervous and anxious according to their own genetic profile. You may observe specific iris signs in the breast area corresponding to the tumor together with some typical abnormal condition such as intestinal disorder, constipation, lymphatic congestion, dark or brown metabolic pigment, and abnormal and overwhelming collarette going in zig-zag often entering in the breast area, indicating an inflammatory process, as an example. It always shows the relationship between the disease and the colon.

There is an interrelation between the colon and most of the organs. Connection between the intestine, the nervous system and the brain is a theory that I developed a few decades ago when observing the iris of hundreds of patients, which today is well demonstrate with the new discovery

about the intestine being our second brain. In observing the iris of cancer patients and again breast cancer patients, it is important not to forget to observe the colon, nervous system, and brain area and see the connection. You can see many examples with breast cancer, brain cancer, ovary cancer, lung cancer, colon cancer, bladder cancer, prostate cancer along with how to detoxify the body together with the protocol, in my book, *Health and Disease Begin in the Colon* (pages 184-197). About 20 years ago I developed a profile chart of breast cancer iris signs, based upon many years of observation of breast cancer patients, and have saved a number of iris photos of patients showing a cancer profile.

To me iridology is the first approach in order to understand the health condition of the patient, risks, family background, and other organic dysfunction. An iridology interpretation can show the condition of the gut area both in relation to toxicity, bad bacteria, and especially associated with the brain area, which today seems to attract more interest with diseases such as Parkinson's. Decades ago I was able to understand this association since the iris-chart represents typically the position of our organs showing how they developed in the embryo. But you can be sure that the nervous system is always associated with most cancers, as you can observe in my book, and needs to be taken care of while treating.

How I Diagnose My Patients

This is the basic range of complementary diagnosis that I am using, some more recently compared to iridology, notably live blood analysis and the oxidative dried blood test. Here you really have all the information you need both from an empirical and scientific standpoint, especially both, to determine the total body's dysfunction and blood constitution from a cellular level.

The Protocol of Cancer

This is only a brief view of my protocol, and additional information especially about each compound or product use is found in my document "Protocol of Cancer," with information about food/diet, which is a main component for obtaining better results, in "Can Food Diet Prevent and Be Efficient in Cancer Treatment?" (both available in slideshare). However, results of the molecular markers testing are different from one patient to another. Therefore, for each one we may have to adjust the treatment depending on the result. One example is the difference between a misfolded P53 tumor suppressor gene and a mutated P53 or normal P53 but activated only to a certain extent.

The first approach with the following three compounds can target most of the mechanisms of cancer that include apoptosis, immune activation, angiogenesis.

- **Rice Bran Arabinoxylan Compound (RBAC)** A biological response modifier with strong anticancer properties which basically activates the immune cells, but especially NK cells and dendritic cells. Administration: 1 bag of 1 mg, three times per day.
- **Curcumin** (3000 mg-4000 mg per day) Administration can be in capsules of 500 mg or in liquid, like the one I use made in my own pharmaceutical laboratory for immediate absorption. Curcumin in capsule form is not well absorbed. (An interesting fact: RBAC + curcumin work in synergy with several types of chemotherapy and increase the effectiveness by faster decrease or elimination of tumor.)[14]
- **Liquid Cartilage Extract (Comitris)** Contains only molecules in frozen liquid form with strong angiogenic property.[15, 16] Administration: 30 ml. ampule: One per day sub-lingual before breakfast.

Other products include the following:

- **Alpha-Lipoic Acid** Administration: Oral form with 600 mg in the morning and 600 mg in the evening. Some doctors use in perfusion such as 600 gr slowly and after three weeks can be taken orally.
- **Melatonin** Administration: High doses such 10 gr per day taken during the day and at bedtime.

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How to Approach Cancer Disease

Screening the Patient	Approach to the Patient and the Disease	Treatment
History	Build a Nutritional Diet	Products
Medical Examination	Education – Information	Enzyme Yeast Cells Preparation
Blood Analysis	Value of Anti-Cancer Food	Curcumin
Cancer Markers	Books to Read	Chlorella Growth Factor
Physical & Psychological Profile	How Mixed Vegetable Juices are Important	Fermented Chlorella
Complementary Diagnosis	Psychological Support	Rice Bran Arabinoxylan Compound
Iridology	Walking	Alpha Lipoic Acid
Live Blood Analysis	Exercises	Liquid Cartilage Extract
Oxidative Dried Blood Test	Yoga	Venoms Snake (Ophiotherapy)
Vega Energy Test	Positive Attitude from the Patient	Artemisinin
Thermography	Sleep	Genistein
Molecular Markers Testing		Probiotics
Chemical Brain Analysis		Melatonin

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- **Fish Peptides** (short chain amino acids). To reverse mutant P53. Administration: three tablets after each meal.
- **Fresh bamboo leaf extract.** For detoxification, immunotherapy, and antioxidant properties. Administration: 20 drops, three times per day in a glass of water.
- **Enzyme Yeast Cells Preparation** (Young active live yeast cells similar to human cells). Use for a general purpose of nutritional support, to promote biological regeneration, including the small and large bowel, and to detoxify. Contains all the enzymes and minerals to reactivate the Krebs's cycle and the processes of cellular respiration in mitochondria – in other words to reactivate mitochondria function.[17] If not available, chlorella extract (Sun Chlorella or fermented chlorella) can be substituted for nutritional support and detoxification. Chlorella is also the perfect complete food supplement that the patient needs during the treatment. Chlorella removes heavy metals from the body, which cause damage including to the immune system. Administration: From 40 to 60 ml per day diluted in a mixture of carrot and beetroot juice. Chlorella extract: 15 to 20 tablets per day.
  Many patients on chemotherapy suffer severe anemia and are often subjected to blood transfusions. In such cases, we prescribe Chlorella Growth Factor (CGF), 30 or 40 ml diluted in water to drink two or three times per day. Both enzyme yeast cells preparation and chlorella may be used to detoxify the body, serving as an important step in our cancer protocol. Optionally, a coffee enema may be taken as well.

For advanced cancer patients with pain and taking morphine (or before), we use different substances such as:

- **Snake venom** (Horvi-enzym C 33-300) Also with anticancer properties (especially breast and lung cancer) and as pain killer. Administration: three or four times per week one ampule of each injectable i.m. (also available in oral intake).
- **Liquid Cartilage Extract** also possesses anti-inflammatory properties to decrease or eliminated pain especially from bone metastasis.
- **Horvi-enzyme -Psy 4**. To support patient with depression, anxiety. Administration: eight drops taken on the tongue and keep two minutes before swallowing before each meal.
- **Traumeel, Echinacea compositum, Hepar (Heel Lab).** Administration: mix one ampule of each in one syringe for i.m. or s.c. injection. Can be injected several times per week.

Microbiome therapy is also used as gut bacteria can influence the responses to cancer immunotherapy, increase chemotherapy effectiveness, and modulate anticancer immunosurveillance.[18]

- **Symbioflor (Prosymbioflore + Symbioflore 1).** Contains cells and autolysate of bacteria *Enterococcus faecalis* and *Escherichia coli* 1.5-4.5x10 7. Administration: 30 drops, three times per day directly on the tongue and kept there for about one minute before swallowing. Before breakfast, and before lunch.
- **Probiotics.** Good combinations of probiotics can also be used and need a variety of gut bacteria such as *Lactobacillus johnsonii*, *Lactobacillus rhamnosus*, *L-acidophilus*, *L-paracasei*, *L-murinus*, *L-acidophilus*, *Bifidobacterium bifidum*, *Enterococcus hirae*, and *Ruminococcaceae*. This is just one example of the good bacteria important for our gut to activate the immune function.

Many other dietary compounds and anticancer agents can be use depending on the need and result obtained: resveratrol. green propolis, indole-3-carbinol, artemisinin, CoQ10, IP-6, *Viscum album* (mistletoe), genistein, EGCG, modified citrus pectin (MCP), Avemar, etc….[19]

Curcumin+Resveratrol+EGCG work in synergy to kill cancer stem cells from breast cancer recurrence.

We can better combine the treatment of cancer patient with a personalized therapy if we do the molecular markers testing since, for each patient, the result obtained from the genes is different. The P53 test and testing for other pro-apoptotic-anti-apoptotic genes (VEGF etc.) and analysis of brain chemicals is available at Galkina Laboratory (England): email dntaylor@thegalkinalab.co.uk.

Conclusion

Cancer is a disease of the cellular cycle but also a metabolic disease that implicates mitochondria, and we cannot ignore a malfunction and intoxication of organs such as liver, intestine, kidney, and the nervous system. It also, for many patients, has a relationship with brain neurotransmitters leading to states of depression and anxiety. The intestine-brain axis cannot be ignored, and it is why cancer is not simply a cellular DNA disease, fought with toxic agents called chemotherapy, but a whole disease. To treat the disease, we need to go down to the root, know other factors that may be involved. Classical oncology is looking at the patient as a box and worries only about chemotherapy protocol, including today's new barbaric method such as the Angelina Jolie effect, which is tragic since it removes from the patient the responsibility to recover by treating herself in a way that her body can not only fight the disease but become even more healthy and adopt

Product Sources

Liquid Cartilage Extract (LCE)	(Comitris) Douglas Labs. USA
Horvi enzymes BV	Horvi EnzyMed www.horvi-service.com Leenwerik 23191 DL, Hoogvhet, Rotterdam, Neederland Email: info@horvi-service.com | Phone: 00 31102950161 | www.horvi-service.com
Sun-Chorella USA	Call toll free 1-800.8289-2828 ext .2455
Symbiopharm Gmbh	Tel 44277251268
(Symbioflore 2) Germany	https://www.symbiopharm.de/en/products/symbioflor-2.html
PeakImmune 4 (Rice Bran Arabinoxylan compound)	Daiwa Health Development, Inc. 1411 W. 190th St., Ste. 375, Gardena, California 90248 Email: info@dhdusa.net | Phone: 310-329-2362 | Fax: 310-329-2648
Melatonin	www.swansonvitamin.com; www.iherb.com; www.lef.org
Zell Enzyme Yeast Cells / Zell Oxygen	https://www.regenerativenutrition.com/shopproduct.asp?x=4&x=3&x=2&prod=77
Curcumin	Readily Available www.swansonvitamin.com; www.iherb.com; www.lef.org
Coenzyme Q10	Readily Available www.swansonvitamin.com; www.iherb.com; www.lef.org
Alpha Lipoic Acid	www.swansonvitamin.com; www.iherb.com; www.lef.org

a better way of living – which should be the main objective for any human.

We don't always cure cancer, but we do obtain remarkable results, faster remission, long-term remissions, and longer-term survival with better quality of life in advanced metastatic cancer, which is a victory.

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Serge Jurasunas is a Doctor of Naturopathic Medicine, professor of naturopathic oncology, and a pioneer at the global vanguard of innovative cancer treatment. He has treated thousands of patients who have lived longer. His fields of interest and development include live blood analysis, oxidative dried blood test, iridology, mitochondrial medicine, and colon health. His book *Health Begins in the Colon*, is a reference work for all health professionals. Being a true pioneer in his field, in 1994 he was appointed professor at Capital University of Integrative Medicine in Washington, DC. For the past 10 years, he has been involved in the research and practical application of the P53 tumor suppressor gene and other apoptotic players related to cancer disease and was invited twice to China to speak about it at the World Congress of Molecular Medicine. He has been practicing for over 50 years, traveled and lectured in more than 40 countries. He is the author of seven books, 54 papers presented at international conferences, 28 publications in magazines of alternative medicine, and a frequent contributor to *Townsend Letter*. His work has been translated in several languages including Chinese, Japanese, German, Romanian, Croatian and his field of research, articles and lectures is widely quoted by Google. In 2017 he was honored with the Lifetime Achievement Award, presented at the Congress of Iridology and Integrative Care, by David Pesek, PhD, President of the International College of Iridology, in Orlando Florida. Serge Jurasunas is now writing a new book, *Cancer Treatment Breakthrough,* about immuno-oncology using the rice bran arabinoxylan compound including about a choice of 30 of his best clinical cases to be published sometime in 2019 in the US.

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Hyperthermia Therapy

by James Odell, OMD, ND, LAc©2017

BRMI Medical Director

Hyperthermia is one of the most powerful anticancer, antiviral, and antibacterial therapies available, yet it is underutilized and largely unknown in North America. Hyperthermia treatment involves raising the temperature of the whole body, or of local areas of the body to 39 to 43 degrees C (102 F to 109 F). Research has shown that high temperatures stimulate cellular immunity and can damage cancer cells, usually with minimal injury to normal tissues.[1-5] By damaging proteins and structures within cancer cells, hyperthermia may shrink tumors.[6] In general, malignant cells are more sensitive to heat than are normal cells in the range of 41-45°C. In addition, most clinically apparent tumors (above 1-cm diameter) have blood perfusion rates less than one-fifth that of surrounding normal tissue, meaning that they may be preferentially heated.

In Europe, hyperthermia is considered the fourth major modality of cancer therapy along with surgery, chemotherapy, and radiation. And in Europe, hyperthermia is often utilized as an adjunctive therapy with various conventional cancer treatments, such as chemotherapy and radiotherapy, but in some clinics, is also used alongside biological regulatory therapies.[7] As hyperthermia is non-myelosuppressive and can potentiate the tumoricidal effects of biological regulatory therapies, its use as part of a multimodality treatment approach is attractive. The positive results of randomized trials have established hyperthermia alone, or in combination with biological regulatory therapies, as an effective clinical modality for the treatment of cancer.

Temperature is a highly conserved and important parameter in all living systems. In mammalians, particularly in humans, a narrow range of 37.0 – 37.5°C is attempted to be maintained by regulation. In this range, the complicated cellular and physiological processes are working most efficiently. Under stress conditions, e.g. infectious diseases, fever is a reaction of the organism to better handle with the external attacks. Hence, fever is a natural defense reaction of the human body. The immune system's defense cells work best at a temperature above 39 degrees Celsius (102° F). At this temperature, all metabolic and detoxification processes are intensely stimulated. This helps overcome infections, inflammations, and pain much quicker and more effectively. During fever, the build-up of perspiration activates the excretion of toxic substances. This purifies the body and improves metabolism; and after the fever subsides, the body relaxes, and the pain disappears.

The following are complementary effects of fever:

- Increase in blood circulation and oxygenation of tissues,
- Acceleration of metabolism, detoxification, and excretion processes,
- Relaxation of muscle tension,
- Increase stimulus conduction of nerve fibers,
- Stimulation of cellular immune defenses, and
- Inactivation of chronic bacteria and viruses.

Hyperthermia treatment may be local (tumor only), regional (e.g., a limb), or whole body. Physical techniques for hyperthermia include metabolic heat containment, conduction through the skin (e.g., hot water bath), perfusion of externally heated blood, heated intravenous fluids and anesthetic gases, ultrasound, and electro-magnetic EM coupling modalities. Thermometric requirements vary with the treatment modality and clinical situation. Until the late 1990s, the use of radiant whole-body hyperthermia (WBHT) was restricted to a few specialized treatment centers worldwide. During the last decade, a larger number of WBHT-devices were put into operation, particularly in Germany. Worldwide, hyperthermia is becoming more utilized clinically, due to the substantial technical improvements made in achieving selected increase of temperatures in superficial and deep-seated tumors. In North America, however, it is rarely used, and then only as part of an alternative cancer treatment protocol or research project.

History of Hyperthermia

Fever as the imminent sign of infectious diseases has been used as a diagnostic indicator since ancient times. The effectiveness of heat as a therapy against disease is believed to be known since 3000 BC.[8] Parmenides, a Greek physician and philosopher 2500 years ago said, "Give me a chance to create a fever and I will cure any disease." Fever is one of the body's best defensive and healing forces, created and sustained for the purpose of restoring health. Belief in the curative effect of fever was also

shared by Celsus, a Roman author of the first systematic treatise on medicine "De Medicina," and Rufus of Ephesus, a Greek physician who lived at the turn of the 2nd century. Celsus described the hot baths as a tool in the treatment of various diseases.

There has been a historic, cross-cultural recognition of the benefit of fever and heat therapy. The healing effect of heat was first mentioned in the early civilizations of ancient Egypt, where baths in hot desert sand were prescribed for the ill. Doctors of ancient Greece started using this therapeutic approach and named it 'overheating' (in Greek: hyperthermia). Other examples are the Roman sulfur hot baths, Finnish saunas, Japanese hot baths, Native American sweat lodges, and the many therapeutic hot springs in Europe, Iceland and in the Americas. Saunas and hot baths do not significantly increase core body temperature enough to have an anti-cancerous effect, but they have been shown to stimulate the immune system. More technologically innovative approaches have developed that increase core temperature or local temperature of tumor tissue to levels that damage or destroy cancer cells.

Bacteria-Induced Fever Therapy – William Coley and Coley's Toxins

The history of bacteria-induced fever therapy (fever induction therapy) began in the mid-19th century with several European physicians. One of the first papers on hyperthermia was published in 1866 by German surgeon Carl D. W. Busch. He described the case of a 43-year-old woman with advanced sarcoma on her face. After the tumor was removed, the patient fell ill with erysipelas. The disease induced a high temperature, which led to tumor regression for over two years. Busch's discovery was fundamental because it was the first reported case showing that high temperature can selectively kill cancerous cells while not affecting normal cells.[9] About that time, others reported that cancer patients who experienced a feverish period after surgery survived significantly longer than patients without fever. In 1882, Fehleisen discovered the erysipelas causative organism as *Streptococcus pyogenes*. He inoculated these live bacteria to seven cancer patients and achieved complete remission in three cases.[10] In the second half of the 19th century, the practice of infectious febrile therapy was quite common not only in Germany and France but also in Russia, and it was used to treat a wide range of diseases.

The American surgeon William Coley (1862-1936) also observed that cancer patients often recovered from their cancer if they had suffered a severe post-surgical infection of the wound accompanied by high fever. Coley developed the theory that it was the fever from the infection that had helped patients to recover from their cancer. So, he began to treat patients by injecting *Streptococcus pyogenes* directly into inoperable tumors. He found the treatment was most effective when it provoked a fever and a full-blown infection. This led physicians to understand that the increase in body temperature not only mobilized the body's own immune system, thus fighting off the infection, but also destroyed the tumor at the same time.

Later Dr. Coley decided to use a mixture of dead *Streptococcus pyogenes* and dead *Serratia marcescens* bacteria. This was subsequently termed "Coley's toxins." In 1893, the first patient to receive Coley's toxins was John Ficken, a sixteen-year-old boy with a massive abdominal tumor. Every few days, Coley injected this bacterium directly into the tumor mass and produced the symptoms of an infectious disease but did not produce the disease itself. On each injection, there was a dramatic rise in body temperature and chills. The tumor gradually diminished in size, and after four months of intensive treatment, the tumor was a fifth its original size. Later that year the remains of the growth were barely perceptible.[11] The boy received no further anticancer treatment and remained in good health until he died of a heart attack 26 years later.

Over the next 40 years, as head of the Bone Tumor Service at Memorial Hospital in New York, Coley injected more than 1000 cancer patients with bacteria or bacterial products. By the end of his career, Coley had written over 150 papers on this subject.[12-14] Coley mainly used his toxins on patients with inoperable bone and soft-tissue sarcomas, observing that this treatment was less effective on other types of cancer such as melanomas and carcinomas. Beginning in 1899, Parke Davis and Company had begun to prepare the Coley's toxins, so they were available for all physicians. They were widely used for the next 30 years.

Saunas and hot baths do not significantly increase core body temperature enough to have an anti-cancerous effect, but they have been shown to stimulate the immune system.

In the first half of the 20th century, different formulas of Coley's toxins were manufactured by several drug companies in the US. These formulations were used to treat patients with a variety of cancers until the early 1950s, when other forms of cancer treatment, such as radiotherapy, became more widely used. Despite his reported positive results, Coley's toxins came under a great deal of criticism because many doctors did not *believe* it possible. Medicine has always been, and still is, ruled by belief.

Additional controversies surrounding Coley's work reflect the field of oncology struggling to stabilize its understanding of how to treat cancer. For example, James Ewing, perhaps the most famous cancer pathologist in the country, was a leading opponent of Coley's work. This was a problem for Coley because Ewing was Medical Director of Memorial Hospital and, for many years, was Coley's boss. Their memos to one another reflect constant interpersonal animosity. Ewing himself had become a fanatical supporter of radiation therapy for the treatment of all bone tumors

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and repudiated any other theories for the treatment of cancer. Ewing therefore refused Coley permission to use his toxins at Memorial Hospital. This was ironic because Coley had more experience than any other surgeon in the country in treating the small round blue cell sarcoma that still carries Ewing's name.

Skepticism and criticism, along with the development of radiation therapy and chemotherapy, caused Coley's toxins to gradually disappear from use in the US. By 1952, the Park Davis Company no longer produced Coley's toxins; and, in 1962 the FDA refused to acknowledge Coley's toxins as a proven drug.[15] Thus, in 1962 it became illegal to use Coley's toxins for the treatment of cancer in the United States. However, in Europe, Australia, and Asia, bacteria-induced hyperthermia continued in certain medical circles and has become an advanced immunotherapy. In retrospect, William Coley's intuitions were correct. Using fever induction therapy to stimulate the immune system is effective in treating cancer. Coley was a model of the clinician-scientist, treating patients and using his practice to initiate research and build theories. But he was a man before his time, and he met with severe criticism.

During the second half of the 20th century, which is characterized by heavy use of antibiotics, fever was regarded by mainstream medicine as an unnecessary, weakening state which should be suppressed or prevented. The situation today has not changed much. The immune system is constantly repressed with anti-microbials, and even mild fever is suppressed with anti-febriles.

The Modern Development of Hyperthermia

Fever induction therapy today involves the injection of specific bacterial lysates, which induce the release of cytokines and bring about a fever reaction. The immunological response of cytokine release with underlying fever has been extensively researched over the last several decades. Direct endogenous pyrogens, or proteins that produce fever, are associated with IL-1alpha, IL-1beta, TNF-alpha, TNF-beta (lymphotoxin-alpha), IL-6, macrophage inflammatory protein 1, and IFN-alpha.[16-18] Indirect fever inducers are considered to be IL-2 and IFN-gamma.[19] Usually, the fever response only reaches a maximum of around 39°C (102°F), which is not sufficient to induce enough thermal damage within cancerous tissue. However, the immunological effect of this treatment can greatly improve the general condition of the patient through stimulating the immunity, resulting in a positive response.[20, 21]

Within the last century, hyperthermia has been shown to be of great use in treating cancer. Such techniques as immersion in heated water, artificial fever production by toxins, and fever cabinets have been used historically. In September 1965, physicist and cancer researcher Manfred von Ardenne (1907-1997) presented in the Heidelberg Cancer Research Centre the concept of his so-called systemic Cancer Multistep Therapy – a combined modality treatment including whole-body hyperthermia. At the time, whole-body hyperthermia was attained by a warm water bath plus induced hyperglycemia and a high dosage application of oxygen. Since hyperthermia treatment was a very strenuous procedure, Ardenne supplied oxygen to the patients in support of the treatment. At first, he had difficulty optimizing the treatment, since there was no way to exactly control the internal temperature of the body.[22] Dr. von Ardenne was the first person to specifically treat cancer patients with the help of hyperthermia by using long-wave infrared light. Over the years, however, more technologically advanced equipment guaranteed better control of the overheating process and made widespread use of hyperthermia in clinics possible.

Types of External Hyperthermia

To reach the temperatures necessary to disrupt cancer cell growth, today externally induced hyperthermia procedures are used. These involve ultrasound, microwave, radio wave technology, or infrared light. This differs from induced-fever therapy, by which body temperature increase is induced with a bacterial protein. The high-tech science of external hyperthermia has greatly evolved in the precise control of the therapeutic application of heat. Numerous devices have now been developed to produce elevated temperatures of the body, by a variety of physical means. After a shift in focus to local and regional hyperthermia, there is now a resurgence of interest in systemic hyperthermia or whole-body hyperthermia (WBHT) for treatment of cancer as well as other systemic diseases.

Apart from the induction of biological fever by pathogens or toxins, all methods of external hyperthermia involve transfer of heat into the body from an external energy source. The administration of a hyperthermia treatment requires technology to heat the tissues as well as technology to monitor, control, and evaluate the thermal or other parameters involved in the heat treatment. External hyperthermia is basically divided into three types: local hyperthermia, regional hyperthermia, and whole-body hyperthermia.[23, 24] Because of the different routes and different range of heating temperatures, the treatment scopes are also different. Local hyperthermia is appropriate for small tumors, such as breast, whereas, the regional and whole-body variant is used for metastatic tumors.

Local hyperthermia is performed with superficial applicators (microwave, radio wave, ultrasound) of different kinds (waveguide, spiral, current sheet etc.). These applicators are positioned upon superficial tumors coupled to the tissue by water bags or a water bolus. The penetration depth depends on the frequency and size of the applicator, and typically the clinical range is not more than 3 – 4 cm. A system for local hyperthermia consists of a generator, the control computer, the applicator and the possibility to measure temperature in the tumor. Then the power is increased until the desired

temperature is achieved. Indications for local hyperthermia include chest wall recurrences, superficial malignant melanoma lesions, and lymph node metastases of head and neck tumors.

Local hyperthermia is further typed as external, endoluminal, and interstitial. Local external approaches are used to treat tumors that are in or just below the skin. External applicators are positioned around or near the appropriate region, and energy is focused on the tumor to raise its temperature. Intraluminal or endocavitary methods may be used to treat tumors within or near body cavities, such as the esophagus or rectum. Probes are placed inside the cavity and inserted into the tumor to deliver energy and heat the area directly. Based on their design the interstitial hyperthermia techniques can be categorized in four groups; radiofrequency, microwave, hot source and ultrasound techniques. The hot source techniques distinguish themselves from the other techniques because the tissue is heated by thermal conduction while the other techniques deposit energy directly in the tissue at a distance from the heating source.

