

activities, member sought acute care, causes neurological dysfunction, or requires medication above simple analgesics.⁷ Migraines with aura and scotoma are considered not waivable.⁷ Waiver consideration factors include frequency, predictability, severity, history of incapacitation, treatment required, type of aircraft, flight hours, experience, diagnosis, and the flight class of the aviator.⁷

The U.S. Army considers migraines disqualifying, while headaches may also be disqualifying, depending on whether or not the headaches are primary or secondary to an underlying condition and if the headaches pose a risk to flight safety.⁸ Waiver consideration requires a neurology consult, an aeromedical summary detailing history, timing, frequency, triggers, medication required, and any imaging required.⁸

The Federal Aviation Administration (FAA) has an algorithm to determine whether aviation medical examiners can issue medical certificates for migraines and chronic headaches.² If a candidate meets all the requirements, the aviation medical examiner can issue a medical certificate; otherwise, evaluation by the FAA for a special issuance is required.² Ocular and complicated migraines require an FAA decision.²

The aeromedical concerns of headaches and the reason a waiver is necessary are an important discussion. The main concern with an incapacitating headache is the potential for recurrence and the negative effects this could present to operational effectiveness and mission safety.⁵ This is of particular concern if the headache is incapacitating and/or associated with visual symptoms, vomiting, or vertigo.⁵ Single seat operators are of particular concern, but in reality any crewmember affected would be of significant concern.⁵ Increasing the difficulty and concern are the inability to precisely predict the onset of headaches and the potential to strike at any time.⁵

After appropriately medically treating the airman, he returns to you in a week. He informs you the symptoms have completely abated and he would like to proceed with the waiver process. After discussion with leadership, since this is the patient's first headache, you decide to observe the patient for 4 mo to see if there is any reoccurrence of the headache. You also discuss with the patient the importance of lifestyle modification, while also paying close attention to sleep, exercise, dietary habits, and life stressors, particularly if another headache occurs.

After the 4 mo, the airman returns for a follow-up and to initiate the initial waiver process. He states over the past 4 mo he has not had any reoccurrence of the headache. He also mentions that he has worked to improve his sleep hygiene, diet, and exercise program. He states that work is still stressful but feels that he is better able to handle the stress. He is eager to return to flight status. He is not taking any medications and his physical exam, including a complete neurological exam, is all within normal limits. The waiver was written and submitted, and

within a few weeks the waiver was approved. The airman was able to return to flight status.

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You were the flight surgeon on duty when a 36-yr-old airman came in for his postdeployment health assessment. He was a navigator and electronic warfare officer (EWO) with 2600 flying hours and 14 yr of service. He told you that during his first week of the deployment, he was flying as an EWO and his aircraft was called to the crash site of an F-16 in which the pilot was killed. The following month his team was

called to the scene of a cargo plane fatal mishap during takeoff that killed all the aircrew. He described those as the worst days of his life after witnessing the crash sites via video feed. He had no other complaints and appeared fine during the interview. You cleared him and

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informed him that help was available, if needed, from the clinic, Military OneSource, and the chaplain.

During his next deployment a year later, he was flying on a C-130 when they experienced near controlled flight into terrain. "Terrain" warnings went off and the pilot pulled back hard to avoid collision with the ridgeline. There was no aircraft damage or personal injuries and they continued the mission with no incidents. Although as the navigator he was not found at fault following an investigation, he carries some guilt about this because he had assured the crew they were all right at that altitude 15 min prior. He had disturbing and intrusive memories about this close-to-crash experience and self-blame. He avoided contact with other navigators and information about aircraft mishaps, was self-isolated, and showed decreased interest in squadron activities. Most notably, this led to decreased trust in his fellow crewmembers and difficulty sleeping at night. On the job, he responded with increased hypervigilance in the aircraft by taking on other crew position duties and listening in on all radio calls.

You saw him again for a postdeployment health assessment following the second deployment. This time he expressed concerns about flying and you noticed changes in his mood. You referred him to mental health for evaluation. He scored 13 on the Patient Health Questionnaire and was diagnosed with adjustment disorder with anxiety and depressed mood. He received several sessions of psychotherapy and reported feeling better after four sessions of treatment in less than 60 d, mainly by learning some new breathing techniques. You returned him to flying status with no waiver required.

