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Operator syndrome: Nursing care and considerations for military Special Operators

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Abstract: Operator syndrome is a common and predictable constellation of interrelated medical and psychiatric conditions and social and functional impairments experienced by special operations forces. Nurses in all settings should be aware of this emerging trend among veterans they encounter in practice so they may identify and intervene using evidence-based approaches and effect a positive outcome.

Keywords: blast exposure, interventions, nursing assessments, Operator syndrome, OS, special operations forces, SOF

From ED visits to primary care appointments, nurses in the US encounter active-duty and veteran service members in everyday practice. Many veterans seek care outside of the military healthcare system, including accessing EDs and other acute care settings.[1]

Operator syndrome (OS) is a predictable and prevalent constellation of symptoms that cause severe health, social, and functional impairments among military Special Operations Forces (SOF).[2]

OS was first identified among the individuals who comprise military SOF units, who are called Operators.[2] These units are the military's most elite and lethal instruments of war and national security.[3] Famed units such as US Army Green Berets, Navy SEALs, Marine Raiders, and Air Force Pararescue are SOF units. Operators are trained to ignore potentially serious injuries and health symptoms and persist in the face of extreme adversity[4,5]

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to complete missions and training evolutions.

Often, Operators maintain this pattern in their personal and post-military lives. Their high operational intensity, fast-tempo career leads to overwhelming stress overload: a devastating, chronic burden of stress, injuries, and blast exposure that may precipitate predictable and severe functional and health impairments over time.[1]

While all service members may experience similar stressors, these stressors produce a specific pattern of impairments among SOF.[2,5,6,7]

Case study

JF was a 42-year-old male who arrived by ambulance at a local ED in Delaware following a motor vehicle crash. The airbag had deployed, and he was disoriented on the scene. Since arriving in the ED, he had been alert and oriented to self, place, time, and situation (AOx4) and had complained of head, neck, and left hip pain. He appeared physically fit and was casually dressed.

While rooming him, the nurse learned JF was a paramedic who lived a few hours away and in town visiting his mother and children. He is divorced, and his two children live with his ex-wife nearby. He stated: "She says I am angry all the time. I probably am."

He recently retired from the Navy after 23 years of service. Upon further investigation, the nurse learned that he was a former enlisted Navy Sea, Air, and Land (SEAL) Teams medic and he had deployed "a few times." Although he had been AOx4, he was easily distracted during the conversation, which he said had been his baseline "since maybe 15 years ago." He stated, "I'm exhausted all the time. I got out when I couldn't keep up anymore. I still can't sleep." He reported sleeping 4 or fewer hours most nights for the past 15 years. "Nothing helps. I fall asleep like normal, but I'm up within 4 hours and can't go back to sleep." He reported consuming several energy drinks daily (between two and four most days) and chewing tobacco daily to stay alert. He also reported having two to three beers most evenings, "usually a few more on days off."

JF had reported a right hip replacement in 2023 due to "wear and tear in the [SEAL] Teams," and chronic pain in the right hip, lower back, and right shoulder. When asked about other injuries, he stated: "I probably had a few head injuries, but nothing official. I was too close to breach scenes [ordinance explosive blasts] on missions a few times. Rung my bell. I bled from my nose and ears."

Upon assessment, the nurse noted early stages of ecchymosis apparent on the left side of his body, as well as scarring on his right hip consistent with a hip replacement. Several scattered scars were on his upper back and right shoulder from shrapnel.

JF's lab results included a blood glucose of 287 mg/dL (normal, 70-99 mg/dL), despite having had nothing but water for the past 8 hours, and his A1C was 8.1% (normal, less than 5.6%).[9] His testosterone was 11 ng/dL (normal, 291-1,100 ng/dL).[9] He had denied any knowledge of his high A1C. When asked about his low testosterone level, he reported that he had taken sildenafil as needed for erectile dysfunction, which he had for at least 9 years.

His patient health questionnaire (PHQ-9) and generalized anxiety disorder scale (GAD-7) scores reflected that he was moderately depressed and anxious, and his alcohol use disorders identification test (AUDIT) score reflected hazardous drinking but not dependence. JF reported, "I get stuck on dark thoughts a lot." When asked if he had thoughts about harming himself or others, he said: "I've lost friends to suicide. I don't think I'd do it because of my kids, but we all have demons inside that make it difficult to adjust to life after the [SEAL] Teams." He noted that he had felt a loss of community and loneliness since retiring. He stated that he drank most nights to "have something to do and to sleep" and that he missed the camaraderie of the Teams.