Endoluminal hyperthermia uses natural orifices to position various kinds of endocavitary applicators (microwave, radio wave, ultrasound) in direct contact to a tumor. A counter electrode might be positioned on the body surface to steer the power deposition pattern. For physical reasons, the penetration depth around those endoluminal applicators is limited and of the order of the applicator´s diameter (in the cm-range). Accessible tumors include esophageal carcinoma, prostate carcinoma, rectal and cervical carcinoma.

Interstitial techniques are used to treat tumors deep within the body, such as brain tumors. This technique allows the tumor to be heated to higher temperatures than external techniques. Under anesthesia, probes or needles are inserted into the tumor. Imaging techniques, such as ultrasound or magnetic resonance, may be used to make sure the probe is properly positioned within the tumor. The heat source is then inserted into the probe. For interstitial hyperthermia, an array of interstitial antennas (microwave) or electrodes (radio wave) is implanted in accessible tumors which might be located in deep or superficial tissues. The distance between the antennas must not exceed 1 – 2 cm, and therefore lesions with diameters below 5 cm are suitable (in order to limit the number of puncturing tracks). Interstitial hyperthermia is an invasive procedure. Temperature measurements must be performed at the antennas and between them. In most systems, every single antenna is controlled by its own generator. Dedicated systems have in addition two or more segments per antenna or electrode controlled in phase and/or amplitude. Clinically, interstitial hyperthermia has been applied for prostate carcinoma, recurrent breast cancer, and malignant brain tumors.

Thermoablation may also be performed with thin laser applicators (laser induced thermotherapy or LITT) and is considered a minimally invasive procedure. The applicators must be implanted in the lesions under computer tomography or magnetic resonance guidance. Achieved temperatures are high (up to 90 °C), but the thermal gradients are quite steep and the effective range is 1 – 2 cm (i.e. lesions with diameters of 3 – 4 cm are the limit using standard techniques). Liver metastases (number up to 4) are probably the most treated condition with LITT.

Another form of local hyperthermia that is growing in popularity, especially in China, is high intensity focused ultrasound (HIFU). HIFU is a hyperthermia procedure that applies precise high-intensity focused ultrasound energy to heat and destroy cancerous and diseased tissue through ablation. When magnetic resonance imaging is used for guidance, the technique is sometimes called magnetic resonance-guided focused ultrasound, often shortened to MRgFUS or MRgHIFU. Magnetic resonance imaging guidance allows the tumor to be visualized and targeted and, in addition, provides a means to measure tissue temperatures in real time. HIFU is used often as a solo treatment or sometime used with other treatments. Unlike radiotherapy, HIFU is a non-invasive technique that also leaves healthy tissue next to a tumor undamaged. In China, over the last decade, thousands of patients with breast cancer, liver cancer, pancreatic cancer, bone tumors, renal cancer, prostate cancer and uterine fibroids have been treated with ultrasound imaging-guided HIFU.

In the US, HIFU is only approved to treat uterine fibroids. However, there is ongoing research in the area of breast cancer with HIFU conducted by Dennis L. Parker, PhD, a professor of radiology at the University of Utah and Director of the Utah Center for Advanced Imaging Research (UCAIR). Dr. Parker and colleagues at UCAIR are leading in the development of a HIFU system for breast tumors. Now in prototype form, their system has been tested on phantoms and samples. According to Dr. Parker, "From the standpoint of something that could ultimately be used to treat breast cancer, I think this

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is an excellent, potential device. The advantage of HIFU for breast cancer is that it's totally noninvasive. It has the opportunity eventually to totally eradicate the disease without any surgical intervention at all."[25]

In regional hyperthermia, interference patterns in deep-seated tumors of the pelvis or lower extremities are generated by an array of phase-controlled antennas radiating in the range of 70 – 150 MHz These antennas are surrounding the whole circumference of the cross section, i.e. all possible directions are employed to deposit power into the target volume. The higher the number of antennas (and the higher the frequency), the better the potential to control the patterns. In particular, several rings of antennas in direction of the patient axis are useful to enable the flexibility with respect to the anatomical structures for optimization. A current frequency of clinical interest is 100 MHz. Locally advanced and/or recurrent tumors of the pelvis are the major indications for regional hyperthermia, i.e. rectal carcinoma, cervical carcinoma, bladder carcinoma, prostate carcinoma, or soft tissue sarcoma.

In contrast to local or regional hyperthermia which heats only one part of the body, namely where the tumor mass is located, whole body hyperthermia (WBHT) heats the entire body. WBHT heats the whole body either up to 42 °C for 60 - 120 minutes (so-called extreme WBHT), or only 39.5 – 41 °C for longer time, e.g. 3 hours (so-called moderate WBHT). Temperature and duration of treatment is usually individually determined depending on the patient's health condition. Between the heating and cooling phase, the entire procedure may last about four to five hours. Generally, WBHT in the treatment of metastatic cancer raises the patient's temperature to 41.6° C. to 41.8° C for 60 to 90 minutes. This is a much higher temperature and longer plateau than the WBHT IRB[26] research protocols used in the US.

For WBHT, the patient is as far as possible thermally isolated, and infrared radiation with different ranges of wavelengths (for several available systems) is depositing energy in the superficial tissues of the body until the desired temperature is achieved. For extreme WBHT, 60–120 minutes are needed until the patient has 42°C achieved under general anesthesia (plus/minus intubation). For moderate WBHT, often deep sedation is sufficient. In any case, careful monitoring of the systemic parameters is required for any kind of WBHT, and an intensive care unit should be available in the background.

WBHT is used principally in advanced stages of cancer and as a metastatic prophylaxis in high-risk patients, e.g., young premenopausal women with breast cancer, lymph node involvement and negative hormone receptor status. Several WBHT-approaches have proved to be safe and associated with acceptable toxicity rates when radiant heat devices are employed. Until the late 1990s, the use of WBHT was restricted to a few specialized treatment centers worldwide. During the last 20 years, a larger number of WBHT-devices have been put into operation throughout Europe and Asia. Because many women diagnosed with invasive breast cancer have undetected occult metastases at the time of their primary tumor diagnosis, it may be more desirable to employ WBHT as opposed to local hyperthermia.

In Europe and Asia there are several types of WBHT systems in clinical use. Over the last decade, patient warming with infrared radiation has been established as a standard procedure for WBHT treatment. WBHT systems differ with regard to the spectrum of infrared radiation used and the area of application (front or back of the patient). At the time of this writing some of the more common systems are the Heckel HT-3000,[27] the Oncotherm WBH-2000,[28] the Chinese manufactured Gamma Star GMX-RL-03 WBH system, and the Ballya International Ltd WBH system, only to name a few. The Heckel HT-3000 (manufactured by Hydrosun Medizintechnik GmbH, Esslingen, Germany), uses water-filtered infrared radiation (wIRA) delivered by four wIRA emitters to the chest, and two heating elements for warming the air under the tent-like canopy. It features continuous measurement of core temperature, heart rate, oxygen saturation, blood pressure, ECG, respiratory frequency. The OncoTherm WBH-2000 unit is a chamber that encloses all but the patient's head. Special light-emitting diode (LED) radiators deliver computer-generated, alloy-filtered IRA wavelengths that penetrate the skin to deliver heat to the capillary bed. The manufacturer claims that these wavelengths also preferentially stimulate the immune system.

Hyperthermia Societies

Much of the history and development of hyperthermia is rooted in Europe and has been fostered by organizations such as the European Society for Hyperthermia Oncology.[29] China and Japan have also become world leaders in the clinical use of hyperthermia. In 1978, research on hyperthermia in Japan was started by the Hyperthermia Study Group. Six years later, the Japanese Society of Hyperthermic Oncology (JSHO) was established. Since then hundreds of research articles have been published in China and Japan. It is estimated that more than two hundred hyperthermia units are in use across Japan. Compared to other countries, Japan has the highest number of installed hyperthermia equipment and the most doctors involved in hyperthermia therapy. The main reasons for the advanced state of hyperthermia research in Japan include the development of excellent heating equipment, high membership in JSHO, grant-in-aid by the Japanese government, and coverage by insurance for this form of therapy.[30]

In 1981, the North American Hyperthermia Society was founded by those who shared the opinion that hyperthermia continued to show promise as a therapeutic modality and that the growing numbers of investigators and the amount of data produced required a separate forum for discussion of results and planning future directions of research and application. In

1985, the North American Hyperthermia Society, together with the European Society for Hyperthermic Oncology, and the Japanese Society of Hyperthermic Oncology cooperatively founded the *International Journal of Hyperthermia* and adopted it as their official journal.[31]

Despite several decades of ongoing usage in Europe, China, and Japan, and numerous human studies, WBHT is still considered 'experimental' in the US, where chemical medicine trumps all other forms of oncological therapy. Hence, WBHT is limited to a few research IRBs (institutional review board) in the US. However, numerous clinics abroad, especially in Germany, Austria, Italy, Switzerland, China, and Japan, regularly use WBHT as an integrative approach for cancer care.

Hyperthermia Anti-Cancer Mechanisms

Understanding of the mechanisms by which heat destroys cancer cells is ever changing, partly because is a new emerging field; and the biological effects of local hyperthermia and WBHT, or systemic hyperthermia, are different. Aside from the stimulation to the immune system, hyperthermia has an unique physiological effect on tumors. It was initially thought that tumor cells have intrinsically higher heat sensitivity than normal cells, but this is now shown to be not universally true. Although some neoplastic cells are more sensitive to heat than normal cells, this appears to be more the case for local hyperthermia than the lower temperatures used in WBHT. However, as we have seen in oxidative therapy, tumors do have their weaknesses, and heat definitely can disrupt the tumorous environment. Contrary to healthy tissue, tumors cannot easily divert heat because of their primitive blood supply. This has to do with the fact that tumor cells have a different metabolism and their vascular supply network is different compared to those of healthy cells. Because of their poorly constructed vasculature, tumors have poor perfusion, thus heat dissipation by convection is reduced. At high temperatures (43.8 C and up) tumors become a heat reservoir with a consequent rise in temperature, which if maintained for too long damages their microcirculation and further impairs convective heat loss. Also increased fibrinogen deposition at damaged sites in the vascular wall leads to occlusion of tumor microvessels. Significant heating of the tumor cells results, which may be directly cytotoxic.[32]

We know when body temperature reaches 101.3° F (38.5° C) the immune system becomes active and begins producing white cells and immune chemicals. Within hours, almost every major defense within the immune system doubles its efforts. This process appears to be dormant in many cancer patients, who typically report never having experienced a fever in a long time. Results from studies show that cancer cells form a special type of protein structure on their surface when heated to a temperature of approximately 42° C, which does not happen with normal cells. These protein structures, also known as heat shock proteins (HSPs), are recognized by the body's immune system as foreign substances, thus enabling the immune system to destroy them.[33, 34]

The increased expression of HSPs after hyperthermia treatment has been shown to correlate with increased immunogenicity of cancer cells through their lysis by alpha/beta T cells. HSPs belong to a group of "stress proteins" secreted after a wide range of stimuli such as exogenous heat, oxidative injury, heavy metal toxicity, and microorganism toxins. HSPs have been suggested to act as 'molecular chaperones' in presenting protein structures to the lymphatic system. In this respect they may serve as carriers for antigenic tumor peptides and, thereby, increase the natural immunity to attack cancer.[35, 36]

Basically, hyperthermia works in two ways: first by creating thermal damage and secondly by stimulating the body's own immune system.[37] An overview of some specific mechanisms of hyperthermia in cancer treatment are as follows.[38]

Programmed cell death of cancer cells (apoptosis). The mechanisms of hyperthermia causing cancer cell apoptosis are complex, but mostly related to disrupting the vascularity of the tumor, denaturing cellular proteins, changing the fluidity of bio-membrane, leading to destruction of the cancer cell membrane, as well as cell nuclei and other cytoplasmic components.

Inhibiting metastasis. Hyperthermia can inhibit the synthesis and repair of cell DNA, RNA and protein to stop cancer cells' reproduction, and inhibit the gene expression and synthesis of tumor matrix metalloproteinase to inhibit the metastasis trend of tumor. Another proposed metastasis inhibiting mechanism of hyperthermia is that it can inhibit transforming growth factor beta-1-induced epithelial-mesenchymal transition in cancer cells, hence, altering the properties of metastatic potential in cancer cells and inhibit tumor metastasis.[39]

Basically, hyperthermia works in two ways: first by creating thermal damage and secondly by stimulating the body's own immune system.

Inhibiting the formation of tumor blood vessels (anti-angeogenesis). Studies have shown WBHT can inhibit gene expression and synthesis of vascular endothelial growth factor excreted by cancer cells. This can prevent the formation of blood vessels to tumors, which destroys the basic condition for growth and development of cancer metastasis.

Enhancing the effect of chemotherapy. WBHT results in an increased delivery of drugs to tumor sites partly because of increased systemic blood flow. Additionally, because hyperthermia can change the permeability of cell membranes, this can increase the concentration of anticancer drugs in the cancer cell cytoplasm.[40] WBHT can also increase blood vessel permeability by increasing the effective pore size between the

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loosely bound endothelial cells forming tumor microvessels, permitting larger molecules, such as nanoparticles and gene therapy vectors, to pass into the interstitium.[41]

Enhancing the effect of radiotherapy. Hypoxic cells and the cells in the S-stage are especially sensitive to heat, but resistant to radiation. Hence, hyperthermia and radiotherapy compensate each other. Hyperthermia has been shown to potentiate the effect of radiation therapy in the treatment of superficial lesions (less than 3 cm in depth).[42] Clinical experience has largely been limited to treatment of recurrent, metastatic superficial melanomas, chest wall recurrence of breast cancer, and cervical lymph node metastases from head and neck cancers. Tumor depth is a critical factor when combining radiation therapy and hyperthermia. Lesions less than 3 cm from the surface treated with radiation therapy and hyperthermia have been shown to have a significantly greater complete response rate compared to the complete response rate of lesions greater than 3 cm deep.

Bone marrow protection. WBHT can stimulate bone marrow by increasing peripheral blood flow and can induce the differentiation of peripheral blood and hematopoietic stem cells in bone marrow. Clinical practices showed that whole-body hyperthermia will not increase marrow suppression like radiation or chemotherapy.

Improves the function of immune system. Because practically all cancer patients have a lower than average core temperature and are unable to develop a fever, they are unable to activate their immune system. Hyperthermia assist in activating several immune functions. Though the immunotherapeutic role of hyperthermia is not yet completely understood, it has been shown that WBHT can activate long-acting T-lymphocyte and increase the activity of T- and B-lymphocyte.[43] At treatment temperatures above 40°C, both enhancing and inhibitory effects of cytotoxic activity of NK cells against tumor cells have been reported. In particular, an enhancement of human NK cytotoxicity against tumor cell targets has been demonstrated using a temperature of 39.5°C.[44] WBHT can also facilitate the redistribution of the body's white blood cells to improve the monitoring function of body's immune system.

Though whole-body hyperthermia has primarily been used in the field of oncology, it is also used to treat an array of other illnesses. Particularly, WBHT is clinically used for certain chronic infectious diseases, such as HIV,[45] hepatitis C,[46] herpes,[47] borellia[48] (Lyme disease), and numerous other pathogens.[49] Literature supports that the retrovirus, human immunodeficiency virus (HIV), which is thought to cause acquired immunodeficiency syndrome (AIDS), is heat sensitive at temperatures which can be tolerated in humans. This heat sensitivity is true for many viruses and bacteria.

Toxicity and Side Effects

Based on several research groups' reports, whole body hyperthermia, accompanied by suitable monitoring, does not lead to any serious or sustained organ dysfunction and can therefore be regarded as a safe therapy.[50-54] Bear in mind that many advanced cancer patients are debilitated, anemic, and may have poor organ function due to chemotherapy and radiotherapy. Sophisticated monitoring equipment has greatly lessened the side-effects of WBHT, but the condition of the patient's health should be evaluated prior to each treatment.

Since WBHT is rarely utilized as a single treatment modality, it is important to recognize that systemic hyperthermia combined with chemotherapy and radiation may enhance some of the toxicities associated with these modalities. For example, the cardiotoxicity of doxorubicin and both the renal toxicity and hematological toxicity of platinum agents may increase under hyperthermia.[55] However, non-toxic biological regulatory therapies are excellent companions to hyperthermia and minimize any risk.

Impressive effects of hyperthermia, both internally induced as fever therapy, and external applications, have been proven again and again in scientific studies. Research has shown that temperatures between 40°C and 43°C can activate immunity, damage cancer cells, and treat numerous infectious diseases with no or minimal injury to normal tissues. There currently are dozens of clinics operating throughout the world that are using various types of hyperthermia for treatment in oncological and other conditions.

The information in this monograph is intended for informational purposes only and is meant to help users better understand health concerns. Information is based on review of scientific research data, historical practice patterns, and clinical experience. This information should not be interpreted as specific medical advice. Users should consult with a qualified healthcare provider for specific questions regarding therapies, diagnosis, and/or health conditions prior to making therapeutic decisions.

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A Metabolic Explanation of Cancer: The Bio-Energetic Theory of Carcinogenesis

by Michael J. Gonzalez[1], DSc, NMD, PhD, FACN, and Jorge Duconge[2], PhD

Abstract

Cancer is considered a genetic disease involving nuclear mutations. This view has persisted despite numerous inconsistencies with the somatic mutation theory. In contrast, emerging evidence advocates cancer as a mitochondrial metabolic disease, in accordance to the original theory of Otto Warburg. In this paper, we discuss the evidence that favors cancer as a metabolic derangement instead of a genetic disease. This paradigm changing concept can also influence how we treat cancer with hope in improving outcomes.

Introduction

Eukaryotic mitochondria resulted from symbiotic incorporation of α-proteobacteria into ancient archaea species. During evolution, mitochondria lost most of the prokaryotic bacterial genes and only conserved a small fraction, including the encoding 13 proteins of the respiratory chain. In this process, many functions were transferred to the host cells, but mitochondria gained a central role in the regulation of cell proliferation and apoptosis, and in the modulation of metabolism. Defective mitochondria may contribute to cell transformation and cancer, diabetes, and neurodegenerative diseases. Many effects of the mitochondria depend on the modulation of respiratory rate and on the production of hydrogen peroxide and other oxidative species released into the cytosol.

All cancer cells regardless of their tissue origin express a defect in mitochondrial energy metabolism. The view of cancer as a genetic disease has been an issue of confusion and is largely responsible for the failure in treating the disease. This view of cancer as a genetic disease is based on the flawed assumption that somatic mutations cause cancer—although we should state that genomic instability is linked to respiratory insufficiency. The mitochondrial oxidative rate has to remain depressed for cell proliferation to occur; even in the presence of oxygen, energy is obtained from increased glycolysis (Warburg effect) (Antico-Arciuch et al, 2012).

It is likely that the major impediment to the effective treatment of cancer has been the confusion surrounding its origin. Most of the confusion arises from the absence of a unifying theory that integrates all aspects of the disease. We propose the Bio-Energetic Theory of Carcinogenesis as the main theory to fill this gap in the understanding of the origin of cancer (Gonzalez et al, 2012).

In general, the Bio-Energetic Theory of Carcinogenesis states that cancer originates from damage to the mitochondria that impairs the cell's capacity to generate energy with oxygen (oxidative energy production) with a concurrent increase in energy generation without oxygen. In other words, this theory states that cancer is not of genetic origin but rather a disease of metabolism.

This theory is based on the ideas proposed in 1924 by the Nobel Prize-winning German biochemist Otto Warburg. These ideas were subsequently discarded when it was discovered that cancer cells had mutations to their DNA. So, it was concluded that if cancer cells have mutations to the molecule that dictates all cellular functions, then that must be the cause of the disease.

A healthy cell produces 89% of its energy using oxygen, and 11% through non-oxidative metabolism (non-oxidative metabolism is also known as fermentation). Oxidative energy production is far more efficient than fermentation. Almost 20 times more energy is released when glucose is completely oxidized, as opposed to when it is just fermented.

The Bio-Energetic Theory of Carcinogenesis explains that the disease begins with damage to the mitochondria. The cell is then forced to shift energy production to fermentation in order to survive. So, two main characteristics of cancer are (1) damaged mitochondria and (2) increased fermentation, which are present in all cancer types. Also, the greater the degree of fermentation displayed by a given cancer, the more

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aggressive the cancer is. Because a tumor cell's mitochondria are damaged and, therefore, are forced to generate energy by an inefficient pathway, they need to consume much more glucose to remain viable. A glance at a PET scan, which uses a radioactive-labeled glucose analog to image cancer, provides stunning visual evidence of the necessity that tumor cells have for glucose compared to normal cells.

It is interesting that since 1885, when Freund observed that patients with malignant disease can develop spontaneous hyperglycemia (Freund et al, 1885), there has been episodic interest in the association of the altered glucose metabolism in nutrition and neoplasia (Marks et al, 1957). As early as 1924, Händel and Tadeuma summarized the findings in those days by the following statement: "A diet rich in carbohydrates has a pronounced stimulating impact on tumor growth" (Händel et al, 1924).

Emerging evidence reveals that all hallmarks of cancer can be explained by mitochondrial damage followed by a shift to non-oxidative energy metabolism. Once the oxidative energy generating capacity of the cell is impaired, the cell undergoes a dramatic transformation; it is when oncogenes are switched on, initiating and propagating the uncontrolled proliferation that is the main hallmark of cancer.

Genetics and Cancer

Most genetic changes in tumor cells are irrelevant to the origin of cancer. They can be described as an epiphenomenon of the metabolic/physiological chaos due to the less availability of cellular energy.

Genomic instability has been assumed to elicit the large number of mutations found in tumor cells, thus supporting the idea that cancer is a genetic disease. While genome changes participate in disease progression, they do not cause the disease. Cancer is a disease of defective cellular energy metabolism. Most genomic effects found in cancer arise as secondary downstream effects of defective energy metabolism (Seyfried et al, 2010).

Respiratory insufficiency precedes the genomic instability that further contributes to tumor development. Once established, this genomic derangement also contributes to further respiratory impairment, mutability, and tumor progression. Metabolic derangements precede genetic changes. It is, in essence, a process that starts as an epigenetic phenomenon that eventually changes the genotype.

The genetic mutations acquired following mitochondrial impairment unquestionably contribute to the tumor cell's features and aggressiveness but are not the cause of the disease. They appear to be of secondary consequence or an epiphenomenon to the metabolic dysfunction. While it's true that most of the agents known to cause cancer – chemical carcinogens, viruses, radiation, and inflammation – can cause mutations to DNA, it is also true these agents damage cell membranes and especially the mitochondria. Once the mitochondrion is damaged, the cell reverts to fermentation to obtain energy, we can state that the cancer has begun. It is subsequent to the shift in energy metabolism that genomic instability and mutations occur (Seyfried et al, 2010). Genetic sequencing data has been unable to implicate genetic mutations as the cause of cancer; in contrast metabolic dysfunction has been shown to be present in every type of cancer, regardless of tissue of origin. In an attempt to explain the random complexity of the thousands of mutations reported in cancer, researchers claim that cancer is a collection of over 200 different diseases. We believe that cancer is just one disease, a metabolic one. It is not a collection of over 200 different diseases as the genetic theory proposes.

The genetic mutational profile of any given cancer type looks different from person to person, rendering it impossible to claim that mutations are definitely responsible for the origin of the disease. To make this issue even more confusing, the mutational profile is different from cell to cell within the same tumor, rendering drug development to target mutations next to impossible. No mutation has yet been identified that is reliably diagnostic of any type of cancer. So, we definitely see genetic changes in cancer progression but secondary to the metabolic problem, which contributes to perpetuate the malignant state.

To achieve real therapeutic progress, the true origin of the disease needs to be determined. All therapeutic progress, from prevention to treatment, must arise from a foundation of understanding of the disease.

While it's true that most of the agents known to cause cancer…can cause mutations to DNA, it is also true these agents damage cell membranes and especially the mitochondria.

A series of nuclear/cytoplasm transfer experiments are exceptionally important in revealing the true nature of the disease. In brief, the experiments consist of transferring the nucleus of a cancer cell into a healthy cell that has had its nucleus removed prior. The newly created hybrid cell has the genetic material of a cancer cell, with all of its defects, but now has the healthy mitochondria of a normal cell. Intuitively, if the origin of cancer is indeed due to mutations to DNA, the newly created hybrid cells that still retain all of the mutations of the cancer cell nucleus should be tumorigenic. But they were not.

These experiments were carefully executed with strict controls and were found to be very reproducible. Experiments like these provide irrefutable evidence that DNA mutations are not the origin of cancer; the damaged mitochondria are. All cells require regulated energy homeostasis to maintain their differentiated state (Elliott et al, 2012). It should be stated that mitochondrial dysfunction leads to nuclear genome instability.

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Cell Energetics

In order for cells to remain viable and to perform their programmed function, they must produce energy. Membrane pumps require constant energy to maintain functionality. Most cell functions are linked to the membrane potential and to the Na+/K+/Ca+ gradients. Availability of ATP to the pumps maintains these ionic gradients. If these pumps are disrupted, cellular dysfunction will ensue. Regardless of cell type or tissue origin, cancer cells share a singular characteristic and that is abnormal energy metabolism. Energy dysregulation is the hallmark of malignant cells. Tumor cells differ from normal cells in the origin of the energy produced rather than in the amount of energy produced.

