Applying the Science of Toxic Stress to Support Children's Health – Transcript

April 14, 2021

Jennifer Ryan: Hello, and welcome to today's ACEs Aware webinar focused on Applying The Science of Toxic Stress to Support Children's Health. This is our 12th educational webinar in a series designed to share practical information on screening for ACEs and providing trauma informed care. Your feedback is highly valued and we do use it to create our ongoing webinar content. So please continue sharing your thoughts with us after each of these sessions.

Jennifer Ryan: My name is Jennifer Ryan and I serve as the executive vice-president at Aurrera Health Group. We are proud to be supporting the office of the California Surgeon General and the Department of Healthcare Services on the ACEs Aware Initiative.

Jennifer Ryan: Before I introduce our speakers today, please note that you can receive continuing medical education and maintenance of certification credits through those ACEs Aware webinar. All information related to CME and MOE credits can be found in the chat. These credits will also be available to clinicians viewing this ACEs Aware webinar after today's event.

Jennifer Ryan: As always, we want to thank those of you who submitted questions in advance. Many of those questions will be covered during the speaker presentations and the question and answer period that follows. If you would like to add some questions to the Q&A icon at the bottom of your screen, you may do so. Right now, attendees and the chat function on muted. Our ACEs Aware team will respond to you directly, and we'll also be sharing some resources through the chat.

Jennifer Ryan: Now let's get started. Today, we'll hear from three excellent speakers. First, Dr. Rachel Gilgoff, Child Abuse Pediatrician, and ACEs Aware Clinical Advisor, as well as a Pediatric Integrative Fellow at Stanford University. Then we'll meet Neeta Thakur, Assistant Professor at the University Of California, San Francisco School of Medicine. And finally, we'll hear from Dr. RJ Gillespie, a pediatrician in the Children's Clinic in Portland, Oregon.

Jennifer Ryan: Our speakers will discuss the physiology of toxic stress as medical providers who research and treat ACE associated health conditions in children, especially asthma. Then we'll hear some real case studies from a clinical provider who uses a screening and evidence-based interventions as part of clinical practice to provide better patient care. And we'll end by answering a few of your questions. And now I'm excited to turn things over to Dr. Rachel Gilgoff.

Dr. Rachel Gilgoff: Hello. My objective today is to review the physiology of toxic stress. So let's jump right in.

Dr. Rachel Gilgoff: The term Adverse Childhood Experiences or ACEs refers to 10 categories of adversity, including physical, emotional, or sexual abuse, physical or emotional neglect, and the five household challenges you see in this slide.

Dr. Rachel Gilgoff: One piece that's really important to recognize is that the 10 ACEs identified in the landmark CDC Kaiser Permanente studies are certainly not the only risk factor for toxic stress. Other factors such as discrimination, separation from a parent or caregiver for other reasons like deportation or migration, or even any medical trauma, may be a risk factor for toxic stress.

Dr. Rachel Gilgoff: The ACE study, as well as numerous additional studies have shown that ACEs are common, with nearly two thirds of us having at least one ACE and 12%, so one in eight of us, having four or more ACEs. The other important finding is that ACEs are associated in a dose dependent manner with worse health outcomes. And this includes nine of the 10 leading causes of death in the United States. Dose dependent, meaning that with every additional category of ACE someone has, there's a higher risk of poor health outcomes. The Office of the Surgeon General has pulled together a list of ACE associated health conditions and what's presented here on this slide is just a partial list. So the longer list is available for both pediatric and adult conditions on the ACEs Aware website.

Dr. Rachel Gilgoff: So how does adversity in childhood become toxic stress, impacting our physiology and increasing our risk for poor emotional and physical health? And to answer that, we really have to look at our biological threat response system. So I use the example of a snake on a trail because it happened to me. I was jogging with my friends, saw a snake up ahead. I couldn't think clearly. I couldn't speak. I let out this weird jibberish scream. My heart was racing. And yet at the same time, my right arm

jumped down in front of my friend without any conscious thought, stopping her from stepping on it. And how did that happen? Why couldn't I speak and think, but my arm could go out and help protect my friend? And these are really impressive biological and physiological mechanisms here.

Dr. Rachel Gilgoff: And it all starts with a perceived threat and I did write perceived threat for two reasons. First, what if I had actually mistaken a stick for a snake. Crazy, but the same physiologic process would still happen. So how we perceive an event is as critical as the event itself. And the other reason I'm highlighting perceived threat is what if I actually have fond memories of coming across a snake with my mom on a camping trip, for example, and my mom was calm and excited to see the snake, right? I would probably not feel threatened by the snake when I was jogging. And that really speaks to the power of the buffering relationship in calming our threat response system and shaping both our present and future perceptions.

Dr. Rachel Gilgoff: So this perceived threat is coming in as a sensory input through my eyes, in this case, as a snake, but could be through my ears or my skin, if I feel something. And then it's carried through my cranial nerves to the lower and mid brain first. So our perception of threat is largely determined by the locus coeruleus and the amygdala before the frontal lobes can register what's going on or weigh in. And the amygdala is often termed the threat detector and then signals the release of stress hormones. So cortisol through the HPA access and norepinephrine and epinephrine through the sympathetic nervous system pathway. And this is initiating that fight or flight response.

