

Meghan L. Marsac, Aimee K. Hildenbrand,
and Nancy Kassam-Adams

Injury, illness, and associated medical care are among the most frequent potentially traumatic events (PTEs) experienced by children (Murray and Lopez 1996). While most children are resilient and display transient distress after PTEs, a notable subset demonstrates adverse psychological reactions that often include (but can extend beyond) posttraumatic stress symptoms (PTSS; Kahana et al. 2006; Kassam-Adams et al. 2013; Price et al. 2016). *Medical traumatic stress* is defined as PTSS and other emotional reactions that develop because of injury, illness, or their treatment in children and families (Kazak et al. 2006). A meta-analysis revealed that nearly 20 % of injured and 10 % of ill children develop persistent and impairing PTSS; similar rates are reported for parents (Kahana et al. 2006; Landolt et al. 2003). A recent systematic review suggests that roughly 30 % of ill and injured children and their parents experience subthreshold yet clinically significant PTSS (Price et al. 2016). PTSS can be especially problematic in medically involved children, as they are associated with poorer adherence, health-related quality of life, and health outcomes (e.g., mental health, functional impairment, pain perception, general health; Landolt

M.L. Marsac (✉) • N. Kassam-Adams
Perelman School of Medicine, University of Pennsylvania,
Children's Hospital of Philadelphia, Philadelphia, PA, USA
e-mail: marsac@email.chop.edu; nlkaphd@mail.med.upenn.edu

A.K. Hildenbrand
Department of Psychology, Drexel University, Center for Injury Research and Prevention,
The Children's Hospital of Philadelphia, Philadelphia, PA, USA
e-mail: hildenbranda@email.chop.edu

et al. 2009; Zatzick et al. 2008). In addition, as described in Chaps. 2 and 3, millions of children have encountered other PTEs such as witnessing violence or natural disasters (Copeland et al. 2007). After PTE exposure, many children interact with healthcare networks, with most families visiting their primary care provider first if they need help managing reactions (Schappert and Rechsteiner 2008). Thus, medical settings can be an ideal setting to identify PTSS and intervene.

Pediatric healthcare settings provide direct access to children recently exposed to potentially traumatic medical events (PTMEs), and medical providers play an important role in facilitating child development. As such, pediatric healthcare networks are an ideal setting for the implementation of “trauma-informed care” (Marsac et al. 2015a, b). The US Substance Abuse and Mental Health Services (2015) has defined a trauma-informed approach as encompassing four key elements: (1) realizing the widespread impact of trauma; (2) recognizing how trauma may affect children, families, and staff; (3) responding by applying trauma knowledge into practice; and (4) preventing re-traumatization. Applying this definition to healthcare, a trauma-informed approach requires that staff understand how PTE exposure affects patients and families as well as healthcare staff and incorporate this understanding into interactions with patients and families throughout healthcare delivery. This includes recognizing and addressing any PTSS associated with pediatric injury or illness and minimizing potential trauma during medical care, as well as recognizing how preexisting trauma may impact a child’s reactions to medical care (Marsac et al. 2015a). See Marsac, Kassam-Adams et al. (2015a) for an overview of guiding principles related to implementation of a trauma-informed approach in pediatric healthcare settings.

19.1 Theoretical Underpinnings

Etiological models of child PTSS that have been applied to medical trauma include social cognitive theory, information-processing theories, models of emotion regulation, and models of the interplay between neurobiological processes, emotions, and coping (see Chap. 5 for more on these theories; Kassam-Adams 2014). Perhaps the most comprehensive conceptual framework for understanding psychological reactions and adjustment across various pediatric injury and illness populations is Kazak et al. (2006) integrative model of pediatric medical traumatic stress (PMTS). Five assumptions underlie the model: (1) there are common dimensions across illnesses and injuries related to PTEs and risk/protective factors; (2) there are a range of normative reactions to PTMEs; (3) children and families’ preexisting psychological functioning influence risk for PMTS; (4) a developmental lens is essential for understanding responses to medical trauma; and (5) a social ecological or contextual approach is optimal to guide intervention (Kazak et al. 2006).

These models highlight a number of empirically supported risk factors for PTSS across pediatric illness and injury populations (Kassam-Adams 2014; Price et al. 2016). See Table 19.1 for a summary of these risk factors. As noted by Kassam-Adams (2014), those designing interventions to prevent or reduce PTSS should select methods that are likely to change specific etiological processes; thus many of the risk factors in Table 19.1 represent potential targets for intervention.

Table 19.1 Risk factors for persistent PTSS related to injury, illness, and/or medical treatment^a

	Children/Patients	Parents
History of behavioral, emotional, or other mental health problems (Trickey et al. 2012)	✓	✓
History of past trauma (Copeland et al. 2007)	✓	✓
Perceived of threat (medical event/condition or world view) (Trickey et al. 2012)	✓	✓
Elevated heart rate at first medical exam (Alisic et al. 2011)	✓	
Child early PTSS (Alisic et al. 2011; Cox et al. 2008)	✓	
More severe pain (Hildenbrand et al. 2015)	✓	
Specific frightening aspects of treatment experiences (Kazak et al. 1996)	✓	
Separation from caregivers during/after trauma (Winston et al. 2003)	✓	
Low social support (Trickey et al. 2012)	✓	✓
Parent early PTSS (Alisic et al. 2011)	✓	✓
Other life stressors or disruptions associated with the index trauma (Trickey et al. 2012)		✓

^aAdapted with permission from the Center for Pediatric Traumatic Stress (2015)

Regardless of the underlying theoretical model, several crosscutting issues are relevant to the design of interventions for children exposed to PTMEs. One key issue is the timing of intervention (Kassam-Adams 2014). Price et al. (2016) updated the integrative model of PMTS, now referred to as the integrative *trajectory* model of PMTS. The updated model emphasizes that phases of PMTS progress according to the course and timing of medical events and treatment. In this model, child and family adjustment are described across three consecutive phases: *peri-trauma*, *acute medical care*, and *ongoing care or discharge from care*. Phase I, *peri-trauma*, includes the initial PTME as well as surrounding events (e.g., emergency transport, invasive procedures, diagnosis). Phase II, *acute medical care*, is characterized by active treatment and related physical demands of ongoing illness or injury. Phase III, *ongoing care or discharge from care*, refers to the time beyond active acute medical care when children may have completed care for the index medical event, or may be engaged in long-term care for an illness or for the longer-term sequelae of an injury. The revised model, informed by longitudinal research, also adds several possible trajectories of PMTS, labeled as resilient, recovery, chronic, and escalating PMTS. Most children and families demonstrate a resilient trajectory marked by minimal initial distress that resolves over time, whereas a smaller proportion exhibits a recovery pathway (i.e., high initial PTSS that remits within several months). The smallest subset exhibits chronic or escalating trajectories, characterized by consistently elevated or increasing PTSS (Price et al. 2016). Across all phases of the timeline, children may present for medical care with PTSS related to exposure to PTEs outside the medical setting; this is of particular relevance to primary care providers. Trauma exposure (regardless of whether it is related to medical events or other experiences) can impact medical care (e.g., the child's response to medical procedures or interventions) and child health outcomes (Marsac et al. 2015a).

