

Posttraumatic stress in school-age children and adolescents: medical providers' role from diagnosis to optimal management

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Abstract: Millions of children and adolescents each year are exposed to potentially traumatic events (PTEs), placing them at risk for posttraumatic stress (PTS) disorder symptoms. Medical providers play an important role in the identification and treatment of PTS, as they are typically the initial point of contact for families in the wake of a PTE or during a PTE if it is medically related (eg, injury/illness). This paper offers a review of the literature focused on clinical characteristics of PTS, the assessment and diagnosis of PTS, and current effective treatments for PTS in school-age children and adolescents. The clinical presentation of PTS is often complex as symptoms may closely resemble other internalizing and externalizing disorders. A number of screening and evaluation tools are available for medical providers to assist them in the accurate diagnosis of PTS. Treatment options are available for youth at minimal risk of PTS as well as for those with more intensive needs. Additional training regarding trauma-informed medical care may benefit medical providers. By taking a trauma-informed approach, rooted in a solid understanding of the clinical presentation of PTS in children and adolescents, medical providers can ensure PTS does not go undetected, minimize the traumatic aspects of medical care, and better promote health and well-being.

Keywords: posttraumatic stress, medical traumatic stress, children, primary care, assessment, treatment

Introduction

Childhood trauma exposure is unfortunately prevalent. According to a national survey in the USA, 60% of children and adolescents have experienced or witnessed a potentially traumatic event (PTE),¹ such as domestic violence, injuries, and natural disasters.²⁻⁴ Approximately 30% of youth who are exposed to a PTE develop symptoms of posttraumatic stress disorder (PTSD),⁵ and an additional subset experience significant, chronic symptoms of posttraumatic stress (PTS). For instance, while PTS resolves for a majority of children and adolescents within 3 months of a potentially traumatic injury, approximately 15%–25% will experience chronic symptoms.⁶⁻⁹ Chronic PTS can adversely affect child health and development and lead to worse functional outcomes.¹⁰⁻¹⁴

Empirical evidence indicates that PTS is more likely to go unnoticed and untreated in children and adolescents than adults; this may result from the challenging nature of the expression of PTS in youth (eg, internalizing symptoms that children do not share with adults; adults mistaking externalizing symptoms for oppositional behaviors).¹⁵⁻¹⁸ However, early identification of youth at risk for PTS can help reduce morbidity, societal cost, and long-term disability through the implementation of early interventions.¹⁹⁻²³

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Following exposure to a PTE, many children and families interact with medical providers. Most will report to their primary care provider first for assistance dealing with a PTE.²⁴ As medical providers are typically the first line of defense in the wake of traumatic experiences, it is important that they are well equipped to manage PTS, yet most receive little training.^{25,26} Although PTS cannot be diagnosed until symptoms have persisted for at least 1 month, significant symptoms may emerge shortly after the PTE, providing an opportunity for providers to support and monitor these children and adolescents. Developed specifically for medical providers practicing within the USA, the American Academy of Child and Adolescent Psychiatry (AACAP) created guidelines for the management of youth with PTS. Regarding assessment guidelines, the AACAP recommends that medical providers routinely ask questions about PTEs and possible PTS, conduct a formal evaluation if symptoms are endorsed, and pay particular attention to possible differential diagnoses. Furthermore, the AACAP guidelines indicate the treatment approach should be developed based on consideration of the severity and degree of impairment of the symptoms and should incorporate appropriate interventions for comorbid disorders. Psychotherapy is recommended as the first-line treatment, although the AACAP practice parameters also specify that selective serotonin reuptake inhibitors (SSRIs) as well as medications other than SSRIs may be used for treatment. The use of therapies involving binding or restriction (eg, rebirthing therapies) is not supported.²⁷

Thus, in line with the aforementioned AACAP guidelines, the purpose of this review is to provide information to strengthen medical providers' knowledge about assessment and treatment for PTS following trauma exposure in school-age children and adolescents. The information presented in this paper is focused for US-based practitioners; however, much of the information is relevant to those in other developed countries as long as cultural differences are considered. For providers practicing in countries with fewer resources, youth responses to treatment and guidelines post-PTE may differ from research and recommendations presented here. The following narrative review includes the clinical characteristics of PTS, assessment and diagnosis of PTS, and current effective treatments for PTS in school-age children and adolescents (Figure 1 provides a summary of specific steps for medical providers).