Operator syndrome

OS is a constellation of symptoms that cause predictable and severe health, social, and functional impairments among SOF Operators.[2,5] The physical and mental demands of Special Operations deployments and work cycles have been reported to cause behavioral, cognitive, and physical effects and impairments.[2,5,6,10]

For example, an Operator who experiences chronic, low-level blast-related exposure may develop astroglial scarring along their white and gray matter margins;[10] the downstream effect of astroglial scarring can include suicidal ideation and impulsivity.[3]

Pathophysiology

Over time, the grinding pressure of allostatic (stress) overload causes homeostatic changes, such as hypertension and sleep dysregulation.[2,5] There are three recognized contributing factors to Operators' allostatic overload: blast and concussive neurotrauma resulting from blunt force trauma and chronic exposure to shearing forces of explosive ordinance; high operational tempo (the frequent coming-and-going between missions, home, and training trips away from home), which can yield sleep dysregulation or deprivation and significant mental stressors; and physical stressors and injuries.[1,3,5] While many service members experience neurotrauma, high operational stressors, and mental and physical injuries,

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Operators experience these factors exponentially more than most; and SOF careers tend to last between 10 and 25 years, with numerous deployments.[2,5]

Chronic blast exposure is an insidious and invisible contributor to neurocognitive changes.[5] Also known as blast-related traumatic brain injuries (bTBI), chronic blast exposure causes neurocognitive injuries. It is unknown precisely how much blast exposure is needed to kindle cognitive changes,[2,5,10-12] but recent findings yielded identification of biomarkers and a blast exposure estimation model.[8]

Blast exposure encompasses more than demolition ordinance exposure; in fact, the cumulative effect of smaller blasts, like those of smaller firearms and explosive breaching to open structures' walls and doors, is a potentially significant contributor.[5,7,11,12]

Blast waves create sheering forces over and through the brain, which cause astroglial scarring along the margins of white and gray matter[5,10] and hypothalamic-pituitary-adrenal (HPA) axis disruption.[2] Symptoms of astroglial scarring, such as suicidal ideation and sleep changes, are believed to have a more rapid onset than other types of brain injuries.[5] Approximately 33% of those with bTBI develop neuroendocrine alterations, which can lead to psychiatric and health-related disorders.[2] Long-term outcomes of HPA axis dysregulation include metabolic and endocrine changes.[2]

Clinical manifestations

The most common OS symptoms include chronic sleep problems, somatic symptoms and chronic pain, cognitive impairments, endocrine changes, mood dysregulation, marital and intimacy problems, and substance use (see *OS causative factors*).[2] Although OS symptoms may be present among non-SOF veterans, OS symptoms are more severe and more frequent among Operators.[2] OS symptoms most typically present after at least 5 years served on an SOF unit in an Operator role, including at least one deployment or mission.[2,5]

Due to its insidious onset, Operators and their clinicians may not realize the interconnectedness of symptoms until they become severe and cause functional impairments[3] (see *Common signs and symptoms of OS (during or after service)*. Behavioral health, sleep, somatic, and endocrine symptoms may appear mild and unrelated or be misattributed to other causes. As time passes and symptoms coalesce, the Operator may begin to experience symptomatic autonomic dysregulation, such as in a constant state of emotional distress, anger, or anxiety, and present in acute settings in crisis.[6]

Operators' self-reliance and adaptability create powerful coping mechanisms. As OS symptoms build, their compensation patterns eventually fail due to symptom severity, and they decompensate rapidly. This presentation is most frequently seen among Operators returning home from deployment or recently separated from service;[5] however, OS may bring Operators to civilian health settings at any time.

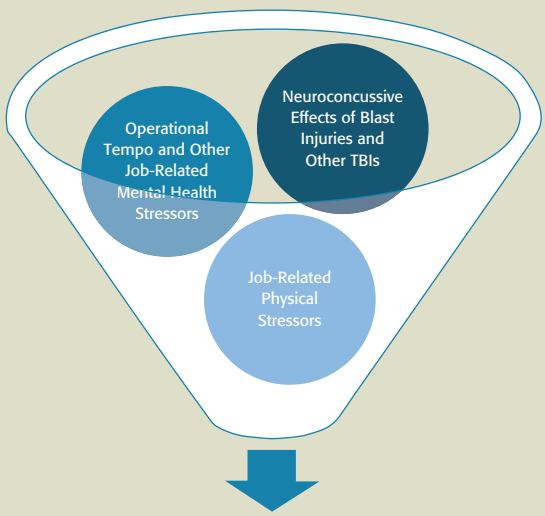
Nursing assessment

Nurses may be the first to identify symptoms of OS. Tasked with obtaining patient health histories and skilled at collaborating with the patient, nurses can recognize constellations of signs and symptoms, develop trusting rapports that allow an Operator to share personal details, and initiate first-line interventions.

