



# Preventing Childhood Toxic Stress: Partnering With Families and Communities to Promote Relational Health

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By focusing on the safe, stable, and nurturing relationships (SSNRs) that buffer adversity and build resilience, pediatric care is on the cusp of a paradigm shift that could reprioritize clinical activities, rewrite research agendas, and realign our collective advocacy. Driving this transformation are advances in developmental sciences as they inform a deeper understanding of how early life experiences, both nurturing and adverse, are biologically embedded and influence outcomes in health, education, and economic stability across the life span. This revised policy statement on childhood toxic stress acknowledges a spectrum of potential adversities and reaffirms the benefits of an ecobiodevelopmental model for understanding the childhood origins of adult-manifested disease and wellness. It also endorses a paradigm shift toward relational health because SSNRs not only buffer childhood adversity when it occurs but also promote the capacities needed to be resilient in the future. To translate this relational health framework into clinical practice, generative research, and public policy, the entire pediatric community needs to adopt a public health approach that builds relational health by partnering with families and communities. This public health approach to relational health needs to be integrated both vertically (by including primary, secondary, and tertiary preventions) and horizontally (by including public service sectors beyond health care). The American Academy of Pediatrics asserts that SSNRs are biological necessities for all children because they mitigate childhood toxic stress responses and proactively build resilience by fostering the adaptive skills needed to cope with future adversity in a healthy manner.

## abstract

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*In order to develop normally, a child requires progressively more complex joint activity with one or more adults who have an irrational emotional relationship with the child. Someone's got to be crazy about that kid. That's number one. First, last and always.*

Urie Bronfenbrenner<sup>1</sup>

## INTRODUCTION

The term “toxic stress” refers to a wide array of biological changes that occur at the molecular, cellular, and behavioral levels when there is prolonged or significant adversity in the absence of mitigating social-emotional buffers.<sup>2</sup> Whether those adversity-induced changes are considered adaptive and health-promoting or maladaptive and “toxic” depends on the context. For example, in an abusive context, biological changes, such as the methylation of the glucocorticoid receptor gene,<sup>3-5</sup> an increase in the size or activity of the amygdala,<sup>6-8</sup> and a hypersensitivity to potentially threatening cues<sup>9</sup> could be considered adaptive, at least initially, because those changes might promote survival in a threatening environment. But those same biological changes could prove to be maladaptive, toxic, and health harming over time.<sup>10,11</sup>

This toxic stress framework is powerful, because it taps into a rich and increasingly sophisticated literature describing how early childhood experiences are biologically embedded and influence developmental outcomes across the life course.<sup>12-14</sup> This was the focus of the original technical report on toxic stress from the American Academy of Pediatrics (AAP) in 2012.<sup>2</sup> Current threats to child well-being and long-term health, such as widening economic inequities, deeply embedded structural racism, the separation of immigrant children

from their parents, and a socially isolating global pandemic, make the toxic stress framework as relevant as ever.

That said, the toxic stress framework is a problem-focused model because it is focused on what happens biologically in the absence of mitigating social and emotional buffers. Conversely, a solution-focused approach would focus on relational health<sup>15</sup> (see the Appendix for a glossary of terms, concepts, and abbreviations) by promoting the safe, stable, and nurturing relationships (SSNRs) that turn off the body's stress machinery in a timely manner.<sup>1,16,17</sup> Even more importantly, a strengths-based, relational health framework leverages those SSNRs to proactively promote the skills needed to respond to future adversity in a healthy, adaptive manner.<sup>16,18,19</sup> The power of relational health is that it not only buffers adversity when it occurs but also proactively promotes future resilience. The toxic stress framework may help to define many of our most intractable problems at a biological level, but a relational health framework helps to define the much-needed solutions at the individual, familial, and community levels (see Table 1).

This revised policy statement on childhood toxic stress builds on the 2012 policy statement<sup>12</sup> and technical report<sup>2</sup> by:

- Acknowledging that a spectrum of adversity exists, from discrete, threatening events (such as abuse, bullying, or disasters) to ongoing, chronic hardships (such as poverty, racism, social isolation, or neglect). These varied adversities share the potential to trigger toxic stress responses and inhibit the formation of SSNRs.
- Reaffirming an ecobiodevelopmental framework<sup>2</sup> because early childhood experiences, both

adverse and nurturing, are biologically embedded and influence the development of both disease and wellness later in life.

- Asserting that adults with core life skills are essential, not only to form and maintain SSNRs with children but also to scaffold and develop the basic social and emotional skills that enable children to be resilient and flourish despite adversity. A multigenerational perspective is fundamental.
- Promoting a public health approach that not only prevents, mitigates, and treats toxic stress but, more importantly, proactively promotes, reduces barriers to, and repairs relational health (the capacity to develop and maintain SSNRs with others).
- Emphasizing that the vertical integration of this public health approach or the layering of primary, secondary, and tertiary preventions and/or interventions is necessary because the heterogeneity of responses to adversity seen at the population level will need to be addressed through a menu of programs that are layered and matched to specific levels of individual need (universal preventions, plus targeted interventions for those at risk, plus indicated therapies for those with symptoms or diagnoses).
- Proposing that the public health approach also be integrated horizontally across multiple public service sectors (eg, health care, behavioral health, education, social services, justice, and faith communities) because SSNRs are promoted in safe, stable, and nurturing families that have access to safe, stable, and nurturing communities with a wide range of resources and services.

This policy statement asserts that to move forward (to proactively build

**TABLE 1** A Comparison of the Toxic Stress and Relational Health Frameworks

	Toxic Stress	Relational Health
Definition	Toxic stress refers to the biological processes that occur after the extreme or prolonged activation of the body's stress response systems in the absence of SSNRs.	Relational health refers to the capacity to develop and sustain SSNRs, which in turn prevent the extreme or prolonged activation of the body's stress response systems.
Contribution	Toxic stress explains how a wide range of ACEs become biologically embedded and alter life-course trajectories in a negative manner.	Relational health explains how SSNRs buffer adversity and promote the skills needed to be resilient in the future.
Approach to clinical care	Toxic stress is a deficits-based approach because it is focused on the problem: those biological processes triggered by significant adversity in the absence of SSNRs.	Relational health is a strengths-based approach because it is focused on solutions: those individual, family, and community capacities that promote SSNRs, buffer adversity, and build resilience.
Primary preventions in the framework	Primary preventions in the toxic stress framework are focused on how to prevent the wide array of adversities that might precipitate a toxic stress response.	Primary preventions in the relational health framework are focused on how to universally promote the development and maintenance of SSNRs.
Secondary preventions in the framework	Secondary preventions in the toxic stress framework are focused on identifying individuals at high risk for poor outcomes resulting from toxic stress responses by using population-based risk factors (eg, ACE scores) or emerging biomarkers (eg, methylation patterns).	Secondary preventions in the relational health framework are focused on identifying the potential individual, family, and community barriers to SSNRs by developing respectful and caring therapeutic relationships with patients, families, and communities.
Tertiary preventions in the framework	Tertiary preventions in the toxic stress framework are focused on the evidence-based practices that treat toxic stress-related morbidities such as anxiety, depression, oppositional defiant disorder, posttraumatic stress disorder, and substance abuse disorder.	Tertiary preventions in the relational health framework are focused on the evidence-based practices such as ABC, CPP, or PCIT that repair strained relationships and assist them in becoming more safe, stable, and nurturing.
Summary	Toxic stress defines the problem. Toxic stress explains how many of our society's most intractable problems (disparities in health, education, and economic stability) are rooted in our shared biology but divergent experiences and opportunities.	Relational health defines the solution. Relational health explains how the individual, family, and community capacities that support the development and maintenance of SSNRs also buffer adversity and build resilience across the life course.

not only the healthy, happy children of today but also the well-regulated parents and productive citizens of the future) family-centered pediatric medical homes (FCPMHs) (see the Appendix for a detailed description) need to universally promote relational health. SSNRs not only buffer adversity when it occurs but also proactively build the foundational social and emotional skills that lead to resilience in the face of future adversity. Although pediatric and early childhood professionals have long recognized the parent-child relationship as foundational,<sup>20-22</sup> the elemental nature of relational health is not reflected in much of

our current training, research, practice, and advocacy. To prevent childhood toxic stress responses and support optimal development across the life span, the promotion of relational health needs to become an integral component of pediatric care and a primary objective for pediatric research and advocacy.

