



**ARMY MEDICINE**  
Serving To Heal...Honored To Serve

# **Soldier 2020**

## **Injury Rates/Attrition Rates Working Group**

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### **Medical Recommendations**

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The Surgeon General and  
Commanding General, USAMEDCOM

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**SECURITY CLASSIFICATION:**  
UNCLASSIFIED



# Purpose and Outline

**Purpose:** To present Medical recommendations in support of Soldier 2020 Initiative.

## **Outline:**

1. Bottom Line Up Front
2. Current Data and Research Findings/Conclusions
  - Musculoskeletal Injuries & Load Carriage
  - Injury Prevention
  - Behavioral Health
  - Female Specific Issues
3. Recommended Mitigation Strategies



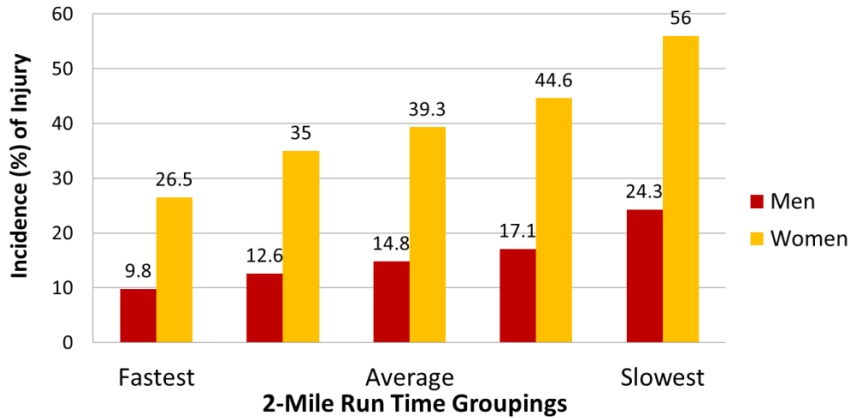
# BLUF

- **Problem Statement:** Medically non-available rates are high and too many Soldiers, of both genders, are lost to injuries and medical attrition. Musculoskeletal (MSK) and Behavior Health (BH) are the primary reasons for medical encounters.
- Overall focus on matching the right Soldier to the right job, while maintaining performance standards.
- **Conclusion:**
  - The appropriate use of physical standards should reduce injuries and medical attrition.
  - There is no medical basis to prohibit any MOS opening to females.
- **Recommendations:**
  - Physical fitness
  - Leadership driven
  - Optimized performance



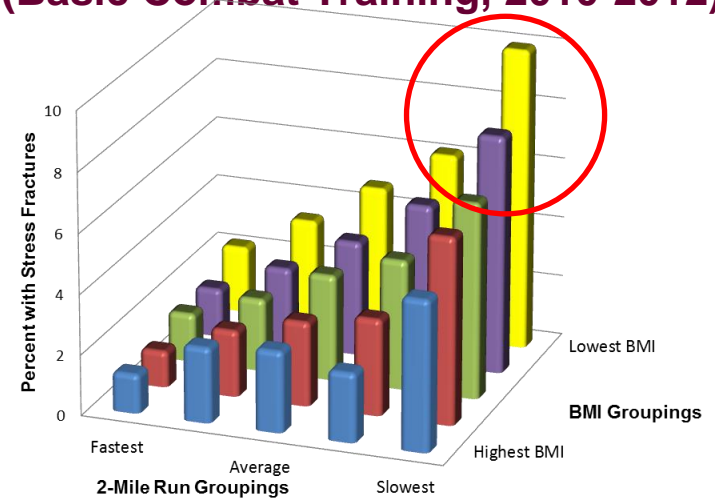
# Musculoskeletal Injuries (1 of 2)

## Incidence (%) of Training-related Injuries by fitness levels for Males and Females in Basic Combat Training (2010-2013)



- In Basic Combat Training, females are injured at roughly twice the rate of males.
- Injury incidence is lower for males and females with the fastest run times and higher for those with the slowest run times.
- In other studies, we know there is a small subset of females that perform at the same fitness level as males resulting in similar injury rates in Basic Combat Training.

