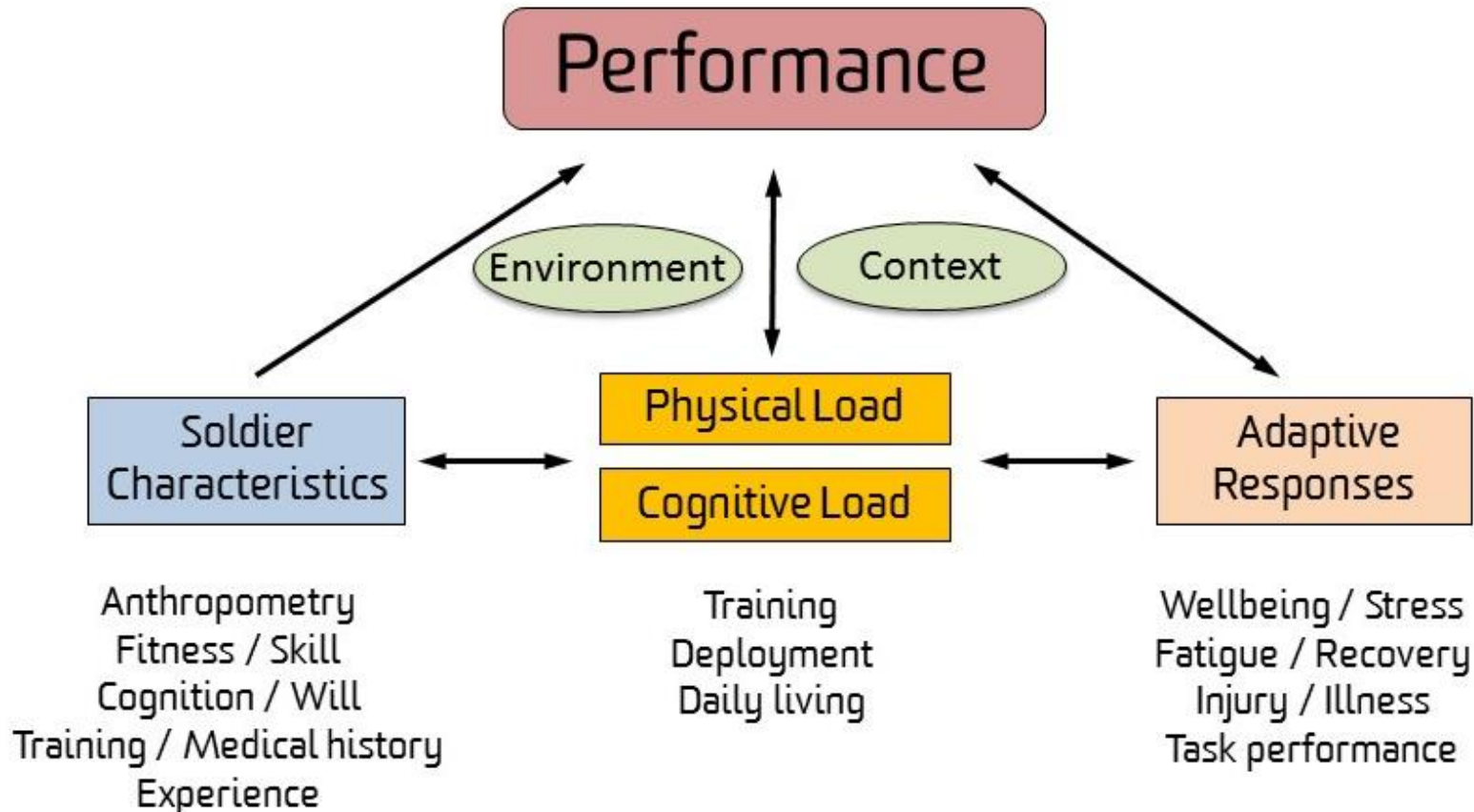


## Soldier performance management: Monitoring of load, adaptation and performance



## Soldier performance management: Monitoring of load, adaptation and performance

1. Assess and describe the physical demands and physiological and psychophysiological responses of soldiers in the field.
2. Validate and/or develop methods to detect maladaptive responses from wearable sensor data.
3. Develop prognostic tools that can alert or provide early warning for the likely onset of maladaptive responses.

