Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis

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INTRODUCTION

Posttraumatic stress disorder (PTSD) has been described as "the complex somatic, cognitive, affective, and behavioral effects of psychological trauma" [1]. PTSD is characterized by intrusive thoughts, nightmares and flashbacks of past traumatic events, avoidance of reminders of trauma, hypervigilance, and sleep disturbance, all of which lead to considerable social, occupational, and interpersonal dysfunction.

The diagnosis of PTSD can be challenging because of the heterogeneity of the presentation and resistance on the part of the patient to discuss past trauma. Another complicating factor is that traumatic events are associated with a range of other psychopathology including depression and anxiety disorders. Patients exposed to multiple traumatic events may be mistakenly diagnosed with PTSD rather than another primary disorder.

The epidemiology, pathophysiology, clinical manifestations, course, and diagnosis of PTSD are discussed here. Our approach to treating PTSD in adults is also described separately. Pharmacotherapy and psychotherapy of PTSD are reviewed separately. The epidemiology, pathophysiology, clinical manifestations, diagnosis, and treatment of acute stress disorder are also reviewed separately.

- (See "Posttraumatic stress disorder in adults: Treatment overview".)
- (See "Posttraumatic stress disorder in adults: Psychotherapy and psychosocial interventions".)
- (See "Dissociative aspects of posttraumatic stress disorder: Epidemiology, clinical manifestations, assessment, and diagnosis".)
- (See "Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis".)
- (See "Acute stress disorder in adults: Treatment overview".)

EPIDEMIOLOGY

Many different types of trauma have been found to result in posttraumatic stress disorder (PTSD). These types and the proportion of PTSD cases they make up include:

- Sexual relationship violence – 33 percent (eg, rape, childhood sexual abuse, intimate partner violence).
- Interpersonal-network traumatic experiences – 30 percent (eg, unexpected death of a loved one, life-threatening illness of a child, other traumatic event of a loved one).
- Interpersonal violence – 12 percent (eg, childhood physical abuse or witnessing interpersonal violence, physical assault, or being threatened by violence).
- Exposure to organized violence – 3 percent (eg, refugee, kidnapped, civilian in war zone).
- Participation in organized violence – 11 percent (eg, combat exposure, witnessing death/serious injury or discovered dead bodies, accidentally or purposefully caused death or serious injury).
- Other life-threatening traumatic events – 11 percent (eg, life-threatening motor vehicle collision, natural disaster, toxic chemical exposure).

Many of these events are common, resulting in a large number of affected individuals. An analysis from a survey of a large, representative community-based sample in 24 countries estimated the conditional probability of PTSD for 29 types of traumatic events [2].

PTSD prevalence — The lifetime prevalence of posttraumatic stress disorder (PTSD) ranges from 6.1 to 9.2 percent in national samples of the general adult population in the United States and Canada [3-6], with one-year prevalence rates of 3.5 to 4.7 percent [6,7].

As an example, in a sample of 5692 respondents in the United States, 82.7 percent were exposed to severe and potentially traumatic events, and 8.3 percent of the trauma-exposed respondents were diagnosed with lifetime PTSD. Among patients from a community primary care clinic, 65 percent reported a history of exposure to severe, potentially traumatic events; 12 percent went on to develop PTSD [5,8].

Higher rates of PTSD have been found in population subgroups in the United States compared with the general US population, including Native Americans living on reservations and refugees from countries where traumatic stress was endemic. In two large samples of Native Americans, lifetime prevalence of PTSD ranged from 14.2 to 16.1 percent [9]. In a systematic review of 19 studies of mental disorders among Native Americans in the United States, Canada, and Latin America, indigenous peoples had 1.4 greater odds of lifetime PTSD compared with nonindigenous [10]. Among Cambodian refugees, two decades after resettling in the United States, 62 percent met criteria for PTSD in the previous year [11].

Lower prevalence rates have been found outside of North America:

- A World Health Organization study found a lifetime prevalence of PTSD in upper-middle income and lower-middle income countries of 2.3 and 2.1 percent respectively [5].
- A national sample of 10,641 Australians found a lifetime prevalence of PTSD of 1.0 percent [12].

The reasons for lower rates of PTSD outside North American samples are not well understood [8].

PTSD risk factors — The likelihood of developing posttraumatic stress disorder (PTSD) and the presentation of the disorder appear to be affected by a number of individual and societal risk factors [13-15].

