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For many, acute Covid was just the beginning of a long, bewildering odyssey of illness. The challenging task facing many clinicians and their patients is the management of Long Covid. Five key physiological processes seem to underlie its myriad symptom patterns.

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CHRONIC DISEASE

The Five Drivers of Long Covid

BY ERIK GOLDMAN
Editor

Since the Spring of 2020, roughly 200 million Americans have had Covid-19. That's an estimated 60% of the country's population. Worldwide, the number is around 700 million.

For many, the acute infection was just the beginning of a long, bewildering odyssey of illness.

With Covid-related admissions to US hospitals now under 1 case per 100,000 population, the focus for most clinicians has shifted from preventing and treating acute infections to the challenging task of managing Long Covid, as this post-viral syndrome is known.

Government agencies and medical organizations have yet to reach consensus on formal definitions of Long Covid, and there is considerable debate about its prevalence and its risk factors. But by any accounting, it is a significant public health problem.

According to the World Health Organization, up to 10% of all people who've had Covid have persistent symptoms 3 months (90 days) or more after acute infection. Roughly 2% still have symptoms at 12 months. The Centers for Disease Control defines Long Covid as the presence of symptoms 30 days post-acute infection. By that definition, one in five US adults

Recent reports suggest that incidence may be on the wane. According to a national survey of more than 60,000 individuals by the Census Bureau and the National Center for Health Statistics, the number of Covid patients who report long-term symptoms declined from 35% to 28% between June 2022 and January 2023.

That's a positive signal, but on a population basis, the Long Covid numbers are still mas-

sive. And official figures may underestimate the problem, because cases only show up in epidemiological databases when practitioners diagnose them and code for them properly. Given that many Long Covid symptoms overlap other disorders, a lot of cases may not be properly logged.

A Chaotic Situation

There are upwards of 200 distinct symptoms linked with the post-Covid syndrome, and they can affect nearly every organ system. Though sometimes disabling, they're often diffuse and episodic, appearing, disappearing, and reappearing in seemingly random manner. And unlike the acute infection, there is no definitive "yes or no" test for Long Covid.

In May, the National Institutes of Health published the first data from the Researching Covid to Enhance Recovery (RECOVER) project. Based on records from nearly 10,000 adults, the paper is NIH's first attempt to formally define the post-Covid syndrome, catalog its most common symptoms, identify who's at risk, and provide direction for future clinical guidelines and research projects.

On a practical level, though, RECOVER offers little to help practitioners right now.

For patients, questions about the formal definition are academic: they simply know that their health cratered after having Covid. They want help, and they have trouble finding it.

A Coherent Framework

Over the last year, a working group of functional medicine practitioners came together to review the world's literature on Long Covid, compare clinical experiences, and lay

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HERBAL MEDICINE

The Colors of Maca: Balancing Hormones with Phytochemical Phenotypes

BY DEANNA MINICH, PHD, CNS &
KIM ROSS, DCN, CNS

Maca (*Lepidium*) is a genus of cruciferous root vegetables representing 249 known species of plants native to the Andes mountains of Peru and Bolivia. Various types of maca have been used as both food and medicine by indigenous peoples of that region for thousands of years.

Maca belongs to the same Brassicaceae family as turnips, broccoli, watercress and cabbage. But because it grows at 4,000–4,500 meters above sea level, it is subject to a very different combination of environmental stressors than its botanical cousins growing at lower altitudes. These intense xenohormetic exposures to altitude, sunlight, and varying moisture conditions create maca's complex therapeutic phytochemical profile.

Traditionally, Andean peoples have used maca as medicine for energy, fertility, hormone balance, healthy thyroid function, improved sexual function, premenstrual syndrome (PMS), menopausal symptoms, bone health, and as a vitality tonic for aging (Gonzales GF, et al. *Evid Based Complement Altern Med*. 2012).

In Western botanical medicine, maca is regarded as an adaptogen. Adaptogenic herbs are unique in their ability to balance endocrine hormones, regulate the immune system, and help the body maintain optimal homeostasis. Adaptogens have a normalizing effect: they can tone down the activity of hyper-functioning systems or strengthen the

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NEWS & POLICY

A Renewed Push to Include Supplements in Fed Programs

BY ERIK GOLDMAN
Editor

Should people with Health Savings Accounts (HSAs) be permitted to use their tax-deferred dollars to buy dietary supplements and herbal medicines?

It's a question that will once again confront members of Congress in the months to come.

Under current federal tax rules, supplements are excluded from HSAs and also from Flexible Spending Accounts (FSAs) unless they are explicitly prescribed by physicians. Over the years, self-care advocates and supplement industry trade groups have challenged that policy, to no avail.

Now, it appears the idea has found some new congressional allies.

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On July 20, Rep. Darin LaHood (R-IL), son of longtime conservative stalwart Ray LaHood, introduced a new bill titled the *Dietary Supplements Access Act*, calling for amendments of the federal tax code that would include all types of supplements in HSAs and FSAs. LaHood has a senior position on the influential House Ways and Means Committee, which will likely have influence on the future of the bill.

LaHood's co-sponsors are Reps. Brendan Boyle (D-PA), John Curtis (R-UT), and John Gottheimer (D-NJ), a coalition that suggests the proposition has a fair degree of bipartisan support.

The bill emerged from a renewed joint effort by the five major supplement industry organizations—the *Council for Responsible*

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Supplements

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Nutrition, the American Herbal Products Association (AHPA), the Consumer Health Products Association (CHPA), the Natural Products Association (NPA), and the United Natural Products Alliance (UNPA)—to end the exclusion and redefine supplements as eligible HSA/FSA expenses.

According to Patricia Knight and Peter Reinecke, political advisors to the UNPA, more than 35 million Americans have tax-preferred HSAs, representing over \$100 billion. An additional 21 million people have FSAs through their employers.

UNPA and the other industry organizations contend that the longstanding exclusion of supplements as an eligible expenditure denies HSA and FSA holders full freedom of choice, and reflects a nonsensical bias against one of the cornerstones of a healthy lifestyle.

A Strong Case

On June 21, Steve Mister, CEO of the Council for Responsible Nutrition, along with executives from several of the organization's member companies, met with representatives on both sides of the political divide to advocate for the new bill which, if made law, would include "everything that has a 'Supplement Facts' box on the label" as an eligible FSA/HSA expense.

In an [interview](#) with Nutraingredients-USA, Mister said he was optimistic about the future of the proposal.

The new bill is essentially the same as the *Dietary Supplements Access Act* (HR 5214), introduced in 2021 by Rep. Curtis. It declares all vitamin, mineral, amino acid, and botanical supplements to be eligible expenses.

HR 5214 failed to make it past the House Ways and Means committee in 2021.

Mister says CRN and other industry groups have done a lot of homework since then, and he feels they are now much more able to make their case.

He says congressional objections to the proposal tend to fall into two general categories.

Some lawmakers view HSAs and FSAs as "tools for rich people as tax dodges." They tend to view any expansion of HSA/FSA benefits as further opportunity for wealthy people to avoid paying their fair share.

To redress this perception, Mister points to a survey of HSA/FSA holders showing that "the vast majority of people using these accounts are not wealthy 'one-percenters,' but rather, ordinary middle-class working Americans."

Further, the [survey](#) showed that 78% of the 1,100-plus account holders want to be able to use their tax-exempt healthcare savings to purchase supplements.

"They want that flexibility. They want to be able to do things that are more proactive on healthcare, and not just use their HSA reimbursements for co-pays on doctor bills and prescriptions when they're sick," Mister told NutraIngredients.

The other major congressional objection is the belief that expanding HSA/FSA benefits would encourage diversion of more money away from taxable income streams, which would negatively impact the national treasury.

To this, Mister cites data showing that in reality, peoples' decisions about FSA/HSA allocations come down to how much they believe they can afford to take out of their paychecks, which is typically not that much. Tax avoidance is rarely a driving factor.

Potential Cost Savings

He contends that measures to encourage wider use of supplements would lead to long-term, system-wide cost savings.

A 2022 study called *Supplements to Savings* indicates that broad adoption of evidence-based supplementation strategies for six conditions—coronary artery disease, osteoporotic fractures, age-related macular degeneration, irritable bowel syndrome, and

childhood cognitive disorders—could potentially cut over \$400 billion from the nation's medical bill by 2030.

Data like that, Mister says, should be able to win over the nation's elected officials. "In so many places, government is paying for healthcare—whether it's VA benefits, or Medicare, or Medicaid. They've got a real interest in lowering healthcare costs. So, with all of that together, we had a pretty compelling argument."

It remains to be seen whether the cost-savings argument will prevail in a gridlocked, highly partisan congress bent on "fiscal restraint," as UNPA's political advisors have termed it. Knight and Reinecke note that the influential Joint Committee on Taxation (JCT), which rates the budgetary impact of all tax-related legislation, has in the past scored proposals for supplements in HSAs as a net cost, not a savings, for the government.

Advocates for the revision are urging practitioners, patients, and any other interested parties to call or write to their congressional representatives and urge them to support and co-sponsor the bipartisan *Dietary Supplements Access Act*.



A Push for Vitamin D

The HSA/FSA campaign is not the only current attempt to crack the federal government's intransigent attitude toward supplements.

Earlier this year, a coalition of nutrition advocacy groups led by the Organic & Natural Health Association (ONHA) began a campaign urging Congress to include vitamin D as an eligible expense under the federal Supplemental Nutrition Assistance Program (SNAP).

The project, titled *All for Vitamin D: Building Stronger Families in a SNAP*, is a joint effort between ONHA, the [Council of Holistic Health Educators](#), the Independent Natural Foods Retailers Association (IFRA), [Natural Grocers](#), and [SENPA](#) Natural Products Alliance to improve the health impact of the SNAP program.

As is the case with HSAs and FSAs, dietary supplements, including vitamin D, are excluded from SNAP, aka "Food Stamps."

ONHA and its allies are rallying health-conscious citizens, nutrition industry representatives, and medical professionals, to press their elected officials to amend the Farm Bill, which governs SNAP, and permit recipients to make vitamin D an eligible expense.

"Vitamin D3 supplements offer an affordable solution to address a range of health challenges faced by families, including pre-term births, depression, respiratory infections, asthma, cancer, and chronic diseases like cardiovascular issues, high blood pressure, and Type 2 diabetes," says Karen Howard, ONHA's CEO, in a [statement](#) announcing the advocacy campaign.

She holds that permitting more low-income citizens to buy vitamin D with SNAP will ultimately reduce the burden of chronic disease, cut healthcare expenditures, and save taxpayer dollars.

Over 41.2 million Americans—roughly 12% of the US population—are now enrolled in SNAP, which was born out of federal food assistance programs established during the Great Depression in the 1930s. The modern SNAP program's [stated intention](#) is to provide "food benefits to low-income families to supplement their grocery budget so they can afford the nutritious food essential to health and well-being."

Cruel Irony

In practice, a lot of products that people can buy using SNAP are very far from "nutritious" or "essential to health."

Soft drinks, cookies, cakes, and a wide range of nutritionally void junk foods are considered "eligible" under existing SNAP rules. According to a [2016 report](#) by the US Department of Agriculture, sodas are the top most-purchased commodity by SNAP beneficiaries.

All for Vitamin D's leaders point out that "While SNAP permits the purchase of a diverse range of foods, encompassing fruits, vegetables, grains, dairy, and proteins, it lacks explicit guidelines concerning the quality and nutritional value of these items."

When it comes to meeting therapeutic vitamin D levels (40–60 ng/ml), SNAP falls short, especially since it is very difficult to obtain these levels solely via food or sunlight alone. This is doubly true for dark-skinned people, who represent a disproportionate number of SNAP recipients.

ONHA cites several studies showing that people who maintain serum vitamin D levels above 40 ng/ml obtain myriad health benefits, including a [60% reduced risk of preterm birth](#)

and a [65% lower cancer risk](#), and [decreased](#) incidence, severity, and morbidity from Covid-19.

An Ongoing Effort

The *All for Vitamin D* campaign is the [latest step](#) in a long, arduous effort to convince lawmakers to expand SNAP's definition of "food."

In 2017, Rep. Mike Rogers, an Alabama Republican, introduced the *SNAP Vitamin and Mineral Improvement Act*, which would have modified the program to include vitamins, minerals, and other supplements as an eligible expense.

Rogers' bill had strong support from nutrition industry trade groups, as well as some high-profile policymakers, and was included in the House version of the 2018 Farm Bill. But it was killed in the Senate, despite strong support from Sen. Orrin Hatch, a long-time supplement advocate.

At the time, Senate agriculture committee chairman Pat Roberts (R-KS) and ranking Democrat Debbie Stabenow (D-MI) opted to cut all Farm Bill amendments that might be perceived as partisan obstacles to smooth passage. The committee deemed Rep. Rogers' proposal as one of those obstacles, and [nixed it](#) from the final 2018 version.

Under SNAP's current rules, vitamins and supplements are considered "non-food" and therefore ineligible for purchase with SNAP dollars. Policymakers justify the exclusion, arguing that if beneficiaries can use SNAP coupons for supplements, they will divert their limited funds away from "real" food. That's ironic given the myriad junk foods now covered by the program.

Further, the notion that everyone can derive all important nutrients directly from food, and that supplements encourage people to skip "real" meals, ignores the fact that many people on SNAP and other forms of food assistance already miss meals simply because they don't have enough to eat.

The average SNAP benefit equals around \$4 per person per day, or approximately \$1.40 per meal. That doesn't go very far given today's food prices.

Missed Opportunities

Outside of SNAP, many other food assistance programs such as local food banks and pantries also exclude supplements.

The number of people visiting food banks, already high before Covid, has soared since the pandemic. Three years on, 80% of food banks still report either an increase in or a steady demand for emergency food relief month-to-month, according to Feeding America. Nationwide, food banks and related programs are serving 55% more people than before Covid. Feeding America [reports](#) that at least 60 million Americans visited food banks last year.

As is the case with SNAP, many people who rely on community pantries are unlikely to get all the nutrients they need through diet alone. Yet these programs do not provide dietary supplements.

Administrators at food banks say they often receive donations of supplements from retailers, distributors, food drive collections, and manufacturers. But these products create a real conundrum. On one hand administrators recognize their potential for improving nutritional status, but on the other they are aware of issues like purposeful or accidental [adulterations](#) and exaggerated product claims.

There are no established standards for evaluating the safety and potential benefits of supplements, so food bank staffers—who are typically overwhelmed by the sheer numbers they must serve—are left to their own judgment in deciding whether or not to distribute supplements.

In 2019, a national program called Healthy Eating Research (HER) convened an expert panel "to improve the quality of foods in food banks and pantries in order to increase access to and promote healthier food choices."

The group issued a [final report](#) in March 2020 entitled *Healthy Eating Research Nutrition Guidelines for the Charitable Food System*. The guidelines acknowledge the existence of supplements, grouping them among protein powders, baby food, and other "miscellaneous items" considered necessary "only for specific populations. Though HER does not categorically dismiss supplements, it definitely counsels against wide use and does not provide practical guidelines for food pantry administrators.

The reality is, supplement products rarely make it to the pantry shelves.

Vitamins, minerals, and other supplements are not the ultimate answer to poor nutrition among the nation's poorest citizens. But they could be important tools in helping people move toward better overall health.

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WHOLE FOOD NUTRIENT SOLUTIONS

Five Drivers

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groundwork for a comprehensive therapeutic approach.

The resulting 90-day Post-Viral Recovery Program (PVRP), developed under the aegis of [OvationLab](#) and [ANDHealth](#), is a major step forward in bringing clarity to a confusing situation. It creates a set of multimodal protocols for assessing and treating patients, and provides a coherent framework for further research and refinement.

The 10-member PVRP working group was directed by OvationLab's Laurie Hofmann, MPH, and included Patrick Hanaway, MD, Kara Parker, MD, Michael Stone, MD, and Kristine Burke, MD among its members.

The group defines Long Covid as "diverse symptoms of new, returning, or ongoing health problems...after an acute Covid infection." The protocols are centered around the core observation that there are five main physiological drivers underlying the syndrome and its myriad manifestations:

- ACE2-mediated tissue damage
- Viral persistence
- Chronic inflammation
- Microbiome dysbiosis
- Mitochondrial dysfunction

These basic processes are interrelated and often concurrent (Fig.1). For example, ACE2-mediated tissue damage in one or more organs can trigger chronic, systemic inflammation. Likewise, the presence of persistent viral particles drives immune system dysregulation, which feeds the inflammatory cascade.

