

# Self-reported load carriage injuries in Australian Regular Army soldiers

**Orr RM<sup>1</sup>, Pope R<sup>1</sup>, Coyle J<sup>2</sup>, Johnston V<sup>3</sup>**

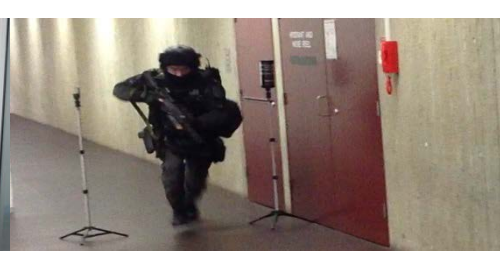
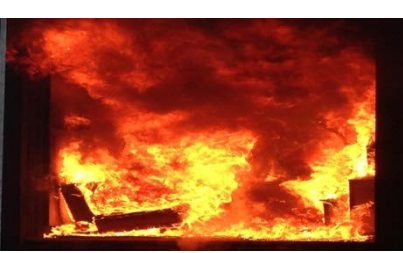
**1 Bond University, Gold Coast**

**2 Charles Sturt University, Albury**

**3 University of Queensland, Brisbane**



Orr, R., Pope, R., Coyle, J. & Johnston, V. (accepted). Self-reported load carriage injuries in Australian Regular Army soldiers, *International Journal of Injury Control and Safety Promotion*



# Background

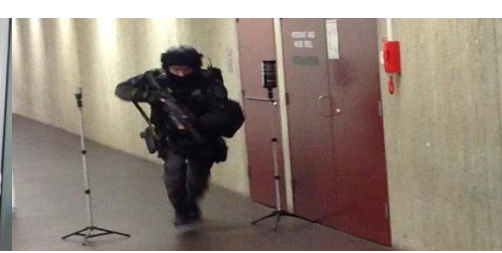
- Soldiers are required to carry heavy loads on military operations (often 60+kg)

(Orr et al., 2015)

- These loads have been found to cause injuries over a given load carriage event and over a longer period

(Orr et al, 2014; Reynolds et al. 1999; Knapik et al. 1992)

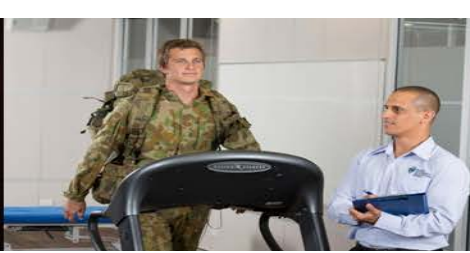




# Aims

- Aim:
  - To profile load carriage injuries sustained by soldiers over their careers





# Participants

- Australian Regular Army soldiers from Corps with high exposure to load carriage (selected via purposive sampling):
  - Royal Australian Infantry
  - Royal Australian Artillery
  - Royal Australian Engineers
  - Royal Australian Armoured Corps, and
  - Royal Australian Corps of Signals.

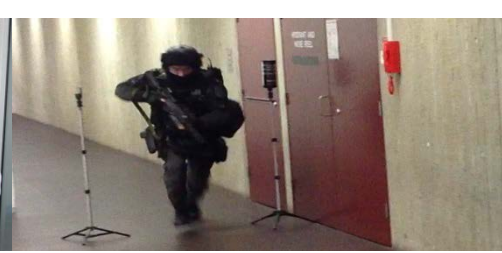




# Methods

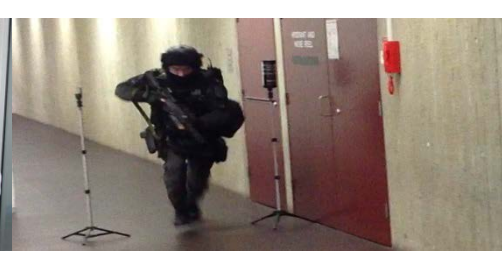
- All personnel posted to the selected units at the time of this study were invited to participate subject to the following inclusion criteria:
  - 1) a member of the ARA,
  - 2) posted to one of the selected units, and
  - 3) in full time service.





