

Improving Low Back Health in Soldiers via Leadership-Driven Cultural Change

by CPT Brooke Sorrell

The U.S. Army has come a long way since the days when ibuprofen, water and more running were the solution to all aches and pains. As our technology and medical capabilities progress, the Army continues to evolve to meet the Army Chief of Staff's No. 1 priority of Soldier readiness. This is reflected in two recent changes: the medical health-care system shifting to the Defense Health Agency, whose mission is to increase readiness and provide better health and care, and the implementation of the Army Combat Fitness Test (ACFT).

As the Army works diligently to stay at the forefront of technological and medical advancements, it is imperative that leaders at every level employ this knowledge to identify potential risks associated with training and military-occupation specialty demands. It is every leader's responsibility to exercise due diligence in risk mitigation to preserve Soldiers' health and maximize the longevity of the Army's investment in its most critical asset. Furthermore, it is incumbent on leaders to foster an environment where Soldiers feel comfortable seeking medical care without fear of reprisal or perception of weakness.

Cost of injuries

With Soldier readiness becoming a priority for our Army, musculoskeletal injuries (MSKI) have become a top focus of our military leadership. Non-combat MSKI in the military cause 25 million days of limited duty and more than 2 million clinic visits per year, costing the government more than \$3.7 billion annually.¹ Non-combat MSKI account for about 60 percent of limited duty and 65 percent of non-deployable Soldiers.²



Figure 1. 1LT Nichelle Pascoe, a physical-therapy intern from Martin Army Community Hospital at Fort Benning, GA, is instructing 1LT Tyler Smith on proper bracing and form prior to executing the deadlift, one of the six events in the ACFT. Proper bracing is imperative to activate the core and stabilize the spine for injury prevention and performance optimization. (Photo by CPT Brooke Sorrell, Fitness Training Unit)

Low back and knee pain account for a large portion of MSKI, with low back pain (LBP) having higher disability impacts and the most work days missed. The World Health Organization estimates that 80 percent of the population worldwide will experience back pain at some point in their life, and that back pain plagues some 32.8 percent of veterans.² Most individuals with LBP have no specific diagnosis and are categorized as having non-specific LBP based on exclusion of specific pathologies.

Although these statistics are staggeringly high, they may not fully capture the severity of the MSKI problem due to underreporting, especially in the U.S. Army Training and Doctrine Command environment. A study completed in 2019 looked at the reporting of MSKI during initial-entry training across Forts Sill, OK; Benning, GA; and Leonard Wood, MO. (The study was conducted five weeks before the Soldiers' graduation from advanced individual training or one-station unit training.) The study concluded that 64 percent of trainees did not report a training-related MSKI that lasted seven days or more.³ There were seven main reasons trainees did not seek medical treatment, with the most common reasons being "I wanted to graduate on time" and "I wanted to avoid a profile."

Unit leaders should implement a command climate in which the importance of early detection and care is emphasized at all echelons. This emphasis mitigates the risk of Soldiers developing more severe injuries that may lead to a higher disability or potential of being discharged from the Army. When the commander fights to overcome the stigma that discourages trainees and Soldiers from seeking the care they need, they are prioritizing unit readiness and fulfilling their command responsibility as outlined in Army Regulation 600-20, ***Army Command Policy***.

Risk mitigation

Injury prevention through risk mitigation is just as important as encouragement to seek treatment in maintaining Soldier readiness. A centerpiece of an injury-prevention strategy in the Armor community should be to identify risk factors in each vehicle platform and mitigate risk of injury by optimizing physical training, reinforcing good practices and ensuring proper equipment fit for the operator.

Most often when commanders are completing a risk assessment for training, it is easy to think of the potential acute MSKI such as a sprained ankle or twisted knee after landing improperly while jumping off the side of a tank after failing to use the proper dismounting procedures. However, leaders must also address chronic injuries such as non-specific LBP, which slowly develops over time and eventually becomes debilitating. Although chronic conditions can be harder to treat with the passage of time, controlling modifiable risk factors such as work/rest cycles and equipment fitting should be a focus.

A meta-analysis article written in 2016 concluded that long exposure to vehicle vibrations in simulators led to spinal musculature fatigue of the lower back stabilizers, specifically the lumbar multifidi muscles, in mounted warfighters.⁴ These muscles are important for stabilizing the lumbar spine during functional activities to reduce the undue stress on the surrounding structures such as the bones, cartilage and intervertebral discs. Dysfunction of this muscle group has been strongly associated with chronic LBP. However, the warfighter can combat potential fatigue and dysfunction with targeted muscle activation through strength and endurance training. The quadruplex, one of the four for the core exercises, and the deadlift are two specific exercises that target this muscle group.

