Jenifer Matthews: I will maybe just add a little bit more about who I am briefly as we move into this talk, and why I decided to talk specifically about teen hormones, acne, and PMS, integrative strategies for balance. I'm an integrative pediatrician with a background in integrative health in general, but a real special interest in East Asian medicine, and so part of the talk this evening will focus on some of that as foundations to think about, and also some treatment strategies. Let's touch on the realities of teen health. About 85% or up to 85% of teens will experience acne at some point. PMS, premenstrual syndrome, affects up to 40% of menstruating teens. We'll touch on what that means in terms of physical symptoms, but these issues really can impact kids and teens in multiple ways, including confidence, mood, and social well-being. This talk really isn't just about skin or periods. It's about quality of life. We will be covering what's happening hormonally and touching on some of the physiology that happens as kids move into puberty and adolescence, why acne and PMS occur, where conventional treatments help, and where we might want to explore and lean in a little bit on things like nutrition supplements and other integrative approaches. Let's talk a little bit about the biology of puberty. Puberty really is a symphony of hormones, and it's orchestrated from signals from the brain to the ovaries. These hormones not only shape our bodies, but they influence organs like the skin, the brain, and the uterus. Hormones also drive the development of secondary sex characteristics, including breast development, body hair, voice changes, growth spurts. What we see here is there are signals from the brain, and that is labeled as GnRH and LH and FSH, and those hormones from the brain go through the bloodstream and travel down to the ovaries to interact and produce hormones such as estrogen and progesterone, as well as androgens. We can see here that these hormones have a myriad of effects, including effects on mood, the menstrual cycle, and things like sebum or oil and acne production. Again, thinking about how these hormones have these everyday effects in the body, we can think about androgens, and one androgen that we're all very well familiar with is testosterone. There's another form of testosterone as well, called DHT or dihydrotestosterone, and these androgens activate what are called sebaceous glands or oil glands within the skin, and that affects oil production, which is one of the key components to acne production. We also see hormones, what we call cyclic hormones, and thinking about the menstrual cycle, estrogen and progesterone, and think about how those regulate the menstrual cycle and how these hormones can affect mood and fluid changes. We'll touch on when we touch on PMS is how estrogen and progesterone, how these hormone changes, how they change throughout the cycle, and how that really contributes to the development and the symptoms of PMS. What I want to touch on a little bit as well in terms of thinking about the physiology of what we see manifesting with the two common conditions of acne and PMS, are very common things that we think about and we talk about in a clinical context, and those are things such as our diet, our nutrition, what we're eating, and stress. When we step back and think about diets here in the western part of the world, in the United States, we know that Western diets often lack something called Omega-3 fatty acids. There's an imbalance in fatty acid content in terms of the food we're consuming, with often low Omega-3 content and high Omega-6 content, and that imbalance is thought to be pro-inflammatory. We also know that high glycemic foods, so those would be sugars, refined carbohydrates, and processed snacks. Those as well can cause rapid blood sugar spikes, making the body make more insulin, which subsequently leads to elevation of this little friend here in the middle, IGF-1, which is something called a cytokine in the body and with elevation of the cytokine, that leads to increased inflammation in the body as well. What we see is contributing from the left side of the diagram is things like saturated fats, and low Omega-3 fatty acids, foods with high glycemic indexes, driving inflammation, driving elevated insulin levels, and that continuing to further drive inflammation. The other thing I want to touch on, and we'll touch on again once we think about nutrition recommendations, is dairy consumption. Dairy is not a problem for some people, but when we think about milk, especially skim milk, we know that it contains a bioactive IGF-1 as well, which we can see here can be a contributor to inflammation. What studies have shown is that people who regularly consume cow's based milk do have elevated levels of serum IGF-1 and insulin levels in comparison to those who don't consume dairy. If we move over to the right side of the diagram when we think about stress, we know that chronic stress increases cortisol production, which in turn boosts

