

# Functional *Maternity*

USING  
FUNCTIONAL MEDICINE AND  
NUTRITION TO IMPROVE PREGNANCY  
AND CHILDBIRTH OUTCOMES

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Functional Medicine is a physiological, systems-based approach to medicine. The focus of diagnosis and treatment is on finding root, underlying causes and connections between biological systems, not symptom management. Professionals who are certified in functional medicine do so as a certification off their medical licenses. Medical licenses or healthcare professions that are approved for functional medicine certification include certified nutrition specialists, dentists, optometrists, podiatrists, mental health professionals, occupational therapists, pharmacists, physical therapists, physician assistants, registered dietitians, registered nurses, nurse practitioners, midwives, chiropractors, acupuncturists, MDs, and DOs. Functional Medicine is not a licensed profession.

This book is dedicated to:

My daughters.

My motivation to try. May their future be brighter.

My grandmother.

She inspires me, even though she is gone.



# Contents

	Introduction.....	1
<b>PART ONE</b>	<b>THE PROBLEM.....</b>	<b>7</b>
Chapter 1	A Society Of Lost Women.....	9
	Women Are Looking for Answers.....	10
	Practitioners Are Looking for Answers .....	12
	There Are Answers.....	13
	Why No One Is Listening .....	14
	Collaboration.....	18
Chapter 2	Why Me? .....	21
	The Imposter in the Room .....	21
	The A-ha Moment.....	24
	What I Learned from My Traditional Chinese Medicine Training .....	26
	Bridging Two Worlds .....	28
Chapter 3	Why Maternity Functional Medicine .....	31
	What Is Functional Medicine .....	31
	You Can't Reverse Physical Damage.....	33
	Standard American Nutrition Versus Functional Nutrition .....	34
	Respecting Dietary Culture.....	37
	It Starts in Childhood .....	38
	Insufficiency Versus Deficiency .....	42
	The Nutrition Connection .....	43
	Nutrition in Disease.....	46
	Why Specializing Matters.....	48

<b>PART 2</b>	<b>FUNCTIONAL MATERNITY: A DIFFERENT APPROACH .....</b>	<b>51</b>
Chapter 4	Preconception Nutrition for Baby And Mom.....	53
	Fetal Programming.....	53
	DNA Methylation .....	55
	A Word on Unmetabolized Folic Acid.....	61
	Folate or Choline in Methylation.....	64
	Histone Modification.....	65
	Placental Development .....	67
	You Are Your Mother and Your Grandmother .....	69
	Nutrition and Physical Degeneration .....	70
	A Cultural Approach to Phytates.....	73
Chapter 5	Metabolic Changes Throughout Pregnancy .....	75
	The Krebs Cycle .....	76
	Oxidative Stress.....	79
	Understanding Carbohydrates.....	83
	Glucose Metabolism Changes Throughout Pregnancy.....	85
	Lipid Metabolism and Ketogenesis.....	86
	Importance of Cholesterol.....	87
	Oxidative Stress, Coenzyme Q10, and Fat Protection .....	89
	Protein Metabolism.....	91
	Anabolism, Catabolism, and Metabolic Regulation .....	94
Chapter 6	The Story of Hormones.....	95
	Steroidogenesis.....	96
	Adrenal Hormone Synthesis.....	99
	Vitamin K and Steroid Synthesis Regulation .....	103
	Vitamin D and Steroid Synthesis Regulation.....	104
	Vitamin D Metabolism in Pregnancy .....	106
	Progesterone.....	107
	Estrogen.....	110
	Testosterone .....	115
	DHEA-S.....	115
	Cortisol.....	117
	Hormonal Interactions that Sustain Pregnancy.....	120



	Nutrient Power .....	189
	Depression as a Sign of Inflammation .....	190
	Anxiety Is the Physical Manifestation of Stress .....	192
	Pregnancy Depression & Anxiety and DHEA .....	193
	Assessing Depression and Anxiety in Pregnancy .....	194
Chapter 11	Gestational Hypertension.....	197
	Diet and Hypertension.....	198
	Anemia and Hypertension.....	200
	Electrolyte Balance and Dehydration .....	201
	Nutritional Associations to Preeclampsia.....	204
	Epigenetics, Placental Development, and Preeclampsia Risk ....	206
	Maternal Vascular Changes in Preeclampsia .....	207
	Oxidative Stress in Hypertension and Preeclampsia.....	208
	Mitochondria, CoQ10, and Preeclampsia .....	212
	Know Your Scope.....	213
Chapter 12	Functional Childbirth .....	215
	Old Discoveries, New Applications .....	216
	A Quick Look at Labor Physiology.....	217
	The Wonderful, Amazing Cervix .....	220
	Collagen Remodeling.....	222
	Nutritional Deficiencies and Cervix Remodeling .....	224
	Prostaglandins and Cervical Ripening .....	226
	The Other Prostaglandins .....	227
	Dietary Fats and Prostaglandin Formation and Function .....	228
	Hyaluronic Acid – The Forgotten Component of Cervical Ripening.....	231
	Oxytocin and Protein.....	234
	Oxytocin Physiology in Labor.....	236
	Oxytocin and the War on Prenatal Vitamin A.....	238
	Are You the Key Master? .....	242
	What About Baby? .....	243
	An Illusion of Control.....	244

Chapter 13	Why the Method Of Birth Matters .....	247
	The Catecholamine Surge.....	247
	Possible Impact of Scheduled Birth on Baby’s Brain .....	248
	The Microbiome.....	249
	Mom’s Diet and Microbiome Health.....	251
	Group B Strep and Antibiotics in Labor.....	253
	Birth Method and the Microbiome .....	255
	Health Risks in Cesarean-delivered Babies.....	256
	Cesarean Risks for Mom .....	257
Conclusion	Take the Next Steps.....	259
	Using this Information in the Clinic .....	259
	The Death of Philosophical Debate in Medicine.....	262
	Don’t Stop Here .....	264
Appendix A	Prenatal Dietary Reference Intakes .....	266
Appendix B	Glossary of Terms .....	294
Notes	.....	297
Index	.....	335
Resources For Continuing Your Journey.....		348
Acknowledgments .....		354
About the Author .....		355



# Introduction

If you have navigated the maternity world as a pregnant mother or even as a birth professional or practitioner, you will know very quickly that little emphasis is given to the mother's nutritional health.

Questions at prenatal appointments are not driven toward prevention or nutrition but are used to determine the health of the baby and assess for possible complications that could lead to the need of medical interventions, such as medications, induction, or surgical delivery of a baby safely.

The little attention given to maternity or even prenatal nutrition is often simplified to, "Are you taking a prenatal vitamin?" As you will see in this book, there is no prenatal vitamin that gives the necessary nutrients needed for a mother to function throughout each trimester. So many changes occur, maternally, that a single prenatal vitamin is more likely to leave the mother insufficient in different nutrients at various stages of gestation and possibly with more different nutrients at other times. This is because a prenatal vitamin is designed to grow a baby, not support a mother functionally.

Often, the discussion on nutrition during pregnancy ends there.

Maternity nutrition is much more complex than a standard set of nutrients that can be put into a pill with one purpose: to grow a baby. Maternal demands through gestation vary so greatly from person to person and from trimester to trimester that it would require someone specifically trained in this specialty to deliver the information required to facilitate a functional pregnancy.

OB/GYNs and midwives are strategically placed to be able to offer a glimpse of this biochemical uniqueness yet are often poorly trained in nutritional approaches and are unable to support their patients in this way.

They need help.

Over the years, I've worked with physicians, nurses, midwives, doulas, and women all over the world who are searching for answers to their nutrition and pregnancy questions. Functional medicine has given me the skills I need to truly help these women thrive.

Nearly every patient who has come to see me in late gestation or postpartum has said, "I wish I had found you sooner. No one had discussed with me how important nutrition was." If we were discussing how important nutrition was to these ladies, we might just have seen our negative maternal health statistics come down.

This is where we, as practitioners and women, have a unique opportunity to change maternity statistics. By understanding the unique needs and demands the mother's body undergoes in pregnancy, we can help facilitate the natural processes that build upon each other throughout pregnancy to end in a functional labor. If we are to change the current state of health in America, we need to start at the beginning. Birth is the beginning, for both the mother and the future mother-to-be. To be able to provide the best care in these phases of life, specialized focus in continuing education is a must, just like any other medical specialty.

When I first started writing this book, I had several people ask why I titled it *Functional Maternity*. Why not *Functional Pregnancy* or *Functional Prenatal Nutrition*? The reason they were asking was that they really didn't know what I meant by maternity. You see, the care of women has been lost in our care of pregnancies.

I recently sat down with some family friends, a group of successful businessmen. I was surprised by their curiosity about my book. They were all first-generation Americans with a strong cultural influence. Even as men, they were receptive and strongly believed in the natural methods of birth and the importance of diet in childhood for overall health. After our conversation, they all congratulated me on being the one to present this information and

how important they thought it was. I did not expect that from a group of older male businessmen. They were ready to order a copy for their daughters and granddaughters.

