

REVIEW ARTICLE

Adverse Childhood Experiences: A Call to Action for Osteopathic Medicine

Deanna St. Germain, DO¹ & Kyle J Rutledge, MS, PhD, OMS IV²

¹Medical Director, Kids' FIRST Center, Eugene, Oregon

²Medical Student, Western University of Health Sciences, Lebanon, Oregon

Keywords:

Adverse Childhood Experiences

Behavioral Medicine

Osteopathic Medicine

Pediatrics

Psychiatry

Trauma Informed Care

It has been nearly 20 years since the first Adverse Childhood Experiences (ACEs) study was published. It is time for the osteopathic profession to embrace these findings – that adversity and trauma in childhood foster ill health in adults and children. We need to champion a well-informed work force of medical providers who practice trauma-informed care. This should be completely intuitive for us, as our credo of mind, body and spirit aligns perfectly with this knowledge.

INTRODUCTION

In 1998, Felitti *et al.* published the ground breaking article, "Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study."¹ With this publication and the more than 1,500 published studies that followed,² Felitti *et al.* scientifically substantiated what we have all observed and "known" for years from our own anecdotal observations: when traumatic events happen in people's lives, they experience a multitude of medical, psychological and social ills.¹ However, nearly 20 years later, ACEs continue to be under-addressed in clinical practices, public health-care, and medical education,³⁻⁵ despite affecting as many as 1 in 8 children.⁶ In our current state of exorbitant healthcare costs and an unresolved opioid epidemic, we cannot afford to ignore the connection between ACEs, chronic disease¹ and chronic pain.⁷

As osteopathic physicians and followers of A.T. Still, we are called to enact his entreaty for considering "first the material body, second the spiritual being, third a being of mind which is far superior to all vital motions and material forms, whose duty is to wisely manage this great engine of life. This great principle known as mind, must depend for all evidences on the five senses."⁸ In treating the whole person, as we have been trained to do, we already embrace the concept that our patients are a product of their environment (their five senses). Therefore, we are uniquely prepared and perfectly

positioned to lead a reform of the practice of medicine in which it becomes routine to consider our patients' trauma histories and practice trauma-informed care throughout their lifespans. Furthermore, we must ensure our student physicians are educated, self-aware and ready from day one to meaningfully interact with patients who have experienced ACEs.

THE IMPACT OF TRAUMA & ACES

The term "trauma" can refer to a wide variety of experiences, ranging from emotional/psychological to strictly physical contexts. The Substance Abuse and Mental Health Services Administration (SAMHSA) Division of the United States Department of Health and Human Services provides a comprehensive definition: "Individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being."⁹

In Felitti's study of almost 10,000 adults who answered questions related to seven categories of ACEs (such as abuse, intimate partner violence, substance abuse or mental illness in the home and a household member incarcerated), researchers found that the higher the exposure to these adversities, the greater the risk for serious medical problems and death in the adults (See Figure 1). Fifty-two percent of respondents experienced one or more ACEs and 6.2% experienced four or more. The most common ACE was substance abuse in the home at 25.6%.¹ Later studies added three more categories of adverse experience to include loss of a parent and two types of neglect.²

CORRESPONDENCE:

Deanna St. Germain, DO | deanna@kidsfirstcenter.net

The effect of ACEs can also be dose-dependent. When comparing people who experienced four or more ACEs to those who had none, there was a four- to twelve-fold increase in health risks of substance abuse, depression and suicidality and a two- to four-fold increase in smoking and sexually transmitted infections, to name a few. The authors concluded: “persons with multiple categories of childhood exposure were likely to have multiple health risk factors later in life.”¹¹

Further study has shown these adverse effects can be observed as early as childhood.^{11,12} Flaherty *et al.*'s study of child health after early childhood adversity looked at over one thousand children at high risk for child abuse and neglect. They found that one adverse exposure almost doubled the risk of poor health while four adverse events or more almost tripled the risk of illness requiring medical attention by the age of six years.¹¹

Cronholm and colleagues studied a more socioeconomically and racially diverse urban population¹³ – compared to Felitti's study of an insured, not racially diverse population¹ – and created an expanded list of ACEs which included the following: witnessing violence, feeling discrimination, unsafe neighborhood, experiencing bullying and living in foster care. Their study involved almost 1800 respondents, 14% of whom experienced only the expanded ACEs and would not have been recognized as experiencing adversity using conventional ACEs.¹³

