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Combat and operational stress reaction

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INTRODUCTION

Military personnel who deploy to combat zones will experience some degree of combat and operational stress. Reactions to these stressors can affect individuals in a number of domains: physiologic, emotional, cognitive, and behavioral.

Combat and operational stress reaction (COSR; or combat stress injury) is a term used to describe the wide range of anticipated, maladaptive psychological and behavioral symptoms, often transient, that may emerge in response to these stressors following exposure to combat or other particularly stressful military operations.

The epidemiology, pathogenesis, clinical manifestations, course, diagnosis, prevention, and treatment of COSR are described here. The epidemiology, pathogenesis, clinical manifestations, course, diagnosis, prevention, and treatment of psychiatric disorders related to stressful experiences, acute stress disorder, posttraumatic stress disorder, and other psychological sequelae of military combat are discussed separately.

- (See "[Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis](#)".)
- (See "[Acute stress disorder in adults: Treatment overview](#)".)
- (See "[Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis](#)".)
- (See "[Posttraumatic stress disorder in adults: Treatment overview](#)".)

- (See ["Posttraumatic stress disorder in adults: Psychotherapy and psychosocial interventions"](#).)
 - (See ["Medical care of the returning veteran"](#), section on 'Psychological sequelae'.)
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DEFINITION

Combat and operational stress reaction (COSR) is a term used by the United States Army to describe the wide range of maladaptive mental and behavioral symptoms that can emerge in response to combat. The COSR designation is limited to individuals with COSR symptoms during the 72 hours from their onset or identification. (See ["Clinical manifestations"](#) below.)

The effects of battlefield stress on military personnel have been recognized throughout the history of warfare. Older terms to describe the syndrome include “shell shock” [1,2], “soldier’s heart” [3], “battle fatigue” [4], and “psychoneuroses” [5]. The United States Army adopted the term “combat stress reaction” to describe the syndrome in 1999, which was later revised to “combat and operational stress reaction (COSR)” [6].

Individuals are classified as experiencing COSR independently of whether or not they meet criteria for a psychiatric disorder. COSR differs from a psychiatric disorder in several ways:

- A psychiatric disorder is diagnosed using criteria that specify the signs, symptoms, behaviors, and levels of impairment that must be present to make a diagnosis; there is no threshold number or severity of symptoms that establish the presence of COSR.
 - The United States Army does **not** consider COSR to be a psychiatric or medically diagnosable condition. COSR is not included in any version of the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM) [6] or the International Classification of Disease (ICD). (See ["Overlap with psychiatric and medical conditions"](#) below.)
 - If symptoms persist beyond 72 hours (or are clearly representative of a disease or psychiatric disorder), the service member should be evaluated for a psychiatric disorder or medical illness and provided with appropriate treatment.
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EPIDEMIOLOGY

Combat and operational stress reaction has been described as highly prevalent in military populations in combat environments [4]. There are no published data on the prevalence of the

syndrome or the proportion of service members in combat who receive the designation.

PATHOGENESIS

The pathogenesis of combat and operational stress reaction (COSR) is unknown. The emotional and behavioral symptoms of a COSR-type response to traumatic stress may be related to neurobiologic processes believed to underlie acute stress disorder and posttraumatic stress disorder (PTSD) [7]. (See ["Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis"](#), section on 'Pathogenesis' and ["Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis"](#), section on 'Pathophysiology'.)

Conceptual framework — Military personnel may experience combat stress in response to:

- **Combat stress** – Distressing events that are a direct result of use of deadly force with an enemy such as:
 - Attacks
 - Personal injury
 - Killing combatants
 - Witnessing death and injury
- **Operational stress** – Distressing operational conditions associated with military operations such as:
 - Prolonged exposure to extreme environments
 - Prolonged separation from usual family and community
 - Austere living conditions
 - Demanding work hours; sleep-wake cycle disruption
 - Prolonged exposure to threatening environments

The United States Army describes these stressors collectively as combat and operational stress.

- **Responses to combat and operational stress** – Responses to combat and operational stress occur along a continuum of expectable transient and adaptive reactions to more prolonged and significant reactions that cause impairment to new or reactivated psychiatric illness ([figure 1](#)).

