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Title: Trauma-Informed Medical Education (TIME): Advancing Curricular Content and Educational Context

Trauma-Informed Medical Education (TIME): Advancing Curricular Content and Educational Context

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Abstract

The majority of patients and medical students experience some form of psychological trauma or adversity across their life course. All forms of trauma can be associated with adverse health consequences and can negatively affect learning and professional development. Trauma-informed care (TIC) offers a framework to address and mitigate these consequences and promote safety and health. The Substance Abuse and Mental Health Services Administration describes 6 domains of TIC: safety; trust and transparency; peer support; collaboration and mutuality; empowerment, voice, and choice; and cultural, historic, and gender issues.

At present, TIC is not taught routinely in undergraduate medical education (UME)—a crucial educational gap given that UME grounds the development of key perspectives and practices that students use throughout their careers. Further, given the prevalence of preexisting trauma among leaners and the likelihood of new traumatic exposures during training, medical schools' processes, practices, and learning environments may risk exacerbating or even causing trauma. To address this educational need and support students and their future patients, the authors propose a Trauma-Informed Medical Education (TIME) framework.

TIME informs medical schools' curricular content and educational context. In UME, curricular content should address trauma epidemiology, physiology, and effects; trauma-informed clinical skills including sensitive communication and physical exam techniques; and trauma-informed self-care techniques including education on organizational resources, how to elicit supports, and personal self-care practices. A trauma-informed educational context encompasses curricular development, including student–faculty coproduction of educational content; curricular delivery, including faculty development on TIC principles; and learning environment including trauma-,informed educational practices, medical student advising, institutional policies, and recruitment.

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TIME offers practical strategies to support teaching, learning, educational administration, and professional development and aims to inspire new strategies for effective learner and faculty engagement. TIME aims to foster students' development of competency in TIC and promote student engagement, learning, health, and well-being.

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Medical practitioners and trainees face an epidemic of trauma and medical schools are well positioned to respond. Trauma is defined by the Substance Abuse and Mental Health Services Administration as "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."[1(p7)] This definition encompasses natural disasters and accidents; terrorism and acts of war; sexual, physical, emotional, and verbal abuse; systemic discrimination and acts of prejudice; and medical illness. As we consider how undergraduate medical education (UME) can address learners' needs, we use the term "trauma" to refer to psychological trauma and the physiological and behavioral sequelae stemming from traumatic events such as those listed above.

To characterize the need for trauma-informed medical education (TIME), we will first explain the extent and consequences of trauma and the therapeutic approach of trauma-informed care (TIC). Trauma is ubiquitous; in one study, 90% of American adults reported at least one traumatic exposure in their lifetime.[2] All forms of trauma, especially childhood trauma, may be associated with adverse physical and mental health outcomes.[3,4] A Kaiser Permanente study described a dose-response relationship between adverse childhood experiences (ACEs) and negative health outcomes.[4] ACEs included experiences such as physical, sexual, and psychological abuse and household dysfunction related to a household member's substance use, mental illness, domestic violence, and/or incarceration. Adults with the highest number of ACEs had 12 times higher odds of attempting suicide than adults with an ACE score of zero and over 2 times higher odds of suffering from cardiovascular disease.[4] Subsequent work from the ACEs study has included 3 additional ACEs: separation/divorce, emotional neglect, and physical

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neglect.[5] Rates and types of trauma can vary by social position and identity. Some populations experience particularly high rates of adversity, including women, veterans, racial and ethnic minorities, sexual and gender minority (SGM) individuals; and people who have experienced illness or disability.[2,6–9] Trauma can cause acute physical injuries with associated sequelae, post-traumatic stress disorder, and poor health outcomes that occur decades after the inciting event.[3] Lifetime exposure to traumatic events has been linked to increased pain, depression, anxiety, and substance misuse.[10]

Trauma-informed care (TIC) is a framework used to address and mitigate these health effects. TIC encourages health care providers, institutions, and systems to consider the impact of trauma; recognize its signs and symptoms; respond by integrating knowledge about trauma into policies, procedures, and practices; and plan and act to avoid retraumatization.[1] The TIC framework posits that health care providers and institutions adopt a universal, systematic, trauma-informed approach.[11] This approach is based on 6 principles: safety (ensuring everyone feels physically and psychologically safe); trustworthiness and transparency (making decisions with transparency to build and maintain trust); peer support (promoting mutual support to aid in healing and recovery); collaboration and mutuality (leveling power differentials and recognizing that everyone plays a role in recovery and care); empowerment, voice, and choice (recognizing and building upon individuals' experiences and strengths); and cultural, historical, and gender issues (acknowledging and addressing the impact of historical trauma, overt discrimination, and implicit biases).[1]

