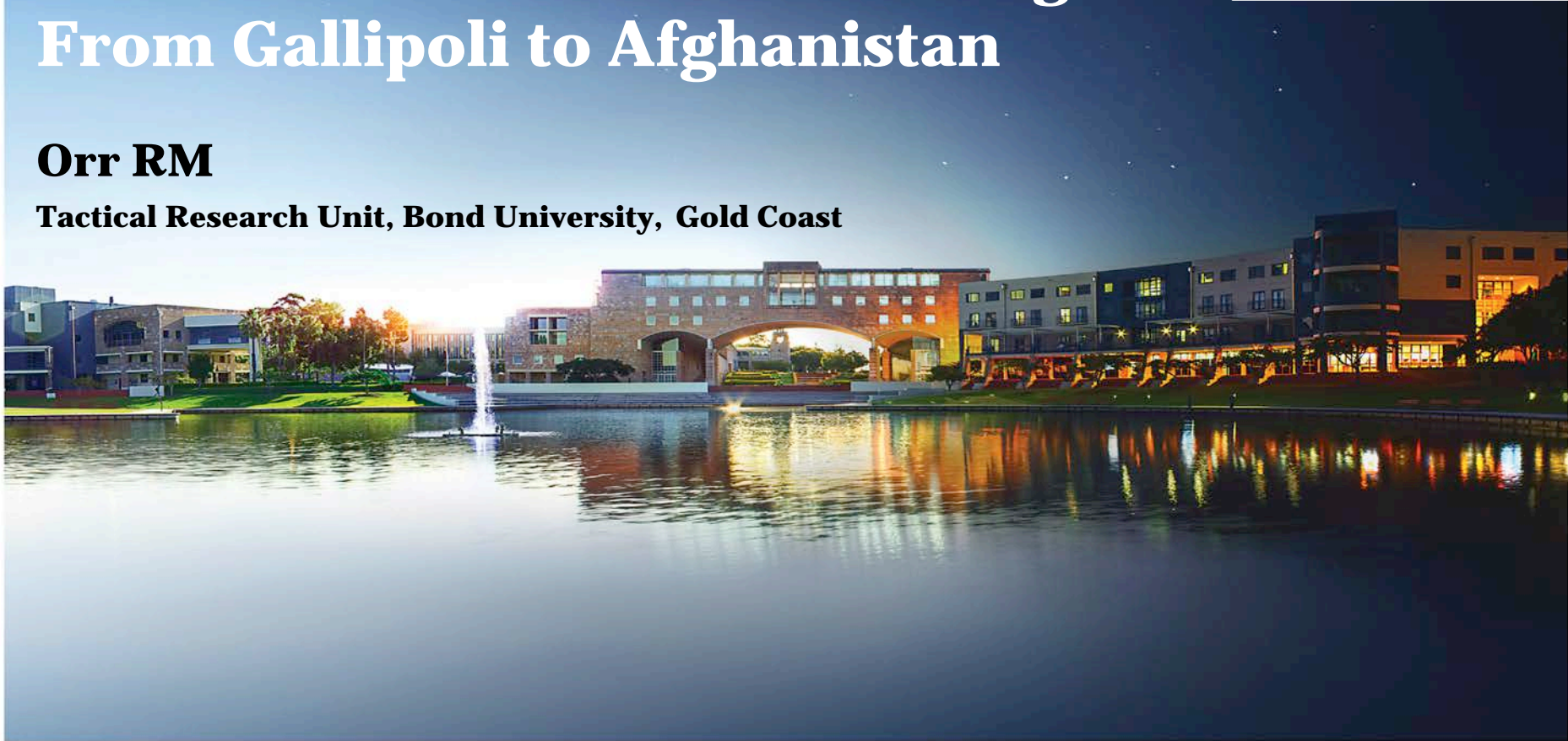


Australian Soldier Load Carriage: From Gallipoli to Afghanistan

Orr RM

Tactical Research Unit, Bond University, Gold Coast



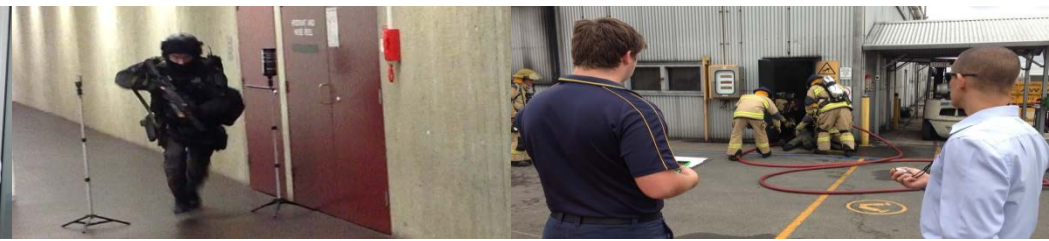


Background

- From the early Assyrian spearman of antiquity (circa 800 B.C.), soldiers have been required to carry external loads consisting of weaponry, equipment and food
(Orr, 2010; Knapick et al., 2012:2004)
- Downstream effects of these loads have been shown to impact on the tactics of warfare, cause injury and reduce fighting force size