Dr. Rachel Gilgoff: And it's really designed to accomplish three major goals. So think quick, shift to quick instinctual, emotional thinking. Don't take time planning A, B or C. By that time, the snake's already bitten me. Get energy to my muscles. So engaging my endocrine and metabolic systems. I breathe faster to get more oxygen. I mobilize glucose and amino acids into the blood. My heart rate and blood pressure go up to distribute this oxygen and glucose to the muscles. And I'm going to shut down non-essential functions like digesting my meal. And then three, protect. So the sympathetic nervous system largely is going to activate my immune system in case there's an internal invader, right? I get bitten and I need to mount an immune response and the HPA access and cortisol are generally, these are all oversimplifications, but they're going to quiet that

inflammatory system to get me back down to baseline when the threat is over.

Dr. Rachel Gilgoff: And then the freeze response. So if we cannot escape, if we feel powerless, our system can refer to one of a few freeze responses and that can involve releasing endogenous opioids, engaging the parasympathetic system, and constricting blood to the periphery. So essentially playing dead and hoping the threat goes away. And this is the system that's often activated in dissociation and dissociation related medical issues.

Dr. Rachel Gilgoff: This threat response system is a fantastic evolutionary response against snakes in the middle of a trail, and may keep us alive in overwhelmingly stressful situations, such as neglect, and violence, and loss. But what if there are scary snakes at home every night, right? What if a child or an adult perceives a snake around every corner and stress response becomes chronically activated or repeatedly activated? This constant or repeated or prolonged reactivation can lead to a hyperactive or actually dysregulated system. At some point, our brains and bodies adapt, become really good at detecting reacting to threats, even if the snakes are no longer around. It goes from being adaptive and life-saving to maladaptive and health damaging.

Dr. Rachel Gilgoff: And so ACEs are stressors. They're risk factors for toxic stress, but they're not destiny. That depends on protective factors that we have around and predisposing vulnerabilities. Toxic stress is the physiologic response. It's this NEI, neurologic, endocrine, immune metabolic dysregulation seen in the pink arrow. And then this can lead to those poor health outcomes.

Dr. Rachel Gilgoff: There is substantial individual variability in how the impact these experiences manifest over the life course. So it's important to know that ACEs are not destiny. So there are people represented in this top line who've experienced ACEs and live long and healthy lives.

Dr. Rachel Gilgoff: For a long time, we really thought about ACEs and the long-term health impacts in terms of this bottom line that's in this diagram. You have a rough childhood. You're more likely then to engage in risky health practices, such as drug use and risky sexual practices. And that it's these risky behaviors that then lead to worse health. So from smoking and alcohol and the drugs. And while this does happen for some people, and this is a pathway, there's actually also this whole other group represented by the middle line who have ACEs. There is a disruption of that neurologic, endocrine, and immune function, because of the glucose

and because of the heart rate and high blood pressure being chronically activated, they don't adopt risky health behaviors, but they still have increased risk for heart disease, COPD, and all of these other conditions. And so that's why it's so important to think about ACEs and screen everyone, even those who may not be obviously symptomatic, to break this cycle.

Dr. Rachel Gilgoff: When I was working at the Center for Youth Wellness in San Francisco, we organized the ACE associated health conditions into the categories of neurologic, endocrine metabolic, and immune, as a way to help assess for signs of NEI dysregulation. Again, while ACEs are known to be associated with elevated risk for poor mental and physical health, in practice, it can be difficult to see beyond the behavioral and mental health issues and symptoms like the school problems, and drug use, depression, anxiety.

Dr. Rachel Gilgoff: The hope is though that grouping these health conditions by NEI, by taking a step back, looking at the big picture, we can then actually start to link what may seem to be disparate medical conditions with the underlying physiology, this toxic stress, that a person may be experiencing. And sometimes this may even point to a change in diagnosis.

Dr. Rachel Gilgoff: So for example, let's say I'm treating a child with ADHD and behavior issues, and we're really struggling. And the stimulant medication does not seem to be working. And I take a step back and I realize the child's also overweight and has been having frequent asthma exacerbations. And now I'm seeing that this child actually has issues in the neurologic, endocrine metabolic, and immune systems. And I look at the ACE score and I see that it's a two. And now this is all suggesting that maybe these conditions and symptoms are connected and there are this underlying physiology of toxic stress. And the ADHD might actually not be ADHD, but rather developmental trauma disorder. And this could mean changing to guanfacine, an alpha two agonist, which will lower blood pressure and regulate the release of norepinephrine from the locus ceruleus, and helping to address any current stressors and adversity, and providing those stress regulation strategies that we'll talk about in a slide later, to really treat that underlying physiology, that overall NDE dysregulation, and what might happen then is that'll help improve the weight issues and the asthma as well.

Dr. Rachel Gilgoff: So what can we do across the lifespan? Toxic stress is treatable. So I'll give a brief intro into the clinical response and Dr. Thakur and Dr.

Gillespie will take a deeper dive. And so to go through this slide just briefly, to point out that a full effective clinical response should start with trauma informed care. So start by addressing any immediate safety concerns in a safe, empathic, trauma informed manner.

