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# Adverse childhood experiences and trauma informed care: treating the whole patient with a more complete osteopathic approach

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**Abstract:** In 1998, a seminal study identified a strong connection between participants' exposures to adverse childhood experiences (ACEs) and the development of risk factors for serious health conditions later in life. More than two decades later, leaders in both policy and health care professions now appreciate the impact of social determinants of health, including the enormous societal costs incurred by deleterious experiences, and recognize that treating illness begins with prevention in early childhood. The trauma informed care (TIC) model offers a treatment approach that lends consideration to the traumatic experiences that impact a given patient and allows for more complete treatment by their physician. Delivering care under the TIC model encourages trauma identification, early intervention, system level awareness and policy change, and avoiding retraumatization in the therapeutic setting. Various programs across the country seek to employ these methods at the community, state, and federal level. Several programs aimed at introducing medical students to these principles have contributed to an incorporation of TIC within the physician pipeline. In this Commentary, the author proposes an expansion of the *Tenets of Osteopathic Medicine* with a fifth principle—considering the implications of a patient's past formative experiences, their present life circumstances, and their future prospects—as a vehicle for instilling TIC principles ubiquitously throughout osteopathic medical training to develop physicians who treat the *whole* person more completely and are better equipped to manage this public health crisis.

**Keywords:** ACEs; adverse childhood experiences; tenets of osteopathic medicine; trauma-informed care.

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In 1998, a seminal study [1] analyzed data collected with confidential mail based surveys over two years (1995–1997) and in two waves from 17,000 Kaiser Health Plan members residing in Southern California. That study [1] would eventually be referenced as the ACEs study, as it identified a direct dose-response relationship between participants' exposures to forms of trauma—described as adverse childhood experiences (ACEs)—and the accumulation of risk factors for serious health conditions later in life. More than two decades later, leaders in both policy and health care professions better recognize that treating illness begins with prevention of ACEs in early childhood [1–4]. This awareness is the culmination of decades of work in identifying the social determinants that influence health, as medicine looks beyond the disease process and into the environmental and experiential factors that influence a person's health even decades later in life [1–4]. Trauma informed care (TIC) was devised to address these pervasive ACEs in a therapeutic manner that mitigates retraumatization and offers a guideline for encompassing support in all settings, at all levels, for all populations [2]. Ensuring the integration of TIC into routine practice requires its incorporation into the foundational philosophic principles upon which our clinical approach as osteopathic physicians is built. Expanding the tenets of osteopathic medicine with a fifth clause encompassing the principles of TIC would be consistent with the concept of treating the *whole person*, and would mark a paradigm shift in the guiding philosophy under which osteopathic physicians are trained, from undergraduate to continuing medical education levels.

## Social determinants of health—the ACEs study and ramifications of trauma

The concept of social determinants of health gained significant momentum in the waning years of the 20th century, with the World Health Organization (WHO)'s December 1, 1998

first edition release of the policy booklet *Social Determinants of Health: The Solid Facts* [3], coming on the heels of the ACEs study published in May of the same year [1]. The WHO booklet [3] pushed ideas originally confined to academic circles to the forefront of health policy, lending credence to impact on health outcomes of the political, economic, and social policies that influence the conditions of one's living environment and greater community. While certain positive and nurturing experiences impart protective effects, other experiences are strongly correlated with deleterious outcomes on physical and mental health, educational advancement, career attainment, and a multitude of other success metrics [1, 4]. Specifically identified in data from the original 1998 ACEs survey—and expanded by a series of studies using the same dataset [1, 5, 6]—were three categories of 10 separate harmful experiences that correlated with unfavorable health outcomes. These included abuse (physical, sexual, or psychological), neglect (physical or emotional), and household dysfunction (substance use, household member with mental illness, mother suffering violence, parental divorce, or caregiver incarceration) [1, 4–6]. In contrast, a 2019 cross sectional telephone survey of 6,188 adults from Bethell et al. [7] evaluated “positive childhood experiences” (PCEs) that appeared to moderate the influence of ACEs, reducing the risk of adverse mental health outcomes and promoting the development of socially and emotionally supportive relationships in a dose-response manner. These PCEs included a variety of positive attachments and relationships with one's family, friends, school, and community [7]. The overall health impact of PCEs warrants further study and discussion beyond the overview in this Commentary, which will focus more on ACEs and the role of TIC [7].