(Lee, 2007; Breen, 2002; Lothian, 1921)



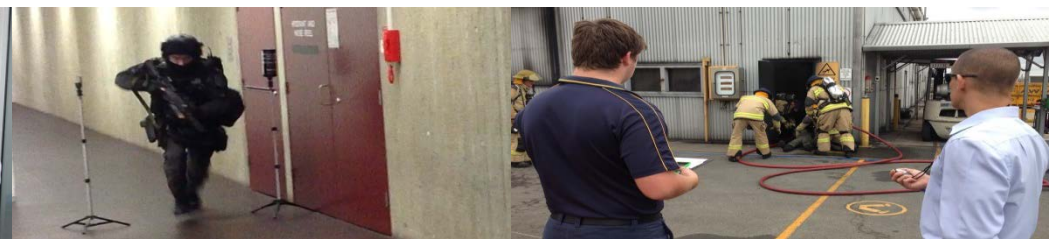


The Great War

- From Gallipoli through to assaulting Mont St Quentin, Australian soldiers carried loads ranging between an estimated 27 kg and 33.5 kg (59 and 62 lbs)

(Stanley, 2005; Landers, 1998)





The Great War

- Dry loads

- The 3.2 kg (7 lbs) British coat could absorb up to an additional 9 kg (20 lbs) of water

(Ellis, 1989; Lothian 1921)

- British soldiers, who would start a march with 27.5 kg (60 lbs), could well finish with loads in excess of 43.5 kg (94 lbs) when water saturation and mud were taken into account

(Ellis, 1989; Lothian 1921)





The Second World War

- These loads were similar through the Second World War
 - North African desert: - 22 and 32 kg (48 to 70 lbs) into the battles at Bardia and El Alamein

(Johnston, 1996; Millett & Murray, 1988)

- Pacific Theatre: - 20 and 41 kg (48 lbs to 90 lbs) in PNG and Borneo

(Australian Army Staff, 2007; Brune, 2003; Johnston, 2002; Kuring, 2002)



The Vietnam War

- Australian troops generally carried heavier loads of between 30 to 40 kg (66 lbs to 88 lbs) for rifleman and up to 47.5 to 56 kg (105 to 123 lbs) for radio operators

(McKay, 1987; Kuring 2002; Taylor, 2001; Hall, 2000)

- It was these loads that led to the Australian soldiers constantly taking measures to lighten their loads by removing stores like dixies, blow up mattresses and other non-essentials

(Hall, 2000)



East Timor

- In East Timor, on Operation CITADEL, Australian soldiers carried loads in excess of 45 kg (99 lbs), with gunners and signalers carrying loads in excess of 50 kg (110 lbs)

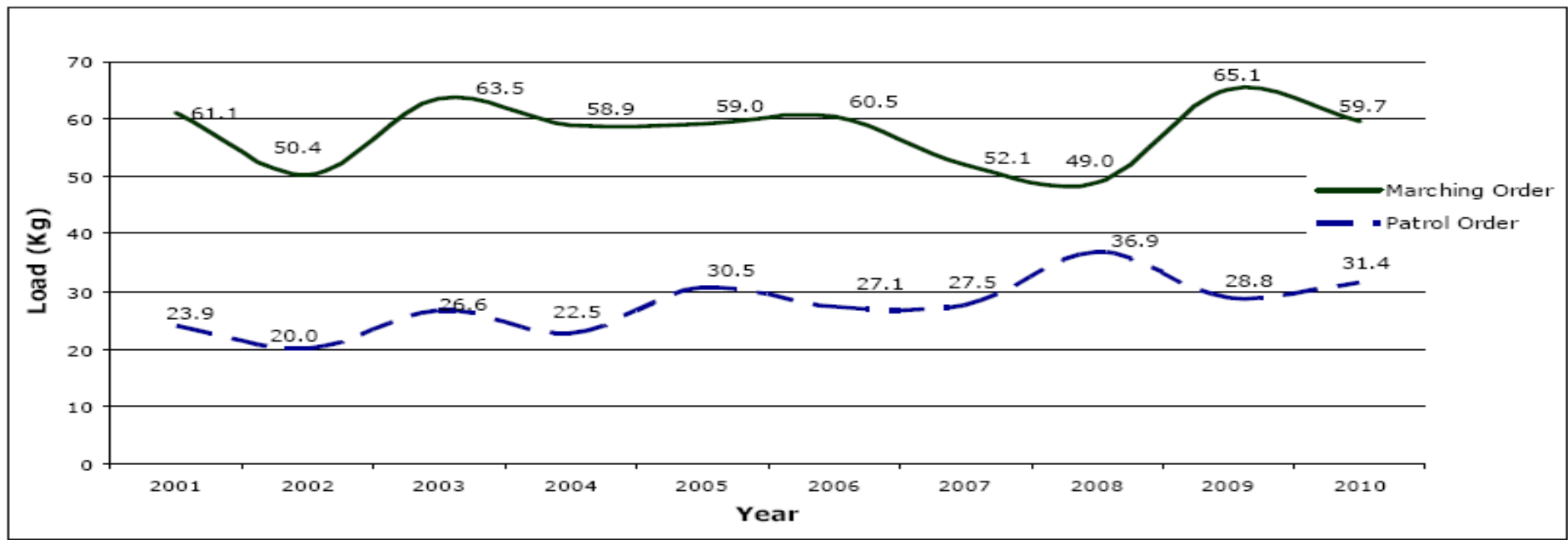
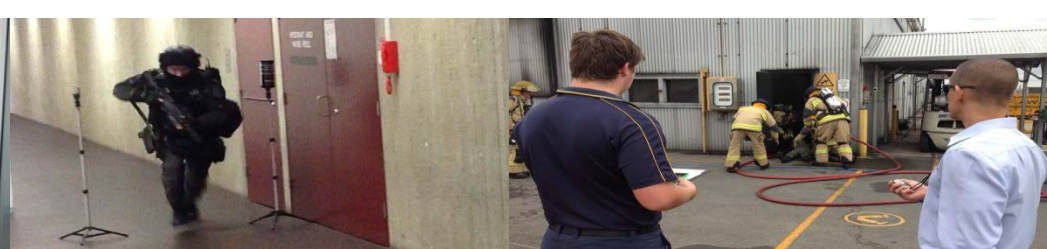
(Davison, 2007)