What it showed me is that everyone is concerned, everyone knows that nutrition is important, but not many people are talking about it. I do not pretend to have all the answers, but I do believe that nutrition is a crucial part of healthcare that has been neglected.

If you Google “maternity nutrition”, you’ll find hundreds of articles that talk about pregnancy nutrition, but all of them are geared toward the growth of the baby, not the function of the mother.

Prenatal is defined as “care of pregnancy.” Prenatal nutrition is focused on the growing baby and nutrients needed to pass the placenta to help a fetus become a healthy baby, not the functional health of the mother.

Maternity is defined as “care of the mother.” Maternity functional medicine takes nutrition a step further by looking at the intricacies of maternity physiology and how the body compensates for the fetal demands. Changes that require a different set of nutritional needs than that of the growing baby. Nutritional demands that, if not met, could change pregnancy and labor outcomes for the mother.

This is an area of nutrition that has failed mothers. Our focus, medically and nutritionally, has been on the growth and delivery of a healthy baby and not on the health and function of the mother.

In this book, I’m going to show you the utterly amazing world of functional medicine, and how this deep knowledge of nutrition and system interconnection has the power to change the course of maternity healthcare. To not only help women during their current pregnancies but just maybe save future women from the increasing risk of maternity complications by creating healthier pregnancies and healthier daughters.

To help you better understand this all-encompassing approach to supporting maternity, I'm presenting the information in three parts.

In Part One, I will outline the shortcomings of the standard approach to maternity and why functional medicine is needed. I highlight the burning questions you have and help introduce you to the answer. You will get a deep look into the connections between nutrition and birth statistics and begin the process of using nutrition to improve pregnancy health. This will set the stage on which the rest of the book's topics play out by explaining the faults of the current system and the need for collaborative work between conventional and adjunct professionals.

In Part Two, we'll talk more specifically about how to apply functional medicine in support of mothers and babies. I'll take you on a journey into a more complex understanding of how hormones and systems work to support the pregnant mother and her growing child. This information is crucial in accurate differentiation and treatment of the conditions we will discuss in Part Three. I'll illustrate the complex topics of metabolism, steroid hormone formation and function, as well as thyroid function and other aspects of physiology that can affect pregnancy health and function.

In Part Three, we'll dive more deeply into applying nutrition and functional medicine to all phases of maternity. I'll build upon the information I presented in Part Two by applying this information to specific and common conditions that affect pregnancy health and childbirth outcomes, such as nausea in pregnancy, hypertension, and the functional processes of childbirth.

Finally, I will guide you through the intake process and give you the tools necessary to begin assessing, diagnosing, and treating these complaints in your clinic.

Whether you are a seasoned practitioner, birth worker, or expectant mother, this book will become an essential resource over time that will help you learn to do the following:

## Introduction

- Recognize unique patterns of maternal health and the effects nutrition has on the increased risk of pregnancy-related complications.
- Create dietary protocols for gestational hypertension, pregnancy nausea, and many other common conditions in pregnancy.
- Use nutrition and diet to increase natural birth success.
- Be confident in guiding others through their pregnancy journey with research-backed nutrition advice.
- Practice on the cutting edge of advanced specialized functional medicine.
- And so much more.

My hope is that *anyone* who works with pregnant women or is preparing for pregnancy can use this book as a maternity and prenatal nutrition resource for improved pregnancy health success.

Welcome to the journey.





## PART ONE

# The Problem

*“Childbirth should be a natural event that occasionally needs medical help,  
not a medical event that sometimes happens naturally.”*

- KEMI JOHN

A society of lost women ■ Why me? ■  
Why maternity functional medicine



## CHAPTER I

# A Society Of Lost Women

**M**aternity healthcare in America has become heavily medicalized over the last few centuries as I'm sure you've seen through your own experiences in the birthing world. I am not saying that conventional medicine isn't amazing. Without the vast discoveries and medical advances, we as humans would not have the life expectancies that we enjoy in modern times. There are many birthing women who do, in fact, need these interventions.

As we have advanced, our medical sciences with new techniques and procedures, we have lost our connection to the natural biology and preventative nutrition that cultures before us knew. An overuse of these lifesaving techniques also comes with risks and possible complications and should be reserved for only true emergency scenarios.

For the last several decades medical researchers, professors, physicians, midwives, doulas, mothers, and women like you have begun to sound the alarm and raise questions as to whether our medicalized approach to pregnancy and childbirth is to the benefit of women. They are beginning to question why we are seeming to need more intervention in birth.

The changing environment of natural medicine and the increasing interest in alternatives to the conventional model of care abounds in all aspects of health—none more than in maternity support and care. Women are beginning to question the care they are receiving through these standard practices and are seeking more natural ways to experience birth.

The natural birth world is exploding with those seeking ways to encourage natural and functional experiences that leave women empowered. The

increasing demand for midwives, doulas, and other pregnancy support personnel is testament to the desire of women to seek support and knowledge in their pregnancy and to the desire of practitioners to seek ways to provide additional support for these women.

I have not found a medical modality that has all the answers. There is not one view of maternity healthcare that is better than the other, we need each depending on the situation presented. Chiropractors offer structural support to keep the mother's body aligned. Acupuncturists offer a traditional Chinese medicine (TCM) approach to biochemical changes and can help modify dysfunctional patterns. Mental health specialists can help with the psychological changes that occur from the transition into motherhood. Doulas offer emotional and physical support and guidance through labor and encourage a mother in her journey. Midwives offer low-risk moms a less aggressive approach to prenatal care. And conventional Western physicians need to be available if true emergencies arise.

The different views on maternity care have remained mostly separate and at odds. Conventional medicine argues that natural therapies give false hope to birth outcomes while the natural modalities condemn the interventions of conventional medicine, stating that all women have the capacity to birth naturally. Because of this division in care, women and practitioners alike are wrought with questions.

Maternity functional medicine offers a link between the conventional western medicine ideas and the alternative and support practitioners, answering many of the questions consistently raised by mothers and practitioners.

### **Women Are Looking for Answers**

A physician I know once told me that patients come to him because they want "something." It doesn't have to be the 100 percent cure, but they want to know that they are doing everything they can and that you have an answer for them. The worst thing you can tell a pregnant mother is, "There is noth-

ing we can do.” The reality is, there is always something that he can do. If not he and his services, he can refer to someone else who might offer some support or answers.

Pregnant women have questions—lots of questions. As the rates of pregnancy complications continue to rise, mothers are becoming afraid of childbirth and are losing trust in the medical system. They do not want to be a statistic if they can help it. They are looking for answers to help them support themselves physically and psychologically. I remember, over a decade ago, being a pregnant woman asking the questions. It is a hard place to be because deep down you know there is more that can be done, and there is more than what you are being told.

Many women are looking to nutrition and nutritional support to help them achieve their ideal pregnancy. Nutrition is confusing, and as women become more aware that nutrition is a foundational key to proper health, the more confused they seem to be. They have more questions about prenatal nutrition than ever before. These women are asking the questions but not receiving answers. Physicians are not equipped with the training or skills to be able to answer these nutrition questions. So, these women are turning to social media for advice from their friends, followers, and want-to-be nutritional professionals, setting themselves up for less helpful nutrition advice from multilevel marketing schemes and people with anecdotal information that may be more dangerous than helpful.

Humans are a combination of physical and psychological components, with interconnected systems that are dependent on proper nutritional intake. We must be able to support them in all aspects of health, and if we are not capable of providing this sort of support, then we need to refer to the specialists who can.

## **Practitioners Are Looking for Answers**

Whether you are a conventional medicine provider, an alternative medicine provider, or a birth support professional, we have all sought out our professions because we wanted to have the best tools in our toolbox to treat and prevent disease and support pregnant women. Each professional has chosen the path that called to them in their desire to help birthing women.

I've never met medical or birth professionals that took this path because they wanted to abuse pregnant women. They each believe they have the answers and genuinely want their clients and patients to achieve birth success. It's just that their idea of birth success is different.

I am trained as a birth doula. My acupuncture and functional medicine practice has been, primarily, a fertility and pregnancy-based practice. It seemed like a great addition to follow my patients from fertility struggles to childbirth success and beyond by being present at their birth and guiding them through their transition into motherhood. It also helped me open doors to connections with a variety of birth professionals. Through the years, I've been blessed to have OB/GYNs, certified nurse-midwives (CNMs), and homebirth midwives as colleagues, references, and partners in patient care. Many of these professionals are going on to do their own functional medicine training, many in my mentorship and coaching programs.

