February 2012 Issue | Kristi Hughes, ND The Healing Center

http://jeffreybland.com/knowledgebase/february-2012-issue-kristi-hughes-nd-the-healing-center/

DOWNLOAD AUDIO |DOWNLOAD SUMMARY NOTES |

Welcome to *Functional Medicine Update*, February 2012. Can you believe that we're into the second month of the year already? Things just are moving, I think, at almost light-speed. It's suggestive of the nature of change that the whole world culture is undergoing right now. There are these convergences of very remarkable, paradigm-shifting perspective s, including not only biological sciences/medical sciences, but also information sciences and social sciences. These are all on a converging course to really create—I would call it—an amplified motivation for change.

New Clinical Tools are Making a Difference in the Practice of Personalized Lifestyle Medicine

This month we're going to be focusing on the area that is near and dear to my heart and that is the concept of personalized lifestyle medicine, built upon the principles of Roger Williams and biochemical individuality, Linus Pauling and orthomolecular medicine, and the view that each of us are genomically unique and that our requirements for optimal function are our own and not that of the average. In fact, Roger Williams said years ago—in 1974 actually, when I was at one of the early meetings of the then-American Academy of Preventive Medicine—"Nutrition is for real people, statistical humans are of little interest." I remember that—it is just kind of emblazoned in my memory from all those years ago—because it's a sound bite that so captures this concept of uniqueness and personalization.

The unfortunate thing is from 1974 to 2012, we often didn't have the tools to really make this concept stand up, we weren't able to find effective ways to personalize, but I think those limitations are changing rapidly in the post-genomic era in which we're now living. Now we are able to define certain specific subsets of the whole, and define unique clan genomics (as it is called) that connect us together with people with similar types of patterns of genomic pluripotential. Clan genomics would determine response to an environment like low gluten, or changing the protein-to-carbohydrate ratio, or changing the specific levels of certain nutrients. That's really what we mean by personalized lifestyle medicine.

How are we going to approach this discussion in this issue of *Functional Medicine Update*? We're going to look through the lens, the eyes, the experience of one of the master clinicians in personalized lifestyle medicine. That would be our Clinician of the Month this month, Dr. Kristi Hughes, who is a marvelous clinician, also a fantastic educator, and a seeker, like all of us, looking for better ways of managing individual presentations of complex chronic illness.

How Hard is it to Reverse Established Medical Practices?

What's the field in general starting to look like? What's the domain saying about the whole nature of medicine? This leads me to a short article in the *Journal of the American Medical Association* in the January 2012 issue titled "Reversals of Established Medical Practice: Evidence to Abandon Ship."[1] It's quite an interesting title, isn't it? What's the theme of this particular short article? I think the theme is that many of the things that we thought were truth, that were facts, that were prima fascia, peer-supported, and standard of practice, when we have better information and stronger data, we find that they were, in some cases, not just partially incorrect in their assumptions, but the whole paradigm was incorrect, and there was a factual misconnection with what we have found is more likely the truth. I think the introductory paragraph of this article sets the context: "Ideally, good medical practices are replaced by better ones, based on robust comparative trials in which new interventions outperform older ones and establish new standards of care. Often, however, established standards must be abandoned not because a better replacement has been identified but simply because what was thought to be beneficial was not." So then it goes on to discuss same examples of this, things like the story related to the use of equine estrogen replacement therapy in women, or the story that relates to the emerging understanding of percutaneous coronary intervention for stable coronary artery disease, and goes on to really talk about the more detailed intervention trials that have been done in these areas, or retrospective studies that have demonstrated that many of these therapies that we've taken as fact, as standards of care, as the best available, were actually not delivering the goods, even though they may have been used by board-certified trained individuals that had been examined on these and part of their licensure renewal was dependent upon understanding and reciting on demand the value of these particular therapies, that, in actual fact, when they were exposed to more rigorous evaluation, proved to be either incorrect or even—in some cases—had some adverse effects associated with them in terms of outcome.

So that's one interesting, as I call it, fifty-thousand-foot perspective. The other one that I think is interesting also comes from *JAMA*. This is an article that appeared a few years ago, but I think in the context of what we are talking about now with revisiting the importance of personalized lifestyle medicine and the management of chronic age-related diseases, this becomes a more interesting article. The title of this article is "The Conflict Between Complex Systems and Reductionism."[2] Again, let me emphasize: "The Conflict Between Complex Systems and Reductionism." This appeared in *JAMA* as well in 2008. This particular article is about the way many of us have been trained—this reductionistic Cartesian approach: taking big and breaking it down to smaller fractions until we understand the piece parts, and then assuming that the assembly of the piece parts makes us able to understand the whole. This is the one-pill-for-one-ill mentality that leads us to believe that blocking enzymes downstream in complex physiological processes in a system actually can lead to remediation of long-term disease. We have a whole series of drugs that are involved with blocking, or anti-this, or basically inhibiting specific types of downstream metabolic functions. What this article talks about is that the emerging science recognizes that we are a complex adaptive system. That's what the human is. It's modifying its function in real time, all the time, on the basis of environmental inputs (information coming from the environment) that are translated through our unique genes to give rise to our genetic expression into our phenotype that then regulates how we act, feel, look, and perform, and determines our health and disease over time, and that

this is individually unique to all systems built around our exposure to the environmental inputs and how that's focused through the lens called our genome.

