

## Soldier performance management: monitoring and modelling of load, adaptation and performance

# Solider performance management

## Research aims

1. Assess and describe the physical demands, the psychological and physiological (i.e. psychophysiological) responses of personnel in the training force.
2. Identify measures and develop prognostic tools that may alert or provide early warning for the likely onset of maladaptive responses in the training force.
3. Validate measures and prognostic tools to detect maladaptive responses in the training force.

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## Project design

### 1 Hypotheses

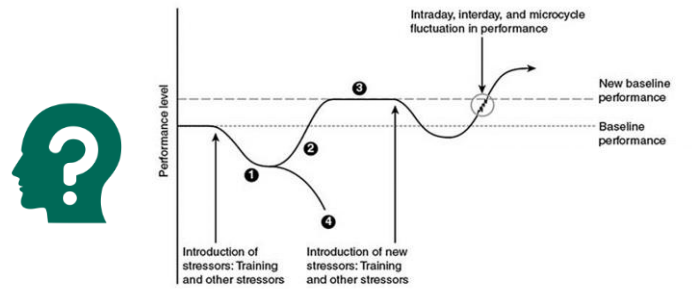
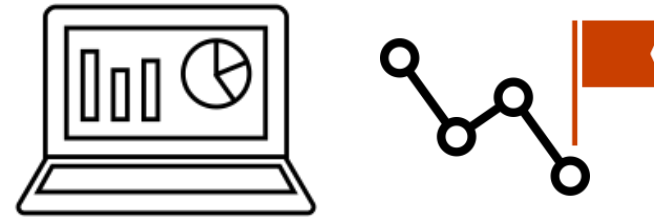
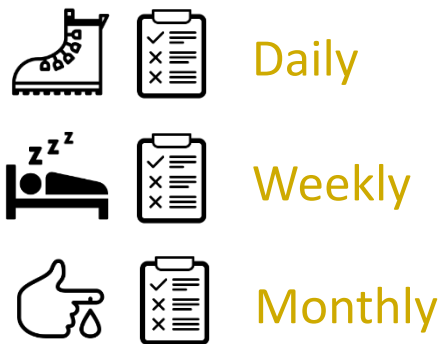


Figure 1. General adaptive syndrome that occurs following a stressor or training stimulus (14)

### 3 Deliverables



### 2 Experimental methodology

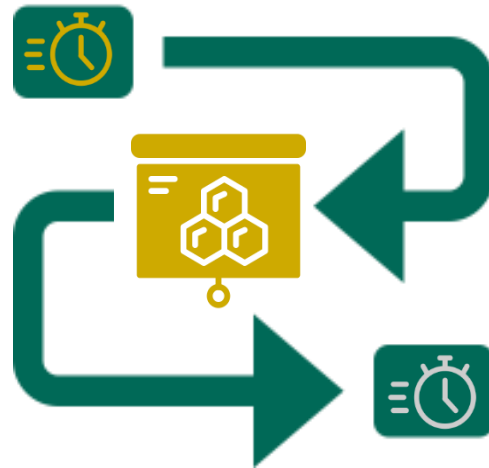


### 4 Timelines



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## Progress, challenges & lessons learnt



Required n=24 for statistical power  
Assumed 40% attrition rate  
Recruited n=48  
Approximate 27% attrition

### Data collection period #1

1. Ethics submitted October 2017 – approved early 2018
2. January 2018 – Scoping visit to Kapooka – initial view to commence data collection Feb/ March – decision to hold over until new training program
3. February – April 2018 conversations around inclusion of data collection touch points into training program
4. Ethics amendment submitted May 2018 – approved May 2018
5. Data collection commenced 3 July 2018 – ended 23 September
6. Completed a back brief to key staff at Kapooka 26 October 2018

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## Progress, challenges & lessons learnt



June 2018 - Leadership change

- Prof. Paul Gustin moved to Latrobe University
- Dr. Luana Main new Academic Chair



Grown the research team **+4**

- n = 4 original Chief Investigators (LM, PG, KM, RV)
- n = 1 DST Liaison (JD)
- n = 2 PhD Students (SB, **SC**)
- n = 2 SENS PhD Supervisors (**BA, SW**)
- n = 1 Research Fellow (project coordinator) (**JT**)
- n = 1 Project Officer (CL)

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## Progress, challenges & lessons learnt



As early as practicable, commence discussions with Army to make sure expectations are clear and that there is a common understanding of study requirements.