#### A SPECTRUM OF ADVERSITY

The previous policy statement<sup>12</sup> and technical report<sup>2</sup> on childhood toxic stress noted the 10 adverse childhood experiences (ACEs) studied in the landmark ACEs Study that began in the 1990s:

physical, emotional, or sexual abuse; physical or emotional neglect; problematic parental substance misuse; parental mental illness; parental separation or divorce; intimate partner violence; and an incarcerated house member.<sup>23</sup> These adversities are associated with a wide array of negative outcomes in a dose-dependent manner, such that the higher the ACE score (1 point for each category experienced before the age of 18 years), the higher the risk for unhealthy behaviors such as tobacco, alcohol, and other substance use; risky sexual behaviors; and obesity.<sup>23,24</sup> Dose-dependent relationships have also

been found between ACE scores and several of the leading causes of adult morbidity and mortality,<sup>23,24</sup> including cardiovascular disease,<sup>25</sup> lung disease,<sup>26</sup> liver disease,<sup>27</sup> mental illness,<sup>28</sup> and cancer.<sup>29</sup>

These well-established associations between ACEs and poor health outcomes decades later highlight the importance of understanding the biological mechanisms that allow adversity in childhood to “get under the skin” and to negatively impact life-course trajectories.<sup>30–36</sup> As discussed in the 2012 AAP technical report,<sup>2</sup> toxic stress responses, in which the physiologic stress response to adversity is large, chronic, and unmitigated by social-emotional buffers, are one such mechanism. Toxic stress responses are known to alter multiple systems that interact in a reciprocal and dynamic manner: genomic function, brain structure and connectivity, metabolism, neuroendocrine-immune function, the inflammatory cascade, and the microbiome.<sup>13,14</sup> Toxic stress-induced alterations also influence the adoption of maladaptive coping behaviors decades later.<sup>37–40</sup>

Several researchers have noted that many other experiences in childhood are also associated with poor outcomes later in life, and these include being raised in poverty,<sup>41</sup> left homeless,<sup>42–44</sup> exposed to neighborhood violence,<sup>45–47</sup> subjected to racism,<sup>48–50</sup> bullied,<sup>51,52</sup> or punished harshly.<sup>53</sup> This finding suggests that there is a wide spectrum of adversity that runs from discrete, threatening events (such as being abused, bullied, or exposed to disasters or other forms of violence) to ongoing, chronic life conditions (such as exposure to parental mental illness, racism, poverty, neglect, family separation or a placement in foster care, and environmental toxins or air

pollution; unrelenting anxiety about a global pandemic, climate change, or deportation; or social rejection because of one’s sexual orientation or gender identity). Although children experiencing discrete catastrophic events such as abuse are at a high risk for toxic stress responses, epidemiology suggests that the largest number of children at risk for toxic stress responses are those affected by ongoing chronic life conditions such as neglect.<sup>54,55</sup> This finding suggests that although interventions targeting children with acute threats are needed urgently (eg, efforts preventing physical abuse, child trafficking, and gun violence), those interventions alone will almost certainly miss large segments of the population (eg, those experiencing the threats of parental mental illness, racism, poverty, social isolation) who may also develop toxic stress responses and their associated poor outcomes. To minimize the burden of toxic stress responses at the population level, the entire pediatric community needs to identify and address not only the acute threats to child wellness such as abuse and physical violence but also the ongoing, chronic life conditions such as racism, poverty, and isolation that are rooted in deep-seated social constructs, societal inequities (including those within the health care system), and public policies that inhibit social cohesion, equity, and relational health. Acute threats to childhood wellness such as abuse need to be taken seriously; similar attention should be given to the social inequities and ongoing, chronic life conditions that similarly imperil a child’s biological wellness and life-course trajectory.

This wide spectrum of adversity underscores the fact that ACE scores and other epidemiologically derived risk factors at the population level are not valid or reliable predictors

of outcomes at the individual level.<sup>56</sup> Toxic stress, by contrast, refers to an individual’s physiologic response to these adversities, and biomarkers of this physiologic response have the potential to be more sensitive and specific measures of experienced adversity at the individual level.<sup>37</sup> Validated biomarkers also offer transformational potential as measures of responsiveness to specific interventions.<sup>37,57</sup> With these applications in mind, the pediatric research community is hoping to develop clinic-friendly, noninvasive biomarkers for different forms and degrees of adversity.

Finally, the diverse conditions included in a broader spectrum of adversity make the formation of SSNRs more difficult. Consequently, the challenge is not only to prevent a broad spectrum of adversities from occurring but also to prevent them from becoming barriers to the SSNRs that allow individuals from across the spectrum of adversity to be resilient and flourish despite the adversity.<sup>17,58,59</sup>

An important consideration across many harmed and exploited communities (such as American Indian or Alaska Native populations) is the accumulation of toxic stress responses across generations, sometimes referred to as historical trauma.<sup>60</sup> Although higher levels of historical trauma are associated with poorer health outcomes, the science underlying these associations is only now being studied rigorously.<sup>61</sup> A detailed discussion of historical trauma and the special needs of these communities is beyond the scope of this policy statement, but the layered, integrated public health approaches presented here to prevent childhood toxic stress and promote relational health might inform efforts to address historical trauma as well.

## THE ECOBIODEVELOPMENTAL MODEL OF DISEASE AND WELLNESS

Fortunately, adversity in childhood is only half the story, as positive experiences in childhood are associated with improved outcomes later in life. For example, positive relational experiences, such as engaged, responsive caregivers,<sup>59,62-65</sup> shared children's book reading,<sup>66-68</sup> access to quality early childhood education,<sup>69-71</sup> and opportunities for developmentally appropriate play with others<sup>66,72-74</sup> are associated with positive impacts on learning, behavior, and health. Early childhood experiences, both adverse and positive, appear to be biologically embedded and influence both disease and wellness across the life course.<sup>30</sup> The ecobiodevelopmental model of disease and wellness explains how the ongoing but cumulative and reciprocal dance between ecology and biology leads to changes at the molecular (eg, methylation patterns), cellular (eg, brain connectivity patterns), and behavioral levels (eg, tobacco, alcohol, or other substance use).<sup>2,17</sup> These changes are either adaptive or maladaptive depending on the context, and they are either benefits or risks to future health, academic success, and economic productivity.<sup>75</sup>

For example, significant adversity in the last trimester of pregnancy is associated with methylation of the child's glucocorticoid receptor gene.<sup>76</sup> In adults, the methylation of this gene is associated with the expression of fewer glucocorticoid receptors in the brain.<sup>5</sup> Because cortisol downregulates its own production via negative feedback loops in the brain that use glucocorticoid receptors, children with fewer glucocorticoid receptors would be expected to have higher cortisol levels and be more irritable and harder to console.<sup>77</sup> These