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UME has a responsibility to patients, providers, and students to adopt trauma-informed curricular content and practices. We propose a trauma-informed medical education (TIME) framework to address the epidemic of trauma and adversity faced by medical students, the medical professionals they will become, and ultimately, the patients they will serve. TIME requires universal integration of TIC principles throughout the UME experience, including attention to both curricular content and educational context. We define curricular content as the subject matter that educators include in the curriculum (i.e., what is taught). We use the term "educational context" to include 3 elements: curricular development (i.e., how the content is created); the nature of educational "delivery" (i.e., how the content is taught and the faculty development to support this instruction); and the learning environment (i.e., medical schools' policies, practices, and supports).

Trauma-Informed Curricular Content

TIC has been proposed in recent years as an important clinical tool in medicine and as a framework to promote health care engagement and health equity.[11–13] Despite these clinical benefits, UME has yet to develop, adopt, and advocate for trauma-related curricular content. Published trauma and TIC competencies exist for entry-level psychologists, for all levels of nursing education, and for general health care providers; yet our literature review uncovered no current nationally-accepted TIC competencies for UME.[14–16] At a minimum, UME curricula should include content that addresses trauma epidemiology, physiology, and effects; trauma-informed clinical skills; and trauma-informed self-care skills.

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Trauma epidemiology, physiology, and effects

TIME establishes that students learn the definition and prevalence of different types of trauma and their associated adverse health effects; biopsychosocial mechanisms by which trauma impacts health across the lifecycle, including exposure to inequitable structural and social contexts; and evidence-based therapeutic strategies to promote healing and recovery. TIME highlights and calls for educators to recognize trauma epidemiology, physiology, and effects within social and behavioral sciences, in health equity coursework, and across the fields of medicine that engage topics related to trauma.

Efforts to teach medical students these concepts are emerging. Rutgers New Jersey Medical School recently incorporated a workshop on ACEs and TIC into their first-year curriculum.[17] The University of California, Davis School of Medicine developed a 6-hour training module to introduce students to the prevalence and definition of trauma, ACEs and their health impacts, and a trauma-informed framework for clinical care.[18] A workshop at our own institution, Harvard Medical School (HMS), teaches first year medical and dental students about trauma, ACEs, TIC, and vicarious traumatization.[19]

Trauma-informed clinical skills

Students must develop trauma-informed clinical skills because medical care, however routine, involves some degree of vulnerability. Patients both with or without histories of trauma may fear loss of control, pain, disfigurement, disability, or death. They may feel apprehensive about undergoing painful procedures or may feel embarrassed by the indignities of procedures such as genitourinary exams or colonoscopies. Patients risk being blamed or shamed for engaging in health risk behaviors (e.g., unhealthy dietary habits, sedentary lifestyle, substance misuse, high-risk sexual activity). They may fear that providers will not affirm their identities or will

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discriminate against them (e.g., SGM patients, religious minorities, immigrants, people of color).

Students must learn and practice TIC as a "universal precaution" that is applied to all patients

regardless of their individual trauma histories. Students who develop these skills will be more

able to engage, support, and serve patients by restoring the balance of control in health care

encounters; by increasing patient empowerment, voice, and choice; and by maximizing patient-

centeredness.[20] This educational approach arises from concepts such as "patient-as-partner" or

"coproduction of care" that prioritize collaboration with patients and respect their perspectives

and autonomy during clinical encounters.[21,22]

During UME, students should receive instruction in trauma-informed clinical practices.