Specialized education in functional medicine is on the rise. Those of us in this field have seen the beauty and benefits of functional medicine. We were looking for answers for our patients and have sought out the knowledge to help them and ourselves. Physicians and alternative medicine practitioners alike have been drawn to the science behind the medicine because it helps answer our questions and our deeper questions into function and nutritional connections. Functional medicine not only answers the questions we have but also gives us the skills to be able to help answer the questions our patients have.

## **There Are Answers**

You are here because you have questions and are looking for answers. Whether you are a mother or a practitioner, I have been you.

When I first started my acupuncture practice in 2005, I worked for an interventional pain management specialist. It wasn't until I became pregnant with my own child that I started to think about women's health and pregnancy. I started researching pregnancy and childbirth. I had always been aligned with more natural techniques and as I became more educated on the current state of pregnancy statistics, I, like many mothers, did not want to fall into these statistical groups. It was scary. Natural birth, not so much. Vaginally birthing a child scared me less than the idea of inductions, epidurals, and cesareans.

It was then that I came across the book *Nourishing Traditions* by Sally Fallon.<sup>1</sup> Now, I had studied nutrition in undergraduate and graduate school, and what she was presenting was completely different than what I had been taught. I was intrigued.

Everything she wrote about in her book was a modern interpretation of a much older book, *Nutrition and Physical Degeneration*, by Dr. Weston A. Price. Every great functional medicine practitioner will agree that this one book, lost in time, has set the foundation of how they approach their practices and nutritional advice.

I give credit to this book and its timing in my life for igniting my obsession with prenatal and maternity nutrition and the effects dietary habits have on childbirth outcomes and future generations.

Dr. Weston Price was a dentist who practiced in the early 1900s. Today he is known as the "Isaac Newton of Nutrition" for his advancement in nutritional studies. Dr. Price made several connections in practice between the "civilized" diet of the times and the increase in dental cavities and overall poor health of those populations. He had to know *why*? He traveled the world

studying different traditional cultures. These cultures, with their ancestral diets, had little to no cavities, beautifully straight teeth, and as Dr. Price notes, were less likely to have complications in birthing.

The early 1900s was a dangerous time to have a baby if you lived in “civilized society.” During that time, the maternal mortality rate was 1 in 100 (wow!). From the time of Dr. Price, medical discoveries, improved nutrition, and other advancements decreased the mortality rate, and it decreased until the 1990s when it began to slowly rise again. In 2000, we saw a dramatic shift—in the wrong direction. While the rates in the rest of the developed world decreased substantially, the U.S. maternal death rate and the rate of preventable complications went up.<sup>2</sup> As of 2017, the maternal death rate in the U.S. did drop slightly but has remained stable with no change. According to some studies, 50 percent of the maternal deaths in America are preventable because they are highly associated with chronic preventable diseases associated with poor nutrition.<sup>3</sup>

Women and birth professionals alike are looking for answers as to why these statistics have risen sharply and continue to rise. As the data connecting nutrition to these complications continues to pile up, the professionals we consider the most trusted in our healthcare may not be the best resources for nutritional advice.

### **Why No One Is Listening**

Nearly every woman that comes into my office leaves saying, “I feel like you actually listened to what I had to say.” Every woman who leaves the office of any type of medical professional should feel this way. Even if the practitioner doesn’t have all the answers, every mother deserves to be heard, understood, supported, and educated.

The focus of prenatal care has been put on the health of the baby, not the health of the mother. In this, we have neglected women emotionally and physically. Pregnant women have become lost in the system of baby care.

The worst thing you can say to a mother who is experiencing a horrible pregnancy or has had a traumatic birth is, “At least you have a healthy baby.” This is not support; it is ignoring the physical and emotional pain this mother has gone through. We have invalidated her questions, concerns, beliefs, and her journey to motherhood.

The reality is that most practitioners say this not because they are heartless or cold but because they truly do not have the training to provide the necessary support to these women. Physicians were not given the nutrition education that would give them the skills to support these women through pregnancy by addressing their symptoms, nor are they therapists trained in emotional trauma. They carry the burden of primary care, with the general public feeling they should be able to provide the answers. That is a lot of pressure.

My father is a physician, and I grew up in a medical household. Many of my close friends are medical professionals, and none of them knows a lick about nutrition. Yet surveys show that most Americans believe their physician is a trusted source for nutrition information.<sup>4</sup>

Prior to the 1950s, nutrition was considered a medical discipline, and as the science of cellular medicine and technology grew, the focus on nutrition declined. Dr. Weston Price and Dr. Francis Pottenger were the beginning and end of an era in nutrition research and exploration into disease. Between the 1950s and 1980s, medical schools lowered their curriculum on nutrition, with some schools completely doing away with courses altogether. In the 1980s, a new spark into nutrition began as we saw an increase in diet-related diseases. A comprehensive report prepared by the National Academy of Science-National Research Council in 1985, *Nutrition Education in U.S. Medical Schools*, recommended that medical schools incorporate separate courses in nutrition of at least 25 hours and reinforce this in the clinical experience.

Since then, little has changed. Twenty-five hours of coursework is nowhere near enough training in nutrition therapy, and with the advances in nutrition research we've seen in the past decades, it is inadequate at best.

In 1981, 26 percent of medical schools offered a separate nutrition course. Currently, 71 percent of medical schools fail to provide the minimum recommendations for nutrition education, 36 percent provide fewer than half the recommended number of hours.<sup>5</sup> The majority of coursework available to physicians is preclinical (meaning all textbook, no practical application) and averages 14.3 hours total. Of those schools that do provide clinical experience in nutrition, this clinical practice accounts for, on average, 4.7 hours total! Meaning, primary care physicians most likely have fewer than five hours of clinical experience in nutrition before graduation.

A physician and I had a conversation once about his nutrition training in medical school. He was lucky enough to have attended one of the few medical schools that offered the clinical nutrition curriculum. His coursework had focused on IV nutrition therapy for patients on life support and those unable to feed themselves. He joked that it wasn't very practical to his family practice clinic. Funny/not funny as these are the trusted sources of information for many Americans. These are the people we are supposed to go to for medical help and support, and they are missing a large part of how the body functions and they know it.

More than 50 percent of graduating medical students rate their nutrition knowledge as inadequate, and physicians report that they have not received adequate training to give them the ability to counsel their patients on nutrition.

A 2008 survey of resident physicians found that, although 77 percent agreed that nutrition assessment should be included in routine primary care visits and 94 percent agreed it was their obligation to discuss nutrition with patients, only 14 percent felt physicians were adequately trained to provide nutrition counseling.<sup>6</sup>

Multiple surveys of residents, fellows, and practicing physicians assessing specific nutrition knowledge found mean correct responses ranging from roughly 50–66 percent. Meaning, in all the surveys, the physicians scored an average of 58 percent. Wow! People, that’s an “F”. So, the professionals we’ve been told to trust the most with our health are scoring an F on nutritional surveys.

This may not get better either. Time is not limitless, and medical school is composed of a specific amount of time. The advances in medical technology and science are growing by the day, and these subjects outweigh nutrition in medical curriculum. For schools that do want to improve their nutrition programs, they are unable to find suitable professors. Physician nutrition specialists are far and few between and bringing in non-physician faculty is difficult.

The truth is that many physicians may never be that source. For them to obtain the knowledge they need, they will need to pursue continuing education and certification in programs, such as the Institute for Functional Medicine (IFM), or clinical nutrition.

Again, this takes time, and the average physician is overworked, with little time to devote to extensive new studies. According to a 2018 survey produced by The Physicians Foundation, 80 percent of physicians across all specialties reported being at full capacity or overextended, and 40 percent of physicians reported feelings of burnout. This survey is done every other year and the newest—the 2020 survey—isn’t any better, with an increase to 58 percent of physicians experiencing burnout.

Our physicians can’t do it all, and we cannot expect them to. Collaborative practitioners such as midwives, nutritionists, and functional medicine providers can come together to support physicians and, in turn, help mothers become healthier.

Together, we can improve our stark maternity statistics.

## **Collaboration**

Megan and John were like many couples today, who not only wanted a healthy baby but also had desires for their birth experience. Their first child was born via cesarean due to a failed induction after Megan's blood pressure rose sharply at the end of her pregnancy. Their physician had told them it was a good thing they were under medical supervision because this could have taken her or her baby's life.

Megan believed her physician but was not convinced that her symptoms could not have been caught early or treated differently—maybe even prevented. She also had guilt that maybe she had done something to cause the issues in her pregnancy. She had shown signs of preeclampsia earlier in her third trimester, such as pitting edema and headaches. But because her blood pressure had not risen and she was not losing protein in her urine or gaining excess weight, her physicians did not see a problem—yet. She asked questions regarding what she could be doing to feel better or prevent the possible complications. She was told there was nothing she could be doing, that these were just “a part of pregnancy” and may or may not lead to something bigger. They would watch her symptoms, and if they became concerning, they would induce.

After her traumatic delivery, in her mind, she wondered what she could have done differently.