These studies addressing general categories of adversity have been shored up by extensive research regarding the mechanism of the toxic effect of ACEs on the developing brain, also referred to as the neurobiological consequences of trauma. These studies are well summarized in the American Academy of Pediatrics (AAP) Technical Report: *The Lifelong Effects of Early Childhood Adversity and Toxic Stress*.³ Namely, the plasticity of the young brain makes it sensitive to stress and the chemical influences created by toxic stress which in turn can interrupt normal brain development in a structural way. As an example, glucocorticoid receptors found in the hippocampus, amygdala and prefrontal cortex, when overstimulated, can influence the size and architecture of these areas of the brain with resultant pathologic functioning.³

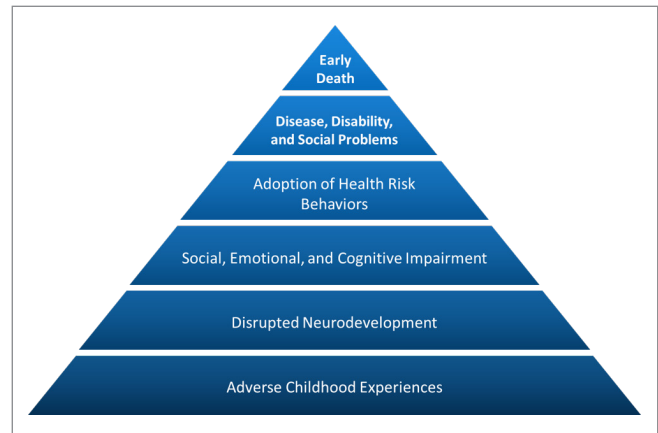
In addition to the degree of impact that ACEs have on individuals, it is striking how prevalent these adversities are. As Felitti *et al.* discussed, 52% of respondents had one ACE, and one-quarter of respondents experienced substance abuse in the home.¹ Studies on child maltreatment, such as the *JAMA Pediatrics* article “The Prevalence of Confirmed Maltreatment Among US Children, 2004-2011” by Wildeman *et al.*, suggest that 12.5%, or one in eight children, will experience confirmed maltreatment by the age of 18 years.⁶ The deep, lasting impact of ACEs, coupled with their markedly high prevalence, therefore demand significant attention both in our medical practice, and in our training of future medical professionals.

ADDRESSING TRAUMA & ACES

While the prevention of the initial occurrence of ACEs is a worthwhile endeavor¹⁴ that may occur through methods such as home visitation programs¹⁵ and the Safe Environment for Every Kid (SEEK) Model,¹⁶ osteopathic physicians are also in the position of screening for ACEs and addressing their sequelae within our own offices. The identification of ACEs and individuals at high risk for

FIGURE 1:

Proposed mechanism of the relationship between ACEs and health consequences over the lifespan (adapted from Felitti *et al.*¹ and the CDC).¹⁰



toxic stress naturally leads to supportive efforts for our patients.¹⁷ Furthermore, adults receiving care in overcoming the sequelae of their ACEs may be better able to cope with the stresses of raising children, reducing the trauma their children experience. Therefore, it is imperative to routinely screen patients for ACEs and trauma exposure, whether through non-judgmental, open-ended questions or even brief checklists given in the waiting room.¹⁶

SAMHSA explains that a trauma-informed care system “realizes the widespread impact of trauma and understands potential paths for healing; recognizes the signs and symptoms of trauma in staff, clients and others involved with the system; and responds by fully integrating knowledge about trauma into policies, procedures, practices, and settings.”⁹ Machtinger *et al.*, a national strategy group, published an instructive article on the promise of trauma-informed primary care (TIPC) for women in 2015.¹⁸ They recommend that all staff be trauma trained and the physical space be calm, safe and welcoming. Confrontations should be avoided and empowerment should be supported. It is likely that interdisciplinary teams will be necessary to properly progress the healing of these patients. Practices should screen for trauma histories and be prepared in response to disclosures both personally and professionally, being aware of available community programs and safety planning. Machtinger *et al.* stress the need for a strong organizational foundation with trauma-informed values, partnerships and champions. As always, there should be support for providers and staff as well as monitoring success and quality improvement.¹⁸

SAMHSA's statement⁹ notes that trauma-oriented clinical teams must be self-aware; they must attend to the traumas of not only their patients, but also those experienced by staff members. Therefore, beyond treating our patients and educating our teams, we are called to acknowledge the effects of traumas and ACEs on the members of our healthcare teams and promote self-care, including in physicians and medical students. Educating medical students about understanding, screening, preventing, and intervening in ACEs, and even having them calculate their own scores during their education,⁵ we may create better prepared, healthier, more resilient and compassionate physicians.

Seriously addressing what we now know about ACEs does not only decrease the number of children affected by a downward trajectory of mental and physical health, but also improves the quality of all of our lives since criminality has been linked to ACEs.¹⁹ A study of 22,575 delinquent youth referred to juvenile justice suggests that “each additional adverse experience...increases the risk of becoming a serious, violent, and chronic juvenile offender by 35%.¹⁹ Therefore, addressing ACEs in the clinic may lead to a safer, more productive society.

