

# Posttraumatic Stress Disorder in Elite Athletes

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## Abstract

Posttraumatic stress disorder (PTSD), which may develop following exposure to severe trauma, can occur in all people at any age. PTSD affects approximately 10 million Americans, with an incidence of approximately 3.5% diagnosed every year. Elite athletes are not immune to posttraumatic stress. While difficult to precisely quantify, an estimated 1 in 8 elite athletes suffers from PTSD. Because of its complex presentation, PTSD can be challenging to diagnose and effectively treat in athletes. Several barriers unique to elite athletes exist which may inadvertently delay or prevent access to the appropriate clinical experts. Several best practice models for mental health screening in elite athletes have been developed in the past decade. Treatment of PTSD in the athlete population is similar to trauma-informed treatment in the general population, but should involve the athlete's multidisciplinary team of clinical experts to account for unique demands and preferences in the context of sport.

PTSD includes a constellation of symptoms. These may include intense, persistent intrusive thoughts and feelings related to the traumatic event (flashbacks). Associated symptoms include sadness, fear, or anger; and feeling detached or estranged from other people. People with PTSD may avoid situations or people that remind them of the traumatic event and may experience strong negative reactions to common events, such as loud noises, crowded places, or an accidental touch (2). There is considerable overlap in symptomatology with other mental illnesses; therefore, professional consultation is important for correct diagnosis. Differential diagnoses include major depressive disorder, generalized anxiety disorder, acute stress disorder, panic disorder, and substance abuse disorder (to name a few) (Table).

## Introduction

As defined by the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), posttraumatic stress disorder (PTSD) is a pathologic "trauma and stressor-related disorder" that occurs following exposure to severe trauma. PTSD is comprised of four clusters of symptoms, including intrusive and recurrent memories of the trauma, avoidance of trauma-related stimuli, numbing and/or negative changes in mood or cognitions pertaining to the trauma, and changes in reactivity and arousal (1). The American Psychiatric Association defines PTSD as a disorder that may occur in people who have experienced or witnessed a traumatic event. While sometimes misconstrued as specific to war or combat, a variety of stressors may cause PTSD, such as childhood neglect or abuse, rape, or a serious accident, and may include even threats of death, sexual violence, or serious injury. PTSD can occur in all people, of any ethnicity, culture, and at any age. PTSD affects approximately 10 million Americans, with an incidence of approximately 3.5% of U.S. adults every year. An estimated one in 11 people will be diagnosed with PTSD in their lifetime. Women are twice as likely as men to have PTSD (2).

depressive disorder, generalized anxiety disorder, acute stress disorder, panic disorder, and substance abuse disorder (to name a few) (Table).

## PTSD Prevalence in Athletes

Athletes suffering with invisible injuries from trauma may have been exposed to traumatic events in a variety of ways ranging from childhood abuse or neglect to sexual assault to life-threatening injuries. Precisely how prevalent the PTSD diagnosis is in the athlete population is difficult to define, but undoubtedly, there are many athletes on the playing fields around us who have not been formally diagnosed but who suffer from posttraumatic stress symptoms nonetheless. The epidemiology of behavioral health issues in athletes can be difficult to assess as compared with physical conditions such as musculoskeletal injuries or concussion for which there is robust data for athletic populations. In general, there is a lack of comprehensive research on athletes across the psychological spectrum (3). This reminds us of the need for high quality research to provide us with a deeper understanding of athlete mental health. It is through rigorous research that we may inform sport-specific policies, guidelines, and interventions designed to enhance athlete mental health (4,5).

For perspective, the lifetime prevalence of PTSD in the general population worldwide differs according to social background and country, ranging from 1.3% to 12.2%, and the 1-year prevalence is 0.2% to 3.8% (6). In the United States and Canada, the lifetime prevalence of PTSD ranges from approximately 6% to 9% in national samples of the general adult population with 1-year prevalence rates of 3.5% to

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**Table.****Diagnostic Criteria for Posttraumatic Stress Disorder (1).**

A) Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:	<ol style="list-style-type: none"> <li>1) Directly experiencing the traumatic event(s).</li> <li>2) Witnessing, in person, the event(s) as it occurred to others.</li> <li>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.</li> <li>4) Experiencing repeated or extreme exposure to aversive details of the traumatic event(s).</li> </ol>
B) Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:	<ol style="list-style-type: none"> <li>1) Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).</li> <li>2) Recurrent distressing dreams in which the content and/or effect of the dream are related to the traumatic event(s).</li> <li>3) Dissociative reactions in which the individual feels or acts as if the traumatic event(s) were recurring.</li> <li>4) Distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).</li> <li>5) Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).</li> </ol>
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:	<ol style="list-style-type: none"> <li>1) Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).</li> <li>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).</li> </ol>
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:	<ol style="list-style-type: none"> <li>1) Inability to remember an important aspect of the traumatic event(s).</li> <li>2) Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world.</li> <li>3) Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.</li> <li>4) Persistent negative emotional state.</li> <li>5) Markedly diminished interest or participation in significant activities.</li> <li>6) Feelings of detachment or estrangement from others.</li> <li>7) Persistent inability to experience positive emotions.</li> </ol>
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:	<ol style="list-style-type: none"> <li>1) Irritable behavior and angry outbursts, typically expressed as verbal or physical aggression toward people or objects.</li> <li>2) Reckless or self-destructive behavior.</li> <li>3) Hypervigilance.</li> <li>4) Exaggerated startle response.</li> <li>5) Problems with concentration.</li> <li>6) Sleep disturbance (<i>e.g.</i>, difficulty falling or staying asleep or restless sleep).</li> </ol>
F) Duration of the disturbance (criteria B, C, D, and E) is more than 1 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 ( <i>e.g.</i> , medication, alcohol) or another medical condition.	

4.7% (7,8). The most frequently reported traumatic events in the United States are physical and sexual assaults (52% lifetime prevalence) and accidents or fires (50%) (9). In over half of cases, PTSD co-occurs with mood, anxiety, or substance-use disorders (10).

Specific to athlete populations, research suggests a prevalence of PTSD of approximately 13% (11). While not specific to PTSD, a recent systematic review reveals that the prevalence

of mental health symptoms and disorders in current and former elite athletes seems to be slightly higher than in the general population (12). This same trend was recently reinforced by researchers in Australia as well (13). As is the case with the general population, female athletes report higher rates of mental health symptoms than their male athlete counterparts (14,15). So, while not clearly defined, we may be able to approximate from the available evidence that roughly one in

eight elite athletes may suffer from diagnosed or undiagnosed PTSD, with a greater number of female athletes affected than male athletes.

## Barriers to Care

### A Complex Diagnosis

One of the most critical barriers to addressing PTSD in athletes is simply defining the problem. PTSD is an extremely heterogeneous condition. Using DSM-5 criteria, there are more than 636,000 possible combinations of symptoms that qualify for the diagnosis of PTSD. For comparison, major depressive disorder has only 227 possible combinations (16). For clinicians and patients alike, this heterogeneity of PTSD complicates how to determine which treatments are effective. If those suffering from the effects of trauma do not believe there is a helpful solution, they may not truthfully answer symptom questionnaires or even seek care in the first place (17). On the other side of this complexity problem are the countless undiagnosed individuals in need of mental health care who fall short of DSM-5 criteria for PTSD despite suffering from significant posttraumatic symptoms (18). Based on DSM-5, there are more than 100,000 combinations of PTSD symptoms that do not meet full diagnostic criteria despite having one or more symptoms in all categories (16).

### Barriers Unique to Athletes

There are characteristics unique to the elite athlete environment which may serve as significant barriers to prevent the proper diagnosis and treatment of PTSD, or even to prevent athletes from seeking appropriate care in the first place. Although there has been increasing attention to athlete mental wellness, historically the world of elite sports has been remiss in providing comprehensive solutions to nonphysical injuries. As was nicely summarized by leaders on this topic in a recent publication: “It is our collective view that the relative failure to address mental health in sport over the years has been in part due to prevailing stigma and false misconceptions that athletes have an indestructible psyche” (19).

For the vast array of PTSD symptoms to be considered pathologic, there must be clinically significant distress or functional impairment. This key criterion may be difficult to self-assess for athletes who adhere to rigid training programs, close coaching direction and supervision, and are fully immersed in their sport. Atypical signs and symptoms, such as a sudden onset of reluctance to train with full intensity, avoidance of activities outside of training, or sleep disturbances may be ascribed to other issues (e.g., “overtraining syndrome”) when there may have been a recent case of acute trauma (3). A much more complex issue is identifying symptoms that may be present for years as the result of childhood trauma. If not alerted, an untrained eye may overlook some chronic PTSD symptoms, such as patterns of social isolation or using alcohol to treat anxiety and ascribe them to character flaws or poor teamwork skills. And, as is the case with the general population, athletes also may have to overcome the same barriers to mental health access that result from insurance limitations and challenging availability of some mental health specialists.