sebum or oil production and secretion and promotes inflammation. Cortisol, as well, increases IGF-1, and again, this cycle continues. If we think about acne and we think about, what causes breakouts, the etiology of acne is actually complex, and it appears to come from genetic, hormonal, and environmental causes. While acne might just feel like this superficial skin issue, we actually know there's a direct relationship between gut health and our skin, and as we're touching on now, these hormonal things that are at play as well for teens. There are four crucial determinants to acne production. The first one is excess oil production or excess sebum production. Hyper proliferation of a specific bacteria that's called cutibacterium acnes, and then excess keratiization of hair and sebaceous follicules as well as these general inflammatory mechanisms. What we see is acne is this combination of excess oil, clogged pores, bacteria, and inflammation. This is all influenced by hormones and what we often see is that breakouts will fluctuate with the menstrual cycle. We think about conventional treatments for acne. We often think about things like topical retinoids, benzyl peroxide. We may think about topical antibiotics or oral antibiotics. Or a medication called isotretinoin, which is a medication that can be taken by mouth. One option may also be hormonal therapy, like a birth control pill. These things may all help, but sometimes just using this alone is not enough and the other concern about these options is they don't address the root cause of some of these issues, including inflammation. What I'd like for us to think about here are some additional options for treating acne. There is a good body of evidence thinking about oral supplements and their use for acne, including vitamin D, probiotics, Omega-3 fatty acids, zinc, and then some topical botanicals like tea tree oil or green tea extract. There is some data showing that about 1,000 international units of vitamin D taken by mouth daily can reduce inflammatory lesions. There is good evidence for probiotics, specifically looking at the strains Lactobacillus and Bifidobacterium, that can reduce acne severity. When we think about Omega-3, as we touched on before, and think about potentially the lack of Omega-3 fatty acids through diet, we can not only increase foods that are high in Omega-3 fatty acids, which we'll talk about, but we can also think about taking a daily supplement like fish oil to help reduce inflammation and lesion counts. Zinc is an interesting supplement. The literature is pretty mixed, and there are a lot of different forms of zinc. But there is some data to show that taking zinc can help inflammatory acne if zinc levels are low. But one thing I do want to note is, it's important to know what type of zinc to take, and long-term higher-dose zinc supplementation can lead to copper deficiency. This is definitely one supplement I would caution to talk with the practitioner about before starting. One other thing I'll mention about zinc is it should be taken separately from antibiotics to minimize interaction risk. Then the last two that we'll touch on is a pretty well-known topical botanical, and that's tea tree oil. It's usually used as a 5% gel formulation, and there's evidence that shows it reduces acne lesions and may have fewer side effects than some of the other topical conventional items that we mentioned in the prior slide. The other option to consider is topical green tea extract, and this could be potentially an effective natural treatment for mild to moderate acne. And there are some components that are specific to green tea extract that are thought to help with reducing that oil production, fighting that bacteria, and lowering inflammation. Moving on to thinking about premenstrual syndrome and premenstrual syndrome is really related to how the body responds to these hormone fluctuations. With these hormone fluctuations, these shifts can affect brain chemistry, leading to mood changes, fatigue, bloating, and cravings. What we know is that for someone with PMS, their hormone levels are typically normal. The issue is their response to the hormones, not an excess or deficiency of estrogen or progesterone or testosterone. Typical common treatments for PMS would include NSAIDs like ibuprofen, potentially hormonal therapy like OCPs, and potentially SSRIs or selective serotonin reuptake inhibitors. These treatments may all be very helpful, but what I'd like to talk us through, again, is some potential alternative or additional agents to think about to support PMS symptoms. Supplements such as calcium, magnesium, vitamin B6, and Omega-3 fatty acids, as well as probiotics, may be helpful. We'll also touch on Chaseberry or Vitex this evening. Calcium is a very safe supplement to take, and it plays a role in neurotransmitter release, such as serotonin. It can also be helpful with muscle relaxation. I do want to caution that high doses of calcium can cause constipation and calcium potentially should

be taken separate from certain medications. Magnesium is also used in neurotransmitter signaling and specifically is thought to have a calming or anti-anxiety role. Similar to calcium it is involved with muscle relaxation, and magnesium also can help decrease inflammation and pain. B6 or pyridoxine as it's also called, can help with PMS, as well as it helps support neurotransmitter synthesis as well. But it also can have effect on hormones and fluid balance, which are all of those drivers that we've been talking about for PMS. One thing I want to know about vitamin B6 is that elevated levels, for example, above 100 milligrams per day, with longer use does carry a risk of causing what we call peripheral neuropathy, which can be a issue with the nerves, and so we really need to be thinking about touching bases with a practitioner if B6 is something that we want to consider taking. Thinking about Omega-3 fatty acids, similar to thinking about it for acne. I usually recommend taking around 1-2 grams of EPA and DHA, which is components with an Omega-3 fatty acid supplement. Then, similar to probiotics. The evidence is mixed in terms of which strain to use, and no official recommendations, but I usually think about a good blend of something with lacto-silicon bifidobacterium. The botanical that I want to spend a little bit more time with tonight is something called Vitex, and this botanical has the most robust evidence among herbal interventions for PMS. It works indirectly by influencing the hypothalamic pituitary ovarian access. Some studies have shown that it may be as effective as SSRIs, the medications we were talking about earlier, things like potentially Prozac or Zoloft or some oral contraceptives, and the studies have shown it is better than placebo.

Jenifer Matthews: The body that gives us the official recommendations, which we call the American College of Obstetrics and Gynecology, does note that vitex appears to be well tolerated with improvement in premenstrual symptoms in very small studies, but they don't make an official recommendation. One thing I do want to note about vitex is it should be avoided during pregnancy due to potential hormonal effects that could affect things like conception or health, teratogenic activity. Vitex, additionally, just a note of caution, this would be a supplement, a botanical that I would talk with a practitioner before starting, because of potential medication interactions as well. So next, let's touch basics about nutrition and think about nutrition and how it can support hormones for acne and PMS support. Again, we touched on the fact that the gut is related to the skin as well as our hormones. The gut microbiome, meaning all the bacteria that live in our digestive system, really is the largest endocrine organ in the body, and it's making all sorts of things like short-chain fatty acids, neurotransmitters, and these things affect gut physiology, the gut barrier integrity, how tight things are, what can pass through. There are studies that show that skin health is directly associated with the integrity of the intestinal barrier. If we think about helping improve the quality of our skin and helping smooth out hormones to help with PMS symptoms, there are a lot of wonderful strategies to think about through nutrition to really support that gut lining and a healthy microbiome. Some of this, as we've already touched on, but really thinking about emphasizing and adding healthy fats here at the bottom, so emphasizing omega-3 fatty acids, and that would include olive oil, salmon, avocado oil for healthy fats. Thinking about an anti-inflammatory diet. Reducing fried, heavy, or highly processed foods, thinking about limiting dairy and very spicy foods, and I'll talk a little bit about why spicy foods within the next few slides. Then thinking about stabilizing that blood sugar. How do we build balanced meals? Pairing fiber with protein to stabilize blood sugar. Really thinking specific strategies for supporting gut health. Thinking about prebiotic foods. Those are foods that serve to feed those healthy bacteria, and thinking about probiotics, foods that contain those healthy bacterias, like yogurt, kefir, or fermented foods. Some other prebiotic-rich foods for teens that might be helpful include things like bananas, garlic, onions, oat, flax seeds, beans, whole grains. I usually like to think about how we add things to the diet versus take things away. A little bit more on omega-3 fatty acids. They really reduce inflammation linked to acne, thinking about fatty fish, high-quality fish oil, or plant omega-3s, those can be good sources as well. If you need a vegetarian or vegan option, thinking about algae based omega-3 fatty acids or adding ground flaxseeds to foods. I want to round this out thinking a little bit about a traditional Chinese medicine perspective. This is a different way of thinking about the body. Health is really seen as a balance between different systems. We really have these different pillars that we think about nutrition, herbs, acupuncture, Tui Na, Qi Gong, and this emphasis