Clinical presentation of childhood PTSD

Recognizing PTSD symptom presentation in primary care or other medical settings can promote recovery and healthy

development in children and adolescents exposed to PTEs. *The Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5) differentiates PTS symptoms across four distinct symptom clusters, providing an initial roadmap for identifying those who may be struggling with such symptoms. DSM-5 accounts for developmental considerations with modified criteria for youth older than 6 years. Table 1 lists criteria and examples of how symptoms may present in school-age children and adolescents. Regardless of whether their symptoms meet full diagnostic criteria, high levels of distress and functional impairment can occur amidst symptoms that do not meet diagnostic threshold of PTSD.^{28–30} Children and adolescents who are struggling from significant PTSD symptoms but who do not qualify for a diagnosis for PTSD may benefit from consideration of PTS from a dimensional perspective (ie, severity of symptoms and subsequent impairment); this offers flexibility in recognizing symptoms that require clinical attention apart from diagnostic status.³¹

Co-occurring symptoms and comorbidities: initial recognition of PTS

In children and adolescents, PTEs and subsequent PTS may manifest in the form of internalizing and externalizing symptoms that do not fit neatly within the PTSD diagnostic criteria. Such symptoms may well originate from and represent underlying PTS. For example, symptoms may devolve into anxiety about separating from one's caregiver,³² shame, and/or guilt.³³ Alternatively, or in addition, youth may present with low frustration tolerance or seem as though a breaking point is imminent at any moment.³⁴ Thus, it is not surprising that significant rates of comorbidities are evident between PTS and the following disorders: 1) attention-deficit hyperactivity disorder (ADHD),³⁵ as hyperarousal can present as hyperactivity and impulsivity and intrusive thoughts can impair attention and concentration;^{36,37} 2) externalizing disorders such as conduct disorder (CD) or oppositional defiant disorder (ODD), as youth with PTS may exhibit temper outbursts, defiance, hostility, and aggression due to underlying symptoms of irritability, extreme avoidance, and hypersensitivity;³⁶ 3) obsessive compulsive disorder (OCD), a disorder characterized by recurrent, intrusive thoughts, similar to the reexperiencing symptoms of PTS;³⁶ 4) anxiety disorders, as the avoidance, irritability, arousal, and anxiety associated with panic disorder and generalized anxiety disorder are also characteristic of PTS;³⁶ and 5) traumatic brain injury (TBI), as youth who