Another barrier to mental health care specific to athletes relates to sports performance staff who are critical in helping athletes succeed and accomplish their training goals. While

this may seem counterintuitive, the role of *Sports Psychology* in the care of athletes may unintentionally contribute to a lack of precise diagnosis and treatment of psychopathology, including for those with histories of trauma. The term “sports psychology” can be confusing to many athletes, coaches, and families primarily because there is ambiguity in the titles of sports psychology professionals. *Clinical sport psychologists* are trained in applied areas of psychology, such as abnormal, clinical, and counseling psychology, and are licensed psychologists. In distinction, “educational” or “applied sport psychologists” are titles, which may include mental performance coaches who are not licensed psychologists (20). The APA recognizes *Sport Psychology* as a proficiency acquired after a doctoral degree in one of the primary areas of psychology and licensure as a psychologist. This proficiency does not include those who have earned a doctoral degree in sport psychology but are not licensed psychologists (21). Mental performance coaches or consultants are essential and invaluable members of the sports medicine and performance teams for many athletes, and their role should not be minimized. Certified Mental Performance Consultants® (CMPC) do not typically become licensed psychologists, but are experts in areas such as goal setting, motivation, focus, and concentration. While the CMPC designation signifies the “highest standard of education and training in the psychological aspects of sport science, it does not designate the individual as a ‘sport psychologist’” (22). Requirements for providing psychological services are determined by individual state or territorial licensing boards (22). An unintentional byproduct of this confusing terminology in mental performance roles is that athletes with true psychopathology may believe that they are seeing a clinician skilled in assessing their mental health who may in fact not be a licensed clinician. If mental difficulties are perceived in athletes, coaches may encourage athletes to see the “sports psych.” Mental performance coaches may be able to assist with optimizing the mental aspect of performance and identify obvious mental illness, but they also may overlook true clinical pathology such as underlying major depressive disorder, generalized anxiety disorder, or posttraumatic stress disorder. These different roles are critical for athletes, coaches, and all members of the sports medicine team to understand.

## Recommendations

### Screening

To address PTSD in the athlete population, we must have a system that will identify trauma survivors with ongoing psychopathology, reduce stigma of seeking help, and provide evidence-based standard of care treatments. This article describes systems in collegiate and Olympic/Paralympic sport with the intent of sharing best practices rather than differentiating details of these different systems. The National Collegiate Athletic Association (NCAA) Mental Health Best Practices is a good place to start. In 2016, the NCAA Sport Science Institute and leading mental health organizations across the United States developed (then later updated in 2020) an Inter-Association Consensus Document: Best Practices for Understanding and Supporting Student-Athlete Mental Wellness. *Mind, Body and Sport: Understanding and Supporting Student-Athlete Mental Wellness*, the “Mental Health Best Practices” was developed and endorsed by 25 of the most prominent mental health, medical, higher education, and sports medicine organizations in the U.S. The NCAA Mental

Health Best Practices include the following four main recommendations: 1) clinical licensure of practitioners providing mental health care, 2) procedures for identification and referral of student-athletes to qualified practitioners, 3) preparticipation mental health screening, and 4) health-promoting environments that support mental well-being and resilience (23).

To maximize performance and, at the same time, provide optimal mental health care, the roles of applied sports psychologists and clinical psychologists should be clearly defined for athletes and coaching staff. The staffing required to accomplish both tasks well for a team can certainly be dual-purposed by many gifted sports psychologists who also are practicing clinical psychologists; however, this should be an intentional plan. The NCAA Mental Health Best Practice 1 states, "Formal evaluation and treatment should be conducted by a licensed practitioner who is qualified to provide mental health services. Such licensed practitioners may include the following: clinical or counseling psychologists, psychiatrists, licensed clinical social workers, psychiatric mental health nurses, licensed mental health counselors, and primary care physicians with core competencies to treat mental health disorders" (23). The clinical acumen required of these specialties is essential to assist athletes with trauma histories due to the complexity of presentation, diagnosis, and treatment of PTSD, as detailed above. As experts in this topic reiterate, it is athletic *Leadership* who is key to securing mental health resources and athlete retention (24). The trust required to engage a mental health professional is a critical factor for athletes with post-traumatic stress. In contemporary times, it has become more and more acceptable to publicly speak about one's depression or anxiety; however, for rape survivors or those struggling with the invisible injuries of childhood trauma, there is still a considerable stigma, which prevents many from stepping forward to ask for help. In addition, regarding childhood trauma, many athletes may simply be unaware of the presence of PTSD symptoms, since they are not new but rather ingrained in their behavioral patterns since childhood. This highlights the importance of an effective mental health screening program in elite athletics (25).

