AAOS/Major Extremity Trauma and Rehabilitation Consortium Clinical Practice Guideline Summary for Evaluation of Psychosocial Factors Influencing Recovery From Orthopaedic Trauma

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ABSTRACT

The *Clinical Practice Guideline for Evaluation of Psychosocial Factors Influencing Recovery from Adult Orthopaedic Trauma* is based on a systematic review of current scientific and clinical research. The purpose of this clinical practice guideline is to improve outcomes after adult orthopaedic trauma by evaluating, and addressing, the psychosocial factors that affect recovery. This guideline contains one recommendation to address eight psychosocial factors after military and civilian adult orthopaedic trauma that may influence clinical, functional, and quality of life recovery. Furthermore, it addresses additional factors that may be associated with greater biopsychosocial symptom intensity, limitations, and/or diminished health-related quality of life. However, this guideline did not evaluate effective treatment strategies for the treatment or prevention of psychosocial factors. This guideline cannot be fully extrapolated to the treatment of children or adolescents. In addition, the work group highlighted the need for additional research because studies of general traumatic injuries do not always generalize to specific orthopaedic populations.

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This clinical practice guideline was approved by the American Academy of Orthopaedic Surgeons Board of Directors on December 6, 2019.

The complete document, *Clinical Practice Guideline for Evaluation of Psychosocial Factors Influencing Recovery from Adult Orthopaedic Trauma,* includes all tables, and figures, and is available at www.aaos.org/prfcpg.

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Overview and Rationale

The American Academy of Orthopaedic Surgeons (AAOS), and the Major Extremity Trauma and Rehabilitation Consortium, with input from representatives from the American Academy of Physical Medicine and Rehabilitation, the Orthopaedic Trauma Association, and the American Psychiatric Association, recently published their clinical practice guideline (CPG), for the Evaluation of Psychosocial Factors Influencing Recovery from Adult Orthopaedic Trauma.[1] This CPG was approved by the AAOS Board of Directors in December 2019 and has been officially endorsed by the Society of Critical

Care Medicine, the Orthopaedic Trauma Association, and the American Academy of Physical Medicine and Rehabilitation. The purpose of this CPG is to improve outcomes after orthopaedic trauma by evaluating and addressing the evidence-based psychosocial factors that affect recovery trajectory. The guiding theoretical model for the effort, the biopsychosocial model,[2] recognizes that each of the major domains (biological, psychological, and social) contribute to the recovery process and influence the long-term outcomes after adult orthopaedic trauma.

In incidence, musculoskeletal trauma continues to be a leading cause of mortality and disability globally.[3] In the United States, trauma is among the leading causes of death and disability, accounting for more than 2 million hospital admissions annually.[4-6] In addition, injury survivors often continue to experience physical and psychological challenges for years after the initial event and hospitalization.[7-9]

Historically, musculoskeletal trauma has been a notable issue in a military combat-deployed setting, comprising 58% to 88% of all injuries since the Korean War.[10-12] However, relative to previous major combat engagements, combat-deployed service members are more likely to survive combat in this era than in any previous time.[13] Indeed, combat deaths sustained in Afghanistan and Iraq (Afghanistan: Operation Enduring Freedom/Iraq: Operation Iraqi Freedom) have decreased from 33% to approximately 4.6%.[13,14] Although combat survival rates have increased, extremity wounds and fractures still account for approximately 54% of all wounds.[15,16] Combat-related extremity injuries are also extremely costly, accounting for approximately two-thirds of initial hospitalization costs and estimated disability payments.[15,17] Given the extent of extremity injuries among the US military personnel, it is critical to reduce disability, costs, and lost duty days associated with these injuries to enhance force readiness and improve individual outcomes.

Therefore, the Department of Defense partnered with the AAOS to develop an evidence-based, CPG to aid practitioners in the evaluation of psychosocial factors influencing recovery from military and civilian adult orthopaedic trauma.[1] Furthermore, the CPG calls for continued research to identify optimal strategies for, and barriers to, the implementation of mental and social health assessment and treatment.

A comprehensive literature search was conducted involving 6,600 abstracts with over 1,550 articles selected for full review. The articles were then graded for quality and aligned with the work group's patient subgroups, clinical activity, and outcomes of concern. This process resulted in one recommendation supported by 67 research articles meeting stringent inclusion criteria. This recommendation is based on research classified as "moderate strength." The strength of recommendation is assigned based on the quality of the supporting evidence. The strength of recommendation also takes into account the quality, quantity, and the trade-offs between the benefits and harms of a treatment, the magnitude of a treatment's effect, and whether data exists on critical outcomes.

Guideline Summary

This guideline is intended to be used by all qualified and appropriately trained members of an adult orthopaedic trauma interdisciplinary treatment team, which includes, but is not limited to, surgeons, physicians, physician extenders, nurses, physical/occupational therapists, and behavioral health providers. These recommendations are based on the foundational beliefs that (1) orthopaedic trauma care is optimized when conducted by an interdisciplinary team of providers and (2) clinical decision-making should be driven by a comprehensive evaluation that includes an assessment of biopsychosocial factors.

