



2022 NSCA TACTICAL ANNUAL TRAINING #NSCATactical22

CONFLICT OF INTEREST STATEMENT

I have no actual or potential conflict of interest in relation to this presentation.

The Soldier's Dilemma

Training with Pain, Fatigue, and the Rigors of High Operational Tempo



George Brett Pulvermacher, PT, DPT, CSCS* D
*The Soldier's Dilemma: Training with Pain, Fatigue, and the
Rigors of High Operational Tempo*

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Agenda

- Injury and Fatigue in a US Army Infantry Brigade Combat Team
- Barriers to Physical Training
- Variables to Adjust for Physical Training
- Appropriate Regressions for Injury and Fatigue
- Take Home Points

Injury and Fatigue in a US Army Infantry Brigade Combat Team

- Musculoskeletal Injuries (MSKIs) accounted for more than eight million limited duty days in 2018 (1)
- MSKIs accounted for 65% of all medically non-deployable AC soldiers as of March 2019. This is approximately equivalent to 19.1K soldiers or four brigade combat teams. At any time, 4% of AC soldiers cannot deploy because of MSKIs. (2)
- The total injury rate for the entire Army AC was 1.8 new injuries per person-year in 2017 (3)
- Overuse MSKIs comprise approximately 70% or more of all injuries among trainees and the entire Army AC. (4,5,6)
- Low APFT rates and 2-mile times are associated with increased risk for injury (7)

Injury and Fatigue in a US Army Infantry Brigade Combat Team

- Prior to Holistic Health and Fitness
 - Organic medical resources often with minimal depth in MSK care or performance (medics, PAs, MDs)
 - One organic MSK expert per brigade (BDE PT)
 - One “performance expert” per company (MFT)
- Current Support with Holistic Health and Fitness
 - Prior organic resources
 - Three physical therapists
 - Seven athletic trainers
 - Fourteen strength and conditioning coaches
- Performance programs and injury rehabilitation often occur unsupervised



