



The Hard “Truth” about Musculoskeletal Injuries: Perspectives from Providers vs. Patient

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Presenter

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Disclosures

- Dr. Christian Brown has no relevant financial or non-financial relationships to disclose relating to the content of this activity.
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Learning Objectives

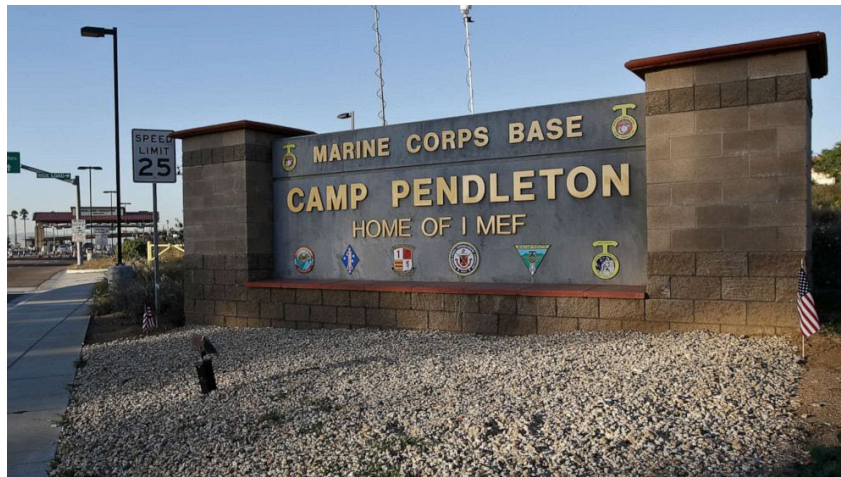
At the conclusion of this activity, participants will be able to:

1. Comprehend the prevalence of Musculoskeletal (MSK) injuries and impact on military readiness.
2. Identify cause and risk factors of MSK injuries.
3. Outline three different types of truth affecting treatment plans.
4. Analyze obstacles preventing desired positive outcomes.
5. Summarize four key MSK injury concepts.
6. Discuss the hard “truths” regarding MSK injuries and paths to improvement.



Camp Pendleton

- One of largest Marine Corps Training Base, and Navy Military Hospital
- ~ 40-45k Active Duty Service Members (ADSMs), Marines, Navy, Army/Air Force Reservists
- 2 Chiropractors, Sports Medicine Outpatient Clinic



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Main Presentation Outline

- Introduction: MSK injuries, overview, statistics
- Causes/Risk Factors and Current Military Health System (strategies)
- Case Studies (3)
- Types of truth
- Areas of conflict, obstacles, avoidance
- Key concepts of MSK injuries
- Hard “truths” and future discussions of reduction



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Initial Thoughts

Current military medical model is not optimal, not efficient to meet MSK injury needs