With her second child, they decided to go a different route. They chose a midwife in the hospital system experienced with vaginal birth after cesarean (VBAC) deliveries. She hired a well-known local doula when she read studies showing that women with doula support had better birth outcomes with decreased rates of cesarean delivery. She hoped that these changes might give her a different way to prevent the same outcome but with the medical support available if she did need intervention.

Even with midwifery care, she started to experience similar symptoms to what she had with her first pregnancy, pitting edema and headaches. Her

midwife started watching her urine for protein and taking her blood pressure. At 33 weeks, she had a small spike in blood pressure. Their midwife told them that if her blood pressure continued to rise, they would need to transfer care to an obstetrician (OB), and that there was a chance they would need to deliver via cesarean again if symptoms continued to rise.

Megan and John were referred to me by their doula. They came to see me at 34 weeks. When I first saw Megan, she was exhibiting pitting edema, mild headaches, and her blood pressure in-office was 134/82. No laboratory tests (labs) other than a basic complete blood count (CBC) that showed borderline anemia at 30 weeks had been done. I decided to run a few more, starting with a comprehensive metabolic panel (CMP), magnesium, and vitamin D (calciferol).

Her CMP showed extremely low levels of potassium as well as an increase in her liver enzymes. Her magnesium was low, and her vitamin D was low—all nutritional and chemical prerequisites to preeclampsia.

I connected with their midwife, and we discussed what I thought might be going on and consulted on a protocol and plan to treat the presenting deficiencies in hopes of correcting them before symptoms became worse.

We looked at her supplement regimen. She was taking a prescription prenatal that she had received from her midwife with only five ingredients: 400 IU of vitamin D, 1.7 mg riboflavin, 2 mg pyridoxine hydrochloride (pyridoxine HCl), 1.4 mg of folic acid, 8 mcg methylcobalamin. This was the approved prescription prenatal for their multi-practitioner practice that was recommended to every patient.

Megan's midwife was intrigued about what I was able to see in her lab work and was even more interested to see how the changes I made would affect what she thought was an inevitable outcome.

Megan's diet was good but not great. She ate a standard American diet and followed many of the national nutrition guidelines. She ate low-fat dairy,

avoided high-fat foods, ate grains at most meals, snacked on fruits, ate her vegetables (but typically only at dinner and as garnishes at lunch). She avoided excess refined sugars, baked goods, and sodas. She felt like she was doing a good job.

We changed up her diet, adding in more dietary fats, had her eat whole eggs every day, increased her vegetable intake, added in nuts and seeds, increased electrolyte-rich foods like coconut water, cucumbers, and watermelon, cut down on her refined grains, and gave her some better supplements. Within a week of starting the dietary “tricks,” her edema had improved.

We retested her metabolic panel at 36 weeks and saw improvements in her electrolyte values and a slight decrease in her liver enzymes. We decided to test them again the following week. Again, we saw improvements. Megan’s blood pressure improved as well and came down to normal levels.

Megan was able to have a beautiful, natural hospital VBAC birth with her midwife and doula, all because we looked at her symptoms from a functional view that could be changed, not an inevitable condition that would be controlled with medical intervention.

Medical intervention is the norm, not because conventional medicine is not good at catching and treating medical conditions as they arise, but because we have failed to train our primary professionals in nutritional importance and fail to work collaboratively in patient care.

We have a defensive position against the other side, and this approach is becoming detrimental to the health of the women we serve. Functional medicine could be the tie that binds us as a collaborative system that works together in patient care—giving our physicians the support they need, mothers the care they deserve, and together improving our national birth statistics.

## CHAPTER 2

# Why Me?

I had coffee with a colleague several months ago to connect after COVID-19 shutdowns and touch base on where we both were in business. He is a psychotherapist who specializes in wilderness therapy, which, if you are not familiar with, you should explore—it’s fascinating. I was about midway through writing this book at the time and he asked how it was going. I was honest, as I usually am (probably to a fault).

I told him the information part was easy. I could talk about how amazing functional medicine is, how it can be applied to maternity care, and why it is important all day long. What I couldn’t seem to do was talk about myself. Everyone was telling me I needed to sell myself as the expert in my book, but I just didn’t know how.

He said, “You’re an imposter.”

Excuse me?

“You don’t belong.”

He was right.

### **The Imposter in the Room**

What he had meant in this conversation was not that I didn’t belong, but that I personally believed I didn’t belong.

Apparently, this is common. So common that psychotherapists have a term for it: “imposter syndrome.” People who have become good at their trade but still feel they are not ready to be “the expert.”

One of the great things I took from my medical education was, so I had always thought, that I am just the facilitator of the medicine and it is the medicine itself that heals. When I graduated from traditional Chinese medicine, they told us, “We’ve given you enough to get started, but you are not a master; go out and learn more.” So, my entire career, I’ve felt that I’m still learning and not yet a master.

I’m nothing special; in the scheme of things, I’m a nobody. I’m not a famous doctor with a fancy medical degree and titles from Yale or Stanford who worked for the Centers for Disease Control and Prevention (CDC) or some other prominent medical group. I’m not a biochemistry PhD who studied nutrients in applied science. I am none of these, so why do I think I can sit at the same table as some of these great minds? Basically, what is my experience to give me the confidence to be the one to write this book?

I’ve struggled with this for years, literally years, as I’ve thought about writing this book! *Why me?*

All I’ve done is find other people’s studies, compile and connect them, and share this knowledge with patients and colleagues. Anyone could do this. I kept wondering when some great mind out there would write a book on all the cool things I had found. It wasn’t until patients, birth professionals, midwives, and physicians themselves started telling me I should write a book that it actually hit me that maybe I’m the person to do it.

When I was a kid, I was obsessed with dogs. Trust me, there is a point.

I was that kid who read every book I could find on the different dog breeds. I wanted to know everything I could about the evolution of dogs, how humans were able to engineer different breeds for different jobs, and the breeds’ genetic predispositions to diseases. You name it, I probably knew it. I also took pride in being able to identify different breeds of dogs out in public or on TV and in movies. I found books on extinct breeds of dogs and studied their ancient history. Literally, if there was a book on it, I bought

it, read it, highlighted it, and wrote notes in it, and I engulfed myself in the knowledge of dogs. I still have them; it's embarrassing.

Yeah, I was the awkward kid—still am. You know those “me at a party” memes? I start talking about pregnancy, nutrition, or, to this day, dogs, and I've lost everyone.

All right, Sarah, what does any of this have to do with maternity?

My point here is that I am, by nature, a “how and why” person as are most of those scientists who are exploring hypotheses and physicians who continue their education in specialized fields and those professionals seeking out functional medicine. We are full of questions and yearn for answers. We just chose different paths and professions to do so.

Even as a kid I had to know everything I could about what I was passionate about. I asked questions and searched for answers and seemed to gravitate to the road less traveled. If I couldn't find the answer, I dug deeper. Just as I do now. I oddly enjoy studying.

After years of tolling and some great colleagues who help me work through my own fears and insecurities, I've discovered something important about myself. I am not the imposter in the room. I have every right to sit at the table and be the voice to share this knowledge. Not because I discovered it but because I brought the voices of thousands of scientists around the world together in a collective that can now have a voice.

Instead of asking, “Why me?” I should be asking, “Why not me? If not me, who?”

I am still not a master. “People who think they know everything know nothing.” I am still studying and exploring. I am continuously looking for the next article or study because we do not know everything about the body, and scientists are discovering new things daily. We are just fledglings in the understanding of the body. This is just another step in increasing the reach

of the studies that connect nutrition with disease and nutrition as the real savior of future women.

### **The A-ha Moment**

Anyone who has known me long enough will know that when I was younger, I had zero interest in kids, pregnancy, or the whole family thing. I had goals, career goals. And was going to be happy as a dog mom. I wanted to do sports medicine and pain management and kick ass. I started off learning everything I could about what I was newly passionate about. I took additional courses in orthopedics and trained with one of the most world-renowned orthopedic acupuncturists in the world. I even got a job working with a pain management physician in my hometown to increase my experience and knowledge in chronic pain treatment.

Nothing about pregnancy and women's health was on my radar.

I had always studied and respected the role nutrition played in health, and with my pain patients, we discussed how diet could help them recover, heal, or decrease their pain.

When I first started my journey into maternity care, I was pregnant with my first baby. (Surprise!) It was fascinating; Why had no one told me how amazing women's health and reproduction was? Ha! I was enthralled with pregnancy and this tiny human I was creating. How could I make her (we didn't know she was "her" at the time) the healthiest person I could? How could I make myself the healthiest mother I could be? A-ha! I needed to know more.

Enter a new obsession.

I chose to work with hospital-based midwives, and I began asking them questions. Lots of questions. Even with my midwives, what I was eating never came up. With my base in traditional medicine, nutrition, and my newfound love for Dr. Price, I was concerned about the lack of acknowledg-

ment of nutrition in my care. I had no idea it was this way. How could no one be addressing what I was or was not eating throughout my pregnancy, and how could they expect me to navigate this on my own?