Long Covid has its own unique characteristics, lessons from post-acute EBV, chronic fatigue, other coronavirus-related diseases, and even Lyme disease have relevance in this context.

Who's at Risk?

"We know that people who had more severe SARS-CoV-2 infection are more likely to get Long Covid," says Dr. Hanaway. "However, we find that about two-thirds of those 2 million-plus people who have Long Covid actually had mild cases of acute SARS-CoV-2." That's in part because, statistically, far more people had mild versus severe primary infections. The point is, long-term problems often develop in people who had mild initial infections.

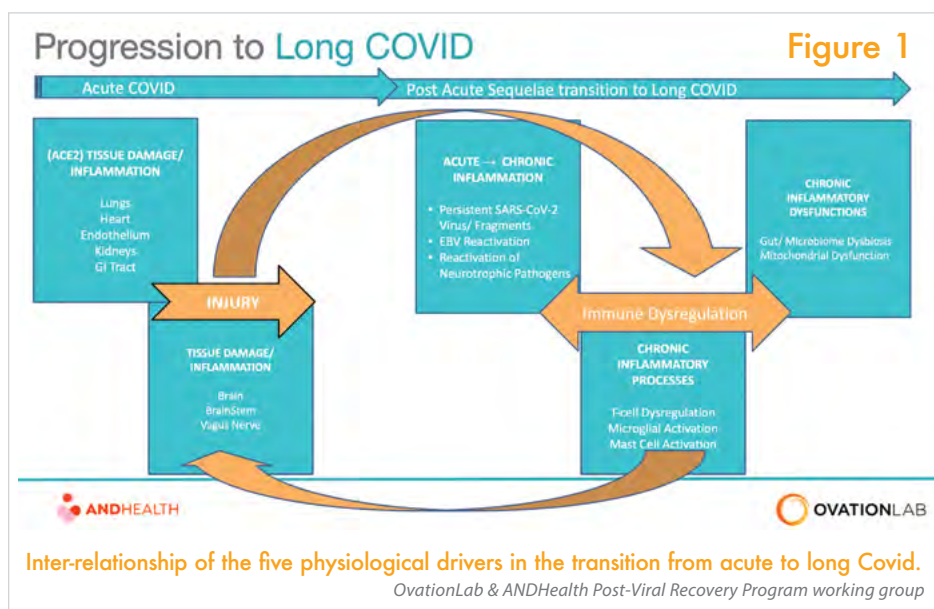
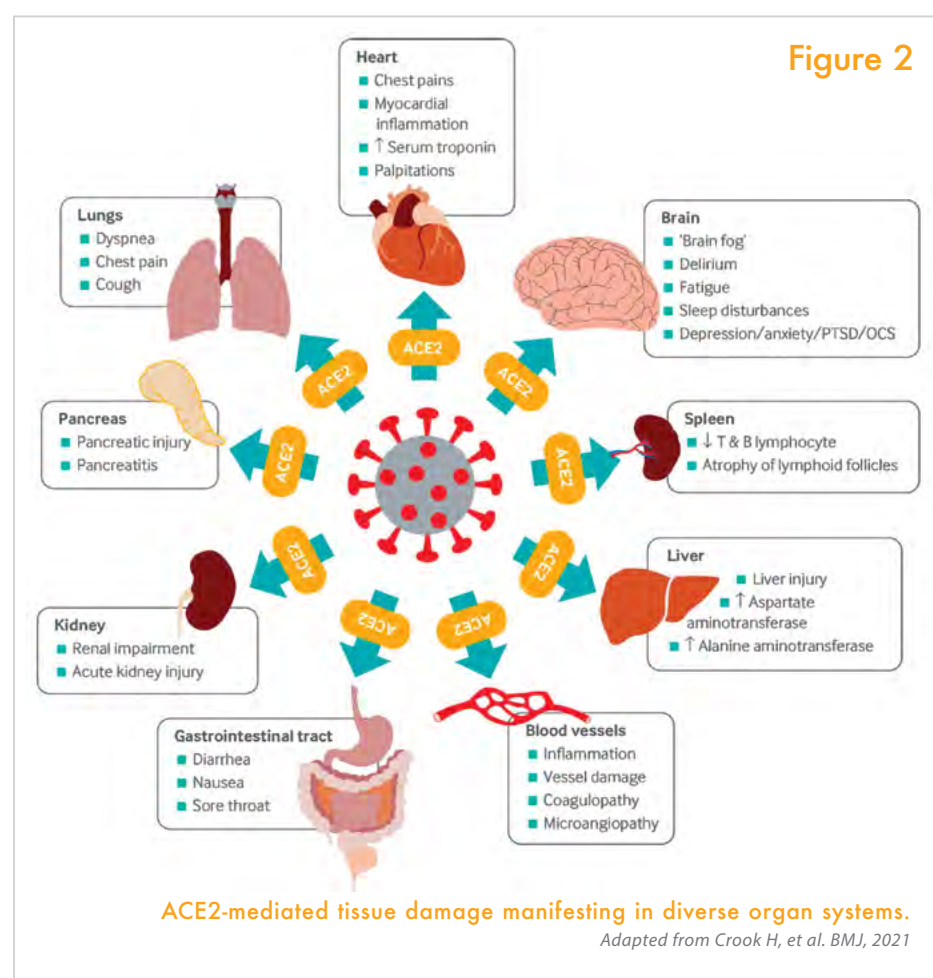
Obesity, diabetes, metabolic syndrome, and/or cardiovascular disease raise the risk of Long Covid, as does having a history pre-Covid CFS or other post-viral syndromes.

In 2022, researchers at the [Institute for Systems Biology](#) published a study looking at potential predictive factors for Long Covid in a cohort of 309 patients. They identified four factors—type 2 diabetes, presence of SARS-CoV-2 RNAemia, Epstein-Barr virus viremia, and presence of specific auto-antibodies—as highly predictive (Su Y, et al. *Cell*. 2022). They also found that patients with severe post-Covid GI problems show a unique expansion of cytotoxic T-cells measurable during the acute phase of illness.

All that said, roughly one-third of people with Long Covid have no pre-existing conditions or major risk factors at the time of primary infection.

Assessing Long Covid

Though there are no definitive tests for Long Covid, the Working Group says practitioners can glean important information from the



All of the above can disrupt the gut microbiome, resulting in dysbiosis, which adds to the symptom burden.

"The five pathophysiological drivers give us points of orientation for treatment," says Hanaway, formerly the chief medical education officer of the Institute for Functional Medicine, and founding medical director of the [Cleveland Clinic Center for Functional Medicine](#). He and other Working Group members described the PVRP principles and protocols in a series of [three free webinars](#) sponsored by AndHealth, and supported by all of the major functional and integrative medicine education organizations.

"If there's ongoing tissue damage, we can treat it. If there's evidence of viral persistence, can we identify the pathogen or pathogens and focus there. If there's chronic inflammation, we need to define what's out of balance and take steps to rectify that. Same for the microbiome. And then there's supporting the mitochondria. These factors all overlap. You can't just focus on one aspect because they're all interrelated."

Working group members recognized that Long Covid shares features with other post-viral syndromes, and that exposure to SARS-CoV-2 often reactivates latent sequestered viruses like EBV, Herpes, and Varicella. Though

following basic lab tests: Complete blood count (with differential), Sedimentation rate, Comprehensive metabolic panel, D-dimer, Fibrinogen, High-sensitivity C-reactive protein, Vitamin D, and Thyroid hormones.

Several research groups contend there are distinct "endotypes" or "immunophenotypes" of Long Covid, identifiable by particular cytokine profiles, autoantibodies, and cellular activation phenotypes. In a [landmark 2021 paper](#), Proal and VanElzakker propose that lab testing can predict which patients will likely have clotting and vascular problems, or impairment of brain and vagal nerve function, or viral reactivations, or microbiome dysregulation (Proal AD, VanElzakker MB. *Front Microbiol*. 2021).

Virologist Akiko Iwasaki and colleagues at Yale School of Medicine showed that by measuring cytokines and markers of cellular activation, they could predict 96% of Long Covid cases in a cohort of 215 individuals (Klein JB, et al. *MedRxiv*. 2022).

According to the PVRP Working Group, immunophenotyping may be valuable for research, but it is seldom needed for routine patient care.

Assessing Functional Status

"If we talk to people and get their clinical histories, we can predict who's going to get Long Covid with 95% accuracy. We don't need all of

the sophisticated immunophenotyping. It won't really change what we're going to do," says Dr. Hanaway.

Lab data needs to be viewed in the context of a patient's symptom patterns and functional status. The PVRP Working Group advocates routine use of the [PROMIS-29](#) (Patient Reported Outcomes Measurement Information System), through which patients can self-assess seven key domains—pain, fatigue, physical function, sleep, anxiety, depression, and social well-being—with simple point-rating scales.

The Post-Covid-19 Functional Status Scale (PCFSS), a tool developed 3 years ago by Dutch researchers, is also helpful. It uses 0–4 rating scales to gauge the impact of Covid-related symptoms on activities of daily life.

Make sure to evaluate exercise tolerance, Hanaway added. Movement is vital for restoration of health, but it needs to be carefully tailored to a patient's abilities and functional status. Too much can be as problematic as too little.

ACE2-Mediated Tissue Damage

All five drivers play a role in the pathogenesis of Long Covid, to varying degrees. But ACE2-mediated tissue damage is, arguably, the most central to the disease process.

Virally-induced tissue injury leads to immune system dysregulation, which causes further tissue damage. "It's a feed-forward process," says Dr. Hanaway.

SARS-CoV-2 can enter any organ containing tissue that expresses ACE2 receptors. This means the heart, liver, pancreas, kidneys, spleen, brain, and tissues throughout the GI tract are vulnerable to viral invasion, inflammation, and damage (Fig. 2).

According to Harry Crook and colleagues at the Imperial College, London, that simple fact goes a long way in explaining the diversity of Long Covid symptoms (Crook H, et al. *BMJ*. 2021) (Fig. 2). A [2021 study](#) of 201 people following acute Covid showed that 66% had MRI evidence of damage in the heart, liver, pancreas, kidneys, or spleen 4 months after infection. Many had multi-organ involvement (Dennis A, et al. *BMJ Open*. 2021).

In an excellent review article, Malaysian researchers noted that in the brain, the brainstem region shows the highest density of ACE2 receptors. Viral damage to the brainstem worsens acute Covid, and may underlie longer term neurological and cognitive changes (Yong SJ. *Infect Dis (Lond)*. 2021).

Neuroinflammation may be triggered directly by the virus, or it may be secondary to generalized systemic inflammation, said Dr. Hanaway. It accounts for many symptoms patients experience—brain fog, sleep disturbances, chronic distress, and anxiety.

The myocardium, which also expresses high levels of ACE2, is vulnerable. In a study of 79 Covid survivors, 29% showed radiological evidence of ventricular remodeling (Moody WE, et al. *J Am Soc Echocardiogr*. 2021). Persistent cardiac symptoms like chest pain, palpitations, and tachycardia are common Long Covid.

So far, there is no evidence of long-term sequestration of whole SARS-CoV-2 virus in human tissue. But researchers have identified a number of specific viral protein fragments that hang around long after the acute illness phase. These can trigger and perpetuate inflammatory responses.

Treating Long Covid

There's no simple "magic bullet" treatment for Long Covid. Restoring health in the wake of SARS-CoV-2 requires a carefully tailored, long-term, multimodal approach that includes diet and lifestyle changes, attention to sleep hygiene and stress mitigation, movement and exercise, and intensive nutritional support.

"Changing lifestyle and helping people optimize it in the post-Covid context is not just about treating the Covid-related symptoms. It's about preventing future harm and future chronic disease," said Kara Parker, MD, of Hennepin Healthcare, Minneapolis, who is a member of the Working Group. "There's no downside to helping people improve their lifestyles."

During the PVRP webinars, which had several thousand physician attendees, Dr. Parker reviewed the key lifestyle facets of the PVRP:

Food & Nutrition: Plant-based, colorful, and minimally processed are the watchwords for good nutrition following Covid. The PVRP nutrition program is built around the [Whole30 plant-based program](#), which Dr. Parker described as "simple and well-resourced."

The plan provides patients with grocery guides, shopping lists, meal planning tools, plant-based recipes, and tips for navigating the inevitable the ups and downs of energy levels.

Citing a [six-country study](#) of nearly 3,000 healthcare workers that looked at the impact of various diet patterns on Covid severity, Dr. Parker noted that those who had plant-based

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diets prior to infection had a 72% lower rate of hospitalizations and deaths, and those who were primarily plant-based but also included fish had a 50% reduction, compared to those who routinely consumed a lot of meat, processed foods, sugar, and alcohol.

In general, plant-based diets reduce HbA1c, increase insulin sensitivity, lower total and LDL cholesterol, improve mood and motivation, downregulate inflammation, reduce BMI, and improve the gut microbiome. All of the above will likely improve the health status of someone dealing with Long Covid.

The Working Group chose *Whole30* because it simplifies plant-based nutrition. There's a strictly vegetarian version and one that includes animal protein, giving patients the option based on their preferences and nutritional needs.

In general, the Working Group advises:

- Eliminating processed foods and sweetened beverages as much as possible
- Time-restricted eating, for those who can tolerate it
- Low-glycemic meals, to reduce postprandial glucose surges and inflammation
- Increasing intake of lactofermented foods, to rebuild the microbiome. The exceptions here are patients whose symptoms are suggestive of mast cell dysregulation. These patients should avoid foods that trigger histamine release, which includes most fermented foods, aged cheeses, and leftovers of all sorts.
- Increasing intake of herbs and spices for flavor and medicinal effects. For example, rosmarinic acid in rosemary, thyme, and other herbs can help rebuild depleted ACE2 receptors.

"Sleep Snacks": Circadian rhythm dysfunction, combined with the neuroinflammation caused by the virus, aka "Coronasomnia," is rampant these days, said Dr. Parker. It can cause blood-brain barrier leakage, which creates a feed-forward cycle of more sleep disruption and further circadian dysregulation.

"With sleep, both quantity and quality matter. Any way that we can help patients improve their sleep hygiene and their deep restoration time will be important."

One helpful way to do this is to teach patients about **ultradian rhythms**—the cyclical ebbs and flows of energy that naturally occur over the course of a day—and to work with these cycles rather than fighting them and "pushing through." Periodic "sleep snacks" during the day can be extremely helpful for people who don't sleep well at night.

Ultradian breaks need not always be full-on naps. Standing and stretching, yoga postures, walking outdoors, non-caffeinated herbal teas, engaging with a friend or pet, drawing, journaling, reading something enjoyable offscreen, or just giving the mind time to wander, can all be highly restorative.

Regarding nutraceuticals for sleep, the Working Group recommends melatonin when appropriate. Not only does it help reset circadian rhythms, it **prevents peroxidation of cardiolipin** in mitochondrial membranes. Given that mitochondrial dysfunction is a hallmark of Long Covid, this effect would have obvious benefit for these patients.

Exercise: "Movement is certainly a pillar of healing from Long Covid. But you have to be careful in how you message this. People know this, and they want to move, but often times they have severe post-exertional malaise, or POTS (postural orthostatic tachycardia), or orthostatic hypotension, and movement in the way they used to move is not an option," says Dr. Parker. For some, even minor exertion can result in days-long fatigue and symptom relapse.

Still, some activity is better than none. The key is to tailor activity to the patient's current energy level, and progress slowly. "Make goals that are attainable for each patient accommodating the new limitations. Be aware that some patients may feel a lot of grief over the loss of their previously high functional levels. It can be a big, big loss."

Group Visits: A group visit model enables practitioners to efficiently scale their Long Covid care to help more patients, while simultaneously providing patients with much needed social and emotional support. "For people experiencing Long Covid to be with other people who understand them and what they're going through is fantastic," says Dr. Parker, who's worked with hundreds of patients in groups over the last 3 years.

She runs the groups in 7-week series, that includes in-person and virtual visits. The latter, she says are really helpful for these patients, many of whom "already have a medicalized life, and are often going to lots of visits."