Ensure testing plan is clearly articulated and agreed on. Expect changes, be flexible, & willing to accommodate.



As early as possible, commence discussions with Army staff directly involved in testing. Will improve outcomes.



Researcher always available to training staff; regularly liaising to maintain minimal impost for maximal outcome.

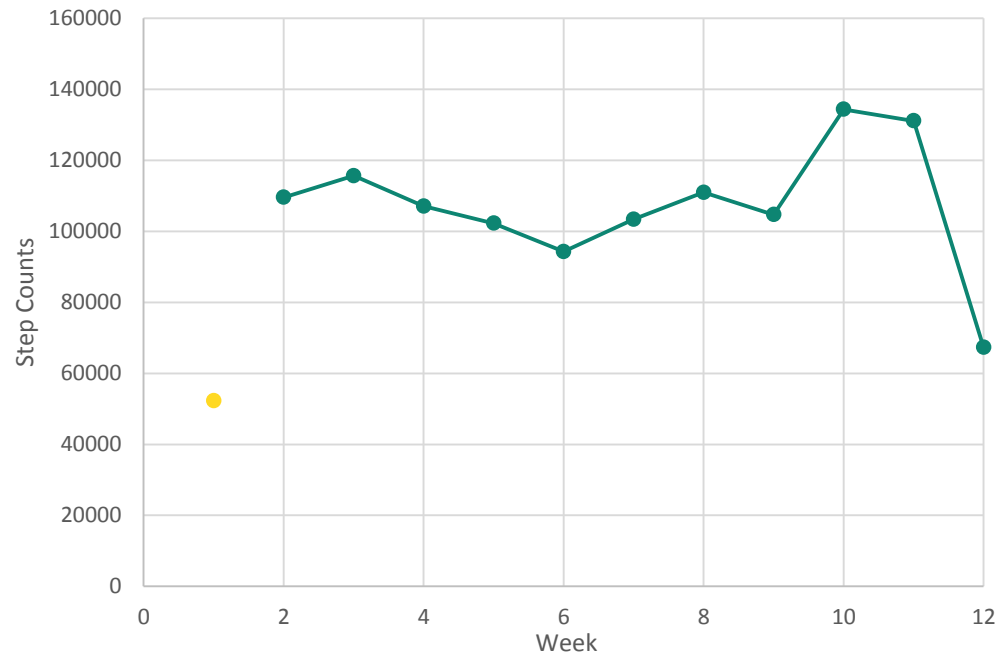


Pay it back, keep them informed of relevant progress, and again commence discussions for #2 as necessary.

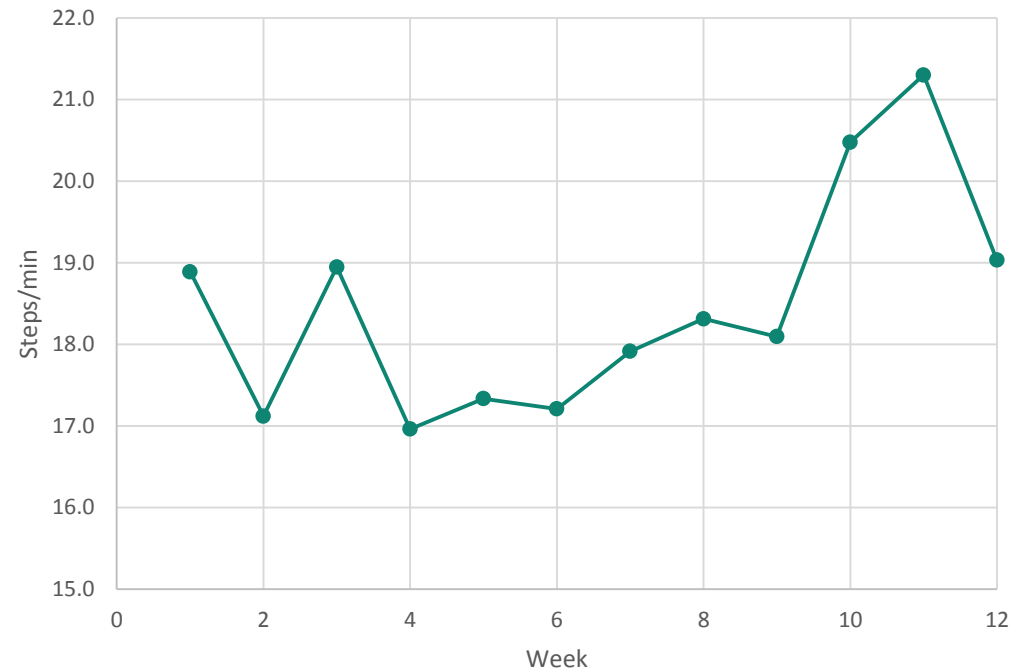
**Lessons learnt  
= primarily  
administrative**