### *Modifications / change in emphasis:*

- *Data collection during Basic Recruit Training*
- *Little direct emphasis on performance*
  - *We will consider proxies eg. psycho-physiological measures*
  - *Opportunity for collaboration*

## Project Design

### 1 Deliverables

- Tools to inform personnel management regarding training loads
- Description of demands and psycho-physiological responses of soldiers during military training
- Prediction of soldier outcomes and responses from sources including wearable sensor data and psychometric inventories

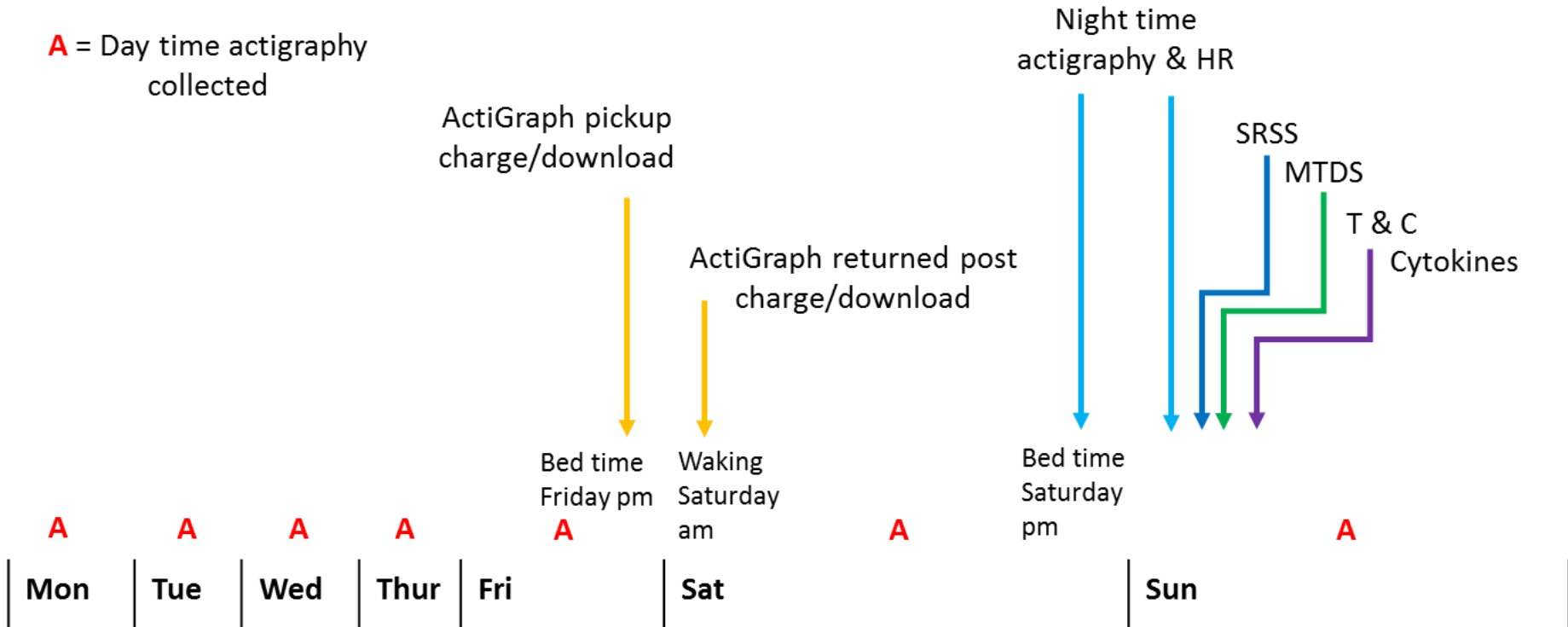
### 2 Timelines

- ESS PhD: Confirmation Nov 2017
- IT PhD: Commencement Jan 2018
- Data collection:
  - Mar – Sept 2018 (Phase 1)
  - Mar – June 2019 (Phase 2)

### 3 Design

- Recruit training (Kapooka): 12 weeks
- Training load: ActiGraph GT9X (daily counts; wrist); Basic training syllabus
- Self-report (weekly):
  - Multi-component training distress scale (Main & Grove, 2009)
  - Short recovery stress scale (Nassi, Kellmann et al, 2017)
- Hormones (weekly): Testosterone and cortisol (saliva)
- Inflammatory markers (weekly): Cytokines (capillary blood, finger-stick)
- Sleep (weekly): ActiGraph GT9X
- Heart rate (weekly): HR variability (GT9X or Zephyr Bioharness)

## Project Design



# Progress, challenges & opportunities

- Project officer (3 days/week)
- Recruitment of x2 PhD students (ESS, IT)
- ESS student (Sean Bulmer): x1 day/week at DST; Dr Jace Drain external industry PhD supervisor
- Pilot testing of Zephyr Bioharness in athletes (basketball training and competition; sleep in cyclists)
- Ethics application submitted (Oct 2017)
- Attendance at ICSP (Nov 2017)
- Scoping visit to Kapooka (Dec / Jan?)

## Opportunities for collaboration

- Performance measures: physical, cognitive, military task specific
- Support for data collection (VU, UoW)

## Challenges

- Data management, data sharing