Targeted Supplementation

Dietary improvements and other lifestyle changes go a long way in improving someone's general health status post-Covid. But most patients with Long Covid will require a period of intensive supplementation aimed at mitigating the physiological drivers of the condition.

In developing their supplement recommendations, the PVRP Working Group made an exhaustive search of the global literature to find safe, evidence-based botanicals and nutraceuticals that would be relevant for and accessible to Long Covid patients.

"We found ourselves needing a curated suite of nutritional product solutions that were targeted at the five main drivers of Long Covid: ACE2-mediated damage/tissue damage, viral persistence, chronic inflammation, mitochondrial dysfunction, and microbiome/dysbiosis," said Kristine Burke, MD, a member of the Working Group.

"We're not promoting specific brands necessarily. But the ones on the list, we found data to support the use of each of them to target one or more of the five key drivers," she said during the PVRP webinars.

The protocols (see sidebar) are divided into two sets: Foundational Supplements that include basic vitamins, minerals, omega-3 fatty acids, antioxidants, and products to optimize mitochondrial function; and "Specialty" Supplements, which specifically target the five drivers.

The latter list includes some new and unique products, like **Tollovid** (Todos Medical), a compound derived from *Lithospermum erythrorhizon*, an Asian medicinal plant. It binds the 3CL protease that many RNA viruses produce to cleave their RNA. In so doing, it inhibits viral replication, thus targeting the Viral Persistence driver.

Another new product called **ITIS** (Return Healthy) is a combination of anti-inflamma-

tory herbs including *Scutellaria* (Skullcap), *Curcumin*, *Boswellia*, and others. It is unique in that it crosses the blood-brain barrier, meaning that it will help with the cognitive impairment and mood disturbances often seen in Long Covid. It also mitigates inflammation, reduces pain, and improves joint and muscle function.

Dr. Parker says that addition of the PVRP supplement regimens can make a major difference over lifestyle changes alone. "I've seen this over and over again."

But it is important to recognize that adherence to this 90-day program requires a strong commitment. "Supplementation is, in fact, a lifestyle change for many patients."

Origins of the PVRP

OvationLab, a consulting firm focused on developing products, services, protocols, and technologies in the functional and integrative medicine field, became the hub of the working group process because its leaders—Laurie Hofmann, Tom Blue, and Andie Crosby—are well known and well connected in the functional medicine space, and because they began doing surveys on the impact of Covid early on in the pandemic.

Hofmann told *Holistic Primary Care* that she and her colleagues saw an urgent need for a comprehensive, systematized, "root cause" approach to the evaluation and treatment of Long Covid.

ANDHealth, a private company that specializes in bundling condition-specific care services for disease reversal, played a catalytic role in the evolution of PVRP. Ovation and ANDHealth already had a working relationship when, in late 2021, AND provided funding to assemble the Long Covid working group.

Early in 2022, the team convened what Hofmann called a "social listening" study, analyzing over 1 million social media conversations about Covid and its post-acute sequelae, to find out what people were experiencing, what were their greatest concerns, and what were their biggest unmet needs.

see **Five Drivers** p. 7

"If we talk to people and get their clinical histories, we can predict who's going to get Long Covid with 95% accuracy."

—Patrick Hanaway, MD

The Post-Viral Recovery Program Supplements Protocols

The Long Covid nutritional protocol, developed by the 10-member practitioner working group under the aegis of **OvationLab** and **ANDHealth**, is divided into two parts—Foundational Supplements aimed at improving overall health and Specialty Supplements focused on the five main drivers of Long Covid: ACE2-mediated tissue damage, viral persistence, chronic inflammation, mitochondrial dysfunction, and microbiome/dysbiosis.

The working group is continually re-evaluating and refining the protocol and dosing schedule.

The Foundational Supplement protocol includes:

- **MitoCore** (Ortho Molecular Products), a comprehensive multivitamin that also contains N-acetyl cysteine (NAC), Glucoraphanin, Alpha lipoic acid (ALA), Resveratrol, Epigallocatechin gallate (EGCG), Acetyl L-carnitine, Manganese, and Zinc. The working group recommends 2 caps twice daily for 90 days.
- **OmegaGenics** (Metagenics), a concentrated omega-3 product containing 710 mg EPA and 290 mg DHA; 1,000 mg twice daily for 90 days.
- **Magnesium Glycinate**, 200 mg twice daily for 90 days.
- **Co-Enzyme Q10**, 200 mg daily for 90 days.
- **Quercetin**, 500 mg twice daily for 90 days.
- **Vitamin K2 with D3**, up to 10,000 IU daily, with specific dosing based on each patient's serum levels. If the serum level is below 40 ng/ml, use 10,000 IU. If it's within 40–60 ng/ml, use 5,000 IU. If above 60 ng/ml, the patient does not need supplementation.

The Specialty Supplement protocol consists of:

Arterosil (Calroy Health Sciences): The main constituent in Arterosil is **Rhamnan sulfate**, a sulfated polysaccharide from two types of marine algae (*Monostroma latissium* and *Monostroma nitidum*). Rhamnan sulfate has a similar structure to glycosaminoglycans found in the human endothelial glycocalyx—the thin gel-like layer that coats the luminal surfaces of healthy blood vessels. **Glycocalyx damage** is one of the earliest steps in the pathogenesis of cardiovascular disease, and it is a common consequence of Covid.

"In order to have any hope of repairing tissue damage, we need optimized blood flow and optimized vessel health. Arterosil targets the regeneration and repair of the endothelial glycocalyx," said Kristine Burke, MD, a member of the PVRP Working Group, during a **webinar** outlining the protocols.

ITIS (Return Healthy): This product is a complex of anti-inflammatory herbs, including Skullcap (*Scutellaria baicalensis*), Curcumin (*Curcuma longa*), Frankincense (*Boswellia serrata*) and others. Dr. Burke noted that *Scutellaria* produces a compound called Baicalin that is able to cross the blood-brain barrier, making the product useful for mitigating the cognitive impairment, mood disturbances, and "brain fog" that many Long Covid patients experience. That's in addition to the product's capacity to reduce systemic inflammation, one of the main drivers of the post-viral syndrome.

Tollovid (Todos Medical): This unique substance is derived from an herb called *Lithospermum erythrorhizon*, known colloquially in English as Gromwell root, or Zicao in Traditional Chinese Medicine.

"Tollovid addresses persistent viral infections by blocking viral replication capacity," explained Dr. Burke.

It does this by binding tightly to the **3CL protease**, an enzyme that coronaviruses use to cleave the long polypeptide chains produced from their mRNA during the replication process. Tollovid is among a number of 3CL inhibitors being explored in the Covid context. Essentially, it shuts down the replication process.

MegaSporeBiotic (Microbiome Labs): This probiotic product delivers spores from five strains of *Bacillus subtilis*. PVRP Working Group members believe it is ideally suited to address the marked microbiome alterations associated with Covid and, sometimes, Covid vaccination. "We want to recondition the gut and bring back a healthier microbiome, especially facilitating the resurgence of those species that are important in immune regulation," Burke said.

Rather than "seeding" the gut with exogenous probiotic organisms, the goal of treatment with a spore-based product like this is to shift the microbial ecology so that it favors growth and flourishing of a patient's own endogenous bacterial species.

MegaPre (Microbiome Labs): A prebiotic product containing three different types of non-digestible oligosaccharides derived from kiwi fruit, nonGMO corn cobs, and rBST-free cow's milk. Supplementation with this combination increases GI microbial diversity and selectively feeds beneficial organisms like *Akkermansia muciniphila*, *Faecalibacterium prauznitzii*, and various species of *Bifidobacteria* which, Dr. Burke noted, are often decimated by SARS-CoV-2 infection.

For the first 30 days, in addition to the full array of Foundational Supplements, patients

should take: Arterosil, 2 caps twice daily; Tollovid 3 caps 4 times daily; and MegaSpore alone (the prebiotic is added later), 1 cap daily for the first 7 days, and then 2 caps daily until the bottle is finished.

From Day 30 to Day 90, patients can cut the doses to: Arterosil, 1 cap twice daily; and Tollovid, 1 cap twice daily for 30 days. They can eliminate the MegaSpore probiotic, replacing it with the MegaPre oligosaccharide formula, 3 caps daily.

All products in the protocols are **available as a bundle** from Fullscript. Practitioners with Fullscript accounts can prescribe the complete protocols for patients, and Fullscript will deliver the full product suite to their homes, along with detailed implementation instructions.

Dr. Burke and members of the Working Group stress that the current protocols, though based on a scientific review of hundreds of potential candidate products, are still a work in progress. The team has established a standardized registry to track outcomes in hundreds of patients now on the protocols, and they will use the data to revise the protocols if necessary.

She added that these regimens are flexible. "There may be some patients for whom we want to add some other tools not on the protocol list. You may choose to add or subtract products. But this is the broadest and simplest set of products and processes that we could develop. We're not promoting specific brands necessarily. But, for the ones on the list, we found data to support the use of each of them to target one or more of the five key drivers of long Covid." 🍌

Disclosure: ANDHealth and Calroy Health Sciences are clients of OvationLab.

"Great Resignation" or Long Covid?

BY JACOB TEITELBAUM, MD
Contributing Writer

Early in 2021, roughly one year after authorities declared Covid-19 a pandemic, a lot of people left their jobs, and business leaders began fretting about "the Great Resignation," also known as "the Big Quit."

Politicians, economists, and social scientists offered a wide range of plausible explanations: people had gotten used to spending time at home and wanted better work-life balance; the break gave workers a chance to re-assess their priorities and reassert their value; wages had not kept pace with living costs; compensation was not commensurate with hassle; the pandemic encouraged laziness. And on and on.

To some extent, all of these factors may be influencing the situation. But the experts missed one of the most important factors: post-viral fatigue.

Simply put, many people have experienced—and continue to experience—profound multi-system fatigue following infection with SARS-CoV-2. As is the case with other viral pathogens, this one can be highly debilitating, rendering some people unable to return to work.

A Widespread Problem

I believe the Great Resignation isn't happening because people are lazy; it is happening in large part because many people are burdened with chronic illness.

Countless infections can trigger persistent chronic fatigue syndrome or fibromyalgia (CFS/FM). For example, Epstein-Barr virus (EBV), Herpes simplex (HSV-1), Lyme disease, and even polio have been implicated. We can now add SARS-CoV-2 to this list. Between 10% and 15% of people who've had Covid-19 develop persistent exhaustion, as part of the syndrome we're now calling Long Covid.

According to the CDC's [National Center for Health Statistics](#), 79% of people with Long Covid experience limitations of their daily activities, and 27% have severe limitations. This assertion is based on a nationwide [Household Pulse Survey](#) involving well over 60,000 individuals.

A [Kaiser Family Foundation](#) analysis of this and other surveys suggests that the debilitation caused by Long Covid has affected at least 500,000 American workers, and the number may actually be as high as 4 million.

Gaslighting & Stigmatization

Unfortunately, our healthcare system seems to be treating Long Covid in the same way it has always treated CFS/FM. Essentially, it is "gaslighting" people, telling them they are depressed or lazy. Historically, physicians have done this for complex, poorly understood, and time-intensive conditions, especially when they affect women and when they're not easily diagnosed or quickly treated with profitable drugs or procedures.

Some examples? Multiple sclerosis used to be called "hysterical paralysis." When I was in medical school, Lupus was still considered a neurosis. With CFS/FM, patients often go for years without the correct diagnosis or thorough treatment. Too often, their doctors abusively insinuate that "since I don't know what's wrong with you, you must be crazy."

This is now occurring with Long Covid as well.

Long Covid carries considerable social stigma. A [recent UK study](#) of nearly 900 such patients showed that 95% experienced stigma at least sometimes, and 76% experienced it often. Practitioners may unintentionally contribute to the problem by failing to recognize that CFS/FM is rooted in actual post-viral pathophysiology, leading patients to believe their fatigue is a character flaw.

Exhaustion & Insomnia

Part of the challenge in treating post-Covid fatigue is that it is seldom an "all or nothing" condition, where people are either totally disabled or "just fine." Many are "walking wound-

ed," so to speak. They're marginally functional, but far from their pre-Covid energy levels.

Despite the fatigue, many have difficulty sleeping. A [Cleveland Clinic study](#) just published in the *Journal of General Internal Medicine* shows that 40% of a cohort of 962 patients with Long Covid have moderate to severe sleep problems.

The paradox of chronic exhaustion with insomnia is a typical feature of post-viral CFS/FM. The insomnia, along with brain fog, chronic pain, and weight gain, indicate hypothalamic dysfunction.

When someone is overloaded by viral infections, other types of infections, or extreme stress, the hypothalamus basically shuts down and the body loses one of its "circuit-breakers." This key control center in the brain regulates sleep, along with hormonal and autonomic function.

But it's a tricky situation because in the first year after a primary SARS-CoV-2 infection, patients may experience hypersomnolence, which later gives way to insomnia.

I've created a simple 10-minute [free quiz](#) to help people make a CFS/FM diagnosis. There's also an easy-to-use one-page [checklist](#) for determining if someone meets the American College of Rheumatology's 2016 diagnostic criteria for fibromyalgia. Though these tools are for CFS and FM in general, and not specific to Long Covid, they can be helpful in the post-Covid context.

Rise & SHINE

For CFS/FM of any cause, our published randomized double-blind [placebo-controlled study](#) showed that 91% improved, with an average 90% increase in quality of life, using a comprehensive approach I call the [SHINE Protocol](#). The acronym stands for: Sleep, Hormones (and Hypotension), Infections, Nutrition, and Exercise. By addressing these five domains, we can greatly improve the health of people with post-viral CFS.

SHINE includes supplements, botanicals, hormonal therapies and, in some cases, antivirals, antifungals, antidepressants, and drugs for sleep. Exercise also plays a role. The basic protocol includes a multivitamin, magnesium plus malic acid, melatonin, and a Valerian/Melissa combination. But there are many ad-

ditional options depending on an individual's test results and clinical history.

I've written a number of articles on applying the SHINE Protocol at the patient care level. If you're interested in learning how, email me at FatigueDoc@gmail.com

Ginseng Revival

One herb that I've found to be particularly helpful for CFS/FM is *Panax ginseng*.

For centuries, Ginseng has been one of most popular herbal medicines in Asia, and for good reason: It can be dramatically effective for numerous conditions.

The problem is that for wild ginseng, it takes at least 17 years for a plant to mature and to develop high levels of active ginsenosides in response to harsh weather, threats from insects, and other challenges. And since it is the root portion that we use therapeutically, harvesting usually means ending the life of the plant.

Decades ago, over-harvesting of wild ginseng led to insane prices (over \$700 a pound), encouraged adulterations and substitutions, and essentially drove the plant to the brink of extinction. In response, farmers began cultivating ginseng, but I found that products derived from farmed ginseng just weren't as effective as those from wild plants. Because of this, I stopped using ginseng in my practice over 30 years ago.

Recently, cultivators developed a unique and ingenious aquaponic farming technique that reproduces the challenges the plants face in the wild. It results in a form of farmed ginseng, called [HRG80™ Red Ginseng](#), that has the same active phytochemical profile as mature wild plants. Initially skeptical when I first tried it, I was shocked at how effective it was.

Enough so that I decided to do an [open-label study](#) using the product with 188 patients with severe post-viral CFS. Prior to treatment, all patients reported that they were functioning at 50% or less of their pre-illness energy levels. They supplemented with 200–400 mg of HRG80 in capsule form, or 100–200 mg in tablet form, daily for one month.

The results speak for themselves:

- 60% rated themselves as "improved," with 13% rating themselves as "much better" ($p < .001$)
- 67% average increase in energy
- 44% average increase in overall well-being

Colors of Maca

cont'd from page 1

activity of hypo-functioning systems (Panosian AG, et al. *Med Res Rev*. 2021).

Phytochemical analysis by Henry Meissner at the Charles Sturt University, Sydney, Australia, suggest that maca's mechanisms of action on human physiology are quite unique, and go beyond that of other traditional adaptogenic herbs (Meissner HO, Reich-Bilinska H, et al. *Int J Biomed Sci*. 2006).