# Results

- A total of 380 personnel commenced the online survey
- Completion rate was 88% (n=333), partial completion rate was 1% (n=5), and 'break off' rate was 11% (n=42)
- This provided a total of 338 personnel data sets for analysis
  - 34% (n=116) reported at least one load carriage injury over their military career ( $9.4 \pm 7.4$  years of service) of which 8% (n=9) were female and 92% (n=107) were male

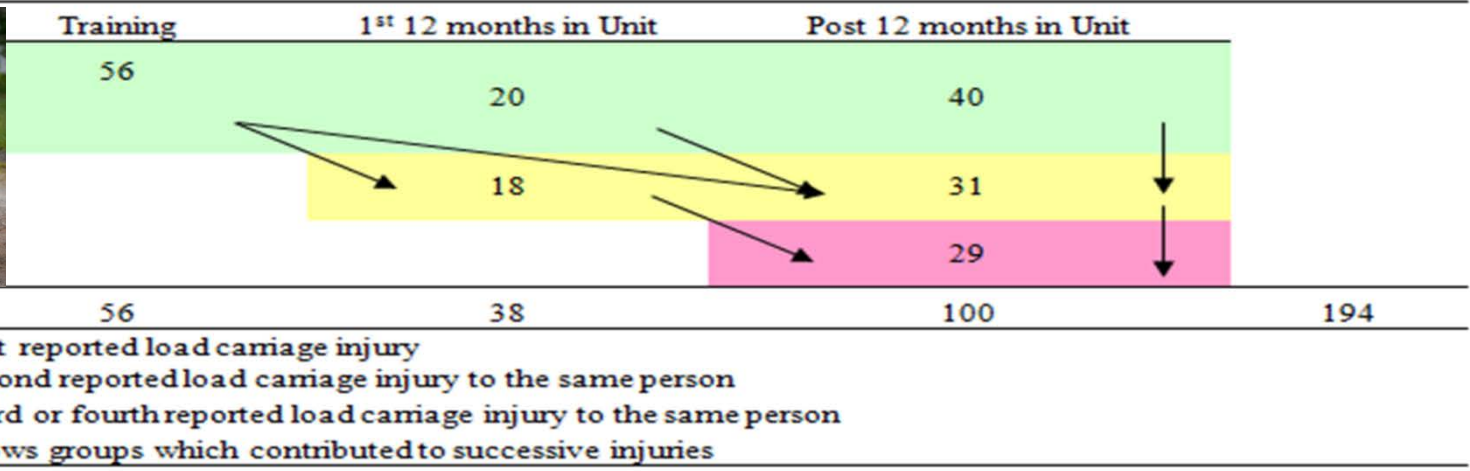


# Results

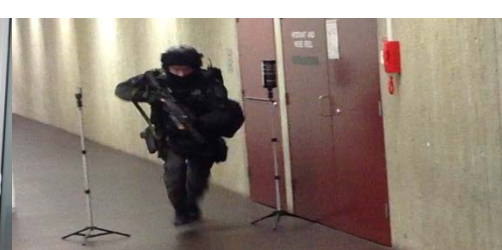
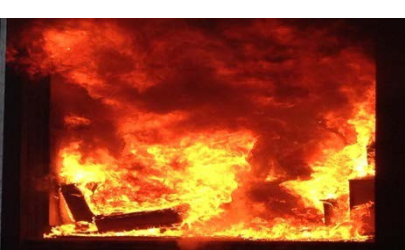
- Female soldiers reported 1.21 (CI 0.71 to 2.04) times as many injury incidents per capita as males.
- Of the 42% (n=49) of injured soldiers who reported sustaining more than one injury...
  - 43% (n=21) reinjured the same body site
  - 31% (n=15) suffered a subsequent injury to a different site, and
  - 27% (n=13) both reinjured the same site and suffered an injury to a different site