Coursework should teach students to discuss options to promote confidentiality and safety (e.g.,

provide a private area to discuss difficult topics, use chaperones when appropriate);[1,23] apply

sensitive communication techniques (e.g., avoid stigmatizing terms like "addict," use

professional and/or reflective language when referring to body parts, ask for permission before

proceeding to examine the patient);[11,23] and use trauma-informed physical exam maneuvers (e.g.,

sensitive draping, standing within the patient's sight at all times, asking before touching,

considering the patient's potential experience of examinations of any body region—mouth, neck,

etc.).[11,23] When counseling and treating patients, students and their clinical instructors should

consider how trauma and adversity may have caused, exacerbated, or interacted with their

current presentation (e.g., patients may use substances to cope with emotional consequences of

trauma, patients may be distrustful of practitioners due to prior negative health care experiences,

patients may not choose recommended medical therapies due to fears based on personal or

community history).[1] Specialty-specific TIC principles should also be incorporated during

clerkship rotations (e.g., considerations for children, obstetrics and gynecology patients, and

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patients undergoing surgery or in the intensive care unit).

Medical schools are beginning to use TIC principles to teach students sensitive communication and physical exam techniques. Educators at the Warren Alpert Medical School of Brown University have taught trauma-informed physical exam approaches to students and assessed students' interviewing and physical exam skills through standardized patient encounters using a trauma-informed rubric.[24] A workshop at HMS has taught trauma-informed communication to first-year medical and dental students, who then practiced the techniques using role plays.[19]

Trauma-informed self-care techniques

Schools must teach medical students trauma-informed self-care because many students may carry trauma histories and are at risk of being negatively affected by traditional educational practices.[25–29] A 2019 study of 98 medical students found that 51% reported experiencing at least 1 ACE, while 12% reported greater than 4 ACEs.[25]

Prematriculation ACEs do not account for all the mental health difficulties seen in students during medical school. UME experiences may retraumatize learners and/or introduce new distress.[27,29–31] Patient death, for example, can lead students to feel powerless, have flashbacks, or experience emotional detachment.[30] A study of 64 medical students found that 26% of students had experienced symptoms of vicarious traumatization, i.e., experiencing post-traumatic symptoms after caring for someone with trauma, during their clerkship years.[32] In the same study, 40% of students felt that they were insufficiently prepared by their medical school curriculum to handle distressing events.[32] Brazeau et al. found that matriculating medical students had lower levels of depression and burnout than nonmatriculating college graduates of the same age;[33] yet, medical students, residents, fellows, and early career physicians experienced higher rates of burnout and depression than population controls.[34] A study at Wayne State

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University School of Medicine revealed that 40% of participating students experienced symptoms of emotional numbing during their surgery clerkship.[35] The training process itself contributes to student distress. Student mistreatment represents another potential source of distress. Cook et. al found that 64% of participating students had been mistreated by faculty and 75% by residents, and that students subjected to recurrent mistreatment were more likely to experience burnout.[36] These data demonstrate that students can both enter medical school with preexisting trauma burdens and accumulate subsequent traumatic exposures.

Given these findings, instruction in trauma-informed self-care (TISC) skills is essential to promote resilience and well-being. Social work experts have recognized the importance of TISC, and, in developing a validated TISC measure, have identified 3 TISC domains: organizational resources and supports (e.g., trainings on secondary trauma, trauma effects, and stress management); organizational practices (e.g., peer support, supervision, and feedback); and personal self-care practices (e.g., stress management through exercise and meditation, development of written plans for work-life balance, and practicing work-life balance strategies).[37] Among child welfare workers, higher levels of TISC were associated with lower levels of burnout.[38]

As part of the previously described trauma-informed communication session at our institution, we affirmed the importance of self-care as an important skill for learners and introduced students to self-care techniques.[19] The session supported students to reflect on their own self-care habits and discuss them with peers. The session aligned with TISC domains identified above: utilization of organizational resources and supports (e.g., training on vicarious traumatization, information on university-sponsored mental health and counseling resources, and trauma-specific university and community resources); organizational practices (e.g., video on how to elicit and provide peer

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support on trauma-related topics, tips on how to request help and communicate with supervisors and team members when interfacing with patient trauma); and personal self-care practices (e.g., physical activity, creative expression, positive psychology, reflection, healthy eating, words of affirmation, social connection, and organizing for justice).

Trauma-Informed Educational Context

The clinical social work literature suggests that teaching trauma-related content without a trauma-informed approach may cause harm to both students and educators.[39] Research on undergraduate students demonstrated that students with 3 or more ACEs had higher salivary cortisol levels and self-reported emotional reactivity scores after exposure to trauma-related lectures compared to their peers with fewer than 3 ACEs.[40] These findings suggest that students' trauma histories may affect their ability to engage with TIC content, an essential component of UME. Educators must be thoughtful about curricular context, and attend to how content is produced, how it is delivered, and how the learning environment supports learners. By applying TIC principles to the educational context, TIME supports all students' safety and access to learning, increases accessibility to and effectiveness of medical education for those with trauma burdens, and minimizes the risk of new trauma or retraumatization. In the following sections we highlight examples of interventions in the domains of curricular development, curricular delivery, and the learning environment. Table 1 outlines a more complete list of examples.