While the integrative trajectory model of PMTS underlines core features across pediatric populations with regard to psychological adaptation to medical trauma, it also notes that significant variability in PMTS is possible based on child, family, injury/illness, and treatment factors (Price et al. 2016). This suggests that the appropriate level and type of intervention will vary across children and families within each phase. The intensity and target(s) of trauma-informed interventions in medical settings must be matched to risk status and level of need (Kassam-Adams 2014; Kassam-Adams et al. 2013). *Universal interventions* are appropriate for all children exposed to PTMEs, *targeted interventions* are appropriate for those with known increased risk, and *indicated interventions* are for children with more severe and persistent distress requiring formal treatment. *Stepped care models* systematically combine universal, targeted, and indicated interventions, with individuals progressing through these levels of care as warranted. Many universal and targeted interventions can be delivered directly by pediatric healthcare providers, while most indicated interventions must be delivered by mental health (MH) providers (Kassam-Adams 2014). See Table 19.2 for an overview of key interventions across phases of PTMEs.

Table 19.2 Interventions based on level of need and timeline

		<i>Peri-trauma</i>	<i>Acute medical care</i>	<i>Ongoing (post-acute) care or discharge from medical care</i>
		<i>PTMEs and immediate treatment</i>	<i>Active medical treatment and ongoing acute illness/injury</i>	<i>Time beyond active acute medical care</i>
<i>Universal</i>	<i>All children and families presenting for medical care</i>	Minimize traumatic aspects of medical care Support family in providing effective support to child (e.g., calming child, distract child during stressful procedure) Consider possibility that prior trauma exposure (even if not known to healthcare team) may impact child/family responses Screen for indicators of higher risk	Provide information that supports adaptive coping with injury, illness, acute treatment Consider potential impact of prior medical or other trauma exposure on child’s response to medical care and to ongoing stressors related to injury or illness Periodic screening, especially at critical junctures, for indicators of distress/higher risk	Provide information on long-term impact of child’s illness/injury/treatment Provide information on common ongoing child/family psychological responses and coping strategies Provide children and families with tools for ongoing self-screening for indicators of distress

(continued)

Table 19.2 (continued)

<p><i>Targeted</i></p>	<p><i>Children with known risk for greater than normal distress or where distress may have more severe consequences</i></p>	<p>Initiate “watchful waiting” with ongoing screening Address specific mechanisms related to known risk factors Implement strategies to reduce distress/promote coping (e.g., psychological preparation for procedure, extra attention to pain management, possible sedation)</p>	<p>Continue “watchful waiting” Anticipatory guidance and evidence-based self-help resources Address specific mechanisms related to known risk factors Continue strategies to reduce distress or promote coping and plan for use of these strategies during future events and procedures</p>	<p>Screen periodically for indicators of distress; arrange for more thorough mental health assessment if needed Assist with self-assessment of lasting impact of child/family’s ongoing needs and strengths Specific suggestions and support for adaptive coping/effective self-help</p>
<p><i>Indicated</i></p>	<p><i>Children with known risk for severe distress or with current severe response</i></p>	<p>Initiate clinical mental health intervention for severe PTSS and other acute distress Provide more intensive psychological support during current events and treatment</p>	<p>Conduct more thorough assessment Provide trauma-focused treatment for severe acute distress that interferes with functioning/medical care/adherence Plan for provision of more intensive support (psychological and/or medical/sedation) during future events/procedures</p>	<p>Conduct more thorough assessment Trauma-focused mental health treatment</p>

19.2 How to Implement Interventions in Medical Settings

As MH providers, our involvement in supporting psychosocial interventions in medical settings allows us to extend our reach to those who may not otherwise come in contact with MH services. There are various ways in which MH providers become involved with children in healthcare settings. MH clinicians may be integrated as key members of interdisciplinary healthcare teams, may be “co-located” (i.e., delivering MH services within the same facility), or may be external resources who serve

as consultants to healthcare teams. Regardless of their role within the healthcare setting, all MH practitioners can serve as partners and advocates for routine MH screening and for the delivery of medical care using a trauma-informed approach. The appropriate type and intensity of intervention is determined based on timing and severity of child or family trauma reactions (see Table 19.2). Each phase of care is described in more detail below. Two core elements should continue throughout all phases of medical care and at all levels of need: implementing trauma-informed pediatric medical care and screening for risk and distress (Marsac et al. 2015a; Price et al. 2016). In acute medical settings (particularly those in which the child or family does not have a long-term relationship with the medical team), MH providers may face additional challenges in systematic implementation of trauma-informed care and screening. MH providers can work with teams to identify how to integrate trauma-informed medical care into their standard practice such that it does not result in additional time. Similarly, assessment tools that are easy to administer and score can be selected; administering screenings electronically that can be directly tied to the medical record may be helpful. Finally, in acute care settings, providers need easy access to referral information.

Trauma-Informed Pediatric Medical Care

MH providers can serve as leaders in medical settings in promoting a trauma-informed approach to care, with the goal of preventing trauma reactions in the early aftermath of PTEs. The DEF Protocol for Pediatric Healthcare Providers (see [HealthCareToolBox.org](https://www.healthcaretoolbox.org)) can be a useful framework for conceptualizing trauma-informed care actions (Center for Pediatric Traumatic Stress 2009). The DEF protocol was developed based on evidence on the etiology of PTSS and preventive techniques. This protocol encourages medical providers to address physical health (i.e., airway-breathing-circulation or the A-B-Cs) while remembering emotional health using D-E-F: reduce *D*istress, promote *E*motional support, and remember the *F*amily. The DEF protocol can be used in primary care, specialty care, and hospital-based care settings. Mutually respectful partnerships among MH providers, physicians, and nurses can enhance the provision of skilled and sensitive trauma-informed care.

In addition to supporting patients exposed to PTEs, a trauma-informed approach recognizes the challenges of providing medical care and takes into consideration self-care for medical staff. Medical providers care deeply about their patients' well-being, which may make them vulnerable to trauma reactions (e.g., burnout, compassion fatigue) related to witnessing children's suffering (Robins et al. 2009). When medical providers experience compassion fatigue or burnout, work performance and patient care can suffer (e.g., providers display less empathy; Najjar et al. 2009). To promote the best possible care for children and well-being of providers, MH practitioners can partner with medical teams to minimize compassion fatigue and burnout (Marsac et al. 2015a).

Screening for Risk and Distress

It is important to distinguish two common uses of the term "screening," each of which has an important role within a comprehensive response to children's trauma

reactions. The first is predictive screening to identify children and families who are likely to be at greater risk for ongoing distress or impairment. The second is concurrent screening to identify children and families who have current psychological distress that may warrant ongoing monitoring or immediate clinical attention. Some screening tools can serve both purposes; predictive screening in the peritrauma or acute phases may include brief assessment of current psychological symptoms as well as other markers of risk for persistent distress. Both predictive and concurrent screening provide valuable information to healthcare teams in determining how to allocate scarce resources or supportive services based on which children and families have the highest need. In medical settings, plans for screening must take into account that some children have preexisting trauma exposure as well as trauma exposure related to current medical treatment. Screening measures vary in their coverage of preexisting and current risk markers and/or symptoms, and this may be a factor in selecting the most appropriate instrument for a specific patient population (Kassam-Adams et al. 2015a, b; Kazak et al. 2015).