on the mind-body connection that emotions, stress, and physical symptoms are closely linked. We want to think about homeostasis or balance in the body. From a TCM framework, a traditional Chinese medicine framework, if we think about how we would think about acne and PMS, the symptoms would reflect internal imbalance. There's these different concepts we think about from a traditional Chinese medicine lens, concepts such as heat and dampness. The heat would be inflammation and redness, the dampness would be congestion and oiliness. We think about these organs, and these are TCM organs, and understanding of how they function in TCM. It's a little bit different than in Western medicine, but we think about the liver, the spleen, and the lungs. A TCM diagnosis for acne and PMS may be something like liver Qi stagnation and blood deficiency. We don't necessarily have to know what the TCM diagnosis is to use some of the wonderful foods and herbs that are available to help with symptoms. I want to share some of those with you, including cooling foods, cucumbers, leafy greens, watermelons, pears, apples, including foods that clear heat and dampness. Yi Yi Ren, also known as Job's tears or Chinese barley, can be a wonderful addition to a rice porridge or oats in the morning. Mong beans. I'll share a recipe on the next page. Thinking about foods that nourish blood and hormone balance, iron-rich foods, leafy greens, beets, and lean proteins. Thinking about teas. Are there herbs that we can use that we can add to teas? Cooling herbs would be things like chrysanthemum, honeysuckle, and dandelion. Nourishing herbs would be goji berries and red dates. One thing I want to emphasize with this is it's really important to make sure if you're adding things and sourcing things to make sure that ingredients are organic. An example of a wonderful tea that can be very balancing and nourishing in heat clearing is a chrysanthemum, goji berry, red date tea. I've listed the ingredients here, and one of the things that I love about this is it can be a really nourishing experience to actually have the ingredients and work with them and make this tea for yourself. I want to wrap us up thinking about the mind-body component to thinking about how to really help with teen balance and balance through the years of puberty and adolescence, and really thinking about a TCM approach to teen well-being. Thinking about harmonizing what we consider what we call energy is Qi. Thinking about harmonizing Qi through stress reduction, mindfulness, breathwork, journaling, a big one that David will touch on, Dr. Becker will touch on screen breaks and social media detox, and supporting balance with proper rest, gentle movement in a way that feels good for the adolescent, and really importantly, hydration. The last concept I want to touch on from a TCM lens for supporting well-being for teens is Shen. In Chinese medicine, the Shen is our mind and spirit. Thinking about cultivating Shen through self-care and body positivity. In summary, if we think about an integrative strategies for balance, it may include things like medications, but also thinking about nutrition, supplements, and lifestyle can help give us a better balance. I want to just touch on and emphasize it's important to use safe, evidence-based, integrative strategies, and if you do feel excited and interested about starting a botanical or a supplement, to make sure to check in with your healthcare provider. Thank you so much.

Jeannette C. Lager: Dr. Matthew Stock, thank you so much for that wonderful lecture. I would also like to introduce our next speaker, Dr. David Becker. He specializes in pediatric integrative medicine, pediatric behavioral health, and pediatric chronic pain. He sees children and young adults with a range of chronic and complex medical issues and also provides mental health counseling for children and young adults through their mid-20s, focusing on anxiety, depression, and other behavioral concerns. He has extensive training and clinical experience with integrative medicine, mind-body strategies, chronic pain management, and clinical psychology. Welcome.

David Becker: When I was asked to give a talk on this series on teen mental health, I knew right away, actually, that I wanted to shift from what the content of this talk had been in the past. They used to talk about a range of complementary approaches and what integrative care meant around mental health. But we've all been wrestling more with questions about how social media and now AI are contributing to worsening mental health statistics in our youth, and it's become clear to me that as much as a range of integrative health topics apply to teen mental health, they're increasingly being dwarfed by the influences of technology. I'm going to try and cover a fair amount of ground and too