| SECTION 2: PERMANENT PROFILE | | | | | | | | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--|--------------------------|--------------------------|---|------------------------|---|---|
| 1. REASON FOR PROFILE (In Lay Terminology) | 10. | P | U | L | H | E | S | 11. PROFILE CODES | 12. PROFILING PROVIDER | 13. APPROVING AUTHORITY | 14. DATE | | |
| COMBINED PULHES | | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| SECTION 3: ACTIVE TEMPORARY PROFILE(S) AS OF: | | | | | | | | | | | | | |
| 5. REASON FOR PROFILE (In Lay Terminology) | 16. SEVERITY | 17. MECHANISM OF INJURY | | | 18. DUTY STATUS | | 19. EXPIRATION DATE | | 20. DAYS ON PROFILE | | 21. PROFILING PROVIDER | | |
| 2. TOTAL DAYS ON TEMPORARY PROFILE IN THE LAST: 2 MONTHS: <u>0</u> 24 MONTHS: <u>32</u> DATE: <u> </u> | | | | | | | 23. IS SOLDIER AVAILABLE TO TAKE RECORD APFT? YES <input type="checkbox"/> NO <input type="checkbox"/> IF "NO", ANTICIPATED APFT AVAILABILITY DATE <u> </u> | | | | | | |
| SECTION 4: FUNCTIONAL ACTIVITIES | | | | | | | | | | | | | |
| 4. A SOLDIER MUST BE REFERRED TO THE DISABILITY EVALUATION SYSTEM (DES) IF THERE IS AT LEAST ONE PERMANENT (P) "3" IN THE PULHES AND LIMITATION(S) NOTED IN THE FUNCTIONAL ACTIVITIES. TEMPORARY (T) LIMITATIONS DO NOT CAUSE REFERRAL TO DES. | | | | | | | | | | | | | |
| INDICATE THOSE ACTIVITIES THAT THE SOLDIER CANNOT PERFORM BY PLACING AN "N" IN THE APPROPRIATE COLUMN(S). | | | | | | | | | | | | P | T |
| . Physically and/or mentally able to carry and fire individual assigned weapon? | | | | | | | | | | | | | |
| . Ride in a military vehicle wearing usual protective gear without worsening condition? | | | | | | | | | | | | | |
| . Wear helmet, body armor, and load bearing equipment (LBE) without worsening condition? | | | | | | | | | | | | | |
| . Wear protective mask and MOPP 4 for at least 2 continuous hours per day? | | | | | | | | | | | | | |
| . Move greater than 40 lbs (e.g. duffle bag) while wearing usual protective gear (helmet, weapon, body armor, LBE) up to 100 yards? | | | | | | | | | | | | | |
| . Live and function, without restrictions in any geographic or climatic area without worsening condition? | | | | | | | | | | | | | |
| 5. ADDITIONAL PHYSICAL RESTRICTIONS (CHECK IF APPLICABLE) | | | | | | | | | | | | | |
|] a. LIFTING/CARRYING RESTRICTION: MAXIMUM WEIGHT RESTRICTION: | | | | | | | Permanent: <u> </u> lbs. | | | Temporary: <u> </u> lbs. | | | |
|] b. STANDING LIMITATION: | | | | | | | Permanent: <u> </u> min | | | Temporary: <u> </u> min | | | |
|] c. MARCHING WITH STANDARD FIELD GEAR: | | | | | | | Permanent: Time: <u> </u> min / Distance: <u> </u> mi | | | Temporary: Time: <u> </u> min / Distance: <u> </u> mi | | | |
| 6. MEDICAL/ADMINISTRATIVE BOARD STATUS: <u>Not Applicable</u> | | | | | | | | | | | | | |
| SECTION 5: MEDICAL INSTRUCTIONS TO UNIT COMMANDER (Permanent restrictions listed in bold type) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| SECTION 6: ARMY PHYSICAL FITNESS TEST (See FM 7-22) | | | | | | | | | | | | | |
| 8. APFT EVENT | P | | T | | 29. ALTERNATE APFT (Only if Soldier is unable to do APFT 2 mile run) | P | | T | | | | | |
| | YES | NO | YES | NO | | YES | NO | YES | NO | | | | |
| MILE RUN | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | APFT WALK | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| IT-UPS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | APFT SWIM | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| USH-UPS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | APFT BIKE | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| SECTION 7: PHYSICAL READINESS TRAINING CAPABILITIES (See FM 7 - 22; Activities related to permanent conditions are in bold type) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| SECTION 8: UNIT COMMANDER | | | | | | | | | | | | | |
| 1. COMMANDING OFFICER: | | | | | | | | | | 32. DATE: | | | |
| DA FORM DA 3349-SG, <u> </u> 2016 | | | | | | | | | | PREVIOUS EDITIONS ARE OBSOLETE | | | |



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| Sun | Mon | Tues | Wed | Thurs | Fri | Sat | | Sun | Mon | Tues | Wed | Thurs | Fri | Sat |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 12-Jun-22 | 13-Jun-22 | 14-Jun-22 | 15-Jun-22 | 16-Jun-22 | 17-Jun-22 | 18-Jun-22 | | 10-Jul-22 | 11-Jul-22 | 12-Jul-22 | 13-Jul-22 | 14-Jul-22 | 15-Jul-22 | 16-Jul-22 |
| Sun | Mon | Tues | Wed | Thurs | Fri | Sat | | Sun | Mon | Tues | Wed | Thurs | Fri | Sat |
| 19-Jun-22 | 20-Jun-22 | 21-Jun-22 | 22-Jun-22 | 23-Jun-22 | 24-Jun-22 | 25-Jun-22 | | 17-Jul-22 | 18-Jul-22 | 19-Jul-22 | 20-Jul-22 | 21-Jul-22 | 22-Jul-22 | 23-Jul-22 |
| Sun | Mon | Tues | Wed | Thurs | Fri | Sat | | Sun | Mon | Tues | Wed | Thurs | Fri | Sat |
| 26-Jun-22 | 27-Jun-22 | 28-Jun-22 | 29-Jun-22 | 30-Jun-22 | 1-Jul-22 | 2-Jul-22 | | 24-Jul-22 | 25-Jul-22 | 26-Jul-22 | 27-Jul-22 | 28-Jul-22 | 29-Jul-22 | 30-Jul-22 |
| Sun | Mon | Tues | Wed | Thurs | Fri | Sat | | Sun | Mon | Tues | Wed | Thurs | Fri | Sat |
| 3-Jul-22 | 4-Jul-22 | 5-Jul-22 | 6-Jul-22 | 7-Jul-22 | 8-Jul-22 | 9-Jul-22 | | 31-Jul-22 | 1-Aug-22 | 2-Aug-22 | 3-Aug-22 | 4-Aug-22 | 5-Aug-22 | 6-Aug-22 |

Training days available: 36



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Staff Duty

Range

Field Exercise

Competition Coverage

Leave/Off

ABN Op

Training days available: 13



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How do we train with pain, injury, and fatigue?