Collectively, these recommendations create a framework for the evaluation of psychosocial factors influencing recovery from military and civilian adult orthopaedic trauma. The recommendations cannot be fully extrapolated to the treatment of children or adolescents. This guideline should not be construed as addressing all aspects of psychosocial care. Rather, it is an evidence-based guide on the psychosocial factors to be evaluated in the recovery period. The ultimate judgment regarding any specific evaluation or subsequent treatment must be made in light of patient circumstances and clinical environment.

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Factors Recommended for Psychosocial Evaluation

The psychosocial evaluation recommended in the guideline focuses on factors that have at least modest evidence for influencing patient outcomes in multiple domains. The guideline highlights the importance of the individual's behavioral health in adult orthopaedic trauma outcomes. The presence of anxiety, posttraumatic stress disorder, depression, and any premorbid psychiatric conditions all were associated with negative outcomes including increased pain, decreased functional outcomes, decreased quality of life, and decreased ability to return to activity/work.[18-24]

Smoking behavior is also associated with a variety of negative patient outcomes, including diminished physical function, negative mental health outcomes, and poor return to work outcomes.[25-29] Of note, these studies rely on categorical self-report of being a currently engaged in smoking and did not consider the frequency or number of cigarettes that were consumed. This finding reinforces the importance of early and frequent patient screening and education for patients before and after orthopaedic surgery. Extant research suggests that approximately half of surgeons do not routinely counsel patients regarding smoking cessation preoperatively,[30] despite evidence of increased levels of smoking abstinence after patient education regarding the associated surgical risks of smoking.[31]

The guideline development process also sought to identify protective factors that may affect orthopaedic trauma recovery. Several protective factors were identified—resiliency, social support, and educational status that merit assessment. Resiliency, a multidimensional psychosocial construct, represents the assets and resources within an individual and their environment to negotiate, manage, and adapt after experiencing a significant stressor, trauma, and/or adversity.[32,33] Enhanced levels of resiliency were found to be correlated with improved patient outcomes including improved physical function, higher quality of life, and less behavioral health problems.[23,34] Conversely, lower levels of resiliency as manifested in catastrophic/negative thinking patterns and lower self-efficacy were associated with more negative outcomes.[26,35,36] These findings further support the relationship between psychological processes (eg, thoughts, emotions, and stress response) and the adult orthopaedic trauma patient's recovery and outcomes.

Positive social support was also markedly associated with patient outcomes, most notably the presence and strength of notable other relationships. Research indicates that married patients returned to work markedly faster than single, divorced, or widowed patients[37] and that widowed/divorced patients demonstrated higher levels of depression than their single patient counterparts.[22] In addition, social functioning and societal participation were also markedly associated with patient outcomes, although less definitively.[38,39]

Seven high- and moderate-quality studies documented an association between higher education level and improved orthopedic outcomes, including enhanced quality of life, quicker return to activity/work, improved mental health outcomes, enhanced physical function, and lower levels of pain and anxiety. On the other hand, five moderate-quality and six low-quality studies found no statistically significant relationship between education level and orthopaedic outcomes. The data trended toward significance in most of these studies, and no studies indicated that lower education levels would predict a better orthopaedic outcome. The higher quality of studies showing a relationship between orthopaedic outcomes, combined with a robust and growing body of research that correlates education level and a variety of health outcomes,[40] influenced the CPG's decision to add this factor to the list.

Other Factors to Consider

Multiple other factors were associated with greater biopsychosocial symptom intensity after orthopaedic trauma, but the evidence was not strong enough to include them in the final list for recommended screening. The CPG working group addressed these factors in the "Other considerations" portion of the guidelines. The working group believes that these factors should be considered during the screening process based on the clinical presentation. The CPG recommended that demographic variables, including age, race, and sex, should be considered in determining the risk profile of a patient and the context of care. Of these demographic variables, age seemed to be the most important consideration because several low-quality studies indicated that increased age at the time of injury was correlated with higher disability,[25] higher pain scores,[41] and lower return to work rates.[26,42]

Lack of employment and low income show limited evidence across multiple studies. Body mass index was also shown to be associated with increased pain after musculoskeletal injury in a single moderate-quality study.[43] Three moderate-quality studies indicated that patients with a comorbidity experienced more negative long-term functional

outcomes when compared with patients without a comorbidity.[27,44,45] A single low-quality study demonstrated that veterans experiencing war/combat exposures such as being shot at, threatened with violence, or witnessing war-related violence predicted greater psychological distress after a physical trauma.[46]

Implementation Considerations

The assessment and treatment of behavioral health factors in orthopaedic trauma faces notable barriers, given the challenges in accessing these services. Several studies have documented the mental and behavioral health burden in the general cohort[47] and the lack of availability and access to care even before the COVID-19 pandemic.[48] Given these challenges, an interdisciplinary approach is followed by all qualified and appropriately trained members of an adult orthopaedic trauma team, taking a role in psychosocial assessment and referral.