Dr. Rachel Gilgoff: Two, calm the threat response system through patient education, helping them link their ACEs toxic stress and health conditions, and using those seven strategies for mitigating toxic stress that I'll talk about in the next slide. Using a strengths-based approach, so evaluating for those protective factors. Four, thinking about what I can do in my clinical practice, and when I need to refer for additional services. And five, thinking about more frequent follow-up for patients who might have a higher toxic stress related need.

Dr. Rachel Gilgoff: Okay. So when we're screening for ACEs and ACE associated health conditions and protective factors, what is it in that clinic moment that I really want to know of? What I want to know is how I can help in that clinic visit and these seven areas, these evidence-based, and evidence-informed strategies have all been shown to reduce stress hormones, reduce inflammation, and enhance neuroplasticity. So these are key mechanisms to counteract that toxic stress response and improve overall health and wellbeing. And if you get one thing from this slide, I hope it's this. That again, toxic stress is treatable, and we have tools and strategies to help people heal their physiology. And we do this by focusing on creating safety first for that patient, helping to stop any current or active threats.

Dr. Rachel Gilgoff: And then by using these seven strategies with a trauma informed lens. So starting with supportive relationships, we can ask about who they talk to when they feel sad or scared? Do they feel like they belong in a group? And if not, we can help connect them to things like support groups and team sports, and parenting classes, home visiting programs, dyadic, or family, mental health interventions.

Dr. Rachel Gilgoff: Sleep. What if the child can't sleep because they're worried about the bully at school or the patient with PTSD and nightmares? These involve additional discussions and potential interventions beyond our routine sleep hygiene discussions. So stress management tools like talking to a friend or a parent. Using a journal before bed or specific therapies and medications for PTSD related nightmares.

Dr. Rachel Gilgoff: Nutrition, we can talk to patients about their biology, such as having healthy high fat, high sugar foods, like fruits and nuts, close by to curb

those cortisol induced cravings. Prescribing an anti-inflammatory diet. Exercise can help us metabolize that extra energy, that extra glucose running through those blood vessels. And that'll decrease the risk for diabetes and inflammation and improve cognitive function.

Dr. Rachel Gilgoff: And that'll decrease the risk for diabetes and inflammation and improve cognitive functioning.

Dr. Rachel Gilgoff: Mindfulness, to practice listening to our bodies, to be aware of our emotions. Create that space between sensory input and reaction.

Dr. Rachel Gilgoff: Nature, we can write a prescription for nature. We can make referrals to eco therapy and adventure based mental health programs.

Dr. Rachel Gilgoff: And of course the importance of mental health, right. Referrals to mental health providers that specialize in trauma treatment and medications. So thank you so much and excited to hear from Dr. Thakur and Dr. Gillespie.

Dr. Neeta Thakur: Thank you Dr. Gilgoff for that great introduction of connecting adverse childhood experiences to health.

Dr. Neeta Thakur: Over the next 15 minutes, I'll start to talk us through on how ACEs are connected to toxic stress, which may increase risk for poor health and for the life course. And before we take a deep dive into the biology, I wanted us to review the types of stress and what those responses may look like.

Dr. Neeta Thakur: So when we think about stressors, it's important to think of the nature of the stressor, how that stressor is perceived, the ability to cope and then the physiological response. And so there is positive stress, which is a type of stress that we think about when we're out in nature and trying to fight a bear. Either you're going to run or you're going to stay and fight. And to do that, we need to have our heart rate increase so our muscles are strong. We also need our lungs to expand so that we can breathe well. This is normal and this is healthy.

Dr. Neeta Thakur: The second type is tolerable stress. So this is a serious, temporary stress that is known to have an end in sight and importantly, is buffered by supportive relationships. This is the type of stress I think about when someone is having to study for a really long time for a big test or someone that is going through grief, but has supportive relationships around to help them cope and deal with that stress.

Dr. Neeta Thakur: The last type is toxic stress. So this is the prolonged, chronic stress where there's no end in sight that the stressor is going to go away. Plus, there's

an absence of protective relationships. And in that state, the biology over time continues to be active and things change.

Dr. Neeta Thakur: There are three main categories of biologic responses that I'd like to talk about today. The first is this concept called allostatic load. And that idea is that those primary hormones, cortisol and adrenaline that are released during the stress response, continue to be released over time and they have an effect on other organs that lead to changes that increase your risk for health.

Dr. Neeta Thakur: The second are genetic changes, and this is either how the stress may turn on or turn off genes. How it may change the way that the genome is folded through processes called epigenetics or how it may interact with a person's microbiome and allow for certain bacteria or fungi to flourish and contribute to negative health.

Dr. Neeta Thakur: The last way is through neuroplasticity. There is good evidence that childhood adversity is shown to shrink the prefrontal cortex. And that has implications for executive functioning.

Dr. Neeta Thakur: Now, let's talk about allostatic load a bit more. In this framework, we need to go back and think about our fight and flight response. In that response, we have two main hormones being released. Those are the catacholamines in cortisol. That release has an immediate effect and then with chronic release of those hormones could have potential negative, long-term impact.

Dr. Neeta Thakur: So let's look at the schematic with this child experiencing stress and that leading to the catecholamine release in cortisol. Immediately, that leads to an increased heart rate, blood pressure, your smooth muscle relaxation, your lungs opening up, causing you to take deeper breaths, increasing your blood sugar so that you can have energy readily available and causes your pupils to dilate so you can see well.