To be valid, screening for future risk requires empirical evidence regarding specific factors that can be assessed at the time of screening and that are associated with later symptoms or psychosocial problems. A number of biological, psychological, and social factors contribute to a child's risk for experiencing significant distress and/or impairment in functioning (Alisic et al. 2014; Cox et al. 2008; Kahana et al. 2006; Trickey et al. 2012). See Table 19.1 for a summary of these evidence-based risk factors, some of which represent potentially malleable mechanisms and targets for prevention efforts.

The state of the art in predictive screening is still evolving, but a number of tools have been developed that assess some combination of these risk factors (Kassam-Adams et al. 2015a, b). In clinical practice, the presence of any of these risk factors may warrant continued assessment of child and family member symptoms, coping, and emotional recovery over time. See Fig. 19.1 for a list of questions to consider

- 1) Is my primary purpose to detect current distress or to predict ongoing needs/ distress?
- 2) What primary symptoms am I concerned about?
- 3) Has the measure been validated in my population and for the purpose for which I am concerned for the use of it?
- 4) How much time is needed to administer, score, and review results?
- 5) Who is qualified to administer and interpret results?
- 6) What is the cost of the measure?
- 7) Are there critical items on the measure that need to be addressed immediately if endorsed, and do we have staff to manage this?
- 8) How can we integrate the screening into standard patient care?

Fig. 19.1 Questions to consider in selecting assessment measures for use of with children in medical settings

when selecting screening tools or broader assessment measures. The answers to these questions vary widely depending on the type of medical setting (e.g., primary care, ED, inpatient hospital, specialty centers). Careful consideration of these issues will help MH providers tailor screening and assessment to maximize efficiency, while providing the most relevant and useful information to the healthcare team.

19.2.1 Interventions in the Peri-trauma Phase

During the peri-trauma phase, youth are in the midst of initial PTE exposure (e.g., injury event, new diagnosis), and many are experiencing multiple new PTEs (e.g., challenging medical procedures). Nearly all children and families experience some level of distress and challenges in coping with frightening or painful medical events and procedures. This phase is an optimal time to begin prevention of PTSS or other negative emotional outcomes through the application of trauma-informed care and screening (Marsac et al. 2014). The nature of prevention efforts will vary based on children's initial distress and other risk factors (see Table 19.2).

Universal A key role for MH providers is to facilitate the delivery of trauma-informed pediatric medical care, providing consultation, training, and/or direct services that promote medical teams' knowledge, confidence, and use of specific trauma-informed practices during initial diagnosis and treatment (Marsac et al. 2015a). Trauma-informed care in this phase includes actions by the healthcare team that minimize potentially traumatic aspects of diagnostic and treatment procedures, optimize pain management, attend to emotional distress, promote family presence and emotional support during challenging procedures, and encourage consistent communication between the medical team and the child and family. Regular assessment of the child's pain and optimizing pain management based on the child's perception (rather than assumptions about what the procedure or injury "should feel like") is an essential element of medical care that may also be helpful in preventing PTSS.

In their role as a consultant and trainer for the healthcare team, MH practitioners may find it useful to build on existing skills in patient- and family-centered care and to frame specific skills and practices for trauma-informed care using the DEF protocol (Marsac et al. 2015a; Center for Pediatric Traumatic Stress 2009). Collaboration with medical teams will often help to determine trauma-informed actions for their specific patient population and setting. For example, for children with an acute physical event with anticipation of full physical recovery, a key goal of both medical and psychosocial care is to promote return to normal functioning. For these children, universal trauma-informed care in the peri-trauma phase may include providing psychoeducation about normative physical and emotional recovery, providing a rationale for approaching rather than avoiding situations that may remind the child of the precipitating medical event, and helping parents encourage the child to return to normal activities that are safe (Kassam-Adams et al. 2013). For children with a

new diagnosis of a chronic condition, a key goal (for both treatment adherence and PTSS prevention) is to increase child and family perception of safety and control. Thus, universal preventive interventions in the peri-trauma phase might include setting achievable individual goals that promote a sense of efficacy (e.g., help plan age-appropriate ways for the child to be in charge of his/her medication schedule, plan family activities in which the child can participate; Kazak et al. 2007). Primary care centers may want to consider routine screenings at well visits to help identify children with ongoing or new MH needs. A child may be at any phase of a PTE exposure when presenting for a well visit, which routine screening can help determine (Husky et al. 2011).

Targeted While many children will adapt well over time by using their existing coping strategies and social support networks, a significant number develop ongoing PTSS or other psychological distress (Kahana et al. 2006). When initial distress or risk factors are identified, ongoing screening and follow-up (a “watchful waiting” approach) is warranted, possibly supplemented by targeted prevention efforts (Kassam-Adams 2014; Price et al. 2016). At this point, these interventions are not conceptualized as clinical treatment of symptoms or disorder, although ongoing monitoring may reveal the need to offer indicated treatment.

Ideally, targeted prevention efforts in the peri-trauma phase are designed to address specific mechanisms that may lead to ongoing PTSS and other psychological sequelae (Kassam-Adams 2014). When a child has a known history of trauma exposure, medical teams can modify care delivery to reduce the potential for care (even routine procedures) to be re-traumatizing. For example, a child with a history of sexual abuse could be given the choice of whether s/he is awakened before a nurse checks vital signs overnight. Children (and their family members) with prior PTSS or anxiety may appraise new situations as threatening, beyond the realistic threat posed by specific medical event(s) and treatment. Attending to these perceptions and providing specific age-appropriate explanations and information on the duration, severity, or projected outcomes of treatment can be useful in the peri-trauma phase. In children with known PTSS risk factors, MH providers may become more involved in preparation for procedures, conducting thorough assessments of pain and coping and working with the medical team to facilitate effective pain management.

In some cases, the nature of medical event means that the peri-trauma phase also involves preparation for end-of-life care. Palliative care teams have a role here in promoting child and family sense of control and in providing more intensive support to help manage emotional experiences from the initiation of palliative care (e.g., assisting the family in discussing death, their beliefs, and wishes and creating memories through tangible mementos; Kazak et al. 2007).

Indicated Clinical MH treatment is “indicated” in the peri-trauma phase when a child (or family members) experiences severe or impairing psychological distress. In some cases, severe distress may interfere with the child or family’s ability to communicate effectively with the healthcare team or to participate in medical care.

Children and families in significant distress may benefit from a psychosocial provider to help them navigate treatment and the healthcare system and from a MH practitioner to initiate trauma-focused interventions to address severe acute PTSS. MH providers who are trained in trauma-focused treatment for children, but who are not familiar with medical settings and medical trauma, may benefit from a review of specific issues relevant to pediatric injury and illness (Center for Pediatric Traumatic Stress 2015). It is likely that children with an indicated need for clinical MH treatment during the peri-trauma phase will continue to need this care in later phases and outside of the medical setting. While the identification of MH problems is increasing in primary care settings, many children are not receiving the treatment that they need for their emotional reactions, particularly those with internalizing symptoms (Chavira et al. 2004). Thus, MH providers can partner with primary care centers to help with referrals or to provide co-located services (Cluxton-Keller et al. 2015).