Pre- and peri-trauma risk factors for PTSD include:

- History of trauma exposure prior to the index traumatic event
- Less education
- Lower socioeconomic status
- Childhood adversity (including childhood trauma/abuse)
- Personal and family psychiatric history
- Gender
- Race
- Poor social support

- Physical injury (including traumatic brain injury) as part of the traumatic event
- Initial severity of reaction to the traumatic event [4,16-19]

The frequency with which PTSD occurs after a traumatic event has been found to be influenced by characteristics of the individual and the inciting event [20]. Intentional trauma has been found to have a greater association with PTSD than traumatic events that were unintentional/nonassaultive [2,21]. Increasing duration of exposure to trauma has also been associated with a higher risk of PTSD [22]. Females are twice as likely to develop PTSD as males after adjusting for exposure to traumatic events [23]. The rates of PTSD are similar among males and females after events such as accidents (6.3 versus 8.8 percent), natural disasters (3.7 versus 5.4 percent), and sudden death of a loved one (12.6 versus 16.2 percent).

Types of trauma

Sexual assault — Sexual assault is the most frequent type of trauma experienced by women with PTSD [24,25]. In a nationally representative sample of 4008 women in the United States, the lifetime prevalence of PTSD was 12.3 percent. Of the women who had a history of PTSD, 32 percent had been raped and 31 percent experienced a sexual assault other than rape [24]. (See "Evaluation and management of adult and adolescent sexual assault victims in the emergency department".)

Mass conflict and displacement — A meta-analysis of 145 studies of 64,332 refugees and other conflict-affected individuals internationally found a mean PTSD prevalence rate of 30.6 percent (95% CI 26.3-35.2) [26]. Factors associated with higher PTSD rates included reported torture, cumulative exposure to potentially traumatic events, shorter time since conflict, and the assessed level of political terror.

Combat — PTSD occurring after combat injury appears to be strongly correlated with the extent of injury and with the occurrence and severity of traumatic brain injury [27]. PTSD typically develops over several months. Examples of study findings include:

- The prevalence of PTSD was 4.2 percent at one month and 12.2 percent by four months postinjury in a study of soldiers hospitalized for war-related injuries [28]. Soldiers with a high severity of physical problems a month after injury were at greater risk of PTSD six months later, compared with those with lower physical problem severity (odds ratio 7.0, 95% CI 3.1-16.0). Almost one-half of soldiers with war-related mild traumatic brain injury (concussion syndrome) met criteria for PTSD.

- In a study of 8621 deployed British military personnel [29], factors associated with a higher risk of developing PTSD included:

- Experiencing a combat role in war (compared with deployment without combat)
- Childhood adversity
- Having left the service
- Serious accident

A higher military rank was associated with a lower risk of developing PTSD.

- In Canada, the prevalence of PTSD among Regular Force members who deployed in support of the mission in Afghanistan was 7.7 percent, compared with 3.2 percent of Regular Force personnel who did not deploy [30].

- In a sample of United States military veterans, approximately 15 percent of men and 8 percent of women had PTSD 15 or more years after their military service in the Vietnam War [31].

- Experiencing traumatic brain injury during military deployment was a strong predictor of subsequent PTSD symptoms in a prospective, longitudinal study of 1648 United States Marine servicemen deployed in Iraq or Afghanistan [32,33]. Subjects were assessed prior to a seven-month deployment and again three to six months following their return to the United States.

Physical injury — Indicators of anxiety and pain in the context of physical injury or other traumatic events are associated with the onset of PTSD. Observational studies suggest that self-perceived fear of death during the traumatic event has been associated with PTSD [34]. Multiple studies have shown that a high heart rate (>95 beats per minute) at first presentation to emergency department is a risk factor for PTSD among those with physical injury [35]. Acute high levels of pain have been linked to PTSD among patients with severe physical injury [36]. There is a substantial body of evidence that PTSD and pain are often comorbid through mutual maintenance [37].

Medical illness — An increasing body of research shows that serious physical illness is associated with PTSD. Analysis of data from a nationally representative epidemiological study found that 6.5 percent of past-year PTSD was due to a medical illness [38].

- **Myocardial infarction** – A meta-analysis of 24 observational studies including 2383 patients who experienced an acute coronary syndrome (ACS; ie, a myocardial infarction or unstable angina) found a prevalence rate of ACS-induced PTSD of 12 percent (95% CI 9-16 percent) [39]. Data from three studies of 609 patients that met quality criteria for the meta-analysis found that patients experiencing ACS-induced PTSD had a twofold risk of

subsequent mortality or ACS recurrence (risk ratio 2, 95% CI 1.69-2.37) compared with ACS patients who did not experience PTSD symptoms.