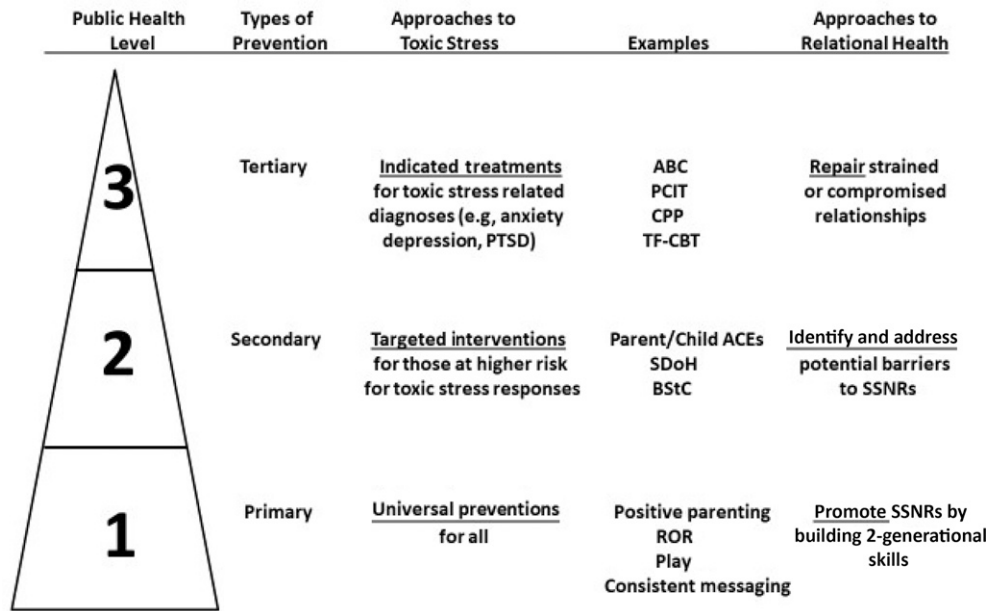
changes could be considered adaptive and beneficial in the short-term because they might prepare the newborn infant for a stressful world in which the infant may need to be more vocal to have his or her needs met. But these same changes could be considered maladaptive over time because the higher cortisol levels could impair learning, and the infant's irritability could impair the formation of a strong parental bond with the infant. Conversely, early supports that allow new mothers more opportunities to bond with, breastfeed, and simply stroke their children are associated with decreases in the methylation of the glucocorticoid receptor gene, perhaps allowing infants to downregulate their stress responses more effectively.<sup>78,79</sup> This finding is one of the most significant predictions of the ecobiodevelopmental model: the biological mechanisms that underlie the embedding of significant childhood adversity may also underlie the embedding of positive relational experiences in childhood. The challenge, then, is not only to prevent adversity but also (for mothers, fathers, and other engaged adults) to actively promote positive relational experiences throughout infancy and childhood.

## COMPONENTS OF A PUBLIC HEALTH APPROACH TO TOXIC STRESS

The ecobiodevelopmental model suggests that, to improve the likelihood of positive developmental outcomes across the life span, efforts should be made to improve the salient features of the child's environment. Changing all of the potentially salient features of a child's environment cannot be reduced to a single intervention or program, so there will be no singular panacea when it comes to addressing childhood toxic stress responses. Rather, an integrated

public health approach (see Fig 1) is needed to support all children, including those with delays in development and special health care needs.<sup>80-82</sup> The foundation for any public health approach is universal primary prevention. In the case of toxic stress responses, universal primary prevention means trying to prevent the precipitants of toxic stress responses (eg, advocating to address the spectrum of adversities discussed above) as well as promote healthy, adaptive responses to adversity through the provision of social supports that nurture the development of foundational resilience skills (such as task persistence, curiosity, and self-regulation).<sup>16,19,59,83</sup>

For children at higher risk for toxic stress responses, targeted secondary interventions with tiered services (eg, HealthySteps<sup>84,85</sup>) may be needed. Children with known adversity but no overt symptoms,<sup>18</sup> children with parents who experienced significant adversity as a child,<sup>86</sup> and families struggling with the social determinants of health (SDoHs) (eg, poverty leading to food or housing insecurity,<sup>87,88</sup> language barriers, or acculturation leading to conflicts within immigrant families<sup>89</sup>) may benefit from an array of interventions that mitigate specific risk factors. For example, the AAP currently recommends screening parents for postpartum depression<sup>90</sup> and food insecurity.<sup>87,88</sup> Similarly, when clinical markers for an individual child's biological sensitivity to context<sup>91-94</sup> (see the Appendix for a glossary of terms, concepts, and abbreviations) are available, children of high (versus low) sensitivity may also benefit from different types of interventions.<sup>95</sup> In concordance with a layered public health approach, these various targeted interventions will



**FIGURE 1** A public health approach to prevent childhood toxic stress is a public health approach to promote relational health. Many of the components of a public health approach to prevent, mitigate, and treat toxic stress responses (see examples) are also components of a public health approach to promote, identify barriers to, and repair SSNRs. The examples provided are illustrative and not intended to be comprehensive or exhaustive. See the Appendix for full descriptions of the abbreviations. BStC, biological sensitivity to context; PTSD, posttraumatic stress disorder. Adapted with permission from Garner AS, Saul RA. Thinking Developmentally: Nurturing Wellness in Childhood to Promote Lifelong Health. Itasca, IL: American Academy of Pediatrics; 2018

supplement but not replace the universal primary preventions.

For children who are symptomatic or meet criteria for toxic stress-related diagnoses (eg, anxiety, oppositional defiant disorder, or posttraumatic stress), indicated, evidence-based therapies are needed. For younger children, these therapies may include attachment and biobehavioral catch-up (ABC),<sup>96-98</sup> parent-child interaction therapy (PCIT),<sup>99-102</sup> and child-parent psychotherapy (CPP).<sup>103-105</sup> For older children, trauma-focused cognitive-behavioral therapy (TF-CBT) may be beneficial.<sup>106,107</sup> The effectiveness of these evidence-based therapies may be reduced if targeted interventions are not used to address emerging areas of risk or if universal primary preventions are not applied as well.<sup>59,108</sup> A layered public health approach mirrors the concept of proportionate universalism (see the Appendix for a glossary of terms, concepts, and

abbreviations), in which the delivery of universal services is at a scale and intensity that is proportionate to the degree of need.<sup>109-112</sup> For example, if access to healthy foods is a universal objective, a proportionate response would recognize that some families may only need education about which foods are healthy, whereas some may need education about healthy foods and additional financial resources to purchase those healthy foods, and still others may require education about healthy foods, additional financial resources, and access and/or transportation to stores that sell healthy foods.

#### THE EMERGING SCIENCE OF RELATIONAL HEALTH

The concept of childhood toxic stress taps into a rich literature on the biology of adversity and explains the danger in overlooking significant adversity in childhood. To move forward (to proactively build healthy, resilient children), the

pediatric community needs to embrace the concept of relational health.<sup>15</sup> Relational health refers to the ability to form and maintain SSNRs, as these are potent antidotes for childhood adversity and toxic stress responses.<sup>57,113</sup> Not only do SSNRs buffer adversity and turn potentially toxic stress responses into tolerable or positive responses, but they are also the primary vehicle for building the foundational resilience skills that allow children to cope with future adversity in an adaptive, healthy manner.<sup>16,17</sup> These findings highlight the need for multigenerational approaches that support parents and adults as they, in turn, provide the SSNRs that all children need to flourish.