- Size, budget, manpower
- Preventative Model?
- Special Operations community

Reactive vs. Proactive

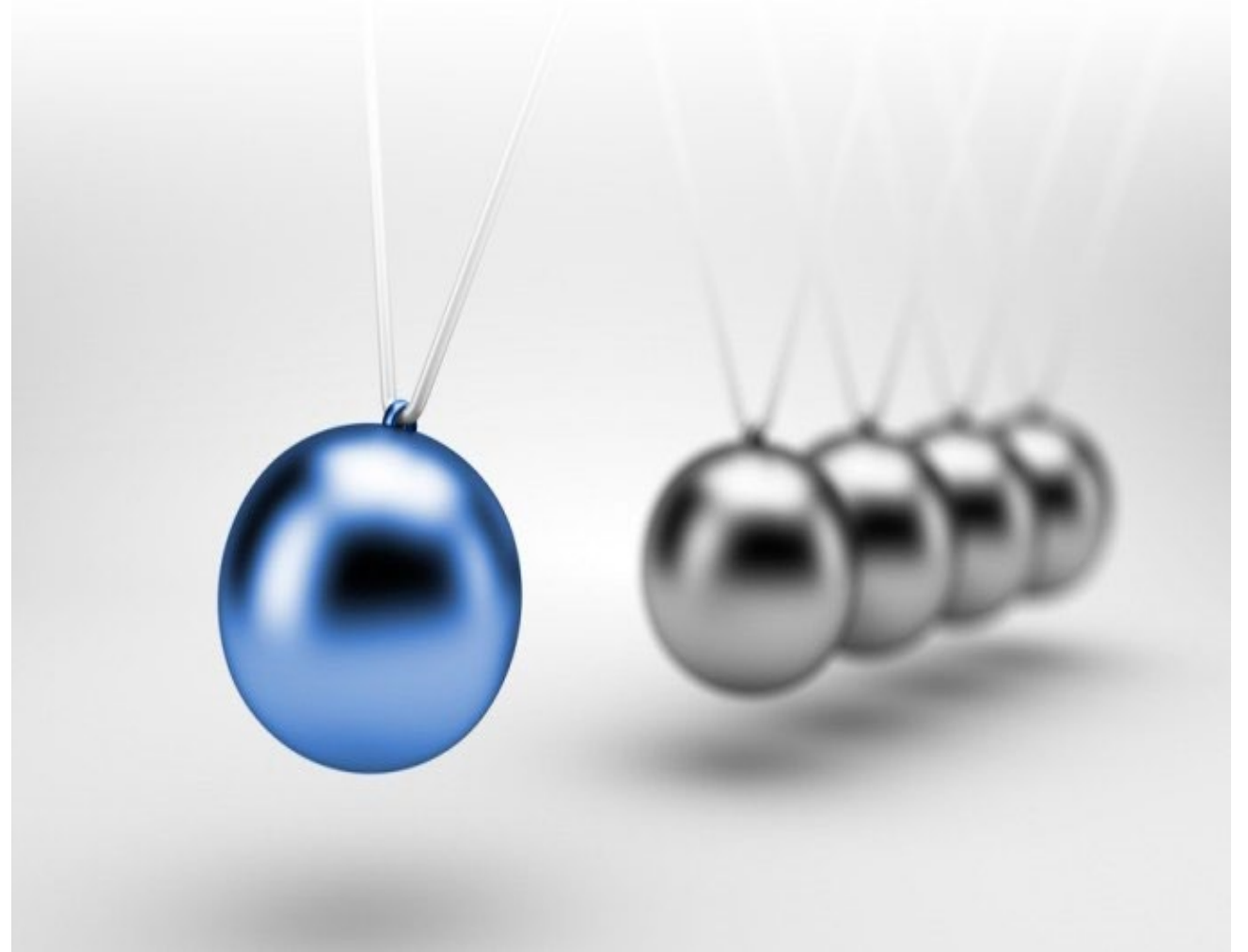
X-Factors:

Military Culture

- Remedial Training
- Individuality vs. Group Training,

What is vs. what can be

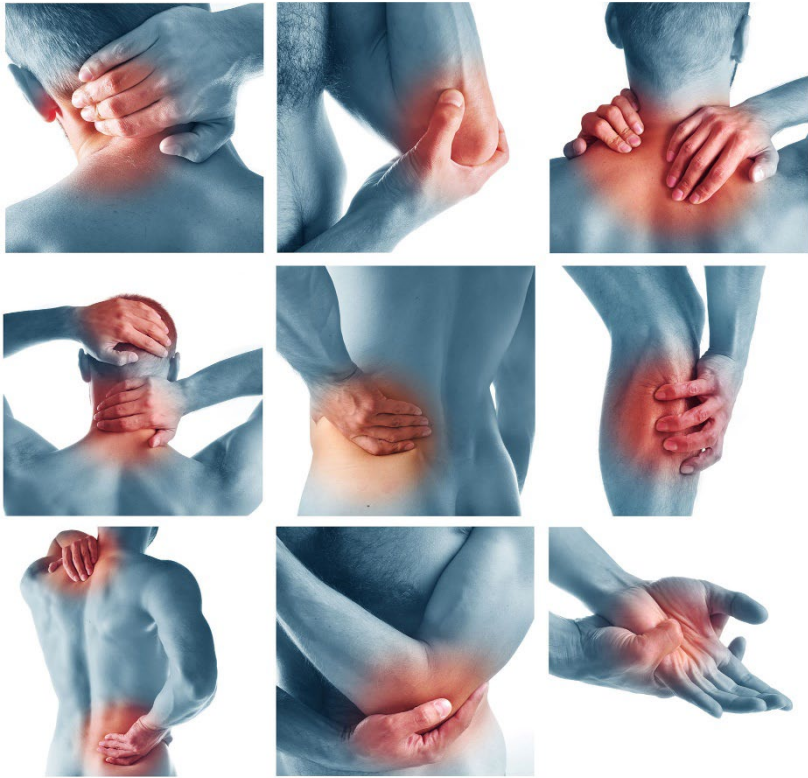
- Perspective



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Introduction: MSK Injuries in the Military



- Non-combat MSK injuries = leading cause of outpatient medical encounters
- Affects mission readiness, decrease deploy ability rates, increase separation rates
- Account for ~60% of leave days, ~65% of non-deployable
- High \$\$\$ medical costs, Spinal Cord Disability compensation
- Often leads to chronic disease and/or secondary health concerns

(Military Medicine, 2020)



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Overview and Impact (Army Studies)



- Iraq/Afghanistan War
 - 85% ADSM evacuated for Musculoskeletal injuries (MSKi) = not return to theatre
 - Evacuated from “backaches” were less likely to return to their units compared to those with severe Post-traumatic stress disorder (PTSD) and combat injuries
 - Medical separations during Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF), 6 of 10 diagnosis (dx) were axial pain, more common than PTSD and combat injuries
- 2011-2016
 - MSKi involved in ~ 70% of medical disability discharges
- 2010-2015
 - ~90% of disability discharges within Service Member’s (SM’s) 1st year of service
- Global War on Terrorism veterans
 - ~44% of all Spinal Cord (SC) disabilities compensation claims

(Military Medicine, 2020)



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Statistics of MSK Injuries in the Military



- ~ 50% of military experience 1 or more MSK injuries each year
- = ~ > 2million medical encounters/year
- ~ 90-120 days or more of lost duty time
- **2018 US Army Unit Type Study**
 - 1430 soldiers, 481 (33.6%) time loss injury, 222 (15.5%) injured without limited work. 5.9+/- 14.4 medical visits per soldier, 21,902 days of limited work and \$1.337 million (\$1901 +/- \$6535 per soldier), 36.3 +/- 59.7 limited work days. Highest in combat service support (65.6%) vs. reference group (combat 41.1%)

(JOSPT, 2018)



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Causes and Risk Factors

- Overuse strain/sprain, stress fractures: most to lower extremity (LE)
- Physical exercise, running, lifting and carry activities
(JSMS, 2021)
- Gender, Age
- Physical Fitness levels, Body Mass Index (BMI), nutrition, smoking, Nonsteroidal anti-inflammatory drugs (NSAIDs)
(Progress in Cardiovascular Disease, 2022)
- Environmental (weather, terrain)
 - Camp Pendleton
 - Marines/Navy: MSK injury, ankle-foot, lumbopelvic, knee, shoulder

(International Journal of Public Health, 2022)



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MSK injury review

What? Muscles/ligaments/tendons, axial skeleton, Upper Extremity/ Lower extremity (UE/LE)

Why? Exceeding MSK system threshold in single sudden event (acute)

Gradual to repetitive cumulative micro-traumas (chronic)

Definitions?

- Chronic
- Degenerative disease
- Scoliosis
- Lower back Stress fracture



100%
OF US WILL DEVELOP
DEGENERATIVE DISC DISEASE

Contributed by Dante F. Vacca, MD, FAANS

WHAT IT MEANS AND WHEN TO WORRY.

I thought I would discuss the most common problem that we see as neurosurgeons that can lead to spine surgery. It is called spondylosis, or degenerative disc disease, and it occurs in all human beings at all levels of the spine—cervical, thoracic and lumbar. Spondylosis is a result of time and gravity, two things we can't avoid, and that's why 100% of the population will develop it to some degree.