Obtaining a thorough health history and establishing a timeline of service is the nurse's first and priority intervention. Nurses should ask every patient, "Have you ever served in the military?" The best practice is to ask every patient, every time.[13]

Nursing care of veterans should be trauma-informed, with a special focus on establishing rapport so the nurse can gather a general timeline and history of service and service-related exposures, such as munitions

OS causative factors[2]



Chronic allostatic overload drives diffuse homeostatic alterations that result in OS symptoms. Alterations may include changes to the endocrine, pulmonary, and cardiovascular systems, and impact cognitive, mental, and physical health.

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blasts and chemical agents.[13] All veterans are at higher-than-average risk of certain health problems due to service and service-related exposures, such as hearing loss, suicidal behaviors, and amyotrophic lateral sclerosis.[13]

Once rapport is established and if the veteran has not shared their occupation in the military, the nurse should ask, "Have you ever served as a Special Operator?" In the case study, JF self-reported that he recently retired from military service, but not all veterans will share more information if unprompted. After collecting information on his military branch and occupational specialty, the nurse discovered that JF was a Navy SEAL. Without these appropriate follow-up questions, he may not have volunteered information regarding his service.

Given the connection of OS to time spent with an SOF unit, priority interventions for the nurse include establishing a timeline of SOF service and obtaining a thorough health history including military-related injuries, such as traumatic brain injuries (TBIs). Through these actions, the nurse can identify initial signs and symptoms of OS.[11] Typically, Operators can share general geographical regions and date ranges of their time in service, as well as very general information on their service-related exposures.

All Operators who report at least 5 years of service in SOF units with at least one deployment should be assessed for OS.[2] However, there are specific presentations that should catalyze a more thorough assessment. Operators who present with signs and symptoms or lab results that appear to be inconsistent or incongruent with their physical presentation should spark concern.[2] For example, concern should be raised when a current or former Operator with no apparent cardiovascular risk factors presents in the ED with hypertension, chest pain, and panic. Another key catalyst for OS assessment is the presentation of a suicidal crisis, self-harm, or risk-related injury. Many cognitive and physical changes that are driven by OS, notably a history of TBI, may lead to autonomic dysregulation and actions like suicide, self-harm, and extreme risk-taking.[5,6]

Common signs and symptoms of OS (during or after service)[2]

Vital Signs & Physical Assessment Findings
- Tachycardia and hypertension at rest
- Chronic pulmonary and cardiovascular symptoms

Endocrine Findings
- Prediabetes or diabetes mellitus type 2
- Labs: High cortisol, low testosterone

Mental Health Changes
- Chronic worry, anxiety, rumination
- Chronic low mood, existential preoccupation, irritability
- Substance abuse, self-harm, suicidal ideation
- Stress reactivity, rage, hypervigilance
- Trauma symptoms with or without PTSD diagnosis

Cognitive Changes
- Difficulty concentrating, short attention, impulsivity, risk-taking
- Poor short term or working memory

Somatic & Recovery Complaints
- Unexplained chronic joint or back pain, chronic headaches
- Impaired physical recovery, inadequate sleep, sleep apnea
- Vestibular, visual, and auditory problems

Relational, Career, & Personal Challenges
- Intimacy & relationship problems
- Interpersonal challenges at work and in social settings
- Unusually difficult transition out of service

Diagnosis

OS is not listed in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) or The International Classification of Diseases (ICD), so there are no specific diagnostic criteria, but OS can be used as a framework to conceptualize injuries, signs and symptoms, and treatment. Nurses can use the Nursing Operator Syndrome Intervention Decision Tool to determine initial intervention priorities (see *Nursing intervention decision tree*). Although not yet psychometrically validated, nurses can use the Operator Syndrome Scale (OSS) to frame questions and assess symptom severity (see *Operator syndrome scale*). Once symptoms and severity are known, the nurse can prioritize and initiate interventions.