Adaptive responses to combat and operational stress can include behaviors such as [8]:

- Strengthened interpersonal bonds among peers within the unit
- Enhanced group identity as overcoming shared adversity, whether failures or accomplishments
- Increased trust and confidence in leaders
- Increased confidence in personal abilities and abilities of others

Adverse responses to combat stress, or COSR, include signs, symptoms, maladaptive behaviors, and impairment. Adverse effects of combat stress on service members manifest in several domains of functioning: physiologic, cognitive, emotional, and behavioral [4,9]. (See '[Clinical manifestations](#)' below.)

- **Development over time** – A military deployment can be thought of as having distinct phases, each with predictable stressors and common responses in service members over time:
 - Predeployment phase:
 - Boredom
 - Anticipatory anxiety
 - Initial phase of deployment:
 - Fast-paced operations
 - New environment, unknown threats
 - Marked anxiety
 - Middle phase of deployment:
 - Homefront concerns
 - Sense of mastery or being “in the groove”
 - Final phase of deployment:
 - Stressful if delay in leaving
 - Complacency in routine tasks
 - Anxiety over injury or death close to departure
 - Homecoming:
 - Family readjustment

- Grief for loss of unit camaraderie
- Accepting or processing losses sustained during deployment
- **Possible risk factors** – The psychological response to combat and operational stressors is variable. Factors postulated to increase the risk for COSR include [10-12]:
 - History of mental disorders/substance use problems or disorder
 - Nonmilitary stress (eg, family or other relational problems)
 - Prior combat exposure
 - Length of exposure to combat or operational stress
 - Severity of combat or operational exposures
 - History of traumatic events (related to combat or noncombat, such as childhood abuse or sexual assault)
 - Lack of unit cohesion/morale
 - Lack of faith in leadership
 - Inadequate training

It has been proposed that a higher risk of developing COSR may be associated with the number of a service member's risk factors, their intensity, and the duration of the period of exposure to stressors [13]. This has not been shown to be true; however, a greater number of combat exposures have been shown to correlate with increased PTSD [14].

CLINICAL MANIFESTATIONS

Combat and operational stress reactions (COSRs) are varied in both manifestations and severity. COSR can present in several domains: physiologic, mental, emotional, and behavioral [4,9]. Signs and symptoms include [10,12]:

Physiologic

- Exhaustion
- Inability to sleep
- Somatic signs (eg, sweating, palpitations, nausea)
- Trembling
- Numbness of extremities
- Tingling of extremities
- Total loss of function in limbs or body parts

Cognitive

- Inability to make decisions or process information
- Difficulty concentrating
- Nightmares
- Memory loss
- Flashback
- Loss of reality testing/sense of what is real
- Self-doubt/loss of confidence
- Apathy

Emotional

- Worry
- Nervousness
- Irritability
- Anger
- Sadness
- Fear
- Anxiety
- Loss of humor

Behavioral

- Inability to complete tasks, decreased efficiency
- Distractibility
- Carelessness, cutting corners
- Recklessness or invincibility
- Isolation
- Inappropriate aggressive outbursts
- Hypervigilance
- Immobility
- Increased presentation for medical complaints
- Misconduct – May range from minor to serious

COSR may be noticeable as acute behavioral and emotional changes immediately after a particularly stressful event, but COSR may also develop after days or weeks of increased exposure to the rigors of military operations (eg, altered sleep-wake cycles, harsh and austere environments, social isolation).

COURSE

Reports suggest that the course of combat and operational stress reactions (COSRs) is highly variable [9,15]. Many service members have been reported to experience COSR for a self-limited duration of hours to days. Analysis of United States Army data from the first decade of the 2000s found that more than 95 percent of individuals identified as experiencing COSR were subsequently returned to active duty [4,13].

The association between COSR and suicidality is unclear. In terms of the limited data available, particular military occupational specialties with higher likelihood of combat exposure (eg, combat arms, combat medics, and special forces) showed that occupation was not linked to suicide attempt during deployment [16]. This might suggest that the immediate exposure to combat/deployed setting does not seem to confer an acute risk of suicide (though later risk is unknown).

For others, symptoms and associated impairment persist and, in some cases, meet diagnostic criteria for psychiatric disorders such as acute stress disorder (ASD) and posttraumatic stress disorder (PTSD). There is an absence of published data on subsequent rates among individuals identified with COSR of ASD, PTSD, and other psychological sequelae observed in veterans of military combat, including substance use disorders and suicide. (See '[Outcomes](#)' below and "[Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis](#)" and "[Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis](#)" and "[Medical care of the returning veteran](#)", section on '[Psychological sequelae](#)'.)

