# Injury Epidemiological Investigations in Army Special Populations

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# The Public Health Process


From Jones et al. 2010:

- Surveillance: identify the problem
- ***Investigations & Evaluations: determine causes and risk factors***
- Intervention: identify what works to prevent the problem
- Policy: authorities implement prevention strategies
- Evaluation: assess effectiveness of prevention strategies

# Injury Prevention Epidemiologic Investigations & Special Studies

- *Assessments of injuries and injury risk for:*
  - Infantry units
  - Military police
  - Army Wheeled Vehicle Mechanics
  - Medical (Leonard Wood Army Community Hospital staff)
  - Armor Brigade
  - Chemical Brigade
  - Paratroopers
  - Quartermaster Brigade
  - U.S. Army Band
  - Special Operations Forces
  - Army War College
  - Command and General Staff College
  - Sergeants Major Course
  - Ordnance School
  - Combat Medic Advanced Individual Training
  - Military Working Dogs
  - Federal Bureau of Investigation
  - Running Shoe Study: Marine Corps Officer Basic Training, Air Force Basic Military Training

# Survey Background

- For investigations in special populations, surveys are often helpful to supplement other data
  - Detailed information about circumstances associated with injuries (activity, mechanism, location)
  - Other related factors associated with injury risk not usually captured in medical records or elsewhere (health behaviors like sleep and tobacco use, unique occupational exposures and injury risk factors, etc.)
- Usually electronic in recent years
- Responses only reported in aggregate
- Must be approved by the Defense Centers for Public Health-Aberdeen (DCPH-A) Public Health Review Board

# Special Population #1: U.S. Army Reserves

# Background

- Fulfilled a 2020 request from the U.S. Army Reserve Command (USARC) to investigate impacts of a new fitness program Pilot among 21 selected Reserve units in the southeast U.S.
  - Included all Holistic Health and Fitness domains: Physical, Mental, Nutritional, Sleep, Spiritual
  - Baseline phase 2021 – summarized pre-implementation injuries, risk factors, health behaviors
  - Follow-up phase 2023 – compared injuries, risk factors, and health behaviors before and after new fitness program
- Reservists are not typically included in Army surveillance or investigations; sparse literature about injuries and fitness among Reservists

# Background

- A novel Pilot program was necessary for the geographically-diverse and part-time Reserve population
- USARC Pilot design includes two groups with differing degrees of support, plus a comparison group

| Year 1: 1 AUG 2021<br>Year 2: 1 AUG 2022 | Pilot A<br>Pilot A and B common elements in red | Pilot B | Comparison Group |
|---|---|---|---|
| Participating Units | 7 units, southeast U.S. | 7 units, southeast U.S. | 7 units, southeast U.S. |
| Pilot Resources | • Virtual Holistic Health and Fitness (H2F) education 2x/year, 8 hours via Contracted H2F team (Year 1)<br>• Access to CoachMe Plus- mobile app to deliver customized physical training programs (Year 1)<br>• Access to H2F Education via All Partners Access Network (APAN) website<br>• Link to Troop Program Unit (TPU) Physical Therapist, Occupational Therapist, and Dietitian<br>• 1:100 Instructor-to-Soldier ratio for Master Fitness Trainers (MFTs)/Master Resilience Trainers (MRTs)<br>• Human Performance Advisor<br>• Eight 90-minute education sessions by O2X© (Year 2)<br>• O2X© mobile application (Year 2)<br>• 3-day H2F Summit events, education, resources, and Individual assessments provided on H2F domains (Year 2) | • Access to H2F Education via APAN website<br>• Link to TPU Physical Therapist, Occupational Therapist, and Dietitian<br>• 1:100 Instructor-to-Soldier ratio for MFT/MRT<br>• Human Performance Advisor<br>• O2X© mobile application (Year 2)<br>• 3-day H2F Summit events, education, resources, and Individual assessments provided on H2F domains (Year 2) | No access to H2F Pilot Resources |

# Results: U.S. Army Reserves Demographics and Characteristics (n=3,588 Follow-up participants)

- 71% male, 29% female
- Average age 30 ± 9 years
- 57% E1-E4
- 28% men and 17% women were obese (Body Mass Index > 30 kg/m$^2$)

Demographic differences from the Active Duty population suggested potential differences in injuries, fitness, and other holistic health metrics

# Unique Population Characteristics

| | Impacts on fitness, injuries, obesity, other H2F metrics? |
|---|---|
| Older average age (30 ± 9) | Guesses? |
| Higher proportion of women (29%) | |
| Higher average BMI | |
| Little or no unit training | |

Discussion: How might these unique population characteristics impact H2F outcomes?