The biology of toxic stress, or “prolonged activation of stress response systems in the absence of protective relationships,” explains the mechanism behind the effects of ACEs on health outcomes [8]. While healthy development requires stressor induced learning, the process becomes pathologic or “toxic” when the stressors are unyielding, overwhelming, and occur in the absence of a supportive environment [8]. With the stress response persistently activated, the cumulative allostatic load facilitates chronic alterations in brain and organ development, decreases in resiliency, and long term reinforcement of behaviors that were possibly adaptive to transient adversity but become unhealthy over time. The collective result is an increased risk of numerous medical conditions; rates of smoking, obesity, sedentary lifestyle, depression, and suicide attempts are positively correlated with ACEs, and the effect is cumulative [8]. The original 1998 ACE study [1] found that participants with a history of a single ACE had mild increases in their risk of these conditions, while participants

with four or more ACEs of any variety had a twelvefold increase in suicide risk, a seven to tenfold increased chance of intravenous drug use and addiction, a risk of stroke 2.4 times higher, and double the risk of cancer [1, 9].

ACEs and their sequelae are ubiquitous, recalcitrant, and costly. The most recent US federal report compiled with 2019 data from the National Data Archive on Child Abuse and Neglect [10] tabulated over four million CPS referrals alleging maltreatment involving nearly eight million children. After screening of these referrals, a rounded total of 656,000 child victims of abuse and/or neglect were identified—an annual rate of 8.9 victims per 1,000 children [10]. Data analyzed from use of the ACEs module in the 2010 Behavioral Risk Factor Surveillance System (BRFSS) covering 27,834 participants in 10 states and the District of Columbia found that participants with higher ACE scores were less likely than their counterparts with lower scores to attain higher levels of education, hold employment, or live above the poverty level [11]. In this manner, the cycle of trauma experienced by participants was associated with perpetuating the cycle of poverty [11]—which would in turn leave them and their offspring more vulnerable to ongoing health detriments and perpetuate a further “chain of social risk” with implications for similar educational, employment, and financial struggle [3].

The economic cost is enormous. A 2018 study [12] utilized data published in prior studies as human capitalization valuations—which do not consider intangible costs to the community and focus only on the direct cost to the payer—as value per statistical life methodology (VSL) and quality adjusted life years (QALYs), which the authors considered to be a more accurate estimate of true impact on mortality cost and morbidity cost, respectively [12]. VSL assesses the value of life lost in terms of society's willingness to pay to avert this loss, while QALYs considers the cost associated with living under the burden of a disease in terms of impaired quality and quantity (duration) of life [12]. Only considering substantiated cases of fatal and nonfatal abuse, the authors estimated the U.S. annual economic burden of child maltreatment as of 2015 at \$428 billion USD, with this figure rising to \$2 trillion USD when including all investigated cases regardless of substantiated status [12]. For nonfatal cases, the per victim lifetime cost was estimated at over \$830,000 USD [12]. A 2019 study [13] calculated the human capital cost of ACE related disability adjusted life years (DALYs) with data from the 2017 Global Burden of Disease Study and estimated the annual North American cost attributable to ACEs at \$748 billion. For comparison, diabetes also had an incidence of about 700,000 cases in the U.S. in 2017, though the calculated annual cost was only \$327 billion USD [14].