Middle East (2001-2010)

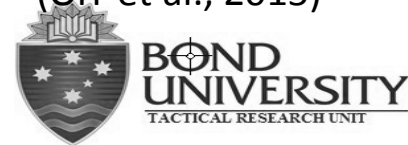
- PO loads
 - M=28.4 kg, SD=10.0 kg
 - heaviest mean load in 2008 (M=36.9±10.8 kg)
(Orr et al., 2015)
- MO loads
 - M=56.7 kg, SD=15.3 kg
 - the heaviest mean load in 2009 (M=65.1 ±16.3 kg)
(Orr et al., 2015)



COMBINED LOADS (PO & MO): M = 47.7 KG OR 56% BW

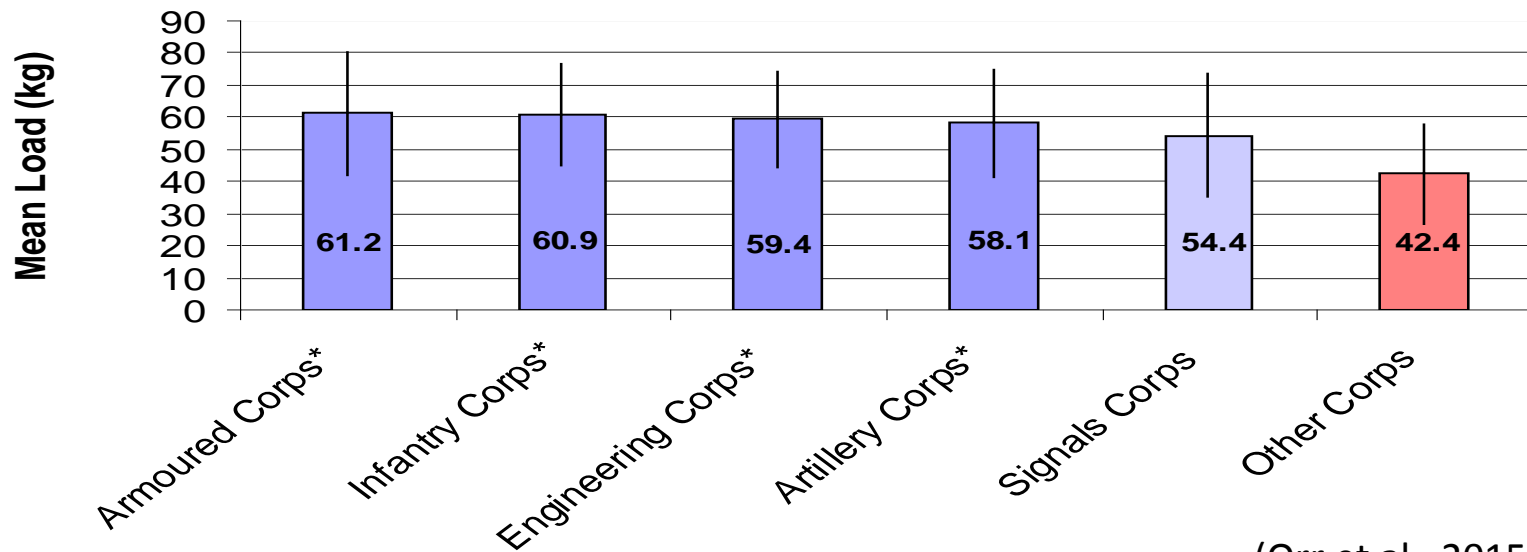
Patrol Order = M=28.4 kg / Marching Order = M=56.7 kg