We truly believe that targeting the defective energy metabolism of tumor cells will eventually become the most effective approach to cancer management.

Another important characteristic of cell energetics is that at physiological levels reactive oxygen species (ROS), a product of oxidative phosphorylation, function as cellular messengers in intracellular signaling and regulation. It is feasible that these molecules have a role in gene regulation, especially cell division.

Warburg Hypothesis

The shift by cancer cells from OxPhos (oxidative phosphorylation) to glycolysis, even under normoxic conditions, is called the Warburg effect. ATP production by glycolysis can be more rapid than by OxPhos, but it is less efficient in terms of molecules of ATP generated per unit of glucose. Therefore, tumor cells must increment the rate of glucose uptake. The energy efficiency of aerobic glycolysis is low, since two ATP are produced, which represents eighteen times less than the complete degradation of glucose producing 36 ATP.

Aerobic fermentation involves elevated glucose uptake with lactic acid production in the presence of oxygen. Warburg stated that irreversible damage to respiration was the prime cause of cancer (Warburg et al, 1931; Warburg et al 1956; Warburg et al, 1969). Warburg was the first to describe in detail the dependence of cancer cells on glucose and glycolysis in order to maintain viability following respiratory damage (Warburg et al, 1931; Warburg et al 1956; Warburg et al, 1969). Warburg considered energy as the central issue of carcinogenesis. Warburg considered fermentation as the formation of lactate from glucose in the absence of oxygen. This type of energy pathway is also utilized in mammalian embryos and muscle cells during strenuous exercise. Here, pyruvate instead of entering the TCA cycle is reduced to lactate in the absence of oxygen. Lactate fermentation generates NAD+ that can be used as an electron acceptor. In cancer cells, this fermentation occurs even in the presence of oxygen.

Lactate is basically a metabolic waste from incomplete oxidation of glucose; nevertheless, it can be recycled at a high energetic cost in the Cori cycle. The Cori cycle produces two ATPs at a cost of six ATPs, which in part explains the cachexia syndrome in patients with advanced cancer. Most lactate enters the blood stream where it is used to synthesize glucose in the liver. Warburg attributed this aerobic fermentation in tumor cells to respiratory damage or respiratory insufficiency. In other words, damaged mitochondria.

One relevant issue pertaining to the Warburg hypothesis is that mitochondrial amino acid fermentation confuses the boundaries between normal respiration and fermentation; this particular issue can bring light to much of the controversy surrounding this hypothesis, since it can give a false impression of mitochondrial oxidative phosphorylation.

Cancer cells not only consume glucose in excess but also amino acids, especially glutamine, derived from muscle proteolysis. Glutamine, which is the preferential mode of transportation of blood nitrogen, provides amine groups for several biosynthetic processes, such as purine and pyrimidine bases synthesis.

Cancer cells that rely on glutamine for energy production are able to produce ATP through non-oxidative processes in the mitochondria. Glutamine metabolism increases ammonia in the extracellular environment. Ammonia can neutralize acidity from glycolytic lactate production (Baggetto et al, 1992; Kelly et al, 1974). So, caution is therefore necessary in using pH as an indicator of lactate production (fermentation) in cancer cells that use glutamine as fuel. This type of pseudo-respiration has the biochemical characteristics of normal respiration but does not involve ATP synthesis through oxidative phosphorylation (OxPhos). The energy is derived from amino acid fermentation. Glucose and glutamine interact synergistically to drive tumor cell fermentation (Seyfried et al, 2010; Seyfried et al, 2011).

The external pH of solid tumors is acidic as a consequence of increased metabolism of glucose and poor perfusion. Acid pH has been shown to stimulate tumor cell growth, invasion, and metastasis.

Mitochondrial Uncoupling and Cancer

Uncoupling involves dissipation of the mitochondrial proton gradient. Uncoupling produces heat instead of ATP. Heat production is greater in less differentiated tumor cells (Seyfried et al, 2010). The greater heat production in the less differentiated cells supports the hypothesis that mitochondrial uncoupling is greater in cancer cells that are more malignant. Moreover, heat production is correlated with increased glucose consumption and lactic acid

Lipids may have a further relevant role in carcinogenesis related to the mitochondrial membrane…. Mitochondrial lipid abnormalities are common in all tumors.

production (Nittinger et al, 1990). The greater the uncoupling, the greater will be the need to produce energy through substrate level phosphorylation (aerobic glucose fermentation).

While reduced oxygen uptake may be indicative of reduced OxPhos, increased oxygen uptake may or may not be indicative of increased OxPhos and ATP production (Jahnke et al, 2010; Samudio et al, 2009; Ramanathan et al, 2005). In this sense, oxygen consumption in tumor cells could provide misinformation of the true respiratory capacity of these cells.

Mitochondrial dysfunction can be characterized by any of three ways: 1) by not having enough mitochondria, 2) by not having adequate substrate or nutrient co-factors needed for oxidative phosphorylation, or 3) by acquired dysfunction in the ATP synthesis machinery.

Mitochondria and Differentiation

Mitochondria provide the energy needed to maintain cellular differentiation. The total number of mitochondria in tumor cells is significantly lower that the number of mitochondria in normal cells (Seyfried et al, 2010). The total respiratory capacity of tumor mitochondria is lower than that of mitochondria of normal cells (Seyfried, 2010; Seyfried et al, 2014). Abnormalities in mitochondrial size and shape are correlated with mitochondrial dysfunction (Benard et al, 2008; Shapovalov et al, 2011; Matés et al, 2009). Highly malignant tumors do not have mitochondria of normal morphology and number (Seyfried et al, 2010). The greater the degree of mitochondrial morphological abnormality, the greater the degree of malignancy (Pedersen et al, 1978). Respiratory impairment requires enhanced fermentation to prevent apoptosis (Seyfried et al, 2010). Moreover, enhanced fermentation prevents differentiation and is linked to uncontrolled cell proliferation (Seyfried et al, 2010).

ATP synthesis through mitochondrial fermentation involving substrate level phosphorylation could give the false impression that tumor mitochondria are producing ATP through respiration (Seyfried et al, 2010). The failure to recognize this type of ATP production by a non-oxidative process in tumor mitochondria contributes to the confusion surrounding the Warburg hypothesis of cancer and explains the basis of its rejection (Denny et al, 2010).

Stem cells are described to have minimal mitochondrial structures with few cristae. Increased mitochondrial function is important for differentiation.

Cellular Communication Between the Mitochondrion and the Nucleus and Cancer

There is a development of bidirectional signaling mechanisms between the mitochondrion and nucleus. Communication and signaling pathways from nucleus to the mitochondria are ancient, early developed communication routes that coordinate the mitochondrial response to changing intracellular microenvironment and act as sensor mechanisms governing the cellular response to external stimuli (Grabacka et al, 2014). Evolution had led to the transfer of increasing numbers of genes encoding the proteins crucial for respiration to nuclear genome. Mitochondrial DNA encodes only 13 subunits of respiratory complexes I, III, IV, and V, although they are indispensable for electron transport and respiration. Nuclei have taken over the significant control expression of respiratory complexes but also numerous proteins involved in the maintenance and replication of mtDNA or enzymatic machinery driving various metabolic pathways in the mitochondrial matrix (Scarpulla,2002, Scarpulla,2002 (B)). Communication and signaling pathways from mitochondria to nucleus evolved as a cellular adaptation to factors and conditions that impair mitochondrial functions. When mitochondria emit such a signal to the nucleus, the cell can switch on repair programs and reorganize metabolism to keep energetic homeostasis (Guha and Avadhani, 2013). This pathway can be induced by defects in the respiratory chain, accumulation of mtDNA mutations, alterations in mtDNA copy number, or loss of membrane potential.

Lipids and Cancer

Lipids may have a further relevant role in carcinogenesis related to the mitochondrial membrane. OxPhos capability is linked to the structural integrity of mitochondrial cristae (Frey et al, 2000; Putignani et al, 2008; Paumard et al, 2008). Lipids maintain the integrity of these bio-membranes. Abnormalities in lipids can compromise mitochondrial function. Mitochondrial lipid abnormalities are common in all tumors. Altered mitochondrial lipids reduce the efficiency of OxPhos, requiring increased energy production through substrate level phosphorylation.

Phospholipids and Cancer

Cardiolipin is known as the signature phospholipid of mitochondria. It is responsible for a wide range of ➤

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mitochondrial functions. Abnormalities in the structure of cardiolipin have been identified in tumor cells (Seyfried et al, 2014).

It is important to clarify that the in-vitro growth environment produces lipid and electron transport abnormalities in mitochondria in both tumorigenic and non-tumorigenic cells (Kiebish et al, 2009). A failure to recognize this fact could confuse data interpretation related to energy metabolism. Caution should be taken when comparing energy metabolism of malignant vs non-malignant cells in tissue culture environments since they do not truly replicate the in vivo environmental growth conditions. This could have been the problem interpreting key experiments defining the metabolic origin of cancer.

Mitochondrial Oncology: The Next Frontier

Once considered exclusively the cell's powerhouse, mitochondria are now recognized to perform multiple essential functions beyond energy production, impacting most areas of cell biology and medicine especially cancer.

The customary cancer therapeutic strategy is based on cancer cell killing, which has not proven to be successful. Treatment of cancer should be based on essential and specific differences between healthy cells and cancer cells.

Protocol for Cancer

If we are correct that cancer is truly a metabolic disease, the therapeutic implications are huge. First, if we are correct, it would explain why virtually no progress has been made in reducing the death rates from cancer since 1950. Second, it opens up many possibilities for new avenues of treatment. The first place to start is manipulating the macromolecules of our diet by implementing a low carbohydrate diet (Paleo or ketogenic diet), starving the cancer cells of glucose. In virtually every experiment in which the ketogenic diet has been tested in mice, tumor growth rates have slowed dramatically. It appears that the ketogenic diet is able to put cancer cells under significant metabolic stress allowing additional non-toxic therapies, like intravenous vitamin C, hyperbaric oxygen, and mitochondrial correction to push the cells further over the edge. We propose that combining these non-toxic treatments would provide a powerful, synergistic anti-cancer effect.

Potential concern may arise regarding the use of a diet therapy for cancer patients susceptible to cachexia. While low carbohydrate or ketogenic diets promote weight loss in overweight individuals, they are also known to spare muscle wasting during conditions of energy restriction and starvation (Manninen et al, 2006; Cahill et al, 2006; Veech et al, 2004; Volek et al, 2002).

The anti-cachexia effects of the ketogenic diet are not surprising when considering a metabolic switch to fat metabolism and subsequent ketosis evolved as a method of sparing protein during prolonged fasting or starvation (Veech et al, 2001; Wu et al, 1988). It makes sense that dietary-induced therapeutic ketosis in a cancer patient would prevent muscle wasting similarly as it does with athletes undergoing intense exercise (Paoli et al, 2012).

Human studies of high-dose intravenous vitamin C in patients with cancer have shown improved quantity and quality of life, as well as improvements in physical, mental, and emotional functions, symptoms of fatigue, nausea and vomiting, pain, and appetite loss (Gonzalez et al, 2014).

In relation to hyperbaric oxygen (HBO2T), there are a substantial number of studies indicating that HBO2T can induce marked anti-cancer effects in vitro and in animal and human studies alike (Daruwalla et al, 2006; Moen et al, 2012; Al-Waili et al, 2005).

Considering mitochondria a possible therapeutic target, two different approaches can be suggested: a) to stimulate mitochondrial activity, in order to restore metabolic pathways characteristic of nonmalignant cells, and/or b) to stimulate mitochondrial dependent cell death pathways. Both ways suppress cancer.

A strategic problem in cancer therapy is how to selectively activate apoptosis in transformed cells. A successful way to eliminate cancer cells can be based on the ability of anti-cancer treatment to activate apoptotic pathways, which are suppressed in tumor cells. This may be achieved by partially restoring damaged mitochondria.

Mitochondrial dysfunction is a primary cause of cancer, and biochemical and genetic deviations develop as consequent events. Cancer therapeutic strategy targeting mitochondria may restore normal physiological functions of mitochondria and open the apoptotic pathway.

Mitochondrial Enhancers (Co-Factors) for Mitochondrial Correction

If the mitochondria are denied the basic nutrition they need to function, they cease to function normally. For their functioning, mitochondria need energy substrates and oxygen, but also cofactors (non-protein compounds, vitamins, and minerals needed for enzyme activity) to perform essential biochemical tasks. Insufficiencies in these cofactors are associated with diseases including cancer; this may result from their role in energy metabolism but also from specific metabolic alterations, such as the formation of toxic metabolites, altered mechanisms that protect against reactive oxygen species, etc. Among the essential cofactors facilitating energy metabolism are B vitamins and minerals such as magnesium. Additional important cofactors are acetyl-L-carnitine, r-alpha-lipoic-acid, coenzyme Q10, phospholipids, vitamin C, vitamin D, mixed tocopherols and tocotrienols, creatine, NADH, NAC, omega-3, resveratrol, arginine, quercetin, Shilajit, PQQ, and curcumin.

Conclusion

In summary, the information presented herein supports the concept that cancer originates from damage to the mitochondria rather than from damage to the genome. The genomic damage in tumor cells follows, rather than precedes, the disturbances in cellular respiration.

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Dr. Gonzalez is a Fellow of the American College of Nutrition and has authored over 200 scientific publications as well as the books *I Have Cancer: What Should I Do?* (2009) and *New Insights on Vitamin C and Cancer* (2014). He serves as a member on multiple scientific editorial boards. He has also served as consultant for several companies where he has been responsible for designing formulations of nutritional supplements and pharmaceutical products.

Dr. Gonzalez has obtained several research awards for his work on nutrition and cancer. He is one of the first Hispano-Americans and Puerto Rican to be inducted to the International Hall of Fame of Orthomolecular Medicine in April 2016.

Jorge Duconge, PhD, is professor at the School of Pharmacy, University of Puerto Rico, with more than 15 years of experience in teaching and scholarly activities. He performs research in the area of pharmacogenomics and DNA-guided personalized medicine. He also has experience in conducting pharmacokinetics and pharmacodynamic studies.

Plechner Findings Presented at International Integrative Oncology Convention

by Al Plechner, DVM

Dr. Al Plechner has been researching severe allergies, autoimmune diseases, and cancer in animals and humans for the past 50 years. He has found, in animals and humans, that the endocrine system regulates the immune system and, normally, the immune system does not function on its own. His endocrine-immune blood studies have involved over 100,000 human and animal patients.

In humans, his studies have identified an endocrine-immune imbalance that occurs from a cortisol imbalance, resulting in elevated adrenal estrogen, tested as total estrogen. Dr. Plechner calls the imbalance Atypical Cortisol Estrogen Imbalance Syndrome (ACEIS). Many times, the general public finds ACEIS hard to remember, so they call it Plechner's syndrome. Dr. Plechner has found the following endocrine-immune imbalances in the patients that he tested:

- Deficient or defective cortisol,
- Increased amounts of total estrogen,
- Thyroid hormones that were either deficient or bound, and
- Decreased immunoglobulins.

His studies in humans have identified an elevated total estrogen (adrenal) imbalance in the following chronic diseases:

- Many different types of cancer,
- Many different types of autoimmune diseases, including autoimmune thyroiditis,
- Multiple sclerosis (MS),
- Amyotrophic lateral sclerosis (ALS),
- Epstein-Barr virus,
- Fibromyalgia,
- Chronic Lyme disease,
- PMS, and
- Irritable bowel syndrome (IBS.

Recently, Dr. Plechner has been collaborating with a noted integrative oncologist by the name of Richard Pooley, MD, regarding some of his autoimmune, cancer, and MS patients. Dr. Pooley recently gave a lecture that included Dr. Plechner's endocrine-immune discoveries at an international convention for MD integrative oncologists in San Diego, California.

Dr. Pooley noted that Dr. Plechner had worked with five human male patients who all had prostate cancer. All five males had normal estradiol, which is usually the only measured estrogen. However, their total estrogen was over 500pg/ml. Normal total estrogen values in a human male may vary from 80 to 115pg/ml.

Once it was identified that each male was either deficient or was producing a defective cortisol, cortisol replacement with a thyroid supplement reduced the total estrogen and reduced the growth of their prostatic tumors.

The results caused Dr. Pooley to investigate ACEIS and collaborate with Dr. Plechner. Dr. Pooley, along Dr. Plechner, decided to check Dr. Pooley's patients for total estrogen and immunoglobulins. Up until this point in medical practice, only estradiol, estrone and estriol are measured, and not, total estrogen. Dr. Pooley has found that half of his patients so far, who range from 17 to 84 years, all have uncomplicated thyroid and cortisol deficiencies, leading to severe allergies, autoimmunity, and cancer. He also found that his patients' total estrogen normalized routinely as the hydrocortisone dose was normalized.

In his own words, Dr. Pooley said the following:

> It behooves us to measure total estrogen for our patients who have allergies, autoimmunity, and cancer….
>
> Although the level of estradiol may be low, the level of total estrogen may be high because of excessive amounts of total estrogen production, presumably caused by continued ACTH stimulation of all layers of the adrenal cortex by the hypothalamic-pituitary axis. The pituitary gland, unsuccessfully, tries to stimulate production of more cortisol. By increasing the hormone binding globulin, this excess of estrogen results in the suppression of thyroid function, which suppresses immune function causing a depression of the immunoglobulins.

Dr. Pooley's case reports indicate the importance of measuring total estrogen, not just the three ovarian estrogens, which includes a very small amount of these three estrogens that are thought to be produced in the brain, fat, and skin. Dr. Pooley presented the following cases.

Case #1: This was a 44-year-old female with breast cancer. Two years ago, she was diagnosed with an extensive ductal mammary carcinoma that occurred in her left breast and left axillary lymph node. A PET scan revealed numerous metastatic lesions in her liver

and in multiple lymph nodes in her mediastinum, axillae, and neck. She was placed on Tamoxifen and underwent a complete ovario-hysterectomy. No chemotherapy was prescribed. She was referred to Dr. Pooley, who determined that she was hypothyroid and hypoadrenal. Dr. Pooley placed the patient on appropriate amounts of hydrocortisone, and NP Thyroid. For four years, the patient did very well, until three months ago, when her quiescent, pulmonary metastases began significantly rapid growth and she developed a persistent cough.

Dr. Pooley measured her estradiol, estrone, and estriole, and all were very low. Her total estrogen, however, was 181; the normal levels in a postmenopausal woman, or a woman with no ovaries, should be 40 or less. Her elevated total estrogen was causing the growth of her pulmonary tumors. Dr. Pooley increased her hydrocortisone until her total estrogen dropped to 37, and her cortisol binding globulin became normal. Her tumor markers became normal, and her PET scan revealed significant decrease in size, metabolic activity, and prominence of all pulmonary metastasis with no evidence of extra pulmonary activity. The patient is feeling fine and no longer coughing. Her total estrogen will be monitored very carefully.

Case #2: A 67-year-old, female patient was seen in November 2015, for autoimmune thyroiditis. She was taking 3 grains of a natural thyroid supplement that was given to her by another practitioner. She was still having major fatigue and brain fog. Dr. Pooley included Dr. Plechner's testing for total estrogen and immunoglobulins before beginning any medication. This is what he found:

- Total estrogen = 113 (normal = 40 or less);
- Estradiol = 18 (normal = 6 to 54);
- Immunoglobulin G = 657 (normal = 700 to 1600).

Dr. Pooley started the patient on 20 mgs of hydrocortisone with divided doses. One week later all the patient's prior clinical symptoms disappeared. At two weeks after beginning the hydrocortisone, these were the blood test results:

- Total estrogen = 57 (decreased from 113);
- Immunoglobulin G = 667 (increased from 657).

Dr. Pooley increased her hydrocortisone to 25 mgs with divided doses; and four weeks later, these were the blood test results:

- Total estrogen = 38 (initially 113, then 57);
- Immunoglobulin G = 782 (initially 657, then 667).

"This is the exact, dramatic change that Dr. Plechner has found in thousands of animals with severe allergies, autoimmunity, and cancer," Dr. Pooley told lecture attendees.

Case #3: An 84-year-old hypertensive female with a severe bronchiectasis is legally blind with pigmentosa retinitis and underwent a hemicolectomy due to cancer. She was given Gleevec, 40 mgs, on March 15th; and it was discontinued on July 20th when a CT scan indicated that there was a residual tumor. An October CT scan indicated a left adnexal tumor in her abdomen. Two months later, a CT scan showed another adnexal tumor on the right side of her abdomen and a tumor in her posterior pelvis. The patient was referred to Dr. Pooley in November 2015.

Dr. Pooley diagnosed her with an adrenal-thyroid deficiency, causing a very elevated total estrogen and a very low IgA. Dr. Plechner has discovered that the IgA in a human must be at 68mg/dL or higher for absorption of a steroid to occur. In canines and felines, their IgA level must be at 58mg/dL or higher for their steroid absorption to occur. Since the patient's IgA was below 68mg/dL, 20 mgs of intramuscular Depo-Medrol was given to bypass her gut and reduce her total estrogen and increase her IgA. Dr. Pooley worked the patient up to 3 grains of NP Thyroid and 40 mgs of hydrocortisone with divided doses in order to normalize her endocrine-immune imbalance.

A PET scan was performed three months later that indicated resolution of all the lesions and no residual evidence of any lesions in her abdomen or her lungs. "What Dr. Plechner has found is very significant," said Dr. Pooley, "and, hopefully, you will include a total estrogen and immunoglobulins when you are testing for severe allergies, autoimmunity, and cancer. Dr. Plechner does have a list of tests that can be included with other tests that might be indicated."

The recommended tests are as follows:

- Total estrogen,
- Estradiol,
- Estrone,
- Estriol,
- Cortisol,
- Cholesterol,
- T3,
- T4,
- Iodine,
- TSH,
- TBG,
- Reverse T3,
- IgA,
- IgM, and
- IgG.

Hopefully Dr. Plechner's discoveries will help many, many humans and animals with their allergies, autoimmunity and cancer. It also should be applied to any and all diseases that are caused by inflammation, due to an elevated, total estrogen.

Please have a very happy, healthy future. ◆

Dr. Alfred J. Plechner, DVM, practiced veterinary medicine for 50 years and performed clinical research on the causes of allergies, autoimmunity, and cancer in animals and humans. He discovered an endocrine immune mechanism that contributes to these disorders using a simple endocrine immune blood test on 90,000 animals and 2,000 humans. Dr. Plechner published more than 30 clinical papers and six books. In addition to his work as a practicing veterinarian and researcher, Dr. Plechner was a pioneer in the development of non-meat and healthy pet foods for dogs and cats, creating Nature's Recipe formulas over 40 years ago. He also had a wildlife preserve, Stone Wood Meadows, in the Santa Monica Mountains for 35 years and was licensed by the California Department of Fish and Game and the Federal Wildlife Service. For more information about his life and work, please go to www.drplechner.com.

Cannaceuticals – Future of Cannabis Edibles

by Betty Wedman-St Louis, PhD

Editor, *Cannabis – A Clinician's Guide* (CRC Press, May 2018)

Cannabis has been described as an oral medication since the Chinese treatise on pharmacology described Emperor Shen Nung in 2737 BCE as using it. In 1850, cannabis was listed in the US Pharmacopoeia as a cure for many ailments; and by the early 1900s, Squibb Company, Eli Lilly, and Park-Davis were manufacturing drugs produced from marijuana for use as antispasmodics, sedatives, and analgesics. But in 1970, the Controlled Substance Act listed marijuana as a Schedule I drug that "has no currently accepted medical use but excluded the seed and seed oil (hemp) or CBD," according to the American Herbal Products Association (AHPA) past president Michael McGuffin.[1]

Today hemp seed and hemp oil products are available as capsules, chewables, emulsions, and soft gels in addition to hemp seeds and hemp flour products. Over-the-counter cannabis edibles are in great demand as a new way of consuming cannabis whether containing the psychoactive THC or non-psychoactive CBD. More than 40 million servings of cannabis edibles were described by Boero in his *Food Technology* 2017 article with 600+ million servings expected by 2021.[2] A national 2016 study of United States adults showed that almost 30 percent of the respondents had used edible cannabis products. Colorado reported 1.96 million units of edible medical cannabis-infused products in 2014; and within one year the market had doubled, accounting for 45 percent of the total cannabis sales in the state.[3] Research in California, Washington, Colorado and Canada found 11 to 26 percent of the medical cannabis users had consumed edibles.[4] Consumers already purchase more than $155 million of hemp-based foods and supplements yearly so the edible market will be an extension of the cannabis market.[5]

Few research studies are available on cannabis-infused edibles. A study by Cone, et al, in the *Journal of Analytical Toxicology* evaluated cannabis-infused brownies.[6] Participants completed behavioral and physiological measures to evaluate drug effect with peak active cannabis responses occurring about three hours after ingestion and total dissipation of effects within 24 hours. The advantage of edibles in the cannaceutical market is their longer duration and reduced intoxicating effects compared to smoking or vaping. Cannabis-infused edibles avoid the issues of odor and stigma of use because they are consumed like any other food. In addition, edibles are easier to transport, particularly to places where their use may not be legal. But despite the advantages, THC-infused cannaceutical overconsumption can result in cognition and motor impairment, sedation, agitation, anxiety, and even vomiting.[7]

Each consumer of cannabis edibles needs to be conscientious of their tolerance. A 10 mg edible will not be the same for a beginner and a regular user. Expectations may also influence effect along with the time of day when consumed. If other food and/or alcohol is consumed at the same time, uptake will be altered, which can influence effects of THC-infused edibles. CBD-infused edibles would best be consumed separate from meals for maximum benefit.