19.2.2 Interventions in Acute Medical Care Phase

As children and families transition from the peri-trauma to the acute medical care phase, they are still involved in active medical treatment and often face many demands and stressors related to the injury or illness itself. However, the initial shock of the medical event or diagnosis may be wearing off. Often child and family distress begins to decrease as they adapt to this new situation. In this phase, which may last from several days to many months, a medical plan is put into place to address physical health needs, and the family is either still in the hospital or still in regular contact with the medical team. Care may be transitioned to the child's primary care provider at this point. For some children and families, the nature of the acute medical treatment or the seriousness of the diagnosis may continue to pose new or ongoing challenges. The acute medical care phase thus offers opportunities for medical teams and MH providers to implement psychosocial interventions.

Rates of significant PTSS during the acute medical care phase vary depending on the type of medical event and treatment, ranging from 4–16 % of children and 11–50 % of parents (Price et al. 2016). In this phase, the child and parents' PTSS trajectory emerges. It may be too early to determine whether a specific child will ultimately follow a resilient, recovery, chronic, or escalating trajectory; evidence suggests that more than two thirds will follow resilient or recovery trajectories, and a minority will have chronic or escalating PTSS (Price et al. 2016).

Universal The need for trauma-informed medical care for all ill and injured children continues through the acute medical care phase (Marsac et al. 2015a). The same basic principles apply – minimizing potentially traumatic aspects of treatment, attending to pain management, and using the DEF protocol as a guide for specific trauma-informed practices (Center for Pediatric Traumatic Stress 2009). Although the need for trauma-informed care is universal, MH providers can work

with medical teams to identify aspects of trauma-informed care that are of particular relevance to their patient population. For example, for children newly diagnosed with a chronic illness, the acute medical care phase often involves efforts to introduce and promote long-term adherence to medical regimens (e.g., medication, diet, restrictions in activities). Knowing that these regimens can potentially trigger traumatic stress reactions, MH providers can help guide the ways in which ongoing treatment regimens are introduced to children and parents (Shemesh et al. 2000). When palliative care is warranted, if support has not already begun during the peri-trauma phase, it should be initiated now.

Information and basic psychoeducation are a key part of universal prevention efforts during the acute medical care phase. MH providers can work with medical providers to ensure that all families receive education about what to expect in regard to medical treatment and normative emotional and psychological responses and to support families' existing adaptive coping strategies and social support systems (Kassam-Adams et al. 2013). Continued periodic screening, especially at critical junctures (e.g., major change in prognosis or treatment plan, discharge), can help to identify children and families that need a higher level of care now and possibly in the future.

It can be very helpful for MH and medical providers to understand not only the child's physical health needs but also the child and family's subjective perceptions of the child's condition and treatment and their beliefs about prognosis and future treatment plans. Research consistently shows that subjective appraisals are key for emotional recovery, much more so than the objective nature or severity of illness, injury, or medical treatment (Price et al. 2016). Trauma-informed medical providers listen carefully to understand the child's and family's understanding of the situation, inquire "What worries you the most?," and provide age-appropriate information about the child's medical condition, procedures, and treatment plan.

Targeted Universal screening during the acute medical phase may identify children and families with distress warranting additional attention. MH providers can support the medical team's readiness to provide additional anticipatory guidance regarding PTSS and expected reactions and to systematically include attention to child distress and emotional support in care plans (during inpatient admission). Based on screening results, MH providers may choose to conduct a more thorough assessment of child symptoms and functional impairment to help target prevention efforts and to determine if a higher level of care is needed. Targeted prevention efforts in this phase should be designed to address specific, malleable risk factors that may lead to ongoing PTSS and other psychological sequelae (Kassam-Adams 2014). Promising targets for prevention during acute medical care include parent responses and children's early maladaptive appraisals and coping strategies (Kassam-Adams 2014).

Preventive interventions appropriate for this phase include evidence-based, self-directed programs for children or parents. The example programs presented here were each designed as a universal preventive intervention, but because research

suggests they are particularly useful for children or families at higher risk for persistent PTSS, we include them as targeted interventions. An injured child may benefit from psychoeducational programs such as an informational booklet or website (e.g., “Kids and Accidents”; Cox and Kenardy 2010; Kenardy et al. 2008); parents of injured children may also benefit from web-based resources (e.g., AfterTheInjury.org; kidtrauma.org; Landolt 2016; Marsac et al. 2013). Programs are under development that teach cognitive restructuring and adaptive coping (e.g., Coping Coach) for children with acute medical events (Kassam-Adams et al. 2015; Marsac et al. 2015b). Children with chronic illnesses can benefit from programs that teach them how to manage disease symptoms, treatment, and associated feelings (e.g., Cellie Coping Kit; Marsac et al. 2012, 2014). Moving beyond evidence-based self-help resources, if a MH provider is available, programs that help families recognize and reframe maladaptive beliefs and work together to face the challenges of life-threatening illness may be beneficial (e.g., Surviving Cancer Competently Intervention Program-Newly Diagnosed; Kazak et al. 2005).

Indicated If children or families’ psychological symptoms are creating significant distress, interfering with medical care, and/or interfering with daily functioning, clinical MH services are warranted. Depending on their role within the hospital or healthcare organization, MH providers may initiate and deliver treatment within the medical setting (if co-located or integrated team members), provide treatment in an external setting, or support the child and family in identifying a knowledgeable provider. Effective treatments for child PTSS (e.g., trauma-focused CBT, reviewed in Chap. 8) are relevant for children in the acute medical care phase but may sometimes require adaptation to address medical issues and triggers (Center for Pediatric Traumatic Stress 2015).

19.2.3 Interventions During Ongoing (Post-acute) Care or After Discharge from Care

A small but significant proportion of children demonstrate persistently elevated or delayed onset PTSS, making long-term follow-up care a critical window of opportunity for the provision of trauma-informed assessments and interventions. Primary care providers have a unique opportunity to follow-up on children that have been discharged from specialty care and, with routine screening, may be able to identify children whose symptoms were delayed. In addition to those with chronic or delayed symptom trajectories, some children may require additional monitoring and support for the late effects or complications associated with their injury, illness, and/or medical treatment. After acute medical care has ended, some children and families experience changes in risk and protective factors (e.g., available support systems) and/or exposure to additional PTEs that impact adjustment and/or recovery. Thus, despite the practical emphasis on prevention and intervention efforts in the peri-trauma and

acute medical care phases, a comprehensive response to pediatric medical traumatic stress must incorporate the *entire* lifecycle of a medical event, including this longer-term phase after discharge or when acute medical care has transitioned to ongoing care (Price et al. 2016).