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Training with Pain, Fatigue, and the Rigors of High Operational Tempo

- Recognize and understand barriers to program creation and execution
- Decrease the chances of detraining and deconditioning during periods of high operational tempo and injury
- Adjust training accordingly to optimize performance without delaying recovery or decreasing job performance

Barriers to Physical Training



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Intrinsic Factors

- Injury
- Fatigue
- Poor Training Experience
- Motivation



Injury

- 1.8 new injuries per person-year
- Un-documented MSKIs possibly more than double that amount
- MSKIs lead to profiles, leading to lost training days, leading to detraining, leading to future injuries

Mitigations

- Proper communication with medical team and adequate understanding of injury/profile limitations to provide adequate and effective training
- Develop better understanding of common injuries and their causes, healing timelines, and restrictions
- Provide effective rehabilitative training, preferably within their organic unit

Fatigue

- Poor nutritional and sleep habits decrease recovery effectiveness
- Physically demanding jobs coupled with demanding physical training
- Long work days with increased stress negatively impact physical training effectiveness

Mitigations

- Understand and promote the value of sleep
- Integrate yourself with your organization's training planners to better understand and account for operational training schedules
- Include recovery techniques in physical training, sometimes making it the priority

Poor Training Experience

- Many Soldiers join the Army straight from high school without experience in sports or physical training
- The majority of training knowledge is passed down by self research or historical norms
- Most leaders creating physical training programs have minimal to no formal education

Mitigations

- Identify new Soldiers with low training ages and provide initial education
- Provide expert opinion to leadership on program development
- Provide direct coaching or supervise a program to leverage MFTs, junior leaders, or motivated Soldiers to serve as extensions of you

Motivation

- Low effort during training sessions
- No physical training occurring outside of duty hours
- Minimal interest in improving physical training programs or personal performance

Mitigations

- Provide flexible training options to cater to multiple interests
- Foster a positive and inclusive training environment
- Provide effective goal orientated training and leverage results

Extrinsic Factors

- Available Training Time
- Unit Culture
- Resource Availability



Available Training Time

- Restrictions on time utilized for physical training
- Long and inconsistent work schedules restricting Soldiers from performing physical training outside of duty hours
- Minimal time spent on education about injuries, recovery, performance, etc.

Mitigations

- Integrate yourself in the daily operations of your organization to find down time to provide training
- Establish flexible training programs that can be adjusted to fit multiple schedules
- Lobby senior leaders to prioritize educational sessions to develop knowledge

Unit Culture

- Outdated and detrimental views on injuries, importance of recovery, and sleep
- Overemphasis on endurance training
- Senior leader values and preferences influencing training programs

Mitigations

- Provide expert opinion and evidence based research during program development
- Build rapport with the Soldiers and leaders in your organization in order to influence buy-in
- Make your ideas work within the already existing culture, build buy-in, leverage that buy-in to make change

Resource Availability

- One “Gym in a Box” per company
- Limited MWR facilities within unit footprint
- Utilization of tracks, fields, and gyms by multiple organizations

Mitigations

- Be creative in utilizing individual equipment for unit training
- Include yourself in every level of program development to de-conflict training schedules
- Establish training programs in advance but be flexible with changes in resource availability

Variables to Adjust for Physical Training



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Adjusting for Pain and Fatigue

- Focus on the “Big Picture” and be flexible
- Plan accordingly and know how to manipulate variables
 - Planning
 - In-Session
- Understand common regressions in order to adjust training on the fly without it losing value