- **Stroke** – Although less extensive than the literature on PTSD and acute coronary syndrome, there is a growing literature suggesting that up to one in four cases of stroke or transient ischemic attack may be associated with PTSD [40-42]. Patients with symptoms of PTSD after a stroke may be more likely to have anxiety about and nonadherence to preventive medications than those patients without PTSD after a stroke. For example, in a prospective study, over 400 patients presenting to an emergency department for symptoms of suspected stroke were monitored for one month [43]. Those patients with symptoms of PTSD were more likely than those without symptoms of PTSD to worry about future stroke (60 versus 24 percent), have aversive worries about cardiovascular medications (38 versus 10 percent), and to be nonadherent to medications (11 versus 2 percent).

- **Intensive-care unit stay** – A 2008 systematic analysis of 15 studies found the prevalence of PTSD in patients who survived intensive care unit (ICU) hospitalization to be approximately 20 percent [44]. A 2015 meta-analysis found pooled prevalences of clinically important PTSD symptoms after ICU discharge of 24 percent one to six months later and 22 percent 7 to 12 months later [45]. Risk factors for PTSD symptoms were benzodiazepine use, early memories of frightening ICU experiences, and pre-ICU comorbid psychopathology. Neither the severity of critical illness nor length of ICU stay were predictors of PTSD. PTSD symptoms were associated with poorer quality of life. (See "Overview of inpatient management of the adult trauma patient".)

- **Obstructive sleep apnea (OSA)** – High comorbidity rates suggest the importance of assessment for OSA among patients with PTSD. A systematic review of epidemiologic studies found that the prevalence of OSA appears to be higher in individuals with PTSD and major depressive disorder compared with other psychiatric disorders [46]. Two population-based studies found prevalence rates of 46.4 and 50 percent in individuals with PTSD [46]. A review of 11 studies using high-quality sleep measures found 63 percent of patients with PTSD had sleep disordered breathing [47]. OSA and PTSD likely have shared pathophysiology with hypothalamic-pituitary-adrenal axis activation, sympathetic nervous symptom activation, brain changes in common areas (eg, hippocampus, amygdala, prefrontal cortex), sleep fragmentation, changes in REM, and microarousals [48].

Childhood trauma — There are important distinguishing characteristics of PTSD symptoms in patients who experienced most of their trauma in childhood (eg, physical and sexual abuse) [1]. Compared with individuals with PTSD who did not experience childhood trauma, these

individuals often show greater difficulty with affect regulation (eg, unmodulated anger) and often demonstrate more dissociation, somatic symptoms, self-destructive behavior, and suicidal behavior.

PATHOPHYSIOLOGY

While much of the pathophysiology of posttraumatic stress disorder (PTSD) is unclear, interesting research findings are accruing. Studies using magnetic resonance imaging scans have shown that there is decreased volume of the hippocampus, left amygdala, and anterior cingulate cortex in patients with PTSD compared with matched controls [49,50]. Other reports have demonstrated increased central norepinephrine levels with down-regulated central adrenergic receptors [51], chronically decreased glucocorticoid levels with up-regulation of their receptors (possibly accounting for the anecdotal finding that there are more autoimmune diseases in these patients), and hemispheric lateralization in which there is a relative failure of left hemispheric function (possibly accounting for confusion related to time sequence of traumatic events) [52].

Researchers suspect that genetics may contribute to an individual's susceptibility to PTSD through an interaction with environmental factors [53,54]. Large-scale genetic studies show that PTSD is a highly polygenic phenotype that is likely influenced by thousands of loci across the genome [55,56]. As an example of a potential gene-environment interaction, the presence of one of four polymorphisms at the stress-related gene FKBP5 was associated with an increased risk for PTSD in patients with a history of child abuse, but not in patients without history of child abuse [57].

Previous exposure to trauma appears to increase the risk of developing PTSD with subsequent traumatic events [58]. The mechanism by which this "sensitization" occurs is unclear. A study of severely injured accident victims who were healthy before experiencing trauma found that the incidence of PTSD was low [59].

CLINICAL MANIFESTATIONS

Cardinal features — Patients with posttraumatic stress disorder (PTSD) experience marked cognitive, affective, or behavioral symptoms in response to reminders of a traumatic event. These may include flashbacks, severe anxiety, dissociative episodes, fleeing, or combative behaviors. These symptoms are more marked and lead to more psychosocial disruption than in other individuals who have experienced trauma without subsequent PTSD. Individuals with

PTSD compensate for such intense arousal by attempting to avoid experiences that may elicit symptoms. This can result in emotional numbing, diminished interest in everyday activities, and in extreme cases, detachment from others.

By definition, all patients with PTSD have some element of the cardinal features, which include experience of a traumatic event, intrusion symptoms, avoidance symptoms, negative alterations in cognition or mood, and arousal or reactivity changes. These are discussed in further detail in the sections that follow.