ASSESSMENT

Recognition is the first step toward management of combat and operational stress reaction (COSR). There are no criteria based on the number, type, or severity, or duration of signs or symptoms that determine the presence or absence of COSR. Service members' peers and supervisors are often the first to recognize COSR. Service members may recognize the emergence of COSR in themselves.

Identifying COSR — COSR occurs within a continuum model. The model is conceptualized to include the following ([figure 1](#)) [17]:

- Ready – Optimal functioning, well trained, and prepared.

- Reacting – Mild and transient distress with irritability, anxiety, poor sleep, poor focus.
- Injured – More severe persistent distress. Higher risk for illness, inability to sleep, persistent shame or guilt, symptoms of panic or rage.
- Ill – Persistent and disabling distress with loss of function. Symptoms often persist over many weeks and may progress. Depression, anxiety, and substance use may be present.

The first step in the identification of COSR occurs at the level of peers and unit leaders. Initial medical assessments are often completed in austere deployment environments, with limited access to mental health providers, presenting challenges for evaluation and initial assistance. A priority is to determine elements of a COSR that require immediate attention as well as elements that may be amenable to simple intervention. (See ['Initial management'](#) below.)

The primary elements of an evaluation include:

- Current symptoms, stressors, and degree of impairment
- Recent losses, injuries, or exposures to traumatic events (eg, firefights or blasts)
- A medical history
- Screening for serious mental illness
- Assessments of safety to self, others, the unit, and the mission

Additionally we assess for the following psychosocial concerns:

- Interpersonal problems
- Living conditions
- Stressors in unit
- Stressors with leadership
- Pace of work
- Current job
- Extent of training for job
- Past deployment history
- Perceived supports in unit
- Psychiatric evaluation including mental health history, substance use assessment, and mental status examination
- Physical examination to rule out medical or neurologic illness
- If a history of head trauma, possibly imaging to rule out traumatic brain injury

The United States Army places an emphasis on the service member's ability to perform their job, as occupational impairment may put others within the unit at risk. Collateral sources can

provide valuable information about a service member's functioning. As an example, the service member's supervisor can often provide information about their job requirements as well as observations of performance and/or impairment.

However, service member concerns about potential stigma can be a barrier to obtaining assistance with a COSR [18], these include concerns that seeking help might harm their career (ie, they may be viewed as weak), or service leaders might lose confidence in them.

Overlap with psychiatric and medical conditions — Numerous psychiatric disorders may initially be classified as COSR. The COSR designation is applied to military personnel with widely varying presentations of signs, symptoms, maladaptive behaviors, or impairments due to combat stress. In contrast, diagnosis of a psychiatric disorder is based on the presence or absence of specific symptoms or behaviors for an established time period that were accompanied by impairment or distress. Psychiatric disorders are diagnosed via a thorough psychiatric evaluation.

Psychiatric disorders that occur as responses to exposure to traumatic events include acute stress disorder, posttraumatic stress disorder, major depressive disorder, and adjustment disorder. These disorders are discussed elsewhere. (See ["Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis"](#) and ["Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis"](#) and ["Unipolar minor depression in adults: Epidemiology, clinical presentation, and diagnosis"](#), section on 'Differential diagnosis'.)

Medical conditions that may need to be distinguished from COSR or identified in patients with the syndrome include:

- Traumatic brain injury (see ["Acute mild traumatic brain injury \(concussion\) in adults"](#))
- Infectious disease
- Dehydration/malnutrition
- Alcohol and other drug withdrawal (see ["Opioid withdrawal in the emergency setting"](#) and ["Benzodiazepine poisoning and withdrawal"](#) and ["Management of moderate and severe alcohol withdrawal syndromes"](#))
- Chemical or nuclear warfare agents and antidotes (eg, [atropine](#)) (see ["Chemical terrorism: Rapid recognition and initial medical management"](#) and ["Management of radiation injury"](#), section on 'Initial management')

INITIAL MANAGEMENT

The aims of management of combat and operational stress reaction (COSR) over the 72-hour period are to promote adaptive stress behaviors and minimize the syndrome's impact. Initial management generally consists of conservative measures; in some cases, these may be accompanied by medication or psychotherapy. (See ['Definition'](#) above.)