Universal Universal interventions for PTSS include continued screening for PTSS during routine follow-up visits and ongoing provision of support, education, and resources targeted toward later stages of PTMEs. For instance, healthcare providers can continue to implement the basic principles of the DEF protocol (Center for Pediatric Traumatic Stress 2009) as a standard part of medical visits. Specifically, providers should screen for current child distress related to either the medical event or its longer-term consequences or complications (e.g., pain, restrictions in activities, missed school, bullying), assess availability of emotional support to cope with distress, and inquire about new or ongoing needs of family members that impact the child's recovery. Partnerships between pediatric healthcare teams and relevant community-based organizations can offer additional opportunities for universal assessment and supports for children in the months and years after a PTE (Kazak et al. 2007).

Universal trauma-informed support includes providing families with psychoeducational resources targeted toward issues relevant to this later phase. For instance, [HealthCareToolBox.org](https://www.healthcaredtoolbox.org) offers developmentally appropriate tip sheets for youth and parents regarding adjustment after hospital discharge, dealing with ongoing pain, and fears or worries (Center for Pediatric Traumatic Stress 2009). Several web-based interventions designed for the early weeks after acute medical events (described above) also offer guidance, strategies, and resources for concerns that can emerge in this later stage of recovery (Cox and Kenardy 2010; Marsac et al. 2013).

Targeted Targeted interventions promote recovery and resilience for children at risk for continued or new onset traumatic stress reactions. During routine follow-up visits, medical providers who are concerned about psychological sequelae of medical events should coordinate with MH clinicians to provide more targeted assessment and intervention services. Specifically, clinicians should assess the lasting psychosocial impact of the medical event as well as the child and family's ongoing needs and strengths. Based on this assessment, MH providers can make suggestions and provide support for adaptive coping strategies. Providers should consider ways to enhance social support for children with problematic yet subclinical reactions by connecting them to resources and supports at the healthcare, school, and community levels. For children who are at risk for persistent and impairing symptoms, referrals should be made for more comprehensive, formal assessment to determine whether MH treatment is needed. MH providers in primary care settings are particularly well positioned to provide these targeted assessment and intervention services during the longer-term post-trauma phase, as primary care providers often have the greatest continuity with and exposure to this patient population.

Indicated Children demonstrating significant and impairing PTSS that persist beyond the early weeks and months after medical trauma require referrals to a MH clinician trained in trauma-focused treatments. These interventions are described in detail in section B of this book. MH providers in medical settings can facilitate the referral process by identifying appropriate treatment providers in the healthcare network and/or the community, preparing patients for treatment by providing basic psychoeducation about evidence-based therapies, enhancing motivation to seek treatment, addressing anticipated barriers, and following-up with patients over time to monitor needs. In addition to facilitating referrals to formal treatment services, providers in medical settings should pay particular attention to the impact of symptoms on adherence to medical regimens and health outcomes (e.g., avoidance of hospital, anxiety around medications or procedures).

19.2.4 Stepped Care Models

Stepped care models systematically incorporate universal screening of PTSS, targeted services for those at risk, and provision of indicated trauma-focused psychological interventions to youth with persistent PTSS (Kassam-Adams et al. 2011). These models provide intervention using a stepped approach: only those at risk for significant and persistent symptoms progress to more intensive levels of care (Salloum et al. 2014). For instance, Kassam-Adams et al. (2011) screened injured children for risk factors and subsequently assigned them to either a low-risk or an at-risk group. Those at risk were randomized to usual care or intervention, which included psychoeducation and brief assessments to identify additional needs. Children with identified needs were then offered additional services (e.g., care coordination, assistance with medical adherence, brief intervention to improve communication and coping, evaluation by MH provider, and/or TF-CBT). Similarly, Kenardy et al. (2010) developed a stepped care intervention for injured children involving a two-stage screening (2 and 6 weeks after injury), followed by child- or family-focused CBT if indicated. Applying stepped care to young children, Salloum et al. (2014) developed a systematic intervention program that begins with an initial assessment, followed by three therapist-led TF-CBT sessions, a parent-child workbook, weekly phone meetings, and provision of a web-based informational resource. Children who demonstrate sufficient clinical improvement terminate active treatment and enter a maintenance phase, comprised of parent-led weekly meetings and continue practicing and using skills learned in the first phase of treatment. Those who did not respond to the first step receive up to nine additional therapist-led TF-CBT sessions. A posttreatment assessment then facilitates decisions around terminating or continuing treatment. While stepped care programs for pediatric traumatic stress are few in number and evidence is preliminary, these models hold promise for providing more efficient, accessible, and cost-effective services relative to standard treatment delivery systems (Salloum et al. 2014).

19.3 Special Challenges

A number of challenges emerge when working to support children and families' emotional health in medical settings. Limited resources can prevent implementing MH interventions on a large scale, particularly those requiring a MH provider. Recent efforts have been made to try to extend our reach of interventions, particularly universal and targeted, while minimizing costs. These include creating programs that do not depend on implementation by a MH provider and developing eHealth applications. These programs require funding for development, evaluation, and sustainability, but can often be disseminated at a low cost.

Evaluation of treatments in medical settings is costly and time consuming. Given that specific populations (e.g., children with cystic fibrosis) are often small in a single setting and agreement to participate in studies can be low with competing medical demands, multi-site studies are often necessary. This can be very costly and challenging, particularly when evaluating a particular type of intervention (requiring consistent implementation by MH providers). Thus, while promising evidence of effectiveness of trauma interventions in medical settings exists, a gold standard of care has yet to be determined.

Another challenge is lack of awareness or training in trauma-informed care for medical providers (Banh, Saxe, Mangione, & Horton, 2008). Most medical providers have limited training in MH and no training in trauma-informed care, resulting in an underestimation of MH symptoms and lack of awareness of available screening tools (Banh et al. 2008). With the heavy demands on medical teams to care for increasing numbers of patients at lower costs, integrating another concept of delivering medical care via a trauma-informed care approach may be overwhelming. However, MH providers can help address this by integrating trauma-informed practices as part of standard care.

Finally, the child and family may want to focus exclusively on the child's physical health. Families may be unaware of how medical events can affect MH, fear stigmas associated with MH treatment, or unable to dedicate time or money to care that extends beyond physical health. If children's emotional health is integrated into their standard medical care to a greater degree, we may be able to overcome or minimize these pervasive stigmas.

19.4 Empirical Support for Interventions in Medical Settings

Evidence on the effectiveness of interventions in medical settings is beginning to grow, but much more research is needed to best support children's emotional health and recovery (Kassam-Adams et al. 2013; Kazak et al. 2007). While trauma-informed care has a strong theoretical background and is solidly anchored in medical traumatic stress and child trauma research, we do not yet know how implementing trauma-informed care directly affects child emotional or physical health outcomes.

As discussed above, screening needs persist across all phases of trauma exposure and can serve two purposes: identifying current distress or predicting future distress.