In some manner, maca promotes optimal function of the hypothalamus and the pituitary gland, to improve the overall communication of the endocrine system. That observation goes back more than 60 years, to the work of Dr. Gloria Chacon-Roldan at the Universidad Nacional Mayor de San Marcos, Lima. Dr. Chacon showed that alkaloids in maca acted on the hypothalamus-pituitary axis, an observation that explains why maca has more than just adrenal effects.

Though maca does affect sex hormone balance, it does not contain phytoestrogens like the isoflavones found in soy and red clover.

A Nutritional Powerhouse

Maca has become popular worldwide over the last decade. Dozens of companies now promote maca-based products as "super-

foods." There is surely some hype in the marketing claims, but there's also some truth. Maca is quite nutrient-dense.

Its nutrient composition includes carbohydrates, fiber, amino acids, fatty acids, minerals (iron, zinc, iodine, calcium, copper, magnesium, and potassium) and vitamins (A, B2, B6, and niacin [da Silva Leitão Peres N, et al. *Food Funct*. 2020. Meissner HO, et al. *Int J Biomed Sci*. 2016]).

Secondary metabolites include alkaloids, thiophenol, thiohydantoin, macamides, macaenes, glucosinolates, and macapyrrolins, as well as anthocyanins, isothiocyanates, imidazoles, polyphenols, lignans, and flavonoids. These secondary metabolites are presumed to be responsible for many of the purported therapeutic benefits of maca.

Notably, there are nine different glucosinolates in maca. According to medicinal plant researchers Dominik Tarabasz and colleagues at the University of Lublin, this class of compounds may be potentially beneficial in preventing memory-loss conditions (Tarabasz D, et al. *Int J Mol Sci*. 2022).

Certain phenotypes of maca "may present a valuable plant material to be considered for the development of therapeutic products with memory-stimulating properties," writes Tarabasz. Further study of maca glucosinolates could lead to "therapeutic products for treating medical conditions related to memory impairment."



- 48% average improvement in mental clarity
- 46% average improvement in sleep
- 33% average decrease in pain
- 72% average increase in stamina

The bottom line is, this unique form of aquaponically grown red ginseng resulted in marked improvements in people with disabling fatigue, including post-viral fatigue.

Of the two delivery forms (capsule or tablet), I prefer the chewable tablets. They contain natural gamma cyclodextrin, which increases absorption almost eightfold. That means, one half to one tablet can be as effective as four capsules.

Important Considerations

Botanicals like ginseng, and other supplements, can be a big help in recovering from post-viral CFS/FM. But there are many other important things to consider:

- **Recommend a good multivitamin** high in B vitamins, magnesium, vitamin D, and zinc. I like the [Essential Multivitamin Tablets](#) by EuroMedica, two daily.
- **Consider adrenal fatigue** if the person gets irritable when hungry ("Hangry").
- **Give thyroid & reproductive hormone support** if symptoms suggest they are needed.
- **Address orthostatic intolerance (Postural Orthostatic Tachycardia Syndrome [POTS])**: This is common. Here's a quick POTS screening method you can do in the office or even have patients do at home. Ask the patient to lie supine quietly for 10 minutes, then check the pulse and blood pressure. Then, ask the patient to stand up and check the pulse and BP again, every 2 minutes, for 10 minutes. If the pulse goes up by 15 BPM any time during the 10-minute standing period, it is suggestive of orthostatic intolerance. If it goes up 30 BPM or more, it confirms the diagnosis. A drop of more than 10 points in systolic BP is also suggestive.
- **Consider low-dose naltrexone**: For patients not taking narcotics, LDN by prescription from compounding pharmacies is [helpful for both CFS/FM and Long Covid](#).

An Ounce of Prevention

Covid-related CFS/FM is more likely in people who felt they needed to push through the

continued on next page

Maca also contains sterols such as stigmasterol and brassicasterol, which are structurally and biochemically related to cholesterol and steroid hormones such as estrogen, testosterone, and progesterone (Gonzales GF, et al. *Evid Based Complement Altern Med*. 2012). These hormone-like compounds may contribute to the body's own hormone production (Meissner HO, et al. *Int J Biomed Sci*. 2005).

Phenotype & Function

Most companies selling maca-based products represent them with the simple catch-all term "maca." This overlooks the fact that there are many species which are distinct from each other in both appearance and phytochemical profiles.

The two most commonly encountered species are: *Lepidium meyenii* Walpers, the wild form of Peruvian maca, named for 19th-century German botanist Wilhelm Gerhard Walpers, who first collected and described the plant in European scientific terms; and *Lepidium peruvianum* Chacon, named after Gloria Chacon-Roldan, who posited that this species is the cultivated form that has its origin among the ancient Incas.

Though many botanists, herbalists, and regulatory agencies consider *L. meyenii* and *L. peruvianum* to be synonymous, Meissner's analysis of the plants via liquid chromatography and mass spectroscopy suggests that this is an error, and that the species are not the same (Meissner HO, et al. *Int J Biomed Sci*. 2015).

Research over the last two decades indicates that there are, in fact, up to 13 different phenotypes of maca, each with its own variations in gene expression, color, and bioactive constituents. These variations correlate with location of cultivation (Huang YJ, et al. *Nat Prod Bioprospect*. 2018).

Five Drivers

cont'd from page 5

Simultaneously, the 10-member clinical working group was gathering and assimilating the scientific literature on the post-Covid syndrome, sharing their own patient care experiences, and studying the prevention and treatment recommendations developed earlier in the pandemic by medical organizations like the Institute for Functional Medicine.

From this process emerged the identification of the 5 primary physiologic drivers, a standardized set of outcomes measures, the lifestyle recommendations, and the 90-day treatment protocol which are the **basic components** of the PVRP.

acute infection phase, instead of resting. It's so important to let patients know that rest is critical when fighting off a viral pathogen—or any bug, for that matter.

Metformin may also have a role in preventing Long Covid. According to a large **phase 3 treatment trial** of 663 overweight people in *The Lancet* earlier this year, metformin reduced incidence of Long Covid by half, if the drug was given within the first four days of acute symptoms.

When starting patients on metformin, I begin with 500 mg on the first day, to make sure that nausea or diarrhea are not severe, and then increase the dose to 500 mg twice a day for 4 days. From there, I increase to 500 mg each morning and 1,000 mg at bedtime for a total of 2 weeks. Metformin is especially important for people who already have CFS/FM, to decrease the risk of a flare. 🍌

Jacob Teitelbaum, MD, is one of the world's most frequently quoted integrative medical authorities. He is the author of several best-sellers, including *From Fatigued to Fantastic!*, the *Beat Sugar Addiction Now!* series, *The Fatigue and Fibromyalgia Solution*, and the popular free smartphone app *Cures A-Z*. He is the lead author of four studies on effective treatment for CFS/FM. In 1975, an extended bout of post-viral CFS left him homeless. He has dedicated his life to researching and writing about effective treatments for CFS/FM. Dr. Teitelbaum earned his MD from Ohio State University, and recently celebrated his 50th year as a physician.

Learn more at Vitality101.com.

Elevation, soil quality, and climate all impact phenotypic expression and phytochemical content of maca. For example, maca grown in China is often distinctly different from native Peruvian maca. Even within Peru, there are differences between the same species sourced from the two primary locations where it is grown.

Altitude affects the color of the maca hypocotyl—the tuberous starchy root, which is the primary part used for food and medicine. The predominant colors are purple, red, black, white, gray, and yellow. Maca plants grown at higher altitudes typically have red and purple hypocotyls, and this correlates with correspondingly higher concentrations of beneficial phytochemicals like glucosinolates, not found in roots of other colors (Meissner HO, et al. *Int J Biomed Sci*. 2017).

Interestingly, although not entirely surprisingly given what we know about phytochemicals, the different phenotypes have diverse physiological effects and gender affinities (Geng P, et al. *Planta Med*. 2020). They're not all the same, and if we are seeking specific health benefits, we need to pay attention to the specific type and color of the maca we use.

For example, Gonzales and colleagues showed that black maca supports spermatogenesis in rats. In particular, the polyphenols and flavonoids from this subtype increased stages of spermatiation (VII–VIII) and mitosis of germ cells (IX–XI). When co-administered with extract of Camu-Camu fruit (*Myrciaria dubia*)—another polyphenol-rich Amazonian plant—black maca increased mitosis, meiosis and spermatiation (Gonzales GF, et al. *Toxicol Mech Methods*. 2013).

see **Colors of Maca** p. 8

Research is of paramount importance to Ovation and the members of the Working Group. To that end, the group collaborated with **National University of Naturopathic Medicine** to establish a **REDCap** patient registry to track and quantify functional outcomes in cohorts of patients as they progress through the PVRP protocols.

Last December, the PVRP group began enrolling its first patients, notably from Dr. Parker's group visit patients at Hennepin Healthcare, and from numerous clinical practices around the country.

The goal is to evaluate patients at 30, 60, and 90 days into the PVRP program, using the PROMIS-29 and post-Covid Function Scale (PCFS). The initial patient intake process is quite thorough, and gathers complete history,

lab values, and timeline information, though Parker said the forms are “specifically written for people with low energy and brain fog.”

As of April 2023, more than 100 patients have enrolled in the registry, and the first cohort has completed the 90-day treatment protocol. The initial outcomes data will help the Working Group revise and refine the protocols. They will also provide the basis for a series of case studies from the project, the first step toward a full-scale, IRB-approved, controlled clinical trial.

From a review of 30 patients with Long Covid (average 15 months) who completed the PVRP at 90 days, there was a 40% improvement in scores on the Post Covid Function Scale.

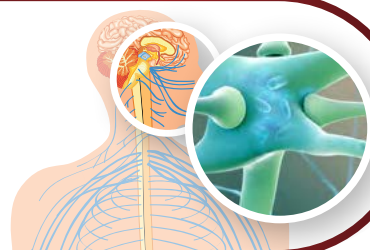
Though the group has accomplished much in the last two years, Hofmann stressed that the

PVRP is still in an early stage, and the discovery process is ongoing.

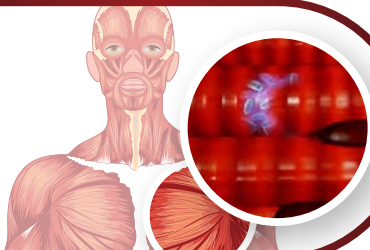
“Right now, we're still in this phase of trying to understand what continues to be an emerging cluster of more than 200 different symptoms. It's a very complicated constellation of symptoms, and it's still very new. There are no proven therapies, no standards of care. The NIH RECOVER program continues to have delays,” she told *Holistic Primary Care*.

“There's a window of opportunity now to demonstrate the effectiveness of this approach. At the same time, I feel cautious about touting that we have something too soon. We need to continue enrolling patients in the program and the registry to track outcomes.” 🍌

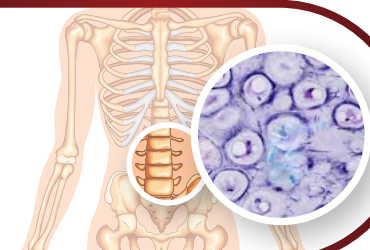
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Colors of Maca

cont'd from page 7

In their thorough review comparing black, yellow, and red maca, Gonzales' team notes that "Black maca shows the best results on spermatogenesis, memory and fatigue, while red maca is the variety that reverses the benign prostatic hyperplasia and experimentally induced osteoporosis" (Gonzales GF, et al. *Rev Peru Med Exp Salud Publ.* 2014).

Earlier this year, a study of 44 elite athletes representing a range of different sports (shooting, racket sports, swimming) showed that twice-daily supplementation with 2,500 mg of 100% concentrated black maca extract for eight weeks decreased inflammation, enhanced mitochondrial biogenesis, and improved physical fitness and performance (Lee F, et al. *Nutrients.* 2023).

For women, yellow maca—especially in a mix with other phenotypes—is beneficial for hormone balance in both the perimenopausal and early postmenopausal stages (Meissner HO, et al. *Int J Biomed Sci.* 2005. Meissner HO, Mrozikiewicz P, et al. *Int J Biomed Sci.* 2006. Meissner HO, Mscisz A, Reich-Bilinska H, Kapczynski W, et al. *Int J Biomed Sci.* 2006. Meissner HO, Mscisz A, Reich-Bilinska H, Mrozikiewicz P, et al. *Int J Biomed Sci.* 2006. Meissner HO, et al. *Int J Biomed Sci.* 2017).

Meissner has shown that different maca phenotypes differ in the ways they modulate hypothalamic-pituitary-ovarian axis via their influence on estrogen, progesterone, follicle stimulating hormone, and luteinizing hormone.

In addition to its endocrine effects, maca may also regulate glucose levels and lower blood pressure, leading to overall improvements in health (Gonzales GF, et al. *Rev Peru Med Exp Salud Publ.* 2014).

The majority of maca superfood powders and supplements consist of random, undifferentiated combinations of different phenotypes mixed together in the ratios in which the tubers were harvested. This means there can be substantial variations in the relative proportions of the phenotypes and, therefore, variations in the phytochemicals they provide.

While generic mixtures may suffice to deliver on the energy benefits of maca, they might not work as well to support other more specific health applications. In many clinical situations, the choice of phenotype really does matter.

Glucosinolate Profiles

There is no single category of phytochemicals that can account for all of the diverse health benefits of maca. But one class in particular—the glucosinolates—merits special consideration. They appear to be among the most physiologically active compounds in maca (Perez CJ, et al. *J Mass Spectrom.* 2021).

Glucosinolates are sulfur- and nitrogen-containing compounds, and they are what give cruciferous vegetables like cabbage, mustard, broccoli, Brussels sprouts, radishes, and horseradish their distinctive bitterness. Roughly 120 distinct glucosinolates have now been identified.

According to *Fahey and colleagues*, glucosinolates and their metabolites have anti-fungal, anti-microbial, and chemoprotective effects. They play a role in the metabolic detoxification of hormones and environmental toxins (Minich DM, Bland JS. *Nutr Rev.* 2007. Higdon JV, et al. *Pharmacol Res.* 2007). Therefore, they may be pivotal in reducing cancer risk (Na G, et al. *Int J Mol Sci.* 2023).

The glucosinolates in maca are different than those produced by other crucifers. The highest glucosinolate levels are found in maca seeds, fresh maca hypocotyls, and maca sprouts (Li G, et al. *Economic Botany.* 2001).

Among the predominant maca glucosinolates are the aromatic glucosinolates, notably benzyl glucosinolate, also called glucotropaeolin (Piacente S, et al. *J Agric Food Chem.* 2002). Recent research suggests that certain glucosinolates have acetylcholinesterase activity, implying that they may have beneficial

effects on cognition and memory (Tarabasz D, et al. *Int J Mol Sci.* 2022).

Research on maca phytochemicals continues, with some recent studies looking at the immunomodulatory and neuroprotective effects of polysaccharides from maca (Cao F, et al. *Heliyon.* 2023 Zhou Y, et al. *Front Biosci.* 2022). Another recent report suggests that a maca-derived fatty amide

mon option offered by conventionally trained physicians. In the 21 years since publication of the *Women's Health Initiative data* underscoring the potential risks of HRT, women's concerns about contraindications and possible side-effects have precluded many from accepting pharmaceutical approaches.

Leading medical organizations like the North American Menopause Society (NAMS)

Over 3–4 months, compared with placebo, intervention with Maca-GO resulted in increases in estradiol and progesterone, and decreases in FSH and LH. This was associated with beneficial impacts on bone density and blood lipids, specifically increased HDL, and decreases in LDL and triglycerides.

The maca supplement also produced a statistically significant 84% reduction in menopausal symptoms, as indicated by changes on the Kupperman's Menopausal Index (see Fig. 1 below) and Greene's Menopausal Scale.

In 2021, one of us (Kim Ross) published an interesting *case report* of a 32-year-old Caucasian woman who experienced vasomotor symptoms, anxiety and mood changes following a hysterectomy and oophorectomy. A personalized nutrition and lifestyle program that included twice-daily supplementation with Maca-GO resulted in significant improvements and resolution of these. This case was presented at the Institute for Functional Medicine's 2023 Annual International Conference in June 2023.

Maca Contraindications

Women with polycystic ovary syndrome (PCOS) and those who show strong estrogen dominance need to be careful with maca—especially with products that contain random mixtures of different maca phenotypes. The adrenal stimulation can exacerbate their conditions.

