

**Audrey Stillerman, MD, ABFM, ABIHM, ABOIM**  
Department of Family and Community Medicine, Office of Community Engagement and Neighborhood Health Partnerships, University of Illinois Hospital and Health Sciences System, Chicago, Ill; Center for the Collaborative Study of Trauma, Health Equity, and Neurobiology, an educational program of the Hektoen Institute of Medicine, Chicago, Ill.

[ajstille@uic.edu](mailto:ajstille@uic.edu)

The author reported no potential conflict of interest relevant to this article.

# Childhood adversity & lifelong health: From research to action

Childhood adversity is a significant root cause of chronic illness and early death. Prevention, mitigation, and Tx of toxic stressors must be part of our paradigm of care.

## PRACTICE RECOMMENDATIONS

- › Refer eligible patients to an evidence-based perinatal home-visiting program and all parents to an evidence-based parenting program to prevent childhood adversity. **(A)**
- › Consider screening adult patients and parents for their own history (and their children's history) of childhood adversity. **(B)**
- › Recommend trauma-focused cognitive behavioral therapy and eye-movement desensitization and reprocessing as first-line treatments for adversity and trauma. **(A)**
- › Consider prescribing yoga, neurofeedback, and other neuromodulatory modalities to treat the consequences of childhood adversity and trauma. **(B)**

### Strength of recommendation (SOR)

- (A)** Good-quality patient-oriented evidence
- (B)** Inconsistent or limited-quality patient-oriented evidence
- (C)** Consensus, usual practice, opinion, disease-oriented evidence, case series

The rising prevalence of obesity, widespread community violence, and the opioid epidemic are urgent health crises that we have, so far, failed to solve. Physicians must therefore ask: Are we employing the right framework to effectively understand and address these complex problems?

Careful review of the literature reveals that these problems and many others begin with, and are profoundly affected by, childhood adversity. Compounding this, studies over the past 20 years that have focused on abuse and neglect *without* including community, structural, and historical adversity demonstrate that our definitions of adversity and trauma have been too narrow. The prevalence and diversity of factors affecting development and health is much greater than our medical model anticipates.<sup>1,2</sup>

### CASE ▶

Eileen W, a 55-year-old married, self-employed woman with a 20-year history of autoimmune thyroiditis, longstanding insomnia, and anxiety presents with intense episodes of terror related to public speaking, which are compromising her work performance. Her history is significant for tobacco and alcohol use beginning in early adolescence and continuing into young adulthood, as well as 2 unplanned pregnancies in her 20s. Additional adversities included the murder of her maternal aunt while Ms. W was in utero, resulting in her parents having fostered 2 young cousins; bullying; and the premature death of a special-needs sibling.

What treatment strategies might have been undertaken to manage consequences of the adversities of Ms. W's childhood—both on her own initiative and as interventions by her health care providers?

## Our medical model must be updated to be effective

Because at least 60% of Americans have had 1 or more expe-



Because at least 60% of Americans have had 1 or more experiences of childhood adversity, family physicians care for affected patients every day.

periences of childhood adversity, family physicians care for affected patients every day—a reality incompletely addressed by our conventional theories and practices.<sup>1,3</sup> Consequently, updating our medical model to incorporate research that confirms the critical and widespread impact of childhood experience on health and illness is an essential task for family medicine.

Core values of family medicine integrate biological, clinical, and behavioral sciences. They include comprehensive and compassionate care that is provided within the context of family and community across the lifespan.<sup>4,5</sup> Family medicine is therefore the ideal specialty to lead a movement that will translate scientific evidence of the effects of childhood adversity on health into training, delivery of care, and research—transforming clinical practice and patient health across the lifespan.

This article describes the dramatic impact of childhood adversity on health and well-being and calls on family physicians to play a crucial role in preventing, mitigating, and treating the consequences of childhood adversity, an important root cause of disease.

### Childhood adversity makes us sick

The first paper about the landmark Adverse Childhood Experiences (ACE) Study, published 20 years ago, is 1 of more than 90 on this topic.<sup>3</sup> This study explored the relationship of physical, emotional, and social health in adulthood and self-reported childhood adversity, and comprised 10 categories of abuse, neglect, and household distress between birth and 18 years of age. One of the largest epidemiological studies of its kind, the ACE Study surveyed more than 17,000 mostly white, middle-aged, educated, and insured participants. Study researchers developed an “ACE Score”—the total number of ACEs faced by a person before her (his) 18th birthday—and found that 64% of respondents endorsed 1 or more ACEs; 27% reported 3 or more ACEs; and 5% experienced 6 or more.

The ACE Study revealed a dose-response relationship between ACEs and more than 40 health-compromising behaviors, negative health conditions, and poor social outcomes. Examples include cardiac, autoimmune disease, obesity, intravenous drug abuse, depression and anxiety, adolescent pregnancy,

➤ **Childhood adversity is at the root of our most pressing physical, psychological, and social health problems.**

and worker absenteeism. Tragically, an ACE score of  $\geq 6$  conferred a significant risk for premature death.<sup>1</sup>

ACE data have been collected in diverse populations in 32 states and many countries through the Behavioral Risk Factor Surveillance Survey conducted by the Centers for Disease Control and Prevention<sup>3</sup>; the Child & Adolescent Health Measurement Initiative's National Survey of Children's Health<sup>6</sup>; and The World Health Organization's ACE International Questionnaire<sup>7</sup>—underscoring the pervasiveness of childhood adversity. Evaluation of ACEs in special populations, such as people experiencing homelessness,<sup>8</sup> incarcerated youth,<sup>9</sup> people struggling with addiction,<sup>10</sup> and even health care workers,<sup>11</sup> uncovers notably higher rates of ACEs in these populations than in the general population.