For children with acute medical trauma (e.g., injuries with expected recovery, sudden, brief illnesses such as appendicitis), a number of screeners have been successfully developed and implemented in medical settings (e.g., Kassam-Adams et al. 2015; Kramer et al. 2013; van Meijel et al. 2015). However, efforts to identify short screeners that can be easily integrated into routine medical care are still underway (Kassam-Adams and Marsac in press). Screening for those with chronic or ongoing medical conditions can be more challenging as the course of medical treatment (thus additional trauma exposure) is often unpredictable. Tools such as the Psychosocial Assessment Tool have had some success in predicting psychosocial service utilization and PTSS in parents of children with cancer (Alderfer et al. 2009). The use of PTSS checklists can be useful in providing information on current distress (Landolt et al. 2003). However, we are in need of validated, brief screeners that can be integrated into medical care to assess and predict child PTSS over the course of chronic illness. Thus, while we can fairly easily determine those children and families who need more attention immediately and suggest who will need to be followed over time, more research is necessary to be able to determine which children will need a high-level intensity of services over time. As our predictive ability improves, we may be able to intervene earlier with these children and better allocate resources to those most in need (given limited funding for MH treatment).

Turning directly to interventions, careful attention is needed in developing and evaluating interventions across phases of medical care. Even the most well-intentioned interventions can have adverse effects, so it is essential that treatments are based in evidence and evaluated as they are developed (Roberts et al. 2009). To date, no clear evidence is available supporting the routine implementation of a specific universal preventive intervention for those exposed to trauma (Roberts et al. 2009). However, some interventions have shown promising results. An example of a promising universal intervention that was initiated during peri-trauma (and continued through later phases) is Stoddard et al. (2011) pharmacological intervention (i.e., 24-week course of sertraline initiated during burn hospitalization); this intervention reduced PTSS in children by parent report (but not by child report). Initiating an intervention during the acute trauma phase, Kenardy et al. (2008) provided children with an informational booklet following an injury. They found a reduction in anxiety (but not PTSS) for the intervention group. Providing this information to children online and with a booklet to parents replicated the same effect (i.e., reduced anxiety in children; Cox and Kenardy 2010). Also during the early acute phase, Zehnder et al. (2010) had success in reducing depression (but not PTSS) in preteens following an injury using a single-session intervention (a therapist met with parents and children together to provide psychoeducation and facilitate reconstruction of the injury event). Finally, during the ongoing/discharge phase, results from the Surviving Cancer Competently Intervention Program (SCCIP), a single session, therapist-led intervention for families with children with cancer, suggest reductions in intrusiveness of stress symptoms for fathers and arousal symptoms for adolescents (but no effect for mothers; Kazak et al. 2004). For newly diagnosed families (SCCIP-ND) during the peri-trauma phase, the intervention includes parents only;

research suggested reductions in anxiety and PTSS in parents (though reductions were not statistically significant; Kazak et al. 2005). In addition, a number of other universal, early interventions in medical settings have been found to “do no harm” and are reported by families as helpful in navigating the challenges of medical care. These interventions focus on providing basic psychoeducation about emotional reactions during peri-trauma and acute trauma phases, promoting the child’s current adaptive coping strategies, and including the parent as a part of recovery. Examples of these interventions include [AfterTheInjury.org](#) (Marsac et al. 2013) and the Cellie Coping Kit (Marsac et al. 2012, 2014).

For children demonstrating PTSS and needing services, evidence of current interventions is stronger. For example, Coping Coach is a web-based intervention designed for children following acute trauma. The intervention is designed to be initiated during the peri-trauma or acute trauma phase (e.g., the hospital or doctor’s office) and focuses on promoting adaptive cognitive appraisals, decreasing excessive avoidance coping, and promoting social support. Though implemented as a universal intervention in the pilot evaluation study (and meeting the “do no harm” criteria), results suggested the greatest impact on PTSS for at-risk children. Additionally, during the early ongoing phase of trauma, Berkowitz et al. (2011) found promising results for children who participated in the Child and Family Traumatic Stress Intervention (CFTSI) following a PTE resulting in visit to a pediatric ED, a forensic sexual abuse program, or a police department’s victim services (see Chap. 7).

For children in medical settings rising to the indicated level of need, evidence to support specific treatment approaches varies based on the trauma identified. For example, if primary care or other medical settings determine that a child has PTSS related to a past trauma (e.g., violence, sexual abuse), trauma-focused CBT has a strong evidence base. For children presenting in medical settings with behavior or adherence difficulties, behavioral and cognitive-behavioral interventions are well-established treatments. However, while we expect that CBT/ TF-CBT would be efficacious for children with significant medical traumatic stress or PTSD related to medical care, no RCTs have been conducted to examine the effectiveness of TF-CBT on reducing medical traumatic stress; more research is needed to determine which treatments are most effective for these pediatric populations. These interventions are most often implemented during the ongoing/discharge phase of treatment but may be initiated earlier if a child’s distress and/or impairment are high.

Conclusions

Medical settings are ideal settings to identify and support children exposed to PTEs. Children presenting to healthcare networks, especially those from underserved populations, may not come to the attention of MH providers in other ways. PTSS affect children’s physical health and functional outcomes (Landolt et al. 2009; Zatzick et al. 2008). The implementation of trauma-informed care, including regular screening for psychological symptoms, is recommended across all phases of medical care (Marsac et al. 2015a; Price et al. 2016). Evidence suggests that psychoeducation about normative emotional reactions and when to get

help, supporting adaptive coping, and behavioral or cognitive-behavioral treatments may be helpful to children with challenging injuries, illnesses, and/or medical treatments. More research is necessary to establish the most efficacious treatments for children with significant PTSS related to medical events, though theory suggests that adapting effective CBT/TF-CBT interventions should be relevant and effective for children with medical traumatic stress.