Interventions

All OS symptoms can be treated using nurse-initiated, evidence-

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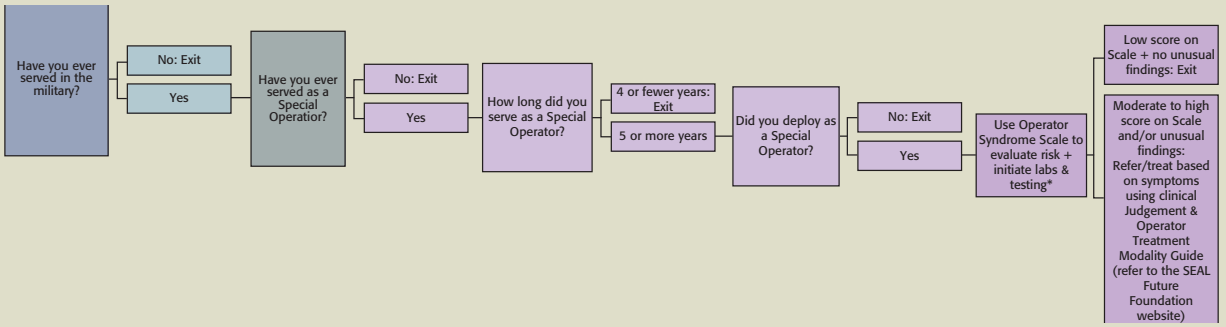
Nursing intervention decision tree



*Labs & testing: For all former Special Operators who deployed at least once and served at least 5 years: Comprehensive metabolic panel and endocrine panel; AUDIT, GAD-7, PCL-5, PHQ-9.

based interventions.[2,10] Whether nurses provide the intervention themselves or initiate consults and referrals, they are the first line in identifying and treating OS.

For a patient who meets the requisite OSS criteria, first-line interventions include initiating comprehensive metabolic and endocrine screening panels[2] and assessing the patient using the GAD-7, PTSD Checklist for DSM-5 (PCL-5), and PHQ-9 questionnaires.[10] Nurses should review lab and questionnaire results for abnormal or incongruent findings. For example, a patient who appears to be physically fit and healthy, like JF in the case study, may have undiagnosed, severe diabetes mellitus and a testosterone level far below the normal range. JF did not initially volunteer information about his erectile dysfunction and sildenafil use, but the information was elicited when discussing his lab results.

If several signs and symptoms of OS are identified, priority treatment should be given to those that may confound or complicate the patient's presentation and treatment. For example, it can be difficult to treat mood if sleep is poor or the patient is misusing substances. Like the nursing "ABC" prioritization model, we can consider using an "SSSS" prioritization model for OS: suicide, sleep, substances, and sex hormones (endocrine levels). These four S's should be addressed within the initial plan of care and concurrently with other conditions.

To date, few clinical resources are available that address the treatment of OS from a comprehensive biopsychosocial perspective. One of these few resources is the Operator Health Index (OHI), which can be accessed for free and online through the SEAL Future Foundation website.[14] The OHI includes traditional, evidence-based treatments, such as the use of antidepressants for post-traumatic stress disorder (PTSD), and treatments that are under investigation, such as psilocybin for trauma symptoms.[14]

In addition to the potential disparity between presentation and findings, Operators' health trends differ in other unique ways. For example, research suggests that most Operators who have trauma symptoms do not meet avoidance criteria for PTSD and, therefore, do not meet criteria for PTSD, regardless of an overall high score on the PCL-5 or severity of trauma symptoms.[1,8] Some less common interventions for the general population are standard practice among Operators. For example, bilateral stellate ganglion blocks for autonomic dysregulation and risk-taking behaviors are frequently used for Operators.[5-10] Healthcare professionals who do not routinely work with SOF may not be familiar with their unique medical needs and intervention outcomes, which reinforces the need for more OS clinical resources.

Nurses should proactively provide trauma-informed care to every veteran. The trauma-informed care framework was developed by the Substance Abuse and Mental Health Services Administration (SAMHSA) and in collaboration with the CDC.[15] A trauma-informed care approach has six guiding principles: (1) safety; (2) trustworthiness and transparency; (3) peer support; (4) collaboration, and mutuality; (5) empowerment, voice, and choice; and (6) cultural, historical, and gender issues.[15] Nurses must create a safe environment while also empowering the patient to make decisions in their care. Using a trauma-informed care approach can have positive outcomes for patients because nurses can recognize and treat the signs and symptoms of trauma.[16]

Case study conclusion

After further evaluation, JF was admitted due to injuries sustained in the motor vehicle crash. The ED nurse initiated several important interventions with JF before he was transported to the medical-surgical floor. First, the nurse flagged JF's lab results for the attending physician, then discussed OS with the attending and resident and shared the Nursing Operator Syndrome

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Intervention Decision Tool. Then, the nurse initiated consults with psychiatry and physical and occupational therapy. On the consult requests, they noted the potential for OS and bTBI. Last, during handoff to the floor nurse, the ED nurse highlighted JF's service history, briefly discussed OS, and suggested the floor nurse reference the OHI.