### **Is childhood adversity a true cause of bad outcomes?**

Or is the relationship between the 2 entities merely an association? To help answer this question, researchers evaluated the ACE Study using Bradford Hill criteria—9 epidemiological principles employed to infer causation. Their findings strongly support the hypothesis that not only are ACEs associated with myriad negative outcomes, *they are their root cause*<sup>12</sup> and therefore a powerful determinant of our most pressing and expensive health and social problems. Nevertheless, strategies to prevent and address childhood adversity, which are critical to meeting national health goals of successful prevention and treatment of myriad conditions, are absent from the paradigm and practice of most physicians.

The body of research about the health impact of additional adverse experiences is growing to include community violence, poverty, longstanding discrimination,<sup>2</sup> and other experiences that we describe as social determinants of health. Furthermore, social determinants of health, or adverse community experiences, appear to maintain a dose-response relationship with health and social outcomes.<sup>2,13</sup> Along with adverse collective historical experiences (historical trauma),<sup>14</sup> these community experiences are forcing further re-examination of existing paradigms of health.

### **The biological pathway from experience to illness**

Neuroscience supports the epidemiology of ACEs.<sup>12</sup> The brain develops from the bottom up, in a use-dependent fashion, contingent on genetic potential and, most importantly, on our experiences, which also influence genetic expression. Although present across the lifespan, the brain's capacity to change—neuroplasticity—is most robust from the prenatal period until about 3 years of age.<sup>15</sup> The autonomic nervous system receives information from the body about our internal world and from sensory organs about our external environment and sends it to the brain for processing and interpretation, resulting in micro- and macro-adaptations in structure and function, both within the brain and in the rest of the body.<sup>16</sup>

Neuroscience demonstrates that adverse experiences, in the context of insufficient protective factors and depending on their timing, severity, and frequency, cause overactivation or prolonged activation, or both, of the stress response system, thus derailling optimal growth and development of the brain and disrupting healthy signaling in all body systems. The dysregulated stress response drives inflammation and subsequent chronic disease (FIGURE<sup>17,18</sup>), and may influence genetic expression in this, and future, generations.<sup>12,14,19</sup> Using neuroimaging and assessment of biomarkers, researchers can see the harm caused by inadequately buffered adversity on overall anatomy and physiology. Protective factors such as a safe environment and positive relationships provide hope that normal biological responses to adverse circumstances can be prevented or reversed, leading to clinical, cognitive, and functional improvement<sup>11</sup> (TABLE 1<sup>20-22</sup>).

### **Evidence-based primary prevention of childhood adversity succeeds**

Primary prevention of childhood adversity offers significant benefits across the lifespan and, likely, into the next generation. It ensures that every infant has at least 1 nurturing, attuned caregiver with whom to develop a secure attachment relationship that is essential for optimal growth and development of brain and body.

Primary prevention is most effective when it focuses on supporting caregivers during the perinatal and early childhood periods of their families, before children's brains are fully organized. Primary prevention involves evidence-based program implementation; collaboration among multiple sectors, including early childhood education, child welfare, criminal justice, business, faith, and health care; and, ultimately, policy change. It incorporates individual, family, and community-based strategies to meet basic needs, ensure safety, fortify a sense of love and belonging in families, and support parents in developing optimal parenting skills. This allows caregivers to devote attention to their children, thus strengthening attunement and attachment, reducing toxic stress, and building protective factors and resilience. Evidence-based and -informed prevention programs include the Nurse-Family Partnership (NFP), Positive Parenting Program (Triple P), and the Family-Centered Medical Home.

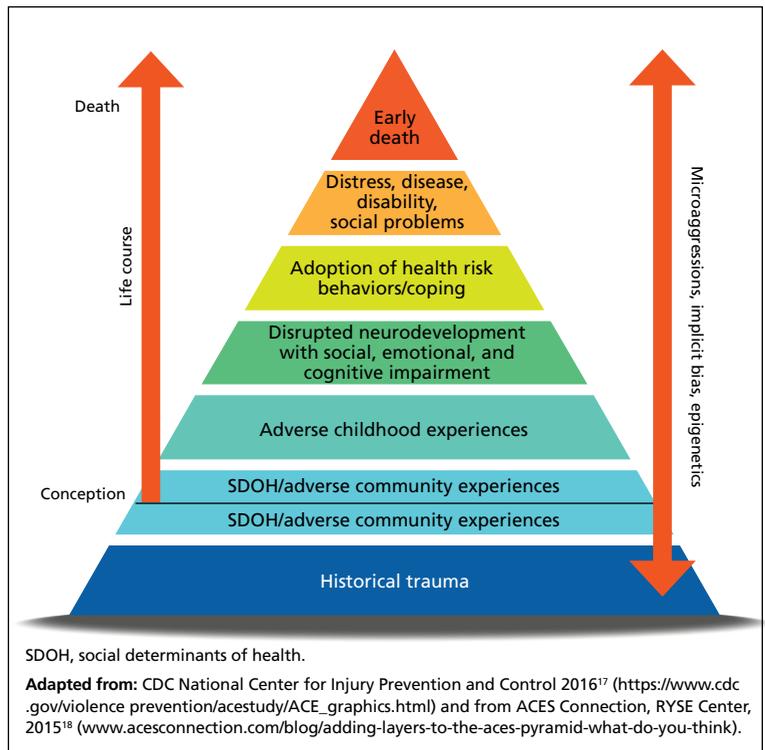
■ **NFP.** Randomized controlled trials of the NFP, a perinatal home visiting program for low-income, first-time pregnant women and their offspring, showed a reduction in the incidence of domestic violence, child maltreatment, and maternal smoking, with improvement in maternal financial stability, cognitive and socioemotional outcomes, and rates of substance abuse and incarceration in children and/or youth.<sup>23</sup>