Over the next 2 yr he performed adequately, including being handpicked for a squadron commander executive officer position followed by flight commander for the Command Support Flight. He noted that he was "burning the candle at both ends" (first person in the office, last person out) and still flying once a week. He maintained adequate function until he was assigned as an instructor for multiple aircrew positions, flying 3–5 sorties a week. It was during this period that he started having flashbacks to the near-miss events. He was aware, during this time, of being easily angered at home and having difficulty talking with his wife about his deployed experiences and feelings about flying. He also noted increasing fatigue, lightheadedness, difficulty concentrating, and early arousals from sleep. Upon waking from a night's sleep, even though he did not remember his dreams, he often woke with an increased heart rate and perceived rapid thought. He started to regularly drink beer on the weekends to cope with these negative feelings.

These symptoms became noticeable to others and their concerns resulted in an overnight local inpatient admission with workups by psychiatry, cardiology, and neurology. Workups including cortical stimulation, computed tomography and magnetic resonance imaging of the brain, and tilt table testing were unrevealing. Endocrinology and immunology workups were also unremarkable. With normal cardiac workup including transthoracic echocardiogram and normal neurological exam, he was discharged and instructed to follow up with mental health.

Today, at 16:00, you get a call from mental health telling you that your airman has been diagnosed with posttraumatic stress disorder (PTSD) related to his deployment experiences.

1. What are the diagnosis criteria for PTSD according to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition?

- A. Direct or indirect exposure to a trauma event.
- B. Intrusive thoughts, nightmares, or flashbacks pertaining to a traumatic event.
- C. Avoidance of trauma-related stimuli.
- D. Overly negative thoughts and assumptions about oneself or the world.
- E. Trauma-related arousal, hypervigilance, or difficulty concentrating.
- F. All of the above.

ANSWER/DISCUSSION

1. F. In 2013, the American Psychiatric Association revised the PTSD diagnosis criteria in the fifth edition of its Diagnostic and Statistical Manual of Mental Disorders.¹ It emphasizes that symptoms such as flashbacks/nightmares, avoidance, and insomnia lasting more than a month and creating functional impairment in a person without other illness or using medications are critical in diagnosing PTSD.

Like physical injury, psychological trauma is widely seen among young airmen, seasoned soldiers, and in all ranks in different wars.¹² Although the mechanism is unclear, it is believed PTSD is a physical manifestation of an internal emotional disturbance resulting from experiencing an unprecedented life event or graphic scene, or repetitive exposure to such. In the context of war, emotional injuries may stem from direct participation in acts of combat, such as direct or indirect killings. Besides combat exposure, four prewar vulnerability factors have the highest risk for PTSD onset: childhood physical abuse, conduct disorder, preexisting psychiatric disorder, and family history of PTSD.¹¹

Not all soldiers exposed to the same trauma event will develop PTSD.¹¹ Resilience is the most common reaction to traumatic events. For those who react to traumatic events with PTSD, combat exposure plays a more important role in the onset of PTSD and prewar vulnerability factors have a greater influence on the persistence of the disorder over time. It is noted that soldiers with severe combat exposure have a higher likelihood of both onset and long duration of the symptoms.¹¹

Among all the symptoms of PTSD, avoidance behavior and sleep disturbance are most likely to affect job performance and physical functioning. People with PTSD have a higher rate of substance abuse and alcohol use itself is a common avoidance behavior. These findings are specifically demonstrated in this aviator, who started to regularly drink on weekends to cope with the symptoms.

2. What treatment do you offer the airman?

- A. Prolonged exposure (PE) therapy.
- B. Dialectical behavior therapy.
- C. Medications (selective serotonin reuptake inhibitors or serotonin and norepinephrine reuptake inhibitors).
- D. A and C.
- E. All of the above.