much that could be normally crammed into this. Hopefully, we'll have some time to talk about this afterwards, including some of the data about the current teen mental health crisis. What do we know about the role of social media? Then, where does AI fit into this picture, and what are options for where we could go from here? This would have been a lot of the content that I would have talked about before, and show this slide because these pillars are really still applicable. They're a part of how we approach integrative care with an eye towards individual differences, individual circumstances, challenges, and goals. How do we apply a range of complementary modalities when we're thinking about adolescent mental health? These all still apply. But to be honest, the effect sizes, specifically of specific integrative interventions, really seem modest compared to the influence that we're under now of technology, and the landscape has changed. Smartphones, social media, and now AI so dramatically changed this environment, the soup in which teens grow and develop that I felt like this was an important topic to cover. This may or may not be a familiar situation for many of you, but if you imagine 2:00 AM period of time and your adolescent daughter or niece is awake and on their own and markedly anxious. She can't sleep. She doesn't want to wake her parents, and there's no therapist available at this hour until she opens an app, and an AI will listen. It won't get tired, it will never judge, and it never charges a copy. Is this a lifeline? Is this something that's actually going to be beneficial, or is it something else? Let's start with the data about adolescent mental health today and the changes that have taken place in the last decade or so. There has been a very well-documented rise in a variety of markers of worsening adolescent health for the last decade plus. One source is the Centers for Disease Control survey that's conducted every two years called the Youth Risk Behavior Survey. In 2013, you can see here that the overall rate of students reporting distress, persistent sadness, or hopelessness was about 30% in 2013, and even at that point, there was a distinction among adolescent girls who reported a significantly higher rate of 39%. Since then, it has stepwise gotten worse. Through the period leading up to the pandemic, a relatively large bump during the pandemic, and then leveling off to a quite high rate since then, with more than half of female high schoolers reporting persistent sadness or hopelessness. One critique of some data, like the Youth Behavior Survey, is that it's self-reported data, and it's more subjective, but we have more objective data about this epidemic of mental health crises. National reported data on depression in adolescents, and you can see in the mid to late first part of the decade of the 2000, it was relatively flat until right around 2012, 2013, and it has started taking off since then. Additional data has really supported this. The rate of emergency room admissions for self-harm among girls aged 10-14 has quadrupled since 2010. Self-harm ER admissions for girls 15-19 has increased twofold, and the increase in suicide rate for ages 10-19 between 2007 and 2017 has been 85%. These are data that you can't just dismiss by willingness to report and self-report data. Other critiques of this data have been that worsening mental health tends to happen during periods of economic stress. As in the previous slide, you can see that during the great recession in this period of time, there really wasn't a change in that. That critique doesn't really hold up quite so well. Additionally, just a basic detail about overall screen time, the CDC has reported that 50% of teens 12-17 get more than four hours of daily screen time, and the average daily screen time for teens is about eight or 8.5 hours. It's not just the time on the screen, it's about what that screen time actually replaces.

David Becker: This means there's less time directly with in person, friends, family, unstructured free play, less exercise, less time outdoors, and crucially less time being confronted with being bored, where we learn how to tolerate the experience and find things to do that engage our curiosity, imagination, and identity development. For those who have critiqued this saying that online presence is a source for creative creation, it turns out only about 3% of teen screen time is spent on content creation. This is a graph taken directly from Centers for Disease Control Report, and it is not designed for readability on a PowerPoint slide, so let me help you with this. This is a comparison of anxiety and depression symptoms between cohorts of teens who have more than four hours of daily screen time in the blue column and less than four hours of daily screen time in the green column. Now you can see that the rates of anxiety symptoms and depression symptoms are a lot higher than those with more screen time. However, this is what we call associative data, meaning that these two factors,

while they appear compelling, they don't prove causation. This has been a challenge in really attributing direct causation to social media and screen use. But there are certain kinds of associative data that are more compelling, and this is a graph demonstrating this with a dose response curve. With each increase in hourly social media use, the rate of clinically significant depressive symptoms rises, and it rises more sharply as it goes from 4-5 hours a day. And here as well, the gender differences is highlighted with a larger effect among girls. In 2023, the CDC's Youth Risk Behavior Survey, for the first time, directly asked students about social media use, and they found that frequent social media use was associated with higher rates of bullying, persistent sadness, and hopelessness and suicide risk. The dose response pattern, the consistency across studies, and the timing matching the smartphone rollout all point in a similar direction. This is something that has been obvious to Jonathan Haidt, among other researchers for quite some time, and many of you may be familiar with him, particularly since the publication of his most recent book, The Anxious Generation in 2024. Dr. Haidt is a social psychologist and professor at New York University. He lays out what he believes to be a causal relationship, and he lays out his data conclusions about the role of two key factors in the rise of distress among adolescents. One is the introduction of smartphones right around 2012, and the other is the expansion of overprotective parenting, which is contributed to the reductions in free play, the reduction in independent exploration and problem solving. As he describes it, the phone based world is significantly replaced in the embodied in-person socialization with 24/7 access to an algorithmically designed alternate universe. His framework for explaining these changes has received a lot of attention, and not everybody agrees with it. But there are now a lot of data globally that also support these associations. It still remains unproven science as some research continued to argue with this, but the crisis is absolutely real, even if the precise role for social media or other factors is still debated. Another piece in this is what companies have known for quite some time. This really first started coming out around 2021 when a whistleblower from Meta leaked what were called the Facebook files in the Wall Street Journal that revealed specific internal research and quotes about how Instagram made body image worse for one in three teens and that they had suppressed that information. There have been other revealing documents that have come out in more recent litigation that has become pervasive now. The legal landscape has really picked up the pace in recent years, and it's much more in the news. As of earlier this year, then a number of advocates are starting to compare this onslaught of suits to the process of the tobacco trials in the 1990s. The first jury trial went to court in January 2026, and there was a jury verdict just last month that came out holding Meta and YouTube partially liable for the mental health of an adolescent. That's the first, and there are now more than 2,000 cases that have been consolidated into a docket in a federal court in Northern California, and these are all playing out. The main underlying legal theory here is that features were designed deliberately because of their addictive quality, they were not just passively hosting harmful content, but features like infinite scrolling and algorithmic amplification and notification systems were part of a known system that would hook young users, particularly because of their vulnerability. We're going to be watching how these cases play out. In the last decade and longer, actually, you have seen a parallel crisis in mental health care about the access to care or rather the lack of access to care. Supporting teens or dealing with mental health struggles, whether related to social media or not, is becoming increasingly challenging. This is mostly due to the access limitations, and if you've had any experience trying to access mental health through insurance covered processes in particular, you're undoubtedly familiar with this. Our system is stressed by not having enough providers to serve kids who need them. There are currently 10 child and adolescent psychiatrists per hundred thousand children, and the American Academy of Pediatrics estimates that we need more like 47 per 100,000. About half of US youth 12-17 have difficulty getting mental health care, and 40% of teens with a major depressive episodes receive no care at all. The message is clear, even if a teen believes they are supposed to be able to handle this completely on their own, our system is clearly telling them, you're right. You're on your own, kid. Into this now, just in the last couple of years has been this massive explosion of generative AI. We've got a growing mental health crisis. We have ubiquitous addictive platforms that have insinuated themselves into nearly all aspects