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Military Medical System

- Typical Treatment for MSK Injuries
 - 1) Medical
 - Medication, Basic HEP handouts, duty status change
 - 2) Specialty Care Level 1
 - Referral based conservative care, Physical Therapist (PT), Doctor of Chiropractic (DC), Occupational Therapist (OT), Certified Athletic Trainer (ATC) etc.
 - 3) Specialty Care Level 2
 - Referral based advanced care, Pain Management, Ortho, Surgery
 - 4) Repeat, Limited Duty, Medical Board, Physical Evaluation Board (PEB)



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Military Physical Assessments



- Marine Corps
 - Physical Fitness Test (PFT) – pull ups/push ups, planks, 3mi run
 - Combat Fitness Test (CFT) – 880yd run, ammo can lift, maneuver under fire*
- Navy
 - Physical Readiness Test (PRT) – pushups, planks, 1.5mi run/row/swim
- Army
 - Army Combat Fitness Test (ACFT) – 3 Repetition Maximum Deadlift (RM DL), Standing power throw, hand release pushups, sprint-drag-carry, planks, 2mile run
- Air Force
 - Air Force Fitness Test (AFFT) – 1.5mile run, pushups, sit ups (*timed shuttle run, reverse crunch, planks, hand release pushups)



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Case Study #1: 36 year old (y/o), Male (M), Marine, 1stSGT (Sargent)

- 19 years of service, MOS: Recon, Current: Recruiter
- Gap in care of 6 months, previously seen for neck/lower back pain (LBP), no new symptoms (sx), chronic 6-7/10 pain Visual Analogue Scale (VAS)
- Current Treatment: physical therapy for neck, Headaches (HA) and concussion
- New referral for LBP, secondary Neck pain
- Initial encounter, previously seen by colleague



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36 y/o, M, Marine, 1stSGT

- Full duty, has waiver for PFT
- Physical Exam Findings:
 - Lumbar Exam:
 - Range of Motion (ROM), Soft tissue, Motion/Static Palpation, Ortho, Functional Tests
 - Cervical Exam:
 - ROM, Soft tissue, Motion/Static Palpation, Ortho



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36y/o, M, Marine, 1stSGT

- Report of Findings:
 - Review of past records/dx/images
 - Clinical impressions: failed Lumbar/Cervical set-ups, postural dysfunctions
 - Discussed, offered alternative treatment options
- ***“I can’t believe I waited 30+ days for this, I will just go out in town”***
- Stormed out of the clinic...



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36y/o, M, Marine,
1stSGT

Next day @ Physical Therapy

“saw chiro yesterday, and cervical adjustment aggravated my neck, 8/10 pain after” ...neck pain is 4/10 and back pain 6/10 so do not want to participate in vestibular, neck/back rehab

Requested: passive modality, soft tissue therapy only

Subsequent sessions: Grade 3 mobilization tx to full spine, assisted stretching + soft tissue

