



PEDIATRIC TOXIC STRESS

Changing the Game For Population Health

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Exposure to childhood adversity can be toxic to normal human health and development. The expanding body of knowledge from neuroscientists, developmental and behavioral psychologists, pediatricians, sociologists and medical and nursing experts makes it clear.

The health of an individual is determined by a combination of factors that includes genetics, social determinants, environmental exposures and personal behaviors, as well as the provision of medical care. But health care services are estimated to contribute only 10 percent to an individual's overall health, with social determinants, environmental factors and behaviors influencing 60 percent, and genetics, 30 percent.¹

Clear and compelling science indicates that the root causes of many diseases and conditions responsible for morbidity and mortality in the U.S. likely start at the very beginning of life.² Nevertheless, most U.S. health care dollars are spent towards the end of life and in addressing noncommunicable, preventable chronic conditions across the life course.

Because many hospitals are hubs of learning and research and hold considerable influence in their communities, health care leaders could leverage these attributes in a form of science-based, educational advocacy. Not only can they champion the health and common good of all populations in their communities, they can increase the

capacity of the current health care system to prevent known threats to health early in life.

In other words, they can help offer children the greatest potential for a healthier future.

THE BIOLOGY OF ADVERSITY

Health care providers have a front-row seat to one of the most important scientific discoveries of our time. What happens in our mother's womb, as well as during the first months and years of life, has a profound and enduring impact on an individual's immediate and long-term health. The Adverse Childhood Experiences (ACE) study found exposure to childhood physical, emotional or sexual abuse; physical or emotional neglect; living with an incarcerated, mentally ill or drug-addicted family member; witnessing

intimate partner or domestic violence; and separation from a parent prior to a child's 18th birthday was predictive of poor health in adulthood.³ What is striking about this list of adversities is that these are all potentially modifiable exposures.

From before birth, lives are, by design, linked to others. Stages of human development as theorized by psychologist Abraham Maslow include safety, belonging and self-esteem as fundamental to human development.⁴ Psychologist Erik Erikson theorized that individuals move through eight developmental stages related to trust, autonomy, initiative, industry, identity, intimacy, generativity and ego integrity.⁵ Both Erikson and Maslow recognized the fundamental principle that human beings are intrinsically bonded to and dependent upon relationships with each other. We are immediately engaged in reciprocal relationships.

These early caregiver relationships can influence both positive and negative health trajectories. The relation-

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Illustration by Roy Scott

ship between a mother and her baby is a critical building-block of society; this relationship represents one of the most important factors for life-long health and well-being. While these are not new concepts, our understanding of the interconnectedness and the importance of a child's early environment to physical and biological pathways

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and systems within the mind and body is new and increasing. Many leading causes of death and disease can be prevented and likely have root causes in early childhood.

Science alone is inadequate to create solutions for health, particularly among those living in poverty or on the margins of society. Childhood poverty poses serious threats to the health of our youngest and most vulnerable citizens. Yet poverty often is framed as a social and economic problem, not as a public health problem. Poverty's relationship to health is largely construed as important due to lack of access to health care services.

TOXIC STRESS

While many people view poverty as simply economic disadvantage, scientists understand the compounding effect of early exposure to adversity and the resulting toxic stress on the developing brain and other biological systems. Evidence in the field of epigenetics demonstrates how toxic stress damages the minds and bodies of children.

Toxic stress occurs when a child's biological stress response systems are activated over and over again because of repeated or excessive exposure to traumatic events or adversities in the absence of a caring adult. The resulting cascade of natural stress hormones, designed to be lifesaving in a life-threatening event, becomes toxic to the developing brain. Developmental delays and behavior problems often are the first signs of toxic stress seen in young children.

Recognizing the toll toxic stress has on a child's executive function to solve problems, learn and succeed in school and contribute to society, the nation's top nurse leaders have made toxic stress one of three national priorities to address population health.⁶ Health inequities are defined by the Centers for Disease Control and Prevention as "avoidable, unfair differences in health status seen within and between populations."⁷ Young mothers and their children, particularly those living in poverty, shoulder a disproportionate burden of the negative economic and health-related consequences of adverse childhood experiences.

Currently, the United States spends more than \$2.6 trillion on health care annually, more than any

other country in the world; yet the public health return on this investment is abysmal. The U.S. ranks 26 out of 34 countries for life expectancy, 25 in maternal mortality and 30 in infant mortality.⁸

Given the enormous resources spent on medical care, it seems fair to ask why the U.S. population is not experiencing better health outcomes. One answer is that the current system is designed to function best when delivering health care services to those who are already ill or injured. It is not designed to address the social and environmental factors that are significantly causal to poor health outcomes.

The opportunity for better health for children will be created by parents and caregivers who themselves understand and translate the science of toxic stress into meaningful language and actions that resonate within their own families and the communities in which they live.

PARTNERSHIP FOR RESILIENT FAMILIES

Children's Mercy is a large, regional, nonprofit pediatric health system composed of two free-standing hospitals and multiple urgent care and outpatient clinics. The main hospital campus is located in the urban core of Kansas City, Mo. A few blocks away, Children's Mercy has a clinic housed in the same building as Operation Breakthrough, one of the largest early Head Start and early childhood education centers in the country. For the past 18 years, the clinic has played an important role in providing a unique combination of school-based care, well child and preven-



tive care, medical care for ill and injured children, and, originally, a sick bay for children who became ill while at school.