Criterion A: Traumatic event — The trauma experienced by those who present with PTSD is extreme. Examples include motor vehicle accidents, exposure to violence in military operations, home invasions/robberies, rape, and severe physical illness that threatens death. Individuals may be the victim in these events, but may also be observers of an event, or may hear about a loved one having experienced the event. Although some patients present with a single traumatic event as their main trigger, many patients present with a history of multiple traumatic events. These traumatic events may begin in childhood with abuse and neglect. In cases of repeated exposure to extreme stimuli, for example, as for first responders (firefighters, paramedics) or police officers, patients may not be able to identify a specific traumatic event. (See 'Types of trauma' above.)

Criterion B: Intrusion symptoms — Intrusion symptoms, also known as “re-experiencing” symptoms, are the hallmark of PTSD. Unwanted intrusive memories of the traumatic event vary widely from occasional unwanted thoughts about the trauma to frequent nightmares to “flashbacks.” Intrusion symptoms are typically associated with substantial psychological distress such as fear or panic. Physiological reactions such as autonomic arousal may also be present. Intrusion symptoms can occur spontaneously or be triggered by events that resemble or symbolize an aspect of the trauma.

Intrusion symptoms can help differentiate PTSD from other mental health disorders associated with trauma.

Criterion C: Avoidance symptoms — Avoidance of stimuli associated with the traumatic event can lead to changes in behavior that affect personal and work life. Patients may try to avoid internal thoughts or feelings related to the trauma but may also avoid activities, people, or situations that remind them of the trauma. This avoidance may lead to impairment in daily life functioning, for example, if it leads to avoidance of driving in a vehicle or being in a crowded location. Victims of trauma will often avoid specific places where the trauma occurred.

Criterion D: Negative cognitions and mood — Depression and negative mood alterations may be initial presentation of PTSD. Patients may have difficulty experiencing positive emotions,

have decreased interest in activities such as work, leisure, or social engagements. They may describe being unable to connect to others. Many patients experience excessive guilt about the event and blame themselves for the occurrence. This may lead to negative beliefs about themselves and may ultimately change their worldview. They may begin to see the world as a dangerous, malevolent place. Recognition of these symptoms as part of a response to a traumatic experience is essential for diagnosis of PTSD.

Criterion E: Arousal and reactivity changes — Patients may initially present with symptoms of irritability or aggressive physical or verbal behaviors. Other symptoms may include reckless or self-destructive behaviors (eg, substance use), feeling on edge, being easily startled, decreased concentration, and sleep disturbances. For accurate diagnosis, it is important to recognize these symptoms as having started after the traumatic event.

Dissociative subtype — Some patients may be classified as having a dissociative subtype of PTSD. These patients have prominent dissociative symptoms, which are common in PTSD. They are associated with higher levels of impairment, comorbidity, and suicide risk than in PTSD without dissociative symptoms [60]. (See "Dissociative aspects of posttraumatic stress disorder: Epidemiology, clinical manifestations, assessment, and diagnosis".)

Dissociative symptoms include:

- **Depersonalization** – The person feels disconnected from one's body. For example, they feel as if their body is not their own or they feel "lost" or "in a daze."
- **Derealization** – The person feels as if the world around them is not real. For example, they feel as if they are watching the world or experiencing the world in a dreamlike state.

Amnestic symptoms may also be present in PTSD. This may include an inability to remember aspects of the traumatic event or loss of awareness of situations [61]. Typically, this is due to a dissociative amnesia.

PTSD symptom clusters — Although all patients with posttraumatic stress disorder (PTSD) by definition have intrusion symptoms, avoidance, negative mood alterations, and arousal or reactivity changes, certain symptoms may be more prominent in some PTSD patients than others. Categorizing patients based on their prominent symptoms or cluster of symptoms has been proposed. However, whether these symptom clusters relate to specific trauma, psychiatric comorbidities, and overall quality of life has not been firmly established [62].

As an example, one model supported by an analysis of veterans with combat related PTSD categorizes patients as having an externalizing or internalizing subtype [63]:

- The externalizing subtype is characterized by symptoms of aggressiveness, impulsivity, high rates of alcohol and drug use, and partial or threshold levels of borderline personality disorder [64].

- The internalizing subtype is characterized by elevated rates of mood disorders, negative emotionality, somatic symptoms, and introversion.

Although the model suggests that treatment can be adjusted based on the subtype (eg, focusing on approaches for impulsivity and personality disorders in patients with externalizing subtypes versus approaches for depression in patients with internalizing subtypes), such an application of these subtypes has not been validated in clinical studies.