(Orr et al., 2015)





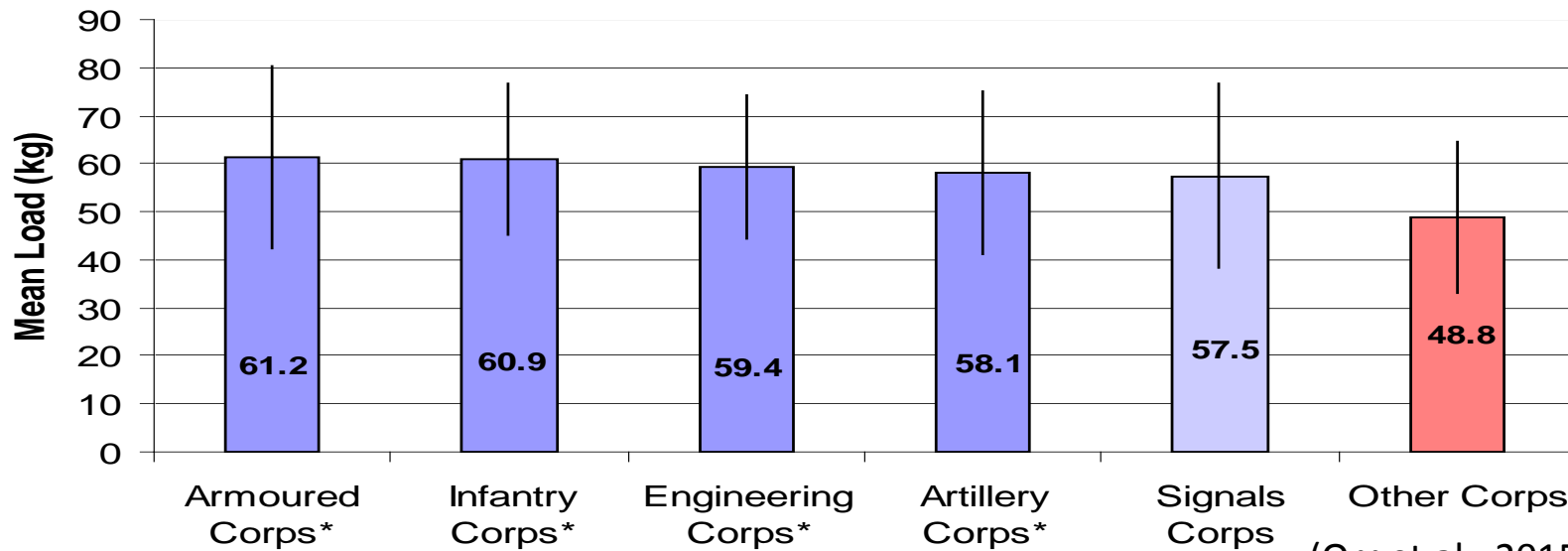
Mean Marching Order Loads (M&F)