■ **Triple P.** A randomized controlled trial of Triple P, an evidence-based, multilevel, population-based preventive intervention system that was designed to support parents and enhance parenting practices for families with at least 1 child (birth to 12 years old), demonstrated a statistically significant reduction in substantiated child maltreatment cases, out-of-home placements, and emergency room visits and hospitalizations for childhood injuries that were the result of child maltreatment.<sup>24</sup>

■ **The Family-Centered Medical Home,** a primary care strategy to reduce premature and low-birth-weight deliveries, used Medicaid dollars for services not traditionally considered "medical" to address all physical and emotional needs of mothers and families as part of the medical relationship. This

FIGURE

## The pathway from experience to illness, across the life span<sup>17,18</sup>



program eliminated premature delivery and low birth weight,<sup>25</sup> both considered evidence of in utero toxic stress.<sup>26</sup>

### Screening can be brief:

#### In some cases, a single question

The prevalence and impact of childhood adversity, along with the opportunity for significant health improvements and savings, inspires providers to explore screening. Existing screening programs have consistent goals<sup>27,28</sup>:

- identify unique experiences shaping our patients' health
- reframe "What's wrong with you?" as "What happened to you?" "What's right with you?" and "What matters to you?"
- facilitate health education and neuro-education, particularly meaning-making and self-regulation
- prevent and mitigate the sequelae of exposure to ACEs
- promote health in this and subsequent generations.

CONTINUED

TABLE 1

What are the risk factors and protective factors for childhood adversity?<sup>20-22</sup>

Risk factor	Protective factor
<b>Individual</b>	
Age ≤ 4 years	Age >4 years
Special needs that increase caregiver burden <sup>a</sup>	
Media use and length of exposure, children and teens <sup>20</sup>	
Parental knowledge and skills deficits <sup>b</sup>	Nurturing parenting skills, household routines
Parental history of abuse or neglect	Extra-familial mentor or support relationships
Family substance abuse or mental health problems	Access to health care and social services
Parental social vulnerability <sup>c</sup>	
Nonbiological transient adults in the home—eg, mother’s male partner	
Parental beliefs justify maltreatment	
Media exposure to physical and relational violence (adolescents and young adults) <sup>21</sup>	
<b>Family</b>	
Social isolation	Supportive family and social networks <sup>d</sup>
Family chaos, dissolution, violence	Stable family relationships
Parenting stress	Concrete support to meet basic needs
Poor parent–child relationships	Knowledge and capacity to monitor children
	Parental employment
	Parental education
	Adequate housing
<b>Community</b>	
Community violence	Community support for parents and families
Concentrated neighborhood distress	Community commitment to preventing abuse
• High poverty	
• Residential instability	
• High unemployment	
• High density—alcohol outlets	
• Poor social connections	

<sup>a</sup>Disabilities, mental health issues, and chronic physical illnesses.

<sup>b</sup>Children’s needs and child development.

<sup>c</sup>Young age, low education, single parenthood, large number of dependent children, low income.

<sup>d</sup>Extended family networks, friendships, block clubs, affiliations with community and faith organizations.

Adapted from: Centers for Disease Control and Prevention. [www.cdc.gov/violenceprevention/childabuseandneglect/riskprotectivefactors.html](http://www.cdc.gov/violenceprevention/childabuseandneglect/riskprotectivefactors.html).<sup>22</sup>

■ **The ACE Study** screened patients in the context of a comprehensive periodic health assessment. Study participants completed an at-home questionnaire and reviewed it with their physician.<sup>1</sup> The Urban ACE Survey added important community

stressors such as neighborhood violence, bullying, and food insecurity to the original ACE questionnaire.<sup>2</sup>

■ **Primary care tool.** Wade developed a short, 2-question ACE pre-screener for primary care<sup>29</sup> and is exploring screening for child-

hood adversity in pediatric practice, as are primary care clinicians around the country.