Trauma-informed curricular development

Thoughtfulness and intentionality surrounding the context of curricular development is not a novel idea. Recently, Englander et al. proposed coproduction—the production of services in collaboration with the intended end-user—as a model to increase student engagement in medical education.[21] TIME can actualize coproduction of medical education through student–faculty

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collaboration grounded in TIC principles (see Table 1).

We consider an example of trauma-informed curricular coproduction at HMS. Students and faculty identified anatomy coursework and cadaver dissection as a traumatic experience for many students. Applying a trauma-informed lens to curricular development, students collaborated directly with faculty to collect student experiences and identified aspects of the course that were distressing. Our institution's support of student well-being drove this collaborative, trauma-informed needs assessment and resulted in implementation of several interventions: faculty development on trauma-informed communication with students, recruitment of upperclassman volunteers to act as near-peer tutors to first-year students during the course, and mandatory discussion of anatomy group agreements and norms prior to the first dissection. The course continues to elicit student input yearly.[41] This collaborative, coproduced evaluation and intervention promotes psychological safety for students, enhances collaboration and trust between students and faculty, and fosters peer support.

Trauma-informed curricular delivery

TIME requires reconsideration of traditional educational practices and delivery models. Historically, many medical schools have taught physical exam maneuvers by having students practice on each other or by having a faculty member demonstrate on students. A survey of 142 medical students found that students acknowledged the importance of learning and practicing the physical exam but had varying levels of willingness to be examined by peers or preceptors.[42] Thirty-nine percent of female students felt unwilling to have their hip joint examined by a male peer and 23% of female students felt unwilling to have male students examine their abdomen.[42] For more sensitive exams (e.g., groin or breast), depending on the gender of student and examiner, as many as 93% of students were unwilling to be examined by a peer.[42] Students

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preferred self-assembled peer exam groups over same- and mixed-gender groups, suggesting that students were more comfortable when able to form their own learning cohorts.[42] Empowering students to choose which learning format (e.g., self-assembled groups, same gender groups, mixed gender groups, or another modality) demonstrates the power of voice, choice, and peer support to enhance the learning environment.

A trauma-informed approach to curriculum delivery was also used in the session we have described at HMS teaching communication skills to first-year students.[19] To participate, faculty preceptors were required to complete faculty development on TIC principles and practices, to enable them to engage with students in a TIC manner and model TIC skills. Students were given time to reflect on the topic in small groups to develop peer support networks, engage with faculty in a collaborative manner, and work through the nuances of trauma and recovery with regard to cultural, historic, and gender issues. A patient with a trauma history along with a trauma-informed provider volunteered to speak with the class to promote empathy and physician–student–patient collaboration and mutuality. Course planners welcomed opportunities for participants to provide feedback on the curriculum, empowering students to have voice and choice about their own education.

Trauma-informed learning environment

The UME educational environment is critical to support and maximize students' learning and personal well-being. TIME calls education leaders to apply TIC principles to medical schools' policies, practices, and supports (see Table 1).

High depression and burnout rates suggest that students with past or current exposure to adversity lack adequate support.[34] Even when resources are available, barriers—including stigma, fear of failure, and guilt about burdening colleagues—may prevent students from seeking

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help.[43] Proposed solutions often focus on improving self-care skills. These practices may offer important benefits, but they do not address root causes of trauma within UME learning environments. A trauma-informed approach to wellness broadens the focus from identifying "individual deficits" to recognizing and addressing structural contributors to distress and burnout.

For example, medical schools should use a trauma-informed lens when considering student underperformance. A recent publication from a remediation center for impaired physicians observed that unprofessional behavior may be related to a history of childhood trauma.[44] The author proposed that we address professionalism issues by reinforcing choice and control, attending to shame, and targeting specific behaviors that can be improved.[44] At HMS, we have piloted a trauma-informed training for students' faculty advisors to explain the link between trauma and professionalism issues. The program trains the advisors on TIC-based approaches to identify and support students in need of additional growth and development.[45]

Concluding Observations

We advocate for TIME to be incorporated across UME. This approach recognizes the ubiquity of trauma in our medical students, in their current and future patients, and in our UME system today. TIME identifies the need to develop curricular content in this domain and to apply TIC principles during curricular development. TIME also recognizes the process and environment of medical education itself as potential sources of trauma. TIME offers practical strategies to support learning, professional development, and personal well-being and aims to inspire new strategies for effective learner and faculty engagement.

