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Chairperson: [Ian Stewart](#)  
Room 1 – Raffles

## **Training for tactical operations in tropical environments: challenges, risks, & strategies for risk management**

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### **Introduction**

Tactical operators, encompassing military, law enforcement, fire and other emergency personnel, can be found in all climatic zones. These tactical operators may be deployed at short notice to tropical environments, often with limited time to acclimatise if based in more temperate zones. They are then expected to undertake arduous tactical tasks, often repeatedly and for extended periods in the tropical area. These demands combine with harsh environments, personal protective equipment (PPE), tactical loads, threats to life, and responsibility for the safety and survival of others to place immense physical and mental stresses on tactical operators. Managing the resulting risks is challenging. The aim of this presentation is to elucidate the challenges, discuss their management and identify knowledge gaps requiring further research. The presentation will draw on experienced tactical operators, research evidence, and reports of adverse events.

### **Personal protective clothing, equipment and loads**

PPE (encompassing personal protective clothing and equipment) and other tactical loads are essential for protection, sustainment and effectiveness of tactical personnel. However, they are heavy, affect mobility, hasten fatigue and can compromise thermoregulation and visibility. By impeding sweat evaporation and body heat dissipation, PPE may contribute to rises in core temperature (T<sub>c</sub>) with physical exertion and hot and/or humid conditions<sup>1</sup>. Heat illness, heat stroke or death can result, with field-based assessment of individual risks sometimes quite difficult in practice<sup>2</sup>. Operational intensity and external threats may reduce opportunities to remove PPE and cool the body and some PPE may impede access to fluid and food. The associated risks must be carefully monitored and managed in real time, with attention to tactical context, loads, clothing layers, T<sub>c</sub>, signs and symptoms of heat illness, cooling options, nutrition, hydration, work/rest schedules and healthcare<sup>1,2</sup>.

### **Nature of tactical tasks**

Tactical personnel fulfil wide-ranging, arduous occupational roles, with roles in special tactical units often the most demanding. Terms such as ‘tactical athlete’ are insufficient descriptors, since athletes are not generally responsible for the safety and survival of others, can generally self-determine levels of participation, rarely require comparable PPE, and do not commonly have to schedule physical training regimes around unpredictable operational taskings. Tactical tasks are frequently critical or essential, not elective. Timelines, workloads and work/rest ratios may not be easily varied to suit ambient conditions in time-critical operational tasks but can generally be controlled in training contexts. Operational taskings are unpredictable. Long sedentary periods (eg transport, waiting in position) may be interspersed with multiple short bursts of intense physical activity; alternately, physical activity can be of long duration and sometimes repeated with little time between bouts to recover<sup>3</sup>. In tropical climates, this may limit opportunities to cool, hydrate and eat, resulting in pre-heated, dehydrated and fatigued<sup>3</sup> personnel re-entering tasks. Task-related stress can push heart rates to near maximum even at rest. Sleep deprivation due to deployment, tasks and tropical and tactical environments may impact cognitive function<sup>3</sup>. Tactical effectiveness may be impaired by all of these factors<sup>3</sup> and training must prepare personnel for these tasks and conditions while carefully managing safety risks<sup>2,3</sup>.

### **Nature of tactical operators**

Tactical operators typically identify as team workers who value teamwork, integrity, courage and good judgement in themselves and others<sup>4,5</sup>. They know and accept risks of the tactical role<sup>5</sup>. Fitness levels vary, and cultural norms can lead some to push beyond their limits. Injury rates tend to be high<sup>6</sup> due to the hazardous and unpredictable nature of tasks and environments. Tactical operators will often view hardship, like tropical heat and humidity, as a normal part