Dr. Neeta Thakur: These are all really great responses if a bear is attacking you. However, to be in this vigilant state chronically, can have really negative health effect. And over time, having those systems revved up on a chronic basis can lead to things such as high blood pressure, asthma, diabetes, and other illnesses in adulthood. And more recently, we've also been showing that these health outcomes are starting to happen in our kids.

Dr. Neeta Thakur: The term allostatic load comes from this idea that homeostasis is no longer being maintained. And so over the life course, if you continue to have chronic stress, those set points where you get stressed, and then

you're not stressed, you come back to normal. You get stressed and then not stressed you come back to normal. But over time, you no longer come back to homeostasis. Instead, you come to this new set point. And that difference between where your set point was before, to this new set point, it's referred to allostatic load.

Dr. Neeta Thakur: Pragmatically, how is that measured? Well, we're looking for dysregulation across multiple biological systems. And so we're not looking for big, huge changes in biomarkers. What we're looking for are these small little wears and tears across your cardiovascular system, across your metabolic system, in the immune response, things part of the HPA axis, parasympathetic nervous system and in the kidney liver function. And then when you add up all of those tears, what you get is your allostatic load index. And what we know from the adult literature is that with more adversity, meaning higher ACE scores, your allostatic load index is increased. And we think that that increase is what puts you at risk for poor health in adulthood. We're still learning more about how this relationship is in children, because when these biological tears happen, can happen at different time of the life course. And so may be difficult to do the same sort of index in kids.

Dr. Neeta Thakur: Now let's talk about the genetic changes and I'm going to focus today about epigenetic changes. There's a couple of ways of thinking about that. One is with telomere length, and the second is with methylation of the genome. I think these are important to go through because these can have intergenerational effects, in that if a mom is stressed, that can affect her embryos, which can then affect the future generations and so this can have an intergenerational process with ongoing chronic stress.

Dr. Neeta Thakur: And so with telomere length, I think the best way of thinking about this is the caps of your DNA. And so at each chromosome, the ends are capped with telomere and that helps protect the chromosomes from being degraded. And as you age, or as you're stressed, what we know is that those telomeres get shortened. When those telomeres get shortened, things can change in the biology.

Dr. Neeta Thakur: The second is with methylation. Methylations are these bodies that get attached to the DNA structure. As these accumulate, they can change the way that the actual DNA is folded. And so in their presence, the DNA can actually fold differently and express genes that weren't previously expressed, when they weren't present. And so this is this idea, is that

with increased methylation or changes in methylation patterns, you can turn on or turn off genes.

Dr. Neeta Thakur: And now I'm going to shift gears and talk about the Pediatric ACEs and Resiliency Study. This study was a partnership between Benioff Children's Hospital, Oakland, UCSF School of Medicine and the Center for Youth Wellness, and was one of the first research projects at the Bay Area Research Consortium on Toxic Stress and Health.

Dr. Neeta Thakur: Through PEARLS, we aim to do three things. The first was to develop a screener for ACEs for primary care, which is now known as the PEARLS Tool. The second was to examine for associations between adverse childhood experiences and health in childhood. And the last one was to develop and pilot primary care based interventions.

Dr. Neeta Thakur: The PEARLS Tool encompasses the three main domains of ACEs as we know them, and then adds in related life events that have also been shown to be associated with biologic responses to stress, and also with health outcomes across the life span. The interventions that we tested were care coordination, anticipatory guidance, and resiliency clinic.

Dr. Neeta Thakur: For all individuals that were screened with the PEARLS Tool, we offered a short two minute scripted statement. This was delivered by providers after they received training on what toxic stress is and its connection to health and how ACEs may contribute to toxic stress. Care coordination and resiliency clinic was offered to those individuals that screened positive for any PEARLS items, so those that had one or more items. Care coordination involved doing an additional screening for unmet social needs and that's current unmet social needs. And what we would then do is connect them to community resources to help address those unmet needs.

Dr. Neeta Thakur: Resiliency clinic was a monthly group class that included caregivers and the patient participant and led by a mental health provider. Over the course of the six month period, the mental health provider would take the group through caregiver relationship building exercises and self-regulation exercises. Many of these were art based. These were all operated within our primary care clinic at Benioff Children's Hospital, Oakland.

Dr. Neeta Thakur: In the PEARLS study, we included 555 children. A third of that group was randomized to usual care. Another third was randomized to being asked about PEARLS or adversities using the identified screeners, asking about

each and every item. And a third was asked using the de-identified screener, so of these items, how many has your child's experienced. And of the kids that participated in one of the screening arms, we saw that almost 20% of them endorsed four or more PEARL items. Here I show the distribution of the different types of PEARLS or adversities that our children were experiencing.

Dr. Neeta Thakur: One thing I want to talk about is the connection between adversity and asthma. In this population, asthma was really high. In fact, almost 43% of our kids had asthma. In comparison, the national prevalence of asthma in children is 8.3%. In California, it's around 14%. And specifically in the San Francisco Bay area, the prevalence is around 20%. So we're seeing a prevalence that's almost 20% higher in the Benioff Children's Hospital, Oakland primary care practice. We also see a large number of adversities endorsed. And in fact, when we looked in our study population, we saw that in comparison to children that reported no ACEs or no PEARL items, that those that had four or more ACEs had two and a half times more likely to have asthma than those kids that had no ACEs. And we also saw this dose relationship, that with increasing number of PEARL items that you endorse, the more likelihood that the child had asthma.