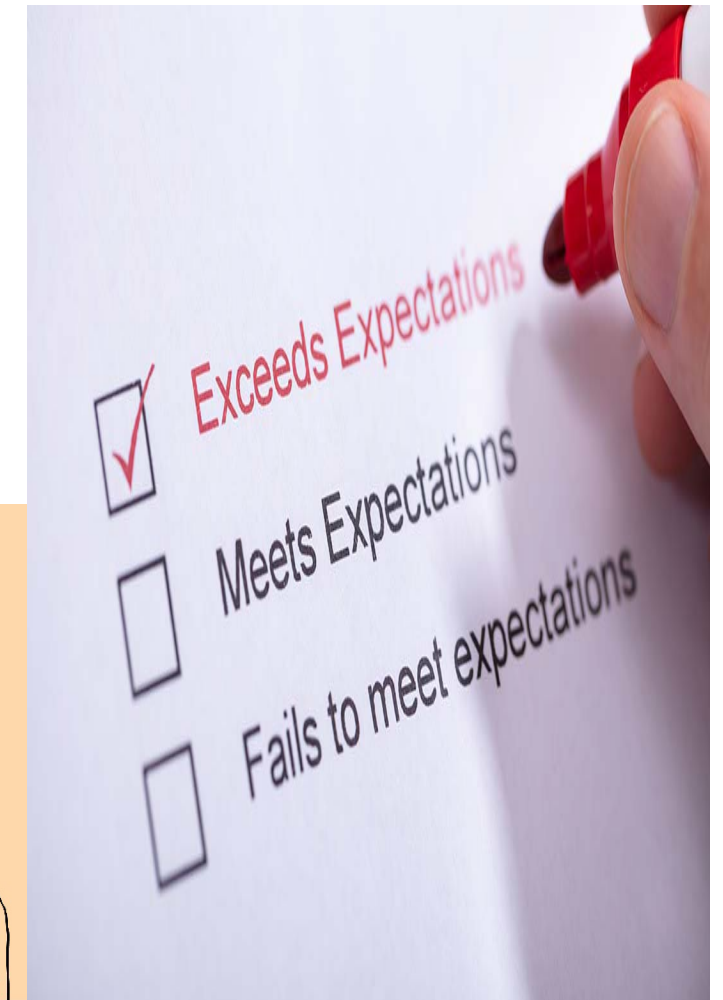
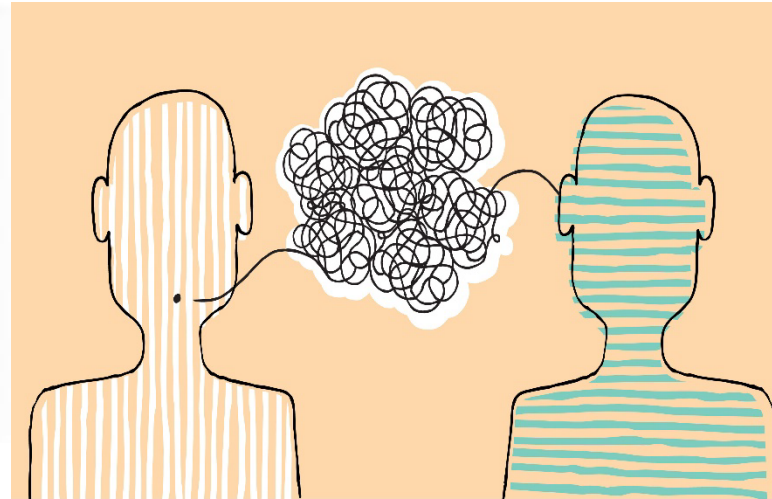


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36y/o, M, Marine, 1stSGT

- So what happened?
- Conflicts of truths?
- Expectations? Patient vs. Provider
- Outcome?



Patients want “something” for their pain/injury

- Press Ganey scores (patient satisfaction scores)
- Patient desires sx -> told not indicated by ortho = LOW SCORES
- Patient given medication (i.e.. Narcotics) or sx = HIGHER SCORES
- Conclusion:
- Show compassion? Empathy? Validation?

(Mazur MD et al., 2015)



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Case Study #2: 38 y/o, Female (F), Army, SGT

- 8 years of service, mechanic, < 1 year remaining before permanent change of station (PCS)
- History (Hx) of chronic LBP, no prior treatment (tx) history until...
- March 2022, Motor Vehicle Accident (MVA), struck by vehicle as pedestrian, “launched in air”
- Civilian chiropractic care x 24, recommended to stop by lawyer
- Passive modalities and side posture only