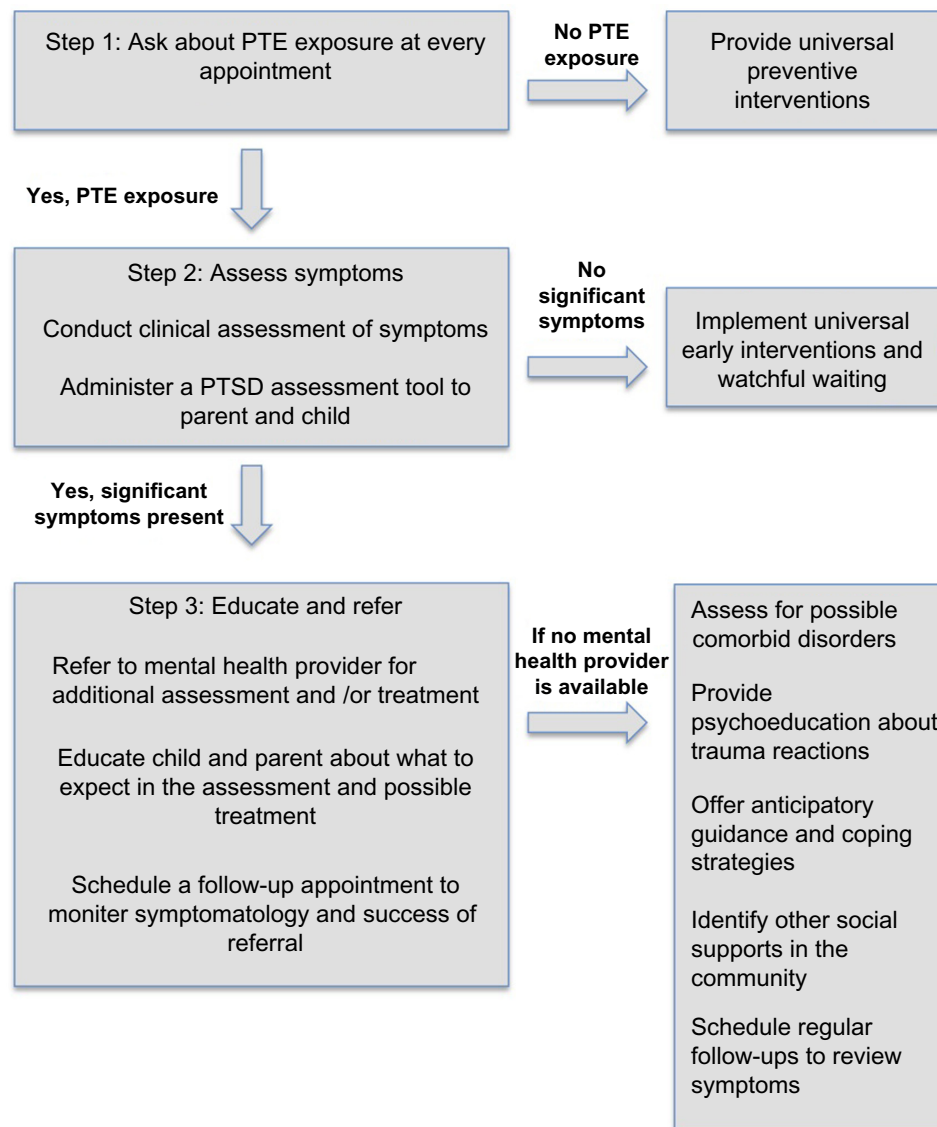


Figure 1 Steps for medical providers for assessing, diagnosing, and supporting management of PTSD symptoms.
Abbreviations: PTE, potentially traumatic event; PTSD, posttraumatic stress disorder.

have incurred a TBI may report somatic, mood, and cognitive changes that overlap with some symptoms of PTS (eg, irritability, concentration difficulties).³⁶ While there may be some overlap between PTS and other disorders, providers ought to take caution in making these diagnoses to determine whether PTS are causing or contributing to the observed behaviors.

Consideration for complex trauma: consistently inconsistent clinical presentation

Among children and adolescents who are chronically exposed to PTEs and/or maltreatment, symptoms may be more diffuse and difficult to categorize. The effects of chronic

trauma can cause changes in neurobiological development as well as the ability to integrate sensory, emotional, and cognitive information; children rarely demonstrate a discrete change in behavior, as occurs following an acute PTE.³⁸ Complex trauma is defined as severe stressors that 1) are repetitive or prolonged, 2) involve harm or abandonment by caregivers or other ostensibly responsible adults, and 3) occur at developmentally vulnerable times in the victim's life, such as early childhood or adolescence.³⁹

While complex trauma disorders are beyond the scope of this paper, it is important to note that children and adolescents who are suspected of having experienced chronic trauma exposure and/or maltreatment greatly benefit from expert assessment and treatment, and generally should be

Table 1 PTS and examples of manifestation in school-age children and adolescents

PTS symptom cluster	Symptom	Example
Intrusion symptoms	Involuntary, distressing memories of the traumatic event	Child who is sexually assaulted perseverates on hypersexualized content when drawing or painting at school.
	Recurrent, distressing dreams	Child who witnesses a homicide wakes up screaming multiple times per night in nightmares, with or without the ability to recall the content of the dreams.
	Flashbacks	Child exposed to physical abuse from a caregiver re-enacting the events in play with other children.
	Distress when exposed to external or internal trauma reminders	Child injured in a car accident shows fearful apprehension, such as a panic attack, while riding in a car.
Avoidance symptoms	Physiological reactions when exposed to external or internal trauma reminders	Child who survived a hurricane experiences increased heart rate, agitation, and sweating when learning of thunderstorm warnings in the weather forecast.
	Avoidance of memories, thoughts, or feelings associated with the trauma	Adolescent increases intake of marijuana to escape trauma-related thoughts and feelings (eg, guilt associated with car accident where adolescent was the driver).
Alterations in mood and cognition	Attempts to avoid external reminders that serve as reminders of the trauma	Child retreats to his bedroom to play video games when his parents begin to discuss a previous house fire.
	Difficulty remembering important aspects of the trauma	Despite having no signs or symptoms of concussion, child who survives a car accident is unable to recall details of the rescue.
Alterations in arousal and reactivity	Exaggerated negative beliefs or expectations about oneself, others, or the world	Adolescent who witnesses his father physically abusing his mother begins to carry a weapon to school to compensate for living in a dangerous world.
	Guilt and/or blaming self/others regarding the trauma or its consequences	Child expresses her feelings of guilt associated with the car accident that her family was in because the accident occurred after her father had picked her up from soccer practice.
	Negative emotions (eg, fear, horror, anger, guilt, or shame)	Child develops low frustration tolerance and frequent temper outbursts after witnessing his best friend sustain injuries after falling out of a tree house.
	Lack of interest in participating in previously preferred activities	Adolescent previously took great joy in being involved in school theater decides not to participate in the school play after the family home was lost in a fire.
	Feelings of detachment from others	Adolescent who was previously engaged in close friendships begins to isolate himself after finding his grandparent deceased.
	Inability to experience positive emotions	Child has more difficulty expressing strong loving feelings toward parents after being attacked by a neighbor's dog.
Alterations in arousal and reactivity	Irritable behavior, angry outbursts, and/or aggression	Adolescent demonstrates increased oppositional behavior toward teachers after witnessing community violence.
	Reckless or self-destructive behavior	Adolescent engages in risky driving behaviors after being diagnosed with cancer.
	Hypervigilance	Child who lived through a tornado becomes fixated on changes in the weather.
	Exaggerated startle response	Adolescent whose best friend was shot while the two of them were walking home from school is jumpy whenever he hears loud noises in public places.
Alterations in arousal and reactivity	Problems with concentration	Child's grades and ability to maintain attention in class begins to slip after following an illness diagnosis of a parent.
	Sleep disturbance	Child unable to sleep in own bed following a bullying incident at school.