I transferred primary care three times during my first pregnancy because I found their attention lacking. I landed on a wonderful midwife who gave me resources and guided me more through my pregnancy than those before but not through everything.

I found and read every book I could find on prenatal nutrition, just like the dog thing, but nothing and no one seemed to be able to answer my questions. They just told me, “Don’t eat oysters,” and “Drink low-fat milk.” I was baffled by the lack of science-based information on prenatal nutrition. Even with my background, I was confused; I could only imagine how a mother without any nutritional training must feel.

I started subscribing to medical journals; they are not cheap. The answers to the questions I was asking were there, in articles, journals, and books, but nowhere had the information been consolidated. It was scattered, spaced, and required composition to pull together. I had binders of notes and diagrams that I had put together connecting the dots of different articles. So many brilliant minds in the past have quotes about asking the right questions, and they are right. Many of the answers I was searching for required me to ask or, in this case, search for the right questions and keywords.

Then I had a double a-ha moment. Why was no one talking about this?

My obsession didn’t end with the birth of my first child. If anything, it only intensified. The more women I met and talked to, the more I felt women needed support and help. This was my purpose, this was my path, and *this* is what I was supposed to do. I was supposed to help women achieve not only better births but also better pregnancies and, thus, postpartum health through nutrition.

## **What I Learned from My Traditional Chinese Medicine Training**

People always ask me how and why I got into traditional Chinese medicine (TCM) as a career path when I'm, obviously, obsessed with the western physiology side of health. It does seem like an odd path, and it wasn't something that was even on my radar until I was in college.

My original path was veterinary school. Remember the dog thing? Seemed like a logical decision. I worked in vet clinics from the time I was 14 years old through my graduate degree. It was through this love of animals that I found acupuncture.

During my undergraduate degree, I worked in two different veterinary facilities that provided acupuncture for animals. The first was an equine vet in my home state of Oklahoma. He worked primarily with racehorses, and acupuncture was a technique that he used frequently for muscle injuries. It was intriguing but didn't quite spur my interest at that point. I really didn't see the beauty in acupuncture until I transferred to Colorado State University (CSU). There, I worked at the CSU Veterinary Teaching Hospital and was able to observe acupuncture treatments done on a variety of conditions. It was here that I finally saw how amazing acupuncture could be.

Animals don't understand placebo; they either get better or they don't. You can't tell a dog, "Today I'm going to needle your hip and it's going to relieve the pain of your dysplasia," and the dog says, "Thanks, doc, I feel great." The dog either gets up and walks or it stays in the same condition it was before the treatment. I watched animal after animal have these amazing changes in their health and demeanor. I had to know more. I had to know *how* this medicine worked. So, to the dismay of my parents, I left the idea of veterinary school and pursued a degree in TCM.

Most people consider the acupuncture degree to be a subpar medical degree. Heck, until recently, we didn't even have the option of a doctorate. Just so you know, we study anatomy and physiology, pharmacology, biochemistry, and

pathology, just like any other medical profession. We also study the TCM view of the body, which is vastly different. Different doesn't mean wrong.

You must understand that many of the physiological discoveries made throughout the centuries through TCM were made in a time where they didn't use modern science to describe and justify their findings. Over the course of centuries, ancient TCM physicians discovered organs and their functions, well before European medicine. These TCM physicians just described them in a way that makes no sense in our modern medical terminology. They used the things they saw around them to describe what they saw in the body. Epilepsy, for example, is a wind condition, as it shakes the human body as the wind shakes a tree. Progesterone is the hormone of the luteal phase, and progesterone is considered a yang hormone. Yang in TCM represents heat in the body. When progesterone is high, like in the luteal phase or pregnancy, the body temperature is higher, and thus, there is more yang.

One of my favorite things about living in this time in history is the physiological discoveries being made on a regular basis that make me say, "Hey, that's the exact theory as the TCM theory on disease progression, just in modern terms and with research backing." For someone like me, reading these journals and finding these connections is thrilling.

But that's not the only thing I learned from my TCM training. The most important thing I took from my medical school was the idea of differentiation and that within a disease are multiple patterns. Identifying the correct pattern is essential to correct treatment.

This is, basically, the same idea as functional medicine: the idea that there is a deeper, more root cause of a condition and not just a single superficial symptom. In TCM, all the organs are connected and work together, each a cog in the system. If a cog breaks or gets rusty, the whole system begins to breakdown, just like in functional medicine. Functional medicine, to me, is the scientific verification of TCM theory.

Within each disease, there are different patterns of symptoms. Consequently, you'll see lists of symptoms associated with medical conditions, but a patient will only have a few of them, and the next patient will have a different set. These represent the different patterns in disease progression.

### **Bridging Two Worlds**

How did a conventional medicine-raised Oklahoma girl like me fall into alternative Asian medicine?

My mother was born in Seoul, Korea, and my grandmother was culturally Korean. So, even though I am a corn-fed Okie, I grew up in a multicultural home. My grandmother is a huge part of who I am. Her Korean traditions were a big influence on my childhood and upbringing. As a young child I even spoke a little Korean, but those days are long gone. I loved hearing her stories from Korea—some beautiful and some sad. These stories were my history, my ancestry, and my culture even though I was American. Her house was always filled with amazing Korean dishes, and she fed us a lot! Seriously, Korean grandmothers don't like skinny grandchildren.

Maybe it was my maternal heritage and connection to my ancestry that gave me my interest and desire to learn more about traditional cultures and ancient medicines. Either way, I've always felt drawn to the ancestral cultures of other countries, tribes, and peoples before the influence of western society. So much innate knowledge, lost.

When I was pregnant with my first child, my grandmother was full of cultural advice on pregnancy, birth, and postpartum care. To me, it was beautiful. If we had lived in another time, she could have been my midwife, doula, and childbirth support. She knew it and lived it. She told me specific foods to eat: not just ingredients but how to prepare them, what temperature I should eat them at, and special meals that throughout cultural history were endemic to childbirth.

Traditional cultures have long understood the nutritional value of certain foods during pregnancy and infancy in the health of both mother and baby, and not that long ago so did western medicine. Although I had studied nutrition in college, the knowledge my grandmother gave me was more informative than anything I read in my studies.

When I first discovered Dr. Weston Price and his book, I ate it up (pun intended). It bridged my cultural heritage with my scientific mind. It seemed to be the missing link between the two schools of thought on nutrition in my life.

I have always felt I was a bridge between two cultures for many reasons, but one big one has always been diet and the culture around food and nutrition. Much of what Dr. Price presented reminded me of the foods and traditions that my grandmother had brought with her and instilled in us. Beliefs with no scientific backing that had been passed down from mother to daughter for generation upon generation. Much of this food culture was counter to what the standard American nutrition guidelines told us, and it never made sense to me.

I've always been drawn to understanding the science of Western-based nutrition. I am very analytical in nature and do not do well with abstract theory, so I went to traditional Chinese medicine school, which is all theory. Makes sense, I know. I lean on studies that help to give a deep picture of how the body functions at the foundation of health. That desire to know is strong, but I also feel connected to my heritage as do many people I've met on my journey.

Functional medicine helps connect the cultural food knowledge with scientific nutrition studies. It is the perfect link for the two worlds when used correctly and may be the resource we need to bring back traditional pregnancy rituals with scientific backing.



## CHAPTER 3

# Why Maternity Functional Medicine

**M**aternity is, arguably, the most important specialty in any profession. As professionals who specialize in maternity care, we are in a position of responsibility. What we do doesn't just affect the women in our office, but the next generation.

Pregnancy and childbirth are crucial transitional times for women. Women become mothers and they change physically, emotionally, and spiritually. They do not remain the same person they were before; in a way, they are reborn. The actions and methods of this transition are crucial to the health of this new woman from then on. If her transition is functional, she is poised for health success; if it is dysfunctional, she will need support and recovery to maintain all aspects of health.

How a mother eats and drinks, as well as her lifestyle choices, not only affect her health but also the health of her unborn child and future generations through genetics. We are not only supporting women but paving the way to reduce preventable disease at the source: fetal development.

All women should be given the opportunity to benefit from functional medicine during preconception, pregnancy, and beyond.

### **What Is Functional Medicine**

I have gravitated toward functional medicine because it connects what we know culturally and traditionally with medical science. We are lucky to live in a time we can begin to connect the two.

Skeptics out there have argued that the definition of functional medicine as “root cause medicine” eludes the question of “What is functional medicine?”

I kind of agree with them. If we want to defend our medicine, we need to do a better job of explaining what we do.

Here goes.

Functional medicine takes western medicine and combines it with clinical nutrition. It also considers how the different systems of the body work together to create overall body function.