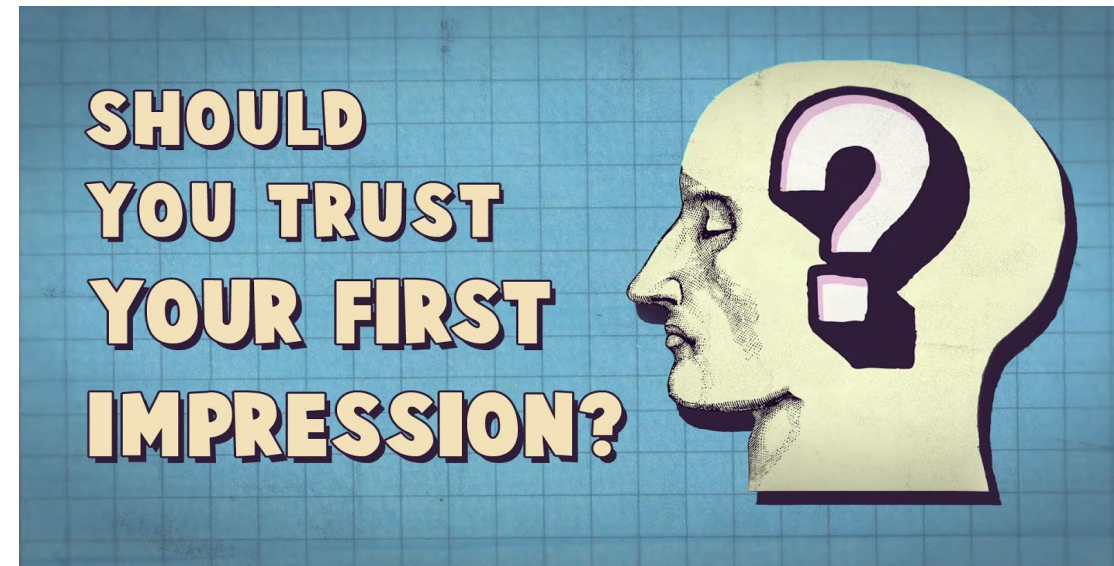


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38 y/o, F, Army, SGT

- Intake form, key details?
- Physical Exam Findings:
 - Unremarkable, ***“I was told by medical, I have a disc injury”***
- Report of Findings
- Conflicts of Truth?
- Expectations: Patient vs. Provider
- Outcome?



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Psychosocial/Emotions/Depression

- ADASM more likely to report chronic low back pain if UNHAPPY and dissatisfied with MOS



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Case Study #3: 21 y/o, F, Navy, Petty Officer Third Class (PO3)

- 2 years. of service, medical board for Hip Injury (labrum)
- Hospital Corpsman, current admin job due to duty status
- Hx of non-traumatic, right hip pain from “training, running”
- Tx history includes: Physical Therapy, Pain Management (PxMgt), Ortho/Sports Medicine (non-surgical)
- Constant px, severe limitations activities of daily living (ADLs)
- New chiropractic consult of LBP



21 y/o, F, Navy, PO3

- Intake Form, Key details
- Physical Exam Findings
 - ***“I have severe arthritis, degenerative disc disease”***
- Report of Findings
- Conflict of Truths?
- Expectations: Patient vs. Provider
- Outcome?



Prevalence of spine findings in patient **WITHOUT** low back pain:

- (Spine, 2001) The longitudinal Assessment of Imaging and Disability of Back Study
 - Disk degeneration – 91%
 - Disk desiccation - 83%
 - Disk height loss – 64%
 - Disk protrusion – 32%
 - Annulus fissure – 38%
 - Endplate changes – 26%
 - Facet degeneration (moderate to severe) – 18%



Truth #1: Normative

- **What may or may not be true: Examples**
- 1) “All/Majority/Some” ADISM have of MSK injuries
- 2) Injuries have “timelines” for healing
- 3) Dx have treatment plans
- 4) Dx/terminology (disc disease, arthritis, fracture) have numerous interpretations...therefor requires context



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Truth #2: Subjective

- **What patient believes to be true: Examples**
- VAS, written/verbal, questionnaires/measurements
- Understanding of self:
 - Pain, mechanisms, MOS, ADLs, related experience
 - Ex: tightness, weakness or fear



Truth #3: Objective

- **Provider's truth**
- Via observation
- Measured: physical exam
 - Mechanical, structural, conditioning
- *****Semi-objective**
 - Review of previous medical records
 - Review of imaging/tests



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Areas of conflict: Obstacles, challenges affecting outcomes

- Unmet Expectations
 - “I want this tx, imaging...”
- Avoidance and Prioritization of types of truth
 - “I just don’t do that anymore...”
- Compliance & Accountability
 - “My unit won’t let me...”
- Ignorance or “new” concepts of “injuring” ...
 - “I didn’t know that...”
- End of Active Service (EAS), Compensation, Veteran Affairs Disability Rating
 - “I need it documented...”
- Psychological/Emotional reservation
 - “My spouse just left...”
- Other?