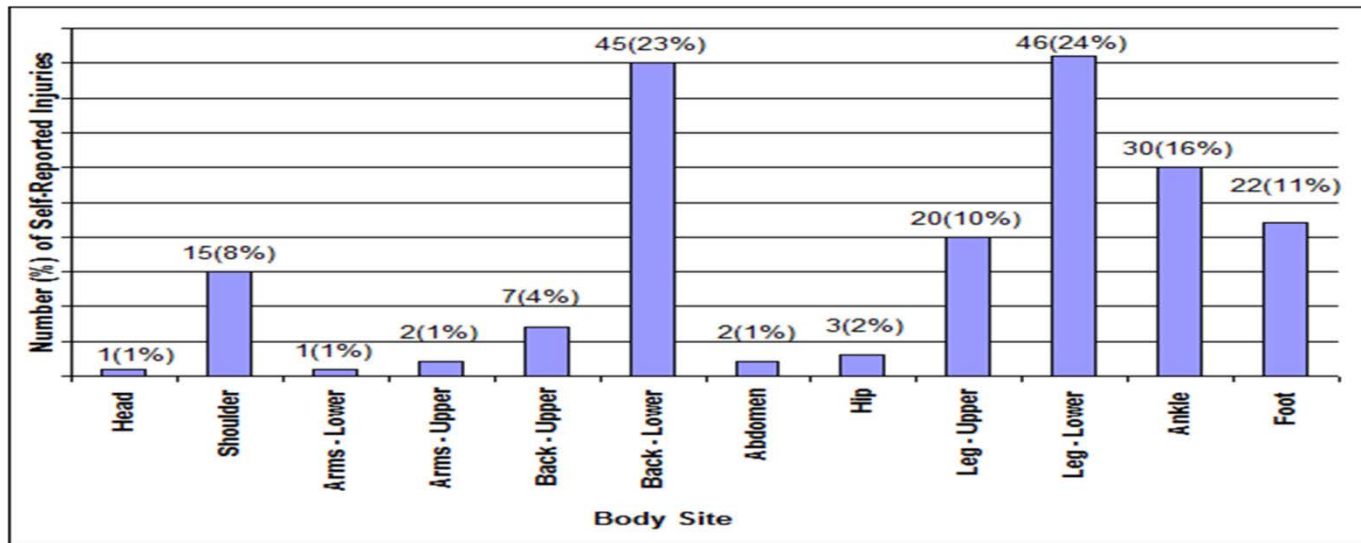
# Results





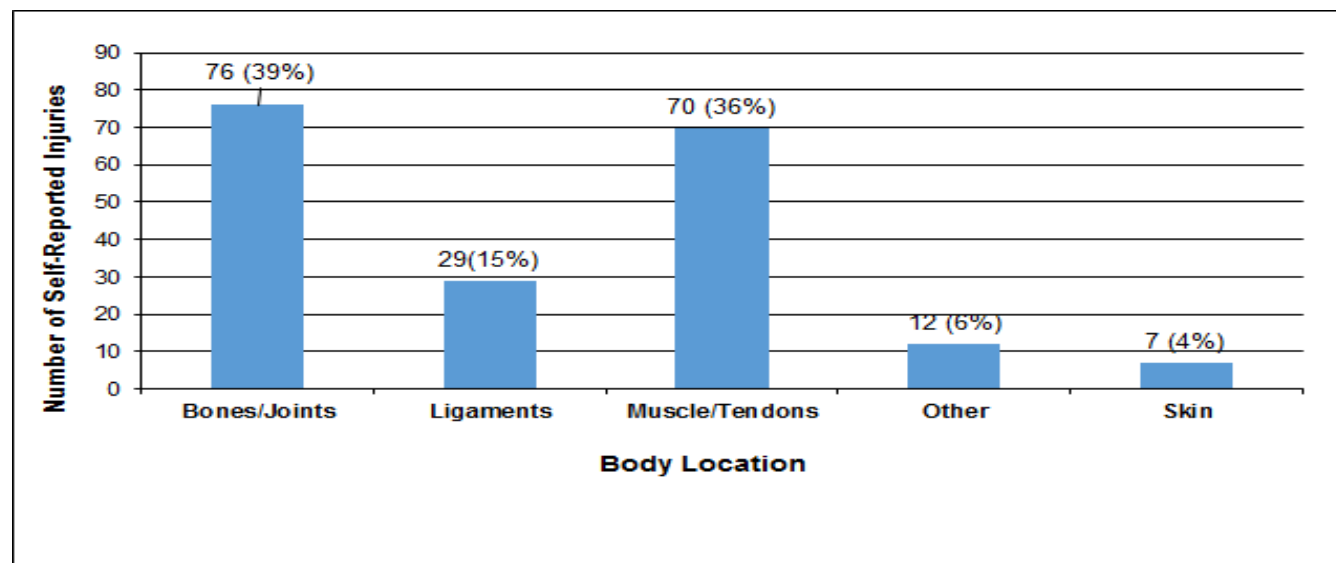


# Results



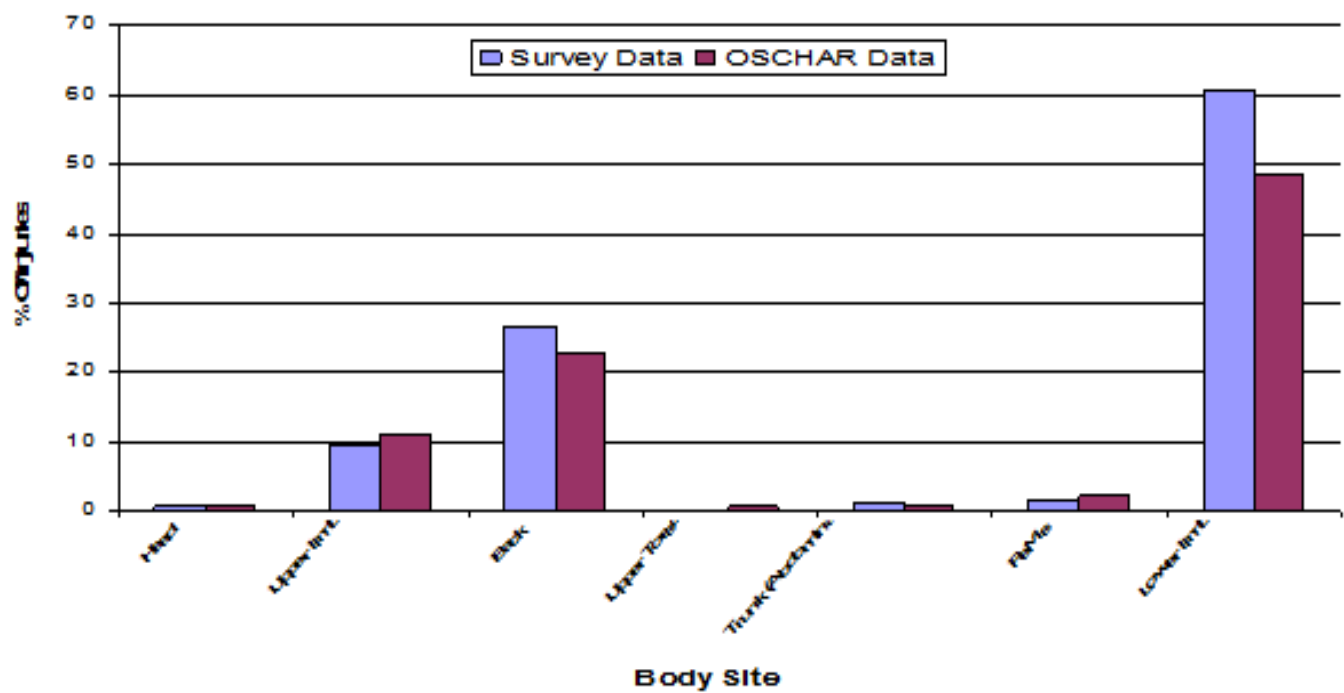


# Results

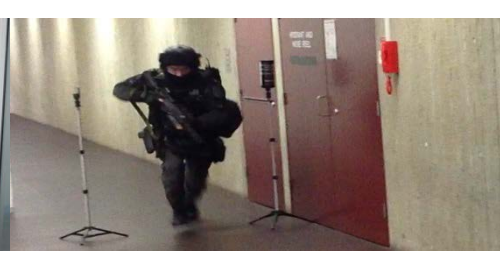




# Results



No sig diff when compared to Reported LC Injuries  
Chi Squared  $p=0.31$   
(Orr et al, 2014)



# Discussion

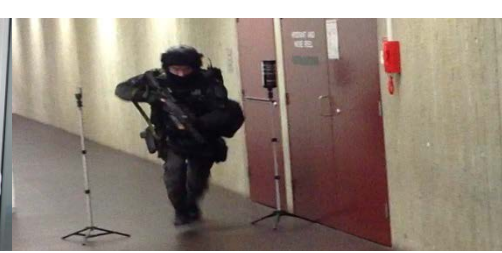
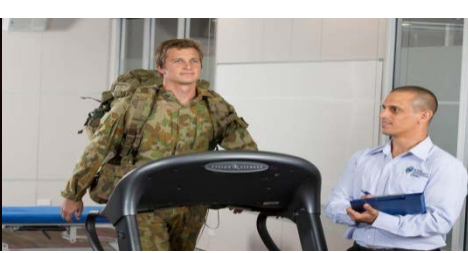
- Reasonably consistent with the figures reported for military load carriage events in US military forces.