Dr. Neeta Thakur: This has been seen before in other studies where we see this association between adversity and asthma start early. What's new about the PEARL study is that we also see that adversity is associated with asthma symptoms, including wheezing in the past 12 months, severe wheezing, frequent wheezing attacks, and wheezing that interrupts sleep. All markers, that the child has uncontrolled asthma.

Dr. Neeta Thakur: As we're starting to move forward with screening in primary care and other pediatric settings, I think it's important to start thinking about how do we incorporate childhood adversity into our clinical approaches for children with asthma.

Dr. Neeta Thakur: And so, I want to go through a case, and this is a young boy, who's 12 years old. He has asthma since he was a young child and he's been hospitalized numerous times for asthma exacerbations. In fact, he's been hospitalized about two times in the past year and requiring a couple of day admissions for those exacerbations. He reports taking his medications as directed and has been on inhaled corticosteroid therapy, Montelukast therapy, and anti-histamine therapy for his allergies.

Dr. Neeta Thakur: When reviewing his history, you find out from his caregiver that's there today, that the caregiver and their partner are going through a separation

and the boy interrupts and comments that there's been a lot of fighting in the house and that sometimes he feels scared. The caregiver also says that part of the reason that it's been taking so long for the separation to occur is because she has been dependent on her partner for housing. Now they're in between housing and having trouble finding a stable place for the boy to live.

Dr. Neeta Thakur: And so, when we think about this child's asthma, it's important to think about it in the context of his current and chronic exposure to stress. So for this child, he has several childhood adversity experiences that are ongoing that might be interrupting and contributing to his poor asthma control that we are seeing today.

Dr. Neeta Thakur: Here, we can see that these stressful events can interact with environmental triggers and cause elevation of inflammatory responses in the body. Those inflammatory responses over time can lead to a blunted response to cortisol and that over time can lead to more airway hyper-reactivity, cause allergies to be worsened, and ultimately lead to asthma exacerbation.

Dr. Neeta Thakur: And this has important implications because chronic elevation of cortisol or the catecholamines may actually impact our response to important rescue and controller medications for asthma. In this study by Miller and Dr. Chen, we see that in children that have major life events and chronic stress, tend to have downregulation of the receptors that respond to our rescue therapies. So in the top graph, we see downregulation of albuterol receptors or beta2-agnoist receptors in those kids that have asthma, which is our main rescue therapy for asthma. In the graph below that, we see similarly that there are downregulation of the glucocorticoid steroid receptors, which is really important to note considering that is our main target for controller medications in children with asthma. And so this might be a reason or a potential explanation for how stress can lead to poor asthma control despite adequate medication, prescriptions and adherence.

Dr. Neeta Thakur: As there are more and more studies that are connecting stress with asthma, we have now formed a committee to review what are the current asthma guidelines from the NIH and from GINA and have also looked at the stress literature. And through that work, have come up with some preliminary algorithms of how to think about approaching a child with asthma who may also have adversity happening in their life. And these are prelim algorithms that I'm sharing from the National

Committee on Asthma and Toxic Stress. So for kids that are having current, recurrent or frequent or severe asthma symptoms, we recommend asking about stressful events that might be occurring in that child's life. And also thinking about screening formally for a history of ACEs or other adversity using the PEARLS tool. And then asking also, or considering asking about any stressors that the caregiver might be experiencing, because we also know that caregiver stress can contribute to poor asthma control in the child. From there, you want to first start with assessing for current safety and consider addressing parental stress, depression, or anxiety, if there is capacity.

Dr. Neeta Thakur: For all patients, I think it's important to talk about how asthma and stress are connected. In some certain stances, the patient and the caregiver may not be comfortable with disclosing stressors that are happening in their life, especially if there's not good understanding of this connection of stress and health. By providing anticipatory guidance, you may provide a future avenue for that information to be shared with you as a provider. We also think that providing strategies on stress reduction are helpful. There is a couple of study that show deep yoga breathing exercises, mindfulness can help with asthma control symptoms. And then also thinking about looking for other sources that may be leading to inflammation. Here are some assessment recommendations for screening for downstream impacts of chronic stress. So looking for autonomic system dysfunction, looking at across the immune system, assessing for comorbid conditions that are associated with toxic stress. And in addition to this, also assessing for current social needs and potential environmental triggers.

Dr. Neeta Thakur: In addition to these assessments, the management recommendations are outlined here. And so for anything that comes up through the ACEs screening or for other adversities, following current protocols on reporting and providing additional supports is necessary. If you're seeing any signs of autonomic dysfunction, there are some studies that suggest adding in an anti- cholinergic medication, such as tiotropium or ipratropium to the medication regimen may be helpful. So that's something to consider. For helping with strategies around stress reduction, referring for integrative medicine approaches to decrease stress and inflammation. And so these can be suggestions such as sleep, exercise, thinking about the diet. Having increased connections with nature, mind, body healing, and thinking about addressing issues of mental health.