■ **Single-question screener.** A Chicago internist interviewed more than 500 patients using a single-question screener that asked whether growing up was “mostly okay or pretty difficult.” This tool accurately confirmed childhood adversity in patients with complex chronic illness, prevented re-traumatization by allowing patients control over disclosure, and opened the door to collaborative healing work over time.<sup>30</sup>

■ **The Hague Protocol,** now mandated in the Netherlands for health and justice professionals, focuses its efforts upstream by offering early detection of children at risk for adverse experiences. The protocol requires asking adults who present with intimate partner violence, suicidality, psychiatric disturbance, or severe substance abuse whether they care for children in any capacity. Those who are so identified are referred to a center at which support services are offered.<sup>31</sup>

■ **Uncertainty about the utility of existing tools.** Many screening tools appear to be promising in terms of identification of the risk for, or actual, childhood adversity, patient and provider satisfaction, and their “fit” in the clinical workflow. Even so, no best practice guidelines exist in primary care to steer screening efforts. Questions remain about<sup>27-29</sup>:

- broad implementation of a specific tool
- how, when, and where screening should take place
- whether to screen adults, parents, or children—or all 3
- how best to use the content and pacing of screening questions to promote self-regulation and prevent re-traumatization
- best strategies for training and supporting health care workers around screening activities
- how to optimally manage a positive screen.

### How best to approach treatment

Treatment includes trauma-informed care, an organizational transformation process (described in TABLE 2<sup>32</sup>; in “The lexicon of

TABLE 2

### Key ingredients of trauma-informed care<sup>32</sup>

<b>The clinical team should:</b>
<i>Involve patients in the treatment process</i>
<i>Screen for trauma</i>
<i>Train staff in trauma-specific treatment approaches</i>
<i>Engage referral sources and partner organizations</i>
<b>The organization should:</b>
<i>Lead and communicate about the transformation process</i>
<i>Engage patients in organizational planning</i>
<i>Train clinical, as well as nonclinical, staff members</i>
<i>Create a safe physical and emotional environment</i>
<i>Prevent secondary traumatic stress in staff</i>
<i>Hire a trauma-informed workforce</i>

Source: Center for Health Care Strategies, Inc. Reprinted with permission.

childhood adversity: Concepts and tools for care,”<sup>33-45</sup> page 696; and in the subsection, “Lessons from neuroscience,” on page 696), and individual treatment strategies. The Substance Abuse and Mental Health Services Administration (SAMHSA) of the US Department of Health and Human Services is advocating for implementation of trauma-informed approaches in health systems.

■ **Trauma-informed care** is a model intended to promote healing and reduce the risk for re-traumatization of patients by staff—significant concerns in clinical settings, where the dynamics of loss of power, control, and safety that are inherent in traumatic experience can be replicated.<sup>46</sup> To operationalize trauma-informed care more formally, the Center for Health Care Strategies, Inc., and the National Council for Behavioral Health are developing recommendations for 1) standardized screening and assessment tools, evidence-based clinical interventions, implementation processes, and relevant and replicable outcome measures, and 2) policy changes to improve patient and staff engagement, enhance health outcomes, and reduce avoidable care and excess costs.<sup>47,48</sup>



**Toxic stress impairs and sensitizes the stress response system, causes neuro-inflammation and systemic inflammation, and leads to chronic illness, disability, and early death.**

CONTINUED

➤ Asking patients whether growing up was “mostly okay or pretty difficult” accurately confirmed childhood adversity in patients with complex chronic illness.

## The lexicon of childhood adversity: Concepts and tools for care<sup>33-45</sup>

**Adversity** A state or instance of serious or continued difficulty or misfortune.<sup>33</sup>

**Attachment** A special, enduring form of emotional relationship with a specific person involving soothing, pleasure, and comfort.<sup>34</sup>

**Attunement** The ability to read and respond to the cues of another.<sup>35</sup>

**Eye-movement desensitization and reprocessing (EMDR)** An evidence-based psychotherapy for posttraumatic stress disorder and other psychiatric disorders, mental health problems, and somatic symptoms. EMDR facilitates resumption of normal information processing and integration; the patient attends to emotionally disturbing material in brief sequential doses while simultaneously focusing on an external stimulus. EMDR targets past experience, current triggers, and future potential challenges, and results in alleviation of presenting symptoms; a decrease or elimination of distress from the disturbing memory; improved view of the self; relief from bodily disturbance; and resolution of present and future anticipated triggers.<sup>36</sup>

**Historical trauma** Cumulative emotional and psychological wounding, resulting from group traumatic experiences, transmitted across generations within a community.<sup>37</sup>

**Neurofeedback** Electroencephalographic biofeedback is a method for retraining brainwave patterns through operant conditioning; it is used to treat posttraumatic stress disorder, various mental health conditions, addiction, chronic pain, epilepsy, and other disorders.<sup>38</sup>

**Neuromodulatory** Having the capacity to alter nerve activity through targeted delivery of a stimulus, such as electrical stimulation or chemical agents, to specific neurological sites in the body to help restore function or relieve symptoms.<sup>39</sup>

**Social determinants of health/adverse community experiences** Conditions in which people are born, grow, live, work, and age and that are shaped by distribution of money, power, and resources at all levels.<sup>40,41</sup>

**Trauma** An event or circumstance experienced or observed by a person as physically or emotionally harmful or threatening and having lasting adverse effects on that person's functioning and well-being.<sup>42</sup>