Abbreviation: PTS, posttraumatic stress.

referred for a psychological evaluation if they are reporting symptoms.⁴⁰

Assessment of PTS in school-age children and adolescents

Initial assessment process

Medical providers play an important role in the initial screening process for PTS given that they are more likely to come into contact with children and adolescents following PTEs than mental health professionals.⁴¹ They can effectively screen for symptoms by inquiring about coping mechanisms and youths' appraisals of the event to better understand who may be at risk for PTS.⁴² As parental report may be influenced

by parents' own symptomatology, it is also critical to obtain children's and adolescents' self-reports in addition to parents' perspectives whenever possible.⁴³ In addition to eliciting symptoms directly from youths and parents during clinical examinations, a number of screening measures for PTS have been developed by medical professionals. Such instruments are typically brief and easy to administer, making them a viable option for use in an acute care or primary care setting. The Screening Tool for Early Predictors of PTSD (STEPP), the UCLA Posttraumatic Stress Disorder – Reaction Index (UCLA-PTSD-RI), and the Trauma Symptom Checklist for Children (TSCC) are evidence-based screening instruments. The STEPP is a tool developed for use in the emergency

department following pediatric injury and is based on early physiological reactions (eg, heart rate) and early psychological responses to the trauma.⁷ The UCLA-PTSD-RI is a brief measure assessing exposure to traumatic exposure and the impact of those experiences,⁴⁴ and the TSCC is self-report measure designed to elicit information regarding trauma-related symptoms.^{45,46}

Evaluating children and adolescents for PTS in an acute care or primary care setting can be difficult for a variety of reasons. First, PTS tends to be more unfamiliar to youths and parents than other more observable disorders, such as ADHD, depression, and OCD.⁴⁷ Furthermore, parents do not always have a good understanding of factors that predispose their children to developing PTS. For instance, parents may believe that their children only develop PTS after a severe trauma, while research has clearly demonstrated that subjective perceptions of threat regarding the PTE or PTE consequences are better predictors of PTS.⁴⁸ Additionally, some parents may minimize or deny their children's symptoms, which may be a function of their own PTS.^{18,49} Moreover, avoidance symptoms may complicate the screening process as parents or youths who do not want to think about the PTE may try to ignore symptoms.⁴⁷ Finally, the sheer number of potential differential or comorbid diagnoses adds complexity to the process of recognizing and accurately identifying PTS, underlying the importance of obtaining a thorough history and description of symptoms as well as assessing sociocontextual factors that may influence symptom presentation and functioning.

Should clinical report and the administration of a screening measure raise significant concerns or questions, a referral to a mental health provider can facilitate a more thorough assessment. Upon making a referral, medical providers should expect mental health providers to conduct thorough assessments including multi-informant report. Mental health providers will often include information collected and documented by school personnel (eg, teachers, administrators, guidance counselors), community members (eg, coaches, religious leaders), medical records, and police reports, when applicable.