Even more astounding, the effect of trauma and ACEs can transcend generations. Recent research in epigenetics reveals that our DNA can be altered by stress, and those changes can be passed from one generation to another.²⁰ However, not every child who experiences trauma will suffer adverse health outcomes, as resilience is a major component in a child’s individual ability to cope.¹ There is therefore hope that if we screen for ACEs and provide proper interventions while supporting resilience in our clinics, these changes can be reversed.²¹ Once again, Still’s faith in the human organism to heal from within is validated.⁸

As stated in the AAP’s Technical Report: “this growing scientific understanding about the common roots of health, learning and behavior in the early years of life presents a potentially transformational opportunity for the future of pediatrics.”³ This is true for all systems of care. In addition to being informed and humane, this approach helps clinicians effectively instruct caretakers in trauma-informed behavior modification for children²² and can help motivate adult patients in need of behavior modification in order to control or improve their disease, and reduce instances of abuse and neglect. The gains for patients and families make the effort to become trauma-informed well worth the effort.²³

CONCLUSION

We should no longer question nature versus nurture but understand that nurture directly influences nature, whereby childhood trauma can turn on or off genetic predispositions and alter genetic material.²⁴ Whereas in the past we looked for broken bones, bruises and burns to assess whether children were safe in their homes, this body of research tells us the lasting psychological injury of adverse events impacts children in profound ways. Therefore, we need to redefine what a safe, healthy home looks like and begin to consider early trauma and adverse experiences in our clinical decision-making. The knowledge gained from these studies should inform our professional roles and be incorporated into the education of our medical students. We must add extensive course work on ACEs and trauma recognition, prevention, and treatment to medical curricula, including trauma-informed care, lifestyle medicine and self-care within trauma-informed offices.

Creating trauma-informed medical systems has the potential to help children and adults who receive care in overcoming the sequelae of their ACEs and should be a priority for physicians. This research and the need for trauma-informed care plays to our osteopathic strengths. Let us make the effort and take charge in creating trauma-informed practices in every corner of osteopathic care.

Author disclosure: No relevant financial affiliations.

REFERENCES:

1. Felitti VJ, Anda RF, Nordenberg, D *et al.* Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med.* 1998; 14(4) 245-258. Available: http://www.traumacenter.org/initiatives/Polyvictimization_Articles/Felitti,%201998,%20Relationship%20of%20Childhood%20Abuse%20and%20Household,.pdf
2. Nakazawa, DJ. *Childhood Disrupted: How Your Biography Becomes Your Biology and How You Can Heal.* New York, New York: Simon and Schuster, Inc; 2015.
3. Shonkoff JP, Garner AS, Siegel BS *et al.* The Lifelong Effects of Early Childhood Adversity and Toxic Stress. *Pediatrics.* 2012; 129:e232-e246. Available at: <http://pediatrics.aappublications.org/content/129/1/e232>
4. Flynn, A.B., Fothergill, K.E., Wilcox, H.C., Coleclough, E., Horwitz, R., Ruble, A., Burkey, M.D., and Wissow, L.S. Primary Care Interventions to Prevent or Treat Traumatic Stress in Childhood: A Systematic Review. *Academic Pediatrics.* 2015; 15, 5: 480-492.
5. Strait, J. & Bolman, T. Consideration of Personal Adverse Childhood Experiences during Implementation of Trauma-Informed Care Curriculum in Graduate Health Programs. *Permanente Journal.* 2017; 21:16-061. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5221850/pdf/ace.pdf>
6. Wildeman C, Emanuel N, Leventhal JM, Putnam-Hornstein E, Waldfoegel J, Lee H. The Prevalence of Confirmed Maltreatment Among US Children, 2004-2011. *JAMA Peds.* 2014; 168(8):706-713. Available: <http://inequality.hks.harvard.edu/files/inequality/files/wildeman14b.pdf>
7. Davis, D.A., Luecken, L.J., and Zautra, A. J. Are Reports of Childhood Abuse Related to the Experience of Chronic Pain in Adulthood?: A Meta-analytic Review of the Literature. *Clinical Journal of Pain.* 2005. 21 (5). 398-405. Available at: <http://www.asu.edu/xed/resilience/images/zautra3.pdf>
8. Still, AT. *Philosophy of Osteopathy (1899).* Colorado Springs, CO: 5th reprint by The American Academy of Osteopathy; 1977.
9. Substance Abuse and Mental Health Services Administration. (2014). SAMHSA’s concept of trauma and guidance for a trauma-informed approach. Rockville, MD: SAMHSA. Available: <http://store.samhsa.gov/shin/content/SMA14-4884/SMA14-4884.pdf>
10. Adverse Childhood Experiences (ACEs). (2016, April 1). Centers for Disease Control and Prevention. Retrieved February 20, 2017, from <https://www.cdc.gov/violenceprevention/acestudy/index.html>
11. Flaherty EG, Thompson R, Litrownik, AJ *et al.* Effect of Early Childhood Adversity on Child Health. *Arch Pediatr Adolesc Med.* 2006; 160:1232-1238. Available: <file:///C:/Users/deanna/Downloads/Flaherty%20et%20al%202006.pdf>
12. Kerker, B.D., Zhang, J., Nadeem, E., Stein, R.E.K., Hurlburt, M.S., Heneghan, A., Landsverk, J., and Horwitz, S.M. Adverse Childhood Experiences and Mental Health, Chronic Medical Conditions, and Development in Young Children. *Academic Pediatrics.* 2015; 15, 5: 510–517
13. Cronholm PF, Forke CM, Wade R *et al.* Adverse Childhood Experiences: Expanding the Concept of Adversity. *Am J Prev Med.* 2015; 49(3):354-361.
14. DeCandia, C.J., Guarine, K., and Clervil, R. Trauma-Informed Care and Trauma-Specific Services: A Comprehensive Approach to Trauma Intervention. American Institutes for Research. 2014. 1-27. Available at: http://www.air.org/sites/default/files/downloads/report/Trauma-Informed%20Care%20White%20Paper_October%202014.pdf
15. Nelson, H.D., Selph, S., Bougatsos, C., and Blazina, I. Behavioral Interventions and Counseling to Prevent Child Abuse and Neglect: Systematic Review to Update the U.S. Preventive Services Task Force Recommendation. Evidence Synthesis No. 98. AHRQ Publication No. 13-05176-EF-1. Rockville, MD: Agency for Healthcare Research and Quality; January 2013.