On a positive note, there seems to be a low risk of harm in evaluating psychosocial barriers to recovery. There is the potential for improved recovery trajectory and outcomes by early identification of those at risk and early referral for treatment. However, data to guide best practices in screening tools and timing of screening and evaluation of these patients are still limited, and no evidence-based recommendations can be made. The working group believes additional work is needed on these implementation issues.

Furthermore, evidence to guide psychosocial treatment is limited, with most evidence coming from observational studies. Despite this limitation, the extant research indicates addressing psychosocial risk factors is critical to improving outcomes. Large gaps in the literature exist because existing evidence regarding general traumatic injuries may not apply to the adult orthopaedic trauma cohort.

Potential next steps identified by the working group include (1) identifying and establishing the utility of screening measures, (2) developing standardized clinical interview guides, (3) discerning the optimal time and frequency of screening along with identifying the

Strength of Recommendations Descriptions

Strength of Recommendation	Overall Strength of Evidence	Description of Evidence quality	Strength Visual
Strong	Strong	Evidence from two or more "high"-quality studies with consistent findings for recommending for or against the intervention. In addition, it requires no reasons to downgrade from the EtD framework.	
Moderate	Moderate or strong	Evidence from two or more "moderate"-quality studies with consistent findings or evidence from a single "high"-quality study for recommending for or against the intervention. In addition, it requires no or only minor concerns addressed in the EtD framework.	
Limited	Limited, moderate, or strong	Evidence from one or more "low"-quality studies with consistent findings or evidence from a single "moderate"-quality study recommending for or against the intervention. In addition, higher strength evidence can be downgraded to limited because of major concerns addressed in the EtD framework.	
Consensus	No reliable evidence	No supporting evidence exists, or higher quality evidence was downgraded because of major concerns addressed in the EtD framework. In the absence of reliable evidence, the guideline work group is making a recommendation based on their clinical opinion.	

appropriate time to discontinue screening, (4) identifying barriers to screening and potential solutions, (5) continued efforts to identify subgroups of patients as risk so that scarce resources can be allocated effectively, (6) ongoing study of patient benefits and harms of routine screening, and (7) analyzing the cost-benefit of screening.

Establishing and maintaining a high standard of practice in interdisciplinary orthopaedic care guided by practitioner ethics, clinical demands, and multicultural proficiency is vital. The working group believes that addressing psychosocial risk factors is a professional responsibility. The working group identified potential challenges, especially in situations where the treating provider does not have the resources to provide screening and/or treatment. This can be particularly challenging when clinicians encounter a patient with altered consciousness or cognitive capacity. The consequences of not doing so places the treating providers in a situation where he/she could experience a moral dilemma/moral injury because of insufficient or ineffective screening/treatment resources resulting in patient suffering. There is an institutional responsibility to support the orthopaedic trauma team by providing the personnel and resources to meet the standard of care called for in this guideline. The goal of this guideline is to provide orthopaedic trauma team members and institutions guidance in developing the resources and competency to treat each individual with an orthopaedic injury in a manner that addresses the biopsychosocial determinants of recovery and quality of life.

Recommendations

This Summary of Recommendations of the AAOS/Major Extremity Trauma and Rehabilitation Consortium *Clinical Practice Guideline of Psychosocial Factors Influencing Recovery from Adult Orthopaedic Trauma* contains a list of one evidence-based treatment recommendation. Discussions of how this recommendation was developed and the complete evidence report are contained in the full guideline at www.aaos.org/prfcpg. Readers are urged to consult the full guideline for the comprehensive evaluation of the available scientific studies. The recommendation was established using methods of evidence-based medicine that rigorously control for bias, enhance transparency, and promote reproducibility.

This recommendation is not intended to stand alone. Medical care should be based on evidence, a physician's expert judgement, and the patient's circumstances, values, preferences and rights. For treatment procedures to provide benefit, mutual collaboration with shared decision-making between patient and physician/allied healthcare provider is essential.

A moderate recommendation means that the benefits exceed the potential harm (or that the potential harm clearly exceeds the benefits in the case of a negative recommendation), but the quality/applicability of the supporting evidence is not as strong.

It is recommended that clinicians evaluate the following factors because they are associated with increased biopsychosocial limitations after adult orthopaedic trauma:

- Anxiety
- Posttraumatic stress disorder
- Depression
- Premorbid psychiatric conditions
- Smoking
- Lower education level
- Less social support
- Resilience issues (ie, limited self-efficacy and less effective coping strategies)

Strength of recommendation: Moderate. ★★★☆

Implication: Practitioners should generally follow a moderate recommendation but remain alert to new information and be sensitive to patient preferences.

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