## Responding to the ACEs epidemic: the trauma informed care model

The cost of ACE related health conditions reflects their largely chronic and challenging nature, while highlighting the potential benefit of implementing preventative strategies. A variety of TIC models exist for guiding professionals of all varieties in more effectively addressing trauma. The model proposed by SAMHSA [2] describes four key assumptions—the four “R’s”—under which organizations become trauma-informed: (1) realizing that trauma as widely impactful on and beyond the individual themselves, (2) recognizing signs of trauma as it presents in both patients, families, and other team members, (3) responding to trauma by incorporating trauma knowledge into medical practice and societal systems, and (4) resisting re-traumatization within support and care services. These assumptions guide adherence to six key principles in delivering TIC: (1) safety, (2) trustworthiness and transparency, (3) peer support, (4) collaboration and mutuality, (5) empowerment by voice and choice, and (6) addressing issues related to cultural, historical, and gender backgrounds [2]. In a 2015 review, Raja et al. [15] presented the “TIC pyramid” as a framework for implementing TIC. In that pyramid, screening is only the tip of the proverbial iceberg, followed by clinician self awareness (recognizing the impact of one’s own experiences and countertransferences on patient interactions), interprofessional collaboration, understanding the health impacts of trauma (the biology toxic stress), and a broad foundation of patient centered communication and care [15]. The final principle serves as the base for universal trauma precautions upon which clinicians may avoid inadvertent retraumatization and thus preserve rapport, regardless of a patient’s trauma screening status [15]. Patient centered communication emphasizes patient autonomy, education, and choice—eliciting visit goals to open the encounter, informing the patient about next steps (including details of the recommended physical examination), and offering options to maximize a patient’s sense of control within the bounds of an effective evaluation [15]. Raja et al. [15] additionally provided an extensive list of specific suggestions for all clinicians interested in employing the TIC principles. In short, the core of TIC involves practicing clinical care under the gentle assumption that any given patient may have experienced any variety of trauma, and approaching the patient with an outlook of “What happened to you?” rather than “What is wrong with you?” [16].

A variety of resources are available for implementing TIC at the clinical practice, community, and organizational levels. The “Change Package” — developed by a multidisciplinary team of healthcare stakeholders collectively

known as the Trauma-Informed Care Primary Care: Fostering Resilience and Recovery initiative and led by both The National Council for Behavioral Health and Kaiser Permanente — offers a comprehensive guide and set of tools for implementing TIC in the primary care setting [17]. The Centers for Disease Control offers technical packages of screening and prevention tools [18] designed to arm communities with evidence based intervention strategies for improving families’ economic status, promoting positive parenting, delivering early childhood education and care, and engaging in harm reduction. The country’s first statewide initiative for universal ACEs screening within the TIC model, *ACEs Aware*, was spearheaded in 2019 by the state of California’s first surgeon general, Nadine Burke Harris, MD, MPH [19–21]. The plan, inspired in part by the *Fostering Futures* program of former Wisconsin First Lady Tonette Walker [19, 22], allocated funding to train and encourage physicians to complete trauma screenings of Medical patients—recognizing past traumas as the first principle in the TIC model—to identify patients for treatment and preventive measures, with the goal being a 50% reduction in ACEs and toxic stress within one generation [20, 21]. A full report — Roadmap for Resilience: The California Surgeon General’s Report on Adverse Childhood Experiences, Toxic Stress, and Health — detailed blueprint for recognizing and addressing these root cause detriments at the community, state, and national levels [23]. These programs are a snapshot of some of the recent burst of TIC related legislative activity across the country. At the federal level, *House Resolution 443* from 2018 aimed to raise awareness of ACEs and TIC through designating a national trauma awareness month and day [24]. Other initiatives at the organizational and philanthropic levels include those from the Mobilizing Action for Resilient Communities (MARC) [25] hosted at 14 different sites, and the Robert Wood Johnson [26] which funded the Advancing Trauma-Informed Care project including six pilot sites across the country. As momentum continues to rise, it is prudent that health care professionals and organizations understand the importance of TIC, its potential impact on patient care, and how to leverage these initiatives in an effective manner to improve health outcomes.

## Criticism of the ACEs/TIC model

The TIC model is not without some criticism. Two papers by Leitch [27] and Campbell [28], along with a comprehensive review by Hamberger et al. [29] explored several of these detractions and offered poignant counterpoints. Both original papers [27, 28] noted that the primary screening

tool—the ACEs questionnaire [1]—and others like it focus solely on negative experiences that could be upsetting or even retraumatizing to patients. The former two papers [27, 28] and an analysis by Finkelhor et al. [30] described the absence of several potentially important items from the 1998 questionnaire, including a query for trauma related psychiatric symptoms, consideration of other childhood adversities and social determinants of health such as poverty and community violence, and a screening for protective factors that mitigate trauma's impact. Without these components, universal ACEs screening could theoretically lead to retraumatization if TIC principles are not adequately employed [28, 29]. Further, Leitch [27] argued that TIC itself may be inadequate if it is delivered without a neuroscience component to guide clinicians in case conceptualization, or if the focus lies solely on information gathering without actual guidance for action. Other arguments against ACEs screening and TIC are more philosophical in nature and contend that the pathologizing of human experience abdicates personal responsibility and shifts the burden of treatment from the patient to society [27].