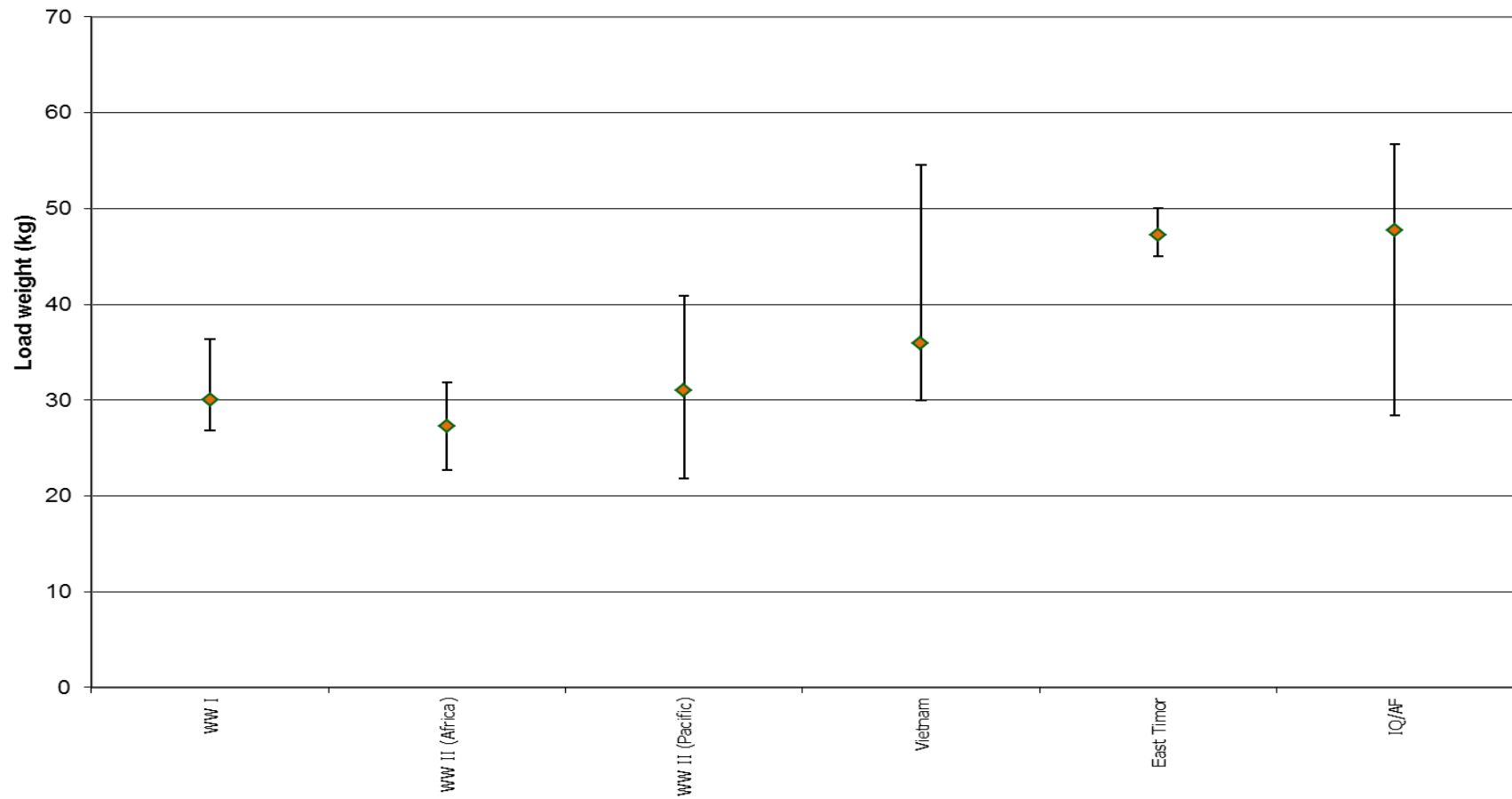
(Orr et al., 2015)