Pharmacokinetics of edibles indicate cannabinoids are introduced through the gastrointestinal tract where THC is absorbed into the bloodstream and travels via the portal vein to the liver where liver enzymes (primarily Cytochrome P450) hydroxylate THC to form 11-hydroxytetrahydrocannabinol (11-OH-THC).[8] According to several studies,11-OH-THC crosses the blood-brain barrier and is more potent than delta-9-THC when ingested, compared to when it is inhaled.[9]

Cannabis edibles can be purchased over the internet in the form of lollipops, gummies, chocolates, granola bars, Kush bars, and dietary supplements. The author has purchased them and had the experience of ordering CBD chocolates and receiving THC-labeled product. Contact with the supplier indicated the chocolates were "high CBD" as indicated on the bottom of the box and just labeled incorrectly. Inconsistencies in dosage for edible products infused with cannabis (whether CBD or THC) was noted in purchases made from internet sources.

Although the 10 mg (a Colorado standard) dose was labeled on chocolates, how was this determined when there are no regulation standards? Gummies were labeled as 10 mg per hemp extract gummie, but how was this calculation made without standards for analysis? Yes, the manual calculation can be estimated using various methods on the internet for homemade edibles, but these potencies are based on how much flower was combined with the butter or oil in the recipe. Steep Hill Labs explained the difficulty in getting an accurate analysis at a Pittsburgh cannabis conference in 2017. First the flowers that will be used in the production run of the edible have to be tested. This provides the amount of cannabinoid and terpene available for extraction. After extraction, testing determines how much cannabinoid and terpenoid extracts are available for use in making the cannaceutical. Each testing can be costly, and the inefficiency of extraction can result in up to a 30 to 60 percent loss of cannabinoids and terpenoids according to discussions with several producers. Botanica, a leading edible producer in Washington, tests individual products from each batch to ensure better accuracy in their potency labeling.

Inaccuracies in labeling and inconsistencies in formulation were reviewed in 2014 by investigative reporting in the *Denver Post*. The reporter found that the actual THC content of retail edibles differed significantly from the amount claimed on the label.[10] As a result, Colorado instituted a requirement that THC concentration be assessed to ensure that edibles do not contain more than 100 mg THC per serving.[11] But this was not a measure to ensure label accuracy.

The need for additional regulations for dosage accuracy in edibles is imperative if overdosing and accidental pediatric exposures are to be avoided. The lack of regulations has forced families to make their own edible cannabis products so they can be assured potency and quality standards. Patients, especially medical cannabis users, need to know precise amounts so they can assess effective dosage titrations whether it is CBD or THC. Vandrey, et al. reported in *JAMA* that some CBD edible products contained only trace amounts or none at all.[12]

Another consideration in edible production beyond dosing and accurate labeling is appropriate testing for bio-contaminants and pathogens. Edible cannabis products need to indicate on the label that they have been tested for pesticides, heavy metals, mold, and residual solvents. If a company discovers a contamination issue after production, the products need to be recalled and destroyed to ensure public safety; but there are no federal guidelines or Food and Drug Administration regulations.

The nutritive value of cannabis – particularly the antioxidant benefit that led to the first US Patent on cannabis – is hardly ever acknowledged. Some individuals may know about Alice B. Toklas's memoir featuring a "hashish fudge" recipe and her cannabis brownie recipe that was mentioned in the Peter Sellers movie, *I Love You Alice B. Toklas*. But the 1996 passage of California's Proposition 215 legalized medical marijuana and opened the door for more people to benefit from the nutrition qualities of hemp even though an exact nutrition profile for *Cannabis sativa* L. is lacking. It is assumed to be equivalent to hemp, one of the world's most nutritious foods with high-quality protein and essential fatty acids found in its seeds. Hemp contains all eight essential amino acids and can be sprouted for use in salads or shakes

Hemp seed is an "underexploited non-legume protein-rich seed" according to Asiello, et al.[13] Albumin and edestin are the two main proteins in hemp, providing similar amino acid profiles as egg whites and soy. Hemp seed protein has significant amounts of sulfur-containing amino acids methionine and cysteine.

The predominate fatty acids in hemp seed are linoleic and linolenic, which nutrition research has indicated are essential fatty acids. The fatty acid content of hemp seed makes it an excellent source for oxygen transfer, hemoglobin production, membrane components, prostaglandin synthesis, growth and cell division. Hemp oil or cannabis CBD oil can be used in salad dressings, mashed potatoes, and substituted for olive oil in recipes. Essential fatty acids must be obtained in the diet and are needed to enhance human health.[14]

Flavonoids and terpenes, the primary antioxidants in cannabis, contribute not only flavor but polyphenolic compounds that inhibit fungal growth and serve as anti-inflammatory, anti-cancer, and anti-viral contributors. These properties are frequently overlooked because of the focus on Schedule I drug status due to delta-9-tetrahydrocannabinol; yet these benefits are important in therapies for neurological, immune, and gastrointestinal disorders. As Gertsch in the *British Journal of Pharmacology* states, "never in the history of human diets have we consumed more carbohydrates and less phytochemicals than today."[15]

Cannabis-infused products need guidelines and standards to ensure their safe and effective use by those wanting pain relief, symptom management, and disease modification. Dosing guidelines are critical, and further research needs to be done to assess digestive metabolism and therapeutic response. Pharmaceutical standards are being proposed to ensure pesticides, heavy metals, and microbiological contaminants are evaluated; and cannaceutical packaging needs to be accurate. Today, most hemp seeds are consumed by birds as commercial birdseed exported from China and sold in local pet stores. Hemp seeds are a preferred essential fatty acid source over rapeseed (canola) and flax for animal feed because it does not contain anti-nutritional components and toxic glycosides. Hopefully the nutritional and medical benefits of hemp/cannabis will be increasingly recognized for more than birdseed and animal food.

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Environmental Toxic Chemicals and Mysterious Illness: A Tale of Two Leukemia Patients

by Simon Yu, MD

Synthetic petro-chemical production has been exploding since the 1940s, along with an epidemic rise in chronic illnesses with a multitude of symptoms including fatigue, memory loss, anxiety/depression, brain fog, allergies, food intolerance, body aches and other undiagnosed mysterious illnesses. There has also been a steady rise in allergies, asthma, Alzheimer's, chronic fatigue/fibromyalgia, diabetes, obesity and cancer.

The most common sources of toxic chemicals are right in our house, school, hospital, or workplace. You may not know but the building may have been sprayed with insecticides, cleaning agents, rodenticides, and fungicides, and be spurting volatile chemical compounds from the carpet and plastic materials – also from synthetic clothes, soap, body and hair care products, and packing materials, etc.

Recently, I saw a 58-year-old man, a construction contractor with newly diagnosed Parkinson's disease, who was on medication to control his tremors and stiffness. His dominant problems were coming from the dental and allergy/immunology points, based on acupuncture meridian assessment (AMA), with a high index of suspicion for environmental toxins. His urine test for toxic chemicals showed extremely high MTBE, ethylene oxide, bromopropane, and propylene oxide. The cause of his Parkinson's-like tremors was from toxics chemicals; he was diagnosed with Parkinson's disease based on his symptoms.

I have been routinely checking for heavy metals like lead, mercury,

Detox Recommendations Based on Great Plains Lab Test Results

Based on your Great Plains Lab results, we may consider the recommendations below to assist detoxification. These are general recommendations, not a protocol.

Additional Testing (if not done or indicated)

1. Hair mineral analysis/Food allergies and recommended supplements
2. DMPS heavy metal, mycotoxins, organic acids test, hormone profile, etc.

Activities

3. High-fat diet, food allergies rotation diet, blood type diet, Plant Paradox
4. Sweat therapy of any kind, exercise, sun exposure
5. Sauna
6. Coffee enema daily and colonics once a week, based on individual
7. Gallbladder/Liver Flush once a month for 12 months
8. Bentonite clay, mud pack, mud bath
9. Sleep: No electronics in the bedroom, melatonin, sleep links, Pineal Code
10. Limit EMF, cell phone, radio frequencies, microwaves, radon
11. Circuit Training: EWOT, Hyper Vibe, PEMF, Swing Master

Therapies

12. IV vitamin C, and/or combination of IV UV/Ozone
13. IV PK protocol plus liposomal glutathione and phosphatidylcholine (BodyBio PC)

Supplements as directed

14. Colon Cleansing: Detox One Colon, Three Whole Body 1x-2x/day
15. Kidney, Liver, Allergy and Lymph 1-3, Drainage
16. Charcoal capsule (one capsule three times a day between meals and meds)
17. Probiotics and prebiotics nutritional support: Green Drink
18. Increase oral vitamin C, E, lipoic acid, glutathione, N-acetyl cysteine (NAC)
19. Hormonal support
20. Emotional Stress Control: Heart's Song, 5-HTP, Ultimate Fields, Ultimate Rescue
21. Nutritional support with vitamins and minerals
22. Homeopathic: Chem Tox, Neuro Tox, Pesticide Tox, Lymph 3, Drainage

cadmium, aluminum, nickel, tin, and tungsten, and treat these patients with chelation therapy, nutritional support, and a general cleansing program. Many people respond to the program, but some of the sickest people do not respond until you get the environmental toxic chemicals out.

About four years ago, I saw two physicians with the same diagnosis called chronic lymphocytic leukemia (CLL), one from Florida and one from La La Land. I focus on uncovering underlying problems, not diagnosis. Most of the treatment plans are similar. Get rid of parasites and fungal problems, correct any dental problems, check for heavy metals and start chelation therapy based on which toxic metals are the dominant problem. Put patients on nutritional support based on hair mineral analysis, food allergy testing, and blood type diet. Dealing with dental-related medical problems is the most difficult area to convince my patients to act.

These two physicians were open to alternative/complementary medicine and highly motivated to follow my recommendations and instructions. The physician from La La Land responded like a classic La La Land story and not only had his leukemia resolved – his severe psoriasis, diabetes and hypertension were also resolved. I have not seen him for the last two years, but he said all is fine. It is hard to convince a busy physician to come back for a routine follow-up checkup.

On the other hand, to my disappointment, the physician from Florida did not respond to my therapies. His blood counts were fluctuating but kept going up. He thought his pulsed electro-magnetic field (PEMF) therapy made the situation worse by stimulating the bone marrow and stopped PEMF. But, his blood counts continue to rise despite intense nutritional and IV therapies and reached a critical level of over 600,000 WBC (white blood cells). The normal range is 3,400 to 10,800 WBC.

He had emergency plasmapheresis by a hematologist in Florida and took an experimental, expensive drug, Ibrutinib, per his oncologist, and stopped coming to see me for almost two years. His blood count dropped to normal at 8,000 WBC, and he stopped the Ibrutinib because of the side effects. His WBC counts started rising again, and he came back to see me for re-assessment of his condition.

Because he did not respond to my usual and customary treatment plan, I decide to test for environmental toxic chemicals based on acupuncture meridian assessment. Surprisingly – or perhaps not – he had massive amounts of petrochemical-based toxic chemicals including MTBE/ETBE, diethyl phthalate, styrene, benzene, perchlorate, diphenyl phosphate, bromopropane and organophosphates insecticides, according to Great Plains Labs. He was also exposed to high level of the herbicide glyphosate and fungal toxin ochratoxin A, considered a carcinogenic mycotoxin from molds.

Now I understand why he did not respond to my usual treatment. Clearly, his blood counts were going in the wrong direction. He also had heavy metals, including mercury, and parasites and fungal problems. It will take him months or years to detoxify his toxic burden.

For common environmental toxic chemical exposures, a home detox program includes gallbladder/liver flush once a month, coffee enemas, sauna or sweat therapy of any kind, charcoal or bentonite clay, mudpack, vitamins, and minerals. For more in-depth information for our clinic detoxification program, see my website article, "Detox Recommendations Based on Great Plains Lab Test Results." (Sidebar)

These environmental chemical toxins and heavy metals are silent killers that our medical professionals overlook, as they typically treat the symptoms based on an arbitrary diagnosis. The other silent killers are parasites, fungal/mycotoxins, and hidden dental-related medical problems.

The mystery of the tale of these two leukemia patients was separated by environmental toxic chemicals. By the way, I found out on his last visit that the Florida doctor was not doing the gallbladder/liver flush which is a part of all my cancer patients' detox program. In fact, he had never done the gallbladder/liver flush for the last four years, as he did not want to drink apple juice because of his concern for fruit sugar content. The mystery of the Florida alligator doctor was not as mysterious as I thought. It seems like miracle stories only come from La La Land.

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Dr. Simon Yu, M.D. is a board-certified internist. He practices internal medicine in St. Louis, Missouri, with an emphasis on integrative medicine to use the best each has to offer. For more articles and information about integrative medicine, patient success stories, and Dr. Yu's health book, *Accidental Cure: Extraordinary Medicine for Extraordinary Patients*, visit his website at www.PreventionAndHealing.com or call Prevention and Healing, Inc., 314-432-7802. You can also attend a free monthly presentation and discussion by Dr. Yu on integrative medicine at his office on the second Tuesday each month at 6:30 pm. Call to verify the date. Seating is limited, arrive early.

Sustainable Medicine: Whistle-Blowing on 21st Century Medical Practice

by Dr. Sarah Myhill

Dr. Sarah Myhill, a veteran clinical physician based in the UK, is the author of *Sustainable Medicine: Whistle-Blowing on 21st Century Medical Practice* (Chelsea Green Publishing, 2017). This book is based on the premise that twenty-first century profit-driven Western medicine is failing to address the root causes of disease. Dr. Myhill's essential book aims to empower people to heal themselves by addressing the underlying causes of their illness. She presents a logical progression from identifying symptoms, to understanding the mechanisms of disease, to offering relevant tests and a comprehensive toolbox of treatment strategies. The following excerpt is adapted from her book, *Sustainable Medicine*, and is reprinted with permission from the publisher.

Five years at medical school followed by one year in hospital jobs do little to prepare a doctor for the real world. I had no answers to the early questions thrown up by National Health Service (NHS) General Practice – 'Why do I have high blood pressure?' 'Why do I get such awful headaches?' 'Why am I depressed?' Correct conventional answers to these questions are deficiency of, respectively, anti-hypertensive drugs, painkillers, and SSRIs. But this is not the 'why' of the matter. Indeed, it is hardly even the 'what' of the matter. Masking the symptoms does not explain them. The clues, which the symptoms represent, have been missed and the investigative detective work, which should have resulted from those clues, has been left undone.

One year on and I was breast-feeding my daughter Ruth. She had terrible three-month colic and all I could do to lessen the screams was to walk round the house, all night, with her in my arms. My husband Nick's reaction was, 'You're the effing doctor – you sort it out.' He was right. It was not until I stumbled across advice for me to give up all dairy products that the problem was resolved. So too was my chronic sinusitis and rhinitis. At the time, this was a momentous and life-changing discovery – but this information was nowhere to be found in the medical textbooks.

Thirty years later, this common cause and effect is still nowhere to be found in the medical textbooks. I worried about not knowing causation. I had been trained to elicit clinical symptoms and signs and recognise clinical pictures, but actually what patients wanted to know was why. What did they need to do to put things right? My standard line had been, 'Well, let's do a blood test and come back next week.' This gave me time to rifle anxiously through my lecture notes and textbooks looking for answers. The answers my patients wanted were not there. It came as a great relief to me to find out that my patients really did not mind me telling them I did not know! Thankfully, they rated my ability to care higher than my ability to know all the answers. Thankfully, too, they were happy to help me with my researches and act as willing guinea pigs with the dietary and lifestyle experiments that actually addressed the root causes of their problems.

The investigation of a patient should be like a detective story – 90 per cent of the clues come from the history and 10 per cent from the examination. Tests may confirm or refute the hypothesis – because every diagnosis is just a hypothesis. Then, once the diagnosis has been further corroborated by test results, it has to be put to the ultimate test. The ultimate test is response to treatment. Is the patient better? If not, then the diagnosis is wrong.

The word 'doctor' originates from the Latin verb 'doce', meaning 'I teach'. My job is to teach my patients to heal themselves and supply them with the necessary tools to do so. The doctor should be the interface between the hard science and the idiosyncratic patient – the practice of medicine is an Art.

Doctors routinely confuse the making of diagnoses with what are merely the descriptions of symptoms and clinical pictures, neither of which constitute a true diagnosis. Examples include hypertension (aka high blood pressure), asthma, irritable bowel syndrome and arthritis, all of which terms are in fact descriptions of symptoms and none of which is an actual diagnosis of the underlying cause. Clinical pictures include Parkinson's disease, heart failure and Crohn's disease, but these are convenient titles simply to slot patients into symptom-relieving categories which do little to reverse the disease process or afford a permanent cure. Symptom-relieving medication postpones the day when major organ failures result. This is unsustainable medicine.

Doctors are dangerous. In the United States, healthcare-system-induced deaths are the third leading cause of death after heart disease and cancer. When doctors go on strike, death rates fall, and when they return to work, death rates rise. However, this effect pales into insignificance when compared with the intellectual neglect demonstrated by doctors failing to understand, recognise and prevent the two major causes of death – namely, heart disease and cancer. The worst example of this neglect is the nonsense propagated by doctors that a high-fat diet results in high cholesterol and consequently in heart and arterial disease – indeed, this has become the popular accepted wisdom. Yet it is completely wrong! It is sugar, fruit sugar, refined carbohydrates and grains that are driving the epidemics of arterial disease, heart disease and cancer. The failure of the medical profession to recognise and act on this is a crime against humanity.

These collective failures mean that it is more dangerous to follow your doctor's advice on diet and take symptom-suppressing medication than to smoke 20 cigarettes a day.

The greatest modern health hazard is metabolic syndrome. This is the clinical picture that results from Western diets and lifestyles. It is easy to diagnose – simply look in the supermarket trolley. If it is largely composed of bread, cereals, biscuits, pasta, fruits, crisps, sweets, chocolate and alcohol then its owner, and his/her family, has metabolic syndrome. The early symptoms include having to eat very often, not being satisfied with a meat and vegetable meal until a sweet pudding has been eaten, having

to snack regularly and eating or drinking to relieve stress. Fatigue, mood swings and insomnia follow. Doctors get involved when these apple-shaped people are found to have high blood pressure and high cholesterol. There follows an inevitable progression to diabetes, heart disease and cancer. We now know arthritis and osteoporosis are long-term effects of metabolic syndrome. Alzheimer's disease too – this has been renamed 'type III diabetes'.

Most doctors have no grasp of the above progression. They fail to appreciate that carbohydrates are eaten in an addictive way. The intellectually risible 'food pyramid' (which places carbohydrates at the bottom as staple foods, with meat and eggs at the top as occasional extras), is evolutionarily incorrect and upside down. Symptom-suppressing drugs and lack of attention to causation together accelerate the underlying degeneration; people become patients on the slippery downhill slope to disease and death.

We experience symptoms for good reasons – they protect the body from damage. Symptom-suppressing drugs allow us to function but do so at the expense of accelerating the underlying disease process. Pain-killing drugs mean joints are damaged faster and so surgery to replace joints is required sooner. Symptom suppression and accelerated damage result in a snowballing effect of disease, and so more drugs are needed to suppress side-effects. As just one example – acid-blockers to suppress gut symptoms relieve the discomfort but result in low stomach acid, which is a major risk factor for osteoporosis and stomach cancer.

Someone with a stone in their shoe would feel the pain and remove the stone. By contrast a doctor would first prescribe a pain killer to restore normal walking. However, the stone would erode the foot and infection would follow – so an antibiotic would be prescribed. Infection rarely clears where there is a foreign body and so gangrene would ensue, followed by amputation. Crutches or a wheelchair would be prescribed. The dignified, independent person would become a dependent patient facing long-term disability and premature death.

Again, the treatment of asthma has switched what was once a benign, self-limiting condition to a life-long pathology requiring life-long, symptom-suppressing medication. Indeed, when asthma is poorly managed, patients die. Conventional treatment means first the blue inhaler, next the brown inhaler, then both. No thought is given to the causes of asthma, which may be allergy (to foods, inhalants or chemicals), pollution or hyperventilation.

If symptom-suppressing drugs are ineffective, then a further line of defense is to blame the patient. Psychiatrists call this 'somatisation' – people are imagining their symptoms. This is a highly successful method of preventing these patients from ever returning to that 'diagnosing'' doctor again because the patient, quite rightly, loses faith in the doctor's abilities and looks elsewhere for answers. However, from the doctor's perspective, they (usually) never see this patient again and so they wrongly assume that their 'diagnosis' of somatisation has satisfied the patient. The doctor is left with the false impression that the patient is cured and pats himself on the back for a job well done. Worse than this though is what happens if the patient persists, returns to the doctor and does not accept the somatisation 'diagnosis'. In that case, the patient is blamed, once again, but this time for being a 'difficult' patient, or even for having views which are resistant to the 'cure' being offered. The phrase 'false illness beliefs' is a common one which is then thrown at such patients. Nowhere is this more apparent than in the treatment of chronic fatigue syndrome – my area of special interest and subject of another one of my books, *Diagnosis and Treatment of Chronic Fatigue Syndrome and Myalgic Enchephalitis* (Chelsea Green Publishing, 2018). The complete failure of doctors to identify and treat the underlying physical causes of this condition is a disgrace to the medical profession. It has dehumanised hundreds of thousands of potentially healthy people and consigned them to a life of misery.

The undergraduate and postgraduate education of doctors converts intelligent, motivated, caring teenagers into unquestioning, narrow-minded, one-size-fits-all doctors. These young people have all these fine attributes 'educated' out of them. Medical education is a brain-washing process which stupefies and petrifies the ability of the individual doctor to think independently. These disciplined minds become blinkered to see only avenues of treatment as laid down by the pharmaceutical symptom-suppressing approach. The job of the doctor is to understand the science of the body and convert this 'raw knowledge' to the art of treating individual patients, each of whom has a unique constitution that requires a tailored approach. Indeed, this is where the challenge, the pleasure and the fun of medicine lie. Nothing is so rewarding as the grateful patient whose health has been restored; health is like money –you don't know you've got it until you've lost it!

Drug companies were launched on the back of antibiotics – miraculous life-saving magic bullets which have saved millions of lives. This led to a general belief, happily adopted by the population, that all ills could be dealt with by pills. Symptom-suppressing drugs were found to bring immediate relief of pain, fever and misery. Massive drug company profits ensued. In modern Western society, money trumps truth. The drug companies used their new-found wealth to capture the intellectual and moral high ground through manipulation of drug trials. Either such trials were set up to achieve a desired outcome or adverse outcomes were not published. Doctors achieve academic success and promotion through drug company bank-rolled research – often the drug company reps ghostwrite the academic papers. If doctors fail to conform to the above expectations, they risk loss of job and status.

Conventional medicine increasingly is being bypassed by intelligent patients who wish to understand the underlying patho-physiological mechanisms which are causing their ill health. Indeed, I often find myself writing the diagnosis of 'PMITD' in the margin of my clinical notes ('patient more intelligent than doctor').

In addressing all of these issues, I am whistle-blowing on current medical practice. This Emperor has no clothes.

Dr. Sarah Myhill is a clinical physician based in the UK and a leader in the treatment of chronic fatigue syndrome. She has focused her career on identifying and treating the underlying causes of health problems and is a frequent lecturer on topics such as organophosphate poisoning, the problems of silicone, and chronic fatigue syndrome. She is the author of *Sustainable Medicine*, *Diagnosis and Treatment of Chronic Fatigue Syndrome and Myalgic Enchephalitis,* and *The PK Cookbook.*

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A Campaign of Disinformation

review by Jule Klotter

Whitewash: The Story of a Weed Killer, Cancer, and the Corruption of Science by Carey Gillam
Island Press; islandpress.org
Hardback; 2017; 305 pp; $30.00

Glyphosate, the active ingredient in Monsanto's herbicide Roundup, has become a mainstay for conventional farmers and homeowners who want to kill weeds. When it came on the market in the 1970s, Monsanto promoted it as a safe herbicide that broke down easily in the soil. Its mode of action is to disrupt a vital enzyme found in plants and microorganisms, 5-enolpyruvylskikimate-3-phosphate (EPSP) synthase. Because this enzyme is not found in humans or animals, Monsanto claimed that glyphosate was less toxic than aspirin for people and animals. In the 1970s, of course, neither Monsanto nor government regulators knew how essential microorganisms – whether in the soil or in our intestinal tracts – are for the health of all life forms. Nor did they know that glyphosate is an endocrine disruptor. But early on, as Carey Gillam reports in her documented book *Whitewash: The Story of a Weed Killer, Cancer, and the Corruption of* Science, both Monsanto and government researchers knew that glyphosate was a probable human carcinogen. Gillam became interested in Monsanto and the glyphosate story while covering agricultural topics as a Reuters' international news correspondent. This book reveals how Monsanto has hidden evidence of glyphosate's dangers for decades with the help of the US Environmental Protection Agency (EPA) and FDA.

In the early 1980s, animal studies showed a dose-related increase in a rare type of kidney tumor in laboratory mice as well as testicular cancers in rats and, possibly, thyroid cancer in female rats exposed to glyphosate. At that time, EPA scientists classified glyphosate as Category C, "possibly carcinogenic to humans." Monsanto convinced a well-known pathologist to cast doubt on the link between glyphosate and kidney tumors and provided EPA with a pathology report from another group that discounted the cancer cases as being 'normal biologic variation' and labeled results as "'spontaneous chronic renal disease...commonly seen in aged mice.'" Monsanto's unrelenting pressure on the agency and its disinformation campaign paid off. A 1993 EPA report declared glyphosate to be safe. EPA memos and other documents show that many of the 290 studies used to make its decision were unpublished studies from Monsanto. EPA refused to release the studies, under the guise of protecting 'trade secrets,' for independent review.

