NATO RTG HFM-344 HUMAN IMPACT ONBOARD HIGH SPEED BOATS

Co-chairs - Prof Steve Myers (UK) & Dr John Fraser (USA)

Background

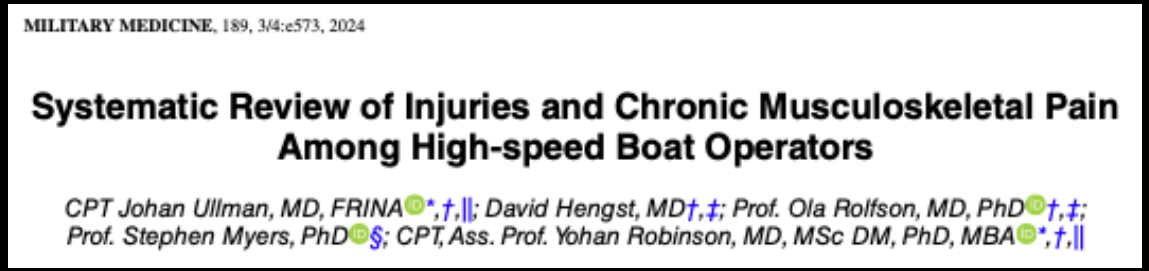
- Research Task Group HFM-344 ran from March 2022 to March 2025 bringing together 13 nations
- Overarching aim to improve conditions for and the health of high-speed boat operators i.e., military and Search & Rescue personnel.

Why was it needed?

- Personnel required to operate HSBs in rough seas are routinely exposed to high-level impacts (3-25+ g) typified by fast onset rates
- This impact exposure can cause severe physical and cognitive fatigue (20-40%), acute and chronic musculoskeletal injuries, and impair both vessel control and operational readiness.

Injury Risk

- These impact-exposure induced injuries are sometimes severe and result in permanent disabilities with emerging research indicating they may include severe traumatic brain injury (TBI)



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Systematic Review of Injuries and Chronic Musculoskeletal Pain Among High-speed Boat Operators

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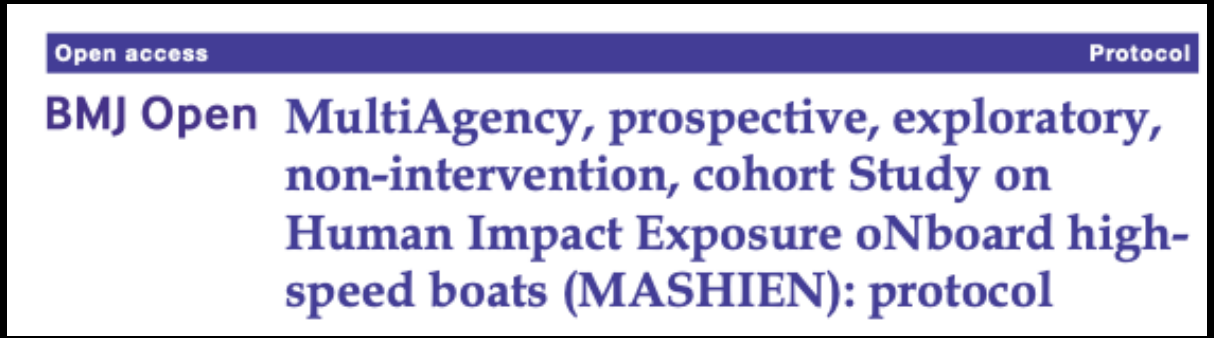
Conclusions: Despite very limited data, this review found evidence that **high-speed boat operators have a higher rate of injuries and a higher prevalence of chronic pain than other naval service operators and the general workforce**. Given the low certainty of these findings, further prospective research is required to verify the injury incidence and chronic pain prevalence among high-speed boat operators.

The Issue

- Operationally HSBs must be able to move as fast as possible
- However, during training maximum speed is not required and boat speed is modified by coxswain's largely by feel in response to sea conditions to a "tolerable speed"
- Boat speed selection would be improved if coxswain's had real-time impact exposure information to allow them to optimize the speed to the urgency of the task and other risk factors
- However, information is lacking on what levels of impact exposure are injurious and require data to be collected over the full range of sea conditions.

The How

- To address this lack of data the HFM-344 has through the multi-nation, prospective, exploratory, non-intervention cohort study “Human Impact Exposure onboard high-speed boats” (MASHIEN) protocol, created an agreed on standard method for data collection
- Methodology for acceleration (boat & operator) and pain data collection.



MASHIEN Data Collection Progress

- The initial data collection is underway/completed/pending by five nations (Belgium, Canada, Curaçao, Denmark, Germany)
- Initial studies helped refine data collection and integration, improving the protocol's robustness and suitability to be rolled out to more nations
- A database has been set-up to collate and analyse these data (supported by Ministry of Defence Sweden), and initial data has been uploaded to it
- The database will allow impacts data magnitudes and characteristics to be correlated with reported pain to provide an indication as to what levels and types of exposure are potentially harmful.

Conclusion

- The study initiated under HFM-RTG-344 represents a significant step forward in understanding the occupational hazards associated with HSB operations
- Its findings can be used for evidence-based guidelines for injury prevention, contribute to safer operational practices, and support improvements in boat design and suspension technology
- The database represents a resource available to NATO and partner nations.

Future: HFM-344 → HFM-419

- The success of HFM-344 has led to the approval of a follow-on Research Task group, HFM-419, which will commence in October 2025 and will continue multi-nation data collection and extend its reach to include TBI and operational performance.
- Contact your NATO country representatives if you are interested in joining and contributing to HFM-419

HFM-419
HUMAN IMPACT ONBOARD HIGH SPEED BOATS

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