For example, black maca, which can help with sperm health and libido in men, may worsen PCOS symptoms in women with PCOS, as was shown in a 2011 case report (Srikugan L, et al. *BMJ Case Rep.* 2011).

That said, Maca-GO, which nourishes the hypothalamic-pituitary-thyroid-adrenal-ovarian (HPTAO) axis, can be used to support women with these conditions when used at the correct dose. However, it is not recommended for women taking hormone-suppressing medications such as Tamoxifen. Likewise, it may not be appropriate for pregnant or breast-feeding women.

Maca, with its various phenotypes, can be a valuable ally in optimizing hormone production in women and men, especially when used in the context of comprehensive lifestyle interventions that include personalized diet plans, support for gut health and detoxification, stress management, and sleep hygiene. But keep in mind that the diverse phenotypes of maca are quite distinct, and it is important to select maca products carefully.

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Kim Ross, DCN, MS, MBA, CNS, IFMCP, has over 16 years of experience in the nutrition industry including multiple roles in the dietary supplement industry, a clinical practice focused on women's health, the development of professional training programs, and academia. Her academic background includes a Master of Business Administration from Utica University, a Master of Science in Applied Clinical Nutrition from Northeast College of Health Sciences, and a Doctorate in Clinical Nutrition from Maryland University of Integrative Health. Dr. Ross is the Director of Scientific Communication at Symphony Natural Health.



Five phenotypes of Maca (*Lepidium*). Each phenotype has a distinct phytochemical profile, which influences its potential physiological effects. Many people use maca indiscriminately for energy support and for hormone-balancing. For optimal clinical outcomes, however, it is important to consider specific phenotypes. *Symphony Natural Health*

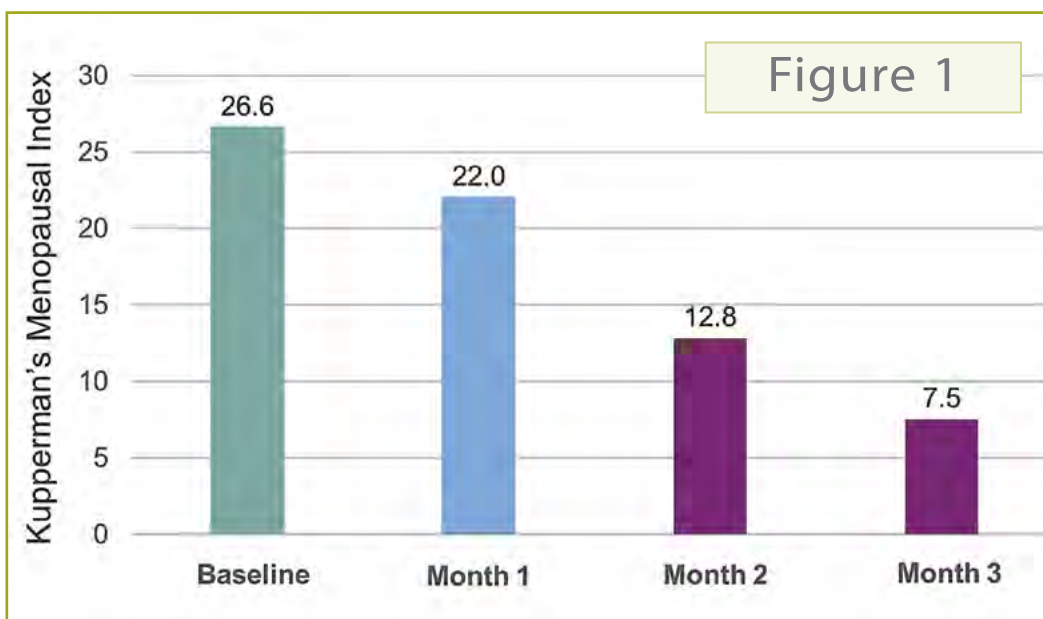


Fig. 1: Changes in total Kupperman Menopausal Index scores in a cohort of 55 women treated for one month with a placebo (blue bar), and then switched to Maca-GO for months 2 and 3 (purple). Mean untreated baseline score indicated by green bar. *Adapted from Meissner H, et al. Internat J Biomed Sci.* 2006

known as N-benzylhexadecanamide may enhance testosterone production (Zhang KY, et al. *Molecules.* 2023).

Maca also produces a unique class of more than 30 compounds collectively called macamides which may contribute to the anti-fatigue effects long attributed to this genus of plants (Liu T, et al. *Molecules.* 2023).

Maca & Menopause

According to a 2015 *paper* published by the Agency for Healthcare Research and Quality (AHRQ), which encompassed nearly 300 studies, up to 85% of peri- and post-menopausal women experience symptoms including hot flashes, night sweats, sleep disturbances, mood imbalances, loss of libido, weight gain, and vaginal dryness.

These women are seeking solutions that will help them regain their quality of life but may have hesitations about hormone replacement therapy (HRT)—the most com-

mon option offered by conventionally trained physicians. In the 21 years since publication of the *Women's Health Initiative data* underscoring the potential risks of HRT, women's concerns about contraindications and possible side-effects have precluded many from accepting pharmaceutical approaches.

That's a positive step, but many women remain hesitant to go on HRT.

Maca represents one potential adjunct or alternative to HRT. A proprietary standardized combination of specific maca phenotypes called Maca-GO® (known commercially as *Femmenessence*®) has been clinically tested in perimenopausal and early postmenopausal women, and the data strongly indicate a beneficial effect.

Four clinical trials have been published on this proprietary phenotype combination, looking at its effects on effects on hormones, symptom relief, bone density, and cardiovascular parameters. Maca-GO is the only maca product with published *clinical trials* demonstrating statistically significant effects on hormones in perimenopausal (N = 18) and early postmenopausal (N = 177) women.

Air Pollution Exacerbates Symptoms of Depression

BY JANET GULLAND
Contributing Writer

Exposure to polluted air is associated with increased depression symptoms in people with bipolar disorder (BPD), according to a new study by Joseph Hayes, MD, PhD, and Aaron Kandola, at the University College London.

In the first project of its kind, Hayes and Kandola tracked symptoms of depression and mania against real-time changes in Air Quality Index (AQI) in a cohort of 1,423 women and men previously diagnosed with BPD.

To do so, they made use of a new self-tracking app called *Juli*, which—among other things—provides users with daily AQI reports based on their smartphone geolocations.

Many previous studies have suggested links between pollution—especially chronic exposure to particulate matter with the diameter of $\leq 2.5 \mu\text{m}$ ($\text{PM}_{2.5}$)—and worsening of unipolar depression. A systematic review by University of Milan researchers looking at 39 small studies found a small but significant increase in relative risk of depression among people with the highest exposures to $\text{PM}_{2.5}$ (Borroni E, et al. *Environ Pollut*. 2022).

Kandola and Hayes are the first to document this association on an individual level in a BPD population, and the observed relationship was more pronounced. “As air quality worsened, symptoms of depression increased,” they write (Kandola A, Hayes J. *BJPsych Open*. 2023).

AQI & PHQ Scores

The AQI is a standardized indicator that integrates daily measurements of particulate pol-

lutants ranging in size from $\leq 2.5 \mu\text{m}$ ($\text{PM}_{2.5}$) to $\leq 10 \mu\text{m}$ (PM_{10}), along with nitrogen dioxide, sulfur dioxide, ozone, and carbon monoxide. Data are drawn from thousands of sensor sites all over the world, with local AQI readings computed hourly and daily.

The AQI scale goes from 0 to 500, with higher values reflecting worse pollution. In general terms, AQI values below 100 are considered satisfactory, and values above 100 are considered “unhealthy.” Scores over 400 are deemed hazardous.

Hayes and Kandola used the Patient Health Questionnaire-8 (PHQ-8)—an 8-item survey—to assess depression symptom burden over two-week intervals. They used the Altman Self-Rating Mania Scale (ASRM), a 5-question rating tool, to measure symptoms of mania. Both scales are well validated and widely used clinically and in research.

Users of the *Juli* platform completed these self-assessment scales every two weeks.

For each study participant, the researchers were able to plot depression and mania scores against daily local AQI readings reported during the two-week period prior to the assessment.

“After adjusting for age, gender, mean step count, temperature and humidity, we found an association between AQI and PHQ-8 score, such that total PHQ-8 score increased by 0.011 points for every one-point increase in AQI,” they write.

A Growing Concern

Essentially, that means a 100-point increase in AQI potentially translates into a 1-point increase in depression symptom scores. This

summer many regions of the US have experienced sudden AQI surges of several hundred points as a result of the massive Canadian wildfires.

In New York City, for example, AQI soared from its typical summer range of 75–100 up to 407 in the first week of June, as a result of atmospheric changes that drove smoke from Quebec and Nova Scotia southward across the eastern seaboard.

In California and other western states, smog caused by fires is an all-too-common occurrence.

Degradation of air quality is a worldwide phenomenon.

“Where I live in London the air quality index is probably 100 most of the time, but there’ll be times when it goes a lot higher and so in those times you start to have a noticeable effect on individuals with bipolar disorder,” Dr. Hayes said in an *interview* with *Fierce Healthcare*. Hayes is the Chief Medical Officer and co-founder of the *Juli* app and data platform.

Notably, the University College London researchers found no association between AQI and ASRM scores, suggesting that pollution exposure preferentially exacerbates symptoms of depression but not mania in people with BPD.

Neuroinflammation

If the notion that air pollution directly affects human psychology strikes you as far-fetched, consider that many pollutants—including fine particulate matter—have been linked to neuroinflammation, neurotoxicity, and hormone dysregulation (Braithwaite I, et al. *Environ Health Persp*. 2019).

Kandola and Hayes point out that even brief exposures to high levels of PM_{10} are associated with elevations of inflammatory cytokines such as interleukins 1-beta ($\text{IL-1}\beta$) and 6 (IL-6), as well as tumor necrosis factor alpha ($\text{TNF-}\alpha$) in people with depression.

“There’s also probably particular subtypes of bipolar disorder that we haven’t really identified yet, as there are with depression, that are more inflammatory in nature, and it might be that pollution has a particular impact on those individuals,” Hayes surmised in his interview with *Fierce*.

A Long, Troubling List

Depression is one more condition on a long and troubling list of disorders that are associated with poor air quality. *Asthma, allergic rhinitis, and other respiratory conditions* are obvious examples. Exposure to fine particulate matter has also been linked to increased mortality from *ischemic heart disease and stroke*. A large *metanalysis of 56 studies* found a correlation between short- and long-term exposure to $\text{PM}_{2.5}$ and increased risk of hypertension, stroke, and myocardial infarction.

Exposure to $\text{PM}_{2.5}$ and carbon monoxide also raises the risk of stillbirth and spontaneous abortion, according to a *2018 systematic review* of 35 human and 8 animal studies.

“Air pollution may be an important modifiable risk factor for symptom severity in various mental health problems, including bipolar disorder,” Hayes and Kandola conclude.

On one hand, that’s a hopeful discovery. On the other, it is troubling given the *number of places worldwide* that routinely have AQI readings far beyond the “safe” threshold of 100, and the increasing incidence of massive fires that can trigger rapid and precipitous rises in pollution levels. 🌪️

Your Key to Understanding Long COVID

SARS-CoV-2 virus spreads like any other virus through infection and replication. For some patients, debilitating symptoms can last weeks, months or years. New research has shown that inflammatory responses to SARS-CoV-2 can activate other latent viruses and attack the immune system.

The 5 hypothesized mechanisms of Long COVID Disease:

- Viral Persistence
- Reactivation of Latent Viruses
- Viral Superantigen Activation of Immune System
- Disturbance in the Gut Microbiota
- Multi-Tissue Damage and Autoimmunity

Array 12 — Pathogen-Associated Immune Reactivity Screen™ detects immune reaction to key pathogens that may lead to multiple autoimmune reactivities. This test determines the role of pathogens in cases of ‘unexplained’ autoimmune reactivities and monitors the effectiveness of clinical protocols for addressing pathogens associated with multiple autoimmunities.

When it comes to your patients’ health,
knowledge is power!



Other recommended tests for Long Haul COVID Symptoms include:
Array 2 - Intestinal Permeability Screen™ and
The Lymphocyte MAP™ - Comprehensive Lymphocyte Immunophenotyping

Ayurveda Meets Allopathy: Getting the Best of Both Worlds

BY CHARLES ELDER, MD, MPH
Contributing Writer

Are contemporary allopathic medicine and Ayurveda mutually compatible? Is it possible to merge modern biomedical science with ancient healing principles defined millennia ago? Is there any relevance in today's medical clinic for a paradigm centered substantially around pulse diagnosis, or for therapeutics focused on behavior modification, herbs, mind-body therapies, and detoxification?

Most importantly, what purpose would be served by integrating these paradigms?

These are questions that confront any practitioner who recognizes that contemporary allopathy, despite its strengths, also has limitations, and who also surmises that India's ancient health practices may have some value.

Qualitative & Quantitative

Modern allopathic medicine derives its strength from its astonishing ability to quantify biochemical processes at the organ system, cellular, and genetic levels. Ayurveda, which evolved centuries before the invention of the microscope or the elucidation of the Krebs cycle, is highly qualitative and descriptive. It reflects a sophisticated understanding of processes and patterns within someone's body and psyche.

Often, a constellation of symptoms that make little sense in allopathic terms will fit within patterns described by Ayurveda.

For example, consider a patient who is constipated and also suffers from insomnia. From an allopathic perspective, these problems are separate "departments." If the "first line" drugs don't work, many MDs might send this patient for separate consultations with a psychiatrist and a gastroenterologist.

Viewed from an Ayurvedic perspective, the insomnia and constipation are very much related: both reflect an imbalance or dysregulation of *Vata*—one of the three *doshas* or basic categories of physiological functions and qualities. *Vata* governs and influences all movements in the body, especially its rhythms and cycles. Sleep, digestion, and elimination are all cyclic, rhythmic processes.

As it turns out, we can optimize both diagnosis and therapeutics through the judicious blending of allopathic and ayurvedic paradigms.

Two Angles on Diabetes

Consider the condition we know as type 2 diabetes, which of course represents a major public health challenge, impacting 11% of adults worldwide, according to a recent analysis of global epidemiological data (Ong KL, et al. *Lancet*. 2023).

In allopathic terms, it is characterized by hyperglycemia caused by increased insulin resistance, impaired insulin secretion, or both. Through that lens, our "job" as primary care doctors is to optimize blood sugar control through a combination of diet, exercise, oral drugs, and injectables like insulin. We monitor the condition by measuring glucose, insulin, and hemoglobin A1c. We try to prevent the downstream cardiovascular consequences of diabetes by prescribing statins, ACE inhibitors, and the like.

In classical Ayurveda, there's no specific disease called "type 2 diabetes," though physicians in ancient India did recognize that some people urinate very frequently, that the urine is sweet, and that this is connected with unhealthy fat accumulation (not all weight gain is considered unhealthy).

What we call type 2 diabetes most closely resembles what Ayurveda calls *madumeha*, or

"honey in the urine." It's one of 20 types of *prameha* (polyuria).

The Three Doshas

Ayurveda views health and disease in terms of the balance or imbalance among the three fundamental physiologic or psychometabolic principles called *doshas*. These are *vata*, *pitta*, and *kapha*. *Vata* governs all movement in the mind, body, and spirit. *Pitta* governs heat, digestion, and metabolic transformation. *Kapha* governs structure and lubrication. Aggravation of one or more of

understanding that the normal state is to be healthy and blissful. By getting too caught up in material concerns, and pursuit of external self-validation, people become anxious and upset, leading to unhealthy behaviors like overeating, consumption of excessive sweets, and drug or alcohol abuse.

A healthy person is someone in whom the three *doshas* are in balance and the organ systems are working well together, allowing the person to experience pure bliss. A healer's "job," so to speak, is to help people find their way back to that state.



Graphic representation of the three doshas or basic categories of physiological functions and qualities: *Vata*, *Pitta*, and *Kapha*.
Marina Demidova/Shutterstock

these *doshas* can lead to imbalances which, left unchecked, eventually result in disease.