After EPA declared glyphosate safe, use of glyphosate skyrocketed with the advent of Monsanto's genetically-engineered soy, corn, and other crops, designed to withstand applications of Roundup. In addition, Monsanto has encouraged farmers to spray glyphosate on over 100 non-GMO crops, including wheat, barley, oats, peas, lentils, and dry beans, just before harvest to increase harvest efficiency and reduce weeds. Because EPA has deemed glyphosate safe, other government agencies have allowed ever-increasing amounts of the herbicide to contaminate animal feed and crops. Neither the FDA nor US Department of Agriculture test for glyphosate residues in the food supply.

> With the use of glyphosate, farmers stopped using time-honored methods for controlling weeds: crop rotation with diverse plants. Now, they have superweeds like Palmer amaranth that can grow three inches/day with resistance to multiple herbicides.

Indications that glyphosate is not safe, as Monsanto and the EPA claim, have continued to arise. Physicians in the Roundup Ready soybean-growing regions of Argentina reported a marked rise in birth defects, cancers, and other previously rare illnesses within a decade after the introduction of Monsanto's products. Non-Hodgkin lymphoma (NHL), a cancer that has become increasingly common in North America, is positively associated with glyphosate use in several epidemiological studies. In March 2015, World Health Organization experts from its International Agency for Research on Cancer (IARC) declared glyphosate a probably human carcinogen. Gillam interviewed several farmers and orchardists who developed cancer after years of using glyphosate (or surviving family members) for this book. Thousands of wrongful death lawsuits, alleging that Monsanto has purposefully hidden glyphosate's harmful effects, have been filed.

Glyphosate's toxicity to humans is not the only problem. Contrary to Monsanto's original claims, glyphosate can remain in the soil for one to two years, compromising the health and decreasing the nutrient composition of future crops. Moreover, weeds have developed resistance to glyphosate, causing farmers to use more 2,4-D, dicamba, and other toxic herbicides.

Despite the volume of evidence of harm, Monsanto has maintained an ongoing campaign to discredit any claims that glyphosate is harmful. Company documents, revealed during court litigation, show that Monsanto scientists ghost-write glyphosate-positive studies and ask scientists from outside the company to edit and sign the papers as their own. Monsanto has funded "independent" websites, such as Bruce Chassy's Academics Review, to promote their products and discredit the scientists who dare to question safety. "These front groups act essentially as echo chambers, citing each other as sources that reinforce industry positions with the veneer of expertise and impartiality," says Gillam. "Their names [e.g., the American Council on Science and Health and Campaign for Accuracy in Public Health Research] often sound impressive and authoritative."

Gillam reports that government researchers who are truly independent of corporate ties are terrified of voicing any

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Make Room on Your Desktop: Herbal ABC's Needs a Spot

review by Jacob Schor, ND, FABNO

Herbal ABC's: The Foundation of Herbal Medicine by Sharol Tilgner, ND
ISBN-10: 1881517047; c. 2018; 440 pp; $29.95

It's been nearly twenty years since Dr. Sharol Tilgner published her first book in 1999. That first book, *Herbal Medicine From the Heart of the Earth*. has sat on my desktop ever since.

By desktop, I mean the shelf that sits above the cubby holes that separate my stapler, otoscope, thumbdrives etc., not the home screen on my computer. Tilgner's first book is in good company; it shares space with my *Merck Manual*, Morrison's desktop companion, Murphy's homeopathic repertory, Fischbach's manual of lab tests, and Kruzel's homeopathic emergency guide. Tilgner is a valuable and trusted resource that has long been kept close at hand. I suppose I could practice without it but I would prefer not to try. After all these years of using Sharol's book as a reference, I am hesitant to even pick up her new book.

She did something rather unique in that first book. She shared the herbal formulas she had created for her company Wise Woman Herbals. While one can guess the approximate proportion of different herbs in compounded formulas by reading the order of ingredients on the label, Sharol actually shared the percentages of each herb that she added. Perhaps that is why 'from the earth' earned its spot on the desktop. I use it all the time to create formulas. I'm what you might call a copycat herbalist. To me this was typical of Dr. Tilgner; it was just another example of her generosity of spirit.

Thus, I took up this new book with hesitation. Tilgner's original book set the bar high and will be hard to top. I once worked for a large food corporation that set out to make a better Oreo cookie and challenge the long reign of Nabisco. For months we baked one batch of imitation Oreos after another and never came close to even matching the unique qualities of an Oreo in blinded taste tests. At first I worried that we would be in a similar pickle here, that trying to replace the original would be impossible.

Dr. Tilgner has nonetheless risen to the challenge and improved on her earlier book. Only fifty pages longer, the new book feels as if it contains far more information. The information feels easier to find. She's shuffled the way the book is organized. In a way she has created a unified field theory of herbalism. The book is organized by body systems and the materia medica is incorporated into these system sections, sub-divided by herbal actions. That sounds complicated so let me give you an example. Under the chapter on the digestive system, she starts by reviewing the physiology of digestion, describing the organs of the digestive tract from mouth on down, talking about healthy

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➤ ***Whitewash*** **review continued**

opinions that are not "industry friendly" for fear of being publicly discredited and losing their jobs. Whistleblower Jonathan Lundgren, who worked as an entomologist and agroecologist at USDA, told Gillam that his managers blocked publication of his research on the harms of neonicotinoids insecticides, disrupted operations at his laboratory, and forbade him from talking to the media. Lundgren told Gillam:

> 'There is a lot of fear in government scientists. If they don't fall into line, their science is torn apart and their personal lives are discredited. In my case, everyone that I cared about was either directly or indirectly attacked by the chain of command. Rules are selectively enforced to make the rogue scientist out to be a miscreant. Threats of criminal accusations are levied. These scientists are made an example of.'

A 2008 survey from the non-profit Union for Concerned Scientists confirmed that pro-industry management interference is widespread in government agencies that supposedly protect public health. And it doesn't matter if an administration that is perceived as environmentally friendly is in the White House: corporate collusion is bipartisan.

Shortly after I read *Whitewash*, National Institutes of Health scientists published a new study that found "no association was apparent between glyphosate and any solid tumors or lymphoid malignancies overall, including [non-Hodgkin lymphoma] and its subtypes."[1] It seemed suspiciously convenient in light of *Whitewash*'s recent publication and the mountain of evidence revealed during the wrongful death lawsuits in progress. In reading the study, I began to wonder if this study was designed to show a corporate-positive outcome. Only 63 percent of the 57,310 of the study's participants completed the follow-up interview. For the other 37 percent, the researchers used demographic data, medical history, and reported pesticide use at enrollment to "impute pesticide use." So nearly 40 percent of the data used to investigate a possible relationship between cancer and glyphosate use wasn't real-life data. Also, Table 2 of the study shows a 4.25 relative risk for non-Hodgkin lymphoma T-cell, the highest RR on the table. Yet, "no association was apparent...."

Some people would say, "It's from the NIH. They are independent researchers." Believers in the independence of government agencies need to read *Whitewash.*

[Editor note: In June 2018, the German chemical-pharmaceutical corporation Bayer AG acquired Monsanto and its products. Monsanto is no longer a company brand name.]

1. Andreotti G, et al. Glyphosate Use and Cancer Incidence in the Agricultural Health Study. *JNCI.* 2018;110(5).

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function and diets that maintain that health before talking about herbs. She first covers nutritive herbs (burdock, chickweed, dandelion, nettle, oats, plantain, parsley and rose hips) then bitters, talking first about how they stimulate digestion spending several pages covering these actions and indications prior to speaking about specific herbs. She then highlights a few bitter herbs (gentian, horehound, and hops). She then covers carminatives the same way, describing the actions, indications and preparations before highlighting fennel, and caraway. Dr. Tilgner goes on to cover herbal laxatives, covering physiology first and then highlighting slippery elm, Oregon grape, cascara and senna. Parasites and anti-parasitic herbs, astringents, demulcents, mucilaginous herbs are covered in a similar manner starting with physiological effects, and several highlighted herbs rounding out each section.

The chapters and subsections flow so smoothly from one to the other that things seem to make sense and practicing herbal medicine seems like it is easier to do than my experience has been over the years. Actually with this book at hand, it might get easier. Ideas for formulas pop up as sidebars throughout the text. One need not reinvent the wheel.

Although each section that covers a particular herbal action under a physiologic system discusses a handful of selected herbs, one specific plant tends to be highlighted; I can easily imagine Sharol standing in front of a group of students holding the plant aloft, gracing the plant with special attention.

As mentioned, the book is divided into chapters by body system and each chapter begins with a summary of the physiology of that system. In the liver chapter, Dr. Tilgner devotes 22 pages to liver physiology and function. One might think this would not be adequate to cover everything one might need to know about the liver, but it is well written, surprisingly complete and readable, covering the majority of main points and even hitting some trivia that gave me pause. I learned things that I didn't know. The main phases of liver detoxification are covered, and the CYP450 pathways along with their substrates, inducers and inhibitors are discussed in detail. Even specific enzymes are discussed in detail and not just the popular ones like CYP3A4, which by the way is induced by garlic, Siberian ginseng, St John's wort, *Panax ginseng*, valerian, DHEA, nicotine etc., but the less popular enzymes such as CYP2D6 that is induced by alcohol and inhibited by hydrastis and black seed. Who knew?

Under inhibitors of glucuronidation, there is an interesting aside about curcumin and piperine. Recall how for a period this was the hot combination that was claimed to enhance absorption 20-fold. Dr. Tilgner discusses the theory that piperine inhibits glucuronidation and so increases curcumin action. Being the naturopathic herbalist that she is, she questions the modern tendency to add piperine to a range of herbs to increase action, what has become something of the elephant in the room, and asks politely whether, "… using piperine or eating a lot of black pepper or anything else that is meant to decrease glucuronidation could backfire on a person and lead to an increased cancer activity. Inhibitors of glucuronidation may expose a person to the ravages of toxins." I think she's asking the right question.

Liver herbs are then divided into the traditional categories of hepatoprotectives, cholagogues and choleretics…. It flows so smoothly and sensibly.

The book is well referenced with recently published studies where needed, giving the impression that although Dr. Tilgner is something of a traditionalist she keeps close tabs and is fluent in the recent advances in the science of botanical medicine.

In fact, I admit that this new book is a better book than her first one. She's managed to balance a presentation of current science and biochemical knowledge of these plants into a framework of classic herbal actions and then speak about them sharing her hard-won knowledge about how to use them in clinical practice from a place of wisdom. One can learn a lot when one applies oneself to acquiring a skill for over a quarter of a century. Sharol certainly has an abundance to share. It doesn't get much better than this.

Sharol Tilgner was an experienced herbalist when I first met her as a naturopathic student in Portland in the 1980s. No one batted an eye when she named her herbal company "Wise Woman Herbals" before she had even graduated; she had already earned that title in our eyes. Thirty years later, she's graduated from being our wise woman to, on some level, even more sage. This book is proof of it. I count myself lucky to have lived long enough to view the fruit of her decades of practice.

Now my only problem is making room for this book on my desktop.

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Review of Dr. Barbara MacDonald's "Cancer Care: Conventional, Complementary, Alternative?"

The article by Dr. MacDonald "Cancer Care: Conventional, Complementary, Alternative?" is an excellent review of an incredibly complex and critical topic. Working directly as I do with cancer patients (and other practitioners) this topic is a daily discussion. Being the author of another article in this issue "Metabolic Therapies in Advanced 'Salvage' Cancer Cases" I am covering a different perspective on this topic which Dr. MacDonald speaks briefly to. Regardless of the perspective Dr. MacDonald provides an excellent overview of a rational method for patients and caregivers to navigate their cancer diagnosis.

In a setting where often naturopathic and integrative oncology practitioners can be misunderstood by conventional oncology on a number of fronts, this article lays out a rational and reasoned overview for any practitioner or patient to follow. One area I personally see misunderstood is the "us versus them" feeling some traditional oncology practitioners have. Dr. MacDonald describes a process that is anything but that! She reasonably proposes essentially an "us together" approach in assessing next steps for the cancer patient. Her thorough and in-depth calculus points out the areas where patients may be confused or misled. This calculus also speaks to the "one size does not fit all" approach one must take with a cancer diagnosis. Integrative and naturopathic approaches are not always bad or good, and standard of care is not always bad or good. There is no truly "bad medicine" but rather inappropriate timing or applications of said medicine. Dr. MacDonald provides a road map for patients, loved ones and other practitioners to sort out this complex concept.

An additional benefit imbued in this article is the care and thoughtfulness which can only come from long years of practice and dealing with these difficult questions with real patients in real time. Having known Dr. MacDonald the better part of three decades now, I can say she has been in the trenches with these issues and brings a deep caring born of practice and a desire to honor the best pathways for each patient. I know that patients who have sought her counsel have experienced the best there is.

In this article Dr. MacDonald helps patients assess the following critical points as they make these high-level decisions. These are the same basic decision points I use in my oncology practice and teach my students.

Time to make an informed decision? A cancer diagnosis is a shock and life changing event. People often either rush to a decision as to what to do, may be pushed into a decision by others or are trapped in indecision. Dr. MacDonald breaks down the factors to use during this troubling time to process the information effectively and in an appropriate manner and time frame.

Choices? In the age of the internet and information overload, there can be too many choices for patients in some respects. This excess of choice however is a mirage created by a lot of information in an unregulated and unfiltered space. Dr. MacDonald breaks down the way to find where one's "real choices" are both from the conventional and integrative worlds. This is a critical point every patient must realize and incorporate into their process.

Will you get the expertise you need to guide you? Who helps you when you have cancer can be as important as what you do. It requires a team as no one person can be expert in all things. Dr. MacDonald outlines the need for, and types of, specialty practitioners to help in the decisions around therapies, when to employ them, and what not to do.

What type of natural medicine is best for you? Similar to "who" will help you is the question of "what" can help? We see often a cancer patient come in with a bag (or two) of therapies suggested by numerous well-meaning people (or the internet). After one locates their team to help with the process, a large portion of that team's job is to assess, prioritize, and stratify the therapies most likely to help.

What alternatives should you be thinking about? Another excellent point Dr. MacDonald brings out is the next step from "what" and that is specifically how do you match your specific personal needs in your own cancer journey to the available therapies. Sometimes alternatives are focused on improving standard therapies. Sometimes, they are focused on healing during and after cancer therapies, and sometimes more on the cancer fight or on prevention. Dr. MacDonald does a masterful job of breaking out these finer points so practitioners and patients can rationally assess the proper interventions and timing for their individual needs.

Can you navigate the conventional system if you choose CAM? An unfortunate reality in the modern world is an inhomogeneity of care options based on location, resources, and other factors. If a person has many options, they are likely to find collaborative practitioners who will work together between standard and integrative therapies for the patient's benefit. This however is not universal, and often (more often than not) a person with cancer may only have one option for therapy and that option may not be "CAM friendly." This is a very real issue I have seen play out in patient cases for over twenty years. Dr. MacDonald brings a level of reality and clarity to this often-ignored topic.

In summary I would say that this article gives any person involved in the process a clear and well-designed pathway to follow. Excellent points for consideration are made and they are related in a clear, caring and thoughtful manner.

Paul S. Anderson, NMD

Dr. Anderson has been a long-time practitioner in the integrative naturopathic oncology field. In addition, he was involved in NIH funded integrative oncology research. He is co-author of the new book from Hay House Publishing *Outside the Box Cancer Therapies*.

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Monthly Miracles

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

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

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. Brandt is also the author of *The Healing Platform*, which details her search for thriving good health, overcoming many obstacles.

The Oncology Resources Library

Dr. Jesse Stoff, MD, HMD, FAAFP, is an internationally renowned physician and lecturer with extensive credentials in clinical immunology and holistic medicine. He is the author *of The Chronic Fatigue Syndrome: The Hidden Epidemic* and *The Prostate Miracle*.

In a major tour de force, Stoff has compiled a comprehensive, database for cancer treatment. Log in by joining the IOICP or the Best Answer for Cancer Foundation. Options include search by cancer type, cancer treatment substances, cancer treatment strategies, cell types, genetics and more. Anticancer strategies include the following: differentiation, oncolytic virotherapy, cytotoxic, onco-immunology, biochemical, targeted therapies, anti-angioneogenesis, cancer stem cell inhibitors, oxidative, anti-inflammatory, detox, nutritional, psychoneuroimmunology, cancer milieu epigenetics, cancer genetics, interventional and radiation.

Dr. Stoff cites the study by Davies et al entitled "Metformin inhibits the development and promotes the resensitization, of treatment-resistant breast cancer" (*PLoS.* December 4, 2017). Metformin may function through a mechanism involving post-translational histone modifications via an indirect histone-deacetylase inhibitor (HDACi) activity.

His Endocrine Cancer Advisor includes thyroid carcinoma treatment regimens.

Immunotherapy for bladder cancer, tracking bladder cancer mutations following vitamin C and vitamin K_3 therapy, is addressed along with investigational immune therapies for bladder cancer which trains the immune system to recognize cancer cells.

Classification of chemotherapy intervention reviews alkylating agents, antitumor antibiotics, antimetabolites, plant alkaloids and hormones. Please use this great resource at center.ioicp.com.

Ozone Sauna, Pulsed Electromagnetic Frequency, and Metallic Mineral Therapy

Distinguished physician Robert Jay Rowen, MD, from Santa Rosa, California, has a long list of accomplishments in oxidative medicine, ozone therapy, and all aspects of integrative medicine. He led a team of doctors to Sierra Leone in 2014 and was successful in curing five out of five Ebola patients with direct IV ozone therapy. His presentation on the mechanisms of ozone taming Ebola is fascinating.

At the conference, he presented novel metals and metal complexes as platforms for cancer therapy. The discovery of cisplatin was a defining moment, which triggered the interest in platinum and other metal-containing complexes as potential anticancer drugs. Dr. Rowen is not a fan of intravenous silver but uses it transdermally. He sites the *Int J Nanomedicine* (2016 June 7) article by Roma-Rodrigues C, et al. which supports the use of peptide-coated gold nanoparticles for the modulation of angiogenesis in vivo in chick embryos.

Head and neck squamous carcinomas responded to an intraperitoneal insufflation of ozone in rabbits. (*Int. J. Cancer.* 2008;122.).

Dr. Rowan postulates that a prolonged cycle of ozonated autohemotherapy may correct tumor hypoxia, leading to less aggressive tumor behavior. He has used the following method. Patients were placed in an ozone steam sauna at relatively low temperatures. They were also exposed to carbon dioxide (carbonic acid) gas and selective Rife frequencies. Afterwards, their bodies were sprayed down with metallic (not ionic) platinum, gold and silver at 300 ppm each. They were then placed on pulsed electromagnetic frequency blanket and /or pulsed electromagnetic frequency paddle and the local area further sprayed with metallic platinum. He presented three patient cases with dramatic improvement with no apparent toxicity. (Look up youtube.com/watch?v=kbQ6kj-tmWY)

Live Your Dreams with Private Pay Practice

Dalal Akoury, MD, is a pediatric hematologist-oncologist in Myrtle Beach, South Carolina, and a flamboyant presenter who exhorts us to transform ourselves and our patients into exuberant models of health and wellness. Her Awaremed.com site features

treatments for cancer remission, addiction recovery, treatment of chronic disease and pain, as well as anti-aging and aesthetics.

Cannabis Therapies for Cancer

Allan Frankel, MD, is a famous internist from UCLA and Santa Monica, whose lectures on medical cannabis have been sponsored by the California Medical Association, Los Angeles County Medical Association, and the Chartscape medical software program used by the UCLA Bowyer Cancer Center. He was also an associate professor of medicine at UCLA for 18 years.

Frankel discovered cannabis following a severe medical condition. He knew that it was significantly less addictive and had less side effects than many pharmaceuticals. What was lacking in cannabis medicine was true dosing. He lists the key players from plant-derived cannabinoids, THCA, THC, CBDA and CBD as well as our endogenous cannabinoids, anandamide and 2-arachidonoylglycerol (2-AG). He identifies the major cannabinoids as THC, CBD, THCA, CBDA, CBG, CBC, THC-V and CBDV.

Benefits of the major cannabinoids include the following: analgesic, anorectic, anti-inflammatory, anti-ischemic, antibacterial, antidiabetic, antiemetic, antiepileptic, antimicrobial, antiproliferative, anti-psoriatic, antipsychotic, antispasmodic, anxiolytic, bone stimulant, immunosuppressive, intestinal anti-prokinetic, neuroprotective and vasorelaxant.

Cannabinoid receptors are divided into two primary types, Cb1 and Cb2. Cb1 receptors are mostly in the brain and Cb2 receptors are primarily within the immune system. In the brain, cannabinoid receptors are found in the putamen, which regulates movements and influences various types of learning; globus pallidus, which regulates voluntary movements; amygdala, responsible for anxiety, stress, emotion, fear and pain; hippocampus, responsible for memory and learning; substantia nigra, important role in reward, addiction and movement; caudate nucleus area for learning and memory; hypothalamus, which regulates body temperature feeding, and neuroendocrine function; cerebral cortex, important for decision making, cognition and emotional behavior; cerebellum, motor control and coordination; and the dorsal vagal complex, emesis.

Frankel feels that the endocannabinoids have a role in maintaining the body's homeostasis and that clinical endocannabinoid deficiency syndrome causes fibromyalgia, migraine, and irritable bowel syndrome. Cannabis as a supplement interacts with the cytochrome P-450 system and influences cancer and seizure conditions.

There are three types of CBD available. The first is from the cannabis plant, the second is from the hemp plant, and the third is made in a laboratory. CBD from the cannabis plant is extracted from the flower and leaves of the plant and contains hundreds of minor cannabinoids, terpenes, and flavonoids. CBD from the hemp plant does not have as robust a profile of minor cannabinoids, terpenes, and flavonoids. Synthetic CBD from the laboratory has only a CBD molecule and does not contain any other compounds. In his clinical experience, CBD from the cannabis plant is much more effective in relieving patient complaints at lower dosages than hemp or molecular CBD.

Cannabis is very useful for palliation, pain in general, neuropathic pain, nausea, mood disorders, and insomnia. Preventively it has utility for chemotherapy-induced neuropathy with CBD to prevent it and CBD and THC-V to treat it. As an anti-proliferative, various cannabis regimen with multiple cannabis agents are probably better than one in very high dose.[1,2,3]

Frankel emphasizes consistent accurate dosage products and the importance of adjusting the medication based on patient reaction. His general recommendation on cannabis dosing is start low and go slowly. Contact Dr. Frankel at info@greenbridgemend.com.

Patient JD – What Did She Do?

Annie Brandt, founder of IOACP and BAFC, reviewed the history of a breast cancer patient, her treatment and successes. As of a March 2018 PET scan, the main tumor in the patient's breast was stable and slightly smaller, two other tumors were greatly reduced in size although some bone metastases were still present. The broad spectrum of her healing quest has been the subjects in Brandt's book, *The Healing Platform,* and includes nutritional supplements with emotional recall healing, spirituality, mind-body medicine, and EVOX sessions.

Mind-body (psychoneuroimmunology) treatment addresses feelings of being trapped, "there is no escape." Traumatic events six months to two years prior to diagnosis are common, and unknown/unrecognized traumas can be triggered and resurfaced. Brandt notes that there are over 2000 references in *PubMed* for these emotional traumas. Tools include prayer, attendance at religious services, meditation, healing touch, Order of St Luke, prayer group, and Reiki. Spiritual coping has significantly predicted greater survival over 17 years.[4]

The cancer personality includes being highly conscientious, dutiful, responsible, caring, hard-working, usually of above-average intelligence, and are people pleasers who have a great need for approval. Cancer patients often have a history of lack of closeness with one or both parents, harboring long-suppressed toxic emotions, such as anger, resentment and /or hostility. Buried, toxic emotions create belief systems of unworthiness, being unlovable and/or displeasing, and may internalize these emotions and have great difficulty expressing them.

Tools to address emotions are that cancer impression is positive, not negative, visualization, imagery, positive affirmations, self-hypnosis/meditation, faith, NuCalm, and a comprehensive cancer wellness program.

Boosting the immune system has great power to support cancer therapy. These include clinical immunotherapies, immune-enhancing supplements and herbs, acupuncture, liver cleanses, healthy gut awareness, and the power of music.

One should use everything that can nourish, strengthen, detoxify, and repair the body at the cellular level. Nutrition plays a key role in cancer therapy. Modify the diet, microbiome, use herbs and spices, enzymes, and switch content of the diet to fool the cancer.

We are all exposed to environmental chemicals, BPS, lead, acrylamides in fried food and gasoline additives. It is important to purify our air and water and use EMF blockers. Physically detox with detox diet, exercise, liver, colon, kidney cleanses, colonics and enemas, and chelation therapy.

In general, supportive lifestyle measures include avoiding sugar, eating little to no starches, insisting on organic food, reduce alcohol consumption, exercise 30 minutes per day, eliminate negatives, (people, situations), reduce/control stress, engage in fun activities and positive support groups, count your blessings, and have an "Attitude of Gratitude."

