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POLICY STATEMENT

Early Childhood Adversity, Toxic Stress, and the Role of the Pediatrician: Translating Developmental Science Into Lifelong Health

abstract

FREE

Advances in a wide range of biological, behavioral, and social sciences are expanding our understanding of how early environmental influences (the ecology) and genetic predispositions (the biologic program) affect learning capacities, adaptive behaviors, lifelong physical and mental health, and adult productivity. A supporting technical report from the American Academy of Pediatrics (AAP) presents an integrated ecobiodevelopmental framework to assist in translating these dramatic advances in developmental science into improved health across the life span. Pediatricians are now armed with new information about the adverse effects of toxic stress on brain development, as well as a deeper understanding of the early life origins of many adult diseases. As trusted authorities in child health and development, pediatric providers must now complement the early identification of developmental concerns with a greater focus on those interventions and community investments that reduce external threats to healthy brain growth. To this end, AAP endorses a developing leadership role for the entire pediatric community—one that mobilizes the scientific expertise of both basic and clinical researchers, the family-centered care of the pediatric medical home, and the public influence of AAP and its state chapters—to catalyze fundamental change in early childhood policy and services. AAP is committed to leveraging science to inform the development of innovative strategies to reduce the precipitants of toxic stress in young children and to mitigate their negative effects on the course of development and health across the life span. *Pediatrics* 2012;129:e224–e231

INTRODUCTION

"It is easier to build strong children than to repair broken men."

Frederick Douglass (1817–1895)

From the time of its inception as a recognized specialty of medicine, the field of pediatrics has attached great significance to both the process of child development and the social/environmental context in which it unfolds. When the American Academy of Pediatrics (AAP) was founded in 1930, the acute health care needs of children were largely infectious in nature.[1] Over the ensuing 80 years, as increasingly effective vaccines, hygiene, and other public health initiatives produced dramatic gains, astute observers began to note that many noninfectious disease entities, such as developmental, behavioral, educational, and

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KEY WORDS

advocacy, brain development, ecobiodevelopmental framework, family pediatrics, health promotion, human capital investments, new morbidity, toxic stress, resilience

ABBREVIATIONS

AAP—American Academy of Pediatrics
EBD—ecobiodevelopmental

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family difficulties, were playing increasingly prominent roles in affecting child health and well-being.

In 1975, the term "new morbidity" was introduced to describe those noninfectious entities that appeared to be most prevalent.[2] This important conceptualization underscored a growing realization that significant societal changes (eg, increasing numbers of single parents and families with 2 working parents) were challenging pediatric health care providers to address complex concerns that were not strictly medical in nature. Although the impact of these "new" morbidities on pediatrics, public health, and society in general is no longer in question,[3–5] the professional training and practice of pediatricians continues to focus primarily on the acute medical needs of individual children. The pressing question now confronting contemporary pediatrics is how we can have a greater impact on improving the life prospects of children and families who face these increasingly complex and persistent threats to healthy development.

The need for creative, new strategies to confront these morbidities in a more effective way is essential to improve the physical and mental health of children, as well as the social and economic well-being of the nation.[6] Developmental, behavioral, educational, and family problems in childhood can have both lifelong and intergenerational effects.[7–18] Identifying and addressing these concerns early in life are essential for a healthier population and a more productive workforce.[5,6,19–21] Because the early roots or distal precipitants of problems in both learning and health typically lie beyond the walls of the medical office or hospital setting, the boundaries of pediatric concern must move beyond the acute medical care of children and expand into the larger ecology of the community, state, and society. Because this call for a broader, contextual approach to health is not new,[22] and the track record of matching rhetoric with effective action is limited, there is a compelling need for bold, new thinking to translate advances in developmental science into more effective interventions.