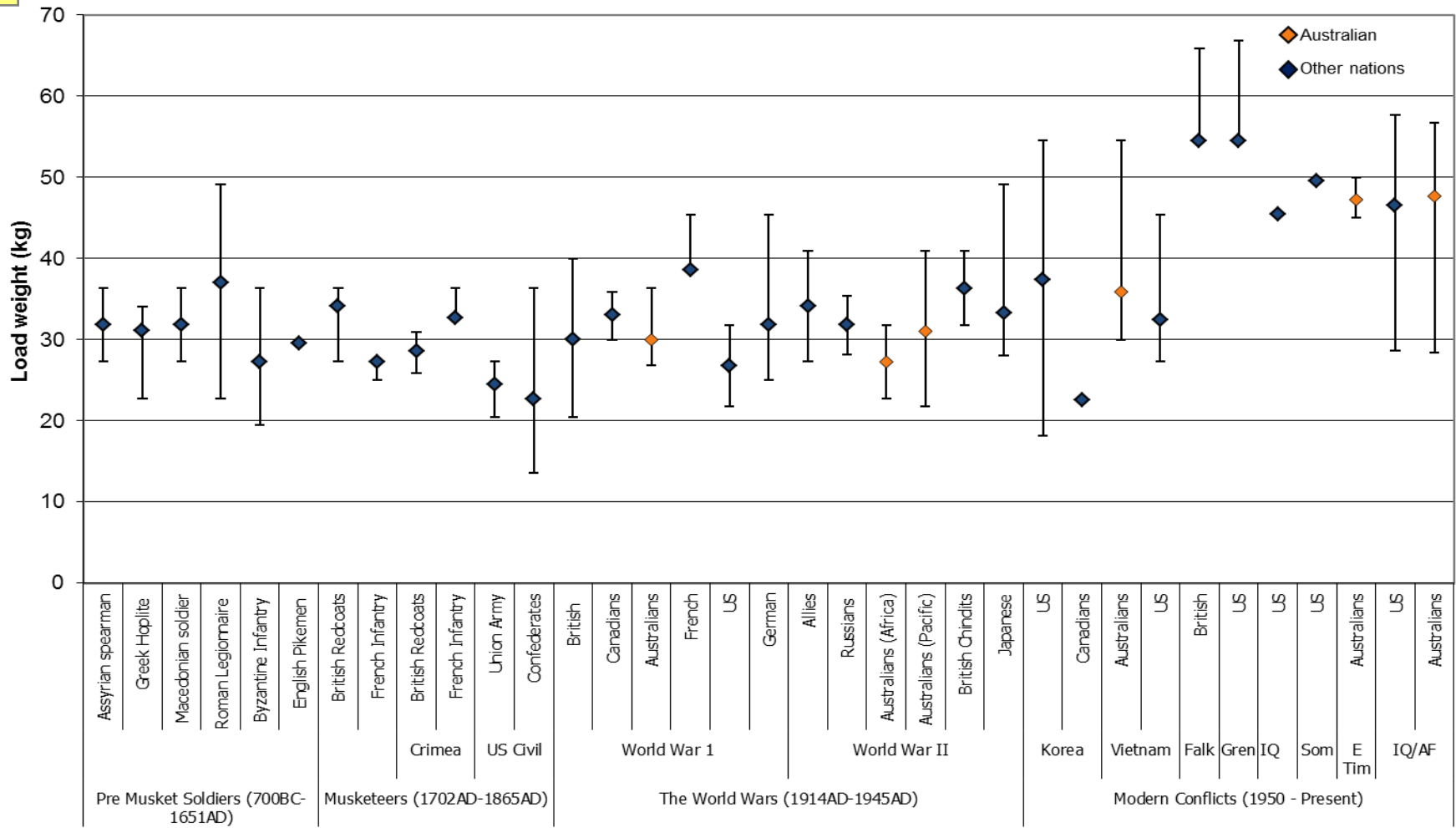


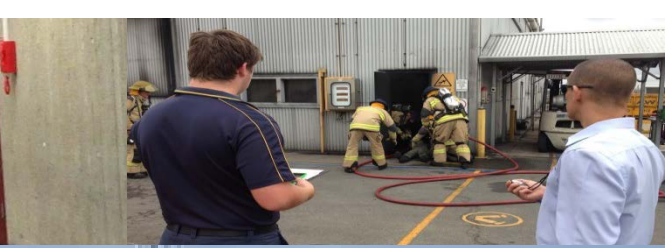
Mean Marching Order Loads (M only)



(Orr et al., 2015)







Injuries

- Injuries to soldiers range in bodily sites from the back to the ankle and knee with muscular stress the leading cause
(Orr, Johnston et al., 2014; Orr, Pope et al., 2013; Drain et al., 2010; Rudzki, 1989)





Injuries

- Gender differences in loads

ABSOLUTE LOADS

FEMALE: $M = 26.4$ kg

MALE: $M = 39.0$ kg

p=.045

RELATIVE LOADS

FEMALE: $M = 43\%$

MALE: $M = 47\%$

p=.55

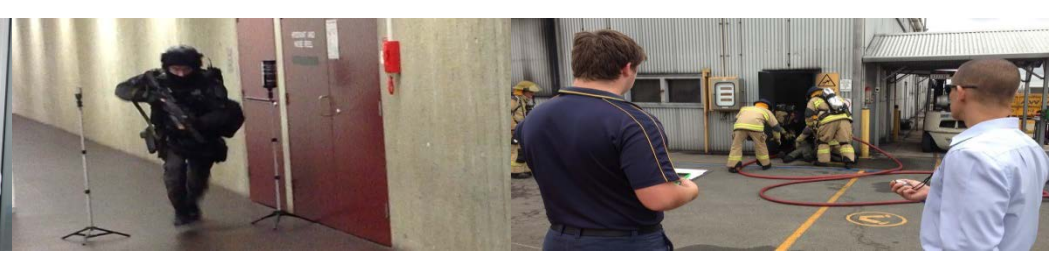




Injuries

- Gender differences in loads
- RR for female soldiers compared to males where found to be similar (RR= 1.02: 95% CI 0.74 to 1.41)
- For female soldiers the RR of SPI was notably higher (RR= 2.40: 95% CI 0.98 to 5.88)