Developmental science is only beginning to understand the way relational health buffers adversity and builds resilience, but emerging data suggest that responsive interactions between children and engaged, attuned adults are

paramount.<sup>1,16,114,115</sup> Not only are infants programmed to connect socially and emotionally with adult caregivers,<sup>116</sup> but the brains of parents of newborn infants appear to be reprogrammed to connect with their infants.<sup>117</sup> Imaging studies of new parents demonstrate changes in several major brain circuits, including a reward circuit, social information circuit, and emotional regulation circuit.<sup>117,118</sup> The reward circuit includes the striatum, ventral tegmental area, anterior cingulate cortex, and prefrontal cortex, where dopamine and rising levels of oxytocin interact to make social interactions more rewarding, thereby encouraging more parental engagement in infant care.<sup>118,119</sup> The social information circuit includes structures such as the anterior insula, inferior frontal gyrus, superior temporal gyrus, and supplemental motor area, which support internal representations of what others may be experiencing and more empathic responses to infant behaviors.<sup>118,119</sup> Finally, the emotional regulation circuit includes the amygdala, superior temporal sulcus, temporoparietal junction, and prefrontal cortex, which promote social cognition and a downregulation of the stress response.<sup>118,119</sup> The convergent conclusion from these preliminary imaging studies of the parental brain is clear: much like the infant brain, the parental brain is programmed to connect.

Recent research suggests that this dyadic need to connect promotes the development of biobehavioral synchrony between parents and infants.<sup>119,120</sup> Feldman<sup>119</sup> states, “Such coordination is observed across four systems: the matching of nonverbal behavior; the coupling of heart rhythms and autonomic function; the coordination of

hormone release [eg, oxytocin following contact with both mothers and fathers]; and brain to brain synchrony [eg, coordinated brain oscillation in alpha and gamma rhythms].” Because the human brain is so immature at birth, the infant is dependent on this biobehavioral synchrony not only for survival but also for laying the foundation for future self-regulation and social-emotional skills. One expert has written that “this synchronous biobehavioral matrix builds the child’s lifelong capacity for intimacy, socio-affective skills, adaptation to the social group, and the ability to use social relationships to manage stress.”<sup>117</sup> Early relational experiences with engaged and attuned adults have a profound influence on early brain and child development.

#### **LINKS BETWEEN RELATIONAL HEALTH AND RESILIENCE**

The importance of engaged and attuned adults does not end in the newborn period. In fact, there is increasing evidence that strong social-emotional supports, such as high family resilience and connection and the provision of positive childhood relational experiences, are associated with children who are resilient and flourish despite their level of adversity.<sup>59,121</sup> This finding has renewed interest in defining the critical elements that children, families, and communities need to thrive despite adversity.<sup>18,19,65,122–124</sup> Resilience, for example, is now understood to be the manifestation of capacities, resources, or skills that allow some children, families, and communities to respond to adversity in a healthy, adaptive manner.<sup>16,83,124</sup> At the child level, foundational capabilities (such as social skills, emotional regulation, language, and executive functions like impulse inhibition, working memory, cognitive flexibility, abstract thought, planning, and problem solving) are

the building blocks of resilience and need to be modeled, taught, learned, practiced, reinforced, and celebrated.<sup>16</sup> A recent literature review identified 5 modifiable resilience factors relevant to clinical pediatric care: (1) “addressing maternal mental health problems”; (2) “encouraging responsive, nurturing parenting”; (3) “building positive appraisal styles and executive function skills”; (4) “teaching children self-care skills and routines”; and (5) “using trauma-focused interventions and educating families about trauma.”<sup>83</sup> The emphasis on building new skills underscores the AAP’s concern that excessive screen time might limit opportunities to develop more adaptive and generalizable skills.<sup>125</sup>

Flourishing despite adversity is another construct that has been studied. Three indicators of flourishing are amenable to parental report and are rough markers of executive function: (1) “the child shows interest and curiosity in learning new things,” (2) “the child works to finish tasks he or she starts,” and (3) “the child stays calm and in control when faced with a challenge.”<sup>59</sup> In analyses of data from the 2016–2017 National Survey of Children’s Health, “the prevalence of flourishing children increased in a graded fashion with increasing levels of family resilience and connection.”<sup>59</sup> In fact, a higher percentage of children with high adversity (ACE scores 4–9) but high family connection and resilience were flourishing (30.5%) than children with low adversity (ACE score of 0) but low family resilience and connection (26.8%).<sup>59</sup> Approaches to minimizing toxic stress that only look at measures of adversity (such as ACE scores or biomarkers) will miss out on opportunities to support the relational health that promotes

flourishing despite adversity. Measures of both resilience and “flourishing despite adversity” suggest that much more can be done to build the SSNRs and overall relational health that buffers adversity and builds both the skills and contexts necessary for children to thrive. The Healthy Outcomes From Positive Experiences framework promotes relational health through positive childhood experiences, such as “being in nurturing, supportive relationships; living, developing, playing, and learning in safe, stable, protective, and equitable environments; having opportunities for constructive social engagement and connectedness; and learning social and emotional competencies.”<sup>126,127</sup>

#### **A PUBLIC HEALTH APPROACH TO BUILD RELATIONAL HEALTH**

Applying a public health approach to the promotion of relational health (see Fig 1) reveals that many of the universal primary preventions for toxic stress are also effective means of promoting the development of SSNRs (eg, positive parenting styles, developmentally appropriate play with others,<sup>66,73,74,128</sup> and shared reading<sup>129,130</sup>). Similarly, many of the risk factors for toxic stress responses that are the targets of secondary interventions are also potential barriers to the development of SSNRs that need to be identified and addressed (eg, child ACE scores, parent ACE scores, SDoHs, or even a strong biological sensitivity to context). Finally, many of the indicated treatments for children who are symptomatic as a result of toxic stress are programs that focus on repairing strained or compromised relationships (eg, ABC, PCIT, CPP, and TF-CBT). In short, a public health approach to prevent childhood toxic stress is a public health approach to promote relational health.

#### **Vertical Integration to Match Levels of Need With Specific Interventions**

Emerging data supporting a biological sensitivity to context (see the Appendix for a glossary of terms, concepts, and abbreviations) begin to explain heterogeneous responses to both adversity and interventions at the population level.<sup>92,131–136</sup> Consequently, there is an urgent need for a battery of biological, behavioral, and contextual markers that might better stratify both the risks and predicted responsiveness to interventions at the individual level.<sup>37</sup> FCPMHs (see the Appendix for a detailed description) are well placed to begin matching levels of need with specific types of interventions, a process known as vertical integration.<sup>82</sup>

Public health approaches are vertically integrated when they are founded on universal primary preventions (eg, promoting family resilience and connection and positive childhood experiences), with tiered, targeted interventions (eg, addressing SDoHs) and indicated treatments (eg, PCIT) being layered on this foundation, depending on the specific needs of the particular child, family, or community. This emphasis on universal primary preventions is congruent with the fact that more children are mentally and socially well and flourish as adults, regardless of their level of childhood adversity, if they also are afforded positive relational experiences and high family resilience and connection during childhood.<sup>59,121</sup> Relational health includes more than “nurturing” in its traditional, spoken sense (eg, verbal warmth or responsiveness); it also includes the activities that support the relationship more broadly (eg, reading aloud and a prescription to play), and research has documented that nurturing words and actions

are inextricably linked.<sup>137</sup> Although there are both practice-based (eg, Reach Out and Read [ROR],<sup>129,138,139</sup> the Video Interaction Project [VIP],<sup>66,72</sup> HealthySteps<sup>84,85</sup>) and community-based programs (eg, positive parenting programs,<sup>140,141</sup> home visiting programs,<sup>142,143</sup> quality early child care settings<sup>69,71</sup>) that promote these early positive relational experiences, they are not funded at levels that would make them universally accessible. More importantly, they are rarely integrated vertically with other programs that layer on additional efforts to address barriers to relational health (eg, SDoHs) or already strained or compromised relationships (eg, PCIT) when needed. A vertically integrated public health approach acknowledges that universal primary preventions are absolutely necessary yet insufficient to promote relational health.