THE MERITS OF AN ECOBIODEVELOPMENTAL FRAMEWORK

The accompanying technical report[23] presents an ecobiodevelopmental (EBD) framework for understanding the promotion of health and prevention of disease across the life span that builds on advances in neuroscience, molecular biology, genomics, and the social sciences. Together, these diverse fields provide a remarkably convergent perspective on the inextricable interactions among the personal experiences (eg, family and social relationships), environmental influences (eg, exposures to toxic chemicals and inappropriate electronic media), and genetic predispositions that affect learning, behavior, and health across the life span. Applying this EBD framework to the challenges posed by significant childhood adversity reveals the powerful role that toxic stress can play in disrupting the architecture of the developing brain, thereby influencing behavioral, educational, economic, and health outcomes decades and generations later.[24] In contrast to positive or tolerable stress, toxic stress is defined as the excessive or prolonged activation of the physiologic stress response systems in the absence of the buffering protection afforded by stable, responsive relationships.[25] Within the ongoing interplay among assets for health and risks for illness, toxic stress early in life plays a critical role by disrupting brain circuitry and other important regulatory systems in ways that continue to influence physiology, behavior, and health decades later.[23] In short, an EBD approach to childhood adversity suggests that (1) early experiences with significant stress are critical, because they can undermine the development of those adaptive capacities and coping skills needed to deal with later challenges; (2) the roots of unhealthy lifestyles, maladaptive coping patterns, and fragmented social networks are often found in behavioral and physiologic responses to significant adversity that emerge in early childhood; and (3) the prevention of long-term, adverse consequences is best achieved by the buffering protection afforded by stable, responsive relationships that help children develop a sense of safety, thereby facilitating the restoration of their stress response systems to baseline.[25] An EBD approach recognizes that it is not adversity alone that predicts poor outcomes. It is the absence or insufficiency of protective relationships that reinforce healthy adaptations to stress, which, in the presence of significant adversity, leads to disruptive physiologic responses (ie, toxic stress) that produce "biological memories"[26] that increase the risk of health-threatening behaviors and frank disease later in life. The recent AAP technical report[23] summarizes the growing evidence base that links childhood toxic stress to the subsequent development of unhealthy lifestyles (eg, substance abuse, poor eating and exercise habits), persistent socioeconomic inequalities (eg, school failure and financial hardship), and poor health (eg, diabetes and cardiovascular disease). Given the extent to which costly health disparities in adults are rooted in these same unhealthy lifestyles and persistent inequalities,[5,9] the reduction of toxic stress in young children ought to be

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a high priority for medicine as a whole and for pediatrics in particular.

AN IMPORTANT ROLE FOR THE PEDIATRIC MEDICAL HOME

The effective reduction of toxic stress in young children could be advanced considerably by a broad-based, multisector commitment in which the profession of pediatrics plays an important role in designing, implementing, evaluating, refining, and advocating for a new generation of protective interventions. Pediatric providers are uniquely qualified and placed to assist in translating recent advances in developmental science into effective interventions for the home, the clinic, and the community. In addition to regular interactions with young children and an appreciation for the important role that families[27–29] and communities[30] play in determining child well-being, pediatricians bring several time-honored perspectives to this challenging task. These perspectives include a developmental approach to health, an understanding of the advantages of prevention over remediation, and an awareness of the critical importance of effective advocacy to promote changes in well-established systems that influence child health and development, even when those systems lie outside the traditional realm of pediatric practice.[31] In this context, it is essential that innovative and practical strategies continue to be developed that strengthen the capacity of the medical home to reduce sources of toxic stress and to mitigate their impact on the lives of young children. Rather than continuing the current trend of "doing more with less," as pediatricians take on a wide range of additional responsibilities, payment reforms should reflect the value of pediatricians' time and knowledge, as well as the importance of a pediatrician-led medical home serving as a focal point for the reduction of toxic stress and for the support of child and family resiliency. This additional work and the reprioritization of efforts should reflect pediatricians' interest in preventive care that is more developmentally relevant,[32] parents' desire for a greater emphasis on their child's emerging skills and behavior,[33] the commitment to team-based services within the pediatric medical home,[28] and the growing evidence base that early developmental interventions can have significant effects on life-course trajectories.[34]

As the most logical candidate for a universal platform to promote healthy development and optimal life course trajectories, the pediatric medical home has become the focus of both increasing expectations and formidable challenges. High expectations are grounded in the public's deep respect for pediatricians as trusted guardians of child health. Compelling challenges include (1) the need for more extensive training for all health professionals on the adverse effects of excessive stress on the developing brain, as well as on the cardiovascular, immune, and metabolic regulatory systems (the technical report[23] is a start); (2) the significant constraints on existing, office-based approaches to fully address the new morbidities effectively; (3) the relatively limited availability of evidence-based strategies, within the medical home and across the full array of existing early childhood service systems, that have been shown to reduce sources of toxic stress in the lives of young children or mitigate their adverse consequences[35]; and (4) the financial difficulties associated with the incorporation of evidence-based developmental strategies into the pediatric medical home.