We are a big engine with lots of moving parts, not independent but interconnected. If you remove a cog, the engine does not function the way it is designed. Each cog moves another cog, that cog moves another, and so on. Functional medicine looks at how these cogs are connected and what grease is needed to lube the connections. When a cog is broken, we use science-backed techniques to repair the damage so that the system works correctly. We don't just put gum on it and say done.

Science has shown us that there are connections between the gut and the brain. The microbiome of the gut—the bacteria we have or don't have—has a profound effect on the production and function of neurotransmitters. Depression can be caused by gut dysbiosis, manic behavior by the *Clostridium* family and its toxic byproducts.

Oxidative stress is a causative factor in numerous medical complications including some found in pregnancy. These are examples of what functional medicine addresses. By looking at these biochemical connections, we can correct the problem and restore system function, not just treat the presenting symptoms.

Functional medicine does not neglect that medications have their place in care. For many, they are lifesaving necessities. Some may not be able to remove their medications, but we can support them more effectively and prevent the common side effects associated with many medications by understanding how they affect the cogs in the system.

## **You Can't Reverse Physical Damage**

There is no magic pill. Functional medicine is the next step in patient care, but it cannot treat everything.

I am an asthmatic. I wasn't diagnosed until my mid-twenties. I had a bad upper respiratory infection that became bronchitis and required a trip to the hospital. Factor in a group B strep lung infection from infancy (another story for another chapter), and I damaged my lungs enough to create chronic asthma.

When I was first diagnosed, I was put on three different medications and was told this was my new life: "There is nothing more we can do." I didn't really like that much as I had just finished my degree and was all about alternative medicine. I thought I could cure the world. I was determined to get myself off *all* my medications. I was going to be an example. I did exercises to improve my lung strength, acupuncture, chiropractic, etc., and was able to remove *one* medication. That wasn't enough. I saw a natural medicine physician who had me do food allergy testing. This didn't make any sense to me at the time because I knew what had caused my asthma and it wasn't food. She really didn't explain to me why it was important, but I was desperate and wanted more relief (daily meds are not my thing). I got the results back and was surprised to see pears as my biggest allergen.

Now, what made pears interesting was that, at the time, I was renting a house on a pear orchard. I ate pears and breathed in pear pollen daily; my whole world was pears. The combination of living in an allergen-saturated environment with the addition of a cold virus and some childhood history was the perfect storm to cause my lungs to trigger severe inflammation and permanent physical damage. When my lease was up, I moved and my exasperated asthma symptoms got better. By identifying triggers that increased immune responses and avoiding them—sorry, cats—I have been able to decrease the inflammation in my lungs.

In time, I got off my daily medications, but you cannot reverse damage. My lungs are still weak, and I will always have weaker lungs from the experiences I have had. I must carry an emergency inhaler and that is okay; I've made amazing progress that I was told I would never achieve.

This is what functional medicine does. It is not a cure; it is a way of helping your body be the best it can be with the genetics, experiences, and damage that has occurred. Prevention is always easier than treatment, so the sooner we can start working with people on their diet and lifestyles, the more likely they are to be able to decrease their risk of disease and complications.

The next question then becomes: What form of nutrition are we using in functional medicine?

### **Standard American Nutrition Versus Functional Nutrition**

The politically correct nutrition platform is what you see in hospitals, schools, nursing homes, and in the government's USDA recommendations to Americans regarding food intake. These guidelines are rooted in poorly done, corrupt research studies that aided the food industry agenda, not actual nutrition science. The guidelines focus heavily on carbohydrates (all whole grain sources are created equal), reducing fat intake (specifically saturated fats), limiting cholesterol-rich foods, adding more polyunsaturated fats, avoiding red meat, and limiting salt.

These guidelines were put in place with the great intention of helping Americans navigate nutrition easily. Sadly, Americans are more confused about nutrition than ever. These outdated guidelines are still being pushed to Americans while the research contradicts what we have been told for generations.

The Western nutrition approach was based on nutritional studies that had accrued between the 1950s and '80s. These studies were very analytical and scientific with not much focus given to overall composition. Also, they were often biased and funded by corporations looking to promote their agenda.

It was during this time that the nutrition guidelines that we use in America were formulated.

If you want to know the politics behind this, read *Food Politics* by Marion Nestle. Talk about eye-opening. Moving on.

Traditional and ancient cultures didn't have modern science to validate their diet or explain the effects these foods had on the body. They used what they knew to describe what they saw, and what they knew was nature. Every traditional and ancient culture described health, medicine, and food based on the things they saw around them: wind, water, earth, fire, metal, bitter, hot, sour, sweet, etc. Such is the way diseases and pathology are described in TCM. It doesn't make it not accurate; it just makes it different.

Dr. Price would have conversations with medicine men from different cultures and discuss disease in terms of presentation. One of my favorite stories in his book is the retelling of his experience in Canada where many people had scurvy. It was being treated unsuccessfully by the local Western physicians, who at the time did not know that vitamin C deficiency was the cause. He spoke with a traditional medicine man, and after describing the symptoms the medicine man told him to eat a specific organ meat from a specific animal to treat the presenting symptoms. This traditional medicine man did not know what vitamin C was, but he knew that if you ate this organ (high in vitamin C, by the way), it would cure the symptoms associated with a specific pattern described in terms they knew based on the world around them.

Dr. Price was bringing light to the knowledge that traditional cultures had known for millennia into terms that could be rationalized by the new scientific mind.

Relying on science doesn't mean we negate past experiences and history. It is a way of validating what we have known throughout generations. Food preparation techniques that have long stood the test of time are now being

shown to increase nutrient density. These traditional cultures did not know why they were doing it other than it did not make them sick when they did.

Much of the functional medicine community has latched onto the paleo diet, autoimmune paleo diet, or some other ancestral-titled diet. I think these diets offer people a quick way to feel better but don't really consider true cultural and traditional diets as we know them. It is easier to tell people to avoid a food group than to teach them how to use it properly. It is well-established that many healthy and traditional cultures have used grains, legumes, nuts, seeds, and other food types removed in these extreme diet programs.

I believe all whole food types have a place in the diet except for special conditions. It is teaching people to use them properly that is difficult. America is a culture of no culture. We are a group of descendants of cultures from all over the world. Those who are more recent transplants still maintain much of their heritage and food culture, but as time goes on, it is lost, leaving us with lost traditions that had helped us navigate the foods around us and gave us the ability to use them in ways that decreased antinutrients and increased nutrient density.

I feel blessed to have had a strong base in Korean food culture growing up. I grew up in a region not known for its overall health or dietary habits. My saving grace was that my family often ate traditional Korean meals with vegetables and whole food ingredients being ever-present. Don't get me wrong; we also ate our fair share of spaghetti and fried chicken too, but my mother and grandmother always had kimchi and seaweed snacks for us and made it a point to have a variety of vegetables. You know that scene from the movie *My Big Fat Greek Wedding* when the main character is reminiscing about her childhood, and she is sitting in the cafeteria by herself with her traditional Greek moussaka for lunch and the other kids make fun of her? Yeah, that was me with kimchi and seaweed.

## **Respecting Dietary Culture**

Confusion about nutrition seems to be, in part, associated with our loss of food culture. Around the world, cultures have unique and regional cuisines that incorporate whole and natural food sources. These food customs are passed down through generations and are based on experiences and ancient analysis of these foods and how they affected health. America is lacking in food culture. Our blending of cultures and our history of development have led to a culture that is highly dependent on processed, easy, and bland foods, in general.

I had a patient who came to see me after seeing another functional medicine practitioner in my community. He had a big practice with multiple functional nutrition coaches and pushed programs. She was of Indian descent. She and her family primarily ate Indian cuisine.

After consulting, he gave her his recommendation and game plan and hooked her up with one of his coaches. The program did not consider her cultural heritage. The meals and foods they had planned for her were highly smoothie-based and she didn't own a blender, and they were all American-based meals. Nothing about it was something she could do because it would have required her to throw out her pantry, culture, and food heritage and relearn a completely new American-style cuisine.

When she came to me, her first question was if I was going to make her drink smoothies and stop eating her cultural foods. No. Part of what functional medicine should do is acknowledge what traditional cultures have developed over millennia. These other practitioners and coaches should have been able to take what this woman was already doing and make it better.

When I work with my patients, I never give out generic meal plans because they don't work. What I do is a technique I call "red-lining." I have them keep a one-week food journal so I can see what they are eating on a regular basis. I assess the cultural cuisines they may be consuming, meals they gravitate toward, and I take what they are doing and make it better by modifying

and adding to what they have given me. I add in nutrient-dense recipes related to what they presented and give them ideas for substitutions.

Because of this technique I can work with anyone around the world, which I do, considering their local and cultural foods, and still have the same results, without making them drink smoothies twice a day. My respect for their food culture is important and stems from my own family heritage.