If the child or adolescent is unable to access mental health services, medical providers may similarly consider reaching out to school personnel, community members, and obtaining medical and/or police reports to obtain more information to inform their trauma-related diagnosis. In addition, if the responsibility of conducting a more thorough assessment (ie, beyond screening) falls on the medical providers, there are a number of commonly employed and psychometrically

sound measures designed to assess PTS among children and adolescents. Table 2 lists a summary of key features and considerations related to each of these tools.

Supporting school-age children and adolescents with PTS

Providers can implement preventive interventions to promote child and adolescent well-being even before experiencing a PTE. Preventive interventions can be considered a universal precaution, but may be especially helpful for youth who are at risk for trauma due to life situations, have a history of difficulty adjusting to stressful events, or are suspected of being victimized without a report of a PTE. According to Pfefferbaum et al,⁵⁰ preventive interventions often include teaching coping skills, increasing affect awareness and modulation, future safety planning, and offering psychoeducation about trauma reactions. Children and adolescents who have experienced a PTE and have symptoms of PTS should receive support based on the intensity of symptoms they are experiencing, as determined by the assessment process.

Children and adolescents with minimal symptomatology following a PTE

For all children and adolescents who have experienced a PTE, a number of early intervention strategies are available to medical providers to promote recovery and resilience in the aftermath of trauma. On the basis of the results of a recent meta-analysis, the following are effective, common elements found in most early interventions: psychoeducation about typical posttraumatic reactions, promotion of coping strategies, and enhancement of social support.⁵¹ Prior to lengthy interventions or assessments for youth without impairing symptoms immediately following a PTE, Kassam-Adams et al⁴² recommend taking a "watchful waiting" approach. These strategies require minimal training and time and are cost less to implement, making them feasible for use within the health care system. For example, providers can offer basic education regarding PTS, encourage positive coping efforts, and monitor symptoms. Table 3 provides a list of resources available to medical providers.

Children and adolescents with impairing PTS

For children and adolescents exhibiting more severe and/or persistent PTS, referrals should be made to clinicians who are

Table 2 Assessment tools that include PTSD

Measure	Constructs measured	Age range (year)	Reporters	Time to administer (minutes)	Conforms to DSM-IV PTSD symptom criteria?	Psychometric considerations
Clinician-administered interviews	<ul style="list-style-type: none"> School refusal Separation anxiety Phobias Panic disorder OCD PTSD 	7–17	Child (ADIS-C) Parent (ADIS-P)	90–120	Yes	<ul style="list-style-type: none"> Good overall properties PTSD scale: excellent interrater reliability and fair agreement between parent and child reports.⁸⁷
Child and Adolescent Psychiatric Assessment (CAPA) ⁸⁸	<ul style="list-style-type: none"> Attention-deficit/hyperactivity disorder Substance use CD Depressive disorders Generalized anxiety disorder Oppositional defiant disorder Panic disorder PTSD Separation anxiety Phobias PTSD 	9–18	Child (CAPA-C) Parent (CAPA-P)	90	Yes	<ul style="list-style-type: none"> Life events and posttraumatic stress module: fair to excellent test-retest reliability and discriminant validity in differentiating between general population and clinic-referred patients.⁸⁹
Childhood PTSD Interview (CPTSDI) ⁹⁰	<ul style="list-style-type: none"> PTSD 	7–18	Child (CPTSDI-C) Parent (CPTSDI-P)	30–45	Yes	<ul style="list-style-type: none"> Psychometric properties are modest and based on a small study (N=30),⁹⁰ with high internal consistency for the measure overall but significant variability in coefficients for DSM-IV criteria B, C, and D. Convergent validity was moderate to high with other measures of trauma symptoms and associated emotional and behavioral problems.⁹⁰
Children's Impact of Traumatic Events-Revised (CITES-R) ⁹¹	<ul style="list-style-type: none"> PTSD Social reactions Abuse attributions Eroticism 	8+	Child	30–40	Yes	<ul style="list-style-type: none"> Adequate internal consistency for most subscales,⁹² good discriminant validity,⁹³ and convergent validity with other measures of PTSD symptoms.^{92,94}
Children's PTSD Inventory ⁹⁵	<ul style="list-style-type: none"> PTSD 	6–18	Child	15–30	Yes	<ul style="list-style-type: none"> High internal consistency at the diagnostic level and moderate consistency coefficients for the individual subscale scores.^{95,96} Test-retest and interrater reliability were good to excellent.^{95,96}