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## Insights: Activity data - PRELIMINARY DATA



**Total steps each week**

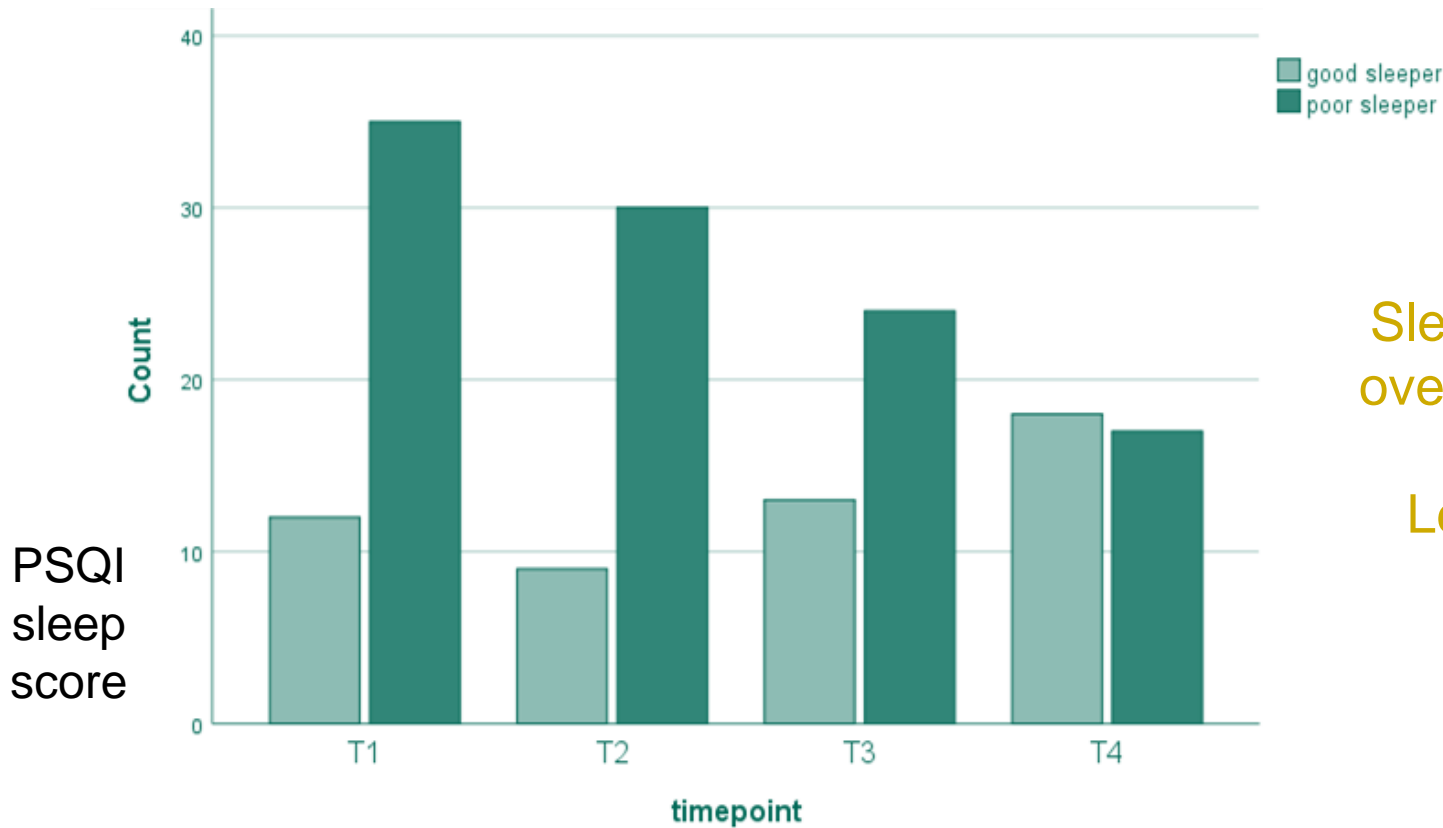


**Steps per minute each week**



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## Insights: Sleep quality - PRELIMINARY DATA