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There are multiple targeted therapies to choose from: IPT/IPTLD, high-dose IV vitamin C, cancer stem cells (CSCs), oxidative therapies including ozone, hydrogen peroxide, Prolozone, UV, UBI, HBOT, thermal medicine, hyperthermia and focused hyperthermia, baking soda IV therapy, IV chelation, immunotherapies, RIGVIR®, enzymatic therapies, colonic therapies, medical cannabis (United Patients Group), Zolodex injections, aromatase inhibitors, Poly MVA, Lugol's iodine, curcumin, metformin and berberine, Haelan 951, GcMAF, hydrazine sulfate, Salicinium®, silver, Artemisinin/Artesunate, Iscador/mistletoe, Laetrile, 3 bromopyruvate (3PB), homeopathy, NuCalm®, Budwig protocol, Ave ULTR® Metatrol, ESSIAC® Tea, red clover, stillangia, Hoxsey formula, Pau d'arco, modified citrus pectin, mushroom extracts, KAQUN water, selenium therapy, DMSO, functional integrative dentistry, psychoneuroimmunological medicine, amino acid supplementation, seeds, and food.

More on Medical Cannabis

John Melanca is the founder of the United Patients Group, which is the premier online resource for medical cannabis information and education for physicians, patients and health-related organizations.

In the beginning of their organization the Melancas searched for treatment for his wife Corrine's father, suffering from end-stage lung cancer with metastases to the brain and given a few weeks to live. They found a cannabis product and gave very small doses to him initially. As they increased the dose, his health improved, and the tumor disappeared. He is in robust health seven years later. (I remember walking into the lunch line behind him two years ago at their Medical Cannabis conference at the Dominican University in San Raphael, California, and he looked great).

Their non-profit group will help physicians with referrals to professionals who address the needs of patients—from cancer patients to seizure patients, pain patients, Parkinson's patients, anxiety and insomnia patients, and many more. They give advice on what types of cannabis and dosing strategies.

Cannabis is not a one-size-fits-all therapy. Melanca emphasizes that patient care is very individual and examines the medical history, current medications, age, current health status, stage of disease, and drug-to-drug interactions. John feels hemp is a good form of medical cannabis and is affordable! It has smaller flowers than cannabis and takes more plant matter to make a CBD product than cannabis. A concern about hemp is that most of hemp is imported with no regulations governing purity and strength.

Melanca echoes other speakers about the entourage effect. Trichomes, cannabinoids, flavonoids, and terpenes in the full extract of cannabis oil are part of the efficacy of the treatment. He reviews applications of tinctures, oils, topicals, sublingual sprays, nasal sprays, and suppositories.

John feels cancer should not be treated with Rick Simpson oil and that dispensaries are a challenge because of a lack of basic medical knowledge about pre-existing conditions such as diabetes and heart arrhythmias. All private product companies should be fully compliant and licensed and test raw plant matter and again after the product is formulated.

The United Patients Group provides medical education; their curriculum has been adopted by medical/nursing schools. They provide monthly educational events, quarterly CNE nurse's training/education, medical consults globally, a physician's registry, and global ambassador's program.

Dietary Therapies LLC – Insider Tips for a Simple Keto Life

Miriam Kalamian, EdM, MS, CNS, provides a comprehensive approach to the ketogenic diet. She dedicated her lecture to her son Raffi, who had brain cancer. Her 1. 2. 3. Approach simply starts with very low carbohydrates, sufficient protein, and very high fats. It mimics fasting/starvation and lowers the availability of fermentable fuels, facilitates changes to gene expression (epigenetics), and alters signaling in nutrient-sensing pathways. It can be a stand-alone therapy for pre-cancer diagnosis or "watch and wait" strategies. Keto as an adjunct to conventional and /or alternative treatments is non-toxic with known side effects, most of which are easily resolved.

She presented a series of clinical trials, which support the keto diet, and case studies and animal model research.[5] Carbohydrate restriction induces ketosis, protein management, and inhibits cancer progression; and calorie restriction induces angiogenesis.[6] Epigenetic influences of a ketogenic diet include up-regulating autophagy and mitophagy, mitochondrial biogenesis, upregulation of SIRT1 and AMPK, and beta-oxidation of fatty acids. It down-regulates insulin and IGF-1 levels, mTOR, ROS, HDAC glycolytic rate and lactic acid production.

Her keto parameters include 70%-80% fat, protein 10%-15%, and carbs 5%-10%. Step #1 is to limit carbs to 12 to 25 grams per day. Calculate the protein target 1.0 g/kg of ideal body weight. Fat intake is variable, less if weight loss is desirable and more for those who need to maintain or stabilize weight. All proteins stimulate the production of insulin so excess protein may drive cancer progression. Online tools for calculations include Ankerl KetoCalculator, Cronometer, KetoDietCalculator. Awareness of the glycemic index is a guide; cabbage is negligible, and berries have a higher glycemic index and should be consumed in small portions.

She exhorts us to consume meat. Overcoming media maligning of animal protein were conclusions based on poorly controlled studies. Keto followers who avoid animal protein may not be consuming the RDA for essential amino acids. Ketone supplements including MCT oil don't require bile or pancreatic enzymes for digestion; beta-hydroxybutyrate salts combined with MCT enhance ketosis.

Rewards of the diet include improved metabolism, less inflammation, consistent energy, improved cognition, improved quality of life and ideal weight. Challenges of the ketogenic diet include dehydration, headaches, constipation, diarrhea, brain fog, light-headedness, electrolyte imbalances, heart palpitations, muscle cramps, fatigue, metabolic acidosis, and rash. It is wise to emphasize hydration and replace electrolytes with salted broth.

Measure success with glucose blood meters, ketone urine test strips, and blood meters or breath analyzers.

Hydrogen-Based Protocols to Modulate Immune Response

Robert Scott Bell, D.A. Hom, has been in broadcast media since 1999 and begins with a discussion of oxidative stress and inflammation as the leading cause of disease. Gut damage, antibiotics, pesticides, heavy metals, diet, and oxidative stress from ROS increase this stress. Every organ system in the body is affected by oxidative stress.

His solution for oxidative stress is molecular hydrogen (H_2). Being #1 on the periodic table, it is so tiny that it can go anywhere in the body and reduces oxidative stress and inflammation through contact with hydroxyl radicals, catalase up regulation, and signal modulation. It is a selective antioxidant and only reacts with ROS, not radicals with a physiological role, and converts hydroxyl radical into H_2O.

Hydrogen stimulates the growth of anaerobic microflora in the human intestinal tract via electrolyzed reducing water. Hydrogen-water enhances 5-fluorouracil-induced inhibition of colon cancer.[7] He mentions 700 studies (45 human) which show benefits in over 170 human disease models and benefits neurological issues such as Parkinson's, Alzheimer's, autism, rheumatoid arthritis, and autoimmune disorders, and significantly decreases the risk of colon, breast, and bladder cancer.

Hydrogen is produced by electrolysis. Patented technology in the Echo^R Ultra machine stops mineral build-up on the cathode and ensures H_2 gas is always dissolved in the water in therapeutic concentration.

Important Stealth Contributors to Most Cancers

Joe Mercola DO, superstar of healthful information dissemination, warrior against fluoridation, GMOs, vaccines and contaminants in our environment took on EMFs and other health obstacles. He advocates supplementation for health and healthful aging.

Mercola commenced with homage to Travis Christofferson and his book *Tripping Over the Truth,* which gives a breathtaking history of cancer physiology and treatment dating back to the 1920s with Warburg's discovery that all cancers are anaerobic fermenters and don't use oxygen for which he received the Nobel Prize. Christopherson also presented on day three of the conference. His book reviews the early heavy-handed use of mustard gas chemotherapy, which was only very shortly effective, and the rise of the genetic theory of cancer causality which has largely proved unpredictable and unsuccessful.

Next, Mercola recognized Thomas Seyfried, PhD, and his book *Cancer as a Metabolic Disease*, which reinforces Warburg's theory that cancer is a mitochondrial failure disease. I encourage everyone to look at his YouTube presentation on this subject.

Mercola's book *Fat for Fuel* outlines guidelines for the ketogenic diet. He feels it is the most powerful metabolic intervention he knows. He champions water fasting which causes autophagy and increases stem cells, and he recommends a 20-hour intermittent fast.

How do cell phones cause cancer? I have reviewed Dr. Martin Pall's work in a previous column that I first read about in a Mercola newsletter. There are two dozen studies noting that calcium channel blockers inhibit the damage from electromagnetic fields. Calcium channels in our cells regulate calcium access to the intracellular environment, which causes huge increases in NO, peroxynitrite, and other free radical moieties damaging mitochondria and DNA. EMFs cause one million calcium ions per second per channel to flow into the intracellular space and have been related to bipolar illness, cardiac arrythmias, and infertility. The World Health Organization gave cell phones a class 2B carcinogen status in May 2011.

Mercola wants us all to limit damage and measure and avoid EMFs. He likes the Acoustimeter and Acousticom 2 for measurement of our local EMF environment. Limiting exposure by removing microwave ovens, portable phones, Wi-Fi and computers, wireless mice and keyboards, smart thermostats, smart TVs, and others, and placing your phone in airplane mode. Measure and avoid extremely low frequency fields (ELFs), which are also damaging by both magnetic and electrical mechanisms. The NFA 1000 gigahertz ELF and magnetic meter is his recommendation.

A building biologist can assist in evaluating your environment (HBELC.org/ International Institute for Building Biology and Ecology). Turn off power to bedroom at night. Limit damage by supplementing magnesium, which helps protect the calcium channels and molecular hydrogen. Additional selenium, zinc, vitamin D (40 to 60ng/ml), and iodine supplementation are recommended. Adjuncts include fasting, vitamin C IVs and liposomal vitamin C. Computer screen blue blocker and avoidance of blue light especially at night is important for improved sleep. IrisTech.co (not.com) provides software to reduce eye strain and improve sleep. Sunshine more that vitamin D gives near, mid and far infrared support as well as structuring of intracellular water and improving cytochrome C oxidase. Hyperbaric oxygen gives live O_2. The blood tests he suggests include serum ferritin 40-60 ng/ml, GGT, HS-CRP, and therapeutic phlebotomy.

Harris Rosen – Keynote Speaker

Harris Rosen is the owner of the Rosen Centre, host of our conference, and owns nine hotel/convention properties in the Orlando area. He is a pioneer in medical wellness care and established RosenCare in 1991 to serve 5,700 Rosen associates and their families in a wellness model in his 12,000 square foot facility. The Rosen Medical Center is multilingual and employs four full-time physicians and supportive staff.

RosenCare is an extremely cost-effective model for health care, and in 2010 he launched Rosen Healthcare Solutions, which assists primary-care medical centers in setting up their own programs. *Forbes* magazine has featured him twice for national recognition of his wellness model for health care.

Mr. Rosen presented the case of his son with brain cancer, who has undergone multiple therapies and is on the upswing in his response. His presentation was very passionate, warm, and fatherly.

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Healing with Homeopathy

by Judyth Reichenberg-Ullman, ND, MSW; and Robert Ullman, ND

www.healthyhomeopathy.com

Teaching Homeopathy in Prague: Acute, Flight-Induced Bladder Infection

An Intercultural Experience

Our first visit to Central Europe was in September 2017 as tourists, along with exploring Slovenia and Austria. We say "Central Europe" because of a faux pas, undoubtedly one of many, that I, Judyth, made during the seminar by referring to the Czech Republic as part of Eastern Europe. So much for being "savvy travelers"! The other time we had taught with the aid of interpreters was in Zurich, some years ago, and we had simultaneous translation. Our Swiss seminar had gone smoothly except for two memorable exceptions: Judyth presented a homeopathic Chocolate case and showed a video of a highfalutin British chocolatier who referred to the delicious substance as the Grande Dame. The students, German-speaking Swiss, erupted into laughter. Turned out they misunderstood her to say "condom." The other glitch was when Bob cracked a Yogi Berra baseball joke that went right over everyone's heads (so to speak) and fell totally flat.

We both prefer an interactive teaching style. Especially after having taught homeopathy for over 25 years, we love to hear the students' reactions and to learn from them, as they are from us. Prior to the Prague seminar, we were informed that the translation would not be simultaneous and that the format would include little to no interaction with our audience of 100 to 150 students. When we inquired about the prior level of homeopathic training and experience of the participants, we discovered that a dozen or so would be seasoned, even practicing for decades, homeopaths, and that many of the other attendees would be students, some beginners. Maybe, we were told, we could entertain a very occasional question, but, by and large, we would speak a few sentences at a time, which would be translated. We conferred with a couple of our colleagues who had offered seminars there, and they warned us that it would be a rather slow-moving interaction. Since we live in Chile half the year and Judyth speaks Spanish and French, we are often able to decipher the local language fairly well, even Portuguese and Italian. But that was not the case in Slovenia, nor in the Czech Republic. How could we gauge our audience response?

A Raging Red-Eye Bladder Infection

It is a long, long flight from Santiago, Chile (after flying from Temuco, nine hours south of Santiago) to Madrid to Prague! We are certainly not newcomers to long, grueling flights (at least we weren't traveling with our two golden retrievers, which always adds many more layers of stress to the ordeal). We geared ourselves up for the 12-to-14-hour flight to Madrid (flight time is wind-dependent) and choked down an awful Iberia Airlines dinner and breakfast. A couple of movies, a little reading, and some sporadic sleep. And several pee breaks on the plane. We were both careful to drink water en route. We had about seven hours to kill in the (enormous) Madrid airport – not enough time to actually find a locker for our luggage and head to the Prado, we were informed by the flight attendants, because it was International Women's Day and we could expect transportation chaos and a huge march in Madrid.

Any such plan was nixed, in any case, after Judyth, went to the bathroom and, to her horror, found a toilet bowl filled with bright red urine! And it hurt a lot to pee. Having treated countless women with cystitis, she knew she wasn't suddenly dying of kidney cancer, but just had a severe bladder infection. What a way to start a homeopathic teaching journey! We normally travel with a black leather kit containing 300+ tiny vials of high-potency remedies. But, knowing we were headed to a seminar with lots of homeopaths, we just took our 50-remedy ("Don't leave home without it," we always say) 30C-potency kit. Which remedy was obvious given the voluminous amount of blood, rapid onset, and intensity: *Cantharis* (Spanish fly). It is the first remedy to consider. We would recommend one dose of a 1M potency, but 30C was what we had. Judyth drank as much water as possible. There was no cranberry juice available. In our practice, in addition to homeopathy, we would recommend that or cranberry capsules, along with Thorne Research Uristatin. But it was a good test for homeopathy!

She pushed *Cantharis* 30C every couple of hours. We found (with difficulty) a bed in the airport hotel for four hours and made the best of our layover. Since we are no longer vegetarians, we enjoyed the iconic baguette with Serrano and brie. Things were

going as well as could be expected up to the awful moment, when Judyth bent over to pick up a receipt for the refreshments and her (no kidding) 48-year-old REI zip-off hiking pants, by now paper-thin, ripped right up the back! It was bad enough to have to drape her sweater around her waist. But, worst of all was tossing those irreplaceable pants!

She felt somewhat better by the time we arrived in Prague the next morning and continued faithfully with the *Cantharis*. An inveterate believer in homeopathy, she wanted very much to avoid antibiotics. By the next morning, her symptoms were about 80% better, and we were able to walk comfortably about five miles around Prague prior to teaching the following day. We visited, unexpectedly, the most remarkable exhibit at the National Museum: Light and Life. It was a perfect way to spend a few pre-seminar hours before teaching the Sensation Method. We were introduced to many bizarre life forms that we had no idea existed and could serve as fascinating homeopathic remedies! Judyth did inquire at the seminar if someone could give her a dose of *Cantharis* 200C just in case, which did happen. But by that time, she was pretty much fine, except for a brief relapse after drinking a couple of cappuccinos. That was proof that coffee can sometimes interfere with remedies.

Chalk up another homeopathic cystitis success story! We have helped many patients over the years, but often with *Staphysagria* or *Sarsaparilla*, depending on the specific symptoms. Judyth was about 90% cured by the time the seminar organizer, Jiri Cekovsky, treated us for dinner at Maitreya, an absolutely wonderful Buddhist vegetarian restaurant. Cured enough to enjoy the fabulous meal 100%!

What to Expect at a Czech Seminar

Judyth was scheduled to present the first day on long-term case management with an emphasis on Rajan Sankaran's Sensation Method. She chose four of my favorite cases, including a woman with autoimmune hepatitis successfully treated for 12 years (her blood values are now normal), a woman with vaginitis, and another with migraines, all needing unusual remedies as well as a case of dermatomyositis, which appeared in one of our recent *Townsend Letter* columns. Bob was scheduled for Day 2 to present his work with children on the autism spectrum, his specialty. Our two women professional interpreters, as well as homeopaths, (they alternated) were excellent. We found it quite easy to get into a rhythm of speaking a few sentences, then having them skillfully translated. For the direct quotes of the patients, it was quite fluid to just let the translation occur without commentary.

It is fascinating that in Prague the organizers don't know who will attend the seminars until they arrive! Quite unlike the US where registration occurs way in advance with the notion that a seminar may be canceled for sparse enrollment. As Jiri predicted, the large room nearly filled – we would guess about 125-140 attendees.

We both noticed, Judyth the first day and Bob the second, that the students were quite self-contained, compared especially to the US. Attentive, avid note-takers, good eye contact, but no spontaneous questions. And, if we did ask them what they thought about the patients, only one or two hands went up. We conversed at length about this with both interpreters as well as with Jiri, homeopath, author, and the seminar organizer, and this is what we discovered:

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- Czechs, until 1989, grew up under a Communist regime. They learned to accept, acquiesce, not to question. And not to show that they were smarter than their comrades. They learned not to stand out.
- These deeply ingrained traits remain embedded, despite the fact that the Czech Republic is now a democracy and that Prague, one of the few European cities to escape bombing in WWII, is now bustling with tourists. As an aside, we talked the other night with close Chilean friends whose families emigrated originally from Czechoslovakia. They likened the reticence we experienced among our Czech students to that of older Chileans who endured a regime of fascist dictatorship from 1973-1990 and may continue to demonstrate a similar reticence.
- The handful of students at the seminar who were Bulgarian or Hungarian assured us that their compatriots are much more outgoing, outspoken, and lively than Czechs.
- If the body language of our seminar attendees indicated interest and animation (students stayed and did not leave, engaged in eye contact with us, took notes avidly, appeared to be interested), that should be our confirmation that all was going well. And so it was.
- Our nation, the US, is very young – not even 300 years old. We are, by and large, more naïve, outspoken, opinionated, less traveled, speak fewer languages, and are far less worldly wise than Europeans. Americans tend to be more boisterous, self-aggrandizing, and, on the positive side, friendly and outgoing. But we have a lot to learn!

From Prague to Lively Southern Spain

We took advantage of our March Prague invitation to seek out some warm weather in southern Europe (which was having a cold snap, including a few hours of snow in mountainous Úbeda). Andalucía seemed like the natural choice, since we speak Spanish in Chile, the weather would hopefully be warm and temperate, and we had fallen in love with Spain while hiking the *Camino de Santiago* a couple of years ago. We had visited Córdoba for the colorful *Fiesta de los Patios* in 2007, but somehow had never made it to Granada or Sevilla.

We knew that Spaniards really know how to eat and have a good time. The timing just happened to be Palm Sunday and the first part of *Semana Santa* in Sevilla. The processions all over Spain, highlighted in Sevilla, are truly amazing. The brotherhoods (*hermandades*) parade their enormous floats, which reside the rest of the year in the cathedrals and churches, through the streets. Each transported by 50 or so hefty, stalwart men wearing abdominal girdles to avoid hernias, accompanied by hundreds or a thousand adults and children dressed in robes and conical hats re-enacting the crucifixion. It is a remarkable experience on all levels, and the spiritual, social, and tourist highlight of the year for Sevilla. Though we found a couple of the processions to be enough to satisfy our fascination, we felt that we plunged deeply into Spanish Catholicism and culture. Rather than just being tourists, we took the local buses, conversed with lots of Spaniards without the use of a GPS, and loved the experience.

Some of the highlights of our trip:

- Sitting up front and center on Palm Sunday in the remarkable *Catedral de Sevilla*. It was second only to the three masses we attended at the *Catedral de Santiago de Compostela* after having completed our 500-mile trek a couple of years ago. The pomp and glory were at least as great, the procession with the palm leaves impressive, and the sermon very moving. The emphasis was on the silence of Jesus just before the crucifixion, how at least as much can be communicated without words as with, and even the contemporary plight of immigrants worldwide was incorporated into the sermon. Plus, the remarkable synchronicity of close friends from Bothell, Washington, sitting in the row just behind us! We'd known we'd be in Sevilla at the same time but decided it was fruitless to try to connect amid the throngs. So, the universe handled it for us! We all joined in a post-mass tapas lunch.
- We also touched base in a very meaningful way with our Jewish roots through visiting the Old Jewish sector in Sevilla and the remarkable *Sinagoga del Agua* (an orthodox synagogue discovered in the past decade as Andalucian architects were excavating to build a three-story apartment building) in Úbeda.
- Being a Spanish literature major, Judyth cannot help herself but to shop at Spanish-language bookstores. It turned out that the owner of a delightful, small Sevillan bookstore was the director of the *Feria de los Libros* (annual book fair) in Sevilla. She is an outspoken proponent of buying books in neighborhood bookstores rather than through Amazon. (She really made us think twice about our book-buying habits)! And we were happy to discover that our book, *Mystics, Masters, Saints and Sages: Stories of Enlightenment*, our only book translated into Spanish, is still available in Spain!
- We did not meet any Spanish homeopaths. It is to our enormous disappointment that there is a dedicated anti-homeopathy movement in Spain at this time. The effort is to eliminate homeopathic and herbal medicine from the Spanish university medical school curricula. What more can we say?
- What trip to Spain would be complete without attending a flamenco performance? We happen to love flamenco – the movements, the costumes, the music, the remarkable visual expressions, the heart-wrenching wailing, the staccato beat, the gypsy influence. So, we took full advantage of the opportunity and enjoyed six, yes six, dance performances. From an intimate cave experience in the Sacramonte hills of Granada to a titillating evening in the "smallest theater in the world" at Triana Market. How exciting it would be to full-out dance tango or flamenco! Next lifetime, perhaps?
- By the way, we cannot help but mention a few culinary delicacies, because, regardless of your dietary preferences, Spain is a foodie's paradise. If you are not a teetotaler, we heartily recommend *tinto de verano,* a red wine with sparkling lemon water. Or, if you can find it, *vino naranja* (local white wine with macerated orange peel). By far the most heavenly delight that we ingested was a Manchego cheese ice cream at Eslava. If you've eaten Spanish food, you know about white sheep cheese with *membrillo* (quince paste). Well, this was truly the best ice cream in the world (even better than Molly Moon's in Seattle and Berthillon in Paris)! We're now back to Zumba to take off a few of those happily-earned pounds.

We'll save some of the homeopathic gems that we shared in Prague for a future article! This one we're sending to Julia Childs with a cc to the *Townsend Letter*!

Judyth Reichenberg-Ullman and Robert Ullman are licensed naturopathic physicians, board certified in homeopathy. We have written eight books on homeopathy as well as *Mystics, Masters, Saints and Sages – Stories of Enlightenment*. We also have an app: Natural Travel Doctor. Apple version: https://tinyurl.com/l7song8 and Android: https://tinyurl.com/m7cnexh**.** We are more passionate than ever about homeopathy and we never seem to tire of traveling.

We practice in Edmonds, Washington, and by Skype. The Edmonds office address has changed, as you will see on our website. We live on Whidbey Island, Washington, and in Pucón, Chile. Visit our website www.healthyhomeopathy.com. Please friend us on Facebook at Healthy Homeopathy. Call us at 425-774-5599 or email us at drreichenberg@gmail.com or drbobullman@gmail.com.

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Optimizing Metabolism

by Ingrid Kohlstadt MD, MPH
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When the Solution Is the Problem: Do Your Mouthwash and Toothpaste Have Untoward Metabolic Effects?

Overview

My April 2018 *Townsend Letter* column is entitled "Crossing the Medical Dental Divide." Readers commented their surprise at the many areas where dentistry can improve medical outcomes. There's more. This column identifies four categories of additives commonly found in oral hygiene products. The additives do not stay in the mouth and have been shown to cause untoward metabolic effects. Reducing exposure to offending additives can improve overall health.

Emulsifiers

Emulsifiers provide an important food technology. They enable oil and water to mix. Mouthwash that is clumpy or has an oily film wouldn't stay on the market for long. Emulsifiers expand the options. They can provide smooth, alcohol-free, no-stir mouthwash. But there's a downside.

Emulsifiers continue to enable oil and water to mix even after the mouthwash has been used. Cell membranes are biologic structures that limit permeability by separating oil and water. A solution with emulsifiers is absorbed even if it isn't swallowed. During digestion the rate and manner in which oil and water mix is carefully calibrated. Increasing the permeability of the intestinal lining is associated with symptoms sometimes referred to as leaky gut.

The food industry's use of emulsifiers was challenged in March 2015 when *Nature* published the murine research of scientists Andrew Gewirtz and Benoit Chassaing from Georgia State University.[1] Mice exposed to the emulsifying agents developed metabolic syndrome faster than those unexposed. Differences were detected at levels one-tenth that permitted by the FDA. The authors and other scientists have since conducted human studies with the same finding.[2] Evidence mounted when removing exposure to emulsifiers demonstrated health benefit. A recent randomized study demonstrated that prescribing a no-carrageenan diet can extend remission of inflammatory bowel disease.[2]

Emulsifiers have an absence of evidence but not evidence of absence. In August 2017, more than two years after the *Nature* study that raised a safety concern, another investigation of emulsifiers was published "[b]ecause no published dietary exposure estimates for commonly used emulsifiers exist for the US population."[3]

Avoiding select emulsifiers may be adequate. While all emulsifiers act to enhance permeability, those that exist naturally in the diet don't raise as much concern as others. For example, lecithin is an emulsifier found in food naturally and is considered a safer additive than carrageenan and carboxymethyl cellulose. While carrageenan is "natural" because it is extracted from red seaweed, it is not a customary component of food and is not "natural" to the human diet. Carboxymethyl cellulose is also "natural" because it's derived from cellulose, which is made water soluble through chemical reactions; but cellulose it not naturally digestible by humans. Synthetically–derived emulsifiers include polysorbates, currently used in medicines and vaccines with rising debate. I share the sentiments of Dr. George Lundberg voiced in his Medscape editorial.[4]

Food Colorings and Preservatives

Mouthwash has to sit on the bathroom shelf unrefrigerated. Artificial food coloring is less likely to fade over time than natural colors. Sitting on the bathroom shelf also requires adding preservatives.