A Critical Assessment of Prevention at the Practice Level

From immunizations to seat belts to parenting education, the field of pediatrics has always embraced the centrality of prevention. That said, some degree of childhood adversity is inevitable, and dealing with manageable levels of stress is an important part of healthy development. Because the essence of toxic stress is the absence of buffers needed to return the physiologic stress response to baseline, the primary prevention of its adverse consequences includes those aspects of routine anticipatory guidance that strengthen a family's social supports, encourage a parent's adoption of positive parenting techniques, and facilitate a child's emerging social, emotional, and language skills. Examples include the promotion of the 7Cs of resilience (competence, confidence, connectedness, character, contribution, coping, and control),[36] optimism,[37] Reach Out and Read,[38–40] emotional coaching,[41–44] and numerous positive parenting programs (eg, Triple P,[45–47] Incredible Years,[48] Home visiting,[49,50] and Nurturing Parenting[51,52]). Although AAP resources, such as *Bright Futures*,[53] *Connected Kids*,[54] and the clinical report "The Pediatrician's Role in Child Maltreatment Prevention,"[55] already provide significant recommendations in this area, implementing a comprehensive, yet practical program of effective anticipatory guidance that nurtures the child's emerging social, emotional, and language skills and promotes positive parenting remains an ongoing challenge.

Beyond working to improve the impact of anticipatory guidance provided in the medical home, some motivated pediatric providers also advocate for a variety of community-based interventions that are implemented in homes,[56,57] preschools,[58] and

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schools,[59–61] as well as through an extended array of programs organized by faith-based organizations, social groups, and recreational centers. A more thorough description of the full range of practices designed to strengthen parenting skills and enhance child development can be found elsewhere.[35,62–64] Although most primary prevention programs have not been evaluated systematically, those that show promise should be assessed and, if found to be effective, replicated and taken to scale. As the number of evidence-based services increases, the pediatric community needs to continue to advocate for systemic changes in reimbursement strategies that incentivize collaboration among pediatric medical homes and the full range of effective community-based resources.[65]

Screening for Children and Families at Risk

Identifying children at high risk for toxic stress is the first step in providing targeted support for their parents and other caregivers. The challenges of developing secondary prevention strategies within the medical home begin with the implementation of practice-relevant screening and proceed through the complexities of diagnostic evaluations, sharing information, formulating joint action plans with parents, locating needed services beyond the medical home, arranging successful referrals, and conducting an ongoing monitoring and assessment of intervention impacts. That said, after several decades of prescriptive guidelines and outcome evaluations of a broad array of prevention strategies, the cumulative evidence of effectiveness is mixed. Some primary care practices have been successful in regularizing the identification and management of new morbidities within their daily routines. Many continue to struggle with the basics of developmental screening, routine referral, and ongoing collaboration with community-based programs outside the medical system.[32] All confront the limited availability of accessible and affordable preventive supports for children and families experiencing significant adversity.

Within this highly variable and multidimensional context, the AAP and others have encouraged pediatric providers to develop a screening schedule that uses age-appropriate, standardized tools to identify risk factors that are highly prevalent or relevant to their particular practice setting.[29,66,67] In addition to the currently recommended screenings at 9, 18, and 24/36 months to assess children for developmental delays, pediatric practices have been asked to consider implementing standardized measures to identify other family- or community-level factors that put children at risk for toxic stress (eg, maternal depression, parental substance abuse, domestic or community violence, food scarcity, poor social connectedness). Pediatric providers have been encouraged to use *Current Procedural Terminology* code 99420 when they are assessing a child's risk and, if additional visits are needed to address any identified concerns, providers are encouraged to bill for that additional time by using codes 99401-4.[68] Continued advocacy at the national and state levels is needed, however, to ensure proper payment for the time needed for universal screening, problem identification, and ongoing assessments. More specific recommendations (regarding which screening tools should be used, when they should be administered, and how to secure reimbursement for their use) will be presented in a forthcoming AAP policy statement on social-emotional screening.

Collaborating With the Community

Routine screening for increased vulnerability is useful only if collaborative relationships exist with local services to address the identified concerns (as outlined in several previous reports[69–71]); moreover, it is also essential that those services demonstrate evidence of effectiveness. This is particularly important for the identification of young children experiencing toxic stress, given the limited proportion of community-based interventions for which significant, positive impacts have been documented in this domain, and the relatively modest magnitude of impact found for those that have been shown to be effective.