# Results: U.S. Army Reserves Fitness Test Performance

- The groups with H2F-related resources showed improvements in ACFT performance between Baseline and Follow-up

| Men | Pilot A | | Pilot B | | Comparison | |
|---|---|---|---|---|---|---|
| | Baseline (n=496) | Follow-up (n=496) | Baseline (n=329) | Follow-up (n=329) | Baseline (n=436) | Follow-up (n=436) |
| Deadlift (pounds, mean ± SD) | 192 ± 57 | 203 ± 63* | 185 ± 61 | 206 ± 66* | 176 ± 52 | 198 ± 59 |
| Standing Power Throw (meters, mean ± SD) | 8.5 ± 1.8 | 9.1 ± 1.7* | 8.9 ± 1.8 | 9.3 ± 1.8* | 8.5 ± 1.9 | 8.9 ± 1.7 |
| Hand-release Push-ups (repetitions, mean ± SD) | 26 ± 13 | 28 ± 14* | 25 ± 13 | 26 ± 12* | 22 ± 13 | 26 ± 12 |
| Sprint Drag Carry (minutes, mean ± SD) | 2.1 ± 0.4 | 2.0 ± 0.3* | 2.1 ± 0.4 | 2.1 ± 0.3 | 2.2 ± 0.4 | 2.1 ± 0.3 |
| 2-mile Run (minutes, mean ± SD) | 18.1 ± 2.9 | 18.5 ± 2.4* | 18.8 ± 2.8 | 18.6 ± 2.4 | 18.5 ± 2.8 | 18.2 ± 2.5 |
| Total Score (ACFT 3.0 Baseline, ACFT 4.0 Follow-up) | 418 ± 73 | 441 ± 59* | 402 ± 83 | 431 ± 70* | 390 ± 100 | 426 ± 74 |
| **Women** | (n=147) | (n=147) | (n=93) | (n=93) | (n=133) | (n=133) |
| Deadlift (pounds, mean ± SD) | 155 ± 26 | 155 ± 34 | 153 ± 23 | 149 ± 33 | 148 ± 20 | 144 ± 30 |
| Standing Power Throw (meters, mean ± SD) | 5.6 ± 1.3 | 5.6 ± 1.1 | 5.4 ± 1.3 | 5.6 ± 1.2* | 5.3 ± 1.3 | 5.5 ± 1.2 |
| Hand-release Push-ups (repetitions, mean ± SD) | 18 ± 9 | 21 ± 11* | 17 ± 10 | 18 ± 9 | 16 ± 9 | 19 ± 10 |
| Sprint Drag Carry (minutes, mean ± SD) | 2.7 0.5 | 2.6 ± 0.4 | 2.8 ± 0.5 | 2.9 ± 0.6 | 2.8 ± 0.5 | 2.8 ± 0.5 |
| 2-mile Run (minutes, mean ± SD) | 20.3 ± 3.2 | 19.7 ± 2.7 | 20.5 ± 2.9 | 20.3 ± 2.4 | 20.4 ± 2.9 | 20.2 ± 2.1 |
| Total Score (ACFT 3.0 Baseline, ACFT 4.0 Follow-up) | 313 ± 101 | 437 ± 74* | 309 ± 92 | 407 ± 89* | 314 ± 79 | 419 ± 65 |

Note: *p<0.05, paired samples t-test (improved performance in green, decline in performance in red)

# Results: U.S. Army Reserves Fitness Test Performance

- The group with the most H2F-related resources had better ACFT performance, especially for women, compared to the other groups.