Operation Breakthrough draws on an urban population that is 81 percent African American. Most households (94 percent) are headed by single mothers, and 88 percent of the community residents live far below the federal poverty guidelines. On any given day, as many as 400 children, ages 6 weeks to 12 years, attend the education center.

Children living in extreme poverty have layers of adversity literally piled on them. In addition to exposure to abuse, neglect and household dysfunction — named as adverse childhood events in the original ACE study — many poor children live in the highest crime-rate ZIP codes in the urban core; they live in densely populated, old buildings with exposure to lead, rodents and other toxins; they live near busy roads and freeways impacting the quality of the air they breathe and the sounds they hear. Fresh fruits and vegetables often are not readily available in these neighborhoods, and safe parks and walkways where they can exercise and play are rare.

In addition, quality early childhood education and day care services are few, and many public schools in large Midwest urban neighborhoods are unaccredited or provisionally accredited, with low graduation rates.

According to Brijin Gardner, the organization's director of clinical services, Operation Breakthrough's 2012 survey of parents revealed that 32.1 percent of parents reported having experienced four or more adverse childhood events and that their children's current exposure to adversity was strongly related to parental exposure.⁹

In the summer of 2013, the Children's Mercy onsite health clinic — though highly valued by leaders and staff of both organizations — no longer was viewed as fully integrated into the education center. Instead, it was regarded as completely separate from the school. Relationships among some stakeholders were strained, and communication and collaboration needed improvement.

At the request of Operation Breakthrough's CEO and Children's Mercy Hospital's COO, leaders from both organizations came together in July

2013 for a retreat to explore the existing partnership and possibilities for the future.

All expressed the collective desire to find ways to decrease and prevent the effects of toxic stress on children and their families. The organizations agreed on a common purpose: to identify gaps in current services related to the social determinants of health and to explore optimal health care delivery models to address the physical, mental, behavioral and developmental health needs of the children and the families they serve. They agreed upon the name "Partnership for Resilient Families" and named a program director to support the collaboration.

The American Academy of Pediatrics provided funding to support the partnership activities from July 15, 2013 to Sept. 15, 2015. Activities included a formal needs assessment, focus groups with parents, educators and clinic staff, as well as videotaped interviews with parents, educators and experts in the field. The interviews were used to produce three educational videos on toxic stress. The videos targeted populations of pediatricians, early childhood educators and parents. The needs assessment revealed three top priorities for Partnership for Resilient Families: to bring back a sick bay for the Operation Breakthrough education center, to provide immunizations on site and to expand services related to mental and behavioral health.

The truth is, the poor are neither entirely responsible for their lot in life nor helpless victims who are unable to contribute and participate in finding solutions to decrease toxic stress and create healthy and safe communities.

Additional nurse staffing allowed the sick bay to be up and running in early 2014, and a full-time Children's Mercy psychologist was on site in July, 2014. Immunizations came on site in September 2014.

The collaboration between Children's Mercy and Operation Breakthrough is an example of both partnership in community health and advocacy

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on behalf of the most vulnerable within that community — children. Active and effective partnerships come with risks as well as obvious benefits. Challenges should be expected, losses acknowledged and the indigenous wisdom of the community sought frequently to keep everyone moving forward.

MERITOCRACY

The American concept of meritocracy — that success or failure in life is a result of personal merit, ambition, hard work and individual talent — is based on an often unexpressed belief that all Americans begin life on a level playing field. That notion isn't true.

Some people regard poverty through a traditional Christian social justice lens and see the poor as helpless victims to be supported by those more fortunate, to share the wealth within a redistributive justice framework. That notion isn't valid, either.

The truth is, the poor are neither entirely responsible for their lot in life nor helpless victims who are unable to contribute and participate in finding solutions to decrease toxic stress and create healthy and safe communities.

The science behind toxic stress is the game changer that has been needed to address root causes of disease, as well as the seemingly intractable issues of violence and poverty. Parity for physical, mental and behavioral health services should be a priority among pediatric health care providers to move the current sick-based system forward to a health-promoting, wellness-based system.¹⁰

Health can no longer be defined as simply the absence of disease. In the 2004 report, *Children's Health, the Nation's Wealth*, the Institute of

Medicine defined the term “children's health” as “the extent to which individual children or groups of children are able or enabled to (a) develop and realize their potential, (b) satisfy their needs, and (c) develop the capacities that allow them to interact successfully with their biological, physical, and social environments.”

The Robert Wood Johnson Foundation calls for a “seismic shift” in our approach to health that calls for action focused on keeping children healthy in the first place.¹¹ It is only logical that to provide optimal health care to children, the health and well-being of their parents and caregivers also must be supported.

Imagine if every child had a safe place to live and play, an adult who loved and cared about him or her, good nutrition, quality early childhood education and access to health services that included health protection and prevention of adverse childhood events. It's possible the health of populations in resource-poor and underserved communities could be changed for the better within a generation.

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