Planning

- Flexible programming
 - Day of the week; time of day; length of workout; equipment needed; fatigue level; with or without supervision
- Planning parallel with operational planners
 - Ex. Avoiding high fatigue workouts prior to high fatigue training
- Planning regressions and progressions prior to a session
 - Allows for quicker adjustments on the fly or for Soldiers to self-progress
- Establishing a “Return to Duty” or “Revamp” program
 - Allows Soldiers returning from injury, field rotations, etc. to progressively return to unit physical training

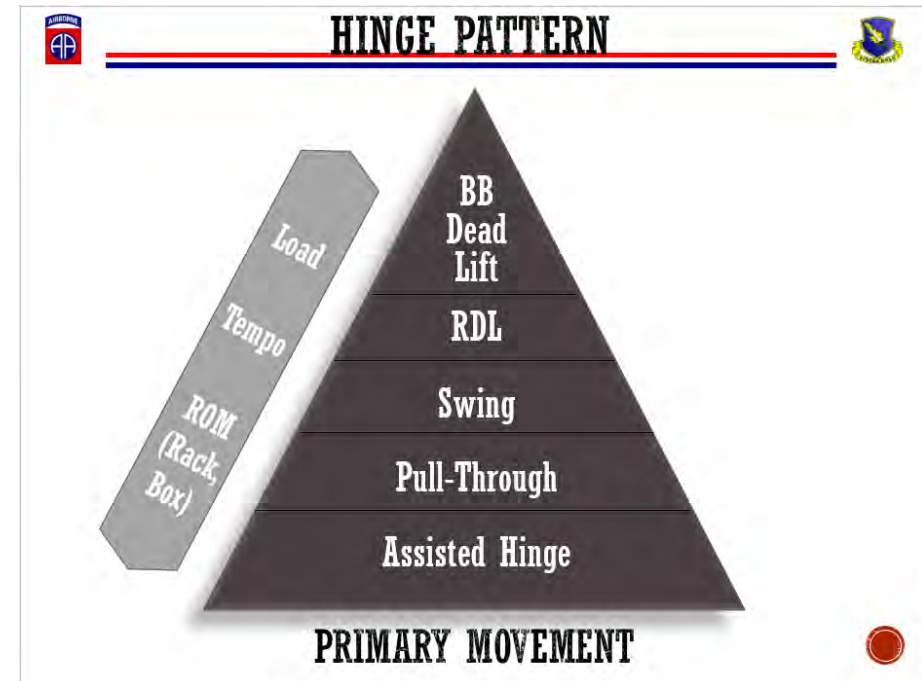
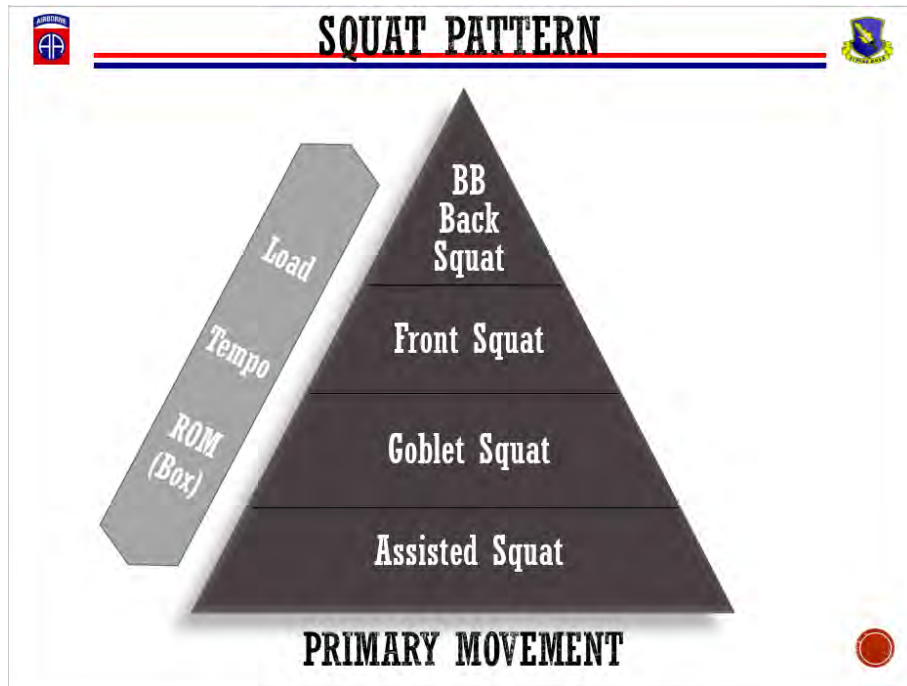
In-Session