| Follow-up Data | MEN | | | WOMEN | | |
|---|---|---|---|---|---|---|
| | Pilot A | Pilot B | Comparison | Pilot A | Pilot B | Comparison |
| | (n=541) | (n=386) | (n=486) | (n=187) | (n=157) | (n=184) |
| Deadlift (pounds, mean ± SD) | 211 ± 64 | 206 ± 63 | 204 ± 64 | 150 ± 31*† | 141 ± 25† | 141 ± 26 |
| Standing Power Throw (meters ± SD) | 9.0 ± 1.8† | 9.3 ± 1.9*† | 9.0 ± 1.7 | 5.4 ± 1.1 | 5.4 ± 1.1 | 5.4 ± 1.1 |
| Hand-release Push-ups (repetitions, mean ± SD) | 29 ± 14* | 28 ± 13 | 27 ± 14 | 22 ± 10*† | 18 ± 8*† | 20 ± 10 |
| Sprint Drag Carry (minutes, mean ± SD) | 2.0 ± 0.3* | 2.1 ± 0.3 | 2.1 ± 0.3 | 2.7 ± 0.4† | 2.9 ± 0.6*† | 2.8 ± 0.4 |
| Plank (minutes, mean ± SD) | 2.1 ± 0.8*† | 1.9 ± 0.7 | `1.9 ± 0.7 | 2.0 ± 0.7† | 1.8 ± 0.7† | 1.9 ± 0.7 |
| 2-mile Run (minutes, mean ± SD) | 18.4 ± 2.5* | 18.4 ± 2.5* | 18.1 ± 2.4 | 19.9 ± 2.6 | 20.2 ± 3.1 | 19.9 ± 2.4 |
| Total Score (ACFT 4.0) | 443 ± 64* | 435 ± 63 | 431 ± 74 | 430 ± 69*† | 396 ± 86*† | 420 ± 72 |

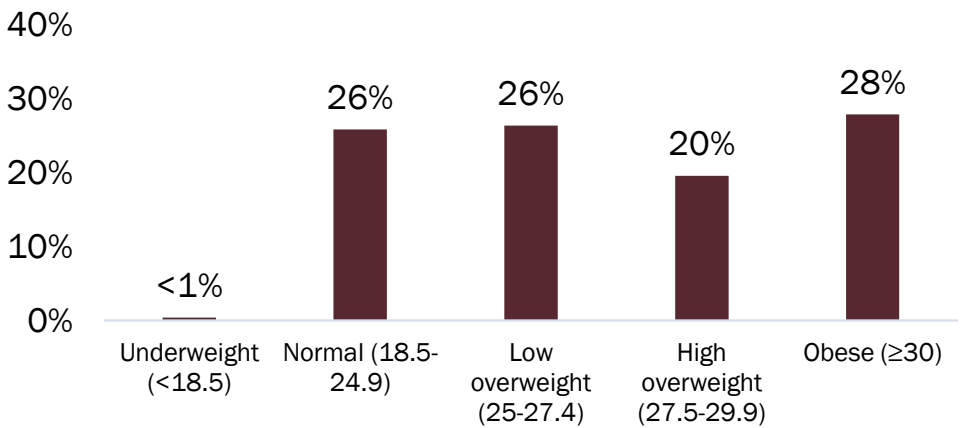
Notes:
*Statistically significant difference from the Comparison group ($p<0.05$), ANCOVA adjusting for age and BMI (better performance in green, worse in red)
†Statistically significant difference between Pilot groups ($p<0.05$), ANCOVA adjusting for age and BMI (better performance in green, worse in red)

- Based on multivariable logistic regression, non-obese BMI (<30 kg/m$^2$) was the factor with the strongest association with passing the ACFT for both sexes

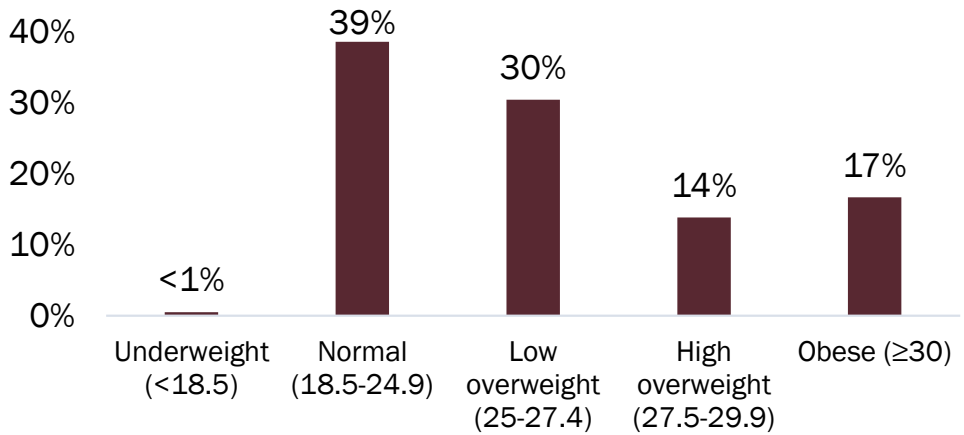
# Results: U.S. Army Reserves Body Composition

- Average BMI during the Follow-up timeframe was 28 kg/m$^2$ among men and 26 kg/m$^2$ among women. There were negligible differences between Baseline and Follow-up or across groups.
- Based on multivariable logistic regression, age was the factor with the strongest association with obesity for both sexes (≥25 years men, ≥35 years women)

Men (n=2,210)




Women (n=809)



# Other Interesting Findings - U.S. Army Reserves

- This Reserves population had lower proportions of Soldiers reporting tobacco use, compared to the overall Army

- No significant differences were observed in health behaviors (sleep, tobacco use, nutritional intake, etc.) or health knowledge between Baseline and Follow-up

# Discussion

- Thoughts, insights, questions about injuries, fitness, and obesity among Army Reservists?