The Systems Approach: Networks not Pathways

The systems approach is to look at the interactions of networks rather than pathways, and to start to put together the complexity of this adaptive system that we call the human body and its response to the environment and things that are going on around us all the time. These things include infectious disease, psychological stress, exposures to chemicals, altered nutritional intake, sedentary lifestyles, or dysfunctional signals that might come from allergens or toxins. All of these are part of a different view of what ultimately leads into a complex approach towards managing patients rather than a pill for an ill. This perspective is: What's the mosaic of inputs that will create a positive outcome through altered lifestyle, which is multivariate, not univariate? We know that lifestyle has a huge number of different variables: what we breathe, what we drink, what we eat, how we think, how we move, interactions of the social network, where we work, what we are exposed to in terms of radiation. All of these variables play a role in modulating our function over time.

Some people say, "Well, that's too complex, and that's outside the bounds of medicine because it doesn't really address pathology in the way that we need to look for a causative agent or a remediating agent." But other individuals say, "We now have the information systems, and we have the capability with our social science systems, to actually start addressing these broader issues, which are really the Rosetta Stone for understanding the origin of chronic disease." Chronic disease is complex. Chronic disease is unique to the individual. And chronic disease is a result of these interactions of the genome and the epigenome with the environment.

So this article, "The Conflict Between Complex Systems and Reductionism," I think is a very, very powerful conceptual framework, particularly when we put it within this bailiwick of "Reversals of Established Medical Practices: Evidence to Abandon Ship." I don't think we need to abandon ship. What we need to do is move our perspective up a notch or three (meaning, to a higher elevation)so we can start to see the forest for the trees, or we can get out of the dust storm that's close to the ground that relates to individual symptom evaluation and the drive for the sine qua non called diagnosis, and move us up to the landscape of understanding of the system that this patient is interacting with that gives rise to the expression of their multi-symptom dysfunctions that we call chronic illness. Of course, I'm really speaking now to the functional medicine model. This is the whole basis of the model: patient-centered, built on the concept of systems biology, it deals with biochemical individuality, and this genome/environment interaction giving rise to the expression of function.

One Size Does Not Fit All When it Comes to Pharmaceuticals: Women, Statins, & Type 2 Diabetes

Can we think of a recent example—a prominent recent example, even--where the concept of a pill-for-an-ill seems to have led us into somewhat of an uncharted blind alley? I think there are probably many examples, but one that has certainly stuck out prominently in the last month or two is discussed in this *Archives of Internal Medicine* paper from 2012 titled "Statin Use and the Risk of Diabetes Mellitus in Postmenopausal Women."[3] These women were part of the the Women's Health Initiative (WHI) studies, This is a very alarming epidemiological, statistical, restrospective analysis of some 161,808 postmenopausal women, so certainly a fairly large number of individuals. These were women 50 to 79 years of age that were recruited at 40 clinical centers as part of the WHI across the United States from 1993 to 1998 and have been followed since. The data that were reported in this paper was through 2005. Statin use was captured at enrollment and year 3. In this particular work, the incidence of diabetes type 2 was determined annually from the date of enrollment and then statistical methods were applied to see if there was any kind of connection between statin use and, in this case, type 2 diabetes. There was an adjustment for propensity score and other potential confounding factors, such as race, ethnicity, obesity, and age, to see if there was any effect of the relationship (at least statistically) between taking statins and the appearance of type 2 diabetes in these postmenopausal women. The results reflected increase in the incidence of diabetes in women who had been taking statins in their postemenopausal years.

Now, the mechanisms of action or the origin of this is not known. This is, again, an associative study; it's not a clinical controlled trial, prospectively, so it always raises all sorts of questions. How important are statistics? If you don't have a relative understanding of a mechanism is it just an outlier, is it circumstantial? But there was a very high association and the odds ratio was pretty well clustered with statin-taking women across all classes of statins interestingly enough, not just one statin, which means is there something interesting in the pharmacology of statins that could be associated with the onset of type 2 diabetes in a unique cohort of individuals, in this case postmenopausal women?
With that as a question, let me diverge for a just second and illustrate how a functional medicine-trained practitioner might think about this. I'm doing this to characterize and maybe contrast how functional medicine training is really about a thought process, not about specific therapies. The therapies drive out of the process. Rather than an algorithm, where we drive to a specific formulaic approach towards the management of that patient (meaning a clinical protocol), what it drives to is a thought process that allows us to understand the variables through the matrix of the functional medicine model that might contribute, in that individual patient, to their situation (their clinical signs and symptoms).
With that as a precept, let me talk a little bit about what this means in terms of the statin connection to diabetes—how, as functional medicine-trained individuals, our brains are patterned to review this. Here's one way of thinking about it. I don't want to say this is THE way. It's certainly not the only way, but it illustrates a way of thinking.

So we go back to the literature and we ask, from our history of experience: What do we know about statins as a class? And depending upon the specific statin, with differing degrees of relative risk, we are historically reminded that statins have one common reported adverse effect, which is muscle pain and its interrelationship to the more extreme example of it, which is called rhabdomyolysis, a situation where you get muscle necrosis and muscle tissue cell myocyte breakdown, and it can become very, very serious (the extreme edge of this adverse side effect). What's the origin of that myocyte problem?
Recall, if you would, that these statins are fungal byproducts. They are manufactured, initially, in the environment (these monacolins off the genome) of a fungus, of a proteus, basically. They are

manufactured by these organisms as a defensive substance that is a toxin to other organisms. We also know that these are enzyme inhibitors. We are well aware that whether you are talking about red yeast rice monacolins, or you're talking about Lovastatin, or Atorvastatin, or whatever the statin of the moment is, that these have influences on specific enzymes, the most prominent of which we know is the hydroxymethylglutaryl Coenzyme A reductase (HMG-CoA reductase), which is the rate limiting step in cholesterol biosynthesis.

