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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.

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.1,2

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-
periences of childhood adversity, family physicians care for affected patients every day—a reality incompletely addressed by our conventional theories and practices. 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. 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. 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.

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 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, 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. Along with adverse collective historical experiences (historical trauma), 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. 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. 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.

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 derailing 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, and may influence genetic expression in this, and future, generations. 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 (TABLE 1).

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.23

**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.24

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

**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 goals27,28:

- 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*
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.\(^1\) The Urban ACE Survey added important community stressors such as neighborhood violence, bullying, and food insecurity to the original ACE questionnaire.\(^2\)

**Primary care tool.** Wade developed a short, 2-question ACE pre-screener for primary care\(^29\) and is exploring screening for child-

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>What are the risk factors and protective factors for childhood adversity?(^{20-22})</th>
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</thead>
<tbody>
<tr>
<td><strong>Risk factor</strong></td>
<td><strong>Protective factor</strong></td>
</tr>
<tr>
<td><strong>Individual</strong></td>
<td></td>
</tr>
<tr>
<td>Age ≤ 4 years</td>
<td>Age &gt;4 years</td>
</tr>
<tr>
<td>Special needs that increase caregiver burden(^a)</td>
<td></td>
</tr>
<tr>
<td>Media use and length of exposure, children and teens(^25)</td>
<td></td>
</tr>
<tr>
<td>Parental knowledge and skills deficits(^b)</td>
<td>Nurturing parenting skills, household routines</td>
</tr>
<tr>
<td>Parental history of abuse or neglect</td>
<td>Extra-familial mentor or support relationships</td>
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<tr>
<td>Family substance abuse or mental health problems</td>
<td>Access to health care and social services</td>
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<tr>
<td>Parental social vulnerability(^c)</td>
<td></td>
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<tr>
<td>Nonbiological transient adults in the home—eg, mother’s male partner</td>
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<tr>
<td>Parental beliefs justify maltreatment</td>
<td></td>
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<tr>
<td>Media exposure to physical and relational violence (adolescents and young adults)(^21)</td>
<td></td>
</tr>
<tr>
<td><strong>Family</strong></td>
<td></td>
</tr>
<tr>
<td>Social isolation</td>
<td>Supportive family and social networks(^d)</td>
</tr>
<tr>
<td>Family chaos, dissolution, violence</td>
<td>Stable family relationships</td>
</tr>
<tr>
<td>Parenting stress</td>
<td>Concrete support to meet basic needs</td>
</tr>
<tr>
<td>Poor parent–child relationships</td>
<td>Knowledge and capacity to monitor children</td>
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<tr>
<td>Parental employment</td>
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<tr>
<td>Parental education</td>
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<tr>
<td>Adequate housing</td>
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<tr>
<td><strong>Community</strong></td>
<td></td>
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<tr>
<td>Community violence</td>
<td>Community support for parents and families</td>
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<tr>
<td>Concentrated neighborhood distress</td>
<td>Community commitment to preventing abuse</td>
</tr>
<tr>
<td>• High poverty</td>
<td></td>
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<tr>
<td>• Residential instability</td>
<td></td>
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<td>• High unemployment</td>
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<tr>
<td>• High density—alcohol outlets</td>
<td></td>
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<tr>
<td>• Poor social connections</td>
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</tbody>
</table>

\(^a\)Disabilities, mental health issues, and chronic physical illnesses.

\(^b\)Children’s needs and child development.

\(^c\)Young age, low education, single parenthood, large number of dependent children, low income.

\(^d\)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).\(^{22}\)
Toxic stress impairs and sensitizes the stress response system, causes neuro-inflammation and systemic inflammation, and leads to chronic illness, disability, and early death.

How best to approach treatment

Treatment includes trauma-informed care, an organizational transformation process (described in TABLE 2); in “The lexicon of childhood adversity: Concepts and tools for care,” 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.

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<tr>
<th>TABLE 2</th>
<th>Key ingredients of trauma-informed care\textsuperscript{32}</th>
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<tr>
<td><strong>The clinical team should:</strong></td>
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<tr>
<td>Involve patients in the treatment process</td>
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<tr>
<td>Screen for trauma</td>
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<tr>
<td>Train staff in trauma-specific treatment approaches</td>
<td></td>
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<tr>
<td>Engage referral sources and partner organizations</td>
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<tr>
<td><strong>The organization should:</strong></td>
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<tr>
<td>Lead and communicate about the transformation process</td>
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<tr>
<td>Engage patients in organizational planning</td>
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<tr>
<td>Train clinical, as well as nonclinical, staff members</td>
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<tr>
<td>Create a safe physical and emotional environment</td>
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<tr>
<td>Prevent secondary traumatic stress in staff</td>
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<tr>
<td>Hire a trauma-informed workforce</td>
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</table>

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

Nicholas A. Perry, June P. F. Cheung, Andraea M. Case, and Joseph M. Orlandic

**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.\textsuperscript{30}

**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.\textsuperscript{31}

**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\textsuperscript{27-29}:

- 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.

**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.\textsuperscript{40} 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.\textsuperscript{27,48}
Lessons from neuroscience guide effective treatment. 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...
Successful strategies for childhood adversity emphasize parenting education programs, trauma-informed organizational practices, and neuromodulatory treatments.

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,
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.

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