# Special Population #2: U.S. Army Band

# Background

- Fulfilled a 2018 request from unit Commanders to investigate musculoskeletal injuries among members in the 42S MOS in the Military District of Washington/National Capital Region (MDW/NCR):
  - The U.S. Army Band (TUSAB), The U.S. Army Field Band (TUSAFB), The U.S. Army Old Guard Fife & Drum Corps (OGFDC)
- Unique population - injuries and risk factors may differ from other Army populations
- Extends previous work by DCPH-A Injury Prevention, 2004-2005

# Demographics (n=465 Army Band Members, rosters)

| Variable | Characteristic | All Band Members n=465 n (%) |
|---|---|---|
| Sex | Female | 113 (24.3) |
| | Male | 352 (75.7) |
| Age (years) | 18–24 | 12 (2.6) |
| | 25–34 | 144 (31.0) |
| | 35–44 | 192 (41.2) |
| | ≥ 45 | 117 (25.2) |
| | Mean ± SD | 38.9 ± 8.0 |
| Rank | E1–E4 | 4 (0.9) |
| | E5–E9 | 449 (96.6) |
| | O1–O6 | 9 (1.9) |
| | W1–W5 | 3 (0.6) |

Instruments were predominantly brass and woodwinds in all groups; more percussion in Old Guard Fife & Drum

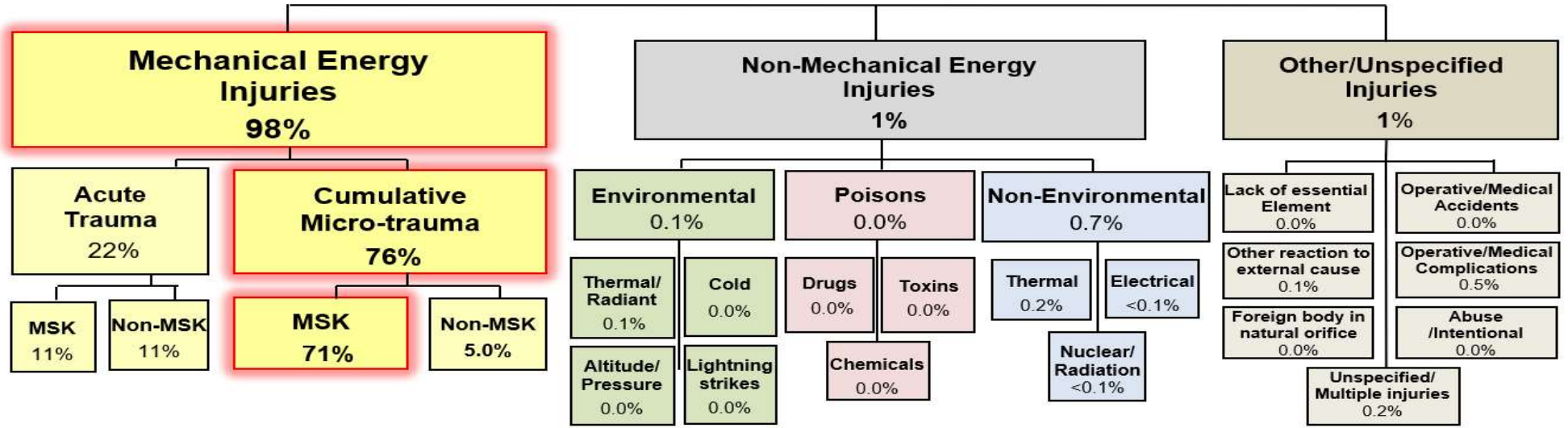
# Unique Population Characteristics

| | Impacts on injuries and injury risk factors |
|---|---|
| Older average age (39 ± 8) | Guesses? |
| Higher proportion of women (24%) | |
| Extended standing, sitting, marching | |
| Non-neutral playing postures | |
| Loading/unloading instruments and equipment for performances (*some) | |

Discussion: How might these unique population characteristics impact injuries and injury risks?