Food colorings are among the chemical additives with known effects on the central nervous system.[5] Consumption of the food colorings sunset yellow FCF, quinoline yellow, carmoisine, allura red, tartrazine, and ponceau aggravates attention deficit hyperactivity disorder (ADHD). The preservative sodium benzoate has similar effects. Conversely, removing the additives from diet ameliorates ADHD symptoms. The science has compelled Europe to take regulatory action.[5]

Here is where I have observed tragic irony. What do you find in the restroom of a dentist's office? Mouthwash. What are you supposed to do at a dental visit? Sit still. No one has published this data, but if it were available I anticipate it would point to an inconvenient truth. Some children prescribed medications to treat ADHD may have been able to avoid the need for medical management or increased dosing if they hadn't been given provocateurs of their symptoms at the dentist's office.

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Sweeteners – New Findings

High-intensity non-caloric artificial sweeteners (NAS) are useful technology for oral hygiene products, since they are a substitute for sugar which is known to be harmful for the teeth. It's also been known that NAS alters satiety and can increase the development of diabetes. Late-breaking research has discovered the mechanism by which NAS alter satiety signaling.[6]

A first in human study conducted by Dr. Richard Young of Adelaide Australia's School of Medicine elucidated a mechanism. In the presence of artificial sweeteners, less glucose may reach the distal portions of the intestine that release glucagon-like peptide 1 (GLP-1). GLP-1 is an incretin hormone that is protective against the metabolic syndrome.

Nanoparticles

Titanium dioxide whitens various foods, adds texture to yogurt and cosmetics, serves as a mild abrasive and whitener in toothpaste, inhibits growth of food pathogens, and blocks light especially in the UVB spectrum.

Food-grade titanium dioxide is larger than nanoparticles, but research is now showing that the titanium dioxide used in foods, cosmetics, sunscreens, and oral hygiene products does contain nanoparticles. Food additive titanium dioxide (E171) is micronized, yet a fraction of this is nanoparticles.[7] This is alarming information because nanoparticles are metabolic wildcards, traveling through cells unchaperoned and interacting with the immune system in unstudied ways. For example, sunscreens using nanoparticles of titanium oxide have been shown to be associated with lung cancer when they are applied by spraying. This is because the nanoparticles penetrate deeper into lung tissue than was realized.[8]

Could titanium-containing nanoparticles found in food and cosmetics be contributing to hypersensitivity reactions to titanium alloy dental and orthopedic implants? The answer is unknown, although possible. Avoiding nanoparticle-sized titanium where possible may reduce metal sensitivity and preserve titanium as an implant material for both dental and medical uses.

Conclusion

Food technologies with metabolic effects are pervasive. They are not limited to processed foods as sometimes assumed. Health foods, dietary supplements, good-for-you foods, and oral hygiene products incorporate newer food technologies. Dentists and physicians can work together to protect patients against mouthwash solutions with metabolic problems.

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Curmudgeon's Corner

by Jacob Schor, ND, FABNO
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Puking Patients

Let's start out with a case history.

A distraught 58-year-old female presents at our office with unrelenting vomiting. She is wearing a wig. Crookedly. "It's this damn chemo," she starts out saying. "It's going to kill me before the cancer."

She leans forward in my patient chair clutching my plastic wastebasket between her knees, pale, trembling. "I just can't stop puking." She has made sure she knows where our restroom is, asking at the front desk, before coming into my room in case she has to make a sudden dash for it.

Obtaining her case history is slow, tedious work. She's forgotten to bring the summary report from her oncologist's office, she hasn't completed her intake forms, she left her diet diary at home and luckily tells me she isn't taking any vitamins or herbs because her oncologist won't let her. I would bet if she was allowed to take stuff she wouldn't remember what she was taking.

This horrible episode in her life started with her finding a lump in her right breast almost a year earlier that she hoped would go away on its own. Long story shortened considerably, a friend persuaded her to see a doctor who sent her in for a mammogram that proved suspicious; a fine needle biopsy came back positive for malignancy; followed by a lumpectomy to remove a tumor that measured 2.5 cm, and now she was doing chemo, "that's killing me, I tell you I need to stop it. It's all a conspiracy." That there is some conspiracy between drug companies and others not to cure her cancer is a theme we have returned to several times during her history. She refers to an online series that she has used to research this 'issue.'

I am able to summarize the basics from a few records that have been faxed from her medical oncologist:

> 58 yo Female
>
> Invasive ductal carcinoma of the right breast
>
> 4/8 nodes +
>
> ER+, PR+, HER2 negative Ki67 moderate, Oncotype 28
>
> Chemo: ACT (adriamycin/cytoxan/ taxotere) round 4 of 6, 2 weeks ago.
>
> CBC: mild anemia. She's receiving Neupagen shots and WBC fluctuate wildly during each cycle, mild anemia.
>
> Cc: Hyperemesis: (non-top puking)

There are two questions that I need to ask this patient, and I debate with myself which to ask first. Here are two possible hints: Rocky Mountain High Colorado is a famous descriptive line about our state from a John Denver song. I ski at a local ski area named Mary Jane.

"Have you tried taking a hot shower?" wins out.

"Oh, yeah, it's the only thing that seems to help," she replies immediately. "I live in the shower. I empty the hot water tank I stay in there so long."

This said, I don't need to ask her how much cannabis she's been using, I already know the answer, it's too much, too often, and for too long.

This patient is suffering from a condition called cannabinoid hyperemesis syndrome.

> Cannabinoid hyperemesis syndrome (CHS) is a medical condition which was identified for the first time in 2004 and affects chronic users of cannabis. It is characterized by cyclic episodes of uncontrollable vomiting as well as compulsive bathing in hot water. The episodes have a duration of two to four days. The vomiting is recognizable by a lack of response to regular antiemetic treatment, and subsides only with cannabis abstinence, reappearing in periods of consumption of this substance.[1]

The compulsive bathing, the non-ending hot showers, hot baths, hot tubs, saunas are the key symptom – aside from the vomiting – as these bring temporary relief. Patients figure this out and compulsively seek the heat.

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For years CHS was considered a rare syndrome, something one might never encounter in clinical practice. That assumption is wrong. A study published in January 2018 suggests CHS is more common than anyone suspected. A total of 2,127 patients, 18-49 years old, were interviewed at New York City's Bellevue hospital about their marijuana use. The researchers wanted to find a group of heavy users, which they defined as smoking marijuana 20 days per month. Out of that initial group of patients, 155 fell into this heavy user group. The heavy users were interviewed about symptoms, in particular the vomiting and relief from hot showers.

Among those surveyed almost a third had CHS symptoms [32.9% (95% CI, 25.5-40.3%)]. That's far more common than anyone was thinking. If this same percentage is extrapolated to the US population, based on how many people are thought to be heavy cannabis consumers, there are approximately 2.75 (2.13-3.38) million people suffering from CHS.[2]

Here in Colorado, the drive to legalize marijuana started with the passage of Amendment 20 in 2000, which amended the state constitution to allow the use of marijuana by patients with written medical consent. Then in 2012, Amendment 64, another ballot initiative, changed the state constitution again to legalize marijuana for recreational use in addition to medical use. Those of us of a certain age recall the public impression that Amendment 20 was just going to make it legal for grandma to smoke pot so she could control her nausea during chemotherapy.

Here in Colorado, the legalization, the wide availability, and probably most importantly the widespread belief that marijuana has profound and widespread medicinal benefits has led to an increase in frequency of use among certain populations. As my practice is oncology focused, it often seems as if the majority of my patients are using marijuana or CBD-containing extracts. If as this study suggests, CHS is common, occurring in about one-third of regular marijuana users, a decent percentage of patients are probably confused; they think their nausea is from chemotherapy when in fact it is from their cannabinoid use.

CHS patients typically present with cyclical vomiting, diffuse abdominal pain, and interestingly, relief with hot showers. Patients will present to the emergency room repeatedly and undergo extensive evaluations including laboratory examination, imaging, and in some cases unnecessary procedures. They will often be treated with an array of pharmacologic interventions, including opioids, that not only lack evidence but may also be harmful.[3]

Cecilia Sorenson et al from Anschutz Medical Center here in Denver did a literature review that was published in March 2017. They found 1253 abstracts on CHS and analyzed 183 of them. The frequency of major CHS characteristics were the following:

1. History of regular cannabis for any duration of time (100%),
2. Cyclic nausea and vomiting (100%),
3. Resolution of symptoms after stopping cannabis (96.8%),
4. Compulsive hot baths with symptom relief (92.3%),
5. Male predominance (72.9%),
6. Abdominal pain (85.1%), and
7. Weekly cannabis use (97.4%).

Episodes typically last 24-48 hours but may last a week or longer. Cannabis cessation appears to be the best treatment.[4]

It's hard to differentiate vomiting caused by chemo from CHS vomiting, except for this hot shower keynote. It is such a peculiar symptom; it feels as if it comes from a homeopathic repertory.

There are two major cannabinoid receptors: CB1 and CB2. The CB1 receptors are found primarily in the central nervous system while the CB2 receptors are found primarily in the peripheral system including the gastrointestinal tract. The cannabinoid receptors regulate and fine-tune neurotransmitter release. The severe vomiting triggered in CHS may be secondary to brainstem effects or enteric neuron effects. Chronic exposure to cannabinoids causes down regulation of the endocannabinoid receptors at least in animal models. Triggering the peripheral CB2 receptors in the enteric nerves may slow gastric motility.

The transient receptor potential vanilloid 1(TRPV1) is a G-protein coupled receptor known to interact with the endocannabinoid system. These receptors appear to play an important role in regulation of body temperature.[5] This receptor is activated by heat (temperature greater than 41°C). This may explain the clinical relief of symptoms by hot showers/baths.[6]

There is one other way to differentiate CHS vomiting from other causes. CHS is relieved by topical capsaicin. The TRPV1 receptors are behind this reaction.[6] Capsaicin also activates TRPV1 receptors the way heat does. In fact, TRPV1 is the only known receptor in the body that has been identified with which capsaicin interacts.

Jeff LaPoint et al reported in 2014 a complete resolution of nausea and vomiting in a series of five patients after applying capsaicin cream to the abdomen.[7] Similar responses were reported by some of the same authors in a separate paper that same year.[8] A 2017 paper by Dezieck summarized thirteen case histories of patients at emergency rooms in Massachusetts and Illinois whose symptoms were relieved this way.[9] In January 2018, Andrew Moon and colleagues reported that topical capsaicin provided significant temporary symptom relief in a patient suffering from severe CHS. They proposed that, "… chronic cannabis use decreases TRPV1 signaling and alters gastric motility."[10]

Guidelines published in March 2018 in the *Western Journal of Emergency Medicine*, written by LaPont et al, describe how capsaicin is used to treat CHS:

> Capsaicin 0.075% can be applied to the abdomen or the backs of the arms. If the patients can identify regions of their bodies where hot water provides symptom relief, those areas should be prioritized for capsaicin application. Patients should be advised that capsaicin may be uncomfortable initially, but then should rapidly mimic the relief that they receive with hot showers.[11]

Thus, the current theory to explain CHS is that chronic cannabinoid exposure inactivates the TRPV1 receptors. This inactivation leads to nausea and

vomiting due to central effects and vagal afferents. This TRPV1 inactivation also changes gastric motility. Cutaneous heat on the skin or capsaicin reactivates TRPV1 normalizing motility and, at least temporarily, reducing emesis.

CHS symptoms are in a way paradoxical. Recall that the reason so many people were supportive of legalizing medical marijuana in the first place was for its long-recognized anti-emetic effects, it helped stop vomiting in cancer patients.

While marijuana may prove to be useful for treating some GI conditions, especially inflammatory bowel diseases, we have to keep marijuana on our differential list as a possible cause for a range of GI symptoms such as nausea, vomiting, anorexia, weight loss, and chronic pain.[12]

Such a dose-related dual action is quite common among natural therapies. If we were to draw a graph that compared nausea with dose of marijuana, we would probably see the sort of U-shaped dose-response curve that is called a hormetic response. We see one effect when the dose is low and the opposite effect as the dose increases. This is so common to see with naturopathic interventions, that one must wonder if the definition of naturopathic medicine shouldn't include this: "Naturopathic medicine is a school of medicine that preferentially utilizes natural therapies that trigger hormetic responses to restore homeostasis and improve health."

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

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

Ask Dr. J

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

The Good, the Bad, & the Ugly of Cancer Diagnosis

I've written previously on what I consider the seven, now nine, E's of cancer treatment/prevention: Earthing, Eating, Education, Emotion, Emunctories, Energy, Environment, Exercise, and Exoskeleton (spinal health). In this column I want to focus on what I, as a naturopathic doctor and an acupuncturist, would do diagnostically for someone who came to me with a cancer diagnosis.

This happens to me all the time. Most people have already passed through the Western medicine portal to a large extent. They have been given, in my estimation, a semi-diagnosis and a semi-treatment. What has happened to them is what I call the cognitive dissonance of slash-and-burn methods of traditional oncology.

So, seeing a cancer patient for the first time, in what direction would I point them? First, I would have to consider giving them the biggest bang for their buck which would probably already be in dangerously short supply due to their previous treatment(s). Second, due to my integrative medical training, I would like to steer them in a direction that would lead them to a more individualized, personalized diagnostic direction that hopefully isn't too awfully pricey!

The first test I would recommend is provided by the Weisenthal Cancer Group, and it is called Personalized Cytometric Cancer Profiling. The patient's living cancer cells are tested to determine exactly which various chemotherapeutic, immunologic, molecularly-targeted, and anti-angiogenic drugs and drug combinations most effectively kill their cancer cells and which do not. This pinpoints the most promising pharmaceutical regimen for just them and spares needless exposure to ineffective drugs. There is no trial and error in this approach, or no "I feel this is the best chemo combo to use for you based on my clinical experience." This is truly individualized, precision medicine, based on specific biological factors that occur at the cellular level of each person's cancer and are unique to each patient.[1]

I find it extremely odd that this testing isn't routinely done. When people present with UTI's or sore throats, they do a culture and then a sensitivity to make sure that the antibiotic given will kill the bacteria that has infected the person. This is standard practice. Why it isn't standard practice to test a person's cancer against various pharmaceuticals to see what it is sensitive to rivals the fact that no one has gone to jail for lying about WMD in Iraq. With, personalized cytometric profiling, ineffective cancer drugs can be avoided and also the harmful side effects from those drugs. Also, valuable treatment time is not wasted, potentially limited monetary funds do not dry up, and the cancer cells do not become chemotherapy-resistant on these trial and error treatments.

In a study using cytometric profiling versus just standard, empiric therapy, there was a 2.5-fold greater mortality at one year in the group just receiving standard therapy. This translated to a 20% mortality in the standard group versus 8% mortality in the profiling group.[2]

In another study involving cytometric testing, the researchers found the sensitivity testing to be 90% accurate in identifying sensitivity and resistance of different drugs used in vivo.[3]

The only downside to this technique is that the patient must have their cancer cells accessible by means of surgery or other biopsy procedure. The test cannot be performed on dead cells or on tissues that were obtained in a past procedure. Thus, the patient has to contact the Weisenthal group in advance and learn what they need to inform their doctor and the lab handling their biopsy with regard to specimen transport materials and methods.

The next direction I would want a patient to head diagnostically would be a blood screening test from RGCC/Research Genetic Cancer Center. This group provides us with a wealth of useful information. They test for CTC's/Circulating Tumor Cells and CSC's/Circulating Stem cells in the OncoStat Plus Test. Both of these are tumor cells that have extricated themselves from the primary tumor and are circulating in the blood stream with the potential to spread to distant sites.[4]

These cells can be isolated and identified, which I feel serves one primary purpose: identifying if tumor cells or tumor stem cells have escaped the primary tumor and are roaming free in

the blood to invade another body area and establish residence there and grow a secondary tumor. Here again this isn't rocket science. Why wouldn't every cancer patient want to know if they have circulating CTC's and CSC's and how to kill them?

This test can also be used to assuage the fears of a person who feels they may have cancer. If a patient has tested negative for, say, a lung cancer but feels the test wasn't sensitive enough, they could have the OncoStat Plus test done. If their CTC's were above a certain level, this could reliably inform the patient that there is possibly a cancer in their lungs that is shedding into the blood stream and that they need a more reliable diagnostic exam to physically prove the cancer is actually present. This test then has the possibility of revolutionizing the field of cancer medicine.

A common misconception in cancer treatment is that treatment with chemotherapy can lower CTC counts and cure the patient of cancer. Chemotherapy has actually been shown to increase CTC counts. Although chemotherapy is an effective agent to initially reduce tumor size, residual CTC's and CSC's can resurface with a vengeance and cause tumor regeneration.[5]

The use of RGCC's test works with all cancers except brain and central nervous system primary tumors, such as glioblastomas and astrocytomas. RGCC can still work with these tumors when provided with a small, live tissue sample from the donor.[4]

In addition, RGCC performs a sensitivity with the OncoStat Plus test against 53 common chemotherapy drugs and 45-49 natural substances. Basically, this is one-stop shopping as you wouldn't have to use the Weisenthal cancer group above.[4]

One last diagnostic tool I will write about is a genetic test performed by Genova Diagnostics called Detoxigenomics. This test is looking at single nucleotide polymorphisms/SNP's in the Phase I and Phase II detoxification systems of the liver.

In naturopathic medical school, I was continuously bombarded with the importance of the liver in some vague concept called detoxification. We could talk detox for 100 articles, but I feel that our emunctories or detoxification organs are extremely important for our long-term health. Of these, presently, the liver has a genetic test that looks for potential deficiencies in its ability to keep toxins out and deal with those toxins that breach its borders.

A useful metaphor that I use with patients, when attempting to persuade them to fork over $500 for a Detoxigenomics test, is comparing their liver to a vase with two openings. The top of the vase is where environmental chemicals and heavy metals enter the liver. I tell them that some people are like a good friend of mine's father, Cranky Frank. Frank died of a stroke at 87 after smoking two packs of Camels a day for 70 years, drinking excessively into his 70s, and eating a diet that mostly consisted of Wonder bread, mayo, a piece of head lettuce (token veggie), and bologna. Now I tell them that Frank was born with gaping holes at the bottom where the toxins are eliminated from the body. A child who develops liver cancer at five might have microscopic openings, which cause the toxins to remain in the body instead of being eliminated. We can use the results of the Detoxigenomics test to maximize their openings, which are more than likely smaller as they are seeing me for some sort of chronic disease.

A SNP is a common genetic alteration in humans and represents a difference in the base sequence of a DNA building block called a nucleotide. One base substitution or SNP that occurs in a gene may play a role in the development of disease by affecting how the gene is expressed and as a result its function in the body. This can predict how a person will respond to various drugs and their susceptibility to multiple environmental toxins that could affect physiologic function and the risk of future chronic diseases.[6,7]

The SNPs in the liver's detoxification system then make the individual more vulnerable to the multiple chemicals and heavy metals that are endemic in our modern society and that we are exposed to in unprecedented levels. If we could identify genetic defects in this system, this could go a long way to the prevention of cancer and other chronic diseases and also increase the effectiveness of treatment, preventing a further recurrence.

The SNPs measured in Detoxigenomics have been selected based on their clinical significance, their population prevalence, and their ability to be influenced by lifestyle, dietary, biochemical, and environmental factors whose effects are measurable.[8]

Using these above diagnostic tests allows us to see, as the singer Van Morrison sings so eloquently, "into the mystic." By the mystic, I mean into the cellular world. We are functionally not a group of organs and organ systems but a mass of cells where the real power grid of the body lies and where the detritus of the world really poisons our body.

On a pathological level, a cancer is also not functionally real. It is also a mass of cells. If we can gain insight into what is powering that mass of cells and what they are susceptible to, then that should allow us to take the proper therapeutic steps to eliminate them and return homeostasis to the person's ecosystem.

Conflict of interest: The author is interested in opening and running an in-patient facility to effectively treat people with cancer and other chronic diseases, similar to those in Southern Germany and Northern Switzerland which he has visited. These opinions expressed above belong solely to the author, who hopes they stimulate contemplative thought in the minds of all who have read this piece. In the larger scheme of life, it just doesn't matter if you completely agree with me, just that you agree to contemplate what I say.

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7. Making SNPs make sense. Learn.Genetics http://learn.genetics.utah.edu/content/precision/snips/
8. https://www.gdx.net/core/sample-reports/Detoxi-Genomics-Sample-Report.pdf

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Calendar

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

JULY 27-29: PRIMARY CARE IN WOMEN – SYNDROMES, SLEEP DISORDERS, PAIN, PRECISION SUPPLEMENTATION AND MORE in Portland, Oregon. CEUs available. CONTACT: http://instituteofwomenshealth.com/

AUGUST 4-5: THE GREAT PLAINS LABORATORY, INC. presents GPL ACADEMY PRACTITIONER WORKSHOPS in Denver, Colorado. This workshop will review organic acids testing, toxic chemical testing, and mycotoxin testing. CONTACT: http://www.GPLWorkshops.com

AUGUST 10-12: THE AMERICAN ASSOCIATION OF STEM CELL PHYSICIANS CONFERENCE in Miami, Florida. CMEs. CONTACT: info@AAOSCP.com; http://www.aaoscp.com/

AUGUST 10-12: INTERNATIONAL HYPERBARIC MEDICINE CONFERENCE & EXPO - ADVANCING HYPERBARIC MEDICINE GLOBALLY in Denver, Colorado. CONTACT: https://www.hyperbaricmedicalassociation.org/conference-agenda

AUGUST 24-26: ACUPUNCTURE MERIDIAN ASSESSMENT (AMA) TRAINING For Doctors, Dentists & Health Professionals: Detecting Chronic Diseases & Causes with Simon Yu, MD, in St. Louis, Missouri. CONTACT: http://www.preventionandhealing.com/

AUGUST 27-29: 3rd INTERNATIONAL CONGRESS ON RESTORATIVE AND ALTERNATIVE MEDICINE – Ancient Herbal Wisdom for Modern Day Healing in Paris, France. CONTACT: https://restorativecongress.conferenceseries.com/

SEPTEMBER 1-3: 46th ANNUAL CANCER CONVENTION in Glendale, California. CONTACT: 323-663-7801; http://cancercontrolsociety.org/

SEPTEMBER 6-9: 9th INTEGRATIVE MEDICINE FOR MENTAL HEALTH CONFERENCE (IMMH) in Dallas, Texas. Evidence-based diagnostic and treatment options to reduce symptoms of autism, ADHD, depression, anxiety, Alzheimer's, and more. CONTACT: http://www.IMMH2018.com

SEPTEMBER 7-9: INTERNATIONAL ACADEMY OF ORAL MEDICINE & TOXICOLOGY (IAOMT) ANNUAL CONFERENCE in Stowe, Vermont. CONTACT: https://iaomt.org/

SEPTEMBER 7-9: INTERNATIONAL CONFERENCE ON CHRONIC PATHOLOGIES in Antwerp, Belgium. CONTACT: https://chronic-pathologies.com/

SEPTEMBER 8-9: BUHNER METHOD OF HEALING LYME AND COINFECTIONS with clinical herbalist Julie McIntyre in Halifax, Nova Scotia. Learn updated protocols from Stephen Buhner's esteemed colleague. CONTACT: eastcoastnaturopathic@gmail.com

SEPTEMBER 14-15: CLINICAL MITOCHONDRIAL AND ENVIRONMENTAL MEDICINE in Heidelberg, Germany. Specialist lectures in English. CONTACT: info@mito-medizin.de; http://www.mito-medizin.de/

SEPTEMBER 14-23: KLINGHARDT ACADEMY LYME & LIGHT MASTERMINDS in Kenmore, Washington. With Neural Therapy-Autonomic Response. CONTACT: 908-899-1650; info@klinghardtacademy.com; http://www.kinghardtacademy.com

SEPTEMBER 22-26: ACADEMY OF INTEGRATIVE HEALTH AND MEDICINE (AIHM) CONFERENCE in San Diego, California. CONTACT: http://conference.aihm.org/annual/2018/keynotes.cfm

SEPTEMBER 26-30: 12th ANNUAL MICROCURRENT CONFERENCE AND TRAINING in St. Pete Beach, Florida. CONTACT: http://www.microcurrentconference.org/

SEPTEMBER 27-30: 16th ANNUAL INTERNATIONAL RESTORATIVE MEDICINE CONFERENCE in Burlington, Vermont. Trends in nutrition, pain management, and mind-body therapies. CONTACT: jen@restorativemedicine.org; https://restorativemedicine.org/Burlington

SEPTEMBER 28-30: DR. PAUL ANDERSON'S ADVANCED APPLICATIONS IN MEDICAL PRACTICE (AAMP) FALL CONFERENCE on Advanced Approaches to Complex Infectious Disease in Portland, Oregon. CONTACT: Sharon Phillips 954-540-1896 (tel) or email sharon@aampConferences.com; https://aampportland.com/