A *kapha* imbalance often manifests as weight gain, lethargy, and then to *madumeha*. Associated symptoms may include accumulation of "dirt" in the teeth, burning sensation in the hands and feet, oily skin, excessive thirst, and a sweet taste in the mouth. In qualitative terms, a *kapha* imbalance is an excess of heaviness, sweetness, and moistness which, in turn, aggravates the fat tissue (called *medu dhatu* in Sanskrit)—a process that we might describe as insulin resistance driving inflammation.

Left uncorrected, a *kapha* imbalance will gradually pull the other *doshas*—*pitta*, and then *vata*—out of balance, leading to a wide range of multi-system problems.

A Higher Bar

Allopathic medicine recognizes that type 2 diabetes is a "lifestyle" disease, driven by high glycemic diets and lack of exercise. But in routine practice, our medical systems give that little more than lip service. Prescription drugs are our primary tools for treating diabetes—and most other disorders.

In Ayurveda—which literally means "science of life"—what we call "lifestyle" is central to the origin of most diseases, and it is the primary means by which we can restore health.

Though people have innate tendencies toward particular *doshic* imbalances, it is really our dietary habits, sleep patterns, exercise, environment, stress levels, and relationships that determine whether they will become problematic.

What we call "unhealthy lifestyle choices" are the result, according to Ayurveda, of *praghyā aparadh*—"mistake of the intellect." This implies that someone has lost the deep

understanding that the bar for clinical success is actually much higher in Ayurveda than in modern allopathy.

In the context of diabetes, yes, we have to pay attention to blood sugar. Yes, we have to normalize insulin responsiveness, reduce inflammation, and prevent end-stage heart, retinal, and renal disease. But our ultimate goal is far beyond just getting someone's blood sugar in range. We need to help our patients restore balance and overcome the *praghyā aparadh* that is the deeper root cause of the illness.

Ayurveda offers many time-tested dietary, botanical, and detoxification modalities to help restore balance and health. It also includes meditation, movement, and stress reduction practices. These are central to the Ayurvedic approach, not low-priority "complementary" side-dishes as they often are in some Western "integrative" clinics.

Pulse Assessment

Recognition of *doshic* imbalances is a clinical art that takes time and training to master. Pulse assessment is a key element in Ayurvedic diagnosis. As is written in one of the classic texts:

"The artery pulsating at the base of the thumb indicates life. Happiness and misery, including balanced and imbalanced states of the physiology, should be known from its movements."

—Sharngadhar Samhita, *Purv Khand*, m3.1

Pulse diagnosis involves placing the index, middle, and ring fingers on the patient's radial artery just proximal to the radial styloid (in other words, just above the wrist). The *vata* value of the pulse is detected by the index finger, the *pitta* value by the middle finger, and the *kapha* value by the ring finger.

This system includes a set of nuanced, almost poetic descriptions of healthy and imbalanced pulses. For example, the *vata* pulse detected by the index finger should feel sinuous, like a snake, while the middle *pitta* pulse should be jumpy like a frog, and the *kapha* pulse should be smooth like a swan.

To a Western medical mind, trained to think quantitatively, these descriptions may seem vague and impractical. But they are actually quite precise, once you begin to sense and study them.

Ayurvedic pulse diagnosis gives us a way to detect physiological imbalances at a very subtle and early level, allowing us to intervene long before disease begins to manifest.

In the context of type 2 diabetes, it can help delineate the prevailing *doshic* imbalance, allowing for more targeted therapies such as an appropriate *doshic*-balancing diet, or a *doshic*-specific program of spices, aroma oils, and herbs. This allows for a more holistic approach to patient care, ultimately leading to improved glucose control.

In Ayurveda, strong digestion is central to good health. Weak digestion leads to accumulation of toxins, which then get deposited in the tissues, providing substrate for the imbalanced *doshic* to cause tissue damage. Pulse assessment provides valuable information about a patient's digestive function.

Further, because it is a gentle, hands-on process, pulse assessment fosters the bond between physician and patient, and enhances the healing connection.

An Integrated Approach

The Ayurvedic perspective is very different from that of Western allopathy, yet it provides a compelling model for augmenting conventional care.

Diagnostically and therapeutically, the two systems complement one another. Each brings strengths that the other lacks. In the case of type 2 diabetes, the Ayurvedic model allows for early detection of imbalances long before disease actually manifests, potentially empowering patients to avoid getting ill.

If the disease has already manifested, allopathic diagnostic guidelines and lab testing provide very accurate measures of glycemic control which are useful in planning, implementing, and monitoring treatments.

Because it emphasizes mind-body interventions, Ayurveda goes a long way in helping patients reduce stress, which favorably affects glucose metabolism. For example, the regular practice of Transcendental Meditation® (TM) reduced insulin resistance in a *randomized controlled study* of patients with metabolic syndrome.

In addition, patients report that TM practice enhances their ability to adhere to a complex behavior change regimen (Elder C. *Altern Ther Health Med*. 2006).

Ayurveda encourages people to follow a plant- and spice-rich lactovegetarian diet. Vegetarian diets have been shown to improve glycemic control in diabetics (Yokoyama Y, et al. *Cardiovasc Diagn Ther*. 2014).

Spices like fenugreek and cinnamon, used often in Indian cooking, can favorably modify glycemic levels. There are a range of other herbs which, when coupled with proper medical, dietary, and behavioral regimens, may contribute to improved glycemic control (Elder C. *Altern Ther Health Med*. 2004).

The best care, then, is an integrated approach merging the best of the Ayurvedic and allopathic paradigms. At Maharishi International University, our *Fellowship MS in Integrative Medicine and Ayurveda for Medical Professionals* provides doctors, nurse practitioners, physician assistants, and other clinicians with the knowledge base and skills to deliver top-notch care that is contemporary and scientific, while at the same time ancient and holistic.

It is the only fully accredited graduate degree program in the country offering Ayurvedic training specifically targeted toward licensed healthcare practitioners. To learn more, please visit: <https://www.miu.edu/fellowship-ms-in-integrative-medicine-and-ayurveda>

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Reflections on the Psychedelic Renaissance

BY MAYA SHETREAT, MD
Contributing Writer

Psychedelics have been hitting the headlines nonstop these days. The *New York Times*, and other major media, have run a slew of articles highlighting the promise of psychedelics for hard-to-treat clinical conditions like major depression, post-traumatic stress disorder, and addiction.

Important discoveries are emerging from prestigious academic centers worldwide that have dedicated millions of dollars to psychedelic research. These include [New York University](#), [Johns Hopkins School of Medicine](#), [Imperial College London](#), [University of California San Diego](#), [University of Exeter](#), and many more.

And that's despite the fact that the vast majority of psychedelics remain classified as Schedule 1, a category of drugs defined as having "no currently accepted medical use and a high potential for abuse."

"Wait," you may be asking. "Didn't you just say psychedelics show benefit as one of the most promising treatments we've seen for addiction?!"

Yes. And therein lies the rub.

On the one hand, growing research shows that these therapies may offer profound relief to people for whom countless other approaches, conventional and otherwise, have failed. On the other hand, psychedelics remain stigmatized and illegal in most cities and states, though that is slowly shifting as part of a national decriminalization effort.

Not unlike the cannabis craze a few years ago, the current "psychedelic renaissance," as it's been called, is leaving a lot of us wondering how to navigate conversations with our patients about psychedelics.

Though the current research is tremendously promising, there is still much more to learn about psychedelics than many advocates admit. At the same time, there's also less to fear than we've been told.

The Power of Uncertainty

As clinicians, we are accustomed to having a reasonable set of expectations about the benefits and risks of the treatments we recommend. From that perspective, guiding patients who seek psychedelic healing experiences—whether at home or in the jungles of Peru—is paradoxical to the risk-averse mindset we've all internalized.

That's because, despite the growing research, we cannot predict exactly what will happen to a particular person during a journey, nor can we be certain the experience will leave the journeyer better off than before. Psychedelic experiences are inherently individual, subjective, and not predictable.

In many ways, the uncertainty—and a person's ability to surrender to the unknown—is the whole point of the treatment. The unique individuality of the experience is exactly what makes it so powerful and transformative.

Yikes! That's very different from the linear, rational certainty we learned in medical school. So what's a clinician to do?

Seeking the Big Shift

These days, many (most!) of us are overwhelmed with patients struggling with chronic physical and mental health conditions that require more than the current medical paradigm offers. These patients have been through a full array of pharmaceuticals, psychotherapy, integrative approaches, and more, none of which have fully resolved their problems or restored their health.

Something more is likely going on. And now we're learning that traumatic experiences (whether "big T" or "little t" traumas) can trigger a persistent cell danger response that manifests physically and mentally, *until something shifts the person out of that state*.

Patients are also learning about this phenomenon, and they want that big shift via psychedelic experiences. Many also want

our guidance about the potential benefits and risks. As practitioners, we cannot ignore the potential to help people that are suffering deeply, even if we have hesitations.

The good news is that there's not just one way to experience the benefits of psychedelics and "Master Plants," as they're called by many of the indigenous cultures who have worked with them for millennia. Master Plants are plants and fungi that produce neuroactive substances that, when ingested, inhaled, or applied, affect human consciousness.

Most people hear the word "psychedelics" and automatically think of what are referred to as peak experiences or "tripping"—states of profoundly altered reality, visual or auditory hallucinations that render someone out-of-

larly those from the Global South—are primitive, backward, or "undeveloped." That's partly because they are preliterate or extra-literate, and thus unschooled in the European literature, history, and science that comprise an "acceptable" education in our cultures. By this logic, indigenous communities have no science, technology, or advanced forms of knowledge.

Those assumptions are worth challenging in any conversation about psychedelic medicine, because indigenous knowledge is the past, present, and must remain a fundamental part of the future of our engagement with Master Plants, if it is to be safe and truly therapeutic.

The prevailing beliefs about "primitive" people conveniently ignore the truth that many of our modern scientific "discoveries,"



commission for the duration. They think that this is the only way psychedelics "work."

Some seek these big experiences whether for therapeutic, spiritual, or recreational reasons. And, indeed, there's research to show that within a context of a therapeutic support before, during, and afterwards, full-on psychedelic experiences can be profoundly transformative and healing.

Yet macrodosing for peak experiences is not the only way people have traditionally engaged with Master Plants. If you study the long history of human interaction with these plants, you'll find a tremendous precedent for use of much smaller doses.

What Are Master Plants?

In their indigenous communities of origin, naturally occurring psychedelics are referred to not as "drugs" but as Master or Teacher Plants. In some cultures, they're called Grandmother or Grandfather, Mother or Father. They're considered to be very old and powerful kin; they convey an ancient wisdom and lineage that can help individuals to heal and communities to evolve.

Some examples of psychedelic Master Plants include psilocybe mushrooms, ayahuasca, San Pedro cactus, peyote, iboga, and salvia, among others. Not all Master Plants are psychedelic (think cacao, opium poppy, or the coca plant), but all psychedelic plants are considered to be Masters.

In contrast to the way we perceive medicine in modern industrialized culture, these plants are not exploitable resources that produce "compounds" to be "taken" or "used"; they are revered community members—honored elders, teachers, and allies. As such, people approach them with extreme reverence and humility, with offerings in hand. The healing benefits are considered sacred gifts from the plants.

Indigenous Science

Skeptical? That's no surprise. Those of us from the Global North have long operated under the assumption that indigenous peoples—particu-

larly those from the Global South—are primitive, backward, or "undeveloped." That's partly because they are preliterate or extra-literate, and thus unschooled in the European literature, history, and science that comprise an "acceptable" education in our cultures. By this logic, indigenous communities have no science, technology, or advanced forms of knowledge.

Fewer than 2% of all the world's plants have been fully explored to date. The vast majority of those plants live in tropical forests inhabited by indigenous communities. Indeed, these communities remain the source of many current and future therapies.

That's why pharma development companies employ "bioprospectors."

Let's consider ayahuasca, for example. The word translates roughly from Quechua as "spirit/soul rope," and this plant medicine has become increasingly popular in the US and Europe among seekers of deep healing and profound shifts in consciousness.

Many people may not realize that the ayahuasca vine (*Banisteriopsis caapi*) alone has no significant hallucinogenic activity. To make the psychoactive substance called "ayahuasca" that's been prepared for millennia by South American indigenous people, two plants must be brewed together in a highly specialized way for hours.

One of those plants often used in the Amazon is called "chacruna" (*Psychotria viridis*). It contains the hallucinogenic substance dimethyltryptamine (DMT). However, like the ayahuasca plant, chacruna alone has no hallucinogenic effect when taken orally. That's because the monoamine oxidase in our stomachs breaks down the DMT.

The combination of the two plants is a whole other story. The ayahuasca vine contains compounds that render this enzyme inactive, so the DMT can survive digestion, penetrate systemic circulation, and enter the brain's inner sanctum.

Indigenous peoples may not be able to explain the biochemistry behind this phenomenon, but they certainly have advanced knowledge of how and why these plants must be prepared together.

Think about it: There are at least 100,000 plant varieties in the Amazonian jungle alone. Yet, somehow, unrelated indigenous communities isolated from one another, discovered not only the relatively nondescript ayahuasca vine but also the possibility of combining it with just the right second plant, and the hours-long process needed for preparing them together to have a psychedelic effect.

When asked how they obtained this intricate, detailed, and very specific knowledge, indigenous people will say the Master Plants *showed* them. And yes, they mean this *literally*. Remember, for them, the plants are not just passive objects that produce useful compounds, they are intelligent beings with spirits.

This is a lot to take in, I know. But the reverence and knowledge these communities show in their relationship with Master Plants has served them well for millennia. It's a deep contrast to the psychedelic free-for-all that took place here in the 1950s and 1960s, when LSD and other psychedelics blasted onto the scene, and drastically different from the current venture capital-fueled psychedelic business frenzy.

Plant Intelligence

Most people in modern industrialized societies don't realize that plants do in fact possess a "brain." It may not be in the form of a solid organ, as it is for us. But plants have neural networks—their root systems.

In their roots, plants store memories, analyze inputs, design responses, and plan for the future. Structurally, plant root systems closely resemble the neural networks of our brains, and they perform similar functions. They produce neurotransmitters, including serotonin, dopamine, melatonin, acetylcholine, GABA and even the psychedelic molecule DMT.

Since we humans like to define other beings in anthropomorphic terms, we could think of plants as upside-down beings—their "brains" underneath the soil, their limbs and genitalia (yep, flowers!) visible to us.

This idea that plants sense their environments and have intelligence is not new, even to "modern" science. There was a scientist, albeit a controversial one, who described the neural nature of plant root systems in his 1880 book *The Power of Movement of Plants*. His name was [Charles Darwin](#).

Small Doses, Big Impact

Indigenous customs and practices for interacting with psychoactive plants can vary widely from culture to culture. In certain communities, only the healer ingests the medicine in a significant "shamanic" quantity, which confers the ability to see inside the person needing healing. Sometimes, the person or people in need of healing might ingest a small amount. But often they ingest none at all, yet still have full healing experiences.

Indigenous people have long recognized—and everyone else is slowly learning—that sometimes our physiology will respond best to a gentle nudge rather than a sledgehammer blow.

The concept of microdosing psychedelics has gained attention recently, popularized by Silicon Valley professionals as a way to get to that "next level." Microdosing means ingesting a subthreshold dose that will not induce profound changes or alter one's normal daily functions, but will still have physiological and cognitive effects.

People are now exploring psychedelic microdosing as a way to enhance cognition; boost physical energy; promote emotional balance; treat anxiety, depression, OCD, and addiction; and even address medical conditions like chronic pain, autoimmunity, asthma, dementia, ADHD, or autism.

Psychedelic Renaissance cont'd from page 11

Those who regard Master Plants bluntly as neurochemical compounds can get stuck in the “more is more” perspective. Yet early research indicates that microdosing offers hormetic effects, in which a seemingly insignificant dose leads to big benefits.

Microdosing may, in fact, prove to be more effective than macrodosing for some conditions. For example, animal studies show that microdoses of psilocybin confer anti-inflammatory effects not seen with larger doses. Small amounts over time may offer cumulative benefits that larger doses do not.

Researchers have discovered a profound shift in T-helper cell recruitment, eosinophilia, and mucus production in the lungs of people with asthma who took microdoses of 5-HT_{2A} receptor agonists that mimic psychedelic molecules.

Microdosing psilocybin may also benefit mood, cognition, sleep, pain, autoimmunity, and allergy. Though some researchers dismiss microdosing as a placebo effect, the practice does seem to facilitate neuroplasticity in gentle ways over time.