# Results: U.S. Army Band Injuries

- Medical record
  - n=766 medical record injuries, October 2017-December 2018
  - 71% of injuries were MSK overuse



# Injury Rates and Prevalence, October 2017–2018

| | All Band Members n=465 | All Army n=465k |
|---|---|---|
| Crude injury rate per 1,000 person-years | 1,328 | 1,821 |
| Age- and sex-adjusted injury rate per 1,000 person-years | 1,040 | 1,821 |
| Percent with at least one medical encounter for injury | 60 | 56 |
| Total medical encounters for injuries (including follow-up visits and long-term effects of MSK injuries) | 1,919 | 2.2M |

# Results: U.S. Army Band Injuries

- Self-reported via electronic survey
  - 48% response rate (n=221, total n=465)
  - 80% of respondents reported at least one injury in the previous 12 months (n=176)
  - Most frequently injured body regions were the lower back (26%), foot/toe (13%) and knee (9%)

| Top activities associated with injury (self-report, n=174 injuries) | Top mechanisms of injury (self-report, n=174 injuries) |
|---|---|
| 21% running for physical training | 30% band-related overuse/repetitive motions |
| 11% repetitive movements associated with playing | 25% other overuse/repetitive motions |
| 11% standing while practicing, rehearsing, or performing | 15% overexertion/over-extension/twisting effort |

# Results: Risk Factors for Injury among U.S. Army Band Musicians (Multivariable, Men Only)

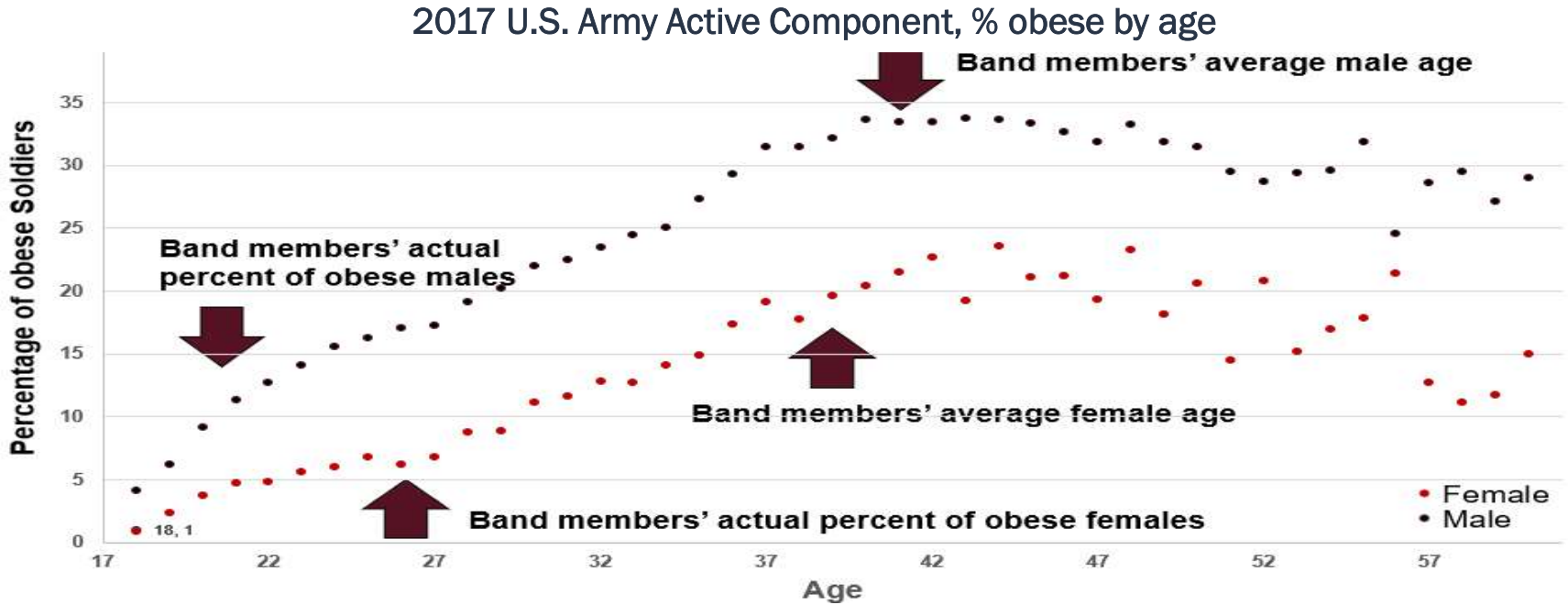
| | | Total n | % with any injury | Odds Ratio (95% CI) | Category p-values |
|---|---|---|---|---|---|
| Fitness test 2-mile run time | <15.4 minutes | 100 | 63% | Ref | |
| | 15.4–16.9 minutes | 101 | 70% | 1.33 (0.73–2.42) | 0.36 |
| | **>16.9 minutes** | **102** | **84%** | **2.23 (1.07–4.67)** | **0.04** |
| | No data | 49 | 90% | N/A | N/A |
| Estimated body fat percentage | <20.5 | 113 | 69% | Ref | |
| | 20.5–23.5 | 120 | 68% | 0.87 (0.48–1.63) | 0.66 |
| | **>23.5** | **117** | **89%** | **2.30 (1.02–5.18)** | **0.04** |
| | No data | 2 | 0% | N/A | N/A |
| Age (years) | 18–34 | 106 | 79% | Ref | |
| | 35–44 | 147 | 86% | 0.88 (0.48–1.63) | 0.69 |
| | ≥45 | 99 | 92% | 1.04 (0.47–2.31) | 0.93 |