Rethinking Advocacy Beyond the Office Setting

Because so many of the origins and consequences of childhood toxic stress lie beyond the boundaries of the clinical setting, pediatric providers are often called on to work collaboratively with parents, social workers, teachers, coaches, civic leaders, policy makers, and other invested stakeholders to influence services that fall outside the traditional realm of clinical practice.[72] In many cases, these efforts extend even further afield, moving into the realm of ecologically based, public health initiatives that address the precipitants of toxic stress at the community, state, and national levels. Translating advances in developmental science into effective interventions and lifelong health will require a fundamental shift in the way the general public and policy makers view and invest in early childhood. Pediatric providers are integral to this effort, as they have a long history of advocating for systemic changes to advance child health and development.[31]

Examples of preventive interventions that could serve as targets for pediatrician-led advocacy campaigns include (1) education efforts focused

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on parents, foster parents, child care providers, and preschool teachers to increase awareness of the adverse consequences of toxic stress in early childhood for lifelong outcomes in learning, behavior, and health; (2) calls for investments in the development of creative, new strategies that can be incorporated into home-, school-, and center-based services to reduce sources of toxic stress and to strengthen the relationships that buffer children from the long-term consequences of significant adversity; (3) investments in community-based mentoring activities (eg, after-school programs, Big Brother/Big Sister, Little League, gymnastics, martial arts programs) that provide supportive relationships for vulnerable children that help them learn to cope with adversity in an adaptive manner; (4) investments in selected early-intervention programs, early-childhood mental health services, specialized family therapies, and medicolegal partnerships that have demonstrated evidence of positive impacts on vulnerable young children and families; (5) professional development programs that educate judges and other key participants in the juvenile court and foster care systems about the biology of adversity and its implications for case management, child custody, and foster care of children who have been abused or neglected; and (6) collaborative efforts with social workers, mental health providers, and other related professionals to address urgent needs as early as possible and to integrate effective services for the most vulnerable children and their families.

Treatment of Toxic Stress

Finally, the pediatric community must provide strong, proactive advocacy for more effective interventions for children with symptomatic evidence of toxic stress. These could include (1) the formation and/or continuous strengthening of local traumatic stress networks to treat children and families experiencing significant adversity; and (2) increasing the number of accessible, affordable, and culturally competent mental health professionals who are qualified to provide evidence-based treatments, such as trauma-based cognitive behavioral therapy and parent-child interaction therapy. In addition to the paucity of appropriately trained professionals in this area of significant unmet need, inadequate or inappropriate reimbursement mechanisms often block access to services for the most vulnerable young children. In such circumstances, pediatricians can be powerful advocates for expanded insurance coverage for childhood mental health services, even when they do not provide those services themselves.[73]

REAFFIRMING A COMMITMENT TO LEAD

This Policy Statement builds on numerous previous statements, including those regarding the new morbidities,[3] community pediatrics,[30] family-centered care,[27] home visitation,[49] and the prevention of child abuse.[55] The proposed EBD framework (1) incorporates growing evidence of the impact of toxic stress on the developing brain, (2) informs a deeper understanding of the early life origins of both educational failure and adult disease, and (3) underscores the need for collaborative efforts to prevent the long-term consequences of early adversity. The AAP is committed to leading an invigorated, science-based effort at transforming the way our society invests in the development of all children, particularly those who face significant adversity.[74]

RECOMMENDATIONS

1. All health care professionals should adopt the proposed EBD framework as a means of understanding the social, behavioral, and economic determinants of lifelong disparities in physical and mental health (see technical report[23]). Psychosocial problems and the new morbidities should no longer be viewed as categorically different from the causes and consequences of other biologically based health impairments.
2. The growing scientific knowledge base that links childhood toxic stress with disruptions of the developing nervous, cardiovascular, immune, and metabolic systems, and the evidence that these disruptions can lead to lifelong impairments in learning, behavior, and both physical and mental health, should be fully incorporated into the training of all current and future physicians (see technical report[23]).
3. Pediatricians should adopt a more proactive leadership role in educating parents, child care providers, teachers, policy makers, civic leaders, and the general public about the long-term consequences of toxic stress and the potential benefits of preventing or reducing sources of significant adversity in early childhood. Protecting young children from adversity is a promising, science-based strategy to address many of the most persistent and costly problems facing contemporary society, including limited educational achievement, diminished economic productivity, criminality, and disparities in health.
4. Pediatricians should be vocal advocates for the development and implementation of new, evidence-based interventions (regardless of the provider or venue) that reduce sources of toxic stress and/or

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mitigate their adverse effects on young children, as they are likely to produce better outcomes and potentially be more cost-effective than trying to treat or remediate the numerous consequences of excessive childhood stress that reach far into adulthood. Such advocacy is particularly important when budget constraints force critical reassessments of public spending priorities.

5. Pediatric medical homes should (1) strengthen their provision of anticipatory guidance to support children's emerging social-emotional-linguistic skills and to encourage the adoption of positive parenting techniques; (2) actively screen for precipitants of toxic stress that are common in their particular practices; (3) develop, help secure funding, and participate in innovative service-delivery adaptations that expand the ability of the medical home to support children at risk; and (4) identify (or advocate for the development of) local resources that address those risks for toxic stress that are prevalent in their communities.

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