Dr. Neeta Thakur: We also think it's important that when screening for current social needs and environmental triggers, that to provide resources to help address those unmet needs and environmental triggers, which is an important cornerstone of asthma management. If there are signs of increased inflammation, particularly if there are markers of increased eosinophils or increased IgE, suggesting that there is a type two inflammation associated with the patient's asthma and they continue to be uncontrolled, we do recommend that considering a referral for subspecialty care to pulmonary or to allergy for further support. And I wanted to end this session with this quote is that, "People live their lives in holistic manners." So when we're tying to talk about medical issues, it's really important to consider ongoing activities and stressors that are occurring in that individual's life and incorporating those into your approach for their care. And now I'll hand it over to Dr. Gillespie. Thank you.

Dr. R.J. Gillespie: Thank you, Neeta. As you've heard earlier, many of the adult medical conditions that we worry about can be attributed at least in part to ACEs. And certainly the way that our medical training goes, we're taught to treat these diseases as individual illnesses in and of their own right. But what the ACEs study teaches us to do is to think about each of these different diseases as symptoms, and that certainly changes the framework that we approach many of these problems from. So if we're not screening, what happens?

Dr. R.J. Gillespie: First of all, we're often stuck in a medical framework. So we're kind of locked into our traditional way of thinking. Screening might allow us to think beyond our typical medical training to see trauma in all of its forms or at least to add it to our differential diagnosis. That said, if we're not doing screening, do we get to the point fast enough in a clinical visit or a screening, in fact, helping us with some efficiencies throughout the course of our medical visits. And even further, if we're not screening, are we missing out on opportunities to prevent some of the outcomes attributed to ACEs, knowing that what's predictable becomes preventable?

Dr. R.J. Gillespie: I'm going to talk through a couple of cases from our clinic in terms of patients that we've come across, where I think screening versus not screening helps to illustrate how things could have been different or could have been better. The first case that I want to talk about is actually a 15-year-old girl who came into my office with her mom for a well visit.

And she is doing what we would typically think of as everything wrong. She was skipping out of school.

Dr. R.J. Gillespie: So she was being kicked out of a last ditch high school. She was having violent fights with her mom to the point where mom had to call the police several times because her daughter was actually throwing furniture at her. And she was having unprotected sex with her boyfriend who was 26. And she was experimenting with meth, marijuana, and cocaine. As a clinician, I'm sure you can imagine the sort of deep breath you have to take to really tackle this kind of patient. But after figuring out this history, I simply asked her if she had any goals, her response to me was, "You think I'm having unprotected sex because I don't have any goals? You're a..." And then she called me a name that I won't repeat here.

Dr. R.J. Gillespie: I think that you can imagine the initial shock of having that kind of a response from a teenager and frankly it was an outward attack. And oftentimes the response that we have is to kind of get militant on her almost and tell her, "I'm the adult. I know what's right for you, and here are the things you're going to do differently." But in my head at the same time, I'm also thinking through a review of possible resources and things that I might have to do for this patient. Do I need to enroll her in a substance use disorder program? Do I need to connect her with a mental health provider? Do I need to do STI testing or pregnancy testing? Do I need to do a DHS report because of the statutory rape that was going on with a 26 year old?

Dr. R.J. Gillespie: And the answer is yes, of course, but if you think a little bit further into why this patient became the way that she did, you end up with a slightly different response. But what I actually did in this visit was first get mom out of the room so that I could talk to the teenager on her own and decided to ask her a little bit more about her history of ACEs. And she reported her ACE score to me as five. First, she said that her father was out of the picture after going to jail for drug abuse. And that honestly is a loaded sentence because that's three ACEs in one. She also reported verbal abuse and emotional neglect as part of her experience. And certainly that changed my instinct in terms of how I approach this patient, because I could see a lot of her high-risk behaviors as being coping strategies for numbing herself to some of the experiences that she had had as a younger child.

Dr. R.J. Gillespie: And so we ended up talking more about resilience and really talking about different coping strategies, things that she could do that might replace some of these high-risk behaviors, but still help her to be respected as a person and to really honor the history that she was reporting. And to take that into account as we try to get her into a better place. In the words of Vince Felitti, "It's hard to get enough of something that almost works." So a lot of the high-risk behaviors that we see in patients really are ways to cope with unresolved trauma. And I think that if we approach things just merely taking away that high-risk behavior without putting good coping strategies in its place, then the patient's going to fall right back into those same habits. At the next visit, which I was surprised she came back at all, given her initial reaction, but at the next visit, I had her come in for a follow-up.

Dr. R.J. Gillespie: And at that point, she had transferred to a Gateway Program at our community college where she could finish her GED and get an associates degree at the same time. She had stopped all drugs except marijuana, and she had ditched her much older boyfriend. So all in all, really sort of startling big changes. And when I asked her what had changed, see said to me, "The kids at that last school were losers. They didn't have any goals." So remember that first question that I asked her about goals, it had actually sunk in. And I think that because someone had taken the time to listen to her and really understand her experiences, she was able to take my advice and take my help in a way that she probably wouldn't have if I had just treated her from a medical perspective.