- Load
 - TRX assisted; band assisted; bodyweight
- Force Angle
 - Overhead press vs. incline press; horizontal vs. hill sled drags
- Volume
 - Sets and reps; miles; foot impacts; time-on-feet
- Tempo
 - Sustained holds; prolonged eccentric loading
- Rest Periods
 - Adjusted based on fitness level; shortened to increase intensity

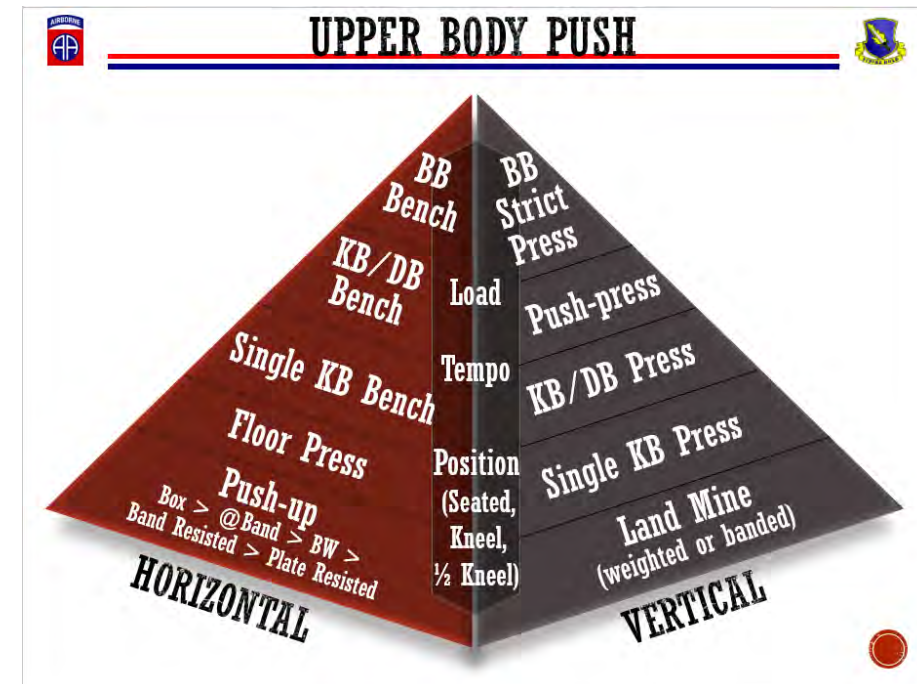
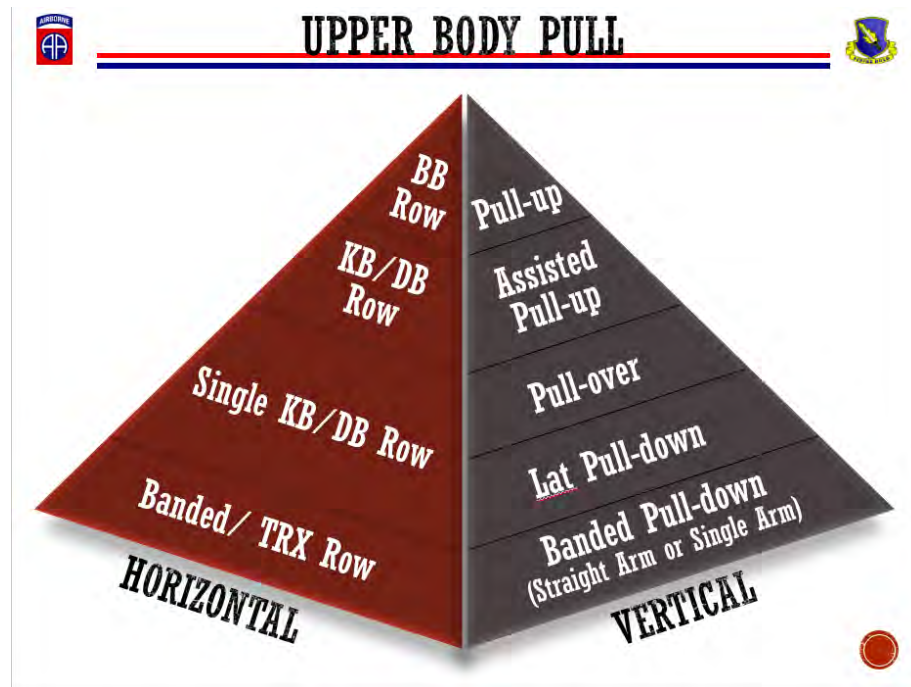
In-Session