Most of these concerns do not hold up to scrutiny and numerous credible experts have disputed their validity [27–30]. Proponents note that the TIC model does not pathologize but rather normalizes symptomatic behavior and medical sequelae as typical reactions to adverse experiences [27, 29]. Updating the original ACEs survey [1, 30] and adapting it to different settings [29] is a simple fix for “patching the hole” and including helpful additions. In an emphatic commentary published in *Journal of the American Medical Association* in 2020 [31], California Surgeon General Harris outlined the overwhelming benefits of recognizing and identifying trauma to avoid mislabeling and promote more accurate treatment triage that allows for better patient outcomes. Qualitative data gleaned from in depth interviews [32] of 22 participants randomly selected from a larger survey assessing gender based violence in South Africa additionally found that the “vast majority (of the participants) thought the survey had a positive effect on them” despite them also experiencing an emotional reaction to the survey. Another study [33] of reactions to trauma assessment for 260 victims of domestic violence, 180 victims of rape, and 62 victims of physical assault suggested positive experiences of the assessment with high levels of participant interest and low levels of distress. With an awareness of a patient's ACEs, treatment can be targeted more directly based on any contributory experiential factors, preventative health interventions and services can be engaged as early as possible, and the therapeutic alliance—or patient-physician bond—can be strengthened to keep patients in care over the long term [27, 29, 30]. Though

imperfect in its present form, TIC is well constructed to allow for improvement. The alternative approach—essentially ignoring the occurrence and influence of ACEs—blindly disregards the fiscal and moral reality of their serious impact on health outcomes.

## The fifth tenet: integrating the ACEs/TIC model into physician education and osteopathic medical philosophy

Addressing the ACE epidemic through TIC begins with screening and awareness, and it continues with clinician education. Physicians need both to understand the implications of ACEs and to be comfortable implementing appropriate evidence based interventions at the practice level. Organizations like the American Osteopathic Association (AOA) may build on the foundation of resources already generated by federal, state, and local organizations; implement TIC related CME; encourage the incorporation of TIC in medical school curricula; and advocate for promising policy initiatives like *ACEs Aware* [21]. The American College of Physicians has called for such wide ranging engagement from the medical profession and beyond at the policy level [34]. Intervention at the undergraduate medical education level has been piloted in several forms. A small study [35] conducted at University of California-Davis evaluated a brief TIC course delivered in a trio of 2-hour modules to 20 medical students and found subjective improvements identification of clinical manifestations of ACEs in adult patients as well as greater student awareness of resource allocation deficiencies. Another study [36] included 35 first year medical students who attended a 2-hour workshop on performing a trauma-informed physical examination that sought to improved their familiarity with TIC principles as a means of enhancing their ability to form a stronger therapeutic alliance in caring for trauma survivors. Students had limited familiarity with TIC prior to this session, and surveys conducted three months after the workshop demonstrated increases in perceived familiarity, confidence, and frequency of use of TIC by 85, 62, and 61%, respectively, with an additional 49% increase in ability to identify actions that were not adherent to TIC principles [36]. At George Washington University School of Medicine and Health Sciences, a 4-hour TIC symposium delivered to 179 second year medical students [37] incorporated small group case discussions on clinical practice applications of TIC, with 24

students per group. Participant surveys that used a 5-point Likert scale produced high ratings of agreement that the symposium improved their overall knowledge of ACEs and their relationship with health outcomes (92% agreed or strongly agreed), as well as their understanding of TIC (93%), and how to incorporate it into patient interactions (87%) [37]. Similar positive feedback with emphasis on the small group case discussion format was gleaned from a 3-hour ACEs workshop for 535 first year medical students at Rutgers New Jersey Medical School [38]. A condensed, 1-hour lecture introduction to ACEs for 124 first-year medical students at Baylor College of Medicine [39] yielded increases on self assessment scores of all content related knowledge areas, including identifying descriptions of household dysfunction as ACEs (a 2.3 point increase on a 5 point Likert scale), calculating an ACE score (increase of 2.2), and recognizing the link between ACEs and chronic medical conditions, among others (increase of 1.4).