Quantum Dosing

There's another even more subtle approach to psychedelics: quantum dosing. It's a way to experience the medicine of Master Plants vibrationally, without ingesting the plant substances themselves.

We now know that all plants oscillate in measurable ways both mechanically and electromagnetically, which creates a kind of music.

Most plant researchers have disregarded these oscillations as inconvenient “noise” or interference. Yet these vibrational transmissions may be as much a communicative expression as the complex chemical compounds that plants produce, and that we consider to be “medicine.” Under the right circumstances, we can access this vast spectrum of plant communication.

For trained *ayahuasqueros* and other indigenous wisdom holders, to perceive this music is as potent a medicine as the ingestion of the actual plants themselves; in fact, many consider medicine songs transmitted to them by plants to be equal to or greater in power than imbibing Master Plants in physical form. Receiving the plant vibrations

spirit. According to this paradigm, it's more than just a material or biochemical substance, and beyond even an essence or an energy. The plant is considered to have intelligence and even sentience.

A form of quantum dosing takes place in traditional settings through music, which is thought to be vibrational medi-



Woman in rural Peru preparing Ayahuasca according to indigenous methods in use for hundreds of years.
Chris Kilham/Medicine Hunter

is a foundational avenue to profound healing, without ingesting plant material at all.

Modern biomedical science points to chemical compounds as the sole source of a plant's medicinal (or nutritional) value. Indigenous science views the medicine of the plants as coming from the Mother of the plant, also referred to as the plant's

cine given over by the Mother of a Master Plant. The Quechua word for this vibrational medicine is *icaró*, which derives from the word for “to blow.”

Icaros are the vibrations of the plant manifested through the Maestro (the healer and leader of an ayahuasca ceremony), in the form of songs that the healer sings or whistles, especially during ayahuasca ceremonies. To be clear, these are considered vibrational transmissions not composed by the Maestro, but offered by the Master Plants over intensive weeks or months spent training together—a period known as *dietas*. These *icaros* serve different functions at the start, the middle, and the end of a ceremony—to provoke visions, to encourage purging and release, and to return to the physical body.

In the words of the indigenous shaman and artist Pablo Amaringo: “Everything is created by music, by vibration, by sound. When the celestial spirits enlighten us with their wisdom, we receive the ability to sing *icaros* and we become part of a divine choir. Music is universal, and we are made of primordial vibration. *Icaros* are the music of creation.”

Though the term “quantum” has been thrown around liberally by marketers and new-agers alike, it has real meaning. Quantum physics describes the behavior of the very smallest detectable particles, acknowledging that they embody both matter and wave state simultaneously. These tight packets of wave energy, known as “quanta,” act in ways that are nonlinear and nonlocal, helping us to explain complex phenomena that are otherwise inexplicable with classical physics.

The burgeoning field of quantum science takes into account the vibration and frequency of our bodies, and the impact of vibration and frequency, including light, sound, and biofield, on human physiology and consciousness. Nobel Prize winner Luc Montagnier's controversial work with water is informing a new wave of research regarding the imprinting of DNA information into water

The oscillations of Master Plants can be imprinted into liquid and then consumed. Ingesting these in the form of quantum drops are another way to experience quantum dosing. It represents another form of vibrational medicine, made together with plants that are never harvested for ingestion. In appreciation for this care, the Master Plants infuse the drops with this ceremonial relationship in the form of sonic medicine. This is similar to the principle behind the Bach Flower Remedies, or other flower essence therapies.

Master Plants can share their medicine and teachings in ways that don't overdrive our nervous systems, and don't overuse the plants or turn them into pharmaceuticals or commodities to be exploited. Growing Master Plants that are legal to grow—such as ayahuasca or San Pedro—and tending them, engaging with their seeds, and even creating or wearing artistic depictions of them are all ways to experience their gifts.

Quantum dosing is vibrational and, therefore, legal. It is also safe for people who are highly sensitive, sober, pregnant, or have other medical or pharmaceutical contraindications to the ingestion of psychedelic substances. It is also helpful in preparing for a ceremony, and for the integration process afterward.

It remains to be seen whether quantum dosing can give the benefits observed in studies of macrodosing and microdosing. Likewise, we don't yet know whether quantum dosing offers benefits not seen with ingestion of plant substances.

All of this is very likely arousing your skepticism, but don't let that dissuade you from exploring.

Consider what we have only recently learned about the microbiome. Thirty years ago, could we have imagined that our cognition, memory, moods, cravings, immunity, hormones, and sleep cycles are governed in large part by microbes in our intestines? Early microbiome research also aroused skepticism and scorn.

Of course, all of this raises big existential questions: What are we, really? Who's in charge? Where do we end and the rest of the world begin?

We think of ourselves as static. But ancient indigenous wisdom—and also our most advanced science—shows us that we are universes within universes, far more complex than an amalgam of organ systems mechanically doing their parts.

Deepening our relationship with Master Plant wisdom—whether via

intense psychedelic experiences, microdosing, or quantum dosing—enables us to cultivate richer relationship with ourselves, each other, and all living beings by enhancing within us a sense of greater awareness, presence, and aliveness. It helps us remember the sacredness of our existence while navigating the challenges of our ordinary human lives. And this can be profoundly therapeutic. ☺

Maya Shetreat, MD is an adult and pediatric neurologist, herbalist, and ceremonialist. A graduate of the Albert Einstein College of Medicine, she is author of *The Dirt Cure* (2016) and newly released *The Master Plant Experience: The Science, Safety and Sacred Ceremony of Psychedelics*. She has been featured in the New York Times, The Telegraph, NPR, Sky News, The Dr. Oz Show and more. Dr. Maya created Quantum Drops (www.quantumdrops.com) a vibrational Master Plant product that is safe, legal, and deeply transformative. She is also the founder of the Terrain Institute, where she offers a Certification for psychedelic-informed professionals as well as an upcoming Quantum Practitioner Certification.

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Maya Shetreat, MD

Gladys T. McGarey: Wisdom from *The Well-Lived Life*

BY MEG SINCLAIR
Publisher

Usually I'm a voracious reader. I've always enjoyed reading and gobbling up books. But this year it seemed I couldn't get past more than a couple of pages of anything at any time.

"The Well-Lived Life," the newest book by Gladys McGarey, had been sitting on my desk collecting dust for months. Then, one day this summer I picked it up, started reading and could barely put it down.

Thank you Gladys. Thank you. Thank you! Thank you!!

Dr. McGarey is one of the most interesting and inspiring people I've ever had the honor of meeting. She is widely recognized as the Mother of Holistic Medicine, and she has lived an extraordinarily rich life.

Her book is centered around the following six "secrets," which she says are the keys to living a happy and purposeful life:

- **Spend your energy wildly:** How to embrace your life fully, and feel motivated every day.
- **All life needs to move:** How to move—spiritually, mentally, and physically—to help let go of trauma and other roadblocks.
- **You are here for a reason:** How to find the everyday "juice" that helps you stay oriented in your life's purpose.
- **You are never alone:** How to build connections and community that are meaningful and supportive for you.
- **Everything is your teacher:** How to glean lessons and meaning from the pain and the setbacks we all experience at times.
- **Love is the most powerful medicine:** Learn to love yourself, and you'll learn to love others. This is the wellspring of healing.

Throughout the book, McGarey addresses the reality of suffering, and offers guidance on responding to it in a life-giving way: "When we look for the lessons, we move our attention away from our suffering and direct it back toward life."

I first met Gladys at a meeting of the American Holistic Medical Association, back in 2000, around the time we launched *Holistic Primary Care*. I was moved by her presence, and she has been a guiding spirit for me and for HPC ever since. Twenty years ago, we published an article covering her talk about the ways that military metaphors and fear-based logic were ruining medicine.

And in the height of the Covid pandemic, we hosted an open conversation in which she reflected on the meaning of the pandemic from the perspective of someone

who lived through the Great Depression, World War Two, the Cold War, the cultural upheavals of the 60s and 70s, and many personal and societal crises.

Whether in person, or in her writing, Gladys McGarey has a gift for saying what needs to be said, for touching peoples' hearts.

"Grief isn't quite the same as depression—grief moves, while depression stands still. When we let our grief move, we don't suppress it; instead, we focus on our love for whom ever or whatever was lost, while letting the suffering pass through us."



Gladys Taylor McGarey, MD

The 25th anniversary of my mother's death came up this July and I was experiencing all the grief I hadn't felt at the time when way too much was happening all at once. It was like a volcano erupting or an oil cap blowing.

In honor of my mother, I wrote *The Peace Rose*, a poem about love, loss, rebirth and life's great mystery.

As Gladys writes: *"Life itself is always in movement, so aligning with our life force means that we must always look for the flow within us."*

The *Well-Lived Life* isn't just a description of Gladys' interesting, exotic and contemplated life, it's a support and template we all can use to frame our own existence. This very wise woman—who raised six children and practiced family medicine for more than 60 years—distills a lifetime's worth of insight on how to heal – how to help.

At the end of her book she shares a dream of walking up an aisle to receive an award while realizing the back of her dress is unbuttoned. With each step she takes, a hand fastens a button, and then another hand fastens the next button until she reaches the stage and her dress is completely fastened.

It's a beautiful image, and doubly interesting to me because in the Spring of 2020 *Holistic Primary Care* was going to honor Dr McGarey with a lifetime achievement award at our then annual conference, *The Practitioner Channel Forum*. Then COVID came and the world shut down, our Forum along with it. We were unable to present her with the award.

Not that she needs it. Gladys McGarey's life has been truly well-lived, and is its own reward. Through her writing, she shares her experiences and tells her tales in a way that inspires and comforts at the same time.

This wise woman is not only a Godmother of Holistic Medicine, she's a Fairy Godmother of life itself, spreading love, and always pointing us toward the fundamental truth that we really do need each other to grow

and live healthy, fulfilling lives.

Gladys McGarey's new book, *The Well-Lived Life*, and its accompanying *Well-Lived Life Workbook*, are available on Amazon, or from Dr. McGarey's website. Her previous books include: *Living Medicine*, *Born to Heal*, *Born to Live*, and *The World Needs Little Old Ladies*.

"When we look for the lessons, we move our attention away from our suffering and direct it back toward life."

The Peace Rose

Seven months from one death to the next

Plus nine when you count the previous

Daddy was first
Mama was last
sister was in between or ...
somewhere in the past

Gone —
Just like that

25 years ago I sat on the tarmac

Hours went by —
I just wanted to be by her side.

Then we flew —
I just knew it'd be the last time —
To say Good-bye

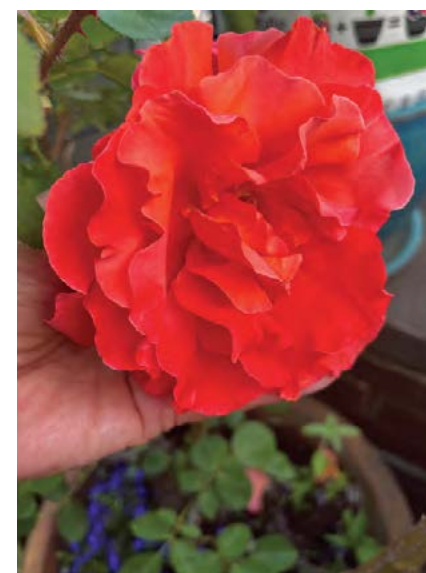
Growing up, I remember roses
roses — roses
All around

The coral Peace Rose
was bigger than my hands.

Mama gave me gardening
Gave me my piano

She gave me life and love.

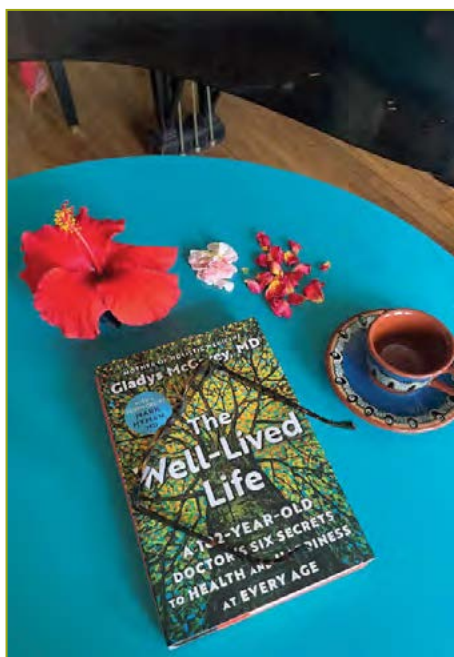
— Meg Sinclair



One of the first American women to ever earn an MD degree, Dr. McGarey trained at a time when there were so few female med students that she had to sleep on an x-ray table for want of a proper dorm room.

From the very beginning of her career, she recognized the limitations of allopathic medicine. She was one of the first physicians to introduce spirituality into medical practice, to utilize modalities like acupuncture, and who spoke openly about the vital role of love in the healing process. Back in the 70s, she co-founded the American Holistic Medical Association (now called the Academy of Integrative Health & Medicine).

At 102 years old, Gladys is still going strong, continuing her healing work as a medical consultant via her Foundation for Living Medicine, and through her writing.



In Surprise Move, Leading Naturopathic Schools Plan to Merge

BY ERIK GOLDMAN
Editor

Two of the country's leading naturopathic medical schools are planning to merge and become a single institution, a move that surprised many in the field.

In June, the presidents of National University of Naturopathic Medicine (NUNM) and Bastyr University jointly announced a non-binding letter of intent to come together under one banner some time in 2024. The two schools, headquartered in Portland, OR, and Kenmore, WA, respectively, are the oldest modern naturopathic colleges in the country.

Founded in 1956, NUNM (then called National College of Naturopathic Medicine) represented a rebirth of naturopathic medicine in the US at that time. The school has a long legacy of training excellent clinicians, researchers, and thought leaders, some of whom went on in 1978 to found Bastyr University. That school was named for John Bastyr, a teacher and early advocate of modern naturopathy.

Both institutions have grown considerably since their founding. Bastyr in particular has expanded quickly over the last 20 years, opening a second campus in San Diego in 2012. But despite the growth, the schools are still small by contemporary university standards. NUNM currently trains around 360 students, and Bastyr has around 750 between its two campuses.

Strength in Numbers

Leaders at both schools believe there's strength in numbers, especially in today's economic environment, which is generally hostile to small institutions.

In an online "town hall" meeting announcing the proposed merger, Melanie Henriksen, ND, NUNM's president, says that by joining forces, Bastyr and NUNM will create a combined student body of well over 1,000—an important threshold. "Higher education research shows that a lot of things improve when a school has more than 1,000 students," she said.

Phototherapy Shows Promise in Mitigating Dementia

BY AUGUST WEST
Contributing Writer

A metaanalysis of 12 clinical studies representing a total of 776 patients diagnosed with dementia shows that phototherapy interventions can significantly improve cognitive function as indicated by changes in Mini-Mental State Examination (MMSE) scores.

Phototherapy did not, however, have measurable impact on depression, agitation, or sleep patterns.

Researchers at the Institute of Geriatric Medicine, Chinese Academy of Medical Sciences, searched the global medical literature for studies of phototherapy in the context of dementia and found a total of 1,088 citations. Of these, only 12 met the project's strict screening criteria, which followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.

Within these 12 studies, 426 patients had undergone some form of phototherapy, with a total of 340 similarly diagnosed patients serving as controls. In all studies, there were more females than males. The mean patient ages ranged from 73 to 86 years old.

The trials represented a broad range of phototherapy protocols, frequencies, and durations. Two studies used blue or blue-green light, while the rest used broad-spectrum lights. Three studies tested multiple daily exposures, while 9 looked at once-daily treatments. Duration of treatment ranged from 6 minutes to 120 minutes per session.

Overall, phototherapy improved MMSE scores by a mean difference of 2.68 points between treated patients and controls. There were no meaningful differences in Neuropsychiatric Inventory score, sleep efficiency, total sleep time, and Sleep Disorders Inventory score between the groups.

"Our meta-analysis indicates that phototherapy improved cognitive function in patients with de-

The new institution, which has yet to be named, would have a combined faculty of 388 members teaching 35 distinct program tracks. It will offer a total of 18 naturopathic residencies, and its three teaching clinics will have a combined capacity to provide nearly 60,000 patient visits.