Therefore, when I look at nutrition and the diets of those I treat, I am not looking at different diet programs like paleo. These diet programs are not universal and often disregard cultural and traditional food preparation and dietary habits. They also do not consider the personal uniqueness of the patient. It is another generic program, and, I would argue, an extreme diet that limits many nutrient-dense whole foods.

Much of food culture around the world is designed around the health of pregnant mothers and the growth of children. Much care and focus have been given to these special times in life. Many societies reserve special foods for these groups, knowing that the nutritional intake of a mother impacts the health of her offspring.

### **It Starts in Childhood**

Remember when I said that by specializing in maternity, we affect more than the woman in the office? We have generations of women whose mothers and grandmothers have been neglected nutritionally, whose childhoods, where diet affects adult health predispositions and genetic expression, were bathed in modernized kids' meals containing chicken nuggets and hot dogs, devoid of nutrient density.

*We have failed women before they even knew they were women.*

Back to the 1930s, Dr. Weston Price spoke highly of his colleague Dr. Kathleen Vaughan and her book *Safe Childbirth*. Dr. Kathleen made great connections between the prenatal diet, prepuberty life, diet of female

children, and how these nutrition and lifestyle patterns affected the development of their pelvic shape and ability to birth. Of Dr. Vaughan's findings, Dr. Weston Price said,

*“Dr. Vaughan presents such an array of facts and data that the book must impress every reader. It is of vital importance that her conclusions be considered, for in my opinion our methods of bringing up our girls and the habits of our women with many of the customs of ‘civilized’ life must be radically readjusted.”*

Sitting in a school lunchroom with a group of parents, teachers, and my kids' elementary school principal, I learned a valuable lesson about the state of the school nutrition programs.

At the time, my kids were attending an expeditionary charter school. I probably set myself up for failure here, but I envisioned this school, with its mission and educational style, to somehow be better than the local school district in many regards to their school health and nutrition programs and philosophies. Yes, they were part of the district school lunch programs, but they had a school vegetable garden. We packed our own lunches, so I wasn't too concerned at first. I assumed that the parents and staff were probably of the same mindset as me.

Like most school classrooms, celebrations for holidays and special events that include food and drinks were common. Most of the teachers sent great lists of items to bring, keeping the fun items and healthy items in balance. I was at this PTO meeting for the first time because I had a concern. One of the teachers had been rewarding the students with Coca-Cola, including mine, and I was not okay with this. We are not soda drinkers by the standard soda description. A sparkling water or quality root beer from time to time, sure, but my kids had never had real soda, especially Coca-Cola.

As I voiced my concern, I was met with a startling comment by the principal: “I got into education to teach kids skills, not nutrition.” He ended it by

saying it wasn't his job to police the teachers in their food rewards. He wasn't wrong, but he wasn't right.

How do most of us get our nutrition knowledge? It sure isn't from our physicians, we've established that. Do you remember how you learned about nutrition when you were growing up? I sure don't.

I remember my physician father following diets he thought were the best for us as a family. I still remember him saying things like, "It's pure protein," when talking about healthy foods and encouraging us to eat them.

According to the CDC, the education system plays an important role in helping students establish healthy dietary habits.<sup>7</sup> In fact, it is the primary source of nutrition education for Americans and should be part of the comprehensive health education curriculum in each school.

Yet students in America receive fewer than eight hours of nutrition education each school year, well below the 40–50 hours required to change behavior.<sup>8</sup> In addition, the number of schools providing the required hours of nutrition education dropped from 84.6 percent to 74.1 percent from 2000 to 2014. Why all schools are not mandated to teach nutrition is beyond me.

In 1947, Congress passed the National School Lunch Act to provide all children, whose families could not afford it, a school lunch. Today, nearly 100,000 schools across the country provide lunches for children, feeding 29.6 million students per day. Furthermore, 21.8 million of these students qualify for the free or reduced lunch prices, meaning their families' income falls at or below 130 percent of the poverty level and up to 185 percent above the poverty level. And 12.54 million students are using the free or reduced-price breakfasts as well.<sup>9</sup>

The following guidelines are listed on the CDC website from the 2015–2020 Dietary Guidelines for Americans recommendations for children ages 2 years and older:

- Eat a variety of fruits and vegetables.
- Eat whole grains.
- Eat fat-free and low-fat dairy products.
- Eat a variety of protein foods.
- Eat oils.

Those are your highlighted nutritional guidelines for children. Thank you, government.

The USDA is responsible for the execution of these guidelines in the school lunch programs, and they are falling short. Data from the National Health and Nutrition Examination Survey (NHANES) showed that, on average, all school children fell short of the Dietary Guidelines for Americans. On a scale of 1–100, the average Health Eating Index for 2005 (HEI-2005) score was 58.

The guidelines do state that a vegetable must be offered at each lunch, but the definition of what constitutes a vegetable is vague and includes french fries, relish, pizza sauce, and ketchup.

Research from the University of Michigan identified school lunches as a direct link to the increasing childhood obesity rates. According to the research, those who regularly had school lunches were 29 percent more likely to be obese than those who brought lunch from home.<sup>10</sup>

Childhood chronic diseases are on the rise, and just like their adult family members, most of these conditions are preventable with proper nutrition. One in five children over the age of six is obese, and the rate of type 2 diabetes diagnosis in children aged 10–15 rose five percent between 2002 and 2012.<sup>11</sup> It is no wonder why when you look at a standard breakfast and lunch menu provided by a government-funded school in America.

Most foods served in school cafeterias are highly processed, and school districts are forced to party with big food industry leaders, such as Tyson and Pepsi, due to low food budgets. If you have kids and you've ever visited

their school cafeteria, you have seen this firsthand. PB&J sandwiches may be listed on the school lunch menu, but what they really are is prepackaged Smuckers Uncrustables. For breakfast, you may see “assorted muffins” on the menu, but what they really are is Otis Spunkmeyer Double Chocolate Muffins with 35 grams of sugar per muffin.

For many kids, their education system is the only place they can receive nutrition education, and for many American children, the school nutrition program is their primary source of calories for their entire day. Children do not learn by what they are told, they learn by their experiences. When their nutritional experiences tell them that these are acceptable choices, this is what they learn. In the communities with the least nutrition education and the most dependence on the school nutrition system we see the most childhood health problems and, in adulthood, higher rates of maternity complications and death.

### **Insufficiency Versus Deficiency**

We have been told for generations that, due to efforts to fortify grains and nutrition education programs, nutritional deficiencies in the United States are rare, and that those Otis Spunkmeyer muffins are fine because they have added vitamins and minerals and are made with whole grains. Well, I hate to be the bearer of bad news, but this is a myth. In all actuality, nutritional deficiencies and insufficiencies are significantly more common than you think.

Insufficiencies in nutrients have long been left out of the nutritional deficiency picture, often left untreated until severe deficiency symptoms are present. To explain this, I am going to use vitamin D.

The term “insufficient” means a mild decrease, and “deficiency” means greater decrease. When we look at serum levels of vitamin D, we see that the normal reference range for this value is large, 30–100 nanograms (ng)/mL. Vitamin D insufficiency, by Western standards, is defined as blood values below 30 ng/mL; deficiency is defined as 20 ng/mL or lower. This definition

is calculated by analyzing bone growth and formation. With serum levels below 20 ng/mL, we see signs of bone malformation. Those with values above 20 ng/mL seem to be fine.

Vitamin D does so much more than help move calcium into bones. We need large amounts of vitamin D for pancreatic function, ovarian and reproduction function, the immune system, and so much more. Science is slowly catching up to the idea that many of our serum nutritional values, like vitamin D, are off.

A 2011 report published by the Endocrinology Society recommended that the deficiency value be raised to 20–30 ng/mL, and insufficiency value be raised to between 30–40 ng/mL, making the functional range of serum vitamin D 40–60 ng/mL.<sup>12 13</sup> This change was spurred by an analysis of studies showing that even those with serum vitamin D levels between 30–40 ng/mL still had markers for bone loss and other vitamin D-associated functional insufficiencies such as depression.

In addition, the current recommended daily intake for vitamin D in pregnancy is 600 International Units (IU), yet studies show that a mother needs to consume 4,000 IU, the upper limit of dietary intake, to meet the demands of pregnancy.<sup>14</sup> Fewer than this and she could fall into the insufficiency and deficiency ranges that are associated with a list of pregnancy complications.

### **The Nutrition Connection**

Since the 1960s, the CDC has conducted a series of surveys to assess different health topics among the American public. In 1999, these surveys became focused, primarily, on nutrition and health across the United States. This survey system is called the NHANES. Data are released every two years.