Dr. R.J. Gillespie: Another case, and this is a case of a four-month-old who is in for a well visit. And mom's primary concern is colic. She gets home from work and the infant spends three or four hours crying every evening. This is a two parent household, so there's a seven-year-old sister at home. Mom works full-time, dad's in training to be a firefighter, so he's out of the house for 48 hour blocks several times a week. And generally, mom leaves work, immediately drives through traffic to get home to relieve the nanny and then comes home to this crying child. He's feeding fine, his growth is great, he's not spitting up, and really there's nothing else from his history or his physical that adds anything to this story. So it sounds pretty much like a run of the mill colic case.

Dr. R.J. Gillespie: So the typical medical response to this kind of case would be to think about silent reflux and maybe start antacids. We might recommend over-the-counter gas remedies or things to calm the baby's stomach, or we may simply reassure the mom about normal variants in behavior. But

when you ask mom about her ACEs, she had an ACE score of five. Her history was that her parents went through a bitter and fairly violent divorce. There was a lot of verbal abuse. Mom had witnessed domestic violence. There was substance abuse in the household. And so she came from a very loud household where there was a lot of yelling, both with her parents and at her.

Dr. R.J. Gillespie: And so her reaction to a yelling infant was actually that she was being triggered by some of the experiences that she'd had as a child. And a lot of the colic that her infant was experiencing was because the infant was reading stress off of mom. And so they were in this endless loop of the baby crying, mom getting stressed, the baby getting concerned about mom's stress and crying more. And so really this takes a different approach than just reassurance that this is all going to be fine in a few weeks.

Dr. R.J. Gillespie: So I started talking to mom about resilience and what she normally does to keep herself calm. And before the new baby, she used to do yoga and had some good self-care activities that she participated in. And so we talked a lot about how mom can return to a mindfulness activity. And now obviously with her schedule, things were a little bit difficult to think about scheduling an entire yoga class, for example, but we talked about how she could spend just even 15 minutes out of her day breathing, relaxing and recharging.

Dr. R.J. Gillespie: And so mom started a new habit of stopping on her way home from work to grab a cup of tea so that she could be a little bit more present when she got home. But also I think she understood now why she reacted the way she did to her crying baby. So when she came back at the six month visit, mom was much more relaxed. The colic wasn't entirely gone, but the stress was less. The crying was a little bit less and mom's perceptions were definitely improved. And over the years that followed that visit, mom was able to talk about other family stressors and talk about her parenting challenges pretty openly with me because she knew that I was going...

Dr. R.J. Gillespie: ... her parenting challenge is pretty openly with me because she knew that I was going to listen and that I was going to be there for her as she faced other challenges. I think the punchline of this case is that parents often need some permission for self care, but also the parents aren't always entirely aware of how their own experiences affect how they handle parenting, stressful situations or even their work life balance. So

why the cases worked and what might've been different? The first is the idea of radical acceptance. And that's a Buddhist principle that whoever comes through my door, I'm going to accept you for who you are and regardless of what your experiences are. That you are a human being with every right to my full attention and my acceptance and my caring. I think too, that there's a lot of power in just listening to people's stories.

Dr. R.J. Gillespie: Oftentimes when we're in a medical model, we spend time thinking through what we're going to do and how we're going to respond to the case in front of us without actually spending time to listen. And when we're distracted with that kind of mental cataloging of what resources we're going to do, we oftentimes aren't really present to listen to the story. I think too, that ACEs and screening for ACEs helps to change the culture of practice so that families understand that my office is a safe place to talk about whatever it is you need to deal with. And furthermore, I think that when we talk to parents about their ACEs, we help them understand what they're modeling for their kids, is that a repetition of what their experiences were or can it be something else? And can we help parents to model good self care and good relational skills with each other?

Dr. R.J. Gillespie: Now with universal screening for ACEs, would we have known the details of families like these earlier so that we could help potentially prevent some of the outcomes that might happen after somebody has experienced ACEs? Or even more importantly, can we prevent ACEs from happening in the first place? And I think that the process of screening gives us an opportunity to move towards prevention that wouldn't have happened if we didn't have the screens in place and if we didn't have the information from families that the screens give to us.

Dr. R.J. Gillespie: For us screening for ACEs in any context within our practice has made us aware of ACEs in all contexts. So, in my practice, we screen parents for their Adverse Childhood Experiences. But as I presented a case of a teenager, the reason that that case went well is that we're aware of ACEs in all contexts. I think the fundamental culture shift towards trauma informed care changes how we view patients and their problems. So instead of just asking what's wrong with this patient? We think, what happened to this patient? I think the other big lesson from screening is that our needs as healthcare providers are extending beyond what our clinic can provide on its own.

Dr. R.J. Gillespie: Now, everything that you've heard may seem a little bit overwhelming, and it may seem like you're faced with the idea of moving a mountain. And so I want to remind you that mountains can be moved. There's a force of nature that moves mountains, it's a glacier. Glaciers are formed by snowpack and snowpack is formed by snowflakes falling just in the right place one at a time. So it's not your job to necessarily be the glacier, but by understanding ACEs and potentially implementing a screening in your practice, you're becoming one of the snowflakes that will collectively move the mountain that we have before us. So a lot of not nice things have been said about snowflakes over the last several years, but I'm reclaiming the power of snowflakes. And you and I can be snowflakes together, and we can prevent ACEs and the effects of ACEs through screening and through awareness in our practice.