(Reynolds et al. 1999; Knapik et al., 1992)

- Corresponds with injury body site findings within both specific load carriage studies and studies of general military training suggesting consistency across contexts of load carriage, as well as across time.

(Jennings et al., 2008; O'Connor, 2000; Almeida et al., 1999)

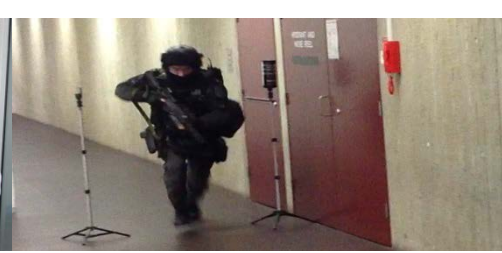




# Discussion

- The lower back was associated with a substantial proportion of reported injuries (23% of all injuries).
- Given the biomechanical impacts of load carriage on the spine, such as increased lumbar compression and shear forces, changes to thoraco-pelvic rhythm and increased forward lean, the high proportion of lower back injuries was not unexpected.

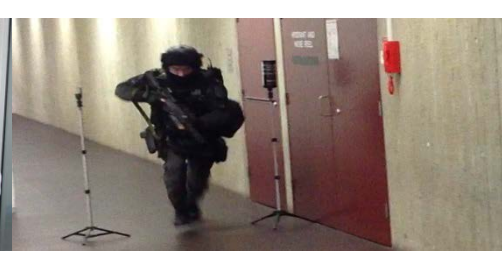




## Conclusion / Take Home Message

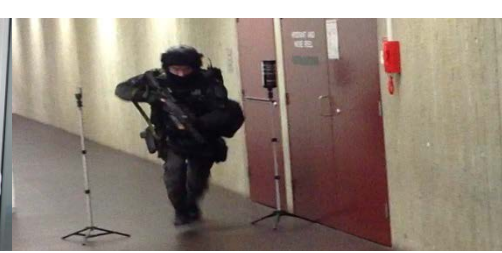
- Soldiers are required to carry loads as part of their occupation and these loads may predispose them to injuries
- Once injured soldiers are at an increased risk of subsequent load carriage injuries
- **When treating a soldier (or other tactical personnel) for musculoskeletal injuries, developing load carriage resilience prior to return to work is a priority**





# References

- Almeida S, Williams K, Shaffer R, Brodine S. Epidemiological patterns of musculoskeletal injuries and physical training. *Medicine & Science in Sports and Exercise*. 1999;31(8):1176-82.
- Jennings BM, Yoder LH, Heiner SL, Loan LA, Bingham MO. Soldiers With Musculoskeletal Injuries. *Journal of Nursing Scholarship*. 2008;40(3):268-74.
- Knapik JJ, Reynolds KL, Staab J, Vogel JA, Jones B. Injuries associated with strenuous road marching. *Mil Med*. 1992;157(2):64-67
- O'Connor F. Injuries during Marine Corps officer basic training. *Mil Med*. 2000;165(7):515-20.



# References

- Orr R, Pope R, Coyle J, Johnston V. Occupational Loads Carried by Australian Soldiers on Military Operations. *Journal of Health Safety and the Environment*. 2015;31(1):451-467.
- Orr R, Johnston V, Coyle J, Pope R. Reported Load Carriage Injuries of the Australian Army Soldier. *Journal of occupational rehabilitation*. 2014;25:316-322.
- Reynolds KL, White J, Knapik JJ, Witt C, Amoroso P. Injuries and risk factors in a 100-mile (161-km) infantry road march. *Preventative Medicine*. 1999;28(2):167-173.