We're all told that the role of these molecules is to selectively block HMG-CoA reductase and to lower cholesterol de novo biosynthesis. As a consequence, we also recognize that it lowers the synthesis of other downstream molecules that are involved with a mevalonate pathway, including things like coenzyme Q10. That is one of the reasons we often supplement with coenzyme Q10 in statin-consuming individuals. This is all kind of historically understood.

What may be less understood is that these molecules that are members of the statin family have other effects such as enzyme inhibitors within the electron transport chain. The electron transport chain, as you probably recall, is found within the mitochondria. It's the biochemical pathways that are involved with energy production/energy regulation within cells. One of the problems that occurs in specific individuals with certain statins is mitochondrial bioenergetics is impaired. These fungal toxins that we call statins and their chemical derivatives that have been modified by synthesis to be improved examples of these monacolin molecules, in certain genetically susceptible individuals and maybe even in individuals of a certain age, hormonal balance, and gender, might influence adversely these functions. If you start injuring, let's say chronically, mitochondrial oxidative phosphorylation and bioenergetics, we know that that is directly related to the appearance clinically of insulin resistance. This is well documented that there is a connection between mitochondrial interruption—let's call it mitochondrial toxicity—and insulin desensitization, meaning insulin resistance, and that ties ultimately to the etiology of type 2 diabetes.

So could it be—and again, this is the way a functional medicine practitioner might think—that part of what we're observing in the statistical connection in this study of 161,808 postmenopausal women (the connection between statin use and type 2 diabetes) is looking at a certain susceptibility in cohorts of postmenopausal women to the effects of these molecules on mitochondrial bioenergetics that affect certain cell types (or cell lines) within their bodies, that influences then insulin regulation/insulin sensitivity and ultimately what we call type 2 diabetes? Could it be the interruption in the downstream production of the mevalonate molecules—things like lanosterol and farnesyl and ultimately on into squalene and finally into the sterol molecules that regulate function and immune response—that these are influenced adversely? Even things like coenzyme Q10, which then shows up, in these women who have undergone hormonal changes with menopause, as altered insulin sensitivity and increased risk to type 2 diabetes?

So I think these are all very, very interesting questions that derive out of functional medicine thinking as it relates to taking a broad statistical evaluation and funneling it down to look at an individual patient, let's say a postmenopausal woman who has been on statins who starts to develop type 2 diabetes, or insulin resistance, or metabolic syndrome. For that woman, we start asking: What's the evidence that she might have mitochondrial bioenergetic problems, or oxidative stress, or that she's got hormonal imbalances that are creating different signaling of insulin, or that she's got a coenzyme Q10 insufficiency that creates alterations in mitochondrial function then presenting as type 2 diabetes? And then what do we do about it in that specific person? If she is going to remain on statins, do we augment her with coenzyme Q10? Do we give her essential fatty acid supplements? Do we give her different vitamins and minerals to promote proper function? Do we give her higher levels of detoxifying nutrients in order to lower risk of toxicity? These are all, I think, very interesting types of approaches that would only derive out of the thinking of a trained functional medicine practitioner.

I think you're going to see how this example weaves its way into personalized lifestyle medicine with this extraordinary discussion with the Clinician of the Month, Dr. Kristi Hughes, and how this ultimately relates to the connection between functional medicine and personalized lifestyle medicine.

INTERVIEW TRANSCRIPT

Clinician of the Month

Kristi Hughes, ND

The Healing Center

819 30th Avenue South, Suite 206

Moorehead, MN 56560

www.thehealingctr.com
The Institute for Functional Medicine

1-800-228-0622

www.functionalmedicine.org

Each month in Functional Medicine Update I have the privilege of doing an interview that takes us down the road of what we call news to use—some of the most recent things that I think are happening that help us to better understand some of the tools that are becoming available within the field of functional medicine. We're certainly fortunate this month to have a clinician's clinician: a teacher, a clinician, a business manager, a thought leader, a person who has stepped up and been recognized as an authority in the field. I think her history really is symbolic of how we all, in this field, are in the pursuit of excellence and moving towards higher level of understanding and application to patients in need. I'm speaking to Dr. Kristi Hughes, who is our clinician of the month this month.

Kristi has been a colleague and friend now for nearly 15 years. She graduated from the National College of Naturopathic Medicine in 1997 in Portland, Oregon after having earned her undergraduate degree at the University of Minnesota in Duluth. From there she has just taken off over the last 14 years. She is symbolic of what it takes to really be a successful practitioner/leader in the area of functional medicine. I think her experience really nicely reflects the rising importance of naturopathic medicine, which I'm very proud to see emerge so brilliantly over the last 25 years. I recall when Joe Pizzorno, Les Griffith, Sheila Quinn, and Bill Mitchell, were starting Bastyr University back in the late 70s and early 80s. At that time I was teaching nutrition at the National College of Naturopathic Medicine. We always wondered in the late 70s if would we be able to see the emergence of a field of natural medicine/naturopathic medicine that would be licensed nationally that would really fill the unmet need for credentialed professionals in the area of natural medicine. Certainly that has been seen in spades over the last 25 years, and Dr. Hughes is really, I think, reflective of the quality of graduates that come out of those programs.
Kristi, it's wonderful to have you as one of our leaders in Functional Medicine Update. Let me start with the trivially obvious question. When you started down this road with earning your naturopathic degree,

did you have in mind where you were heading, or did you just take each step along the road in your own laying process? What was your motive?