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Motivated Reasoning

- Process of deciding what evidence to accept based on conclusion one prefers
- Which Case Study?



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Confirmation Bias

- Giving credit to expert testimony we like and finding reasons to reject other
- Which Case Study?



System Justification

- Situations that represent a threat to established system will trigger inflexible thinking and desire for closure
- Which Case Study?



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Why do patient's avoid the truth?

- Easy & Convenient - avoid > hear, accept the truth
- Commitment & Accountability – avoid > keeps us from knowing our own responsibility
- Emotions- avoid the “bad” < attention to “good”
- Change- avoid/resist discomfort > knowing the truth has the ability to create changes
- Ego- be willing to recreate who we are and view self differently
- Letting go- status quo (safe and in control) > scary of unknown outcomes
- Freedom- new freedom can be overwhelming



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How does a Provider handle the “truth”: Perspective

- New 45min, follow up 15min
- Previous Tx History
- Intake Form
- Observation during history/exam
- Patient engagement/participation
- Buy-in/Feedback
- Trial of care -> follow up appt ->
- Compliance and progression
- Other



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Key Concepts of MSK injuries

- Stress and Load
- Muscles create force and stiffness
- Posture migrates load between tissues
- Stiffness is needed to control movement

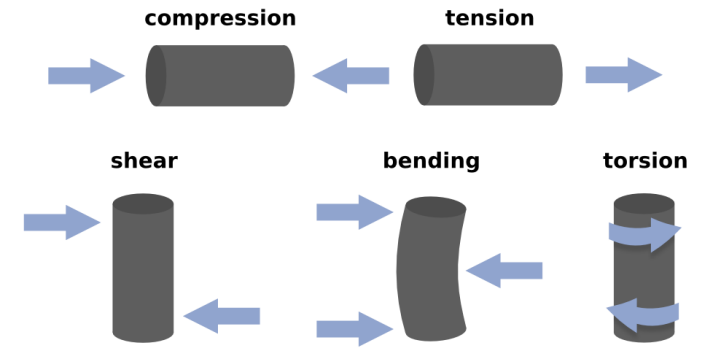


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Concept 1: Stress & Load

- LESSION 1 - EDUCATE:
- Report of Finding
- **Stress** is primary stimulus for cellular adaptation
- Management of stress: Regeneration vs. Degeneration
- **Load** has magnitude...long term duration -> cumulative stress
- Ex: laying in bed-> if you don't change position -> leads to discomfort
 - If you don't continue to change -> discomfort leads to pain
 - If left unchanged -> pain will become an injury -> bedsore



Concept 2: Force & Stiffness

- LESSION 2 - SEE/FEEL
- Physical Exam, ROM
- Muscles create force and stiffness
- Importance of soft tissue/fascia, elasticity
- Too much stiffness is bad -> can limit ROM -> needs proper Neural Drive
 - “output of central motor cortex and brain’s response to stimulus”
 - Focus on eccentric contractions, slow tempos and pauses
- Ex: Calf Muscle as a “pogo” stick



Concept 3: Posture migrates load between tissues

- **LESSON 3 - CHALLENGE/ADAPT**
- **Movement Patterns, Positions of Preference**
- Posture controls thrust lines and elastic contributions
- Posture increases load resilience
- Ex: Slouching changes load from tissues to disc
- Ex: Neutral Stance vs. Military Stance vs. Performance Stance
- Ex: Sitting, Standing, Load Bearing of Spine
- Ex: Pes Planus, Pelvic Tilts, Squats, Lunges



Concept 4: Stiffness is needed to control movement

- LESSON 4: APPLY
- “Pain-Free” Functional Capacity, Strength/Conditioning
- Stabilization, control
- Ex: Proximal stiffness and distal elasticity i.e.: kick
- Ex: PFT – pushups/pullups, run, planks/sit-ups
- Ex: CFT - fireman’s carry, ammo can press



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Hard “truths” ...