<p>Clinician-Administered PTSD Scale for Children and Adolescents (CAPS-CA)⁹⁷</p>	<ul style="list-style-type: none"> • PTSD 	<p>8–15</p>	<p>Child</p>	<p>45–75</p>	<p>Yes</p>	<ul style="list-style-type: none"> • Convergent validity was established with measures assessing anxiety, depression, and other emotional/behavioral concerns.⁹⁶ • Good internal consistency for each subscale, and reasonable concurrent validity with self-report measures of PTSD.⁹⁸ • Psychometric properties are largely inferred from its prior versions. • As a whole, the DICA-IV has demonstrated high test–retest reliability and adequate interrater agreement across most DSM-IV categories.¹⁰⁰ • However, test–retest reliability is not optimal for the PTSD scale in particular.¹⁰¹
<p>Diagnostic Interview for Children and Adolescents-IV (DICA-IV)⁹⁹</p>	<ul style="list-style-type: none"> • Attention-deficit/hyperactivity disorder • Substance use • Depressive disorders • Gender identity • OCD • Elimination disorders • Somatization • Mania or hypomania • Psychotic symptoms • Panic disorder • Separation anxiety • Generalized anxiety disorder • Phobias • PTSD • ODD • CD • Eating disorders 	<p>6–17</p>	<p>Child Parent</p>	<p>60–120</p>	<p>Yes</p>	<ul style="list-style-type: none"> • Generally sound psychometric properties, with excellent interrater reliability and validity among clinical samples.¹⁰² • However, when compared to other K-SADS-PL scales, the PTSD module has shown poorer test–retest reliability ($\kappa=0.60-0.67$).¹⁰²
<p>Schedule for affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL)¹⁰²</p>	<ul style="list-style-type: none"> • Depressive disorders • Mania • Psychosis • Panic disorder • Separation Anxiety • Phobias • Generalized anxiety disorder • OCD • Elimination disorders • Eating disorders • Attention-deficit/hyperactivity disorder • ODD • CD • Tic disorder • Substance use • PTSD 	<p>6–18</p>	<p>Child Parent</p>	<p>35–75</p>	<p>Yes</p>	<p>(Continued)</p>

Table 2 (Continued)

Measure	Constructs measured	Age range (year)	Reporters	Time to administer (minutes)	Conforms to DSM-IV PTSD symptom criteria?	Psychometric considerations
Self-report and parent/caregiver-report Questionnaires	Adolescent Dissociative Experience Scale (A-DES) ¹⁰³	12–18	Child	10	No	<ul style="list-style-type: none"> • Good internal consistency, test–retest reliability, convergent validity with other measures of dissociation, and discriminant validity between adolescents with dissociative disorders, those with other psychiatric disorders, and normal controls.^{103–105} • Strong psychometric properties, including good to excellent internal consistency, test–retest reliability, and convergent validity with structured clinical interviews for PTSD.¹⁰⁶
	Child PTSD Symptom Scale (CPSS) ¹⁰⁶	8–18	Child	10–15	Yes	<ul style="list-style-type: none"> • High internal consistency, construct validity, convergent and discriminant validity, and predictive validity.^{45,107–111} • Standardized with a large, racially and economically diverse sample of children and provides age- and gender-based norms.⁴⁵
	Trauma Symptom Checklist for Children (TSCC) ⁴⁵	8–16	Child	15–20	No	<ul style="list-style-type: none"> • Good to excellent internal consistency, convergent validity with another measure of child trauma symptoms, and test–retest reliability.¹¹³ • Good to excellent internal consistency in both nonclinical and clinical samples, discriminant validity between children with various psychiatric diagnoses and healthy controls, and fair to moderate convergent validity with other dissociation scales for children.^{115–117}
	UCLA PTSD Reaction Index for DSM-IV ¹¹²	7–18	Child (ages 7–12) Adolescent (ages 13+)	15–20	Yes	<ul style="list-style-type: none"> • Initial data suggest good internal consistency, satisfactory test–retest and interrater reliability, and discriminant validity.^{118,119} • Excellent internal consistency, good test–retest reliability, and convergent and discriminant validity as a measure of child posttraumatic distress.¹²¹
	Child Dissociative Checklist (CDC) ¹¹⁴	5–12	Parent	5–10	No	
	Pediatric Emotional Distress Scale (PEDS) ¹¹⁸	2–10	Parent	10	No	
	PTSD Checklist for Children/Parent Report (PCL-C/PR) ²⁰	6+	Parent	10	Yes	

Trauma Symptom Checklist for Young Children (TSCYC) ⁴⁶	<ul style="list-style-type: none"> • PTSD • Somatic complaints • Internalizing symptoms (anxiety/mood) 	3–12	Parent	20–30	Yes	<ul style="list-style-type: none"> • Good to excellent internal consistency of subscales, moderate convergent and discriminant validity, and good construct validity for the PTSD symptom scales.^{46, 109, 122}
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Note: While efforts are underway to update existing measures based on DSM-V, the most current assessment tools available are based on the diagnostic criteria set forth in DSM-IV.