# Recommended Injury Prevention Strategies U.S. Army Band Musicians

- Increase physical training, with a variety of activities
  - Leadership support needed, scheduled around occupational expectations (rehearsals, performances, practicing, etc.)
  - Armed Forces Wellness Center services can be utilized for training support and education
  - Support from athletic trainers, physical therapists, occupational therapists have been shown to improve injury risk among musicians
- Request ergonomic assessments to address non-neutral and maladaptive postures
- Use relaxation techniques, take breaks while rehearsing

# Other Interesting Findings - U.S. Army Band Musicians

Army Band Soldiers had comparable average BMI (26kg/m$^2$ men, 24kg/m$^2$ women) and lower proportion of obese (12% men; 7% women), compared to the overall Army



# Discussion

- Thoughts, insights, questions about injuries among Army Band members?

# Special Population #3: Employees at the General Leonard Wood Army Community Hospital (GLWACH)

# Background

- Fulfilled a 2014 request from GLWACH leadership to investigate injuries and health behaviors among hospital staff

- Unique population – employees include both civilians and Active-Duty

# Demographics Summary (n=380 survey respondents)

- 44% male, 56% female
- 47% were 26-39 years
- 53% military, 45% DA Civilians, 2% other
- 49% Bachelor's degree or higher
- A variety of occupations were represented, including nurses (16%), hospital administration staff (14%), medics (13%), technicians (10%), physicians (6%), and pharmacists (2%)

# Unique Population Characteristics

| | Impacts on injuries and injury risk factors |
|---|---|
| Older average age (47% were 26-39) | Guesses? |
| Higher proportion of women (56%) | |
| Variety of occupations represented | |

Discussion: How might these unique population characteristics impact injuries and injury risks?

# Results: Military Hospital Employee Injuries

- Did not focus on medical records, civilian medical records not captured in the Military Health System
- Self-reported via electronic survey
  - 33% response rate (n=380, total n=1,147)
  - 47% of respondents reported at least one injury in the previous 12 months (n=178)

| Leading injury types | Leading injured body areas | Leading injury activities |
|---|---|---|
| Sprain/strain (30%) | Knee (22%) | Running (34%) |
| Tear (14%) | Lower back (17%) | Other physical training (11%) |
| Dislocation (8%) | Shoulder (9%) | Lifting heavy objects (9%) |

# Results: Risk Factors for Injury among Military Hospital Employees

| Variable | Variable category | Total n | % injured | Injury OR (95% CI) | Category p-value |
|---|---|---|---|---|---|
| Employee status | **Enlisted** | **117** | **60%** | **2.75 (1.32–5.71)** | **<0.01** |
| | **Officer** | **88** | **47%** | **2.98 (1.44–6.17)** | **<0.01** |
| | DA civilian | 169 | 38% | 1.00 | |
| | Other | 6 | 50% | 1.11 (0.18–6.72) | 0.91 |
| Occupational group | Nurse | 61 | 39% | 1.00 | |
| | **Physician** | **23** | **13%** | **0.11 (0.03–0.46)** | **<0.01** |
| | Technician | 38 | 58% | 2.08 (0.79–5.50) | 0.14 |
| | Pharmacy | 8 | 50% | 1.00 (0.18–5.57) | >0.99 |
| | Medic | 50 | 58% | 1.43 (0.51–4.00) | 0.50 |
| | Other Medical Providers | 77 | 53% | 1.35 (0.59–3.10) | 0.48 |
| | Admin | 53 | 47% | 1.79 (0.77–4.18) | 0.18 |
| | Other non-medical/Unspecified | 70 | 43% | 1.57 (0.69–3.54) | 0.28 |