of life, and companies that have produced them appear to have known about their potential harm for years, and we don't have a healthcare system capable of addressing the problem. Into that gap comes the 2:00 A.M. dilemma and an AI that will listen, never judge, never charge copy, and never put you on a six month wait list. It's compelling, we'll table AI use moment, just broadly, but it is hugely compelling if you've had an interaction with it already. It can be particularly compelling for teens. The availability, the lack of worrying about any stigma, the ease of use on their own devices, how friendly, how validating, how safe, authoritative it can feel, and the fact that it can deliver real solid psychoeducation, coping tools, and CBT style prompts that have actually been shown to be effective. It's important to recognize that this is quite appealing. But it's also falling into a period of time for adolescents where they are uniquely vulnerable. There's the development of the prefrontal cortex. This is the part of the brain that is largely responsible for our impulse control, our long term risk assessment, or thinking, our planning, our ability to say, hang on a minute, is this really what I want to do? It's very much in development. In addition, teens naturally have a hypersensitive reward system. This is the system that is evolutionarily helpful in pulling them out of home and into the world around them. They look for rewards for social engagement, for novelty. Related to this is peer affiliation is really at its peak, and they are looking for validation, looking for reward and connection. Identity formation is a part of that process, getting to know who they are. What are the influences in that are most valuable and appropriate? Emotional regulation is a period during this time, as well. This all matters because the interface of an adolescent with an AI is going to be a very different developmental process than it is for a middle aged individual. Data on teen use of AI is really starting to be published now, and it may surprise actually a lot of parents. About 72% of US teens have used an AI companion and half use one every day. About 52% use AI companions regularly, multiple times a month, and about a third of them say it's satisfying or even more satisfying than real friends. One in three discuss something serious with an AI that they would not tell a real person, and parents really don't have a sense about this yet. There are real serious concerns in part related to developmental aspects of adolescence, but also related to how AI is currently functioning. It's quite clear from documented cases of chatbots that there are safety concerns, how chatbots respond to suicidal ideation, impersonation of clinicians. There are lawsuits now about aspects related to what's in the field for licensed therapists, what's in the field of responsibility for an AI. There's privacy data issues. In psychotherapy relationships, there are privileged communications that are private that are regulated, and in the AI world, none of that has been addressed yet. If you look at this as like a deepening of the social media problem highlighted by hate in that now not only is tech replacing play, but it has the potential to replace now the experience of what it's like to be truly human in relationship with others. You're probably familiar with some of these headlights. They're not two active cases about wrongful deaths related to suicide occurring after extensive chatbot communications. I'm not going to get into those in detail. The American Psychological Association is so far the most authoritative current organization that's provided guidance on this topic, and it mirrors some earlier social media guidance, but they're approaching this as a nuanced problem where there are clear benefits of the technology, but also clear risks. They advise really considering youth safety early on issues about race, age, issues about exploitation, and recommending clinician fostering AI literacy, but they're not very specific necessarily. Where does that leave us? With a crisis we don't fully understand, in terms of what the implications are for teens or the rest of us, where do we go with this? These are not recommendations that are just mine per se. These are drawn some from clinical experience, some from advocacy organizations that are concerned about this influence and want to get ahead of it. What can you do at home? Delay smartphone and social media. This is a key one. If Jonathan Haidt's website and substack profile have a lot of this information that's available. But there are a few sets of recommendations here about no smartphone before high school, no social media before 16, phone free schools and more real play. Some of this is being played out now in a variety of countries, Australia being the first that banned the social media use in teens under 16, and there are several other countries considering this now. Protect sleep in real-world time, meaning emphasize face-to-face hours, outdoor time and unstructured boredom. This came up just this week

with a, I said I will consolidate a couple of cases, but a young pre-teen talking about the frustration of the restriction of social media time and how they have a friend literally across the backyard that when I talk to them about going to see them in person, they're like, we don't do that. There are relatively simple ways of advocating for focus on this in the home, focus on getting real and person time. Use AI openly and together and model the curiosity, model the healthy skepticism, and perhaps with girls, we might want to be particularly wary about appearance, weight related issues as this may become more of an issue as it has with social media. How to talk with our teens. These are just a couple of suggestions about particular ways of approaching this. What I would suggest is really, it's going to be hard to argue a 15-year-old out of things. What you want to do is just be part of the conversation. You want to be in the communication. You want to be curious. You want to ask what the experience is like.

David Becker: You want to stay involved with them. Try and help communicate that you're on their side. They may not believe you. Or at least ask them to help understand what it's like for them. Talk about designed features. If you need external authorities, look for other advocacy organizations that can provide more information on this directly, so it doesn't have to come out of the parent's mouth, and there's a couple of references for those organizations here. So outside the home in the community, look for local ways to stay involved. And again, some of those organizations provide toolkits for this. Join other parents, get interested in this, commit together because it's extraordinarily difficult to put limitations on an individual team when so many of their other peers have access to things. This really needs to be done as a community. Push for some phone free school policies, support the local school counselors and mental health staff, and again, invest in more in-person activities and time. At a broader policy level, if you're drawn to this, there are a range of ways of getting involved, and this gets outside a little bit of my clinical role, but these are areas in which you can pursue further interests. There's a range of ways to get involved. The question really here isn't whether AI is good or bad. There's clear answers in both directions, and it's not a black and white question. It's really about paying attention. It's the same issue with the social media. We were caught on our heels. We need to be ahead of the game. Integrative care is all about attending to the whole person. In the age of AI, it got a little bit more complicated, but we can do this, and we need to, and it's time for us to step up. With that, I'll wrap up, and we'll hopefully have some questions in ways we can talk further.