Jennifer Ryan: Thank you very much to all three of our speakers for those informative presentations. Now we'll do some questions and answers from the audience. We'll try to get through as many questions as we can today. Our first question for this group is from Robert and he asks, "I'm a specialty provider. Does ACE screening benefit my patients? Or is it better to leave that to general practitioners or family doctors? And if so, how would I connect them to the support they need?" Let's go to Dr. Gilgoff.

Dr. Rachel Gilgoff: That's a great question. I actually think it's critical for all practitioners, generals and specialists, to understand the science of ACEs and toxic stress and to consider screening in a trauma informed and strength-based way in their practice. For example as you heard in the session, a pulmonologist who has a patient with asthma, who's not responding well to their medications. The pulmonologist might jump to thinking that the patient's just not taking their medications. But in the setting of toxic stress we're finding that patients have decreased sensitivity to glucocorticoids and beta agonist medications.

Dr. Rachel Gilgoff: So most likely this is due to dysregulation of their HPA access and sympathetic nervous system. And then this would point to that pulmonologist to consider changing their medication regimen, as well as, as you point out, connecting that patient to additional support. ACEs Aware has implementation material. They're developing a roadmap for coalescing networks of care. So I definitely recommend looking at their website. And then also bringing together people at your clinic, your institution to have, and make a list ready of supports within the clinic,

social workers, clinic based programs, as well as community-based organizations that you can refer to. Great question.

Jennifer Ryan: Thank you for that response. The next one is a question from Jumee. She asks, "I have a busy practice. So how do I screen for ACEs when I already have so many other things to do during the patient visit?" Let's go to Dr. Gillespie.

Dr. R.J. Gillespie: Well, that's a common question whether or not screening for ACEs is going to throw off your whole schedule or open a Pandora's box that is just going to take up too much time in the course of a visit. And what I would say is that that's not oftentimes the case. In fact, when it's studied in family medicine practices, the process of screening and how that impacts immediate plan, the vast majority of the time, the immediate plan actually isn't changed. And that's because the disclosure of ACEs is really only new to one person. It's new to the provider, it's not new to the patient. And so in the course of a visit, at least 75% of the time, your immediate plan isn't changed in my practice. The conversation around ACEs takes on average, three to five minutes, but I would argue that you're not having any conversations that are more important than that.

Dr. R.J. Gillespie: Certainly, the screening for ACEs does help the patient in the sense of giving them an opportunity to talk about their experiences and giving them an opportunity to reflect on how those experiences might be impacting their health and their wellness. But more often, the disclosure of ACEs changes the provider. And when I've asked my providers how screening for ACEs has changed them, they tell me things like they have more empathy for their patients. They have a better understanding of the forces behind the decisions that they make in parenting, and understand better why parents often have challenges that we wouldn't have understood in any other way. And so really it makes the provider a better caregiver for those families.

Jennifer Ryan: Thank you. This question is also for Dr. Gillespie. "So let's say I find ACEs in my patients during my practice, now what?"

Dr. R.J. Gillespie: That's another common question that comes up. What am I going to do when I find trauma in my practice? Am I going to have the right resources? Do I have the good network of community providers that I may need to refer to? I think oftentimes though, that providers who are just starting screening think that all of the resources they need are going to be around mental health. So trauma focused cognitive behavioral therapy, PTSD treatments, things like that. When we asked parents what

they're interested in, oftentimes it's things like parenting classes, parents support groups, more information about trauma and resilience, mentorship programs, things like that, that are community-based programs that already exist. Home visitation is another great example.

Dr. R.J. Gillespie: Programs again, that already exist, that we don't necessarily think of connecting parents to, because we think that ACEs are going to result just in mental health therapies. And so I think it's important for providers to think outside the box in terms of not medicalizing ACEs necessarily, but really getting to the point of providing families with concrete support. These can often be achieved through again, home visitation programs, programs like Help Me Grow, Family Connects would be another example of programs that you really would want to have at your fingertips if you start screening for ACEs. Because those are the programs that most parents are really going to need or going to want.

Jennifer Ryan: Thank you. And our final question is for Dr. Thakur. "How do I screen for ACEs in low resource communities?"

Dr. Neeta Thakur: Thank you for that question screening for adversities in low resource settings can be really challenging, especially when, as a provider, what we want to be able to do is provide resources for our patients. What we found in the Pearl Study that even providing anticipatory guidance to patients and their family is around how stress and health were connected, was a resource and was helpful to them. In addition to our study, where we included that as part of our workflow, we did do qualitative work where we actually spoke with families about what they found helpful. And one of the things that was repeatedly commented on was that understanding and having their provider share this information on how stress can impact their child's health was considered to be really helpful to the conversation. So even if you are in a lower resource setting, being able to open those dialogues as you look for resources for your patients, is really important in order to be able to help families address toxic stress in an ongoing basis.

Jennifer Ryan: Thank you for those great responses to the questions. That officially wraps up our Q&A. Thank you again to our speakers and to our audience members who submitted questions in advance. As a reminder, please visit our ACEsaware.org website to take the free ACEs Aware training that covers the science of ACEs and toxic stress, how to screen for ACEs and how to implement trauma informed care. Medi-Cal providers should submit their attestation after completing the training so that you can

become certified to receive payment for conducting these screenings. And don't forget to sign up to be part of our ACEs Aware clinician directory. That concludes our session for today. Thank you all very much for joining us, and we look forward to seeing you next month.