Encouraging greater adoption of TIC principles in medical education requires acceptance and integration of these standards into the foundational philosophic principles upon which our clinical approach as osteopathic physicians is built. Osteopathic medicine as a philosophy of care centers on the treatment of the *whole person*, as described in the four tenets of osteopathic medicine well known to all in the field: “(1) The body is a unit; the person is a unit of body, mind, and spirit; (2) The body is capable of self regulation, self healing, and health maintenance; (3) Structure and function are reciprocally interrelated; (4) Rational treatment is based upon an understanding of the basic principles of body unity, self regulation, and the interrelationship of structure and function” [40]. These tenets guide the teaching of osteopathic medicine and thus form the basis for the clinical practice habits of all osteopathic physicians. The tenets themselves appreciate the oneness of the body and mind, innate self-healing abilities, and the key reciprocity between structure and function that must be understood for the delivery of quality, whole person care. With the growing recognition and study of social determinants of health (including ACEs) and the importance of TIC, the whole person concept becomes incomplete without an extension to encompass key factors beyond the physical patient in the examination room. A more complete approach in generating a fully formulated treatment plan employs an emphasis on the therapeutic relationship and consideration for the patient’s formative profile, present environment and life circumstances, and future prospects, as well as the potential challenges they may encounter. The whole patient is not simply the person present in the room, but the culmination of their past experiences, genetic profile, developmental course, and upbringing environment. They exist within the

context of their community setting and living environment, their relationships, their educational or occupational status, and their behavioral habits. They must be understood with regard for not only their prognosis, but their future aspirations and goals, the looming challenges and major life events on their horizon, and the person they wish to become.

As osteopathic physicians, we take pride in “the DO difference”—our unique ability to treat the whole person, to “look beyond the symptoms,” and to provide quality, compassionate care that integrates our distinct philosophy and complementary tools like osteopathic manipulative treatment with the latest science and technology [41]. Sustaining this powerful distinctiveness requires growth and revision. At this juncture, it is vital that we bolster our philosophical foundation to ensure that the care we offer remains complete and whole. The four tenets of osteopathic medicine should be expanded to include this fifth principle of understanding a patient more holistically, under the model of TIC, in the context of their social determinants, and with a perspective on their future. This expansion would ensure that all forms of osteopathic medical education, from the undergraduate medical school level through our continuing medical education requirements, are guided by a more encompassing clinical approach. With this framework, we can ensure that our physician workforce of both the present and the future is equipped with the tools for treating their patients more completely. As healthcare team leaders, physicians who employ TIC will adeptly deliver care while addressing the social determinants that influence their patients’ medical conditions and provide with the supportive treatment environment they deserve. Clinicians applying these principles could engage in more nuanced triage practices, ensure efficient resource allocation, and prescribe more effective multidisciplinary treatment plans tailored to the individual patient. TIC thus advances the osteopathic effort to treat the whole patient—with consideration for their past, present, and future.

## Conclusions

The past few decades have brought greater appreciation for the social determinants of health and understanding of the impact that external factors and life experiences have on patient health. Research has unveiled the deleterious impact of toxic stress and contributed to our clinical understanding of the role this plays in our patients’ medical conditions. In addressing these detriments and their pervasive nature, a TIC approach has potential value for enhancing the patient experience by appreciating the potential impacts of trauma

to establish a more therapeutic environment where patients feel more comfortable and connected to the clinician, who in turn may promote better health outcomes by addressing their risk factors through screening, prevention, and treatment. Outside the clinical setting, initiatives at the local, state, and federal levels have included TIC in various programs and resources aimed at tackling the ACEs epidemic. By incorporating our knowledge of social determinants of health and the principles of TIC into osteopathic care, we as osteopathic physicians and medical undergraduates can be trained to treat the whole person more completely—giving consideration not only to the patient as they physically present, but with regard for their formative profile, current life circumstances, and future prospects and challenges.