CO-OCCURRING CONDITIONS

- **Psychiatric comorbidities** – Psychiatric comorbidity is high in patients with posttraumatic stress disorder (PTSD). The National Comorbidity Survey data suggest that 16 percent have one coexisting psychiatric disorder, 17 percent have two psychiatric disorders, and 50 percent have three or more [21]. Depressive disorders, anxiety disorders, and substance use disorder are two to four times more prevalent in patients with PTSD; substance misuse is often due to the patient's attempts to self-medicate symptoms [4,21]. Approximately 20 percent of people with PTSD have reported use of alcohol or other substances to reduce tension [65]. Other prominent disorder or symptom categories include:

    - **Personality disorders** – Patients with PTSD have been found to have increased rates of co-occurring borderline personality disorder and antisocial personality disorder compared with the general population. PTSD was associated with increased odds of having lifetime and past-year antisocial personality disorder (odds ratios range from 1.8 to 3.3) in a nationally representative United States sample [6,66]. It can be difficult in some cases for clinicians to differentiate PTSD symptoms in patients presenting with borderline personality disorder (BPD). A large United States sample demonstrated that 24 percent of patients with PTSD had a diagnosis of BPD. Compared with people who had PTSD alone or BPD alone, those with comorbid PTSD and BPD had more comorbidity, increased likelihood of suicide attempts, and high levels of traumatic events in childhood [64].

    - **Somatic symptoms** – Studies suggest that somatic symptoms are as much as 90 times more likely in patients with PTSD than in patients without the disorder [67]. (See

"Somatic symptom disorder: Epidemiology and clinical presentation" and "Somatic symptom disorder: Assessment and diagnosis".)

- **Medical comorbidities** – Research evidence suggests that exposure to traumatic events and PTSD are associated with a range of physical health conditions. As examples, large, prospective epidemiologic studies and retrospective data analyses, have found patients with PTSD to have diseases of bones and joints or of the neurologic, cardiovascular, respiratory, or metabolic systems between 1.5 and 3 times more commonly compared with individuals without PTSD [68-70]. Research studies have identified high rates of many medical conditions and risk factors that co-occur with PTSD:

  - **Risk factors for cardiovascular and pulmonary disease** – Including obesity, dyslipidemia, tobacco use, hypertension [71,72], and type II diabetes in women [73]. Examples of studies include:

    - In a population-based study of 3171 community respondents, PTSD was associated with increased risks for angina (odds ratio 2.4, 95% CI 1.3-4.5), heart failure (odds ratio 3.4, 95% CI 1.9-6.0), bronchitis, asthma, liver, and peripheral artery disease (odds ratio range = 2.5, 3.1) after adjusting for sociodemographic factors, smoking, body mass index, blood pressure, depression, and alcohol use disorders [68].

    - A 2018 cohort study of 6481 adults involved in cleaning the debris following terrorist attack on the World Trade Center in the United States found PTSD to be a risk factor for cardiovascular disease. Cumulative incidence of myocardial infarction or stroke were consistently higher for people with PTSD, independent of depression (adjusted hazard ratios 2.22 for myocardial infarction and 2.51 for stroke) [74].

    - A Swedish National registry study with over 136,000 patients with stress-related disorders (ie, PTSD, acute stress reaction, adjustment disorder, and other stress reactions) found an increased risk of incident cardiovascular disease compared with siblings without PTSD and compared with a matched unexposed general population sample (n = 1,366,370). Cardiovascular outcomes included ischemic heart disease, cerebrovascular disease, thrombosis or emboli, heart failure, arrhythmia, and fatal cardiovascular event. During the first year after the stress disorder diagnosis, the hazard ratio for any cardiovascular disease was 1.64 (95% CI 1.45-1.84) [75].

  - **Autoimmune and endocrine disease** – A 2018 matched cohort analysis of retrospective data from Sweden's population-based registry, which included 106,464

patients with stress-related disorders, 1,064,640 matched unexposed individuals, and 126,652 full siblings – found that a clinical diagnosis of stress-related disorders was associated with an increased risk of subsequent autoimmune disease [76].

The incidence rate of autoimmune disease was greater in patients with a stress-related disorder compared with matched unexposed individuals and siblings, 9.1 versus 6.0 and 6.5 per 1000 person-years). Compared with the unexposed population, patients with PTSD were at increased risk for multiple autoimmune diseases (hazard ratio 2.29, 95% CI 1.72-3.04).

- **Aging and dementia** – A systematic review of PTSD and early aging found modest associations between PTSD and possible biological markers of accelerated aging, increased comorbidity with conditions associated with dementia, as well as with earlier mortality (average hazard ratio 1.29) [77].