## Percent of Female Soldiers with a Stress Fracture by Run Time and BMI (Basic Combat Training, 2010-2012)



- Stress fractures are highest in a training environment, with females having ~3.5 to 4.0 times higher injury rates than males.
- Stress fractures are more common in both male and female Soldiers in the slowest 20% for run times and the lowest 20% for BMI.
- The overall injury incidence is higher for female Soldiers with the lowest 20% for BMI and for male Soldiers with the lowest & highest 20% for BMI.

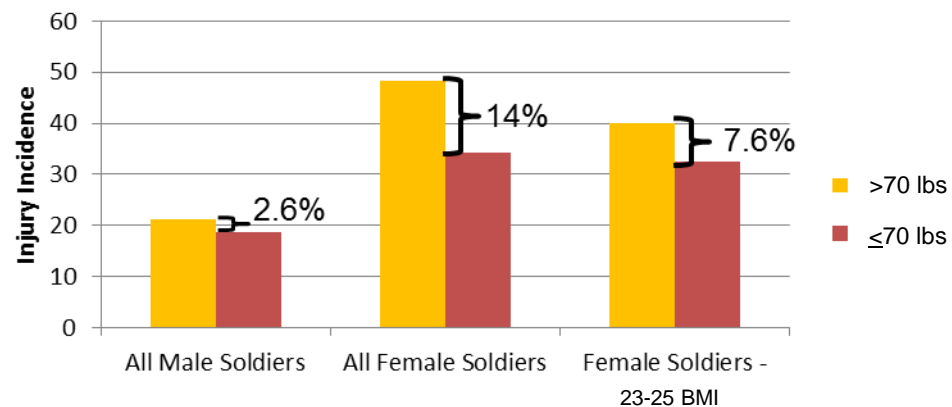


# Musculoskeletal Injuries (2 of 2)

- In Basic Combat Training, male and female injury rates are higher than in the Operational Army.
- Female Soldiers in the Operational Army are more fit than those in initial training.
- Male and female Soldiers' injury rates are similar in the Operational Army.
- Based on limited research, female injury rates are slightly higher than male injury rates in the deployed environment.
- 2.6% of injuries in male Soldiers and 14% in female Soldiers can be attributed to wearing uniform and equipment weighing more than 70 lbs.

**Bottom Line:** There is a subset of female Soldiers who are likely to be injured less with higher load carriage.

**Injuries in Soldiers Performing Load Carriage**

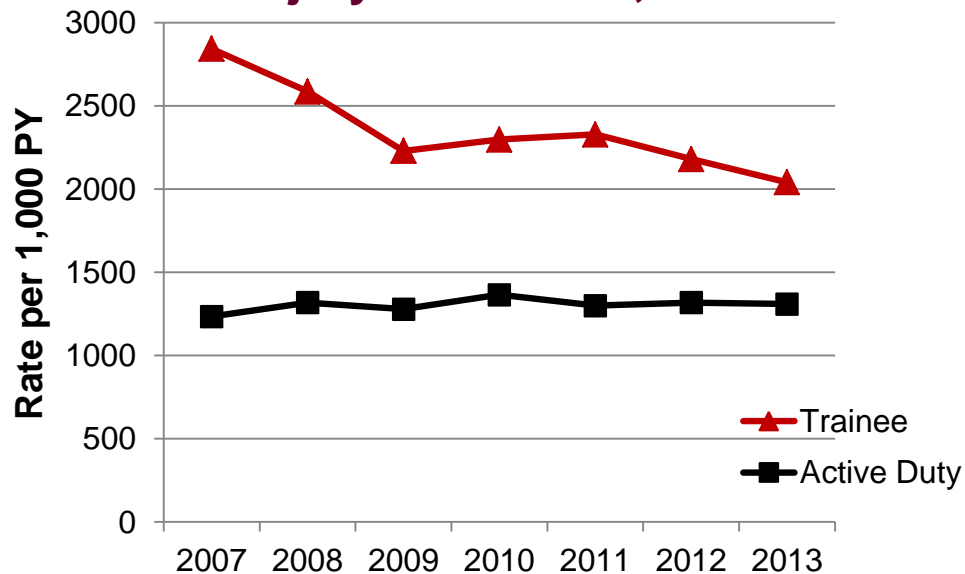




# Injury Prevention

**Bottom Line:** Decrease in trainee injury rates since 2007 is due in large part to Physical Readiness Training (PRT) program implementation across all Initial Entry Training sites.