Other valuable recommendations for best practices come from the consensus statement developed by the Second International Think Tank on Athlete Mental Health, through an initiative by the International Society of Sport Psychology. In 2019, experts from international sport psychology societies convened to focus on elite athlete mental health in an Olympic/Paralympic cycle to develop practical recommendations for sport organizations worldwide. In the statement's "Recommendations for the Pre-Games phase" we find several key strategies that apply more broadly to all elite athletic populations rather than strictly to Olympic/Paralympic athletes. These include the following: 1) establish a collaborative mental health care team, headed by a mental health officer, with organizational clarity for efficiently and effectively managing athletes' mental health (*e.g.*, confidentiality, eligibility criteria, and referral resources); 2) perform mental health screening early on in the quadrennial with proper follow-up for athletes screening positive for mental health struggles; 3) provide mental health literacy programs for athletes, as well as coaches and all expert support staff and management to reduce stigma, increase early help-seeking, and minimize risk; 4) promote self-care, resiliency, and recovery training for athletes, as well as coaches and expert support

staff and management; and 5) establish healthy, sustainable, compassionate, and psychologically safe sport environments that emphasize support, allow time for recovery, and reduce unnecessary stress (26).

Again, highlighted here is the importance of an effective mental health screening program for Olympic/Paralympic athletes. A potential pitfall comes with determining which mental health screening tools to utilize for a busy elite athlete population. To minimize time requirements for athletes to complete mental health screening tests, sports organizations may opt for broad tools to screen for common issues, such as depression and anxiety. In these cases, suspicion for a PTSD diagnosis would rely on overlapping symptomatology followed by more specific patient-reported symptom questionnaires, such as the validated PTSD Checklist for DSM-5 (PCL-5). The PCL-5 is a 20-item questionnaire, corresponding to the DSM-5 symptom criteria for PTSD, which takes about 2 min to complete (27). Alternatively, physical symptoms, such as insomnia, may serve as a marker for underlying mental health issues and may allow for further evaluation of symptoms (28). Regardless, to screen effectively for mental health issues such as PTSD in athletes, the screening system requires clinical acumen by the clinicians reviewing the results. A hybrid model of care which combines traditional face-to-face approaches along with innovative digital technologies may be helpful in early screening and intervention strategies (29). In the past year, the International Olympic Committee (IOC) has offered a comprehensive model to help meet these needs. The IOC Sport Mental Health Assessment Tool 1 (SMHAT-1) was developed for sports medicine physicians and other licensed clinicians to assess elite athletes for mental health symptoms and disorders. The SMHAT-1 consists of: 1) triage with an athlete-specific screening tool, 2) six subsequent disorder-specific screening tools, and 3) a clinical assessment by a sports medicine physician or mental health professional (*e.g.*, psychiatrist, psychologist) (30). The SMHAT-1 contains a third-tier screening checklist called "Form 3" which contains an eight-item tool, "Screening 9," for PTSD symptoms. The Screening 9 tool, however, is designed to be used only if further information may be useful after completing the primary six screening tools. While certainly a step in the right direction to identify athletes with posttraumatic stress symptoms, this system will still rely on experienced clinicians with a high degree of suspicion to move beyond the initial SMHAT-1 screening forms and further investigate athletes who may be suffering from PTSD.