For children deemed to be at high risk for toxic stress responses, potential barriers to relational health need to be identified and addressed through team-based care<sup>144</sup> and collaborative community partnerships (eg, food banks,<sup>145,146</sup> medical-legal partnerships<sup>147</sup>). These additional interventions are supplemental to and do not replace universal primary preventions. Similarly, symptomatic children need to be referred to evidence-based treatment programs (eg, ABC, PCIT, CPP, TF-CBT), but these are supplemental to and do not replace either targeted interventions for potential barriers to SSNRs or the aforementioned universal primary preventions. Efforts to repair strained or compromised relationships are likely to be more effective if other potential barriers to SSNRs are being addressed (eg, parental mental illness and basic needs) and additional efforts are being made to actively promote



SSNRs (eg, the provision of developmentally appropriate play).

### **Horizontal Integration Across Sectors at the Community Level**

A public health approach to promoting relational health should also be integrated horizontally (or across sectors) at the local level.<sup>81,82,148</sup> SSNRs are easier to form when safe, stable, and nurturing families are able to live in safe, stable, and nurturing communities.<sup>124,149,150</sup> The FCPMH is ideally placed to educate families about what a safe, stable, and nurturing family environment looks like for a child, but doing so will require changes at the provider and practice levels (see Table 2). However, FCPMHs are also called to advocate for policies at the federal, state, and local levels that promote safe, stable, and nurturing communities. In doing so, FCPMHs become the anchor for “medical neighborhoods,”<sup>149</sup> in which community resources across multiple sectors (eg, health, education, justice, social services, faith communities, and businesses) collaborate not only to address barriers to SSNRs (such as home visiting programs,<sup>142</sup> HealthySteps,<sup>150,151</sup> medical-legal partnerships,<sup>147</sup> coordinated responses to disasters,<sup>152,153</sup> and efforts to promote access to healthy foods, safe housing, potable water, and clean air) but also to advocate for public policies (such as paid parental leave,<sup>154,155</sup> income support,<sup>87,88</sup> restorative justice,<sup>156–158</sup> and implementation of the Family First Prevention Services Act) that intentionally and actively foster SSNRs (Table 2).<sup>149,159–161</sup>

### **THE CENTRALITY OF RELATIONSHIPS IN PEDIATRIC CARE**

A public health approach to relational health is built on the SSNRs that buffer adversity and build resilience. Such an approach

will require pediatricians, other pediatric health care professionals, and FCPMHs in general to partner with families and communities in practical and innovative ways to universally promote SSNRs, address potential barriers to SSNRs in a targeted manner, and afford indicated treatments that repair relationships that have been strained or compromised (see Table 2). But underlying this approach are 2 fundamental assumptions. The first is that pediatric providers will have the financial supports needed to expand their capacity for developing respectful, continuous, trusted, and nurturing relationships with both the patients and caregivers of the patients who they serve. Without strong therapeutic alliances with patients, caregivers, and families, few of the recommended universal primary preventions will be implemented, few of the targeted interventions will be used, and few of the indicated treatments will be sought. To promote SSNRs at the practice level, both financial incentives (eg, payment reforms) and enhanced training needs to be provided.<sup>162,163</sup> Pediatric providers should be afforded the following: (1) sufficient time with patients and families, (2) the benefit of long-term continuity with patients and families, and (3) opportunities to learn about and practice the interpersonal and communication skills needed to form respectful, trusted, and collaborative therapeutic relationships.<sup>162</sup> For parents to trust, pediatric providers need to listen and understand parental concerns and beliefs before making recommendations. Communication could be further enhanced by cultural humility,<sup>164,165</sup> implicit bias training,<sup>166–171</sup> a more diverse health care team (eg, providing families and patients the opportunity to seeing themselves reflected in the sex, ethnicity, and

cultural backgrounds of the team members), and access to professional interpreters. In the end, the ability of the FCPMH to leverage change within the family context is entirely dependent on the capacity of the pediatric providers to form strong therapeutic relationships with the patients, caregivers, and families.

The second assumption is that the FCPMH will have the capacity to form working relationships with a wide array of community partners. The FCPMH alone cannot leverage significant change within the community context. Changing community contexts will require healthy, trusting, and robust partnerships with a wide array of local community partners from multiple sectors (education, social services, and businesses), not only to facilitate family access to the requisite community interventions but also to coordinate effective advocacy campaigns to secure both those interventions and family-friendly public policies. Simply put, successfully implementing a public health approach that prevents childhood toxic stress and promotes SSNRs will require FCPMHs to put relational health at the center of everything they do.<sup>172</sup>

### **ACKNOWLEDGING THE ROLE AND TOLL OF SOCIAL ISOLATION**

There is an emerging evidence base that social isolation is on the rise and detrimental to both individual<sup>173</sup> and community health.<sup>174</sup> Social scientists have documented the fragmentation of society at the community level<sup>175</sup> as well as its negative impact on how communities view their collective stewardship of their most treasured resource: their children.<sup>176</sup> Psychologists have decried a “crisis of connection” and point to a culture that values the self over relationships and individual

**TABLE 2** Implementing a Public Health Approach to Relational Health Will Require Changes at the Provider, Practice, and Community Levels, as Well as Horizontal Integration Across Sectors

Types of Prevention	Approaches to Relational Health	Examples at the Provider Level	Examples at the Practice Level	Examples at the Community Level
Tertiary	Repair strained or compromised relationships	Build the therapeutic alliance; employ a common-factors approach; explain behavioral responses to stress; endorse referral resources.	Colocate counseling services (warm handoffs); facilitate, track, and follow-up on referrals offered.	Embrace restorative justice and social inclusion (over punitive measures and exclusion).
Secondary	Identify and address potential barriers to SSNRs	Build the therapeutic alliance; surveil for possible barriers to SSNRs; champion screening at practice level; endorse referral resources.	Universal screening for prevalent barriers seen in that practice; facilitate, track, and follow-up on referrals offered.	Identify and address sources of inequity, isolation, and social discord (poverty and racism).
Primary	Promote SSNRs by building 2-generational relational skills	Build the therapeutic alliance; promote positive parenting; encourage developmentally appropriate play.	Provide or support positive parenting classes; participate in ROR, VIP, and other programs that support the dyad.	Implement home visiting; support extended family medical leave.

See the Appendix for full descriptions of the abbreviations.

successes over the general welfare, leading to declining levels of empathy and trust.<sup>177</sup> Epidemiologists have demonstrated that an individual's degree of social isolation is a powerful predictor of mortality, much like traditional clinical risk factors (eg, obesity or hypertension) or ACE scores.<sup>178</sup> Both epidemiologists and economists have pointed to increasing levels of inequity as correlating with poorer levels of overall health for both the impoverished and the wealthy.<sup>174</sup> Finally, physiologists have long known that social deprivation in childhood alters the programming of the body's stress response.<sup>179,180</sup>

Taken together, these diverse lines of inquiry suggest that it may not actually be the wide spectrum of childhood adversity that drives poor outcomes but the degree to which that adversity drives shame, guilt, anger, alienation, disenfranchisement, and degree of social isolation.<sup>181,182</sup> If so, the proposed public health approach toward the promotion of SSNRs is needed, not only to buffer adversity and promote resilience but also to begin bridging political, religious, economic, geographic, identity-based, and ideological divides that increase social isolation, encourage tribalism, diminish empathy, and, ultimately, drive poor outcomes in the medical, educational, social service, and justice systems.