# Results: Risk Factors for Injury among Military Hospital Employees (continued)

| Variable | Variable category | Total n | % injured | Injury OR (95% CI) | Category p-value |
|---|---|---|---|---|---|
| Stress | **Yes** | **119** | **58%** | **2.10 (1.30-3.40)** | **<0.01** |
| | No | 261 | 42% | 1.00 | |
| Education level | GED or High School | 86 | 48% | 1.32 (0.65-2.64) | 0.44 |
| | **Associate's** | **80** | **58%** | **2.32 (1.16-4.65)** | **0.02** |
| | Bachelor's | 83 | 38% | 1.00 | |
| | Master's or Doctorate | 102 | 43% | 1.87 (0.93-3.76) | 0.08 |
| | Other Professional Degree | 29 | 52% | 2.27 (0.87-5.90) | 0.09 |

# Recommended Injury Prevention Strategies Military Hospital Employees

- Leadership should focus on initiatives to address sprains and strains, from activities like heavy lifting and physical training
- Health education should focus on health behaviors contributing to injury risk, like stress management
- Targeted prevention strategies could be used for subpopulations at greater risk (e.g., Active Duty)

# Other Interesting Findings - Military Hospital Employees

- Also looked at barriers to physical activity
- ≥4 reported barriers to physical activity were associated with lower perceived health
- Leading reported barriers to physical activity:
  - Lack of time (65% of respondents)
  - Lack of motivation (45%)
  - Pain or previous medical condition (27%)

# Discussion

- Thoughts, insights, questions about injuries among military hospital employees?

# Special Population #4: U.S. Army Road Marching Participants

# Background

- Sub-analysis of an investigation of injuries among Soldiers in an infantry brigade, exploring road marching injuries; 2017 analysis of 2014 data

- Unique population – road marching participants only

# Demographics Summary (n=831 survey respondents)

| Variable | Category | n (% of total) |
|---|---|---|
| Sex | Female | 6 (1) |
| | Male | 825 (99) |
| Age (years)<br>Mean age: 25±5 | 18-24 | 474 (57) |
| | 25-34 | 297 (36) |
| | 35-54 | 60 (7) |
| Rank | E1-E4 | 553 (67) |
| | E5-E9 | 200 (24) |
| | O1-O5 | 78 (9) |
| Occupation | Combat Arms | 681 (82) |
| | Combat Services | 41 (5) |
| | Combat Services Support | 108 (13) |

# Unique Population Characteristics

| | Impacts on injuries and injury risk factors |
|---|---|
| Mostly young, enlisted, combat-arms Soldiers | Guesses? |
| 99% men | |
| Frequent road marching participation | |

Discussion: How might these unique population characteristics impact injuries and injury risks?

# Results: Leading Injury Activities in an Infantry Brigade (n=831 survey respondents)

Road marching was the second highest reported cause of injury in the previous 6 months

| Activity associated with injury | Total injuries n (%) | # injuries resulting in limited duty n (%) | Total limited duty days | Average # limited duty days per injury |
|---|---|---|---|---|
| Physical training (running) | 113 (27) | 74 (32) | 2,514 (28) | 31 |
| Road marching | 96 (23) | 49 (21) | 1,840 (20) | 33 |
| Physical training (weightlifting) | 43 (10) | 19 (8) | 678 (8) | 36 |
| Lifting or moving heavy objects | 35 (8) | 18 (8) | 957 (11) | 49 |
| Other physical training | 31 (8) | 17 (7) | 482 (5) | 28 |

# Results: Injury Rates per Mile of Exposure

- Commanders may be tempted to replace running with road marching to address high injury rates during running
- In this population, the relative risk of injury during road marching was higher

| Activity associated with injury | Total injuries in prior 6 months | Total injuries resulting in limited duty in prior 6 months | Total miles exposed in prior 6 months | Rate of injury per 10,000 miles | Rate of injury per 10,000 miles resulting in limited duty per mile | Relative risk of injury (95% CI) | Relative risk of injury resulting in limited duty (95% CI) |
|---|---|---|---|---|---|---|---|
| Running | 113 | 74 | 347,537 | 3.3 | 2.1 | - | - |
| Road marching | 96 | 49 | 163,392 | 5.9 | 3.0 | 1.81 (1.38–2.37) | 1.41 (0.98–2.02) |