## US Army Active Duty vs. Trainee Overall Injury Visit Rates, 2007-2013

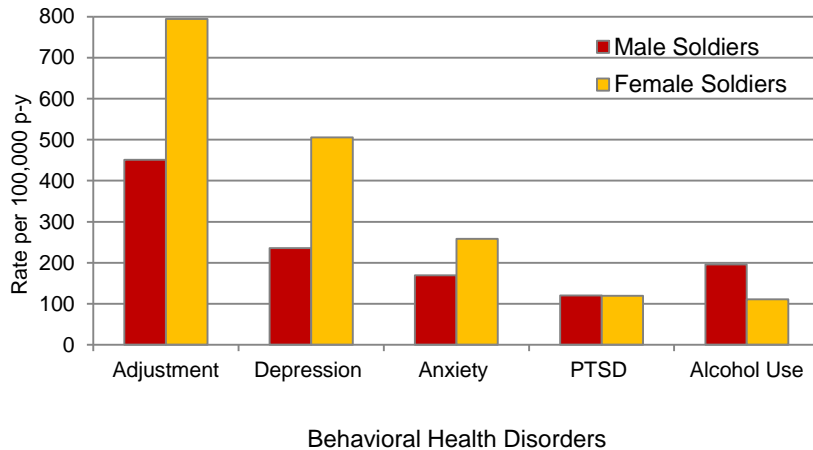


- Promising Prevention Studies:
  - Physical Readiness Training
    - Balanced fitness program
    - Added speed drills
    - Reduced run mileage
    - Conducted distance runs by ability groups
    - Reduced injury rates by 33-45% among trainees when compared to traditional PT and maintained or increased APFT pass rates.
  - Strength training programs for female Soldiers
    - Improved military task performance
    - Without increasing injury rates
    - Increased core strength decreased injury risk in deployed females



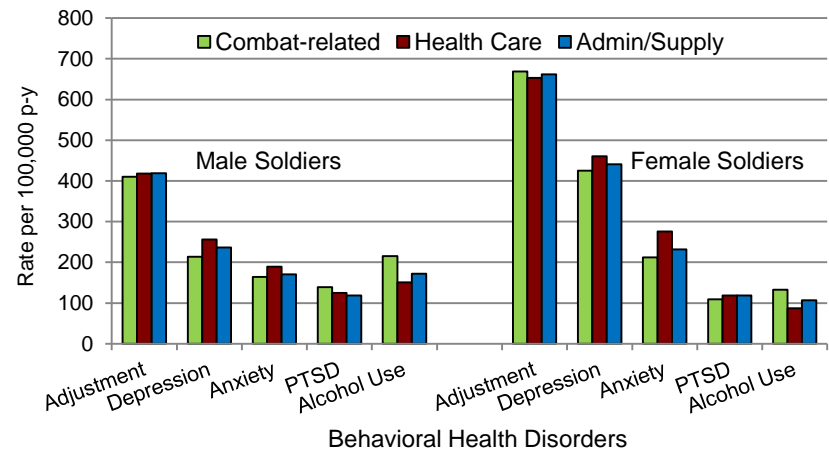
# Behavioral Health

**BH Incidence Rates by Sex**  
Active Component, U.S. Army, 2000-2013



- Incidence rates of many BH disorders are higher among female than male Soldiers.
- PTSD incidence rates are similar among male and female Soldiers.
- Attrition is 38-62% within a year after BH diagnosis or hospitalization for both male and female Soldiers.

**BH Incidence Rates by Sex and Military Occupational Group**  
Active Component, U.S. Army, 2000-2013



- Rates of BH disorders vary little by the occupational groups listed.
- Periods of risk for female Soldiers are during life or career transitions and after exposure to combat or assault.
- Army programs exist to promote mitigation of risks and enhancement of protective factors throughout the Soldier Life Cycle.