OCTOBER 4-7: IVC SYMPOSIUM-Getting to the Roots of Mitochondrial Dysfunction in Wichita, Kansas. CONTACT: Erin Manning, 316-927-4709; https://IVCandCancer.org

OCTOBER 6-7: WANP ANNUAL CONFERENCE "Clinical Pearls in Daily Practice" in Lynnwood, Washington (near Seattle). CONTACT: 206-547-2130; https://wanp.org/

OCTOBER 11: MATRIX REFLEX TESTING (MRT) in Scottdale, Arizona. A one-day introduction to this energetic testing method ("Beginner Muscle Testing") by Louisa Williams, ND. CONTACT: https://iabdm.org/product/2018-annual-conference-registration/

OCTOBER 11-13: INTERNATIONAL ACADEMY OF BIOLOGICAL DENTISTRY & MEDICINE (IABDM) ANNUAL CONFERENCE in Scottsdale, Arizona. Featuring "Focal Infection Theory Returns" and "IntraOral Acupressure." CONTACT: https://iabdm.org/product/2018-annual-conference-registration/

OCTOBER 11-13: 27th ANNUAL IAACN SCIENTIFIC SYMPOSIUM – Infectious Disease: The Influence of Clinical Nutrition on Outcome in Plano, Texas. CONTACT: https://www.iaacn.org/2018-symposium/

OCTOBER 17-22: INTERNATIONAL COLLEGE OF INTEGRATIVE MEDICINE – An Orthomolecular Approach to Cancer in Minneapolis, Minnesota. CONTACT: http://icimed.com/

OCTOBER 19-20: DERMVEDA INTEGRATIVE SKIN CARE SYMPOSIUM in Sacramento, California. CONTACT: http://2018.integrativeskinsymposium.com/

OCTOBER 19-21: AMERICAN INSTITUTE OF HOMEOPATHY ANNUAL CONFERENCE – TACKLING PATIENTS WITH SEVERE PATHOLOGY with Andre Saine, ND, in Cleveland, Ohio. CONTACT: https://homeopathyusa.org/education/2018-conference.html

OCTOBER 25-27: INSTITUTE FOR FUNCTIONAL MEDICINE – GASTROINTESTINAL APM in Nashville, Tennessee. CONTACT: 800-228-0622; https://www.ifm.org/

OCTOBER 26-28: FIELD THERAPY CONTROL® (FTC) THREE-DAY INTENSIVE TRAINING with Savely Yurkovsky, MD, in Westchester County, New York. CONTACT: 914-861-9161; info@yurkovksy.com; https://www.yurkovsky.com/

OCTOBER 30-NOVEMBER 5: 52nd "MEDIZINISCHE WOCHE" (BIOLOGICAL REGULATORY MEDICINE WEEK) in Baden-Baden, Germany. CONTACT: https://www.brmi.online/

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Women's Health Update

by Tori Hudson, ND
womanstime@aol.com

Ovarian and Cervical Cancer Screening Guidelines

Ovarian Cancer Screening Guidelines

The US Preventive Services Task Force (USPSTF) recently published a recommendations statement based on updated evidence and a systematic review of screening for ovarian cancer. Ovarian cancer is the fifth most common cause of cancer-related death in women in the US. Only one in five ovarian malignant tumors are diagnosed when they are stage I disease, and if stage I, the survival rate is 90%. The problem is that most cases of ovarian cancer are diagnosed when they are in advanced stages and thus with a poor prognosis. The last USPSTF guidelines on this topic were published in 2012. The current guidelines are now updated based on a review of recent evidence regarding the benefits and risks of ovarian cancer screening **in women who are considered average risk.**

The key recommendations are as follows:

- Ovarian cancer screening is not recommended in average risk women.
- Screening (such as transvaginal ultrasound and/or a tumor marker, CA-125 blood test) does not reduce the mortality due to ovarian cancer.
- Transvaginal ultrasound and/or CA-125 tumor marker tests have low positive predictive value in average risk women.
- Unnecessary harms include surgery for women who do not have ovarian cancer.
- Harm due to ovarian cancer screening outweighs any benefits.

Commentary: I have been long familiar with the temptation of using transvaginal ultrasound and/or CA-125 testing as an ovarian cancer screening strategy. But I have also been familiar with their misleading results. Transvaginal ultrasound is definitely appropriate in assessing and even monitoring adnexal masses. In addition, serial CA-125 levels are used in following surgical treatment for ovarian cancer. But, for women who are asymptomatic and considered to be at average risk for ovarian cancer (e.g. no known mutation for hereditary cancer syndromes), the evidence results in an unchanged message: Screening in average risk women with transvaginal ultrasound and/or CA-125 testing should not be utilized. The American College of Obstetricians and Gynecologists and the American Cancer Society are all on the same page about these recommendations. ➤

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NOVEMBER 2-3: THE GUT-BRAIN RELATIONSHIP CONFERENCE in San Diego, California.CONTACT: http://ivpmeducation.com/events/gut-brain-relationship-2018/

NOVEMBER 7-9: THE AMERICAN COLLEGE OF NUTRITION 59th ANNUAL CONFERENCE – "Personalized Nutrition 2018: Translate the Science of NutriGenomics into Practice" in Seattle, Washington. CONTACT: Conf@AmericanCollegeofNutrition.org; http://americancollegeofnutrition.org/conference

NOVEMBER 9-11: THE SUMMIT ON NEURODEGENERATIVE DISORDERS: NEW INFORMATION ON POSSIBLE CAUSES, DIAGNOSTICS, AND TREATMENT STRATEGIES in San Diego, California. Presented by Integrative Medicine for Mental Health (IMMH) and The Great Plains Laboratory, Inc. CONTACT: http://www.immh.org/neurosummit

NOVEMBER 16-19: WISE TRADITIONS 2018 in Baltimore, Maryland. CONTACT: http://conferences.westonaprice.org/

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 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

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

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

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At the risk of countering guidelines, there are occasions where I feel compelled to test an asymptomatic woman. These have included a first-degree relative with ovarian cancer (no genetic testing in that relative or our individual woman), obesity, and a diagnosis of polycystic ovarian cancer syndrome (PCOS). A subset of women with PCOS may have an increased risk of ovarian cancer. If I have a patient with all three of these (mother with ovarian cancer + obesity + history of PCOS), I would likely recommend annual transvaginal ultrasound and CA-125 testing.

US Preventive Services Task Force. Screening for ovarian cancer: USPSTF Statement. *JAMA*. 2018 Feb 13; 319:588.
Henderson J, et al. Screening for ovarian cancer: Updated Evidence Report and Systematic Review for the USPSTF. *JAMA*. 2018;Feb 13; 319:595.

Cervical Cancer Screening Guidelines for Women Older Than 65

There have been many changes in cervical cancer screening guidelines, especially since 1988 and the publication of the Bethesda System in which the terminology and the three levels of CIN (cervical intraepithelial lesions) was replaced by LSIL (low grade squamous intraepithelial lesions) and HSIL (high grade intraepithelial lesions). In the last 40 years, with widespread use of cervical cancer screening, the incidence of and mortality from invasive cervical cancer has been significantly reduced. In 2002, the addition of human papilloma virus (HPV) testing to cytology testing led to longer screening intervals. In 2012, consensus guidelines were compiled by an expert panel from the American Society for Colposcopy and Cervical Pathology and supported by the American College of Obstetricians and Gynecologists (ACOG), the American Cancer Society (ACS) and the US Preventive Services Task Force (USPSTF). Amongst the extensive guidelines across age groups, they recommended cessation of cervical cytology screening for women aged older than 65 years if the following criteria are met:

1) Adequate negative screening (three consecutive negative cytology results or two negative co-tests of cytology plus HPV, within the preceding 10 years and the most recent test occurring within the past five years).
2) No history of CIN 2 or worse in the prior 20 years before exiting screening.

For women who have a history of greater than CIN 2 disease, they should continue screening for at least 20 years after treatment. For women over 65 years, the panel does not recommend reentering screening even in the event of a new sexual partner. Their reason for this is that studies suggest that continued screening beyond age 65 in otherwise low-risk women would prevent only 1.6 per 1,000 cancer cases and 0.5 cancer deaths; in contrast, with continued screening, there would be an additional 127 colposcopies per 1,000 women while extending life expectance by less than one day per woman. A further rationale is that even in the event of a new partner after age 65, and acquiring HPV, most women are likely to have similar rates of viral regression as do younger women and older women have a smaller transformation zone with less susceptibility to HPV infection. In addition, the progression of cervical cancer can be (but not always) 20-25 years.

Commentary: I'm one of those clinicians who continues to perform cervical cancer screening in patients aged older than 65 and very much especially if they have a new male partner. If they have a new partner, I perform co-testing. If they do not, I do a pap smear and HPV test every three years if a history of CIN 1 or less. I also continue to recommend an annual physical and gynecological exam, even if they are asymptomatic, or sexually active. It is however important to appreciate that continued screening comes with risks: Older women have a higher false-positive rate of abnormal cytology – likely due to atrophic and inflammatory changes. As a result, more colposcopies and cervical biopsies may be done but are in fact not necessary. That said, continued screening beyond age 65 years reduces further, albeit an already low incidence of cervical cancer diagnoses.

I choose to do screening in low-risk women, never longer than every three years (not every 5 years), due to data that has emerged since the 2012 guidelines that even in a compliant patient, she has a two-fold increased risk of developing cervical cancer in her lifetime if she does screening based on contesting every 5 years.

Miller T, Flowers L. Navigating the cervical cancer screening guidelines for women aged older than 65 years. *Menopause*. 2017;24(11): 1302-1303.

Follow-Up of Women with CIN 2

CIN 2 is classified as a high-grade lesion, but even so, most do regress spontaneously, especially in younger women. The optimal follow-up for women with CIN 2 still remains a bit unclear. The current systematic review attempts to better understand the natural history of CIN 2. A total of 36 studies involving 3160 women with CIN 2 and who did not receive treatment, were investigated. At the two-year follow-up, 50% of lesions had regressed, 32% persisted and 18% progressed. For women younger than 30, regression rates were higher at 60%, and persistence was 23%, and progression only 11%. Progression rates were even lower, 5%, in women who were negative for high-risk human papilloma virus 16/18.

Commentary: This systematic review confirms that 50-60% of CIN 2 lesions will regress spontaneously, which means 40-50% will persist or progress. That's too high for my comfort. CIN 2 is a "tweener," you might say, and consists of a range of malignant potential conditions. Unfortunately, we are not yet at the place of fully understanding who will regress, vs who will progress. One sorting-out methodology is to order the HPV subtyping. If 16 and/or 18 positive, that would lead me to more likely treat rather than wait and watch, due to higher risk of progressing. I have developed my own natural medicine protocols for when researched oral alternatives may be adequate, including selenium, folic acid/folate, *Coriolus versicolor*, indole-3 carbinol, and green tea. In addition, although less researched than the oral, and less researched than the LEEP, topical protocols can include green tea suppositories, or escharotic treatments followed by an herbal vaginal suppository historically called "vag pak." For my comprehensive and current protocols and indications, see the Women's Health Update column in the February/March 2017 issue of *Townsend Letter*.

Tainio K, et al. Clinical course of untreated cervical intraepithelial neoplasia grade 2 under active surveillance: Systematic review and meta-analysis. *BMJ*. 2018;Feb 27;360:k499.\
Cruickshank M. Treatment or surveillance for CIN 2? Women now have better data on regression and progression to help them decide. *BMJ*. 2018 Feb 27;360:k771.

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College of Naturopathic Doctors of Alberta Meeting

by Jacob Schor, ND

Drs. Jacob Schor, Marianne Trevorrow and Paul Saunders

There's usually one speaker at every conference I attend that says one thing that sticks in my mind. Perhaps this is admitting a bit too much about the limitations of my memory. I flew up to Calgary in mid-June to attend the annual CNDA conference. That is CNDA as in "College of Naturopathic Doctors of Alberta" as opposed to the CAND as in "Canadian Association of Naturopathic Doctors" (or for that matter the California Association of …or the Colorado Association).

Tyna Moore, DC, ND, who practices in Lake Oswego just outside of Portland, touted strength training as a near miraculous cure for just about everything. She had a line that she kept repeating in her lectures. A line that I carefully wrote down on a scrap of paper that may still be in my computer bag; it went something like "Lift heavy things and carry them somewhere." Her lecture was probably similar to her 2017 article "Muscle as Medicine: A Most Naturopathic Anti-Aging Medicine" in *NDNR*; but as I don't read *NDNR* all that conscientiously, her lecture was new to me. The basic message: old-fashioned strength training with heavy weights improves most aspects of health. Her simple bottom line is to lift heavy things and move them about. Since I've returned from the conference, there seems to be lots of dense objects requiring my attention. The list includes furniture, boxes of books, kayaks, truck wheels, an antique dresser in the alley that needed to be rescued and so on. Every time as I'm about to heave-ho, I can hear Dr. Moore's voice in my head egging me on, "Lift heavy things…." I feel better just thinking of her saying this.

Dr. Moore was just one of a fascinating line up of speakers the organizers brought to Calgary.

Neil McKinney has been lecturing extensively for the past year or two on dietary effects on metabolism and in particular on mitochondria function. He's tried to explain his theory of how mitochondria and epigenetics influence all disease to me again. He did a fine job, though I always get lost part way through. He's got a new protocol that he's quite excited about to rejuvenate mitochondrial function that I'm eager to try out on patients. You'll hold it against me if I don't list the combination. It's written on that same scrap of paper.

Not being able to find it quite yet, I wrote to Dr. McKinney to ask for it. He was perfectly happy to share his current iteration of the formula he's experimenting with. From his response:

> Clearly mitochondrial adaptation to anaerobic glycolysis has profound implications in carcinogenesis and cancer progression. Cancers are more aggressive as mitochondria fail or are damaged. As I explored mitochondrial resuscitation, inspired by DCA studies in Canada in 2007, I found links to epigenetics and cellular reprogramming. I have had some significant input by doctors of nutrition and naturopathic physicians in creating this most recent iteration….
>
> McKinney Mitochondrial Resuscitation Formula:
> - R-alpha lipoic acid..... 100 mg
> - N-acetyl-L-carnitine ..... 333.33 mg
> - Quercetin ..... 166.67 mg
> - Grapeseed extract ..... 83.33 mg
> - Thiamine (B1) ..... 33.33 mg
> - PQ10 emulsified CoQ10..... 20 mg
>
> Sig: 1-2 tid.
>
> This is synergistic with taurine and Solomon's seal.

No doubt as usual, I was sitting in the back of the room whispering with Dr^3. Paul Saunders, my one-time roommate in Portland. The good Dr^3 has for many years been denoted as the cubed doctor as he was awarded his third doctorate at our graduation together from NCNM in 1991. Prior to graduation we had just called him doctor-doctor. We changed that to the "3" upon graduation. The conference organizers asked Dr^3 to speak about several topics, protomorphogens, and also to look carefully at laboratory testing, an assignment he fulfilled with his usual meticulous diligence.

Michael Traub, ND, flew in from Hawaii, greeted all of us with an "aloha," and then gave a sincere and heartfelt lecture on the healing value of being present with patients; and hardly taking a breath, he embarked on a second lecture that reviewed the use of medicinal mushrooms. ➤

Alberta Meeting

➤

As typical, I kept getting distracted in the vendor hall or out in the hallways talking to people; and I missed more of the speakers than I should admit in print as I'm still going to claim those lectures for continuing education hours. This conference may have been worse than usual because those Canadians are just so pleasant and so appreciative and so sincere when they asked me what is going on in the United States. They are rather fond of their Prime Minister and couldn't understand someone's need to insult him after the G-7 Summit just a few days before the conference.

I missed Carrie Jones's talk about estrogen metabolism. I did hear all of Preet Khangura's lecture on SIBO. My seat was such that I would have had to almost step on and over him if I'd tried to sneak out during his lecture.

Quinn Rivet, ND, Canadian naturopathy's "Kidney Guy," was a hoot. He taught at Boucher Institute of Naturopathic Medicine for 13 years; it sounds like every course on their schedule at one point or another. He wrote the book *Naturopathic Approaches to Kidney Disease* and has managed to survive without the standard anti-rejection drugs for the dozen years since his last kidney transplant. I regret now not purchasing a copy of his book up there. But you know how heavy books are and what a hassle it is to lug luggage around a city. Still, I'm not finding it on Amazon. I may have made a mistake. Perhaps if a copy arrived in the mail, I might write a review.

Calgary, of course, is one of the most pleasant cities on the continent – well, at least in the summer, when the weather is glorious. Of course, being filled with Canadians doesn't hurt. Canadians are nice people in general, and Canadian naturopathic doctors are well above average.

Michael Traub wasn't able to resist the lure of the mountains and snuck out of the conference on Sunday and went to Lake Louise and hiked up to the Agnes Lake tea hut. As a result of his excursion, he missed my lecture. I'm not going to make a big stink about his absence, as he may also need some CE hours.

I brought home a save-the-date card for the conference being put on by the Saskatchewan association of naturopathic doctors, which apparently is going through a name change. They were the Saskatchewan Association of Naturopathic Practitioners and are becoming the College of Naturopathic Doctors of Saskatchewan. By the way, that association, whichever name you use, was founded in 1954.

Their conference is set for June 7-9, 2019, in Saskatoon. Forgive me but I just love writing some of these names and saying them. Saskatoon, Saskatchewan. Another thing one has to love about Calgary is they call highways (or freeways for you Californians), trails. They call their highways trails. If you want to drive to Edmonton from Calgary, you take the Edmonton Trail. The main North-South highway in the Calgary metro-area is the Deerfoot Trail. This is the sort of fact one can think about after reading the newspaper many days. It's something of an antidote. People in Calgary commute to work on trails. Also, their NDs put on fantastic conferences. ◆

Bioregulatory Medicine Institute 2018 Conference Recap

The Bioregulatory Medicine Institute (BRMI) recently held its second conference in Louisville, Kentucky, from May 10-12, 2018. It was attended by more than 150 doctors and practitioners from many disciplines as well as numerous interested non-medical professionals. The conference title was "Understanding, Optimizing and Maintaining the Bioregulatory Terrain." It included two days of plenary lectures, workshops, a live case presentation, and an array of vendors. The conference presented strategies to identify and treat exogenous and endogenous disturbance variables that affect the body's bioregulatory matrix and its internal milieu. Presenters were Gerry Curatola, DDS; Brent Davis, DC; Hennie Fitzpatrick, MD; Sargent Goodchild, Jr; Jack Kall, DMD; Kimchi Moyer, L.Ac., James Odell, OMD, ND, L.Ac.; Sharon Stills, NMD; and Dickson Thom, DDS, ND.

Presenters discussed numerous topics for restoration of the bioregulatory terrain such as detoxification protocols and therapies to support matrix regulation. Personalized treatments involving nutrition, acid-base balance, oxidation, specific nutrients, herbal therapies, homeopathics, isopathics, and bioresonance therapy were discussed. Numerous structural, functional, energetic, regulatory, and psychoemotional diagnostics procedures were presented. Additionally, biological dentistry topics such as the IAOMT's "SMART" dental protocol (Safe Mercury Amalgam Removal Technique), fluoridation issues, and dental foci were also discussed.

Access the presentations at https://www.brmi.online/louisville-2018-presentations.

BRMI is a non-profit program of the Marion Institute, founded to promote the science and art of biological regulatory ("bioregulatory") medicine, and to increase public knowledge and integration of bioregulatory medicine as a wholistic and evidence-based medical system. BRMI hosts conferences and webinars to introduce participants to the fundamental principles, diagnostics, and therapeutics of bioregulatory medicine.

BRMI seeks to provide a global network for practitioners, clinics, and organizations around the world to share their ongoing research and best practices. BRMI also promotes the global advancement and cross-cultural perspectives of bioregulatory medicine through a variety of media – from a free informational website and e-Journal, to training modules and books. BRMI will be offering a tour to the 52nd "Medizinische Woche" (Biological Regulatory Medicine Week) in Baden-Baden Germany from October 30 to November 5, 2018. For more details on BRMI, its future webinars, tours and conferences, visit www.BRMI.ONLINE. ◆

Editorial

➤ *continued from page 120*

It is not surprising that many people who follow the blood-type diet experience various improvements in their health. Every one of the four diets recommends the avoidance of refined sugar and processed foods. In addition, three of the most frequently allergenic foods – wheat, corn, and dairy products – are restricted (3 of the 4 diets prohibit wheat, 3 prohibit corn, and 1 prohibits dairy products). Whether the beneficial effects of these diets have anything to do with a person's blood type has not been subjected to scientific scrutiny until recently.

In a new study, 919 overweight individuals (mean age, 44.6 years, mean body mass index [BMI], 32.5 kg/m^2) who were participating in the Toronto Healthy Diet Study were randomly assigned to consume a diet based on Health Canada's Food Guide or a diet consistent with Dietary Approaches to Stop Hypertension (DASH) and the dietary portfolio principle. Dietary intakes at baseline and at six months were assessed by a one-month food-frequency questionnaire. Diet scores were calculated to determine relative adherence to each of the four blood-type diets. Greater adherence to any of the four blood-type diets was associated with significant improvement in one or more of the following: blood pressure, waist circumference, or body mass index. However, these improvements occurred independently of whether the diet did or did not conform to the person's blood type.[3] These findings suggest that the benefits of the blood-type diets are due to the nonspecific effects of avoiding sugar, junk food, and common allergens, and that the improvements have nothing to do with a person's blood type.

One might argue that the blood-type diet, although of questionable scientific validity, is not harmful, and that it does provide a method by which people can improve their health. However, there are potential downsides as well. First, individuals with type O blood (more than 40% of the population) are advised to consume large amounts of animal food. While the potential deleterious effect of such a diet has been the topic of ongoing debate, there is no question that some people fare best on a vegetarian diet. Second, the restriction of specific foods (such as cruciferous vegetables, lentils, sesame seeds, and buckwheat) on various blood-type diets can be a source of unnecessary inconvenience and deprives people of the benefits of these healthful foods. Finally, there is the philosophical question of whether the positive results obtained with the blood-type diet adversely affect society by providing pseudo-validation of illogical thinking.

Alan R. Gaby, MD

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◆

Coming Next Issue: Brain Health

Do We Have Something NOW to Prevent Alzheimer's?

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Is MSG really the big bad boogeyman that causes headaches and worse?

Sue Visser argues no, not really.

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Blood-Type Diet Not Supported by Research

In 1997, Dr. Peter D'Adamo wrote *Eat Right for Your Type*, a book that claimed that an ideal diet and an ideal exercise program can be devised for every person based on their ABO blood type. The thesis of the book is that by adhering to the blood-type program you can lose weight, slow the aging process, and prevent common diseases such as heart disease, diabetes, and cancer. In the ensuing 21 years, *Eat Right for Your Type* has sold 7 million copies in more than 60 languages. In addition, D'Adamo has developed a line of nutritional supplements, with specific recommendations for each of the 4 ABO blood types.

In 1998, I was asked by the *Journal of Alternative and Complementary Medicine* to write a book review of *Eat Right for Your Type*. In the review, I concluded that the hypotheses upon which the blood-type diet was based were implausible, and that the clinical improvements observed in case reports may have had nothing to do with blood type.[1]

D'Adamo's thesis is based in part on the fact that substances called lectins are present in many common foods. Lectins bind to simple and complex carbohydrates *in vitro* and behave somewhat like antibodies. Specific lectins can agglutinate the erythrocytes of certain blood types, and can also exert a wide range of other biological effects *in vitro*. According to D'Adamo, different lectins have an affinity for different cell-surface components. Therefore, individuals with a certain blood type might be adversely affected by specific lectins, whereas people with a different blood type might react to other lectins. If that is true, then people might be able to improve their health by avoiding foods that contain incompatible lectins.

However, the lectin hypothesis has serious weaknesses. First, the ABO system is only one of more than 30 different cell-surface markers that have been identified on erythrocytes. A diet based on one of these blood-typing systems might be completely different than a diet based on another set of cell-surface markers. Second, research on lectins is still in its infancy, and nearly all of it has been done *in vitro*. It is not clear to what extent food-derived lectins are absorbed, or to what extent they are destroyed by cooking and by digestive enzymes. Moreover, little is known about whether absorbed lectins have any measurable effect *in vivo*, let alone different effects in different people. As I argued in my book review, D'Adamo did not adequately explain how he arrived at his detailed lectin-related dietary recommendations. What little explanation he did provide appeared in some instances to be based on unwarranted extrapolations or misunderstandings of biochemistry and immunology.[1]

The other main rationale for the development of the blood-type diet is that particular ABO blood types are more susceptible or less susceptible to certain diseases such as peptic ulcer, gastric cancer, and diabetes. Based on these differences in disease susceptibility, D'Adamo constructed a "metabolic profile" for each blood type, from which specific dietary recommendations were developed. However, this approach appears to reflect a gross oversimplification of the evidence, as well as a number of unwarranted extrapolations. For example, type O individuals are known to have a slightly higher incidence of peptic ulcer than other groups. Seemingly from this observation, D'Adamo concluded that type Os make too much stomach acid and are therefore evolutionarily designed to eat animal protein (which requires gastric acid for digestion). However, there is no apparent reason to assume that type O individuals *without* peptic ulcer have high stomach acid and should therefore consume large amounts of animal protein. Studies that have looked at gastric acid production as a function of blood type have yielded conflicting results,[2] and some type O individuals have been found to be achlorhydric (i.e., they produce no stomach acid).

continued on page 119 ➤

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