References

- Alderfer MA, Mougianis I, Barakat LP, Beele D, DiTaranto S, Hwang WT, Kazak AE (2009) Family psychosocial risk, distress, and service utilization in pediatric cancer. *Cancer* 115(S18):4339–4349. doi:[10.1002/cncr.24587](https://doi.org/10.1002/cncr.24587)
- Alisic E, Jongmans MJ, van Wesel F, Kleber RJ (2011) Building child trauma theory from longitudinal studies: a meta-analysis. *Clin Psychol Rev* 31(5):736–747. doi:[10.1016/j.cpr.2011.03.001](https://doi.org/10.1016/j.cpr.2011.03.001)
- Alisic E, Zalta AK, van Wesel F, Larsen SE, Hafstad GS, Hassanpour K, Smid GE (2014) Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: meta-analysis. *Br J Psychiatry* 204:335–340. doi:[10.1192/bjp.bp.113.131227](https://doi.org/10.1192/bjp.bp.113.131227)
- Banh MK, Saxe G, Mangione T, Horton NJ (2008) Physician-reported practice of managing childhood posttraumatic stress in pediatric primary care. *Gen Hosp Psychiatry* 30(6):536–545. doi:[10.1016/j.genhosppsych.2008.07.008](https://doi.org/10.1016/j.genhosppsych.2008.07.008)
- Berkowitz SJ, Stover CS, Marans SR (2011) The child and family traumatic stress intervention: secondary prevention for youth at risk of developing PTSD. *J child psychol psychiatry, allied disciplines* 52(6):676–685. doi:[10.1111/j.1469-7610.2010.02321.x](https://doi.org/10.1111/j.1469-7610.2010.02321.x)
- Center for Pediatric Traumatic Stress (2009) [HealthCareToolBox.org](http://www.HealthCareToolbox.org). Retrieved 1 Dec 2015, from <http://www.HealthCareToolbox.org>
- Center for Pediatric Traumatic Stress (2015) Working with children and families experiencing medical traumatic stress: a resource guide for mental health professionals. Retrieved 25 Nov 2015 from <http://www.HealthCareToolBox.org>
- Chavira DA, Stein MB, Bailey K, Stein MT (2004) Child anxiety in primary care: prevalent but untreated. *Depress anxiety* 20(4):155–164. doi:[10.1002/da.20039](https://doi.org/10.1002/da.20039)
- Cluxton-Keller F, Riley AW, Noazin S, Umoren MV (2015) Clinical effectiveness of family therapeutic interventions embedded in general pediatric primary care settings for parental mental health: a systematic review and meta-analysis. *Clin Child Fam Psychol Rev* 18(4):395–412. doi:[10.1007/s10567-015-0190-x](https://doi.org/10.1007/s10567-015-0190-x)
- Copeland W, Keeler G, Angold A, Costello E (2007) Traumatic events and posttraumatic stress in childhood. *Arch Gen Psychiatry* 64(5):577–584. doi:[10.1001/archpsyc.64.5.577](https://doi.org/10.1001/archpsyc.64.5.577)
- Cox C, Kenardy J (2010) A randomised controlled trial of a web-based early intervention for children and their parents following accidental injury. *J Pediatric Psychol* 35:581–592. doi:[10.1093/jpepsy/jsp095](https://doi.org/10.1093/jpepsy/jsp095)
- Cox C, Kenardy J, Hendrikz J (2008) A meta-analysis of risk factors that predict psychopathology following accidental trauma. *J Spec Pediatr Nurs* 13(2):98–110. doi:[10.1111/j.1744-6155.2008.00141.x](https://doi.org/10.1111/j.1744-6155.2008.00141.x)
- Hildenbrand AK, Marsac ML, Daly BP, Chute D, Kassam-Adams N (2015) Acute pain and post-traumatic stress after pediatric injury. *J Pediatr Psychol*. doi:[10.1093/jpepsy/jsv026](https://doi.org/10.1093/jpepsy/jsv026)
- Husky MM, Miller K, McGuire L, Flynn L, Olfson M (2011) Mental health screening of adolescents in pediatric practice. *J Behav Health Serv Res* 38(2):159–169. doi:[10.1007/s11414-009-9207-x](https://doi.org/10.1007/s11414-009-9207-x)
- Kahana S, Feeny N, Youngstrom E, Drotar D (2006) Posttraumatic stress in youth experiencing illnesses and injuries: an exploratory meta-analysis. *Traumatology* 12(2):148–161. doi:[10.1177/1534765606294562](https://doi.org/10.1177/1534765606294562)

- Kassam-Adams N (2014) Design, delivery, and evaluation of early interventions for children exposed to acute trauma. *Eur J Psychotraumatol* 5. doi:[10.3402/ejpt.v5.22757](https://doi.org/10.3402/ejpt.v5.22757)
- Kassam-Adams N, Garcia-Espana J, Marsac ML, Kohser K, Baxt C, Nance M, Winston FK (2011) A pilot randomized controlled trial assessing secondary prevention of traumatic stress integrated into pediatric trauma care. *J Trauma Stress* 24(3):252–259. doi:[10.1002/jts.20640](https://doi.org/10.1002/jts.20640)
- Kassam-Adams N, Marsac ML Brief practical screeners for acute posttraumatic stress symptoms in children in English and Spanish, *Journal of Traumatic Stress*, in press
- Kassam-Adams N, Marsac ML, Hildenbrand AK, Winston FK (2013) Posttraumatic stress following pediatric injury: update on diagnosis, risk factors, and intervention. *JAMA Pediatr* 167(12):1158–1165. doi:[10.1001/jamapediatrics.2013.2741](https://doi.org/10.1001/jamapediatrics.2013.2741)
- Kassam-Adams N, Marsac ML, Kohser K, Kenardy J, March S, Winston FK (2015a) Pilot randomized controlled trial of a novel web-based intervention to prevent posttraumatic stress in children following medical events. *J Pediatr Psychol*. doi:[10.1093/jpepsy/jsv057](https://doi.org/10.1093/jpepsy/jsv057)
- Kassam-Adams N, Marsac M, García-España J, Winston F (2015b) Evaluating predictive screening for children's post-injury mental health: new data and a replication. *Eur J Psychotraumatol* 6:29313
- Kazak A, Alderfer M, Streisand R, Simms S, Rourke M, Barakat L, Cnaan A (2004) Treatment of posttraumatic stress symptoms in adolescent survivors of childhood cancer and their families: a randomized clinical trial. *J Fam Psychol* 18:493–504. doi:[10.1037/0893-3200.18.3.493](https://doi.org/10.1037/0893-3200.18.3.493)
- Kazak A, Kassam-Adams N, Schneider S, Zelikovsky N, Alderfer M, Rourke M (2006) An integrative model of pediatric medical traumatic stress. *J Pediatr Psychol* 44:343–355. doi:[10.1093/jpepsy/jsj054](https://doi.org/10.1093/jpepsy/jsj054)
- Kazak A, Struber M, Barakat L, Meeske K (1996) Assessing posttraumatic stress related to medical illness and treatment: the Impact of Traumatic Stressors Interview Schedule (ITSIS). *Fam Sys Health* 14:365–380. doi:[10.1037/h0089795](https://doi.org/10.1037/h0089795)
- Kazak AE, Rourke MT, Alderfer MA, Pai A, Reilly AF, Meadows AT (2007) Evidence-based assessment, intervention and psychosocial care in pediatric oncology: a blueprint for comprehensive services across treatment. *J Pediatr Psychol* 32(9):1099–1110. doi:[10.1093/jpepsy/jsm031](https://doi.org/10.1093/jpepsy/jsm031)
- Kazak AE, Schneider S, Didonato S, Pai AL (2015) Family psychosocial risk screening guided by the Pediatric Psychosocial Preventative Health Model (PPPHM) using the Psychosocial Assessment Tool (PAT). *Acta oncologica* 54(5):574–580. doi:[10.3109/0284186X.2014.995774](https://doi.org/10.3109/0284186X.2014.995774)
- Kazak AE, Simms S, Alderfer MA, Rourke MT, Crump T, McClure K et al (2005) Feasibility and preliminary outcomes from a pilot study of a brief psychological intervention for families of children newly diagnosed with cancer. *J Pediatr Psychol* 30(8):644–655. doi:[10.1093/jpepsy/jsi051](https://doi.org/10.1093/jpepsy/jsi051)
- Kenardy J, Cobham V, Nixon RD, McDermott B, March S (2010) Protocol for a randomised controlled trial of risk screening and early intervention comparing child- and family-focused cognitive-behavioural therapy for PTSD in children following accidental injury. *Bio Med Central Psychiatry* 10:92–101. doi:[10.1186/1471-244X-10-92](https://doi.org/10.1186/1471-244X-10-92)
- Kenardy J, Thompson K, Le Brocque R, Olsson K (2008) Information provision intervention for children and their parents following pediatric accidental injury. *Eur Child Adolesc Psychol* 17(5):316–325. doi:[10.1007/s00787-007-0673-5](https://doi.org/10.1007/s00787-007-0673-5)
- Kramer DN, Hertli M, Landolt MA (2013) Evaluation of an early risk screener for PTSD in pre-school children after accidental injury. *Pediatrics* 132:945–951
- Landolt MA, Buehlmann C, Maag T, Schiestl C (2009) Brief Report: quality of life is impaired in pediatric burn survivors with posttraumatic stress disorder. *J Pediatr Psychol* 34(1):14–21. doi:[10.1093/jpepsy/jsm088](https://doi.org/10.1093/jpepsy/jsm088)
- Landolt MA, Vollrath M, Ribl K, Gnehm H, Sennhauser F (2003) Incidence and associations of parental and child posttraumatic stress symptoms in pediatric patients. *J Child Psychol Psychiatry* 44:1199–1207. doi:[10.1111/1469-7610.00201](https://doi.org/10.1111/1469-7610.00201)