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## References

- Felitti V, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *Am J Prev Med* 1998;14:245–58. [Accessed 6 Dec 2019].
- SAMHSA. SAMHSA's concept of trauma and guidance for a trauma-informed approach. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014. [https://ncsacw.samhsa.gov/userfiles/files/SAMHSA\\_Trauma.pdf](https://ncsacw.samhsa.gov/userfiles/files/SAMHSA_Trauma.pdf) [Accessed 1 Mar 2021].
- Wilkinson RG, Marmot M. Social determinants of health: the solid facts. World Health Organization. Regional Office for Europe, WHO Centre for Urban Health (Europe) & International Centre for Health and Society; 1998. <https://apps.who.int/iris/handle/10665/108082> [Accessed 1 Mar 2021].
- Adverse childhood experiences (ACEs). Centers for Disease Control and Prevention Website; 2021. [www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/index.html](http://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/index.html) [Accessed 10 Jun 2021].
- Dube SR, Anda RF, Felitti V, Edwards V, Croft JB. Adverse childhood experiences and personal alcohol abuse as an adult. *Addict Behav* 2002;27:713–25. [Accessed 14 May 2021].
- Dong M, Anda RF, Felitti V, Dube SR, Williamson DF, Thompson T, et al. The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse Negl* 2004;28:771–84. [Accessed 14 May 2021].
- Bethell C, Jones J, Gombojav N, Linkenbach J, Sege R. Positive childhood experiences and adult mental and relational health in a statewide sample: associations across adverse childhood experiences levels. *JAMA Pediatr* 2019;173:e193007. [Accessed 3 Apr 2021].
- Toxic stress. Center on the Developing Child at Harvard University Website. <https://developingchild.harvard.edu/science/key-concepts/toxic-stress> [Accessed 6 Dec 2019].
- Dube SR, Felitti V, Dong M, Chapman DP, Giles WH, Anda RF. Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study. *Pediatrics* 2003;111:564–72. [Accessed 11 May 2021].
- U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. Child maltreatment; 2019. <https://www.acf.hhs.gov/cb/report/child-maltreatment-2019> [Accessed 30 Apr 2021].
- Metzler M, Merrick MT, Klevens J, Ports KA, Ford D. Adverse childhood experiences and life opportunities: shifting the narrative. *Child Youth Serv Rev* 2017;72:141–9. [Accessed 6 Dec 2019].
- Peterson C, Florence C, Klevens J. The economic burden of child maltreatment in the United States, 2015. *Child Abuse Negl* 2018;86:178–83. [Accessed 6 Dec 2019].
- Bellis MA, Hughes K, Ford K, Ramos Rodriguez G, Sethi D, Passmore J. Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis. *Lancet Public Health* 2019;4:e517–28. [Accessed 1 Mar 2021].
- American Diabetes Association. Economic costs of diabetes in the U.S. in 2017. *Diabetes Care* 2018;41:917–28. [Accessed 6 Dec 2019].
- Raja S, Hasnain M, Hoersch M, Gove-Yin S, Rajagopalan C. Trauma informed care in medicine: current knowledge and future research directions. *Fam Community Health* 2015;38:216–26. [Accessed 1 Apr 2021].
- Piotrowski CC. Chapter 15 – ACEs and trauma-informed care. In: *Adverse childhood experiences*. Academic Press; 2020:307–28 pp. <https://doi.org/10.1016/B978-0-12-816065-7.00015-X> [Accessed 1 Apr 2021].
- National Council for Behavioral Health. Fostering resiliency and recovery: a change package. Policy Action Center of the National Council for Behavioral Health Website. <https://www.thenationalcouncil.org/fostering-resilience-and-recovery-a-change-package/> [Accessed 1 Apr 2021].
- Technical packages. Centers for Disease Control and Prevention Website; 2020. <https://www.cdc.gov/violenceprevention/communicationresources/pub/technical-packages.html> [Accessed 12 Jun 2021].
- Loudenback, J. California surgeon general readies statewide screening for child trauma. The Imprint Website; 2019. <https://imprintnews.org/child-welfare-2/californias-surgeon-general-readies-statewide-screening-for-child-trauma> [Accessed 5 Dec 2019].
- Trauma screenings and trauma-informed care provider trainings. California Department of Health Care Services Website. [www.dhcs.ca.gov/provgovpart/Pages/TraumaCare.aspx](http://www.dhcs.ca.gov/provgovpart/Pages/TraumaCare.aspx) [Accessed 5 Dec 2019].
- Aces aware. State of California Department of Health Care Services. <https://www.acesaware.org/> [Accessed 1 Apr 2021].
- Walker T. Becoming a trauma-informed state. Kaiser Permanente Institute for Health Policy; 2018. [www.kpihp.org/blog/becoming-a-trauma-informed-state/](http://www.kpihp.org/blog/becoming-a-trauma-informed-state/) [Accessed 5 Dec 2019].
- Bhushan D, Kotz K, McCall J, Wirtz S, Gilgoff R, Dube SR, et al. Roadmap for resilience: the California Surgeon General's report on adverse childhood experiences, toxic stress, and health. Office of the California Surgeon General; 2020. <https://doi.org/10.48019/PEAM8812> [Accessed 1 Apr 2021].