Abbreviations: PTSD, posttraumatic stress disorder; OCD, obsessive compulsive disorder; CD, conduct disorder; ODD, oppositional defiant disorder; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (Text Revision); DSM-V, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; C, child; P, parent; UCLA, University of California, Los Angeles.

trained to treat children with PTS. Understanding the basics of these treatments can help medical providers prepare their patients for treatment and follow-up with their patients over time. Trauma-focused cognitive-behavioral therapy (TF-CBT) has the most empirical support as an efficacious treatment approach.^{52–55} There is also evidence to support the utility of eye movement desensitization and reprocessing therapy (EMDR) and preliminary evidence for pharmacological treatments.^{56–58} Other treatments including cognitive therapy, play therapy, psychological first aid, and multisystemic therapy for PTS in children are listed briefly in Table 4.

Trauma-focused cognitive behavioral therapy

TF-CBT can be particularly helpful for children and adolescents who have experienced one or more PTEs.^{53,59–62} It is based on the principles of cognitive behavioral therapy (CBT), which focus on examining and changing the relationships among cognitions, feelings, and behaviors.^{63–65} Targeting change in negative cognitions and the beliefs that influence these cognitions helps children modify their patterns of thinking and behavior to enhance coping. For example, children are encouraged to examine their unhelpful beliefs such as “I will never feel normal again”, and find alternative, positive ways of thinking by generating positive self-statements and developing coping strategies. Another core aspect of treatment is exposure therapy, where children and adolescents are confronted with trauma reminders in an effort to gradually reduce avoidance of feared stimuli.^{63–65} The efficacy of TF-CBT has been demonstrated for youth who have experienced sexual abuse,^{53,59,61} natural disasters,⁶⁶ accidental injury,⁶⁰ and single-incident trauma, including violence.⁶² TF-CBT utilizes four primary principles of CBT to decrease PTS including psychoeducation and setting goals, coping skills, exposure and cognitive restructuring, and relapse prevention. TF-CBT differs from traditional CBT in that it focuses on the trauma experience and targets decreasing PTS.⁵³ It may be helpful for providers to keep in mind that while the exposure component of treatment is effective, it can be distressing for youth because it requires them to confront upsetting trauma reminders. Children and adolescents may need extra support from their parents and possibly medical providers during this period of time.

Eye movement desensitization and reprocessing therapy

Results from several meta-analyses suggest EMDR is comparable to other empirically supported treatments for

Table 3 Resources for medical providers

Resource	Target population	Main components of resource	Cost	Access
D-E-F Protocol ¹²³	Health care providers of ill or injured children.	Assessment protocol for trauma-informed care	No cost	https://www.healthcaretoolbox.org/
After the Injury ¹²⁴	Parents and health care providers of injured children.	Psychoeducation	No cost	https://www.aftertheinjury.org/
Kids Accident Website ¹²⁵	Parents of injured children.	Psychoeducation	No cost	http://kidsaccident.psy.uq.edu.au/
Health Care Toolbox ¹²⁶	Health care providers of ill or injured children.	Psychoeducation Assessment tools	No cost	https://www.healthcaretoolbox.org/
Psychological First Aid Manual ¹²⁷	Children who experienced a disaster or terrorism and their parents.	Training manual	No cost	http://www.nctsn.org/content/psychological-first-aid
Skills for Psychological Recovery ¹²⁸	Mental health professionals and disaster recovery workers aiding victims in the aftermath of disaster.	Online training course	No cost	http://learn.nctsn.org/login/index.php
The 12 Core Concepts: Concepts for Understanding Traumatic Stress Responses in Children and Families ¹²⁹	Health care providers and parents of children who have experienced trauma.	Psychoeducation	No cost	http://www.nctsn.org/resources/audiences/parents-caregivers/what-is-cts/12-core-concepts