# Results: Risk Factors for Injuries during Road Marching

**ALL ROAD MARCHING PARTICIPANTS**

- Age ≥ 35
- Regular occupational lifting 50–100+ pounds
- ≤4 miles of running per week during personal PT
- Road marching ≥5 times per month
- Wearing >25% of body weight during road marching

**LOW MILEAGE**

(1–19 miles per month)

- Rank E5–E9
- Current smokeless tobacco user

**MODERATE MILEAGE**

(20–32 miles per month)

- Rank O1–O5
- No personal PT running participation

*As road marching mileage increased, concurrent participation in other physical activities became a risk factor for injury during road marching*

**HIGH MILEAGE**

(≥33 miles per month)

- Regular occupational lifting 50–100+ pounds
- <1-4 miles of running per week during personal PT
- ≥31 minutes of resistance training per session during personal PT
- Wearing >25% of body weight during marching

# Recommended Injury Prevention Strategies
# Road Marching

- Establish a balanced, scheduled training program
  - Include a variety of exercises: aerobic, anaerobic (strength, endurance, power), agility, balance
- Use gradual progression for road march training
  - Follow recommendations in Army Field Manual 7-22 and Army Field Manual 21-18

**Table 7-3. 20-week ruck marching progression**

| *Week* | *Recommended Load* | *Distance (miles)* | *Time Standard* | *Pace* |
|---|---|---|---|---|
| 1-2 | 15–20 lb | 2 | 35 min +/- 5 min | 3 mph |
| | | | | |
| 4 | 25–30 lb | 4 | 65 min +/- 5 min | 3 mph |
| | | | | |
| 6 | 30–35 lb | 4 | 90 min +/- 5 min | 3 mph |
| | | | | |
| 8 | 50–60 lb | 6 | None | 3 mph |
| | | | | |
| 12 | 60–70 lb | 6 | None | 3 mph |
| | | | | |
| 16 | 60–80 lb | 6 | None | 3.5 mph |
| | | | | |
| 20 | 60–80 lb | 8 | None | 3.5 mph |

lb pounds mins minutes mph miles per hour

# Other Interesting Findings - Road Marching

- In another recent exploration, road marching injuries among men and women were compared
- Women reported significantly more hip injuries during road marching, compared to men

| | Male | | | Female | | | Relative risk of road marching injury Female : Male (95% CI) |
|---|---|---|---|---|---|---|---|
| | # Injuries | # Road marching participants | Rate of Injuries per 1,000 soldiers | # Injuries | # Road marching participants | Rate of Injuries per 1,000 soldiers | |
| Hip injuries during road marching | 5 | 2,677 | 2 | 5 | 441 | 11 | 6.07 (1.76-20.97) |

# Discussion

- Thoughts, insights, questions about road marching injuries?

# Conclusions

- It's important to explore injuries and injury risks in unique military populations to characterize population-specific injury problems
- Surveys enhance existing data and provide necessary details to inform injury investigations in special populations
- Many common Active Duty Army injury risk factors have also applied in special Army populations (e.g., older age, low fitness, obesity, tobacco use), even when population demographics and exposures differ greatly from the overall Army

# References for Highlighted Injury Investigations

Army Reserves

- Baseline Technical Information Paper (2023): https://apps.dtic.mil/sti/trecms/pdf/AD1196570.pdf
- Baseline manuscript submitted to *BMJ Military Health*, final Technical Report in draft

Army Band

- Technical Report (2021): https://apps.dtic.mil/sti/pdfs/AD1134062.pdf
- Manuscript (2023): https://www.ingentaconnect.com/contentone/scimed/mppa/2023/00000038/00000004/art00005

- Previous investigation:
  - Technical Report: https://apps.dtic.mil/sti/citations/ADA462210
  - Manuscript: https://www.sciencedirect.com/science/article/abs/pii/S0958259210000908
  - Manuscript: https://onlinelibrary.wiley.com/doi/pdf/10.1002/ajim.20532

# References for Highlighted Injury Investigations

Fort Leonard Wood Hospital Employees

- Technical Report (2016): https://apps.dtic.mil/sti/pdfs/ADA633025.pdf
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