24. Maul A. Welcome upswing of state and federal support for trauma-informed practices and policies. Center for Health Care Strategies; 2019. [www.chcs.org/welcome-upswing-state-federal-support-trauma-informed-practices-policies](http://www.chcs.org/welcome-upswing-state-federal-support-trauma-informed-practices-policies) [Accessed 6 Dec 2019].
25. Mobilizing action for resilient communities. MARC. <https://marc.healthfederation.org/> [Accessed 6 Dec 2019].
26. Advancing trauma-informed care. Center for Health Care Strategies; 2019. [www.chcs.org/project/advancing-trauma-informed-care/](http://www.chcs.org/project/advancing-trauma-informed-care/) [Accessed 6 Dec 2019].
27. Leitch L. Action steps using ACEs and trauma-informed care: a resilience model. *Health Justice* 2017;5:5. [Accessed 5 Dec 2019].
28. Campbell TL. Screening for adverse childhood experiences (ACEs) in primary care: a cautionary note. *J Am Med Assoc* 2020;323:2379–80. [Accessed 10 Jun 2021].
29. Hamberger LK, Barry C, Franco Z. Implementing trauma-informed care in primary medical settings: evidence-based rationale and approaches. *J Aggress Maltreat Trauma* 2019;28:425–44. [Accessed 10 Jun 2021].
30. Finkelhor D, Shattuck A, Turner H, Hamby S. A revised inventory of adverse childhood experiences. *Child Abuse Negl* 2015;48:13–21. [Accessed 14 Jun 2021].
31. Sikweyiya Y, Jewkes R. Perceptions and experiences of research participants on gender-based violence community-based survey: implications for ethical considerations. *PLoS One* 2012;7:e35495. [Accessed 10 Jun 2021].
32. Griffin MG, Resick PA, Waldrop AE, Mechanic MB. Participation in trauma research: is there evidence of harm? *J Trauma Stress* 2003;16:221–7. [Accessed 10 Jun 2021].
33. Harris NB. Screening for adverse childhood experiences. *J Am Med Assoc* 2020;324:1788–9. [Accessed 1 Apr 2021].
34. Daniel H, Bornstein SS, Kane GC. Addressing social determinants to improve patient care and promote health equity: an American College of physicians position paper. *Ann Intern Med* 2018;168:577–8. [Accessed 6 Dec 2019].
35. Goldstein E, Murray-Garcia J, Sciolla AF, Topitzes J. Medical students' perspectives on trauma-informed care training. *Perm J* 2018;22:17–126. [Accessed 6 Dec 2019].
36. Elisseou S, Puranam S, Nandi M. A novel, trauma-informed physical examination curriculum for first-year medical students. *Med Educ* 2018;52:555–6. [Accessed 6 Dec 2019].
37. Chokshi B, Walsh K, Dooley D, Falusi O, Deyton L, Beers L. Teaching trauma-informed care: a symposium for medical students. *MedEdPORTAL* 2020;16:11061. [Accessed 1 Apr 2021].
38. Pletcher BA, O'Connor M, Swift-Taylor ME, DallaPiazza M. Adverse childhood experiences: a case-based workshop introducing medical students to trauma-informed care. *MedEdPORTAL* 2019;15:10803. [Accessed 1 Apr 2021].
39. Onigu-Otite E, Idicula S. Introducing ACEs (adverse childhood experiences) and resilience to first-year medical students. *MedEdPORTAL* 2020;16:10964. [Accessed 1 Apr 2021].
40. American Osteopathic Association. Tenets of osteopathic medicine. <https://osteopathic.org/about/leadership/aoa-governance-documents/tenets-of-osteopathic-medicine/> [Accessed 1 Apr 2021].
41. American Osteopathic Association. The DO difference. <https://doctorsthatdo.osteopathic.org/difference> [Accessed 1 Apr 2021].