There is a reason the Army has implemented certain exercises that Soldiers should be consistently performing in physical-readiness training (PRT) programs. However, it is not enough to just perform these exercises during PRT. Soldiers must also make sure they perform them with precision to get the desired effect. This may require tactile and verbal cues to ensure proper execution of the exercises. Leveraging the expertise of athletic trainers, strength and conditioning coaches, master-fitness trainers or physical therapists can help achieve optimal training outcomes.

Recently the terms *Soldier-athlete* and *tactical-athlete* entered our military lexicon. By embracing the sports-medicine model that supports high-level athletic performance, leaders can drive a cultural shift in which Soldiers are viewed as athletes with unique physical demands. In this type of culture, Soldiers are more willing to leverage the assets provided to support their health, rather than conceal injuries out of fear of reprisal.



Figure 2. MAJ George Clevenger, a physical therapist from Martin Army Community Hospital at Fort Benning is teaching SSG Stephen Thomas how to properly execute the quadruplex exercise to activate his lumbar multifidi and gluteal muscles prior to exercising. (Photo by CPT Brooke Sorrell, Fitness Training Unit)

Predictive risk factors

MG Patrick Scully, deputy surgeon general of the U.S. Army (1998-2002), said it best: “Injuries are not random events; they are the predictable result of a complex set of risk factors, many of which can and should be controlled.” Physical inactivity, along with psychosocial difficulties, smoking, suboptimal body composition, sleep disturbances and poor self-rated health have been suggested to be risk factors for LBP, leading to increased disability.⁵ Many of these are modifiable risks that can be addressed through various Army resources and interventions.

It is imperative that leaders are educated and can identify potential risks associated with certain injuries developing within their Soldiers. This ensures we provide Soldiers with the necessary help to optimize their recovery from current injuries and to be proactive in preventing future injuries.

As with any type of evidence, there are always limitations, and a larger data set will provide a better idea of the mechanism of vehicle-related MSKI. In this case, future research is needed to identify if there is a dose-response relationship between military vehicle type (i.e., Stryker, Bradley) and ride time with the development of spine musculature fatigue, as this may provide greater insight into the amount of ride exposure required to elicit spinal musculature fatigue, so that we may implement the appropriate work/rest cycles.

Takeaway

Soldier readiness in the Armor community can be improved through reducing the risk of LBP by creating a positive environment to encourage early reporting and seeking medical care. We can facilitate this cultural change as leaders by supporting injury-prevention programs. It is our duty to be educated leaders who can identify potential risks and provide risk-mitigation measures to protect our nation’s young men and women, improve performance optimization and readiness, and further enhance the lethality of our force.

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Notes

¹ Annette Bolye, "Military Musculoskeletal Injuries Compromise Readiness, Drive Disability Claims," *U.S. Medicine: The Voice of Federal Medicine*, Jan. 24, 2020, <https://www.usmedicine.com/supplement/musculoskeletal-injuries-in-the-dod-and-va/military-musculoskeletal-injuries-compromise-readiness-drive-disability-claims/>.

² Joseph M. Molloy, Timothy L. Pendergrass, Ian E. Lee, Michelle C. Chervak, Keith G. Hauret, Daniel I. Rhon, "Musculoskeletal Injuries and United States Army Readiness Part 1: Overview of Injuries and their Strategic Impact," *Military Medicine*, Vol. 185, Issue 9-10, September-October 2020, <https://doi.org/10.1093/milmed/usaa027>.

³ Bruce S. Cohen, Brooke M. Pacheco, Stephen A. Foulis, Maria C. Canino, Jan E. Redmond, Richard B. Westrick, Keith G. Hauret, Marilyn A. Sharp, "Surveyed Reasons for Not Seeking Medical Care Regarding Musculoskeletal Injury Symptoms in U.S. Army Trainees," *Military Medicine*, Vol. 184, Issue 5-6, May-June 2019, <https://doi.org/10.1093/milmed/usy414>.

⁴ Roger O. Kollock, Kenneth E. Games, Alan E. Wilson, JoEllen M. Sefton, "Vehicle Exposure and Spinal Musculature Fatigue in Military Warfighters: A Meta-Analysis," *Journal of Athletic Training*, November 2016, <https://doi.org/10.4085/1062-6050-51.9.13>.

⁵ Ville M. Mattila, Heikki Kyröläinen, Matti Santtila, Harri Pihlajamäki, "Low back pain during military service predicts low back pain later in life," *PLOS One*, March 10, 2017, <https://doi.org/10.1371/journal.pone.0173568>.

Acronym Quick-Scan

ACFT – Army Combat Fitness Test

LBP – low back pain

MSKI – musculoskeletal injuries

OIC – officer in charge

PRT – physical readiness training