**Trauma-focused cognitive behavioral therapy** An evidence-based trauma treatment for children 3 to 18 years and their parents comprising the elements of the acronym PRACTICE: **P**sychoeducation and parenting; **R**elaxation methods; **A**ffective expression and regulation skills; **C**ognitive coping skills and processing; **T**rauma narrative and processing; **I**n vivo exposure; **C**onjoint parent-child therapy sessions; and **E**nhancing personal safety and growth.<sup>43</sup>

**Trauma-informed approach** This “4-R” approach can be implemented in any type of service setting, organization, or program that: *Realizes* the widespread impact of trauma and understands potential paths for recovery; *recognizes* signs and symptoms of trauma in clients, families, staff, and others involved with the system; *responds* by fully integrating knowledge about trauma into policies, procedures, and practices; and seeks to actively resist *re-traumatization*.<sup>44</sup>

**Use-dependent** The organization and function of neurons, the neural system, and the brain depends on repetitive, patterned stimulation.<sup>45</sup>

■ **Lessons from neuroscience** guide effective treatment.<sup>16</sup> Treatment begins with bottom-up strategies that are focused on decreasing suboptimal excitatory input from the survival brainstem to create safety, connect

patients to resources to meet basic needs, teach self-regulation skills, and improve relational health in and outside of the office. Later-stage top-down methods, such as education and other cognitive activities, focus on

strengthening the regulatory capacity of the thinking cortex.<sup>16</sup> In many ways, treatment mirrors prevention: It emphasizes first helping patients feel safe and loved.

In a follow-up to the ACE Study, 100,000 patients had a primary care visit in which their practitioner reviewed the ACE questionnaire with them; said “I see that you have \_\_\_\_\_. Tell me how that has affected you later in your life” for every “Yes” response; and listened to the answers without passing judgment. This simple intervention profoundly decreased health resource utilization by these patients during the following year: a reduction of 35% in office visits, 11% in emergency room visits, and 3% in hospitalizations.<sup>1</sup>

The neurosequential model of therapeutics assesses neurodevelopment in the context of childhood adversity and relational health to evaluate consequences of childhood adversity and direct treatment. Adopted domestically and internationally, this model has had statistically significant success facilitating improvement in patients’ physical, emotional, and social health status.<sup>16,49</sup>

**■ Trauma-specific treatment modalities** such as trauma-focused cognitive behavioral therapy and eye-movement desensitization and reprocessing (EMDR),<sup>50</sup> a trauma-specific treatment effective in resolving painful childhood memories, are evidence-based treatments that reduce trauma-related symptoms; evidence is also emerging about the efficacy of yoga<sup>51</sup> and neurofeedback.<sup>52</sup> These therapies have been best studied as treatment for posttraumatic stress disorder and other mental health disorders and also hold promise for addressing physical and social consequences of adversity. They present a low risk for harm, appear to be cost-effective, and improve outcomes.

Best regimens involve a multifaceted approach that combines health-system resources with referral to other community practitioners and agencies. An excellent example is a current collaboration between health systems and affordable housing programs to reduce and, ultimately, eliminate chronic homelessness. Positive outcomes of this collaboration include both improved

health and life satisfaction for participants and cost savings to the health system.<sup>53</sup>

#### **CASE ▶**

Beginning in adulthood, Ms. W began long-term psychotherapy and had a therapeutic trial of antidepressants, without significant improvement. None of her medical or mental-health providers educated her about the connection between childhood adversity and illness to help her make sense of her health history and autoimmune disease, or to guide treatment. She learned from a friend about the relationship between childhood adversity and poor health and self-administered the ACE questionnaire, scoring 5 points out of a possible 10.

Ms. W enjoyed loving relationships with her mother, sisters, and friends. She had longstanding personal practices of individual and group physical activity, journaling, and spending time in nature.

About 10 years ago, Ms. W committed to regular yoga practice and later saw a functional medicine provider, who focused on nutrition and restorative sleep. She noticed improvement in all signs and symptoms; however, the terror of public speaking remained. Through friends, she found a practitioner who offered EMDR. Over the past 2 years, her terror has resolved and general anxiety and insomnia have continued to improve; she is now able to speak with fluency and comfort in any arena.

#### **Addressing childhood adversity: Our “natural domain”**

Experiences, positive and negative, shape our psychology and biology; they are powerful determinants of health—or illness. Prevention of, and response to, childhood adversity demand a systems approach to the whole person in context—the natural domain of family medicine.

Although clinical translation is still unfolding, the risks of implementing promising prevention and treatment strategies are low, the stakes are high, and the potential benefits are vast. Therefore, we as family physicians can—must—learn and incorporate the science of childhood adversity, neurobiology, and life course into our training, research,

**▶ Successful strategies for childhood adversity emphasize parenting education programs, trauma-informed organizational practices, and neuromodulatory treatments.**

and clinical paradigm and practice; we can do that by embedding this framework throughout our training and continuing education in formal didactics, case discussions, hands-on skill-building, scientific investigation, and patient care.

We must make our offices and hospitals trauma-informed; connect patients with resources to meet basic needs and with home-visiting and parent education programs; educate patients about the impact of protective and adverse factors on health; provide and practice self-regulation training in our offices or by referral; and advocate for equity.