For many resource-poor families and older children, overall relational health is dependent not only on dyadic serve and return interactions with family members but also on trusted, SSNRs with others in the community through interactions at the medical clinic, school, recreation leagues, faith-based and civic organizations, community improvement efforts, and employment opportunities. Along

these lines, the Aspen Institute has created the Social Fabric Project to incentivize local projects that prioritize the building of relationships and community connections over a focus on self-absorption and hyperindividualism.<sup>183</sup> Similarly, more attention could be given to the built environment and need for public green spaces, such as parks, to promote social cohesion and a sense of community belonging.<sup>184,185</sup>

Finally, it should be noted that public health mandates to maintain “social distancing” during the coronavirus pandemic actually refer to physical distancing and are not intended to further isolate, alienate, or disenfranchise already vulnerable populations. If nothing else, pandemic-mandated stay-at-home orders should increase our collective awareness of the distress associated with being socially isolated or vulnerable. The coronavirus pandemic has highlighted the urgent need to provide all children with the SSNRs that buffer unexpected adversities and build the skills necessary to be resilient.

### **A RENEWED COMMITMENT TO SCIENCE-BASED POLICY FORMATION**

In the decade since the first AAP policy statement and technical report on childhood toxic stress were published, even more evidence has accumulated that:

1. “What happens in childhood does not stay in childhood.”<sup>186,187</sup> Adverse experiences in childhood are not destiny, but for many children, significant adversity bends life-course trajectories for the worse.
2. In the absence of SSNRs, many different forms of childhood adversity (from catastrophic episodes of abuse or violence to chronic conditions, such as

exposure to racism, poverty, and/or neglect) can lead to toxic stress responses that result in changes at the molecular, cellular, and behavioral levels and negatively impact outcomes in health, education, and economic productivity.

3. Individual variation in biological sensitivity to context (see the Appendix for a glossary of terms, concepts, and abbreviations) contributes to heterogeneity in both responses to adversity and responses to interventions. This has important implications for how we nurture and fulfill the potential of all children, not just those who are relatively less sensitive to their contexts and appear to be relatively more resilient despite adversity.
4. In the presence of SSNRs, a limited degree of childhood adversity (eg, normative childhood frustrations and setbacks) can lead to the positive stress responses that build the rudiments of resilience: a set of social and emotional skills that allow children to adapt to future adversity in a healthy manner.
5. Relational health, in the form of at least one SSNR, is a universal, biological imperative for children to fulfill their potential; to be healthy and resilient; to be successful academically, economically, and socially; and, perhaps most importantly, to be the caregivers that value and build SSNRs with subsequent generations.

Society is currently trending toward division, marginalization, alienation, and social isolation.<sup>177</sup> In opposing this trend and calling for a public health approach that builds SSNRs, the AAP is working to translate the latest developmental science into practices and public policies (see Table 2) that build healthy, resilient children. With almost a century of service to children, families, and

communities, the field of pediatrics has made critical contributions at the interface of science and public policy. Be it child labor laws, federal grants to states to promote maternal-child health, support for paid parental leave after childbirth, required immunizations to attend school, the use of car safety seats, the adoption of children by same-sex parents, the harms of corporal punishment, the safe storage of firearms, the care of immigrant children in federal custody, the negative effect of toxins and global warming on child health, or the importance of nutrition and income support for healthy families, pediatric professionals have been a powerful force for bringing a scientifically grounded, evidence-based perspective to public debates. The AAP remains committed to respond when empirical evidence and the latest developmental science shine new light on the issues and trends of the day. Simply put, public policies, social constructs, and societal norms that divide, marginalize, alienate, and isolate are clear threats to the well-being of all children. The commitment of the AAP to the well-being of all children requires that it not only address a wide spectrum of adversities but, also, that it speak against public policies, social constructs, and societal norms that perpetuate the ongoing, chronic precipitants of toxic stress responses such as poverty<sup>87,88</sup> and racism<sup>166</sup> and for public policies that promote relational health, inclusion, and equity.<sup>111,188-191</sup>

### **APPLICATION OF SCIENCE-BASED PRINCIPLES TO STRENGTHEN PEDIATRIC PRACTICE**

Drawing on a framework produced by the Center on the Developing Child at Harvard University,<sup>192</sup> this policy statement highlights the following 3 science-informed principles to prevent toxic stress

responses and to build healthy, resilient children.

### **Support Nurturing Relationships**

Of the 3 principles, this is the one that aligns most clearly with the core functions of the FCPMH and is, therefore, the primary focus of this policy statement. The use of trusted, supportive relationships within the FCPMH to promote the relational health of families is an emerging focal point for pediatric clinical research, and pediatric primary care is increasingly seen as a venue for fostering social-emotional health.<sup>193,194</sup> These universal primary prevention strategies form the base of the public health pyramid (Fig 1 and Table 2), but additional, layered interventions that recognize and address child-level (eg, delays in development and a biological sensitivity to context), family-level (eg, poverty and parent mental illness), and community-level (eg, racism and violence) barriers to SSNRs may also be required for some families, whereas others will need even more intensive, evidence-based treatments (eg, ABC, PCIT, CPP, TF-CBT) to repair relationships that are already strained or compromised. The buffering and skill-building roles of responsive relationships are biologically embedded, and they are essential promoters of healthy development.<sup>59</sup> Existing AAP reports on managing perinatal depression,<sup>90</sup> supporting grieving children,<sup>195</sup> fostering male caregiver engagement,<sup>196</sup> partnering with home visiting programs,<sup>142</sup> encouraging developmentally appropriate play,<sup>74,197</sup> discouraging screen time,<sup>125</sup> and promoting shared-book reading<sup>67,68</sup> include additional recommendations on ways primary care pediatricians might promote SSNRs.

### **Reduce External Sources of Stress on Families**

This principle points to the potential benefits of addressing stressors from across the spectrum of adversity, including those that might have been considered well beyond the scope of traditional pediatric practice in the past. Poverty, food insecurity, housing insecurity, racism, community violence, discrimination, alienation, disenfranchisement, and social isolation are examples that impose significant hardships on families and become potential barriers to developing SSNRs. FCPMHs could work to reduce these barriers by partnering with their AAP chapter, local organizations (such as schools, businesses, and faith-based organizations), and other community assets (including parents, extended family, child care providers, community health workers, and patients) to form medical neighborhoods<sup>149,159,161</sup> that work collaboratively to address the SDOHs while also advocating for policies that support safe, stable, and nurturing families and communities. For example, expanding family leave policies<sup>154</sup> could reduce family stress and promote positive childhood experiences. Similarly, advocating for a Health in All Policies approach could advance health equity and minimize family and community distress by addressing the underlying economic inequities.<sup>198-200</sup> The commitment of the AAP to decreasing family stress is manifest in many of its official statements, including poverty,<sup>87,88</sup> racism,<sup>166</sup> maternal depression,<sup>90</sup> disasters,<sup>152,153</sup> father engagement,<sup>196</sup> home visiting,<sup>142</sup> and the importance of play.<sup>74,197</sup>

### **Strengthening Core Life Skills**

The strengthening of core life skills (eg, executive function and self-regulation) is needed for families

and communities to provide well-regulated, nurturing environments. Although intensive, capacity-building efforts for parents and other caregivers with limited executive function skills is beyond the scope of most pediatric settings, providing information and support around basic child-rearing practices and establishing daily routines is a cornerstone of traditional primary care. Caregivers with core life skills are essential for the development of executive function and self-regulation skills in their children. The guidelines on parent education and support in *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents* (4th edition) is a starting point for all families,<sup>201</sup> but there is a need to provide more effective, individualized, evidence-based parenting supports (eg, ROR, HealthySteps, VIP) beyond simply providing information about child development. Integrated behavioral health services as part of the FCPMH team might be the next layer for parents who need additional assistance (eg, parental depression), and the need for more intensive skill building (eg, PCIT) for some parents becomes yet another focus for collaboration with key services within the community (eg, ABC, PCIT, CPP, and TF-CBT). Understanding, practicing, and reinforcing executive functions and self-regulation skills (eg, managing strong emotions, ensuring adequate sleep, and getting regular exercise) is essential because all caregivers need these skills to create the kinds of environments in which children thrive.<sup>16,37,59</sup> Whether an adult coaching or skill-building component is incorporated within a FCPMH or connected to it in a collaborative manner, the essential role that these programs play in promoting the healthy development of children is clear, especially for those who are the most disadvantaged.<sup>1,16</sup>