KH: You know, the interesting thing is, Jeff, where I grew up in the midwest, I had actually never even heard of a naturopathic physician before. I grew up with a wonderful family base. My mother was very interested in eating right, and looking at vitamins and minerals when I was a child. She went out on a limb to hide and breastfeed me as a baby when it just wasn't accepted in those days. I was raised going to the chiropractor, so my very first directional push to move into this field was really looking at and pursuing chiropractic. I went off to Oregon to attend college in that location, and as soon as I started hearing about naturopathic medicine there, Jeff, I realized that I was close but I wasn't completely aligned with the exact right training for me. So it was through my exposure to being raised very naturally with a hands-on approach that I found naturopathic medicine and that is an absolute blessing for me because that was really the place I belonged all along. Literally, even during my undergraduate training, I had no idea that naturopathic medicine even existed as a career option.

JB: As you then decided how to embellish and fortify your undergraduate and finally your naturopathic degree training, you ended up doing some very, very interesting things, one of which is working with another one of our dearly loved colleagues in functional medicine, Dr. Carolyn McMakin in Portland, who has been an FMU interviewee a number of years ago. Tell us a little bit about that experience, this mentorship program concept. There are not some formal postgraduate courses for many of the people coming out of schools. How did you select Dr. McMakin and what was your experience there?

KH: It was through a personal experience. I had an injury while in medical school and no one could really help me. Carolyn was at the school that I was attending. She was in her last year. She is the one that took me to the student clinic and transformed me, in a couple of visits, with her work with microcurrent. So as I left the chiropractic profession and headed toward the naturopathic, I realized that she had something special that she was doing. As I got into that third and fourth year in naturopathic school, I asked her if I could please come in and work with her, and I would spend up to 20 hours a week. I would go to school all day and then I would go work in her clinic as many hours as I could fit in. It was very informal at that point. It was because I knew she was doing something that was so special and so remarkable with patients and I just wasn't seeing it anywhere else.

One of the interesting and, I think, wonderful things that she set into motion for me was she had the expectation that miracles do happen, and if not then you just haven't found the right stones to turn or the right buttons to push yet. In her office, it was just patient after patient, and the books were full, and it was always a waiting list. I came out of naturopathic medical school with the mindset that that's just the way it is, and I think my intention was such that when you go to work, you've got waiting lists. It was within a six week window from graduating from NCNM back in 1997 that I had full books.

JB: That really raises a very, very important question. For a lot of people who are in this field who are very mission-driven and philosophically aligned with functional medicine, when they move to put it in their practice they find they have a difficult time making a business out of it. It becomes a challenge for them to see how they are going to actually keep the lights on and the doors open from a financial perspective. Somehow you moved back to Minnesota. Reminiscent of the Mayo brothers, you moved back to a portion of Minnesota that might be considered quite rural and out of the mainstream (unlike the Minneapolis/St. Paul metropolitan area), and you became very, very successful in building not one but several clinics, almost immediately being successful as a young initial practitioner. What do you attribute that to?

KH: I think I attribute it back to community. Having grown up in these smaller towns where you've got 20,000 people, not a million people, the one thing that I really learned early on is the sense of community. Communities can heal. You have, I think, a better foot in the door when you go into these regions and

areas and you start moving your first couple hundred patients towards healing and success because they don't stop talking about it. Word of mouth is by far the most powerful advertisement piece when you are in your new private practice. I was having patients driving from all over Minnesota, Wisconsin, North Dakota, South Dakota. Do you remember, Jeff, back in 1997—you and I talked about this in 2000—there was the great flood that wiped out parts of northern Minnesota and the Dakotas, and Grand Forks, North Dakota? This had unbelievable turnover in that community, where a third of the homes and the businesses were flooded. Do you remember us talking about that?

JB: Absolutely.

KH: That was a turning point for me because after that community became so sick, from not only the mold, the mycotoxins, the environmental pollutants that came about from that horrible environmental exposure, I started treating and managing some of the key professors at the university. They were driving five hours to come down and see me, and they actually talked me into coming up to North Dakota—all the way up to Grand Forks, North Dakota—to start seeing them in large groups. I remember telling you this story, Jeff, when I met you at AFMCP in 2000. The year before that there were so many people literally coming out of woods in those areas with fatigue, and pain syndromes, and GI distress, I would go up and manage education groups. I would rent teaching facilities at the hotel. I took literally 80 people through a weekend workshop learning about their GI system, their detoxification mechanisms. I sent everybody off with stool culture and food sensitivity testing and they all came back six weeks later. I ended up having to teach the whole entire group of them what the results meant because I couldn't see people one-on-one anymore at that point. And that for me, Jeff, was the shift, I would say. It put me in a whole different playing field. I was just coming off of that year—that unbelievable growth experience. I had solutions through naturopathy, through natural applications, and through the functional medicine principles at getting to the underlying cause of disease, and when people heal they talk about it.