After report, the receiving nurse researched OS and the 2020 OS journal article,[2] which they discussed with other nurses and the Charge Nurse before JF arrived on the floor. None of the nurses had heard of OS or knowingly taken care of an SOF veteran, so it was a good learning opportunity.

Once JF arrived on the floor and was settled, the nurse performed several more important interventions. The nurse assessed JF's interest in cutting down his use of nicotine and caffeine using motivational interviewing techniques. The nurse provided paper copies of the hospital's standard patient education documents on sleep hygiene and nicotine cessation so JF would not have to rely on his poor memory and attention. Since JF was aware his caffeine use was affecting his sleep, he was open to discussing cutting down caffeine but was not open to changing his nicotine use.

Later, the nurse discussed JF's SOF history and OS symptoms during rounds, highlighting his lab results and constellation of symptoms. None of the clinicians knew of OS, but several knew of TBI-related syndromes. The team was appreciative of the information. The attending consulted the OHI before putting in orders for JF's care.

A social worker visited JF, whom the nurse joined, and they provided JF with the names of a local veterans' community organization and a national SOF community organization to address his loss of community. During this conversation, the nurse encouraged JF to engage with the psychiatry consultant, who would see him later in the day. JF verbalized his gratitude for the resources and encouragement.

JF was discharged from the hospital 4 days later. He experienced caffeine and nicotine withdrawal while in the hospital, which were addressed using a nicotine patch and over-the-counter medication, and he received extensive substance use education from a social worker. Upon discharge, he said that he would continue using the patches because he was now more aware of the dangers of using nicotine, and he would use gum instead of dip if he felt a craving.

During JF's stay, the social worker connected him with a national SOF community organization that would connect him with a mental health physician or advanced practice clinician (APC) within the week. JF's discharge plan included an order for testosterone supplementation, which he continued with his primary care physician. Over time, his sleep, substance use, suicidal ideation, and chronic pain improved, and he also found improved community support by joining community organizations, as well as long-term care interventions, including testosterone supplementation and working with a psychiatric APC and therapist.

Operator syndrome scale

Short form

Operator's name: _____ **Date:** _____

Instructions: Below is a list of difficulties that some people who served in military special operations experience. Please use the totality of information available to you, including medical records and tests that you are aware of as well as your own perspective to make ratings.

		Unable to Rate	None	Mild	Moderate	Severe
1	Traumatic Brain Injury		0	1	2	3
2	Sleep Disturbance		0	1	2	3
3	Endocrine Dysfunction		0	1	2	3
4	Chronic Pain, Orthopedic Problems, Headaches		0	1	2	3
5	Depression		0	1	2	3
6	Anxiety		0	1	2	3
7	Anger		0	1	2	3
8	Hypervigilance		0	1	2	3
9	Posttraumatic Stress Disorder (PTSD)		0	1	2	3
10	Substance Abuse		0	1	2	3
11	Perceptual System Impairments (hearing, vision, balance)		0	1	2	3
12	Cognitive Impairments (concentration, memory, organization)		0	1	2	3
13	Marital and Family Concerns		0	1	2	3
14	Intimacy Cancerns (emotional, sexual)		0	1	2	3
15	Military-Civilian Transition Difficulties		0	1	2	3
16	Toxic Exposure Illnesses and Cancers		0	1	2	3
17	Existential Concerns (guilt, loss, grief, moral injury, survivor's guilt, loss of tribe)		0	1	2	3

Total sum score of all 17 items: _____

Number of items scored ≥ 2: _____

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Conclusion

Nurses are the first line in the early identification and intervention of OS based on their proximity, role in care, and ability to establish trusting relationships with patients.

First-line interventions include asking every patient if they have ever served in the military and if so, if they served as an Operator in a SOF unit. Nurses should establish a service history, including time served, number of deployments, exposures, and injuries.

Using resources such as the Nursing Operator Syndrome Intervention Decision Tool and OHI, nurses should establish signs and symptoms and their severity. Nurses should prioritize "SSSS" interventions since those problems can complicate the patient's treatment. ■

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