- **Alzheimer and vascular dementia** – A review of studies reported preliminary evidence of higher rates of Alzheimer disease and vascular dementia in patients with PTSD [78].

- **Parkinson disease** – PTSD appears to be associated with an increased risk of Parkinson disease in males, particularly those age 72 or over. In a retrospective cohort study, 8336 males with PTSD were matched with 8336 males without PTSD and followed for over 10 years [79]. Parkinson disease developed in 1.4 percent of subjects with PTSD and 0.9 percent of subjects without PTSD (hazard ratio 1.48, 95% CI 1.1-1.99). In the subset of males that received a diagnosis of PTSD at age 72 or older, the risk of developing Parkinson disease as compared with those without PTSD was even greater (hazard ratio 1.95, 95% CI 1.16-3.28).

- **Traumatic brain injury (TBI)** – Studies have found TBI and PTSD to have high rates of co-occurrence among civilians and, particularly, among soldiers with combat-related TBI [80,81]. As examples:

  - In a study of 2235 American soldiers returning from combat in Iraq and Afghanistan, 11 percent screened positive for PTSD in 2008. Among the 268 soldiers with mild TBI, 62 percent screened positive for PTSD [82].

  - A study in United States soldiers demonstrated that deployment-related TBI was independently associated with an increased risk for PTSD during the one-year follow-up period [33].

- **Irritable bowel syndrome** – High rates of irritable bowel syndrome have been found in patients with PTSD. A 2019 systematic review of eight studies that included over 648,000 people demonstrated a pooled odds ratio of 2.80 (95% CI 2.06-3.54) for the association between PTSD and IBS. Most studies were from the United States and conducted on army veterans [83].

The co-occurrence of PTSD and IBS is likely due to a complex interaction between brain and gut, dysregulations in the hypothalamic-pituitary-adrenal axis, potential abnormalities in immune function, microbiome, and altered levels of neuropeptide Y [84].

COURSE AND COMPLICATIONS

Posttraumatic stress disorder (PTSD) is commonly a chronic condition, with only one-third of patients recovering at one-year follow-up and one-third still symptomatic 10 years after the exposure to the trauma [21]. Most individuals who develop PTSD experience its onset within a few months of the traumatic event. However, epidemiologic studies have found that approximately 25 percent experience a delayed onset after six months or more [82].

Individuals with one or more PTSD symptoms are more likely to experience occupational problems, have poorer social supports, have higher rates of problems with intimate relationships [85,86], and have more disability than controls [85]. Additionally, a higher number of PTSD symptoms appears to be associated with worse cognitive trajectories [87]. As examples:

- In a prospective study involving over 2.2 million individuals in Sweden, diagnosis of PTSD was associated with educational impairments across the lifespan [88]. In this study, the presence of PTSD was associated with approximately 70 to 90 percent lower odds of completing compulsory, secondary, or college education.

- In a prospective study including over 12,000 females who had been exposed to trauma and had high levels of PTSD symptoms, females with six to seven symptoms of PTSD had greater rate of decline in both learning and working memory and psychomotor speed and attention [87]. Given that cognitive decline is strongly associated with subsequent Alzheimer disease and related dementias this suggests that earlier cognitive screening among females with PTSD may be warranted.

In addition to effects on relationships, occupation, and education, PTSD may also be associated with higher mortality in certain circumstances. When occurring with symptoms of depression in women, it is associated with nearly four times greater risk of death (eg, cardiovascular,

diabetes, suicide) compared with women with no PTSD or depression [89]. PTSD may increase the risk for attempted suicide [90,91].

Individual psychotherapy has been found to improve overall psychosocial functioning [92]. Accumulating evidence suggests that cognitive-behavioral conjoint therapy for individuals with PTSD and their partners is an effective strategy for reducing PTSD symptom severity and increasing intimate relationship satisfaction [93]. Psychotherapy for PTSD is reviewed separately.

SCREENING

Military personnel and veterans who have experienced combat and traumatically injured civilians should be systematically screened for posttraumatic stress disorder (PTSD); however, screening is likely to lead to better clinical outcomes only when coupled with high-quality mental health services [94] (see "Posttraumatic stress disorder in adults: Treatment overview"). Primary care patients presenting with new anxiety, fear, or insomnia should be screened for PTSD and a history of trauma [95]. Others in which PTSD would be a diagnostic consideration include patients with anxiety symptoms, social isolation, increased substance misuse (alcohol and/or tobacco), or attempts at distraction through excessive work.

Among screening instruments for PTSD, the five-item Primary Care PTSD Screen for the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (table 1) has demonstrated good reliability and validity [96].

ASSESSMENT

Patients with possible posttraumatic stress disorder (PTSD) should receive a comprehensive psychiatric assessment. Examples of questions a clinician can ask to elicit symptoms of PTSD are provided below.