Injuries

ABSOLUTE LOADS

Light 20%: $M = 34.7$ kg

Heavy 20%: $M = 35.7$ kg

p=.902

RELATIVE LOADS

Light 20%: $M = 49\%$

Heavy 20%: $M = 36\%$

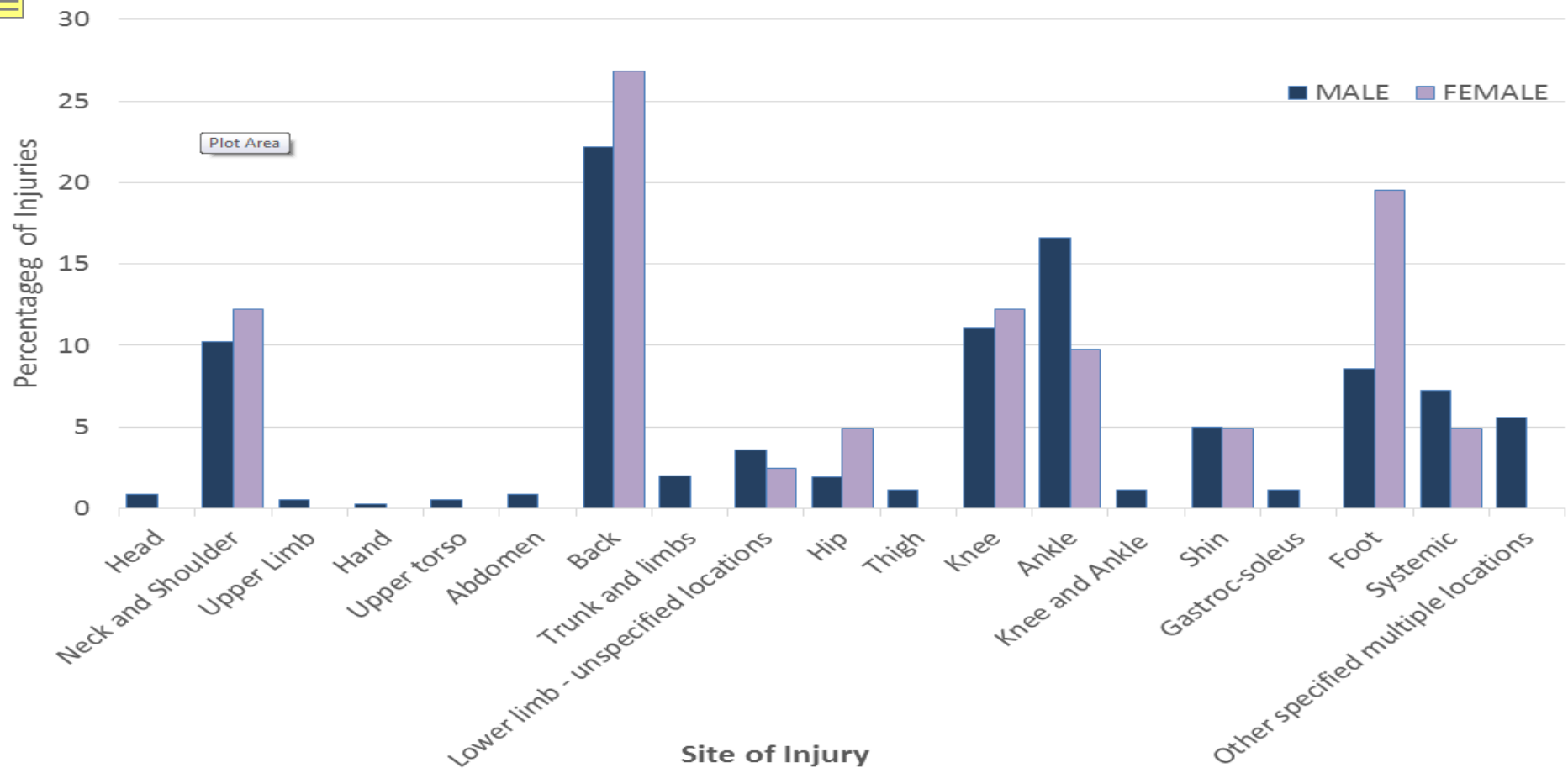
p=.0509



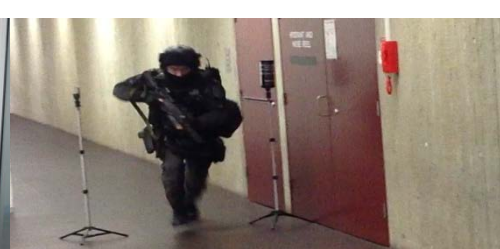
Injuries

- Gender differences in loads
- RR for female soldiers compared to males where found to be similar (RR= 1.02: 95% CI 0.74 to 1.41)
- For female soldiers the RR of SPI was notably higher (RR= 2.40: 95% CI 0.98 to 5.88)
 - The lower back was the most common site of injury and SPI for both genders