The above approaches define important first steps, but TIME will not be realized without changes on a national level. UME institutions must develop and implement TIC competencies to ensure that students acquire the TIC knowledge and skills needed to succeed during residency training.[46] Institutional and national oversight will follow. With changes secured at every level, from individual to institutional to national, we can disrupt the cycle of trauma, nurture healing and recovery, and advance care delivery. It's time.

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References

1. Substance Abuse and Mental Health Services Administration. SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach. HHS Publication No. (SMA)14-4884. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014:1–27.

2. Kilpatrick DG, Resnick HS, Milanak ME, Miller MW, Keyes KM, Friedman MJ. National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. J Trauma Stress. 2013;26:537–547.

3. Substance Abuse and Mental Health Services Administration. Understanding the impact of trauma. In: Trauma-Informed Care in Behavioral Health Services. Treatment Improvement Protocol (TIP) Series 57. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014:59–89.

4. 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;14:245–258.

5. Dube SR, Felitti VJ, 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;111:564–572.

6. Ramsey C, Dziura J, Justice AC, et al. Incidence of mental health diagnoses in veterans of Operations Iraqi Freedom, Enduring Freedom, and New Dawn, 2001–2014. Am J Public Health. 2017;107:329–335.

7. Patel MB, Jackson JC, Morandi A, et al. Incidence and risk factors for intensive care unit-related post-traumatic stress disorder in veterans and civilians. Am J Respir Crit Care Med. 2016;193:1373–1381.

8. Trent M, Dooley DG, Dougé J, Section on Adolescent Health, Council on Community Pediatrics, Committee on Adolescence. The impact of racism on child and adolescent health. Pediatrics. 2019;144:e20191765.

9. Mayer KH, Garofalo R, Makadon HJ. Promoting the successful development of sexual and gender minority youths. Am J Public Health. 2014;104:976–981.

10. Garfin DR, Thompson RR, Holman EA. Acute stress and subsequent health outcomes: A systematic review. J Psychosom Res. 2018;112:107–113.

11. 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;38:216–226.

12. Levy-Carrick NC, Lewis-O'Connor A, Rittenberg E, Manosalvas K, Stoklosa HM, Silbersweig DA. Promoting health equity through trauma-informed care: Critical role for physicians in policy and program development. Fam Community Health. 2019;42:104–108.

13. Marsac ML, Kassam-Adams N, Hildenbrand AK, et al. Implementing a trauma-informed approach in pediatric health care networks. JAMA Pediatr. 2016;170:70–77.

14. American Psychological Association. Guidelines on Trauma Competencies for Education and Training. 2015. https://www.apa.org/ed/resources/trauma-competencies-training.pdf. Accessed May 18, 2020.

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15. Wheeler K, Phillips K. The Development of Trauma and Resilience Competencies for

    Nursing Education .J Am Psychiatr Nurses Assoc. [published online ahead of print

    October 8, 2019. doi: 10.1177/1078390319878779].

16. Ambuel B, Trent K, Lenahan P, et al. Competencies Needed By Health Professionals For

    Addressing Exposure To Violence And Abuse In Patient Care. Eden Prairie, MN:

    Academy on Violence and Abuse; 2011.

    https://www.nsvrc.org/sites/default/files/CoreCompetenciesRevApril2011.pdf. Accessed

    May Ambuel B, Trent K, Lenahan P, et al. Competencies Needed By Health

    Professionals For Addressing Exposure To Violence And Abuse In Patient Care.

17. 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.

18. Goldstein E, Murray-García J, Sciolla AF, Topitzes J. Medical students' perspectives on

    trauma-informed care training. Perm J. 2018;22:17–126.

19. Mehta P, Brown T, Berman S, et al. A trauma-informed approach to the medical history:

    teaching trauma-informed communication skills to first-year medical students. 2020.

    Unpublished [available from the author on request].