Realizing the full impact of these principles within primary care practice, however, will also require fundamental changes in medical education and payment models. To usher in these fundamental reforms, more pediatricians will need to assume leadership positions outside the realm of clinical care.<sup>202,203</sup> In addition, pediatric training programs will need to educate residents about the ecobiodevelopmental model, train them on how to develop strong therapeutic relationships with parents and caregivers, teach them how to model nurturing and affirming interactions with children of all ages, train them how to encourage caregivers to have positive relational experiences with children of all ages, prepare them to work as part of interdisciplinary teams<sup>144,150</sup> (eg, integrated with behavioral health and social service professionals), educate them on how to develop collaborative partnerships with community referral resources, and encourage them to become vocal advocates for public policies that promote safe, stable, and nurturing families and communities.

Foremost on the advocacy agenda will be the need for serious payment reforms that consider the complexity of care attributable to adverse family and community contexts and include financial supports that incentivize families to engage with an FCPMH.<sup>204</sup> Payment reforms need to be sufficient to allow FCPMHs to spend more time with families, function as interdisciplinary teams, integrate into their community's initiatives and services to support children and families (horizontal integration), and anchor medical neighborhoods that not only foster wellness in childhood but promote positive outcomes across the life span.

## SUMMARY AND RECOMMENDATIONS

Preventing childhood toxic stress responses, promoting resilience, and optimizing development will require that all children be afforded the SSNRs that buffer a wide range of adversities and build the foundational skills needed to cope with future adversity in an adaptive, health-promoting manner. The 3 principles described above, each of which is grounded in the research literature, provide a science-based framework for developing innovative strategies to promote SSNRs at the dyadic level, family level, and community level. Translating these principles into pediatric practice will require FCPMHs to:

1. Understand the toxic stress framework, which explains how many of our society's most intractable problems, such as disparities in health, education, and economic stability, are rooted in our shared biology but divergent experiences and opportunities (see Table 1).
2. Understand the relational health framework, which explains how the individual, family, and community capacities that support the development and maintenance of SSNRs also buffer adversity and build resilience across the life course (see Table 1).
3. Foster strong, trusted, respectful, and supportive relationships with patients and their families to encourage the acceptance of individualized prevention, intervention, and treatment strategies. Doing so will require all health professionals to address their implicit biases, develop cultural humility, and provide culturally competent recommendations.
4. Foster strong, trusted, respectful, and effective collaborations with the community partners who are well-positioned to provide the individualized prevention, intervention, and treatment strategies.
5. Acknowledge that a wide range of adversities, from discrete, threatening events to ongoing, chronic life conditions, share the potential to trigger toxic stress responses and inhibit the formation of SSNRs.
6. Embrace an ecobiodevelopmental model for understanding how both adverse and positive relational experiences in childhood become biologically embedded and impact both negative and positive outcomes across the life course.
7. Move beyond singular, panacea programs toward a layering of interventions that are integrated, both vertically and horizontally, into the local public health efforts to promote safe, stable, and nurturing communities, families, and relationships.
8. Employ a vertically integrated public health approach to promote relational health that is founded on universal primary preventions (such as positive parenting programs, ROR, and developmentally appropriate play) but also offers more precise screening for relational health barriers (such as maternal depression, food insecurity, or exposure to racism) as well as indicated treatments to repair strained or compromised relationships (such as ABC, CPP, PCIT, and TF-CBT).
9. Become hubs for medical neighborhoods, horizontally integrating a wide array of local efforts and early childhood initiatives that not only support families with resources and programs but also advocate for

the public policies that promote safe, stable, and nurturing families and communities.

10. Advocate that health systems, payers, and policy makers at all levels of government align incentives and provide funding to promote the universal primary prevention work discussed in this policy statement. FCPMHs are well-suited and even inclined to support the formation and maintenance of SSNRs as outlined in this policy statement, but they are not currently funded to do so.<sup>205</sup>

Finally, to develop the physician leadership for the FCPMHs of the future, pediatric training programs will need to:

1. Educate residents about the ecobiodevelopmental model and the implications for not only health care but education, juvenile justice, and public policy.
2. Provide longitudinal experiences that train residents on how to develop strong, trusted, respectful, and supportive relationships with parents and caregivers. Doing so will require all trainees to address their implicit biases, develop cultural humility, and provide culturally competent recommendations.
3. Teach residents how to identify and develop collaborative relationships with the local referral resources and early childhood initiatives in their communities.
4. Prepare residents to work as part of the interdisciplinary teams<sup>144</sup> that transform FCPMHs into hubs for medical neighborhoods.<sup>161</sup>
5. Educate residents about the many different facets of a fractured early childhood system of care (eg, Medicaid, Individuals with

Disabilities Education Act Parts C and B, Child Care and Development Block Grants, Head Start, etc), as there is little collaboration or communication between the systems, funders, and programs that address child health, out-of-home child care, education, special education, protective services, or public health. Trainees need to understand all of these many facets so they are prepared to be effective advocates for their patients and families.

6. Encourage them to become leaders in interdisciplinary early childhood systems work and vocal advocates for public policies that promote positive relational experiences in safe, stable, and nurturing families and communities.

## APPENDIX

### Glossary of Terms, Concepts, and Abbreviations

#### ABC

Acronym for Attachment and Biobehavioral Catch-up; ABC is an evidence-based program of interventions to assist foster parents in nurturing children who have experienced disruptions in care.

#### ACEs

Acronym for adverse childhood experiences. In the original ACE Study, 10 categories of adversity were examined: emotional, physical, and sexual abuse; 5 measures of household dysfunction, including the mother being treated violently (intimate partner violence), household substance abuse, household mental illness, parental separation or divorce, and incarcerated household member; and emotional or physical neglect. Other investigators have applied the term ACEs to additional adversities known to affect child health, such as poverty, neighborhood violence, and

exposure to racism. Although this term is frequently used to refer to the child's experiences (child ACEs), it has also been applied to the adversities that parents experienced during their own childhoods (parental ACEs).

#### ACE Score

The ACE score is the sum of the 10 original categories of ACEs experienced before the 18th birthday. To determine an individual's ACE score, see <http://acestoohigh.com/got-your-ace-score>.

#### Biobehavioral Synchrony

Biobehavioral synchrony refers to the matching of nonverbal behaviors (eg, eye contact), coupling autonomic functions (eg, heart rate), coordination of hormone release (eg, oxytocin), and alignment of brainwaves between a parent and an infant.

#### Biological Sensitivity to Context

Biological sensitivity to context is a theory with emerging evidence "that children differ in their susceptibility to environmental influence in a 'for better and for worse' manner, depending on their psychobiologic reactivity to stress." As a consequence, "the very characteristics that are often thought of as children's frailties (eg, high stress reactivity) can also be their strengths, given the right context."<sup>91,131,134,206</sup>

#### Common-Factors Approach

The common factors are communication skills that help to build a therapeutic alliance (the bond felt between the clinician and

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\*The quoted material in this entry is from Ellis BJ. *Biological Sensitivity to Context/ Adaptive Calibration Model*. University of Utah, Department of Psychology, College of Social & Behavioral Science. Available at: <https://psych.utah.edu/research/labs/biological-sensitivity.php>.

patient and/or family, a powerful factor in facilitating emotional and psychological healing), which, in turn, increases the patient and/or family's optimism, feelings of well-being, and willingness to work toward improved health. Other common-factors techniques target feelings of anger, ambivalence, and hopelessness, family conflicts, and barriers to behavior change and help seeking. Still other techniques keep the discussion focused, practical, and organized. These techniques come from family therapy, cognitive therapy, motivational interviewing, family engagement, family-focused pediatrics, and solution-focused therapy. They have been proven useful and effective in addressing mental health symptoms in pediatrics across the age spectrum (as per the AAP policy statement on mental health competencies in pediatric care).