For individuals categorized as “reacting” or “injured,” initial intervention occurs within their units and often does not require involvement of medical personnel. For those individuals whose symptoms or impairment persist or are severe, these protocols require medical assessment.

Principles — The initial management of COSR is guided by the principles of brevity, immediacy, contact, expectancy, proximity, and simplicity (BICEPS).

- Brevity – An initial intervention in COSR lasts no more than one to three days.
- Immediacy – The intervention should be initiated as soon as practically possible.
- Contact – Contact or centrality refers to an emphasis on the involvement of the service member's unit leaders in their care, in part to remind the service member that they continue to be part of the unit.
- Expectancy – Steps are taken to normalize the service member's response to stress through:
 - Reassurance that COSR is common and most often transient
 - Encouragement to continue thinking of themselves as a unit member rather as a patient
 - An expectation that they will return to the unit within hours to days
- Proximity – The service member should generally be kept close to their parent unit, and kept separate from medical/surgical patients, to preserve their identity and connectedness to the unit and mission.
- Simplicity – Initial management of COSR focuses on replenishing depleted physiologic reserves through rest and feeding.

Other management principles (consistent with those of psychological first aid) include [\[6,19\]](#):

- Establishing a sense of safety

- Encouraging calming and reduction of physiologic arousal
- Restoring a sense of personal and/or group efficacy
- Restoring a sense of connectedness to others
- Instilling hope

Acute measures — For acute stress reactions such as being “frozen,” detached, or unable to carry out missions, a six-procedure and related training developed by the Israeli Defense Forces and adapted by United States forces to rapidly restore function during operations has been developed. These are peer-based interventions, rapid, and include video instruction designed for use in high-stress situations. The steps are aimed at rapidly restoring orientation to task and include concepts of calming and connectedness [20,21].

Conservative measures — Conservative measures for the individual with COSR include restorative activities such as nutrition, hydration, hygiene, and rest/sleep, as well as communication with supportive individuals in the unit and at home.

The efficacy of these measures in COSR has not been evaluated in published clinical trials. Descriptive reports suggest that in many service members experiencing COSR, symptoms abate within hours to days [6,9,15,22].

Pharmacotherapy — In our clinical experience, short-term benzodiazepines can be useful in cases of intense anxiety, agitation, or sleep disturbance in the immediate period following a traumatic event or in cases where the intensity of the individual’s reaction puts themselves or others in immediate danger. As an example, [clonazepam](#) 0.5 to 2 mg/day in divided doses can be used.

The use of benzodiazepines in this population has not been tested in clinical trials [23]. Given the abuse potential of benzodiazepines, although limited if the medication is prescribed only during the acute postcombat exposure period, some clinicians prefer use of a low-dose atypical antipsychotic, such as [quetiapine](#). Experience with quetiapine for COSR is even more limited than with benzodiazepines.

If a service member treated with a psychotropic medication for a COSR returns to active duty, the effect of the medication on their work responsibilities (in particular, tasks such as guard duty, driving, and handling weapons) should be evaluated.

Persistent symptoms — United States Army protocol calls for reassessment of individuals with persistent symptoms, behaviors, or impairment for the presence of medical conditions or psychiatric disorders after 72 hours [10]. In some cases, this evaluation can be done onsite, while in others an evaluation may only be available at facilities removed from the operational

frontline. Personnel who are returned to duty following the assessment have ongoing access to resources including unit support, chaplains, and medical and psychiatric care. (See ['Assessment'](#) above and ['Overlap with psychiatric and medical conditions'](#) above.)

Restoration centers — In some instances, individuals whose symptoms do not promptly resolve with conservative measures may be evacuated from the immediate front lines to restoration centers. These centers are staffed with mental health personnel and offer comprehensive assessment, brief intensive psychotherapy, and occupational therapy services. The goal of these centers is to assist individuals experiencing more complicated stress reactions, including acute stress disorder, to return to duty or facilitate their evacuation from the combat zone [24]. (See ["Acute stress disorder in adults: Epidemiology, clinical features, assessment, and diagnosis"](#).)