PTS, including exposure therapy.^{56–58} EMDR has been effective in treatment of PTS in children and adolescents who experienced sexual abuse,⁶⁷ disasters,⁶⁸ interpersonal violence,⁶⁹ and motor-vehicle accidents.⁷⁰ The theory behind EMDR is that PTS results from insufficient processing or integration of sensory, cognitive, and affective components of the traumatic memory. During EMDR, the therapist moves his or her finger in front of the child's eyes in a lateral movement to elicit saccadic eye movements. The eye movements are thought to facilitate information processing and integration.⁷¹ Simultaneously, the child conducts imaginal exposure of the traumatic memory. The process occurs

repeatedly until distress related to the traumatic memory subsides.⁷² However, EMDR lacks an empirically validated model for explaining the mechanism through which the eye movements are effective. It has been suggested that it is the exposure portion of the treatment that works to improve children's symptoms rather than the rapid eye movements themselves.^{73,74} Similar to the exposure components of TF-CBT, participating in EMDR treatment can be distressing for children and adolescents at times as they are required to process trauma-related information. Medical providers can fulfill a supportive role for children and families during the treatment period by helping families know what to expect

Table 4 Treatments for PTS

Treatment	Description of treatment	Mechanisms of change
Trauma focused-cognitive behavioral therapy (TF-CBT) ^{52,53,59–62,66}	Uses both cognitive and behavioral approaches to reduce PTS through exposure.	Psychoeducation Coping Exposure Cognitive restructuring
Cognitive therapy ^{130–132}	Uses a cognitive approach to reduce PTS through cognitive restructuring.	Psychoeducation Coping Cognitive restructuring Exposure
Eye movement desensitization and reprocessing (EMDR) therapy ^{56–58,68,69,71} Play therapy ^{133–135}	Employs saccadic eye movements during imaginal exposure to trauma. Used for young children. Provides a safe recovery environment for children to learn coping skills, and uses games and drawings to help them process traumatic memories.	Support and comfort Coping
Psychological first aid ^{136,137}	Used in the early aftermath of trauma. Involves providing comfort, normalizing reactions, and teaching coping skills.	Psychoeducation Support and comfort Coping
Multisystemic therapy ^{138,139}	Designed to change nonfunctional patterns of family interactions in times of stress.	Improves family interactions

Abbreviation: PTS, posttraumatic stress.

and communicating any concerns to the child's mental health provider.

Psychopharmacological treatments

Research investigating psychopharmacological treatments for PTS in children and adolescents is limited.⁷⁵ However, the notion that SSRIs may be an effective treatment option in combination with psychological treatment has garnered recent attention.^{76,77} Tareen et al⁷⁸ posit that SSRIs may be beneficial for youths because of their success with adults. While evidence suggests that SSRIs, tricyclic antidepressants, α - and β -adrenergic blocking agents, anxiolytics, antipsychotics, and anticonvulsants successfully treat PTS in adults,^{79–83} these findings cannot be generalized to children and adolescents due to developmental neurobiological differences.⁸⁴ Huemer et al's⁷⁵ review provides a more detailed explanation of psychopharmacological treatments for youth with PTS. When prescribing medications to treat PTS in children, practitioners also need to be sure that they are up-to-date on ever-changing policies of regulatory agencies. More research is needed to understand how to best support youth with psychopharmacological treatments following trauma. While nonpharmacological approaches (ie, therapy) treatment is the first line of defense for children and adolescents with significant PTS, mental health providers and medical providers may need to collaborate to explore the possibility of psychopharmacological treatment if the child or adolescent continues to experience high levels of distress and/or symptoms that interfere with functioning.

Conclusion

Medical providers play a key role in supporting school-age children and adolescents who have experienced a PTE. Exposure to PTEs place youth at risk for developing PTS, which is related to worse health and functional outcomes.⁸⁵ The clinical presentation of PTS in school-age children and adolescents is complex and may include additional internalizing and externalizing symptoms or comorbid disorders. Screening and evaluation tools can help medical providers in their evaluation of which youths are at risk for significant PTS. To provide the best care for children and adolescents who have experienced trauma, providers may consider seeking additional training in delivering medical care from a trauma-informed approach. By understanding the clinical presentation of PTS, providers can help support youth at the appropriate level of care by either monitoring symptoms over time, providing basic education and supporting coping, or referring them for a more thorough

evaluation and treatment by a mental health provider (Figure 1). In considering trauma exposure and symptoms in pediatric patients, medical providers can better optimize pediatric health outcomes.

Disclosure

The authors report no conflicts of interest in this work.

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