Judith Cuneo: Thank you both so much. We would love to field some of the questions that came in from the audience, and I have some of my own. Let's see. Maybe we could start with, I have a question about nutrition. Dr. Matthews, you spoke about how foundational optimizing nutrition is for the treatment of acne and also PMS. I think we all agree as integrative medicine specialists that nutrition is foundational in everything that we do. To both Dr. Matthews and Dr. Becker, I think it would be helpful if you could illustrate very practically how in your clinical practice you encourage teens to change their diet. In particular, if a healthy diet is not available in the household or not prioritized or there isn't access, really concrete things. How does a family member support a child to evolve their diet?

Jenifer Matthews: The answer is it depends, of course, because as we're all touching on, it's really an individual care plan. I think it's really understanding what a teen's goals are versus parent goals? Are they aligned? What's the motivation? If the teen is motivated to work on skin or PMS or these other things. I think part of what we went through today is really talking through why we would think about maybe nutritional strategies and how that would help. Because I think giving blanket advice, like, eat more fruits and vegetables isn't super helpful versus let's understand what's going on in the body because it's actually really cool. There are so many things we can do with some simple changes in the diet. I like to be really mindful about talking about nutrition and food because for so many of us, it can be a very loaded conversation because people may have had experiences with these conversations around weight. May have had not very positive conversations with their clinician or experiences in the world. I want to really emphasize this is not a conversation about weight. This is a conversation about

putting nutritious foods in our body to have benefits for skin and hormones and things like that. The other thing I want to be mindful of is not asking a teenager to take a bunch of things out of their diet because the last thing we want somebody to do is become restrictive. But to really be thinking about what are things we could add that you like or could try, and let's just start with some slow changes over time that are really teen and patient-led with the things that they think that they can add to their diet. Then touching on some of the other pieces and parts to your question, food is also such a cultural and family experience. I think that's a really important piece to explore with families as well like, what are your, you know, eating habits and customs and foods that you love and you make together? Do you have time to cook? All of those things are really important to think about those nutrition recommendations and make sure they resonate with a family and a teenager. Assessing for food security is crucial and essential, and if it comes up that that's one of the barriers, really thinking about how to connect a teen and a family to resources so that they can start to implement some things. I'll pause there, and I'll let David add.

David Becker: You covered the gist of things beautifully, and I think it's hard to put just broad comments that wouldn't fly across the board because everything really is individualized, especially in our model of thinking about integrative health. But when it comes to adolescence, leading by example is crucial. What model do you show as a home or as a family? How do you show rather than tell? Combined with that the process of individualation and autonomy, recognizing that you are going to have limited ability to control things. Stay curious about what's important for the adolescent and the teen, and you can use outside "authoritative sources" by clinicians who can offer specific information relative to whatever health indications are there and try and pair that with what the teen's goals are. Then recognize it's not easy to make those kinds of changes. Other things you can do, depending, of course, on the home situation, what you have access to is grow some of your own food, even if it's a small herb pot outside the kitchen and bring it into the cooking, this is often emphasized in early education in childhood and younger kids elementary school, where you get them involved in a garden. It's actually been shown clinically that if you get their hands dirty from that, literally, they expand their diet better.

Jeannette Lager: I have another question that I think applies to both of your wonderful talks is, how does screens impact or play into hormones and stress levels in teens and preteens?

David Becker: I'm not sure about whether there are any particular data about the influence of screens on hormones and hormone development. We certainly know that the impact of social interaction through screens is particularly challenging because it's out of the context of direct interpersonal contact. If you're in a group chat and there are a host of negative or critical or harsh comments floating around, then each individual is on their own at their own phone with no other resource. That by itself leaves them without the capacity to get support, to get protection, to break away from it. That by itself could certainly add to stress and stress hormone difficulties, I don't know, Jen, what else?

Jenifer Matthews: Yeah, it's a really good question, and I agree in terms of the direct relationship, thinking about that, but definitely think about sleep disruption with screen use really for all of us, especially thinking about in this really more vulnerable period for adolescence. Thinking back to some of the information on the slides, thinking about sleep deprivation and what that does to us and those elevated cortisol levels, not only from sleep deprivation, but from potentially problematic inflammatory content that they're viewing, really spiking those cortisol levels, and that cascade we see that really builds into inflammation and affects the cascade of things with hormones as well.

Judith Cuneo: I would add the contribution of the accumulation of time of inactivity while on the screens.

David Becker: Definitely.

Judith Cuneo: Doctor Matthews, you talked about cultivating body positivity briefly, and I'd like to ask both of you, how would you practically go about helping a teen cultivate body positivity? I think for some kids that participating in individual or team athletics can be an avenue, but that is not for everyone, and it also is not available to everyone. I wonder how you recommend that as a clinician, and then also how you counsel parents or grandparents or other loved ones to support a teen to do that.