## Treatment

PTSD is treatable. Not everyone who experiences trauma develops PTSD, and not everyone who develops PTSD requires intensive psychiatric treatment. Once properly identified, many athletes with PTSD will require professional treatment to recover from psychological distress, which results in functional impairment. A combination of biological and psychological treatments may provide optimal care. Medication can help to control the symptoms of PTSD which, in turn, may allow athletes to participate more effectively in psychotherapy. Selective serotonin reuptake inhibitor (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) may be prescribed to treat some symptoms of PTSD. Other medications may be used to lower anxiety, physical agitation, or treat nightmares and sleep disturbances (2). While not approved

by the Food and Drug Administration for PTSD treatment, several other medications are occasionally used to treat PTSD symptoms. Alpha-1 antagonists, such as doxazosin and prazosin, have been prescribed to treat nightmares, and athletes should be warned about the unintended adverse hypotensive effects especially when beginning treatment (31). The beta-adrenergic receptor blocker propranolol may be used to reduce some somatic symptoms of anxiety, such as tachycardia and sweating, and may be administered prior to trauma memory reactivation to decrease physiological responses (32). With regard to prohibited substance regulations, standard PTSD medications, such as SSRIs and SNRIs, are not prohibited according to the NCAA or World Anti-Doping Agency (WADA) 2021 Guidelines. Propranolol, however, is prohibited according to WADA rules for archery and shooting both in- and out-of-competition and also is banned for other sports, such as golf in-competition only. Likewise, propranolol is found on the NCAA banned substances list for rifle. This underscores the importance of clinicians who prescribe for elite athletes always checking for banned substances by individual sport against the most recent published guidelines (33,34).

Many physical manifestations of PTSD, such as agitation and hypervigilance, serve as barriers to effective psychotherapy. Several predictors of poor PTSD treatment trajectories, such as comorbid depression and substance abuse, are well known. Exaggerated hyperarousal also is an independent predictor of nonresponse to treatment (35). Despite large decreases in symptoms, approximately half of patients completing cognitive behavioral therapy (CBT) for PTSD still manifest clinically significant insomnia, anger, and irritability (36). Arousal/reactivity symptoms can be specifically addressed in a variety of ways (e.g., meditation) (37). Some treatments may have undesirable side effects as with some medications (e.g., benzodiazepines) and can contribute to noncompliance and dropout (38). Other emerging therapies may be useful adjuncts to standard trauma-informed treatment, such as equine therapy or trauma-informed yoga. Stellate ganglion block, an injection of local anesthetic around the cervical sympathetic chain, is another innovative treatment which targets autonomic nervous system symptoms to provide durable relief of hyperarousal symptoms without requiring daily medications (39,40).

According to the 2017 American Psychological Association (APA) *Clinical Practice Guideline (CPG) for the Treatment of Posttraumatic Stress Disorder (PTSD) in Adults*, the expert panel recommends the use of the following psychotherapies/interventions (all interventions that follow listed in alphabetical order) for adult patients with PTSD: CBT, cognitive processing therapy, cognitive therapy, and prolonged exposure therapy. The panel suggests the use of brief eclectic psychotherapy, eye movement desensitization and reprocessing, and narrative exposure therapy. For medications, the panel suggests offering the following (in alphabetical order): fluoxetine, paroxetine, sertraline, and venlafaxine (41).

Again, PTSD is treatable and is best accomplished with a multidisciplinary team of skilled clinicians. Athletes suspected of suffering from PTSD should benefit from sports medicine teams who are educated to identify posttraumatic stress symptoms and resourced appropriately to provide timely standard of care treatments or referrals (42). The American Psychological Society's Guideline on PTSD provides insightful recommendations which apply here to this topic of PTSD in elite athletes:

“The PTSD literature is relatively recent and continues to need much greater “real world” application of findings. Furthermore, while research findings establish the foundation for the evidence-base, its application requires clinical judgment, knowledge of treatment methods and their relative effectiveness, and competence to offer the treatment on the part of the clinician. *It also requires collaborative decision making that takes into consideration the unique needs and preferences of the patient including his or her contextual and cultural dimensions and the severity and comorbidity of the PTSD*” (41).

## Conclusions

With an estimated one in eight elite athletes suffering from invisible injuries of trauma, sports medicine professionals should be aware of available systems to assist with screening for PTSD. Because of pitfalls in access to care and its complex presentation, PTSD can be a challenge to diagnose and adequately treat in elite athletes. Best practice models exist in elite sport for screening mental health issues in athletes. Treatment of PTSD in the athlete population does not differ significantly from trauma-informed treatment in the general population, but should consist of a fusion of biological and psychological therapies. PTSD is treatable. No athlete should have to suffer in silence.

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