- Marsac ML, Hildenbrand A, Kohser K, Winston F, Li Y, Kassam-Adams N (2013) Preventing posttraumatic stress following pediatric injury: A randomized controlled trial of a web-based psycho-educational intervention for parents. *J Pediatr Psychol*. doi:[10.1093/jpepsy/jst053](https://doi.org/10.1093/jpepsy/jst053)
- Marsac ML, Kassam-Adams N, Hildenbrand AK, Nicholls E, Winston FK, Leff SS, Fein J (2015a) Implementing a trauma-informed approach in pediatric health care networks. *JAMA Pediatr* 170(1):1–8. doi:[10.1001/jamapediatrics.2015.2206](https://doi.org/10.1001/jamapediatrics.2015.2206)
- Marsac ML, Winston F, Hildenbrand A, Kohser K, March S, Kenardy J, Kassam-Adams N (2015b) Systematic, theoretically grounded development and feasibility testing of an innovative, preventive web-based game for children exposed to acute trauma. *Clin Pract Pediatr Psychol* 3(1):12–24. doi:[10.1037/cpp0000080](https://doi.org/10.1037/cpp0000080)
- Marsac ML, Hildenbrand AK, Clawson K, Jackson L, Kohser K, Barakat L, Alderfer MA (2012) Acceptability and feasibility of family use of The Cellie Cancer Coping Kit. *Support Care Cancer* 20(12):3315–3324. doi:[10.1007/s00520-012-1475-y](https://doi.org/10.1007/s00520-012-1475-y)
- Marsac ML, Klingbeil OG, Hildenbrand AK, Alderfer MA, Kassam-Adams N, Smith-Whitley K, Barakat LP (2014) The Cellie Coping Kit for Sickle Cell Disease: initial acceptability and feasibility. *Clin Pract Pediatr Psychol* 4(2):10
- Murray C, Lopez A (1996) The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Harvard University Press, Cambridge, MA
- Kassam-Adams N, Marsac ML (2009) Brief practical screeners for acute posttraumatic stress symptoms in children in English and Spanish (under review)
- Najjar N, Davis LW, Beck-Coon K, Carney Doebbeling C (2009) Compassion fatigue: a review of the research to date and relevance to cancer-care providers. *J health psychol* 14(2):267–277. doi:[10.1177/1359105308100211](https://doi.org/10.1177/1359105308100211)
- Price J, Kassam-Adams N, Alderfer MA, Christofferson J, Kazak AE (2016) Systematic review: a reevaluation and update of the integrative (Trajectory) model of pediatric medical traumatic stress. *J Pediatr Psychol* 41:86–97. doi:[10.1093/jpepsy/jsv074](https://doi.org/10.1093/jpepsy/jsv074)
- Roberts, N.P., Kitchiner, N.J., Kenardy, J., & Bisson, J. (2009). Multiple session early psychological interventions for the prevention of post-traumatic stress disorder. *Cochrane Database Syst Rev* (3), CD006869. doi: [10.1002/14651858.CD006869.pub2](https://doi.org/10.1002/14651858.CD006869.pub2)
- Robins PM, Meltzer L, Zelikovsky N (2009) The experience of secondary traumatic stress upon care providers working within a children's hospital. *J Pediatr Nurs* 24(4):270–279. doi:[10.1016/j.pedn.2008.03.007](https://doi.org/10.1016/j.pedn.2008.03.007)
- Salloum A, Scheeringa MS, Cohen JA, Storch EA (2014) Development of stepped care trauma-focused cognitive-behavioral therapy for young children. *Cogn Behav Pract* 21(1):97–108. doi:[10.1016/j.cbpra.2013.07.004](https://doi.org/10.1016/j.cbpra.2013.07.004)
- Schappert SM, Rechsteiner EA (2008) Ambulatory medical care utilization estimates for 2006. National health statistics reports; no 8. Hyattsville, MD: National Center for Health Statistics. 2008
- Shemesh E, Lurie S, Stuber M, Emre S, Patel Y, Vohra P, Shneider B (2000) A pilot study of post-traumatic stress and nonadherence in pediatric liver transplant recipients. *Pediatrics* 105(2):29–36
- Stoddard FJ, Luthra R, Sorrentino EA, Saxe GN, Drake J, Chang Y, Levine JB, Sheridan RL (2011) A randomized controlled trial of sertraline to prevent posttraumatic stress disorder in burned children. *J Child Adolesc Psychopharmacol* 21(5):469–477. doi:[10.1089/cap.2010.0133](https://doi.org/10.1089/cap.2010.0133)
- Substance Abuse and Mental Health Services Administration. (2015). Trauma-informed approach and trauma-specific interventions. Retrieved 25 Nov 2015 from <http://www.samhsa.gov/nctic/trauma-interventions>
- Trickey D, Siddaway AP, Meiser-Stedman R, Serpell L, Field AP (2012) A meta-analysis of risk factors for post-traumatic stress disorder in children and adolescents. *Clin Psychol Rev* 32:122–138. doi:[10.1016/j.cpr.2011.12.001](https://doi.org/10.1016/j.cpr.2011.12.001)
- Van Meijel EP, Gigengack MR, Verlinden E, Opmeer BC, Heij HA, Goslings JC et al (2015) Predicting posttraumatic stress disorder in children and parents following accidental child

- injury: evaluation of the screening tool for early predictors of posttraumatic stress disorder (STEPP). *BMC Psychiatr* 15:113. doi:[10.1186/s12888-015-0492-z](https://doi.org/10.1186/s12888-015-0492-z)
- Zatzick D, Jurkovich G, Fan M, Grossman D, Russo J, Katon W, Rivara F (2008) Association between posttraumatic stress and depressive symptoms and functional outcomes in adolescents followed up longitudinally after injury hospitalization. *Arch Pediatr Adolesc Med* 162(7):642–648. doi:[10.1001/archpedi.162.7.642](https://doi.org/10.1001/archpedi.162.7.642)
- Zehnder D, Meuli M, Landolt MA (2010) Effectiveness of a single-session early psychological intervention for children after road traffic accidents: a randomised controlled trial. *Child Adolesc Psychiatry Ment Health* 4:7–17. doi:[10.1186/1753-2000-4-7](https://doi.org/10.1186/1753-2000-4-7)