OUTCOMES

Studies in conflicts occurring in the 2010s offer some data on the near-term outcomes of individuals with combat and operational stress reaction (COSR). In a prospective study of 1640 army service members who presented for outpatient mental health care while deployed to Afghanistan, outcomes were as follows [25]:

- Ninety-three percent were given a psychiatric diagnosis.
 - 26 percent were noted to have COSR
 - 24 percent an adjustment disorder
 - 9 percent other mild/moderate Axis I disorders
 - 8 percent other anxiety disorders
 - 6 percent major depressive disorders
- Sixty percent of users given a diagnosis had a severity rating of none, mild, or moderate. Thirty-eight percent were classified as severe.
- Over 80 percent subsequently returned to full duty with no restrictions. Eighty-two percent returned without duty limitations; an additional 10 percent were returned with temporary limitations.
- Less than 7 percent were evacuated, either due to symptoms placing the individual or others at high risk, or due to persistence of significant symptoms despite intervention.

Long-term outcomes of individuals experiencing COSR have not been extensively studied.

Rates of posttraumatic stress disorder (PTSD) among military personnel subsequent to combat, along with the treatment of PTSD, are described separately. (See ["Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis"](#), section on 'Combat' and ["Posttraumatic stress disorder in adults: Epidemiology, pathophysiology, clinical features, assessment, and diagnosis"](#) and ["Posttraumatic stress disorder in adults: Treatment overview"](#).)

PREVENTION

Primary prevention involves monitoring, identifying, modifying, avoiding, or reducing stressors before they result in dysfunction [26]. Although not formally evaluated for effectiveness, United States army practices with potentially preventive effects include:

- Predeployment preparation and training to promote cohesion and self-efficacy
- Appropriate management of sleep-work cycles by leadership
- Adequate resources for nutrition and hydration accompanied by encouragement/reminders to utilize these resources
- Continuous engagement by behavioral health personnel assigned to Combat Stress Control Units with deployed units they support

To identify service members who may be at higher risk for either combat and operational stress reaction or psychiatric disorders, the United States Army conducts routine, predeployment screenings of military personnel prior to deployment through medical record review and questionnaires.

SUMMARY AND RECOMMENDATIONS

- **Definition** – Combat and operational stress reaction (COSR) is a term used by the United States Army to describe the wide range of maladaptive mental and behavioral symptoms that can emerge in response to combat. The United States Army does not consider COSR to be a psychiatric or medically diagnosable condition.

Individuals are classified as experiencing COSR independently of whether or not they meet criteria for a psychiatric disorder. COSR is not included in any version of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Disease (ICD). The COSR designation is limited to

individuals with stress-related symptoms, behaviors, or impairment for the first 72 hours from onset or identification. (See ['Definition'](#) above and ['Assessment'](#) above.)

- **Clinical symptoms** – COSR has a highly variable presentation. Symptoms can present in several domains: physiologic, mental, emotional, and behavioral. Symptoms overlap with those seen in acute and posttraumatic stress disorder (PTSD) but reflect a much wider range of types and intensities. (See ['Clinical manifestations'](#) above.)

COSR may be noticeable immediately after a particularly stressful event or may develop after days or weeks of increased exposure to the rigors of military operations (eg, altered sleep-wake cycles, harsh and austere environments, social isolation). (See ['Clinical manifestations'](#) above.)

- **Course** – Many service members experience COSR for a self-limited duration of hours to days. For others, symptoms and associated impairment persist and, in some cases, meet diagnostic criteria for psychiatric disorders such as acute stress disorder and PTSD. (See ['Course'](#) above.)

The association between COSR and suicidality is unclear. Military occupational specialties with a higher likelihood of combat exposure (eg, combat arms, combat medics, and special forces) are not linked to suicide attempt during deployment. This suggests that the immediate exposure to combat/deployed setting does not seem to confer an acute risk of suicide. Later risk, however, is unknown.

- **Assessment** – United States service members with COSR are categorized as reacting, injured, or ill. For individuals categorized as “reacting” or “injured,” initial intervention in the army occurs without involvement of medical personnel, and generally consists of conservative, restorative activities such as nutrition, hydration, hygiene, and rest/sleep, as well as communication with supportive individuals. (See ['Assessment'](#) above and ['Initial management'](#) above.)

Service members with COSR who are categorized as ill (ie, more severe) require medical assessment, which in frontline units may require separation from the individual’s unit. (See ['Assessment'](#) above.)

- **Management** – Short-term benzodiazepines are used adjunctively to treat individuals who experience COSR that includes intense anxiety, agitation, or sleep disturbance in the immediate period following a traumatic event. (See ['Pharmacotherapy'](#) above.)

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