JB: Just listening to you, what comes across so strongly are two things, I think. Number one is your personal advocacy and your mission is very, very clear, and secondly is your pursuit of lifelong learning and your undaunted courageous spirit. How do those things get manifest in a practitioner? Does this come through courses? Does this come from going to the right meetings? Does this come by seeking out the right mentors? Does this come by being in the right societies/institutions? What might you provide as guidance for people who feel a little bit lost and are trying to find that focus that resonates from your advocacy?

KH: I am really impressed that you pulled that out because I sat back last year when I was thinking about rebranding and launching new websites, and I realized that I have grown into a patient advocate. I'm trained as a clinician, but I spend the majority of my time helping patients navigate the healthcare system. I would say that piece has really come about because of the need of the community, the needs of the patients, those who just need guidance. They're looking for a roadmap: Who do I see and what labs should I consider? I'm not always the one managing their care as their primary. I find myself playing this very important advanced triage liaison role, where I advocate back to their primaries and their principals about their best needs and interests, and then I tend to step back and manage all the pieces that surround the lifestyle and functional medicine aspects of that patient's life. I really believe that the way to transform health care is to empower the other practitioners that have been working with these patients versus take the patient away from that practice.

I am forever encouraging growth within the system. I love it when I have patients I've worked with who go back to their physicians and say, "You know, this is what I've been doing for the last year. I have transformed my diet. I have made adjustments with my food choices. The labs that you and I ordered last year—I've really been working on these underlying causes of disease. It's time for us to repeat these parameters and see how I'm doing." And then for those physicians to see that their own patients that

they've known sometimes for 10, 20, or 30 years are going through such incredible improvements with metabolic dysfunctions, and blood sugar management, and dyslipidemias, and hypertension concerns. You know what I'm talking about, Jeff. The list goes on and on. I think the really exciting piece is empowering the patient and empowering the clinician. I would say it is almost a Trojan horse approach or a very grassroots approach to really get into the clinician's mind (the other physician's mind): what's possible by educating them through their own patients. For me, it's a journey, it's exciting. I love it myself, so when you bring up the piece of this lifelong learning aspect—there's no question. That, I think, is really the key. If I really step back and I say, "What set up me becoming that type of advocate, and what set up this goal and desire for lifelong learning?" I really would honestly have to say it truly goes back to the way I was parented. The space that was created where I was allowed to grow, I was allowed to explore, and really I was always encouraged that the most important aspect is education, and that with education you can believe that literally you can conquer the world.

JB: That leads to really two kinds of questions that I hear very frequently being asked. They can be asked in many ways, but I think they boil down to the following two things. Number one is: "I didn't learn this in school, and so how can I develop a path to competency? What sequence of events in my self-learning experience will get me to feel competent? I don't want to go in there and look foolish with my patients. I don't want to look like I'm underprepared." That's question number one. And then question number two, which we'll come to, is: "Once I start feeling competent, how do I actually get reimbursed for this? What's the business structure, because there has to be an infrastructure for this to be able to be practical?" Let's start with question one. What, would you say from your experience, is kind of a path to competency for someone coming out of school that is affiliated with this concept philosophically?

KH: I have to say my answer is really biased because it's how I got there. Coming out of naturopathy training, you've got this depth, you've got this breadth of knowledge. What I found was that I didn't really know how to apply it. I knew there was so much that could be done. I knew about the solutions. I knew about therapeutics. I knew about the interventions. But I didn't necessarily really get this: How do you treat the underlying cause of disease? When I found the Institute for Functional Medicine (IFM) programs (I found AFMCP first in 2000), that for me was the game-changing piece, because all of a sudden what I had now was a new architecture. When I found the functional medicine matrix for the first time, really looking at the concepts of the matrix, understanding the principles of why we're trying to uncover the antecedents, the triggers, and the mediators, or those perpetuating factors. Those two pieces really transformed me as a clinician more than anything I can say ever before or since. So really it is the fundamentals of functional medicine. It's the ability to really look at what's the underlying cause of the cause, and what's the cause of the causes? And to keep going deeper and deeper and deeper. And then as you're starting to understand the pathophysiology of disease, now I think it gives you a place to apply the knowledge of those therapeutic interventions.

We've got the brand new release of the functional medicine matrix coming out this year through the IFM—and the new matrix, to me, really truly just embodies, symbolizes, I think what hundreds of years of these advanced clinicians have brought together—their clinical experience—and that there really are three principal legs of the stool that set you up for great clinical success and competency. One is you need to be willing to go into a dialogue with the patient and really hear their story and go far beyond just the disease to get a sense of how thatt patient has arrived at that diagnosis. As we hear over and over, there are so many different underlying associations with the development of a particular disease, so getting to know the patient's story, finding those very important predisposing factors, looking closely at their genes, their genetic predisposition, and their familial trends, and then taking the time to find the triggers. What are the points in time in which the patient says, "I've never been well since this happened." Finding either the triggering events or those moments, and then getting clearer with those perpetuating mediators and those

factors that drive cycles forward.

