

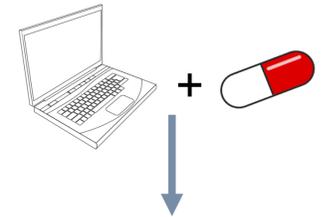
# THE COGNITIVE FUNCTIONS SUPPORTING LIVE-FIRE RESCUE OPERATIONS

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## INTRODUCTION

- Unsafe work behaviours occur at environmental temperatures exceeding 23°C (Ramsey et al., 1983)
- Cognition suffers at core body temperatures above 38.5°C (Schmit et al., 2017)
- Firefighting can involve extreme environmental temperatures (400°C+) and raised core body temperatures (38.5°C+)
- Past research shows that short-term exposure to extreme temperatures impairs cognitive flexibility and sustained attention in firefighters (Thompson et al., 2024)

Baseline battery of cognitive tests / swallow telemetric pill



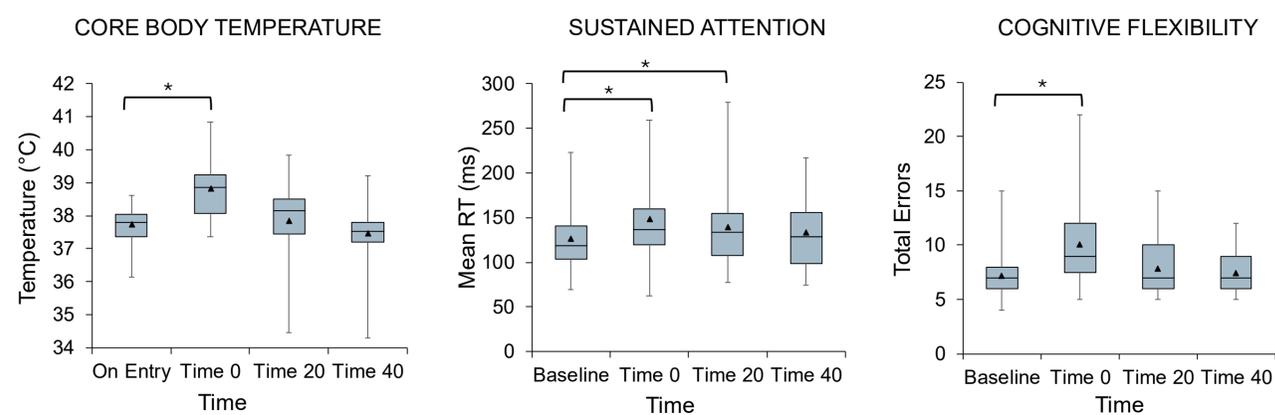
Live-fire training exercise with temperatures ranging from 115°C to 400°C



Time 0, Time 20, Time 40 battery of cognitive tests



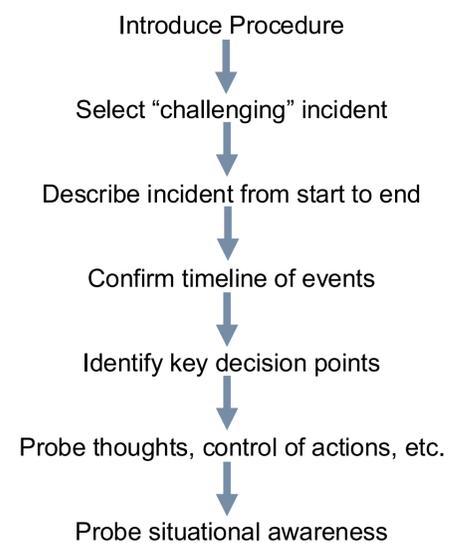
## PREVIOUS FINDINGS



## CURRENT STUDY

- **AIM:** Explore the cognitive processes critical to live-fire search and rescue operations to design a field-based task that can measure firefighter cognition
- **METHOD:** Interview 20 operational firefighters using the Critical Decision Method (CDM; an example of Cognitive Task Analysis)
  - Qualitative interviews elicit the cognitive processes that are most important in specific domains (Brown et al., 2024)
  - The CDM is used to explore cognitive processes of decision-making in natural settings (Klein et al., 1989)
  - The method is valuable when investigating “skilled performance under time pressure”
  - The CDM has previously been used in firefighting to explore decision-making of operational commanders

## THE CDM PROCEDURE



## FURTHER RESEARCH

1. Design cognitive test based on results from CDM
2. Validate the test against existing cognitive tests
3. Measure the impact of heat on firefighter cognition



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