20. Bergeson SC, Dean JD. A systems approach to patient-centered care. JAMA.

    2006;296:2848–2851.

21. Englander R, Holmboe E, Batalden P, et al. Coproducing health professions education: A

    prerequisite to coproducing health care services? Acad Med. [published online ahead of

    print December 24, 2019; doi: 10.1097/ACM.0000000000003137].

22. Karazivan P, Dumez V, Flora L, et al. The patient-as-partner approach in health care: A conceptual framework for a necessary transition. Acad Med. 2015;90:437–441.

23. Schachter CL, Stalker CA, Teram E, Lasiuk GC, Danilkewich A. Handbook on Sensitive Practice for Health Care Practitioners: Lessons from Adult Survivors of Childhood Sexual Abuse. Ottawa: Public Health Agency of Canada; 2008:32–46 .

24. Elisseou S, Puranam S, Nandi M. A novel, trauma-informed physical examination curriculum. Med Educ. 2018;52:555–556.

25. Sciolla AF, Wilkes MS, Griffin EJ. Adverse childhood experiences in medical students: implications for wellness. Acad Psychiatry J. 2019;43:369–374.

26. Heru A, Gagne G, Strong D. Medical student mistreatment results in symptoms of posttraumatic stress. Acad Psychiatry J. 2009;33:302–306.

27. Butler LD, Maguin E, Carello J. Retraumatization mediates the effect of adverse childhood experiences on clinical training-related secondary traumatic stress symptoms. J Trauma Dissociation. 2018;19:25–38.

28. King E, Steenson C, Shannon C, Mulholland C. Prevalence rates of childhood trauma in medical students: A systematic review. BMC Med Educ. 2017;17:159.

29. Butler LD, Carello J, Maguin E. Trauma, stress, and self-care in clinical training: Predictors of burnout, decline in health status, secondary traumatic stress symptoms, and compassion satisfaction. Psychol Trauma Theory Res Pract Policy. 2017;9:416–424.

30. Batley NJ, Bakhti R, Chami A, et al. The effect of patient death on medical students in the emergency department. BMC Med Educ. 2017;17:110.

31. Hirsh D. Longitudinal integrated clerkships: Embracing the hidden curriculum, stemming ethical erosion, transforming medical education. In: The Hidden Curriculum in Health Professions Education. Hanover, NH: Dartmouth College Press; 2014:192–202.

32. Al-Mateen CS, Linker JA, Damle N, Hupe J, Helfer T, Jessick V. Vicarious traumatization and coping in medical students: A pilot study. Acad Psychiatry. 2015;39:90–93.

33. Brazeau CMLR, Shanafelt T, Durning SJ, et al. Distress among matriculating medical students relative to the general population. Acad Med. 2014;89:1520–1525.

34. Dyrbye LN, West CP, Satele D, et al. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. Acad Med. 2014;89:443–451.

35. Kinker B, Arfken C, Morreale M. Secondary traumatic stress in medical students. Acad Psychiatry. 2018;42:181–182.

36. Cook AF, Arora VM, Rasinski KA, Curlin FA, Yoon JD. The prevalence of medical student mistreatment and its association with burnout. Acad Med. 2014;89:749–754.

37. Salloum A, Choi MJ, Stover CS. Development of a trauma-informed self-care measure with child welfare workers. Child Youth Serv Rev. 2018;93:108–116.

38. Salloum A, Kondrat DC, Johnco C, Olson KR. The role of self-care on compassion satisfaction, burnout and secondary trauma among child welfare workers. Child Youth Serv Rev. 2015;49:54–61.

39. Carello J, Butler LD. Potentially perilous pedagogies: Teaching trauma is not the same as trauma-informed teaching. J Trauma Dissociation. 2014;15:153–168.

40. Cless J. Learning about trauma: Cortisol responses, trauma exposure, and emotional reactivity in undergraduate students. [dissertation]. Manhattan, KS: Kansas State University; 2018.

41. McDaniel K, Brown T, Radford C, et al. Anatomy as a Model Environment for Acquiring Professional Competencies in Medicine: Experiences at One Medical School. 2020. Submitted to *Anatomical Sciences Education* [available from the author on request].

42. Burggraf M, Kristin J, Wegner A, et al. Willingness of medical students to be examined in a physical examination course. BMC Med Educ. 2018;18:246.