The merger would also allow faculty clinicians and students to use a common electronic health record system, creating opportunities to easily share information across the three campuses and to pool data for research projects.

Stiff Headwinds

Devin Byrd, PhD, president of Bastyr, says small higher education institutions like his and like NUNM have faced stiff demographic and economic headwinds in recent years: an overall decrease in the younger population driven by a long-standing decline in the US birth rate, a stagnant economy especially for many prospective students, a relentless push toward online education, surging overhead and operating costs, and an aging faculty.

These challenges are not unique to naturopathic training programs; all institutions of higher learning face similar trends, to varying degrees. But they are especially problematic for a small profession like naturopathy, which remains on the margins of healthcare at large, and which has a limited base of financial and structural resources.

By joining together, NUNM and Bastyr will be able to pool financial resources, eliminate curriculum redundancies, and provide a wider spectrum of learning opportunities to the combined student population.

"This merger improves access for students while offering more flexibility in how they learn, more interdisciplinary program options, and expands research and clinical practice opportunities," says Byrd.

One major advantage of the merger is that it will permit faculty members to concentrate on their true areas of expertise.

mentia but had no significant effect on behavioral and psychological symptoms of dementia (BPSDs) and sleep. This suggests that phototherapy may be one of the most promising non-pharmacological interventions for improving core symptoms of dementia," write authors Xinlian Lu, Chengyu Liu, and Feng Shao. Their findings were published in the journal *Brain and Behavior* in April.

The metaanalysis was not designed to evaluate the relative efficacy of specific types of light, or to differentiate between the diverse protocols and schedules used in the trials. Rather, it was intended to answer the broader question of whether phototherapy as a general treatment category has any merit in the context of dementia.

The answer to that question appears to be affirmative.

Lu and colleagues cited several other studies that also suggest cognitive improvement from phototherapy, including a 2021 non-randomized controlled pilot study utilizing 2,500 lux bright light for 8 weeks that showed significant improvement in the MMSE score among mild-to-severe dementia patients (Liu CR, et al. *Front Psychol*. 2021).

They also draw attention to a landmark 2008 Dutch trial showing that regular and frequent light exposure reduced cognitive deficits in the elderly by 5% (Riemersma-van der Lek RF, et al. *JAMA*. 2008).

There are a number of potential mechanisms through which light exposure could affect cognitive function, including: compensation for reduced sensory input associated with aging and dementia, and stimulation of specific regions of the suprachiasmatic nucleus in the hypothalamus, which regulates circadian rhythms and synchronization of brain functions.

Given the age curves prevalent in most of the industrialized world, and the lack of effective pharmaceutical treatments, there's a clear and pressing need for safe, effective, low-cost treatments to curtail the devastating impact of dementia. Phototherapy, say Lu and colleagues, holds great promise. Clearly, this is a field ripe for further research. ☺

"Both of us are small institutions. Many of our departments are departments of 1 or 2 teachers," said Henriksen. "We ask our staff to be jacks-of-all-trades. By coming together, we can allow people to focus more on their strengths, while maintaining adequate staff across all three campuses." The administrators envision a broader range of elective courses available to all students, based on the wide expertise of the combined faculty members.

Harmonizing the Curriculum

Though the two schools share many core principles and common objectives, they are unique and distinct, each with its own culture and legacy. No one is under the illusion that a merger will be easy.

Byrd and Henriksen both emphasized that administrators are soliciting input from everyone connected with the schools, including current students, alumni, and faculty members.

"We need to understand what's working, what's not, and where the opportunities rest. We want to bring forward all the ideas that people may have been sitting on for a long time but not speaking about," says Byrd. "We are seeking guidance from all the programs, and we'll make those decisions based on that. We'll do that with everyone around the table."

Currently, NUNM operates on a block-based curriculum, in which students progress through a sequence of in-depth organ system block courses, one at a time. Bastyr has a more conventional curriculum, with students taking multiple courses at the same time.

This is a major difference that has made it difficult for students at one school to transfer to the other if they so desire. One of the main objectives of the merger—and one of its biggest challenges—is to harmonize the two approaches and create a unified curriculum.

Another challenge is the differences in permitted scopes of practice in the three states where the schools are located. Washington, Oregon, and California all recognize naturopathic medicine, and have licensure for NDs, but they differ in their authorized scopes.

Kristina Connor, ND, dean of naturopathic medicine at Bastyr, says "We will prepare students to operate at the highest level that they can, so grads can be successful in any state that they go to. The combined curriculum will be keeping this in mind, so students can work within different states, different jurisdictions."

Byrd and Henriksen both stressed that the plan is to maintain all three campuses and all current faculty positions.

A formal timeline for the merger has not yet been set, though the leaders say the effort of gathering input from their respective faculty, students, and alumni communities is already underway. The process of creating a new name and identity for the new school will begin this fall.

A Win for Students & Faculty

Paul Mittman, ND, EdD, the president and CEO of Sonoran University of Health Sciences (formerly Southwest College of Naturopathic Medicine [SCNM]), sees the Bastyr-NUNM merger as a win for students, teachers, and for the profession at large.

"I know many of the faculty at both schools. You have these extraordinary faculty members, and they won't be place-bound anymore. It'll be a school with 3 campuses, and the programs will be able to draw on each other's faculties, which will enhance the quality of the educational experience."

A graduate of the former National College of Naturopathic Medicine, Mittman took the helm of SCNM 22 years ago, and has steered the institution through many changes including its recent rebranding as Sonoran University. He told *Holistic Primary Care* that he well understands the economic and demographic forces that moved his peers at NUNM and Bastyr to consider a merger.

"Schools everywhere are looking to collaborate and create new economies of scale. The headwinds facing higher education are real. The inflationary costs, the escalating costs of information technology, they're outpacing all other expenses. Even before the recent surge of inflation, costs were escalating. Schools are seeking all sorts of ways to meet those challenges. A merger is one type of collaboration along a spectrum of options."

Mittman acknowledged that he and his team are feeling many of the same pressures as other institutions, though he added that there are no plans at Sonoran to undertake a merger with any other schools.

Online learning, which accelerated during the Covid pandemic, is changing the very nature of all medical education, not just in the naturopathic field.

Mittman says that in many ways it is liberating. Schools can draw on a wider range of non-local teaching expertise, and a lot of basic didactic work can be pre-recorded for students to view at home. This frees up in-person interactive time with faculty for in-depth discussions, case reviews, and practical application of knowledge, rather than rote lectures.

Strengthening the Core

Joseph Pizzorno, ND, who trained at National College of Naturopathic Medicine in the 1970s, and who was the founding president of Bastyr University, says the news of the merger took him by surprise.

In an interview, he said he is agnostic about it. "All I care about is that the institutions and the professions will be stronger. And I believe that multiple strong schools will make the profession stronger."

Like Dr. Mittman at Sonoran, Dr. Pizzorno has decades' worth of experience in medical school administration. While he, too, recognizes the broader demographic and economic shifts, he sees two additional factors that underlie the unique challenges confronting NUNM and Bastyr.

One is the fact that many of the core principles and practices of naturopathy have been incorporated into functional medicine and holistic/integrative medicine, and are now more widely available outside of naturopathic circles. The other is the gradual shift within the naturopathic field toward a "green allopathy" approach. He is concerned that the naturopathic profession has lost some of the distinctive features that made it unique and appealing to many young would-be healers.

Across the entire naturopathic field, new student enrollment is down, and program administrators need to figure out why.

Pizzorno holds that, merger or not, the administrators at NUNM and Bastyr need to look closely at recruitment and application patterns, and to pay attention to the aspirations of prospective students who inquire about naturopathic training.

A merger will, no doubt, give the schools greater economic efficiencies and increased capability to meet the demands of a new tech-enabled learning experience.

But Dr. Pizzorno emphasized that the profession as a whole needs to re-commit to the basic principles of naturopathy, and to increase efforts to raise public awareness of what makes naturopathy unique and valuable. ☺

By joining together, NUNM and Bastyr will be able to pool financial resources, eliminate curriculum redundancies, and provide a wider spectrum of learning opportunities to the combined student population.

In Memoriam: Michael A. Stroka

(November 5, 1969–June 14, 2023)

Holistic Primary Care honors the fruitful life and laments the untimely death of Michael A. Stroka, co-founder and CEO of the American Nutrition Association (ANA).

A tireless advocate for the principle of Food-as-Medicine, Stroka accomplished much in his 53 years.

With combined JD and MBA degrees from the University of Virginia, Michael began his career as a project leader for Boston Consulting Group (BCG), a strategic management firm that helps companies worldwide solve major business challenges. The job took him all over the US, and to many parts of Asia.

A business trip to Indonesia awakened him to the profound impact of nutrition and holistic medicine. Something he ate from a street vendor there led to severe food poisoning, and later to chronic fatigue and extreme weakness. His health deteriorated to the point that he had to leave BCG and the intense but exciting work he enjoyed.

In his quest to recover, Stroka quickly ran into the limitations of conventional medicine. "I saw every kind of doctor in the medical system. No one could bring me back to health," he said in an [interview](#) posted on the UVA/Darden School of Business website.

It was a nutritionist who focused intensively on his diet that ultimately turned the situation around. Soon after making major dietary changes, he began to feel better than he ever had. This direct experience sparked an intense interest to learn more about nutrition, and ultimately to make a career change. He went back to school and became a Certified Nutrition Specialist.

A Natural Bridge-Builder

It wasn't long until he saw that despite its potential to transform people's lives, nutrition science remained in the margins of American healthcare. Practice guidelines give lip-service to the importance of "healthy lifestyle," but the systems put little attention or money toward nutrition in practice.

"Conventional medicine is amazing for acute conditions, but the vast majority of the problems we have are chronic conditions for which nutrition is crucial. The science shows nutrition is the most powerful lever for our health, but healthcare attention to it is miniscule," Stroka said.

Part of the problem, he soon realized, is that the nutrition field was fragmented, with a dizzying number of credentials, food philosophies, and "tribes" competing for credibility and for practice opportunities.

In this muddled situation, Stroka recognized an opportunity to apply the strategic thinking and business acumen he'd honed during his years as a consultant.

With several other like-minded nutrition professionals, he established the ANA, which brought together five previously separate organizations—the American College of Nutrition, Board for Certification of Nutrition Specialists, Accreditation Council for Nutri-



Michael A. Stroka

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tion Professional Education, Center for Nutrition Advocacy, and the Nutrition for Optimal Health Association—under a single banner, and with a unified vision.

ANA promotes the science and practice of personalized nutrition through education, certification, and public policy advocacy. With a staff of 150, and thousands of members, ANA brought coherence to a previously chaotic field. Among Stroka's many goals was to harmonize and standardize the creden-

tialling criteria for non-RD nutrition professionals, and to ensure that they had a place in healthcare at large.

A Beloved Colleague

To say he was beloved by his colleagues and coworkers is an understatement.

"Michael was an extraordinary person, radiating love and peace to all. It was Michael's visionary leadership that led to the American Nutrition Association coming to fruition," writes Joye Blount, Chair of the ANA's Board of Directors.

In their public statement, the board members of the Integrative Healthcare Policy Consortium (IHPC) said, "Michael was not only an incredible ally of IHPC, but also a personal friend to many of us. His passion, dedication, and intellect touched the lives of so many in his professional and personal life."

A natural bridge-builder, Michael was an active participant in several holistic and functional medicine organizations. I would often see him at conferences, and I was consistently impressed with the energy he brought to his work, the clarity of his vision for moving nutrition to healthcare's center stage, and the practical steps he and his ANA colleagues were taking to make that vision a reality.

His boundless enthusiasm for nutrition was only exceeded by his love for his family. Michael was a devoted husband to his wife, Nancy, and a caring, engaged father to their four children: William, Elizabeth, Margaret, and Edward. He enjoyed putting on magic shows and sharing music with his kids, and spending time in nature. He also maintained close ties with his seven siblings.

Though fully engaged in the rough-and-tumble of life, Michael was also a deeply reflective and spiritual man, practicing meditation daily and working with teachings that ranged from the Advaita Vedanta to the Carmelite contemplations of Sister Bernadette Roberts.

Directly, and indirectly through his work, Michael Stroka positively affected many, many people. May his family and friends be comforted by his memory, and consoled in knowing that his vision and his work will carry on far into the future.

Members of Michael's family have set up a GoFundMe campaign to support his wife and children. Please consider making a donation: <https://www.gofundme.com/f/michael-stroka-memorial-fund>

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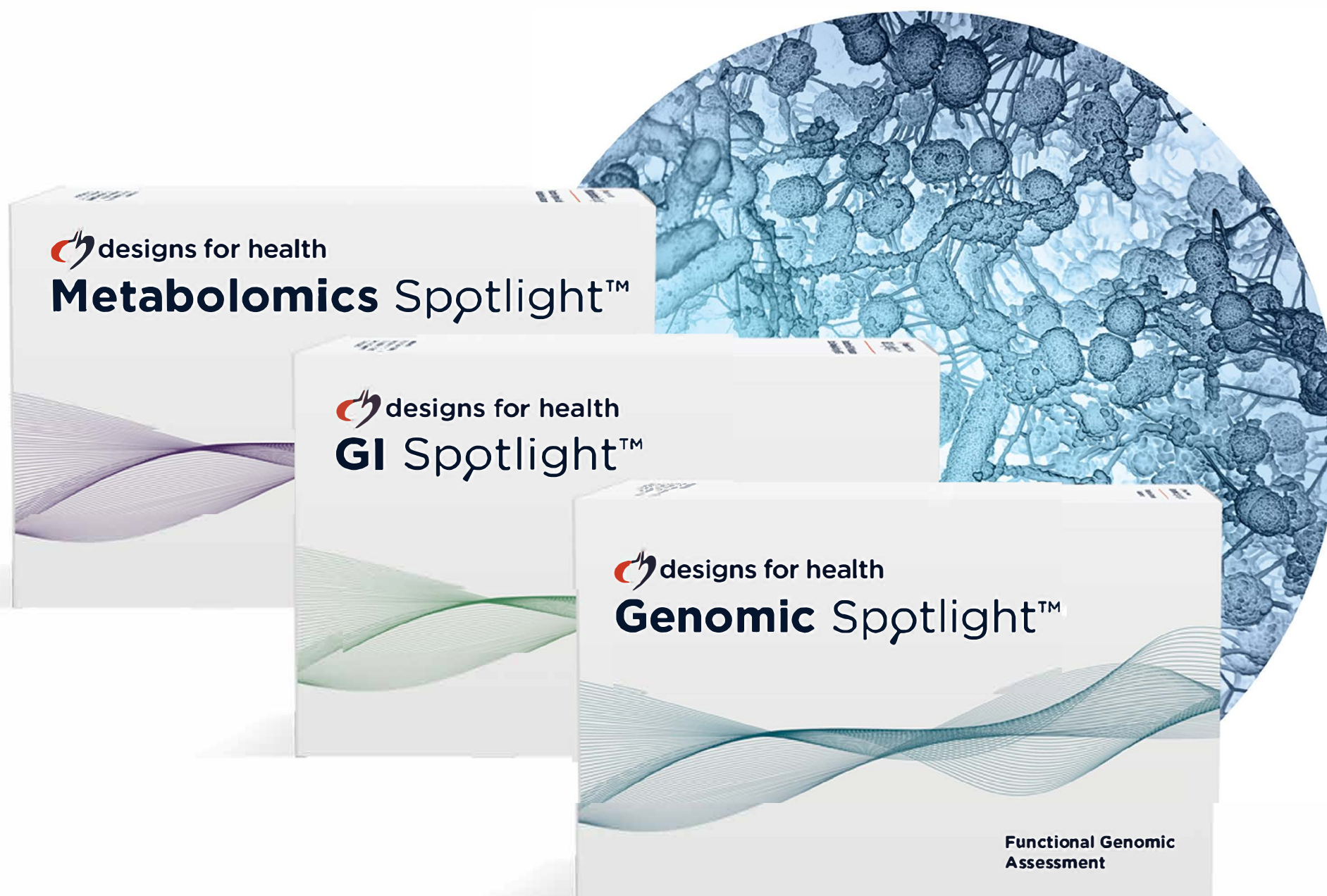
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