So really getting antecedents, triggers, and mediators (ATMs) for me was very important, and now being able to position that on the new matrix. First is the patient's story, where we discover and uncover the ATMs. Two, and this is where I think I have really grown the most, is understanding the foundation of the matrix. That's what we call the personalized lifestyle factors—really getting how critical it is that we move beyond just public health, and we move into personalized lifestyle care, where we look so closely at the diet, exercise, resilience, and ability to find balance in their stress parameters. And then the third is systems biology—really organizing your thoughts for each and every patient's history in that systems approach, where we have the opportunity to think about how all of the organs are orchestrating and working on the patient's ultimate function on a much higher plain. So the third leg of the stool is this organization capability: How is it that the body functions, so when dysfunctions begin to manifest, where is it that we're going to go first? These three "legs of the stool" have really truly moved me down that path to competency. I think of it, very closely, Jeff, as an architect would build a facility. You have this vision of where you want to go, but you need somebody to come beyond just that rendering and help you. You need help with the blueprint and really putting up that first frame, and for me the framework is the fundamentals of functional medicine, and once I had that framework in place, now it allowed for me to fill in those places and those spaces and it gave me the architecture to hang all that information that had come previously for me on that journey.

JB: That was beautiful and eloquently stated and I think really is a great blueprint for the listener who may be aspiring to move to the next level. They might ask, however, a follow-on question. They might say: "Well, as I start to understand this landscape better and I start to develop my blueprint it seems like there are so many doors I could go through with my patients. What tools are most important? Where do I start?" If you were to guide people through this overwhelm, what would be your guidance on where to start and what tools might be most important?

KH: I think the number one tool that clinicians should become comfortable with--and they will almost be freed up once they learn how to master it--is the timeline. This really goes back to the work of Dr. Sidney Baker, and how he says the patient's story is so critical. Taking the time to plot things out on a timeline and look for the patterns to emerge, I think that is by far one of the most important things. The new emergence functional medicine timeline was brought forth by all of the principal faculty over the last couple of years at the institute. That timeline is the place to begin to understand what's happening: pre-birth, the impact of the metabolic imprinting that takes place through that pre-natal exposure, understanding pre-conception the uniqueness of pre-conception health from mom and dad and really what does the familial patter lead to? Then you lay things out on a timeline, where you are looking at this chronological pattern for that patient as things emerge. There is just power that happens when you look at things in a different way, and so if you can begin with the timeline, layout the timeline, look at the patterns and see the overlap and very unique triggers that have set into motion new manifestations of signs, or symptoms, or diseases themselves. That's the first place to begin.

Beyond mastering this new way of taking the medical history, I would get very familiar with the concepts of lifestyle medicine, and feel comfortable knowing that, yes, there is this huge contribution that food plays, and stress, and movement or lack of movement. Get comfortable identifying and moving patients along the healing pathway by transforming their lifestyle.

And then third move into the complexity of understanding systems biology. I'd put money on the table, Jeff, that if you ask the masters, "Where do you begin?" almost everyone says you begin in the gut. You start with assimilation. The majority of your naturopaths, and your really successful functional medicine practitioners, they would say, "We start in the gut. We look at assimilation. What are the foods and the ability to bring things from the outside to the inside world?" Get specific with the diet. Get particular with

changing and transforming immune response patterns. And so I would get very comfortable with all the aspects that have been brought forward through the process of like the 4R Program.
JB: As I listen to you, one of the things that just beams through loud and clear is your extraordinarily well-refined communication skills. We can think of a doctor as a teacher, and this teaching that goes on in that intimate relationship that a practitioner has with their patient in the exam or treatment room is really a model of some kind of high-level communication, probably both verbal and nonverbal. What have you done to really hone your skills as a communicator, which obviously are very highly refined?
KH: I think that's one of the biggest challenges. I am so in love with the biochemistry and the pathophysiology. I love the pathways and I love the understanding of the science. But patients don't relate. I think it was drowning in the deep end of the pool in the first years of practice, forcing me to learn: How do you take something so complex, with such a high level of detail, and then bring it into the story in a way that the patient understands where you're at and where you want to go? It's a whole new language. How you think about the patient, and then what you eventually end up saying to the patient, that's a huge jump, that's a big leap. I don't think anybody really trains the clinician to break things down in a way that is really appropriate for their needs. So, gosh, no one has ever asked that question, Jeff, and I'm not exactly sure where that comes from, but having been guilty of overeducating and always speaking to the highest denominator, it's taken me years to learn that when it comes to patient education, it's best to break things down to that level. You've heard it before: If you're going to teach the public and you're going to train patients, take the time and explain it to someone as though they were literally in junior high or high school. I really think: How would I teach this to somebody that was in high school? Putting it into perspective for them, using those safe, soft words, so they can guide the conversation and bring it up to as high a level as they are comfortable with.