Using these strategies, family physicians will play a crucial role in the prevention, mitigation, and treatment of the root cause of disease and society's deepest individual and collective suffering. **JFP**

**CORRESPONDENCE**

Audrey Stillerman, MD, ABFM, ABIHM, ABOIM, Office of Community Engagement and Neighborhood Health Partnerships, 808 South Wolcott Street, Room 809, Chicago, IL 60612; ajstille@uic.edu.

**ACKNOWLEDGMENT**

Patricia Rush, MD, MBA, and Adrienne Williams, PhD, reviewed the manuscript of this article.

**References**

1. Felitti V, Anda R. The relationship of adverse childhood experiences to adult medical disease, psychiatric disorders and sexual behavior: implications for healthcare. In: Lanius RA, Vermetten E, Pain C, eds. *The Impact of Early Life Trauma on Health and Disease: The Hidden Epidemic*. Cambridge, UK: Cambridge University Press; 2011:77-87.
2. Wade R Jr, Shea JA, Rubin D, et al. Adverse childhood experiences of low-income urban youth. *Pediatrics*. 2014;134:e13-e20.
3. Centers for Disease Control and Prevention. Child abuse and neglect prevention. April 10, 2018. [www.cdc.gov/violenceprevention/childabuseandneglect/index.html](http://www.cdc.gov/violenceprevention/childabuseandneglect/index.html). Accessed September 20, 2018.
4. American Academy of Family Physicians. Definition of family medicine. [www.aafp.org/about/policies/all/family-medicine-definition.html](http://www.aafp.org/about/policies/all/family-medicine-definition.html). Accessed March 5, 2018.
5. Martin JC, Avant RF, Bowman MA, et al; The Future of Family Medicine Project Leadership Committee. The Future of Family Medicine: a collaborative project of the family medicine community. *Ann Fam Med*. 2004;2 Suppl 1:S3-S32.
6. Child & Adolescent Health Measurement Initiative (CAHMI). A national and across-state profile on Adverse Childhood Experiences among U.S. children and possibilities to heal and thrive. Issue Brief. October 2017. [www.cahmi.org/wp-content/uploads/2018/05/aces\\_brief\\_final.pdf](http://www.cahmi.org/wp-content/uploads/2018/05/aces_brief_final.pdf). Accessed September 20, 2018.
7. World Health Organization. Adverse Childhood Experiences International Questionnaire (ACE-IQ). [www.who.int/violence\\_injury\\_prevention/violence/activities/adverse\\_childhood\\_experiences/en/](http://www.who.int/violence_injury_prevention/violence/activities/adverse_childhood_experiences/en/). Accessed September 20, 2018.
8. Roos LE, Mota N, Afifi TO, et al. Relationship between adverse childhood experiences and homelessness and the impact of axis I and II disorders. *Am J Public Health*. 2013;103(Suppl 2):S275-S281.
9. Baglivio MT, Wolff KT, Piquero AR, et al. The relationship between adverse childhood experiences (ACE) and juvenile offending trajectories in a juvenile offender sample. *J Crim Justice*. 2015;43:229-241.
10. Dube SR, Felitti VF, Dong M, et al. Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse