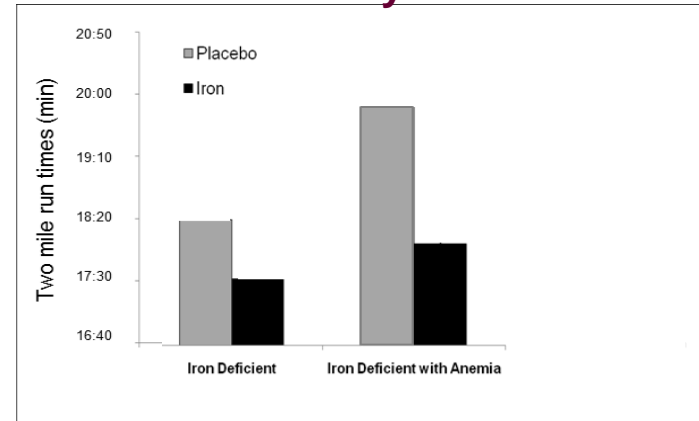


# Female Specific Issues

## Iron Status and Anemia

- Iron is an essential nutrient for physical and cognitive performance and affects vigor.
- Iron status in females declines during intense training.
- Approximately 25-30% of USAF female trainees are iron deficient or anemic upon arrival and are currently being provided a multivitamin in Basic Military Training.

## Iron Status affects Physical Performance



**Bottom Line:** Iron deficient/iron deficient anemic female Soldiers, when treated with supplements, run ~1-2 minutes faster on 2 mile run.

## Pregnancy

- Approximately 5% of female Soldiers are pregnant at any given time.
- This calculates to ~0.75% of the total force not available due to pregnancy and postpartum recovery.
- By comparison, ~9-10% of all active duty Soldiers (approximately 50K Soldiers or 13 Brigade Combat Teams equivalent) are potentially medically non-available each month due to temporary or permanent musculoskeletal profiles.





# Current Research Conclusions

MSK injuries and BH disorders significantly impact Army readiness

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## Fitness

Low fitness levels are associated with increased injury risk for male and female Soldiers  
On average, female Soldiers arrive at initial training relatively less fit than male Soldiers  
Fitness and strength curves for male and female Soldiers overlap to varying degrees

## Injury

Injury rates decrease in male and female Soldiers with comparable fitness improvements  
Use of PRT is associated with decreases in injury risks and improves physical performance for male and female Soldiers  
Load carriage is a leading cause of injuries while deployed for male and female Soldiers

## Behavioral Health

Incidence and severity of specific BH disorders differ between male and female Soldiers  
BH disorders result in high attrition rates, particularly during initial entry training  
BH disorders are 5 of the top 10 diagnoses for which Soldiers are hospitalized

## Readiness

Poor iron status involves greater numbers of female Soldiers and affects performance  
Pregnancy affects approximately 0.75% of the total Army force at any given time



# Recommended Mitigation Strategies

## Fitness and Injury Prevention

- *Establish* pre-basic fitness threshold
- *Implement* physical testing into accessions and MOS/AOC processes
- *Adhere* to PRT principles
- *Utilize* Master Fitness Trainers
- *Integrate* load carriage-specific strength training
- *Assess* injury risk during PHA

## Behavioral Health

- *Utilize* far-forward BH resources
- *Address* periods of higher risk
- *Coordinate* mitigation strategies from Gender Integration Study with BH Service Line initiatives
- *Continue* to develop, promote, and evaluate community and BH programs to assist with Soldier and family readiness and resiliency

## Readiness

- *Conduct* annual injury surveillance reporting to support leadership responsibility and accountability
- *Adopt* Performance Triad concepts throughout Army: Sleep, Activity, Nutrition
- *Implement* multivitamin with iron program for females during intense training (Initial Entry Training)
- *De-stigmatize* early care for MSK injuries and BH disorders to improve medical readiness



# Questions/Discussion

It's about meeting the standards....



....not male vs. female.