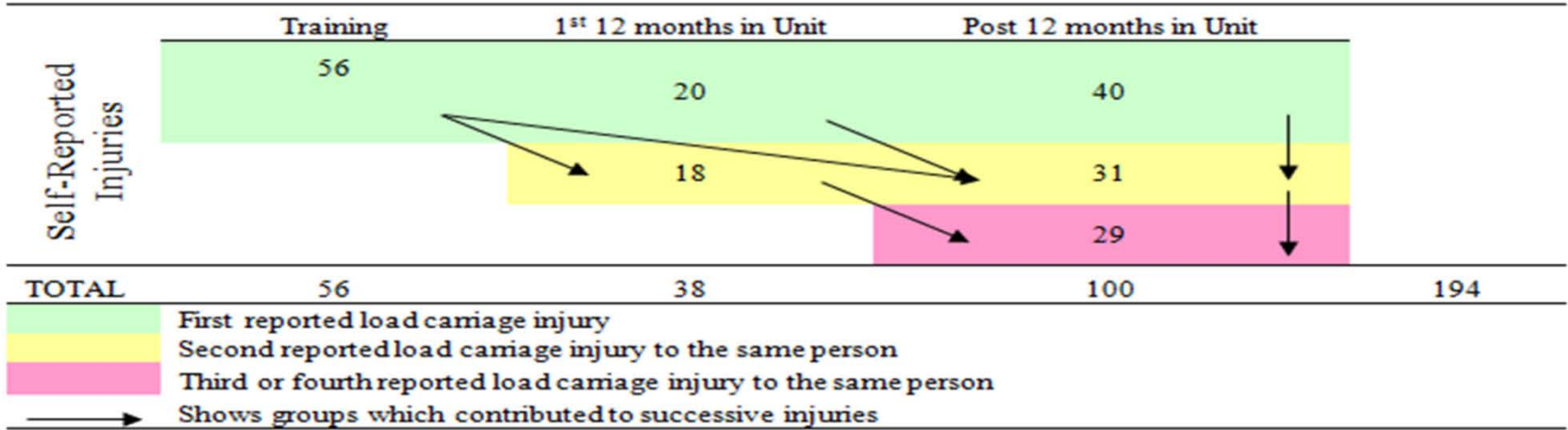




Plot Area



Chance of Re-injury



(Orr et al, 2013)



Summation

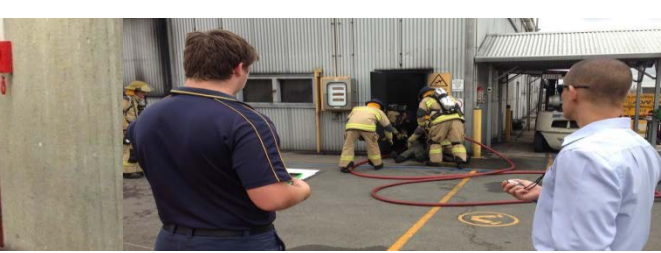
- Nature of warfare has changed....
- Weapons and equipment have changed....
- Loads are increasing....
- Soldiers are still being injured



http://upload.wikimedia.org/wikipedia/commons/5/5a/Australian_soldier_Afghanistan_Aug_2008.jpg

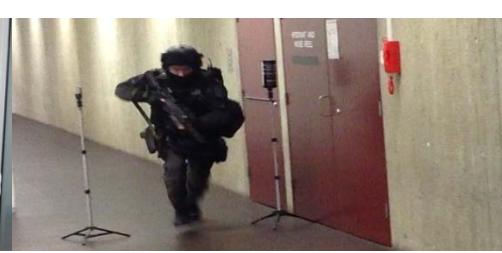


BOND UNIVERSITY
TACTICAL RESEARCH UNIT



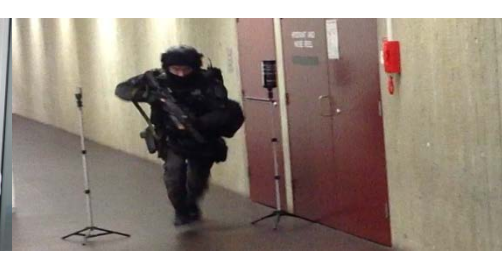
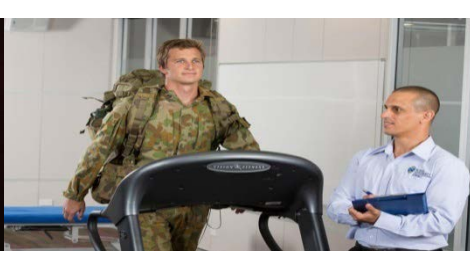
Clearances

- ADHREC (Protocol: 569-09)
- Behavioural and Social Sciences REC UQ (2009001820)
- Abstract approval to present from Joint Health Command (150831)



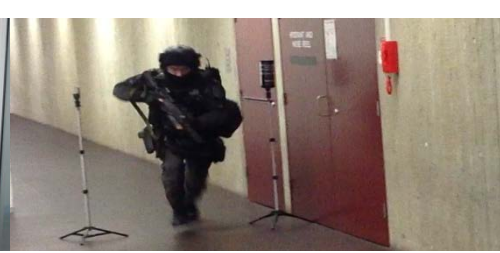
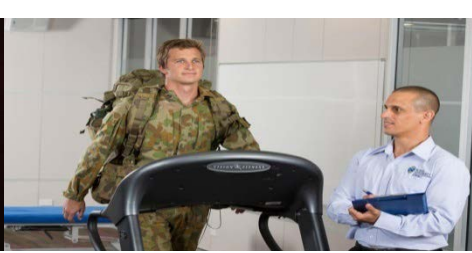
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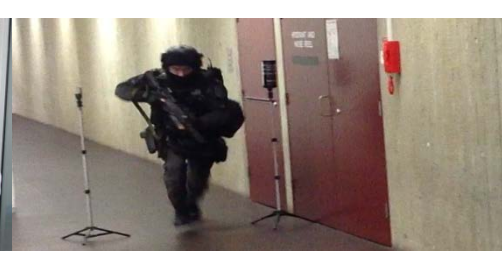
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