- childhood experiences study. *Pediatrics*. 2003;111:564-572.
11. Maunder RG, Peladeau N, Savage D, et al. The prevalence of childhood adversity among healthcare workers and its relationship to adult life events, distress and impairment. *Child Abuse Negl*. 2010;34:114-123.
12. Anda RF, Felitti VJ, Bremner JD, et al. The enduring effects of abuse and related adverse experiences in childhood: a convergence of evidence from neurobiology and epidemiology. *Eur Arch Psychiatry Clin Neurosci*. 2006;256:174-186.
13. Braveman PA, Cubbin C, Egerter S, et al. Socioeconomic disparities in health in the United States: what the patterns tell us. *Am J Public Health*. 2010;100(Suppl 1):S186-S196.
14. Bowers ME, Yehuda R. Intergenerational transmission of stress in humans. *Neuropsychopharmacology*. 2016;41:232-244.
15. Perry BD. Memories of fears: How the brain stores and retrieves traumatic experiences. In: Goodwin J, Attias R, eds. *Splintered Reflections: Images of the Body in Trauma*. New York, NY: Basic Books; 1999:9-38.
16. Perry BD. Examining child maltreatment through a neurodevelopmental lens: clinical application of the Neurosequential Model of Therapeutics. *J Loss Trauma*. 2009;14:240-255.
17. Adverse childhood experiences presentation graphics. The ACE Pyramid. CDC National Center for Injury Prevention and Control, Division of Violence Prevention. April 1, 2016. [www.cdc.gov/violenceprevention/acestudy/ACE\\_graphics.html](http://www.cdc.gov/violenceprevention/acestudy/ACE_graphics.html). Accessed October 10, 2018.
18. Adding layers to the ACEs pyramid—What do you think? Trauma and social location. ACES Connection, RYSE Center. 2015. [acesconnection.com/blog/adding-layers-to-the-aces-pyramid-what-do-you-think](http://acesconnection.com/blog/adding-layers-to-the-aces-pyramid-what-do-you-think). Accessed October 10, 2018.
19. Berens AE, Jensen SKG, Nelson CA 3rd. Biological embedding of childhood adversity: from physiological mechanisms to clinical implications. *BMC Med*. 2017;15:135.
20. Rostad WL, Basile KC, Clayton HB. Association among television and computer/video game use, victimization, and suicide risk among U.S. high school students. *J Interpers Violence*. 2018 Mar 1:886260518760020.
21. Coyne SM, Nelson DA, Graham-Kevan N, et al. Media depictions of physical and relational aggression: connections with aggression in young adults' romantic relationships. *Aggress Behav*. 2011;37:56-62.
22. Centers for Disease Control and Prevention. Violence prevention: Child abuse and neglect: risk and protective factors. April 10, 2018. [www.cdc.gov/violenceprevention/childabuseandneglect/riskprotectivefactors.html](http://www.cdc.gov/violenceprevention/childabuseandneglect/riskprotectivefactors.html). Accessed October 10, 2018.
23. Miller TR. Projected outcomes of nurse-family partnership home visitation during 1996-2013, United States. *Prev Sci*. 2015;16:765-777.
24. Prinz RJ, Sanders MR, Shapiro CJ, et al. Population-based prevention of child maltreatment: the U.S. Triple P system population trial. *Prev Sci*. 2009;10:1-12.
25. Kraft C. Building capacity & support for two generation primary care. 2015 Midwest Regional Summit on Adverse Childhood Experiences. March 13, 2015. [www.hmprg.org/assets/root/PDFs/2015/Summit%20Notes%20for%20Day%20Two.pdf](http://www.hmprg.org/assets/root/PDFs/2015/Summit%20Notes%20for%20Day%20Two.pdf). Accessed September 20, 2018.
26. Smith MV, Gotman N, Yonkers KA. Early childhood adversity and pregnancy outcomes. *Matern Child Health J*. 2016;20:790-798.
27. Leitch L. Action steps using ACEs and trauma-informed care: a resilience model. *Health & Justice*. 2017;5:1-10.
28. Bethell CD, Carle A, Hudziak J, et al. Methods to assess adverse childhood experiences of children and families: toward approaches to promote child well-being in policy and practice. *Acad Pediatr*. 2017;17:S51-S69.
29. Wade R Jr, Becker BD, Bevans KB, et al. Development and evaluation of a short adverse childhood experiences measure. *Am J Prev Med*. 2017;52:163-172.
30. Rush P. How learning about emotional trauma led me to a new understanding of chronic illness and health disparity. Becoming trauma-informed: Perspectives from public health, faith communities, education and medicine. Presented at 2016 Advocate Symposium, "Becoming a Trauma-Informed Children's Hospital and Community: Building Foundations of Care, Collaboration and Practice." Oaklawn, IL: Advocate Children's Hospital; November 16, 2016.
31. Diderich HM, Fekkes M, Verkerk PH, et al. A new protocol for screening adults presenting with their own medical problems at the Emergency Department to identify children at high risk for maltreatment. *Child Abuse Negl*. 2013;37:1122-1131.
32. Fact Sheet: Key ingredients for trauma-informed care. Center for Health Care Strategies, Inc. August 2017. [www.chcs.org/media/ATC-Key-Ingredients-Fact-Sheet\\_081417.pdf](http://www.chcs.org/media/ATC-Key-Ingredients-Fact-Sheet_081417.pdf). Accessed September 22, 2018.