ANSWER/DISCUSSION

2. D. Given the scope and disabling nature of PTSD, much work has been done to identify effective treatment options. There is a convincing

role for psychotherapy in the management of PTSD. The most studied modalities include PE, trauma-focused cognitive behavioral therapy or cognitive processing therapy (CPT), and eye-movement desensitization and reprocessing. The Department of Defense (DoD) and Veterans Affairs (VA) have policies that recommend that all service members and veterans who have PTSD receive evidenced-based psychotherapy as first-line treatment.^{7,19}

The mainstay of pharmacological treatment in PTSD is administration of selective serotonin reuptake inhibitors or serotonin norepinephrine reuptake inhibitors such as venlafaxine. Prazosin has shown efficacy in treating the specific nightmare symptom of PTSD but is not recommended for monotherapy. Studied to a lesser extent were monoamine oxidase inhibitors, tricyclic antidepressants, and the atypical antipsychotics olanzapine and risperidone, which demonstrated some efficacy, but overall insufficient evidence in treatment of symptoms.^{4,15}

The local psychiatrist recommended PE therapy plus Prozac,⁷ which led to excellent results. The airman only had one episode of lightheadedness after this therapy was initiated. He cross tapered from Prozac to Celexa 6 mo ago for waiver consideration and had no significant symptoms or side effects. He had some increase in depressive symptoms when his brother suddenly died, but he noted using his CPT skills and improved baseline to manage his response. He has been stable for the past 6 mo.

In total, the airman finished 26 sessions of PE and CPT therapies and feels great. It has been more than 6 mo since the member reached his baseline duty performance and he sleeps well. He denies flashback and nightmares and is actively involved in all unit and family social activities. No other pathologies or mental comorbidities have developed. Importantly, he has his commander's support, demonstrates superb job performance in the unit, and has regained his wife's understanding and emotional support. His unit eagerly wants him to go back to flying status. His mental health team has also cleared him. You check the Air Force Waiver Guide and are comfortable with the aviator's condition and are ready to write the waiver to support the member, pending Aeromedical Consultation Service (ACS) evaluation, a critical step toward his returning to EWO duty.

A week after you send the waiver package to the major command, the member receives a call for an in-house evaluation at the ACS. In preparation of the waiver package, you review the literature about PTSD. You share what you learned at the professional staff meeting.

3. What is the prevalence of PTSD in the military vs. the general population?

- A. In the military following combat 14%.
- B. In the military following combat 7%.
- C. In the civilian population 7%.
- D. In the civilian population 14%.
- E. A and C.
- F. B and D.

ANSWER/DISCUSSION

3. E. More than half of all individuals will be exposed to a traumatic event over the course of their lives.² In the U.S. military, many service

members develop PTSD following combat exposure. In 2008, the RAND Corporation Center for Military Health Policy Research published a population-based study that examined the prevalence of PTSD among previously deployed Operation Enduring Freedom and Operation Iraqi Freedom (Afghanistan and Iraq) service members.¹⁷ Among the 1938 participants, the prevalence of current PTSD was 13.8%. Data from the DoD and VA show that in 2011, 24.4% of all Operation Enduring Freedom and Operation Iraqi Freedom veterans who used VA health care had a diagnosis of PTSD.⁶

In the civilian population, according to the National Comorbidity Survey Replication, the estimated lifetime prevalence of PTSD among American adults is 6.8%,⁸ making it one of the more common psychiatric disorders, after anxiety, depression, and obsessive-compulsive disorder. It affects 15–24% of people exposed to a traumatic event. Traumatic events precipitating PTSD include interpersonal violence such as rape, natural disasters, exposure to life-threatening mishaps, and others.⁸

Due to high prevalence, the VA and DoD have formed specific committees and work groups to standardize diagnosis and treatment plans.⁷ It should be noted that some factors, such as marital and relationship difficulties, job stress, and hard financial situations, may also influence the development or recurrence of PTSD; thus, several approaches may be needed to help people suffering from PTSD.

4. What other PTSD treatments are currently being researched?

- A. Deep brain stimulation (DBS).
- B. Repetitive transcranial magnetic stimulation (rTMS).
- C. Practice of resilience and social support.
- D. All of the above.

ANSWER/DISCUSSION

4. D. Currently, the mainstream treatment for PTSD is PE and CPT. Various other treatments have been suggested, and DBS is currently under investigation for patients affected by PTSD.^{9,10} DBS is used to treat a variety of neurological and psychiatric diseases, including movement disorders, obsessive compulsive disorder, and refractory major depression.