43. Spiers J, Buszewicz M, Chew-Graham CA, et al. Barriers, facilitators, and survival strategies for GPs seeking treatment for distress: A qualitative study. Br J Gen Pract. 2017;67:700–708.

44. Williams BW. Professionalism lapses and adverse childhood experiences: Reflections from the island of last resort. Acad Med. 2019;94:1081–1083.

45. Berman S, Brown T, Potter J, Trinh N. Trauma-Informed Approaches to Medical Student Advising: a Microsession for Medical Student Advisors. 2020. Unpublished [available from the author on request].

46. Carraccio C, Englander R, Van Melle E, et al. Advancing competency-based medical education: A charter for clinician-educators. Acad Med. 2016;91:645–649.

Table 1

Six Principles of Trauma-Informed Care Applied to Educational Context: Curricular Development and Delivery, and Learning Environment

Principle	Curricular development and delivery	Learning environment
Safety	• Train faculty, staff, and students on the ubiquity of trauma, signs and symptoms of distress, and how to offer assistance in a trauma-informed manner • Train faculty on trauma-informed educational practices (e.g., content warnings, empowering students for self-care when discussing sensitive topics, de-escalation techniques, room awareness) • Train faculty, staff, and students on standards of professional behavior, communication, and physical boundaries (e.g., physical touch must be professionally appropriate at all times, students may opt out of physical exam and procedure demonstrations)	• Embed trauma-informed principles in the institutional mission • Ensure the infrastructure supports individual efforts to maintain and enhance health (e.g., healthy/affordable food, accessible exercise facilities, quiet spaces for rest or nap, etc.) • Create schedules to allow students to attend to basic physical and emotional needs • Develop policies for students to have time off for personal or mental health, when appropriate • Ensure access to counseling, mental health programs, and specific services for students who have experienced trauma/adversity (e.g., intimate partner violence, sexual violence, physical violence) • Ensure access to disability services and accommodations for students with post-traumatic stress disorder and other mental health needs • Deploy anonymous student mistreatment reporting systems • Ensure and support access to Title IX services and third-party remediation services (e.g., Ombuds office) • Implement a policy of zero tolerance for repeated boundary violations and harassment • Develop advising systems that recognize trauma and connects students with trauma-informed services

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Trustworthiness and transparency	• Provide anticipatory guidance for each stage of medical school training • Provide students with clear, consistent, and actionable feedback related to all aspects of their performance • Inform students promptly about academic performance or professionalism concerns and co-develop an action plan • Model vulnerability and resilience (e.g., faculty and leaders sharing personal experiences when appropriate) • Provide easily accessible course and program reviews • Distinguish and delineate faculty in evaluative versus advising roles	• Document institutional rules and procedures publicly • Ensure clear and timely communication of institutional policy and educational changes • Ensure clear procedures for students, faculty, and staff involved in mistreatment, harassment, or assault • Clarify when disclosed information can be kept confidential and when it cannot (e.g., safety concerns, suicidality)
Peer support	• Support self-assembled peer practice groups (e.g., for physical exam training) • Deploy near-peer student facilitators during times of transition (e.g. first-year, classroom-to-clinic)	• Support peer mentoring and tutoring programs
Collaboration and mutuality	• Provide student representation on all education-related committees • Elicit and collect student feedback on policies and procedures • Create system of student–faculty collaboration in curriculum development and school initiatives • Create system of student–student collaboration across affinity groups	• Intervene in a trauma-informed manner when students and faculty manifest professionalism issues
Empowerment, voice, and choice	• Elicit, collect, and respond to student feedback on courses and clerkships • Model how to engage in constructive dialogue in the face of differences of opinion	• Elicit, collect, and respond to student feedback on institutional policies and procedures • Release student schedules at least 4 weeks in advance of clinical electives to enable students to prepare needed supports and self-care strategies • Support resiliency-based educational and wellness initiatives

		• Support open hours in schedule (e.g., "flex time") throughout clinical year during business hours to enable students to attend to basic health care and wellness needs (e.g., for health appointments)
Cultural, historical, and gender issues	• Acknowledge traumatic societal events (e.g., mass shootings) • Establish supports and healing spaces after societal events that impact particular student populations • Establish community advisory boards to assist in the co-production of curricular content	• Recruit, support, retain, and promote underrepresented faculty and staff • Recruit, support, and retain underrepresented students • Recruit, support, and retain students from other disadvantaged or nontraditional backgrounds

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