- Range of Motion
 - Full vs. partial; within pain-free range
- Balance and Stabilization
 - Single arm/leg vs. double; supported vs. unsupported; machine vs. dumbbell
- Motor Control Considerations
 - Simple vs. complex

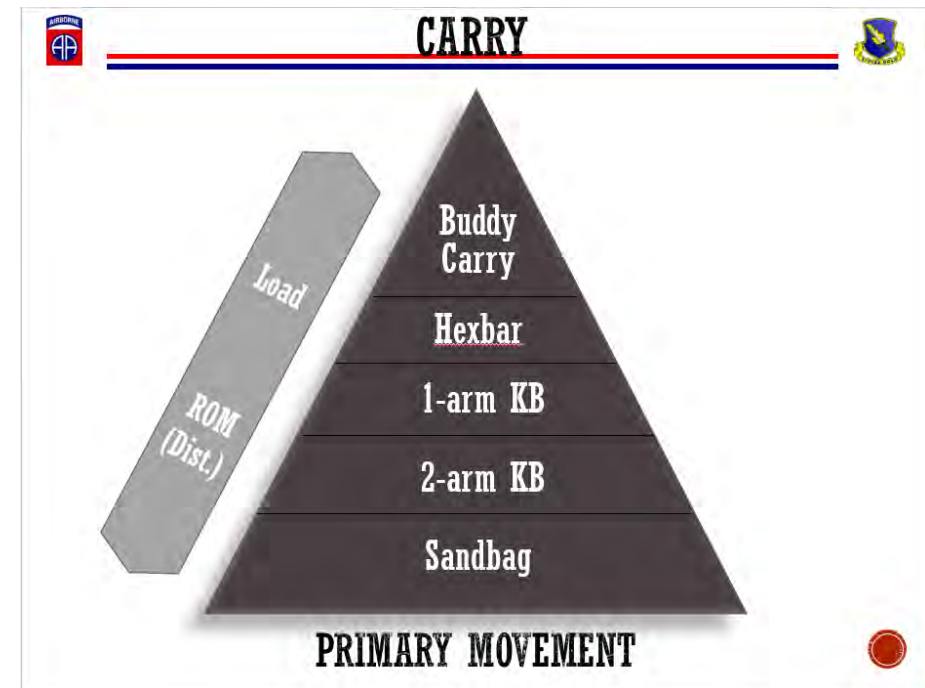
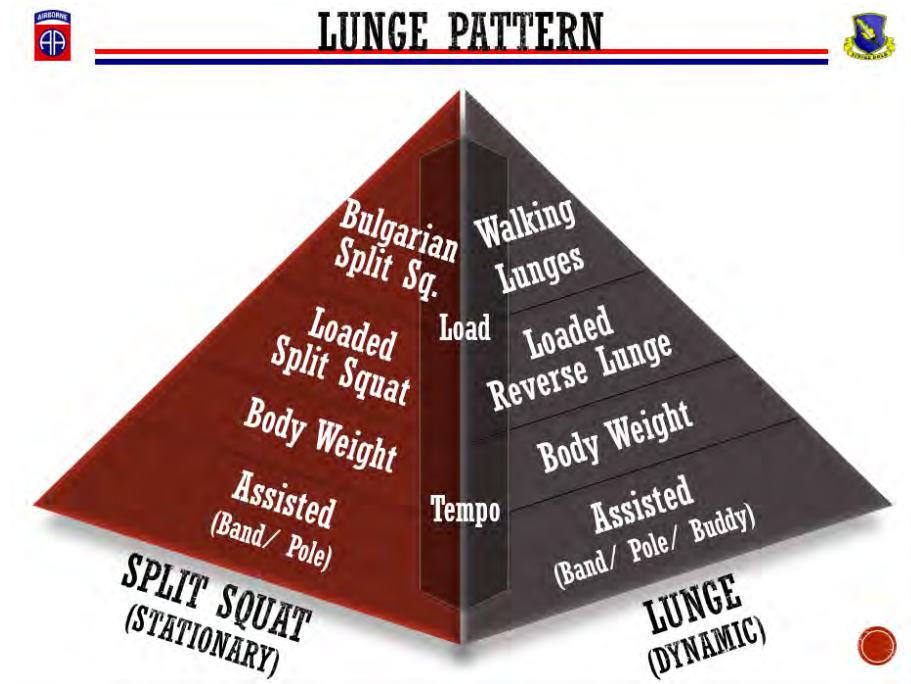
Regressions to Common Movements