**Evidence is emerging about the efficacy of yoga and neurofeedback for reducing trauma-related symptoms.**

33. Adversity. In: Merriam-Webster Online Dictionary. Springfield, MA: Merriam-Webster, Inc. [www.merriam-webster.com/dictionary/adversity](http://www.merriam-webster.com/dictionary/adversity). Accessed September 21, 2018.
34. Perry BD. Understanding traumatized and maltreated children: the core concepts. Child Trauma Academy Video Training Series, Video 4;2004:12. *Child Trauma Academy* (<http://childtrauma.org/>).
35. Perry BD. Understanding traumatized and maltreated children: the core concepts. Child Trauma Academy Video Training Series, Video 4;2004:19. Child Trauma Academy (<http://childtrauma.org/>).
36. EMDRIA's definition of EMDR (eye movement desensitization and reprocessing). Austin, TX: EMDRIA: EMDR International Association. <http://cymcdn.com/sites/www.emdria.org/resource/resmgr/imported/EMDRIA%20Definition%20of%20EMDR.pdf>. Revised February 25 2012. Accessed September 21, 2018.
37. Types of trauma and violence: Historical trauma. Washington, DC: Substance Abuse and Mental Health Services Administration. [www.samhsa.gov/trauma-violence/types](http://www.samhsa.gov/trauma-violence/types). Accessed September 21, 2018.
38. Hammond DC. What is neurofeedback? An update. *J Neurotherapy*. 2011;15:305-336.
39. International Neuromodulation Society. Neuromodulation, or neuromodulatory effect. [www.neuromodulation.com/neuromodulation-defined](http://www.neuromodulation.com/neuromodulation-defined). November 9, 2017. Accessed September 21, 2018.
40. World Health Organization. Social determinants of health. [www.who.int/social\\_determinants/sdh\\_definition/en/](http://www.who.int/social_determinants/sdh_definition/en/). Accessed September 21, 2018.
41. Davis R, Pinderhughes H, Williams M. Adverse community experiences and resilience: a framework for addressing and preventing community trauma. Oakland, CA: Prevention Institute; 2015:4-5. [www.preventioninstitute.org/publications/adverse-community-experiences-and-resilience-framework-addressing-and-preventing](http://www.preventioninstitute.org/publications/adverse-community-experiences-and-resilience-framework-addressing-and-preventing). Accessed September 30, 2018.
42. SAMHSA-HRSA Center for Integrated Health Solutions. Trauma. Rockville, MD: Substance Abuse and Mental Health Services Administration and Health Resources and Services Administration, US Department of Health and Human Services. [www.integration.samhsa.gov/clinical-practice/trauma](http://www.integration.samhsa.gov/clinical-practice/trauma). Accessed September 21, 2018.
43. Cohen JA, Mandarino AP. Trauma-focused cognitive behavioural therapy for children and parents. *Child Adolesc Ment Health*. 2008;13:158-162.
44. Trauma-informed approach and trauma-specific interventions: Trauma-informed approach. Washington, DC: National Center for Trauma Informed Care and Alternatives to Seclusion and Restraints; Substance Abuse and Mental Health Services Administration. [www.samhsa.gov/nctic/trauma-interventions](http://www.samhsa.gov/nctic/trauma-interventions). Accessed September 21, 2018.
45. Perry BD. How the brain develops: the importance of early childhood. Child Trauma Academy Video Training Series, Video 1;2004:21. Child Trauma Academy (<http://childtrauma.org/>).
46. Huang LN, Sharp CS, Gunther T. It's just good medicine: trauma-informed primary care. (SAMHSA-HRSA Center for Integrated Health Solutions webinar); August 6, 2013. [www.integration.samhsa.gov/about-us/CIHS\\_TIC\\_Webinar\\_PDF.pdf](http://www.integration.samhsa.gov/about-us/CIHS_TIC_Webinar_PDF.pdf). Accessed September 20, 2018.
47. CHCS: Center for Health Care Strategies, Inc. Fact sheet: Key ingredients for trauma-informed care. August 2017. [www.chcs.org/media/ATC-Key-Ingredients-Fact-Sheet\\_081417.pdf](http://www.chcs.org/media/ATC-Key-Ingredients-Fact-Sheet_081417.pdf). Accessed September 20, 2018.
48. National Council for Behavioral Health. Trauma-informed primary care: fostering resilience and recovery. [www.thenationalcouncil.org/consulting-areas-of-expertise/trauma-informed-primary-care/](http://www.thenationalcouncil.org/consulting-areas-of-expertise/trauma-informed-primary-care/). Accessed September 20, 2018.
49. Child Trauma Academy. The Neurosequential Model of Therapeutics as evidence-based practice. [https://childtrauma.org/wp-content/uploads/2015/05/NMT\\_EvidenceBasedPract\\_5\\_2\\_15.pdf](https://childtrauma.org/wp-content/uploads/2015/05/NMT_EvidenceBasedPract_5_2_15.pdf). Accessed September 30, 2018.
50. Bisson JI, Ehlers A, Matthews R, et al. Psychological treatments for chronic post-traumatic stress disorder. Systematic review and meta-analysis. *Br J Psychiatry*. 2007;190:97-104.
51. Metcalf O, Varker T, Forbes D, et al. Efficacy of fifteen emerging interventions for the treatment of posttraumatic stress disorder: a systematic review. *J Trauma Stress*. 2016;29:88-92.
52. van der Kolk BA, Hodgdon H, Gapen M, et al. A randomized controlled study of neurofeedback for chronic PTSD. 2016; PLoS One. 2016;11:e0166752.
53. Bryan M. A hospital offers frequent ER patients an out—free housing. "All Things Considered." National Public Radio. June 29, 2016. [www.npr.org/sections/health-shots/2016/06/29/482994000/a-hospital-offers-frequent-er-patients-an-out-free-housing](http://www.npr.org/sections/health-shots/2016/06/29/482994000/a-hospital-offers-frequent-er-patients-an-out-free-housing). Accessed September 20, 2018.



## ECG to screen asymptomatic adults? Not so fast, says USPSTF

Doug Campos-Outcalt, MD, MPA



### INSTANT POLL

Does your practice customarily send along a clinical history and corresponding physician findings with biopsy samples?

### ONLINE EXCLUSIVES

- Obstructive sleep apnea: A better Dx model for primary care
- Adult foot fractures: A guide
- Primary hyperparathyroidism: Labs to order, Tx to consider
- PHOTO ROUNDS  
Persistent erythematous papulonodular rash

### PHOTO ROUNDS FRIDAY

Test your diagnostic skills at [www.jfponline.com/articles/photo-rounds-friday.html](http://www.jfponline.com/articles/photo-rounds-friday.html)

### PLUS

Today's headlines in family medicine

### GET UPDATES FROM US ON





[www.facebook.com/JFamPract](http://www.facebook.com/JFamPract)
<http://twitter.com/JFamPract>
[http://bit.ly/JFP\\_GooglePlus](http://bit.ly/JFP_GooglePlus)

[www.jfponline.com](http://www.jfponline.com)