- How do you feel when you recall the event?
- Do you experience dreams or flashbacks about it?
- Do you find yourself avoiding people or activities you associate with the event?
- Do you find yourself forgetting occurrences from that period?
- Do you find yourself looking carefully around when you are in a public place?

Patients need to be asked specific questions about their traumatic experience(s) to differentiate PTSD from other psychiatric disorders. These questions should be asked with sensitivity. Patients are often reluctant to discuss past traumatic events because of guilt, embarrassment, or discomfort inherent in revisiting painful memories.

Patients may minimize their symptoms of PTSD. Some patients may feel that past trauma has little or no effect on present symptoms. Military personnel in the United States have been reported to be reluctant to disclose PTSD symptoms due to stigmatization and fear of professional repercussions [97]. (See "Combat and operational stress reaction".)

Patients diagnosed with PTSD should also be assessed for suicidal or parasuicidal ideation or acts and co-occurring psychiatric conditions, substance use disorders, and medical conditions. (See 'Co-occurring conditions' above.)

The PTSD checklist (PCL-5), a 20-item self-report measure, can be used to screen patients for PTSD and monitor the severity of symptoms over time [98,99]. A single version of the PCL-5 replaced separate versions for civilian and military populations. The psychometric properties of the PCL-5 show high rates of sensitivity and specificity. A score of 38 (out of a maximum score of 80) is associated with a diagnosis of PTSD (table 2).

The Clinician-Administered PTSD Scale (CAPS) is a 30-item, structured interview that can be used to make diagnoses of PTSD in the past week, past month, or lifetime, as well as to assess the severity of PTSD symptoms.

DIAGNOSIS

Diagnostic criteria — A diagnosis of posttraumatic stress disorder (PTSD) is made for patients older than age six years who meet all of the following the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) criteria [100]:

- A. Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:
  - 1. Directly experiencing the traumatic event(s).
  - 2. Witnessing, in person, the event(s) as it occurred to others.
  - 3. Learning that the traumatic event(s) occurred to a close family member or close friend. In cases of actual or threatened death of a family member or friend, the event(s) must have been violent or accidental.

- 4. Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (eg, first responders collecting human remains; police officers repeatedly exposed to details of child abuse).

Note: Criterion A4 does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work related.

- B. Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:
  - 1. Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).

    Note: In children older than six years, repetitive play may occur in which themes or aspects of the traumatic event(s) are expressed.
  - 2. Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).

    Note: In children, there may be frightening dreams without recognizable content.
  - 3. Dissociative reactions (eg, flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring. (Such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings.)

    Note: In children, trauma-specific reenactment may occur in play.
  - 4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).
  - 5. Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).
- C. Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by one or both of the following:
  - 1. Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).
  - 2. Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).

- D. Negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
  - 1. Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).
  - 2. Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world, for example:
    - "I am bad"
    - "No one can be trusted"
    - "The world is completely dangerous"
    - "My whole nervous system is permanently ruined"
  - 3. Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.
  - 4. Persistent negative emotional state (eg, fear, horror, anger, guilt, or shame).
  - 5. Markedly diminished interest or participation in significant activities.
  - 6. Feelings of detachment or estrangement from others.
  - 7. Persistent inability to experience positive emotions (eg, inability to experience happiness, satisfaction, or loving feelings).
- E. Marked alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
  - 1. Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.
  - 2. Reckless or self-destructive behavior.
  - 3. Hypervigilance.
  - 4. Exaggerated startle response.
  - 5. Problems with concentration.
  - 6. Sleep disturbance (eg, difficulty falling or staying asleep or restless sleep).

- F. Duration of the disturbance (criteria B, C, D, and E) is more than one month.
- G. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- H. The disturbance is not attributable to the physiological effects of a substance (eg, medication, alcohol) or another medical condition.

Subtypes — Specify whether presentation of disorder is:

- **With dissociative symptoms** – The individual's symptoms meet the criteria for posttraumatic stress disorder, and in addition, in response to the stressor, the individual experiences persistent or recurrent symptoms of either of the following (see "Dissociative aspects of posttraumatic stress disorder: Epidemiology, clinical manifestations, assessment, and diagnosis"):
  - 1. Depersonalization – Persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one's mental processes or body (eg, feeling as though one were in a dream; feeling a sense of unreality of self or body or of time moving slowly).
  - 2. Derealization – Persistent or recurrent experiences of unreality of surroundings (eg, the world around the individual is experienced as unreal, dreamlike, distant, or distorted).