Jenifer Matthews: It's a really important question, and again, I think it's individualized in terms of what the team needs. I have patients that come in and we have an agreement. They're like, I don't want to be weighed, and I'm like, okay, that's your decision. It's totally up to you. There's a lot of things that happen within the medical system that are set up for the medical system and not necessarily set up for the patient and what is best for them. I think even knowing if that might be a trigger for a patient can be helpful and taking that out of the clinical situation if possible. But as David touched on earlier with the food piece it really is, like, what's being modeled. I think that's a really good conversation to have just with the family in terms of the language that's used at home. This is not to say, to be critical of parents. I'm a parent, but to really think together about the way we're talking about weight at home, the way we're talking about food at home, and really the environment in which the kids in because they're in clinic with you for a half hour, but they're home with their family most of the time. I think thinking about navigating those conversations with patients and families about how things are being talked about is really important to identify and support this positive language and to avoid some labels like good food and bad food and these things that can set people up, I think, to have reactions to certain foods and things. I think it's coming from a place, hopefully, of curiosity and humility and figuring out what's the best thing for the patient and where they're at, and meeting their needs in the clinical visit, and then also thinking about what's happening outside of the clinical visit and just trying to really support that positive language and modeling for the kiddo at home.

Judith Cuneo: I'm just thinking about the intersection of mind body medicine and body positivity. If there is one in your expertise, is mind body medicine ever a modality that you would use to support a patient around body image or promoting body positivity?

David Becker: The unhelpful answer is it depends. The more general answer is that a range of mind body strategies can really be helpful for just pure self-regulation, autonomic nervous system balance. That's usually a feature in these situations. As a tool for learning more internal control capacities for becoming better aware of one's own emotional and thought processes, mindfulness practices, other mind body tools can be helpful. Then more specific mind body tools, guided imagery or clinical diagnosis can be used for more specific clinical indications on a one-on-one basis depending on what that person's goals or desires are and how they meet with it. Then those can be tailored to support the process of healing and recovery.

Jeannette Lager: There's also a few questions about PMS, and I think that this is a good question with regards to when we think about pain options and pain management. The question is, how do you identify ways, just moved, better to identify what is regular PMS symptoms and tracking them or more serious conditions like endometriosis, and how to advocate for treatment? I think that this is a great question because I think it's including thinking about what you were talking about, Dr. Matthews, about thinking about PMS and maybe ways of tracking it. I think that it also leans into some of the element of chronic pain and different modalities for treatment that Dr. Becker, I know that you also specialize in. I was wondering if you could both talk about that a little bit.

Jenifer Matthews: Sure. Yeah. So I'm also looking at some of the questions and seeing. I think there's two parts to the question. How do you know, it's just PMS and not something else? Then what are some strategies for management of the discomfort or pain that can come along with that?

Jenifer Matthews: We are lucky to work within a medical system where we have access to

phenomenal OB gynecologists. I think when I'm working with an adolescent and it seems like PMS symptoms are coming up, and they're noting higher levels of distress prior to their menses, higher levels of cramping and pain and those sorts of things, usually, I think we start with, could this be PMS and try some of the strategies that have been listed. Again, an integrative approach thinking, should we try some NSAIDs? Should we try some OCPs? Should we try some of the supplements? Are you moving your body? Are you hydrating? So doing all of those things. Then if it seems like, gosh, you know what? This just seems like things are not really getting better or this is really severe, those things, that's when my brain goes, I think we need some help with this and that's when I think about sending the person to see a gynecologist to get a little more information about, could this be more than PMS or something else going on? Because this patient may require further diagnostics and things like that. That's how I usually think about approaching an adolescent who comes in and we think starting out, this seems like PMS. Sometimes, you get family history as well or something where the mom says, I have endometriosis. Again, it's like, I'm going to keep that a little bit more in the forefront then. But there are so many strategies for chronic pain management, and I know Dr. Becker could talk about this as well, that include things like the non-steroidals like ibuprofen, but there are things like a TENS unit, a transcutaneous electric nerve simulator, a non-pharmacologic approach to pain management that's really easy to use and adolescents can use for things like pelvic or cramping pain. We can touch on a lot of the chronic pain or the pain pieces to it, but I'll pause there and see if David wants to add anything to any of that.

David Becker: I think you've touched on this really nicely. It's one of the challenges around chronic pain is understanding what's at the root of the chronic pain itself. Are we addressing pain that is part of an active, ongoing, whether constant or intermittent inflammatory or other injury process where we have specific tools, pharmaceutical and otherwise? Or are we dealing with pain that has persisted past the normal state of healing? Is it pain that is no longer explained by what we can find? In which case, we're shifting our approach because pain itself has become the problem. The first step in that process is reframing and understanding about pain and why it's still present and what explains it when there doesn't seem to be an inciting feature any longer. That's one of the first things to try and distinguish when somebody has had persistent chronic pain. Integrative modalities, whether they're TENS units, massage, mind body strategies, acupuncture, manual medicines, a whole host of things will apply in both circumstances to differing degrees and also depend on their particular symptoms and goals. Those cultural factors, people may be drawn to more strategies when we don't have enough evidence to say distinguish acu therapy from another model or approach. Then we look at what a role expectancy can play. If there's actually a belief and expectancy, a desire, hope that a particular strategy is going to work, it's actually more likely to work. It doesn't diminish the evidence of its efficacy from a placebo control standpoint, but it improves it beyond that.

Jeannette C. Lager: Thank you so much. I would just add from the standpoint of advocacy, Monica mentioned in the question. I do think that sometimes, it can be helpful to use a period tracker. There's many different ways to do it, but I think it gives the patient and their parents some control to say, this is when you're having your periods. This is the symptoms that we're having. Yes, it does seem like they're tied together. It's important to know that, I think, like Dr. Matthews had mentioned, when people start their periods are not always clockwork and regular. They can't be very regular, that we expect that with an immature system as it's developing more of a regular menstrual cycle. Endometriosis is near and dear to my heart. I'm the Associate Director of the Endometriosis Center, and as we know, there's a long delay in diagnosis for many patients. It can be 8-10 years before they're diagnosed. I think you're asking a really important question, which is paying attention to the symptoms that adolescents are having, using all of these great techniques to try and address pain. If it's persistent, those things aren't working, thinking about these other possible diagnoses and keeping them in mind.