16. Dubowitz, H., Feigelman, S., Lane, W., and Kim, J., Pediatric Primary Care to Help Prevent Child Maltreatment: The Safe Environment for Every Kid (SEEK) Model. *Pediatrics*. 2009; 123 :858–864. Available at: www.pediatrics.org/cgi/doi/10.1542/peds.2008-1376
17. Garner A.S, Shonkoff J.P, Siegel B.S., et al. Early Childhood Adversity, Toxic Stress, and the Role of the Pediatrician: Translating Developmental Science into Lifelong Health. *Pediatrics*. 2012; 129: e224-e231. Available at: www.pediatrics.org/cgi/doi/10.1542/peds.2011-2662
18. Machtinger EL, Cuca YP, Khanna N, Rose CD, Kimberg LS. From Treatment to Healing: The Promise of Trauma-Informed Primary Care. *Women's Health Issues*. 2015; 25-3: 193-197. Available: [http://www.whijournal.com/article/S1049-3867\(15\)00033-X/pdf](http://www.whijournal.com/article/S1049-3867(15)00033-X/pdf)
19. Fox BH, Perez N, Cass E, Baglivio MT, Epps N. Trauma changes everything: Examining the relationship between adverse childhood experiences and serious, violent and chronic juvenile offenders. *Child Abuse & Neglect*. 46 (2015) 163-173.
20. Yehuda R, Bowers, M. Intergenerational Transmission of Stress in Humans. *Neuropsychopharmacology REVIEWS*. 2015; 1-13. Available: https://www.researchgate.net/publication/281143940_Intergenerational_Transmission_of_Stress_in_Humans
21. Gershon NB, High PC. Epigenetics and Child Abuse: Modern-Day Darwinism-The Miraculous Ability of the Human Genome to Adapt, and Then Adapt Again. *Am J Med Genet Part C Semin Med Genet*. 2015; 169C:353-360.
22. Stirling Jr J, Amaya-Jackson L, Amaya-Jackson L. Understanding the Behavioral and Emotional Consequences of Child Abuse. *Pediatrics*. 2008; (122)3:667-673. Available: <http://pediatrics.aappublications.org/content/pediatrics/122/3/667.full.pdf>
23. Van der Kolk, B. *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*. New York, New York: Penguin Books; 2014.
24. Nemeroff, CB. Paradise Lost: The Neurobiological and Clinical Consequences of Child Abuse and Neglect. *Neuron*. March 2, 2016; 89:892-909. Available: https://www.researchgate.net/publication/296690505_Paradise_Lost_The_Neurobiological_and_Clinical_Consequences_of_Child_Abuse_and_Neglect