For me, honestly it's been through trial and tribulation, and that's what's driven me to really build out my business model, because I personally find I talk too fast. My responsibility is so high. I have so many patients to see in a day. And the needs that the patients have at times I wasn't able to deliver on, which drew me in this direction of really truly needing to build out a business model that worked. I have brought in additional training teams. I have lifestyle educators on staff. I have built support teams around me that have included other naturopaths. Our new expanding residency program extended my nursing and my lifestyle education tier. And so I put myself in the role of making the most important decisions, and laying out the path, and creating the programs for the patients. Then they really need to sit down and spend an hour learning, what does this really mean when I have an intestinal permeability problem, and it extends fromof a small intestinal bacterial overgrowth (SIBO), and there's good bacteria and there's bad bacteria and we need to change the diet? What I have really found works the best for me, Jeff, is to bring in a tier of support staff that really can take the time, they can slow down with the patient, and create the space for the patients to truly understand what is going on in their health care, where we need to go, and then to open up and create the space for them to ask the questions and truly be heard. That, for me, has been my clinical success.
JB: I think you're being very understated with regard to how you've pursued--as you have in all things I've observed in your life over the last 11 years--a level of excellence. You've gone out and gotten professional coaching in presentations. You've given, literally, hundreds of presentations to different audiences all around the world. There's nothing like being a teacher to learn things and to test different communication styles. You've put in thousands of hours on this whole concept of: What does it require to become an expert? It requires 30,000 hours, and you've paid the dues. So I think there is something there that relates to how someone pursues their craft, their expertise, their discipline, and really becomes competent as an expert. Education doesn't happen just by osmosis, and becoming a world-class

communicator doesn't happen just as a God-gift alone. So I think those are all parts of what has exemplified your path over the last 14 years that characterizes your expertise.

KH: And Jeff, as you say that, there is a book that really stands out in my mind. You're right, I've got an amazing coach that I work with, and I have been working with now for six years. He's transformed my whole entire life, not only what happens when I'm on the podium teaching other clinicians and physicians, he's changed the way I speak to patients, and he's actually transformed the way I read books to my kids at home. What I love about my speaking coach is his premise: How can you be as authentically you as possible? It's you on your best day. How can you be you every day when you get up and do "you" to the best of your capability? Not trying to be someone else, but being you to this high level of authenticity. He has given me permission to fall into myself in a way that no one else has, and one of, I think, the pivotal books for me—it's a short, simple, easy read—is called Real Leaders Don't Do Powerpoint.[4] The title always makes me laugh because I live in Powerpoint. I spend so much of my life in Powerpoint slides. But that book was beautiful for me in my journey because it really helped me understand that to teach and to give a presentation you have to master the knowledge, you have to be able to have your Powerpoint deck and your computer crash and still be able to give the same talk, and yet at the same time that book has done such a beautiful job creating frameworks for how you will communicate and you go in with such a high level of intention, and with the majority of the lectures that I give surrounding functional medicine, I actually use one of the techniques that they talk about in that book. It's a speech—it's a form of lecture—called the I-You-We format. How you give that lecture--not what are you going to say, but how are you going to say it—comes through making sure it's clear that you establish: I have learned to do this and this is my own experience, you can do this, let me show you how you can do this as well, let me help you on your journey, and then won't it be great when we can change the world and we can do it together. So the I-You-We principle I think is really one of the strongest that I use from the podium, and that book is so simple—it's such an easy read—and I've probably read it a half a dozen time now the last five years, and there is always something more inside that helps me. I think it's more about really leading a movement.

I've really connected with the vision, as you've said. My passion is that I really honestly want to change the world. I want to bring functional medicine around the world. With my last breaths, I'm going to think about my family, I'm going to think about my husband and my kids, and I'm going to think about functional medicine. That is going to be, for me, those last moments of feeling the sense of joy, love, and completion. Truly, I believe that every single patient needs to have access to a doctor that is trained in functional medicine. I really believe that is how we're going to heal the planet.

JB: That's so inspiring I almost hesitate to want to say anything else, and just let the beauty of the power of silence be the teacher. But I am, I guess, obligated, given that I said that there were going to be two questions, to finish with a kind of pedantic, but also a real-world, question, and that is about reimbursement: How do we make all this work in the practice? Are there any kinds of guides, or tools, or things you've learned over the years that help us to provide information to a novitiate—a person who is just moving into this—as to how they could construct their practice to be financially viable given that we are on a mission here?

KH: I think the first thing is to give yourself permission to grow out of yourself, or beyond yourself. There are so many practitioners, I know, in solo practice who feel that they can't afford to hire anyone, and I think that's the rate-limiting enzyme in the equation. I truly feel that you want to grow beyond yourself and identify what you're really good at and then build your team to support you to be who you are on your best day. Early-on, I acknowledged that one of my weakest links is stress management, so one of the first things I did was bring in a team of people that can work helping patients with their stress management. I tend to talk fast. Some patients need to have it slowed down. I brought in a team that

could sit down, and take time, and really hold their hand and march the patient forward until the patient is at point where they really understand where they need to go next. I had to understand for myself that I cannot do the same thing over, and over, and over again. I mean, even when it is a lecture and you're giving a 12-city tour, there is no time in which the last seminar is ever the same as the first seminar, and so I've really taken that on in my own practice. There are pieces that I'm good at and there are things that I love to do, and the things that require redundancy, like sitting down to explain the low glycemic modified Mediterranean diet, or sitting down to go through the comprehensive elimination diet, or, you know, when there are just real standard things I need many patients to be educated in, that's where I have brought in the back-up support.