Judith Cuneo: There's a question for both of you, about what you're seeing in your practice now. Are

there particular integrative therapies or modalities that are especially interesting to your young patients? We talked about nutrition and wondering if there are other things that people are asking for.

Jeannette C. Lager: The hot takes for teens.

Jenifer Matthews: No. Go ahead, David, please.

David Becker: It's interesting. In my experience with this, I get much less interest from teens directly, and I get a lot more interest from parents. It's more common for kids to show up in the clinic sitting off to the side, not so interested engaging in the visit and the parent saying, tell my child to meditate. The process becomes one of a whole family visit about exploring what the parent is concerned about and why, where the kid is with this, and what's going on, what they're interested in, and why they would or wouldn't be. I'll use meditation or mindfulness as a really good example because nowadays, most every teen that comes into the clinic has had some exposure to the idea of mindfulness and some exposure to some practice, usually, in school, the vast majority of them said, oh, it was a joke. We sat in the back of the classroom and like, what's going on with this? We have no idea what's happening. It's unfortunate because the intent is good, the intent to expose to this idea of mindfulness, and I'm sure it lands with a certain number of students, but for whatever reason, the posts that I end up seeing usually have at best a neutral experience. They need a reframing. They first need a validation like, that sounds like that was terrible. Then a discussion about, if that appears to be a modality that's helpful about what might be helpful or not. But it's an interesting question because at least nowadays, I get more questions about things from parents than I do teens. Once I've gotten to know teens for a while, then actually some of the other questions may come up. They can be all over the map. It can be about a certain supplement, it could be about certain tea, it could be about acupuncture, it could be about psychedelics, it could be a whole host of things. What's your experience, Jen?

Jenifer Matthews: Well, I would say, I think, it's interesting thinking about the social media piece. [Laughter] Because people come in with quite a bit of information about supplements and botanicals from sources like TikTok and other social media sources. There's some good information out there, but unfortunately, there's a lot of misinformation. But I would say that's a hot topic and feels like much more so where I meet teens who are already taking things and multiple things and maybe started them without the consultation with a clinician. I'm always really excited to talk about that and usually, encourage people to bring in what they're taking so that we can actually really look at it together. The thing is herbal medicines are really powerful and can be really wonderful, but also can have interactions with medications and side effects. That's one area. I think there's been a lot of growing excitement and interest and uptake, which I feel really excited about and also, really cautious about because we really want people to be using things safely. I do think, as David, you mentioned, a lot of parents are excited about acu therapy, which we provide in our clinic. Teens maybe less so because they hear the word needle or acupuncture, and they're like, I'm good. But then we try it, and most of the time, teens love it. One other thing I'll mention is, this is one thing I've been interested in. I have a subset of adolescents that really like ASMR and use it for anxiety and have all different things they're listening to and watching as a relaxation strategy. That was a new one for me. I've had fun checking it out and learning more about it in terms of being better able to understand what some of the teens are using as a coping mechanism.

Judith Cuneo: Speaking of the reality that many people self-prescribe, both adults and parents for children or older teens seek treatments for themselves, I wonder if you have recommendations for people about how to find quality products, perhaps, databases that you might recommend. Also, I want to highlight that if someone, for example, does a search about dosing of a particular product, they may come up with inaccurate information, but also adult dosing. I'm curious if you want to speak at all to pediatric versus adult dosing of supplements.

Jenifer Matthews: Yes, great question. This is something we're actively working on working with our medical trainees around because it's starting to come up so much more in the clinical space with families. I think navigating taking safe or finding safe herbs and supplements is a big topic. The reality is we can all get on Amazon and order something and it's at our house the next day. We don't actually know if what we ordered is even inside the bottle. There's a study also that was done where a group of people went to things like CVS, Target, Walmart and pulled things off the shelves, and a very high percentage didn't have what it was supposed to have in it or had contamination in it. That's one of my big concerns with people taking something that might not have been tested, tested for purity, and tested for it actually has in it, what it says has on the label. They're spending money out of their own pocket and often it's not cheap and it could have contamination. It could have heavy metals or microbes, or it may just not have anything in it at all. That's where it's really important to, if you can work with your clinician and say, I'm thinking about taking this. Can you help me or get me to somebody that can help me? That can be very helpful. I will briefly mention, and please, if any of you also have things to add about this, but there are a few helpful labels on supplements that can be very helpful. One of those is NSF and one is USP. Those labels help us know that these supplements have been vetted and tested and have had to pass a certain level of certification. That's one way to think about it. There are different apps and websites that we can also use to look things up. But getting into dosages for pediatrics is another large topic where there's a lot of things to think about there, but it is not just take the adult dosage because metabolism is different and so needing to think about adjusting the dosage, I actually use a calculation based on the patient's weight to adjust the dosage when I use something that has an adult dosage where I want to extrapolate it for a pediatric patient.

David Becker: I just add to that one of the main reasons this continues to be a problem is the lack of regulation federally, and this is just something that the federal government has dropped the ball on. The supplement industry is massively profitable and not particularly interested in regulation. That said, quite a few companies have really good internal self-regulatory mechanisms to test for purity and contaminants. In addition, there's one resource I'll mention, consumerlab.com. This is one for a relatively low annual fee. You can get quality reviews of specific brand name supplements to at least give some guidance on, does the product have in what it says it has in it, and is it free of at least a certain amount of contaminants? That's easily accessible, relatively cheap resource. Then, otherwise, talking with your providers and asking for guidance. The more you push for guidance on this, the more the healthcare system is compelled to need to address it.

Judith Cuneo: We are wrapping up our time together. I want to thank you both so much for your expertise and your time this evening. Thank you to everyone who attended.

[Music]