It should be pointed out that practice of resilience and social support have been recognized as a way to increase soldier well-being. Straus et al. examined social connectedness and resilience among U.S. veterans (using data from the National Health and Resiliency in Veterans Study) with PTSD and concluded that social support and resilience may be important targets for prevention and treatment efforts.¹⁶

Recent clinical trials and studies using rTMS have also produced some promising results in the evolution of treatment for PTSD.^{3,14} Currently, rTMS is cleared by the Food and Drug Administration as a neuromodulating method only for severe depression and migraine headache.³ There is an ongoing study at Tinker Air Force Base as well as MacDill Air Force Base using rTMS to treat war veterans suffering from PTSD.²¹ It is expected that this alternate treatment may improve the quality of life for persons with PTSD and help service members continue their military career. Given that PTSD in combat veterans may be more resistant to both pharmacological and nonpharmacological approaches

than noncombat PTSD, the research progress in DBS and rTMS in treatment of PTSD is highly anticipated.

During the meantime, the ACS completed its evaluation of this aviator.

5. What is the ACS's likely recommendation after completion of assessment?

- A. Return to flying status.
- B. Disqualify and discharge from military service.
- C. Return to flying status with modification.
- D. Disqualify and continue military service.
- E. None of above.

ANSWER/DISCUSSION

5. D. Your aviator was given a full evaluation by a staff psychiatrist at the ACS at the U.S. Air Force School of Aerospace Medicine, Wright-Patterson AFB, OH, and completed a battery of psychological tests. He presented as an earnest, forthright officer with a willingness to return to flying status. However, there were several inconsistencies in his reporting, collateral data, and psychological testing that indicated ongoing problems with his symptoms and vulnerability. It is known among experts that residual emotional withdrawal persists even during remission.

There were several issues that raised concerns about this aviator's ability to safely complete a mission as a member of a crew. In the controlled environment of the evaluation, he had notable emotional responses/flashbacks while discussing several killing-related scenarios, and this underscored his vulnerability. Furthermore, when specifically challenged with facing stressors like his previous EWO experience, his vulnerability and lack of stability became apparent.

A highly experienced and valuable trained asset, your EWO's abilities and grit are not in question. The issues which concerned the staff at the ACS were his considerable vulnerabilities and, potentially, his lack of stability in the aerospace environment. He has participated in substantial treatment and has likely reached maximum benefit at the local base. Further improvement with more treatment is unlikely in the opinion of the ACS psychiatrist. Although he has had successes and apparent superior performance in duty not involving flying and has commander and local support, the aeromedical risk of returning him to aircrew duties is judged as unacceptably high. Therefore, ACS recommended disqualification for Flying Class II duties secondary to PTSD, with significant negative distortions and severe depressive episodes, improved, but with persistent residual symptoms.* The waiver authority agreed with the recommendation and disqualified your patient.

AEROMEDICAL DISPOSITION

Perhaps you are disappointed by the waiver authority's decision, but you should not be surprised by it. The Air Force, Army, Navy, and Federal Aviation Administration (FAA) have their own approaches to

aviators with PTSD in terms of aeromedical disposition. When traumatic memories of combat are triggered, aviators with PTSD can physically respond with symptoms including headaches, tachycardia, arrhythmia, profuse perspiration, or even fainting. These symptoms can incapacitate the aviator, which is the most severe consequence that all services want to avoid at great length.

The Air Force Waiver Guide emphasizes only granting a waiver if the aviator is not at risk of sudden incapacitation during a mission.²⁰ The moderate to severe risk of vulnerability provides the rationale for ACS's recommendation to disqualify your pilot. For this reason, all three services require a waiver for history of PTSD. Army aviators must be symptom free for 3–4 mo before applying for a waiver, the least stringent duration requirement among all three services.¹⁸ The Navy is more consistent with the Air Force Waiver Guide, not considering disqualification for episodes lasting up to 60 d and requiring a waiver (aeromedical summary plus all supporting documents) after that time period.¹³ However, unlike the Air Force and Army, Navy aviators with PTSD must be symptom free for 12 mo prior to applying for a waiver.¹³ As for the FAA, PTSD is not mentioned specifically in the FAA's Guide for Aviation Medical Examiners, but it would fall under "other personality disorder, neurosis, or other mental condition."⁵ Such illnesses would be a case-by-case determination based on the qualified Aviation Medical Examiner's medical judgment with approval from the Regional Flight Surgeon or Federal Air Surgeon (Silberman W. Personal communication; 2017 Dec. 29).

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