- Deconditioning
- “Imprints”
- Compliance
- Prioritization of Truths, Preferences, Stubbornness
- Psychosomatic
- Support systems
- Other



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Strategies for Prevention or “reduction”

- Educate...
- Detect...become more familiar with rates, types, causes
- Identify...target activities and populations associated with common leading injuries
- Implement...appropriate interventions (obtainable, objective)
- Monitor effectiveness (how?)
- Surveillance (who?)
- Standardize, metrics (realistic?)
- Screen? If so, frequency
- Demonstrate (visual, tactile)
- Accountability/Progression (Training programs, Home Exercise Plan)
- Conditioning (re-assessment/outcomes)



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Summary

- MSK injuries are prevalent
- MSK injuries are easy to diagnose...difficult to prevent and treat in the military*
- MSK concepts are non-negotiable
- Must understand truths, perspectives and obstacles
- Recommend baseline screening, frequent preventative monitoring and understanding
- Do not ignore psychosocial components of MSK injuries



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Key Takeaways

- MSK injuries WILL happen, degenerative changes are inevitable
- Preventative strategies are needed at all levels: DoD, Branch, Unit, Individual and Providers
- If left untreated can and will lead to additional chronic and/or secondary illnesses
- First “imprint” matters, patient’s experience and provider’s explanation
- Important to understand common cause, and rehab concepts
- Current military medical system needs improvements; process, access, follow-ups
- Understand the different types of “truth”, both patient & provider perspectives
- Identify areas of Conflicts



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Questions?



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References

Defense Centers for Public Health. (2023). Army Injuries, causes, risk factors, and prevention overview.

<https://phc.amedd.army.mil/topics/discond/ptsaip/Pages/Army-Injuries-Causes-Risk-Factors-and-Prevention-Overview.aspx>

International Journal of Public Health. (2022). Epidemiology of Musculoskeletal Injuries in the Navy: A Systemic Review.

<https://pubmed.ncbi.nlm.nih.gov/36531604/>

Journal of Orthopedics & Sports Physical Therapy. (2018). Incidence of Musculoskeletal Injury in US Army Unit Types: A Prospective Cohort Study.

<https://www.jospt.org/doi/10.2519/jospt.2018.7979>

Journal of Science and medicine in sport. (2021) Musculoskeletal injuries in military personnel – Descriptive epidemiology, risk factor identification, and prevention. <https://pubmed.ncbi.nlm.nih.gov/33824080/>

Military Medicine. (2020) Musculoskeletal Injuries and United States Army Readiness. Part I: Overview of Injuries and their Strategic Impact .

<https://academic.oup.com/milmed/article/185/9-10/e1461/5805225?login=false>



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References

Military Medicine. (2020). Musculoskeletal Injuries and United States Army Readiness. Part II: Management Challenges and Risk Mitigation

Initiatives. <https://pubmed.ncbi.nlm.nih.gov/32107561/>

Military Medical Research. (2021). Risk factors for musculoskeletal injuries in the military; a qualitative systemic review of the literature from

the past two decades and a new prioritizing injury model. <https://mmrjournal.biomedcentral.com/articles/10.1186/s40779-021>

[00357-w](https://mmrjournal.biomedcentral.com/articles/10.1186/s40779-021-00357-w)

Progress in Cardiovascular Disease. (2022). A state-by state and regional analysis of the direct medical costs of treating musculoskeletal injuries

amount US Army trainees. <https://pubmed.ncbi.nlm.nih.gov/36279948/>

Sports Medicine and Arthroscopy Review. (2019). Combat and Noncombat Musculoskeletal Injuries in the US Military.

<https://pubmed.ncbi.nlm.nih.gov/31361716/>



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