So, the business model, for me, that has emerged is that I still hold the position as the primary principal medical director of the clinic. I'm in a state—Minnesota—that was just recently granted a new registration bill for naturopathy, and increased and improved the scope of practice here, but because I chose to come back to a state to try to work with the politics and move naturopathic and functional medicine into this particular part of the country, it has forced me to begin my practice in a cash-based model, and we've been so successful in a cash-based model that at this point I don't know that I would want to transform to open up for insurance reimbursement directly. Our patients are not rich—they don't have deep pockets, they are teachers, they are farmers, they are local providers from these small rural communities—so I've had to build out my financial business structure so that they spend enough time with me, but not too much time with me that they can't afford me, and they are able to go on and work with one of my middle or lower level providers that bill out at a different rate. So we use me to my highest expertise and they pay for my services, and then they pay for their education at a different pay rate, and then I work with their provider—their principal primary care physician—and if they are uncomfortable or unhappy with their provider, I help connect the dots to get them to someone that can help them within the insurance model. So for the naturopathic profession, I think this, Jeff, will become one of my deepest passions in my next decade, I really want to bring the naturopathic provider to functional medicine because the business model is so incredibly effective, and so many NDs that I've met over the last…more than a decade, since graduating 14 years ago…so many of my colleagues come out and I wish there was a better term, but the only one that really sticks with me is it's almost like a poverty mentality: that they shouldn't make money, that they should be afraid to make money, because it's natural. You know, they're talking about natural things. They're talking about the diet. I would really love to empower my own profession and encourage them. Step back and look at how much we pay for our education: $140,000 for our naturopathic medical school training alone. The knowledge doesn't come free. The continuing education doesn't come free. And, therefore, don't be afraid to charge for that which you know.

JB: That's really, really inspiring, Kristi. You know, as I'm listening to you talk about naturopathic licensure in Minnesota, I'm reminded that one of the graduates of my 1978 class at the National College of Naturopathic Medicine in Portland went home, back to Minnesota, and was the first guy in the state to proclaim a naturopathic license and work in the state legislature to try to get naturopathy licensed. So, progress is made, and things do happen positively, and it's very exciting to hear about licensure status in the state and people of your quality being there to serve what were certainly underserved individuals with this form of healthcare delivery.

We've really enjoyed walking down this path with you, and I've personally enjoyed this journey, knowing you for the last 11 years and watching the extraordinary talents you have come into maturity and be delivered so effectively to thousands of people, globally through your education and even through the development of your residency program, which is, I think, one of the first in naturopathic medicine. You might mention what you've done in your residency program, which I think is very innovative.

KH: The naturopathic medical school—three years ago—talked about wanting to support the movement of the registration bill, and they identified our clinic and our location because of the high volume and the high exposure that we do have, and asked me if I would be willing to consider creating the very first Minnesota-based residency to help bring more financial support and increase the movement of students into this region. And at that point, I have to say, I really wasn't looking for another project. I wasn't thinking, "Oh, I'm bored, I have all this extra space, that sounds like a great plan!" But, it just resonated with my heart and soul, that absolutely I would love to bring in more properly trained naturopathic providers into this area of the country and the world, really.

I would say our residency program is built upon a platform of three fundamentals. One is that my resident applicants and my residents need to understand naturopathic health care. Second, they need to be trained formally in functional medicine; they must go through the AFMCP program and then begin the certification program because I really truly myself have experienced such phenomenal education through IFM and therefore that is one of the areas I really have insisted my residents also are trained in.The third, which is just so near and dear to my heart I almost feel like it is another one of the children in my life that I have birthed, is the ongoing development work around the FirstLine Therapy program. I truly believe and I have seen that the FirstLine Therapy principles have been able to move naturopathic practices forward by creating a very unique system—a very nice business organization system—for the application of nutritional therapeutics, medical foods, and really creates a business model for the naturopathic provider to manage and work with patients with the metabolic syndrome and various cardiometabolic risks. So our program is really built off of those three fundamentals, and then we are also encouraging our residents to go on with their training with Frequency Specific Microcurrent (FSM). So it's a very unique residency that's out there, Jeff, because those are some of the absolute fundamentals in training. It's been learning functional medicine, really understanding the architecture and hanging everything there, coming to terms with understanding what can you do with FSM, when you really empower the healing down deep at that level of mitochondrial ATP production and frequency specificity, and then these very organized and very methodical ways of applying lifestyle medicine principles and unique applications of food. So it is those three things that I feel really bring the naturopathic provider to a whole new level of understanding and creates this depth where I feel the naturopaths can apply their own philosophy of treating the cause of disease by learning how to treat the cause of the cause of the disease.

JB: This was one of the most content-dense and rich, robust reviews of the how-tos of delivery of quality care that we've had the fortune of exploring in Functional Medicine Update. Dr. Kristi Hughes, you are certainly—at every level—representative par excellence of what this field is emerging to become. I'm also reminded of the impact you've had in South Africa and developing the program there—in Europe, in Asia, in Mexico. It's quite remarkable where you have gone and touched over the last 11 years. Continue on this path and journey, and bring with you all these individuals who have this latent capability of being really seen as healers in their community. We wish you the very best in really taking functional medicine to the next level. Thanks for sharing.

KH: Thank you, Jeff, for the opportunity.

Bibliography

[1] Prasad V, Cifu A, Ioannidis JP. Reversals of established medical practices: evidence to abandon ship. JAMA. 2012;307(1):37-38.

[2] Heng HH. The conflict between complex systems and reductionism. JAMA. 2008;300(13):1580-1581.

[3] Culver AL, Okene IS, Balasubramanian R, et al. Statin use and risk of diabetes mellitus in

postmenopausal women in the Women’s Health Initiative. Arch Intern Med. 2012;172(2):144-152.

[4] Witt, Christopher and Dale Featherling. Real Leaders Don’t Do Powerpoint. New York: Crown Business, 2009p>