  Note: To use this subtype, the dissociative symptoms must not be attributable to the physiologic effects of a substance (eg, blackouts, behavior during alcohol intoxication) or another medical condition (eg, complex partial seizures).
- **With delayed expression** – If the full diagnostic criteria are not met until at least six months after the event (although the onset and expression of some symptoms may be immediate).

Complex PTSD/“disorders of extreme stress not otherwise specified” (Complex PTSD/DESNOS) refers to a proposed subtype of PTSD with complex symptomatology often observed in response to prolonged traumatization, occurring during crucial developmental periods [101]. The symptoms include dissociation, emotion dysregulation, somatization, altered relationships/attachments, and alterations in systems of meaning (eg, believing there is no purpose in life; losing faith in others) [102]. (See "Dissociative aspects of posttraumatic stress disorder: Epidemiology, clinical manifestations, assessment, and diagnosis", section on 'Concepts and definitions'.)

Differentiating acute stress disorder — Individuals presenting with symptoms of posttraumatic stress and functional impairment after a highly traumatic event are diagnosed as having acute stress disorder (ASD) for the first 30 days following the event. Most people recover completely within this period. For those who remain symptomatic (at the threshold established by DSM-5-TR criteria) after 30 days, their diagnosis is then reclassified as PTSD. (See "Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis".)

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Trauma-related psychiatric disorders in adults".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, “The Basics” and “Beyond the Basics.” The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on “patient info” and the keyword(s) of interest.)

- Basics topic (see "Patient education: Post-traumatic stress disorder (The Basics)")

SUMMARY AND RECOMMENDATIONS

- **Prevalence** – The one-year prevalence of the posttraumatic stress disorder (PTSD) has been found to range from 1 to 6 percent in the general adult population samples across the world. (See 'Epidemiology' above.)

- **Types of trauma** – Many different types of trauma can result in PTSD, including military combat, sexual or physical assault, disasters, childhood sexual abuse, sudden death of a loved one, severe physical injury or sudden-onset medical illness, and intensive care unit hospitalization. (See 'Epidemiology' above.)

- **Pathophysiology** – The pathophysiology of PTSD is not well understood. However, differences in neuroanatomy, neurotransmitters, and brain functioning, as compared to individuals without the disorder, have been reported. (See 'Pathophysiology' above.)

- **Clinical manifestations** – Individuals with PTSD experience marked cognitive, affective, and behavioral responses to stimuli reminding them of trauma they experienced (eg, flashbacks, severe anxiety, and fleeing or combative behavior). They compensate for this intense arousal through avoidance, emotional numbing, and diminished interest in people and activities. (See 'Clinical manifestations' above.)

  - **Dissociative subtype** – Some patients may be classified as having a dissociative subtype of PTSD. These patients have prominent dissociative symptoms, which are common in PTSD. They are associated with higher levels of impairment, comorbidity, and suicide risk than in PTSD without dissociative symptoms.

- **Co-occurring conditions** – PTSD is commonly accompanied by comorbid psychiatric conditions, including depression, substance use disorders, and somatic symptoms. Comorbid medical conditions include autoimmune and endocrine diseases, risk factors for cardiovascular and pulmonary disease, dementia, and traumatic brain injury. (See 'Co-occurring conditions' above.)

- **Course and complications** – PTSD is typically a chronic condition. Individuals with one or more PTSD symptoms are more likely to have educational impairments, experience occupational problems, have difficulty with intimate relationships, and have poorer social supports than those without PTSD symptoms. Additionally, PTSD is associated with increased risk of suicide attempts and, in some circumstances, higher mortality rates than the general population. (See 'Course and complications' above.)

- **Screening** – Military, veterans, indigenous and refugee groups, and traumatically injured civilians should be systematically screened for PTSD; however, screening is only effective when coupled with high-quality mental health services [94]. Primary care patients presenting with new anxiety, fear, or insomnia should be screened for PTSD and a history of trauma [95]. (See 'Screening' above and "Posttraumatic stress disorder in adults: Treatment overview".)

The five-item Primary Care PTSD measure and the Posttraumatic Stress Disorder Checklist for the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) have demonstrated good reliability and validity for screening for PTSD. (See 'Screening' above.)

- **Diagnosis** – Diagnostic criteria for PTSD include: experiencing or witnessing a severe, traumatic event resulting in symptoms in each of four categories (intrusion, negative alteration in mood and cognitions, avoidance, and arousal); social or occupational impairment; and symptoms and impairment lasting at least one month after the trauma. (See 'Diagnosis' above.)

  A diagnosis of PTSD is made only after a month has passed since the traumatic event. Prior to that time, patients with PTSD-like symptoms and functional impairment are diagnosed with acute stress disorder. (See 'Diagnosis' above and "Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis".)

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