A very telling portion of these surveys is the “What We Eat in America” components. It is conducted jointly between the USDA and the Department of Health and Human Services (HHS), the overseeing body of the CDC, to analyze actual dietary intakes. This information is then compared to the

Dietary Guidelines for Americans, which are already flawed and found to be lacking. What we see from these studies is the following:

- 80 percent of Americans are not consuming the *minimum* recommended servings of vegetables per day.
- 75 percent of Americans are not consuming the *minimum* recommended servings of fruits per day.
- >40 percent of Americans are not consuming the *minimum* recommended servings of whole grains per day.
- >40 percent of Americans are not consuming the *minimum* recommended servings of protein per day.
- 75 percent of Americans are not consuming the *minimum* recommended servings of healthy fats per day.
- >65 percent of Americans are consuming *more* than the recommended limit of servings of added sugar per day.
- 70 percent of Americans are consuming *more* than the recommended limit of servings of saturated fats per day.
- 90 percent of Americans are consuming *more* than the recommended limit of servings for added sodium.

<b>Percentage of dietary intake below the recommended daily intake level</b>		
<b>Nutrient</b>	<b>Girls Age 14–18</b>	<b>Adults Age &gt;19</b>
<b>Vitamin D</b>	98 %	95%
<b>Vitamin E</b>	99%	94%
<b>Magnesium</b>	90%	61%
<b>Vitamin A</b>	57%	51%
<b>Calcium</b>	81%	49%
<b>Vitamin C</b>	45%	43%
<b>Vitamin B6</b>	18%	15%
<b>Folate</b>	19%	13%
<b>Zinc</b>	24%	12%
<b>Iron</b>	12%	9%
<b>Thiamine</b>	10%	7%
<b>Copper</b>	16%	5%
<b>Cobalamin</b>	7%	4%
<b>Riboflavin</b>	5%	2%
<b>Niacin</b>	4%	2%
<b>Selenium</b>	2%	1%

*Table 1: Based on the data collected by the CDC 2016 HANANES*

The data also show that when we apply this to age and sex, children and young adults are consuming less nutrient-dense foods than any other group, with consumption of vegetables being worse in boys ages 9–13 and young women ages 14–18. The data point to adolescent girls as having the highest rates of nutritional insufficiencies and deficiencies at the ages in which their maturing bodies need adequate nutrition intake for future reproductive function.

Data on outright nutritional deficiencies are limited, mostly because many nutrients are not accurately measured in blood work and finding ways to assess nutrient function is limited and evolving. Considering the data that

show Americans are not consuming even close to the minimum nutritional requirements set forth by the Dietary Guidelines for Americans, which is already subpar, we can assume that many are low in nutrients that can affect overall body function—especially in pregnancy where the nutrient requirements increase and change with physiological changes.

### **Nutrition in Disease**

The connection between nutrition and disease is not new—not by a long shot. Throughout all known human history, great emphasis has been given to nutrition across the world.

Plato, the great fifth-century B.C. Greek philosopher, was a known proponent of moderation, frequently saying that excess food intake led to disease and ailments. Many of the dietary philosophies he propounded closely follow the now known Mediterranean Diet that is associated with the best all-around health benefits. That seems fair since Greece is a Mediterranean country. Other cultures, too, took nutrition seriously. In Chinese culture, entire schools of medicine were devoted to understanding the complex relationship food had on the body and disease, with the earliest writings coming from 200 B.C.

The history of modern nutrition science is a bit younger, with the first vitamin being isolated in 1926. The discovery and connection of vitamins to serious diseases of the time were undeniable and ushered in a period of great nutrition excitement. This was the era of Dr. Price and his colleagues, who studied and compared nutrition in both industrialized and traditional societies. Their advances in nutrition research led to food fortification programs that decreased severe nutrition malnutrition and associated disease. This excitement waned with advances in medical technology and the development of medications and vaccines.

The 1970s saw a great shift in nutrition research and theory as rates of cardiovascular disease and diabetes began to increase. Research linking both

high fats and high sugars to cardiovascular disease battled one another for legitimacy. In the end, the fat researchers won, thanks to politics and money. Thus, the standard American dietary guidelines promoting low-fat, high-carb diets were born. In 1980, the U.S. National Academy of Sciences Food and Nutrition Boards reviewed the studies and concluded that evidence against fat was insufficient.

Jump ahead to the 2000s and these dietary guidelines have only slightly changed, still touting low fat and high carb diets with fortified foods. Finally, research has started to grab onto this idea that these dietary patterns are fueling the growing rates of chronic disease.

Chronic disease is on the rise, with nearly half of all Americans having at least one preventable chronic disease.<sup>15</sup> The connection between these chronic diseases pre-pregnancy and the development of them in pregnancy are highly connected to dietary and lifestyle choices.

Yet, when you do a search in PubMed for “Nutrition in Pregnancy Disease,” the studies you find are focused on the nutritional deficiencies, dietary patterns, and their effects on the growing baby yet not on the health of the mother. Yes, making sure babies are healthy is a priority, and protecting these innocent lives from future health problems as a complication from this maternal disease is prudent. But shouldn't we also work on addressing the mother's health and reducing the effects of the disease by focusing on her nutrition when nutrition is a primary driver of the disease?

Some of the most disturbing increases seen, statistically, in maternal health are the rise in chronic pregnancy-associated diseases, such as gestational diabetes and hypertension. Studies are beginning to link these diseases with nutrient intake and dietary patterns as well as lifestyle and childhood health.

In 2003, the *Journal of Nutrition* published an article stating current concepts in the pathogenesis of preeclampsia included endothelial dysfunction, inflammatory activity, oxidative stress, and predisposed maternal factors, providing targets for nutritional investigation.<sup>16</sup>

A 2019 study published by the *British Journal of Obstetrics and Gynecology* found that the standard Western diet increases the risk of developing gestational hypertension, while a diet higher in seafood and vegetables reduced the risk.<sup>17</sup>

In addition, when we look at these data, there is a strong correlation between maternity complications and racial groups, specifically non-Hispanic Blacks. The reason the rates among non-Hispanic Black Americans are so high is under serious debate. Many theorize that it is because medical care in areas with denser minority populations is poor. Some theorize that there is racial neglect by medical staff. While these may be just and accurate causes of the increased rate of maternal death among minorities, I pose a different theory.

Nutrition.

### **Why Specializing Matters**

*You cannot know everything about everything.*

Functional medicine has been wonderful for so many people. The medical understanding of how the body is connected and the role nutrition plays at a biochemical level to create function is the basis of all functional medicine. I love functional medicine, and it is the key to helping so many prevent and overcome chronic diseases. Functional medicine certification gives you the base, but courses and studies that focus primarily on maternity give you mastery.

Everything in the body is connected, but there is uniqueness in maternity, as there are in other times in our life, that requires more specialized focus and education. This specializing in no way takes away from the beauty of whole-body functional medicine but considers the flow of the different stages of life.

Different phases of life offer different metabolic and system function differences. Pediatrics, maternity, menopause, geriatrics—at all these times in our lives the body is not the same, and it does not function the same. Just

like everyone is biologically different with individual needs, so are they at different phases of life.

Nutrition needs change throughout our lives. With specialized medicine, we can focus on these individual times in the journey of life with better focused healthcare. There is nothing wrong with—and I believe we benefit from—having specialized medicine, with the understanding that the whole body is connected.

We have seen functional medicine break off into specialties such as neurology, psychiatry, fertility, and oncology. I would argue that maternity is the most important specialty for not only the individual patient but also humanity.

The nutritional health of the mother, the genetic expression and epigenetic possibilities that can occur when a mother is not nutritionally sound along with the method of birth all play into the foundation of health for the infant and its health into childhood and adulthood. Maternity and birth are the absolute foundation for the future health and prevention of chronic disease. If we really want to reverse the increasing rates of preventable disease in our society, we must start at the beginning with birth.

I had another functional medicine practitioner reach out to me with a question about a patient he had who was pregnant. He had run a functional lab panel on her, most of it unnecessary (one of my big hang-ups with many functional medicine practitioners, but that's a whole other topic). He was calling because her copper levels were elevated, and he was concerned about copper toxicity and how he could chelate and help her detox during pregnancy. Woah, time out! He, obviously, had no training in maternity care and really had no business working with this woman. Copper levels naturally elevate in pregnancy. Her levels were within normal ranges for her gestation, and he was about to put her through the ringer for a misdiagnosis based on non-pregnancy lab values.

Pregnancy is a unique time in human physiology. The body undergoes some amazing changes that outside of pregnancy could elicit disease and damage.

I have not seen a single class or functional medicine program discuss these changes. By not doing so, we have given functional medicine practitioners zero skills in working with pregnant mothers, a demographic that arguably needs functional medicine the most.

Specializing in maternity care gives you bigger, more advanced tools in your toolbox. Understanding how bloodwork values change in pregnancy provides a key component to proper use of functional medicine in pregnancy. Many values that would be considered abnormal prior to pregnancy are completely normal during pregnancy.

This is only one example of how maternity care differs and how having advanced training in the care of pregnant women is crucial for proper treatment.