#### *CPP*

Acronym for child-parent psychotherapy; CPP is an evidence-based, psychoanalytic approach for treating dysfunctional parent-child relationships based on the theory that the parent has unresolved conflicts with previous relationships.

#### *Ecobiodevelopmental*

The ecobiodevelopmental framework asserts that the ecology becomes biologically embedded, and there is an ongoing but cumulative dance between the ecology and the biology that drives development over the life span.

#### *Executive Functions*

Executive functions are the cognitive skills needed to control behavior and attain goals. Executive functions are core life skills, and they include capacities like impulse inhibition, working memory, cognitive flexibility, abstract thought, planning, and problem solving.

#### *FCPMH*

Acronym for the family-centered pediatric medical home; in an FCPMH, the pediatrician leads an interdisciplinary team of professionals providing care that is:

- family-centered: the family is recognized and acknowledged as the primary caregiver and support for the child, ensuring that all medical decisions are made in true partnership with the family;
- accessible: care is easy for the child and family to obtain, including geographic access and insurance accommodation;
- continuous: the same primary care clinician cares for the child from infancy through young adulthood, providing assistance and support to transition to adult care;
- comprehensive: preventive, primary, and specialty care are provided to the child and family;
- coordinated: a care plan is created in partnership with the family and communicated with all health care clinicians and necessary community agencies and organizations;
- compassionate: genuine concern for the well-being of a child and family are emphasized and addressed; and
- culturally effective: the family and child's culture, language, beliefs, and traditions are recognized, valued, and respected.

An FCPMH is not a building or place; it extends beyond the walls of a clinical practice. A medical home builds partnerships with clinical specialists, families, and community resources. The medical home recognizes the family as a constant in a child's life and emphasizes partnership between health care professionals and families (as per the National Resource Center for the Patient/Family-Centered Medical Home at the AAP).

If properly funded, FCPMHs are well placed to implement the following functions:

- screening for behavioral and developmental risk factors and diagnoses, including mental health conditions, developmental delays, SDOHs, and family-level risk and resilience factors;
- care coordination, linking families to community-based supports to address SDOHs, parenting concerns, developmental delays, and behavioral and mental health concerns;
- integrated behavioral health and family support services through colocated, interdisciplinary teams that include case management, behavioral health services, and positive parenting programs;
- preventive and dyadic mental health services that do not require a psychiatric diagnosis code for payment, thereby enabling the deployment of primary and secondary prevention strategies before the emergence of behavioral or medical disorders;
- enhanced payment for prolonged medical visits, allowing for more patient-centered communication, interdisciplinary care, and development of therapeutic alliances; and
- ancillary support services (interpretation, telemedicine, transportation, etc) enabling youth with special health care needs to access the many layers of support that they frequently require.

#### *HealthySteps*

HealthySteps is an evidence-based, interdisciplinary pediatric primary care program that promotes positive parenting and healthy development for infants and toddlers, with an emphasis on families living in low-income communities. HealthySteps uses a tiered approach to match services with the level of need, and the core components include: (1) child development social-emotional, and behavioral screening, (2) screening for family needs, (3) child development support line (eg, phone,

text, e-mail, and online portal), (4) child development and behavioral consultants, (5) care coordination and systems navigation, (6) positive parenting guidance and information, (7) early learning resources, and (8) ongoing, preventive team-based well-child visits.

#### *Horizontal Integration*

A public health approach that cuts across traditional silos and funding streams; a horizontally integrated public health approach also includes the educational, civic, social service, and juvenile justice systems.

#### *Medical Neighborhood*

Extends the concept of the FCPMH into the local community; in a medical neighborhood, the FCPMH or health system anchors and supports cross-sector efforts to address family needs (eg, the SDoH), promote population level wellness, and collectively advocate for needed funding and policy changes.

#### *PCIT*

Acronym for Parent-Child Interaction Therapy; PCIT is an evidence-based intervention to change the patterns of parent-child interactions to improve the parent-child relationship.

#### *Positive Childhood Experiences*

Reciprocal experiences with engaged and attuned adults (like those that occur during developmentally appropriate play) that build SSNRs; they are warm, affirming, and inclusive, and they promote early relational health.

#### *Relational Health*

The capacity to develop and maintain SSNRs with others; relational health is an important predictor of wellness across the life span.

#### *Resilience*

The capacity to respond to adversity in a healthy, adaptive manner;

resilience is the manifestation of skills (eg, social skills, emotional regulation, language, and executive functions) that can be modeled, taught, learned, practiced, and reinforced.

#### *Restorative Justice*

Refers to efforts to repair the harm that occurs with unjust behaviors, as opposed to retributive or punitive justice, which simply punishes those who have acted unjustly. Typically, restorative justice allows the victims and the offenders to mediate a restitution agreement that is satisfactory to both parties. In this way, the victims play an active role in communicating with and understanding the offenders, and the offenders have the chance to take responsibility for their actions, identify steps that might prevent offending behaviors in the future, and redeem themselves in the eyes of the victims and community (as per Garner and Saul<sup>17</sup>)

#### *ROR*

Acronym for Reach Out and Read; ROR is a nonprofit organization and early literacy program. ROR provides age appropriate books and encourages parents to regularly read to and interact with their children to support school readiness and healthy parent-child relationships.

#### *SDoHs*

Acronym for the social determinants of health; SDoHs refer to conditions where people live, learn, work, and play (like socioeconomic status, social capital, or exposure to discrimination or community violence) that are known to affect health outcomes across the life span.

#### *SSNRs*

Acronym for safe, stable, and nurturing relationships; these allow the child to feel protected, connected, and competent.

#### *TF-CBT*

Acronym for Trauma-Focused Cognitive Behavioral Therapy; TF-CBT is an evidence-based, manualized, skills-based therapy that allows parents and children to better process emotions and thoughts related to traumatic experiences.

#### *Toxic Stress*

The biological response to frequent, prolonged, or severe adversities in the absence of at least one safe stable and nurturing relationship; these biological responses might be beneficial or adaptive initially, but they often become health harming or maladaptive or “toxic” over time or in different contexts.

#### *Vertical Integration*

A public health approach that includes primary universal preventions to promote wellness (like promoting positive parenting practices), secondary targeted interventions for those deemed to be at risk for poor outcomes (like using biomarkers both to identify those at higher risk and to monitor the effectiveness of various interventions), and tertiary evidence-based treatments for the symptomatic (like referring to providers trained in TF-CBT).

#### *VIP*

Acronym for the Video Interaction Project; VIP uses video-taped interactions of parent-child dyads to teach parents how to be more engaged, attuned, and responsive to their child’s developing behaviors.

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## ABBREVIATIONS

AAP: American Academy of Pediatrics  
ABC: attachment and biobehavioral catch-up  
ACE: adverse childhood experience  
CPP: child–parent psychotherapy  
FCPMH: family-centered pediatric medical home  
PCIT: parent–child interaction therapy  
ROR: Reach Out and Read  
SDoH: social determinants of health  
SSNR: safe, stable, and nurturing relationship  
TF-CBT: trauma-focused cognitive-behavioral therapy  
VIP: Video Interaction Project

appropriate.

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