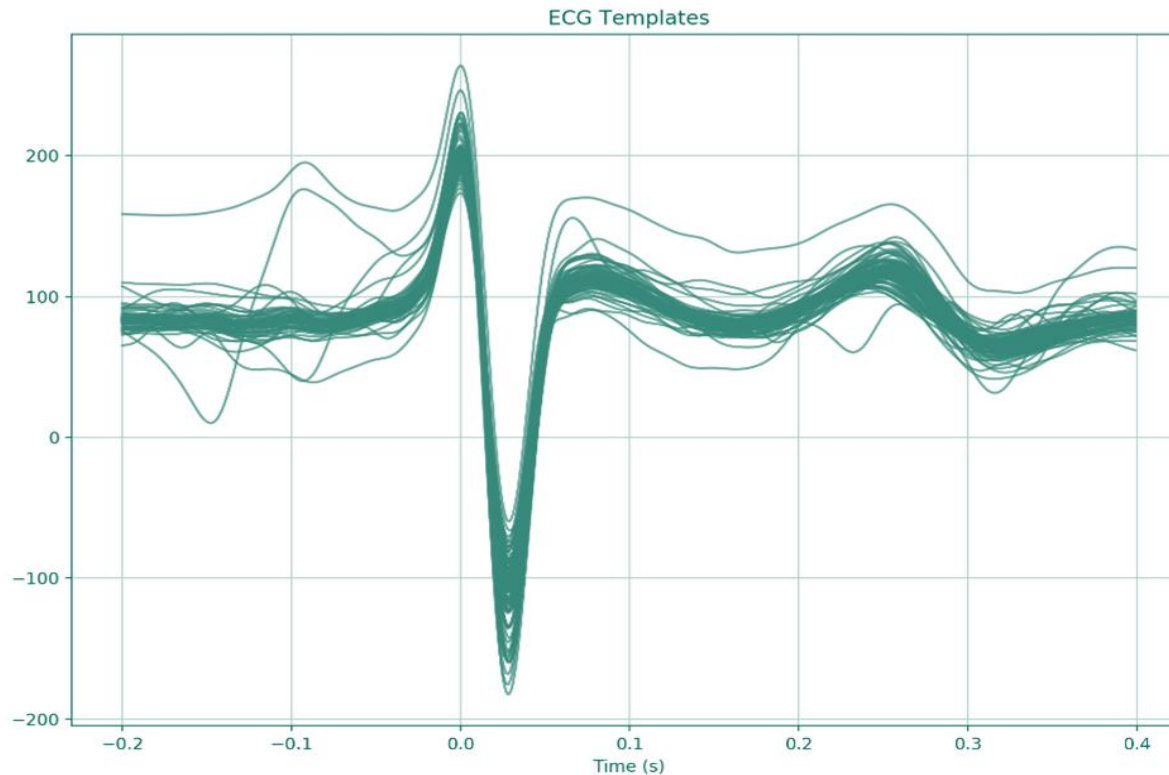
Sleep status improves over the course of BRT

Less poor sleepers and more good sleepers



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## Insights: HRV - PRELIMINARY DATA



Initial analysis is on  
going > 400 GB Data

Overnight HRV  
recordings appears to  
mimic some  
preconceptions about  
sleep patterns

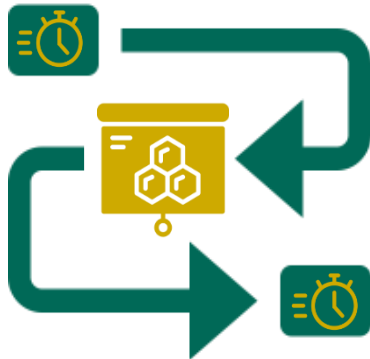
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## Opportunities and next steps

**This methodological approach could be tested in a number of different defence contexts**

### Next steps:

- Questionnaire data has all been double entered
- Finalise data processing for activity counts and HRV
- Complete laboratory analysis for testosterone, cortisol, & ILx markers
- Commenced the development of algorithms to process HRV data
- Complete statistical analyses
- Identify suite of measures for data collection period #2





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