Regressions to Common Movements

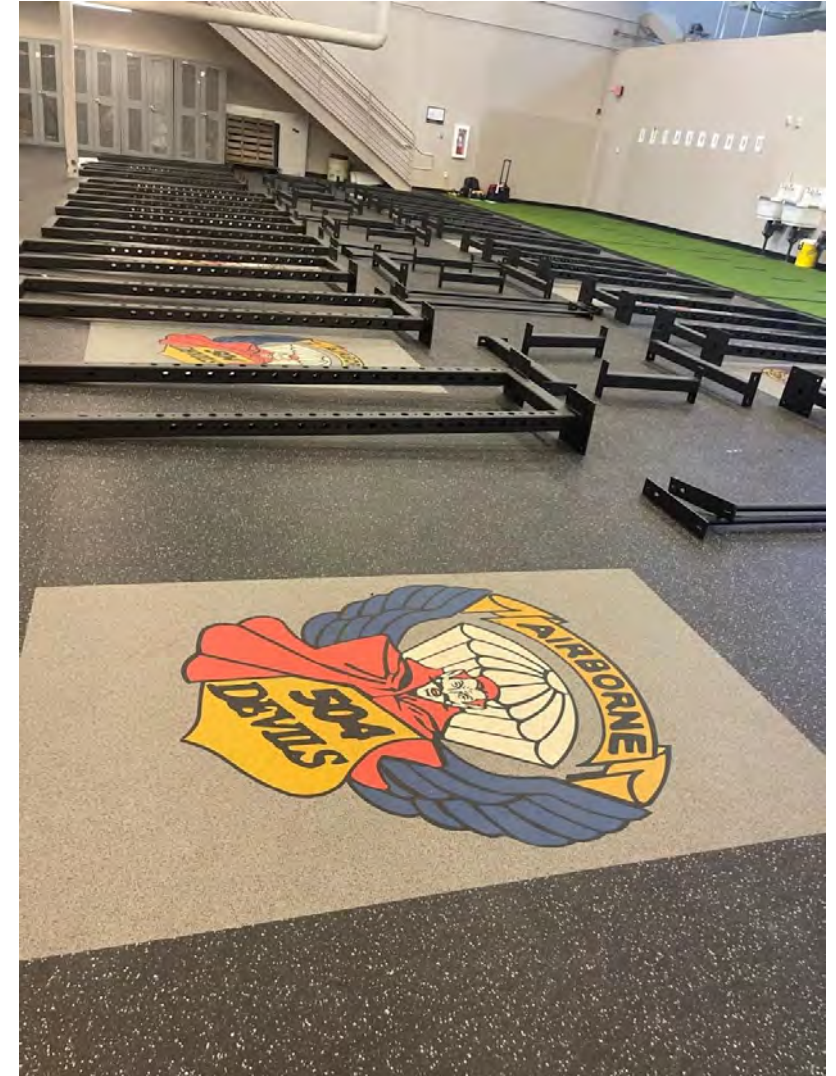


Regressions to Common Movements



Take Home Points

- Spend purposeful time evaluating the current program, culture, and barriers to training when arriving at a new organization
- Plan physical training with operational training schedules in mind
- Take pride in creating a program but be resilient and flexible with inevitable change
- Understand regressions to common movements to quickly modify training without taking someone out of a session



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