ID: 880 / Paper: 90

Applying existing scientific technology and methods to life saving research

Assoc Prof Per Ludvik Kjendlie[1,2,4] and Assoc Prof Robert Stallman[3,4]

Vestfold Univ. College, Norway[1], Norwegian Swimming Federation[2], Norwegian Life Saving Society[3], Norwegian School of Sport Science[4]

Introduction

All aquatic activities have an element of drowning prevention, directly or indirectly. They are all related and have much in common. However, each has its own unique needs and characteristics. Thus there is fertile soil for cross polination of ideas, instrumentation, technology, methods. All aquatic activity areas and all academic disciplines should participate in this exchange. In the context of drowning prevention, we can profit greatly by applying methods used elsewhere.

Advances in technology, mathematical modeling, instrumentation and methodology are advancing at a rapid rate. There are many important research hypotheses to be tested within the rich area of water safety and life saving.

Aims

The aims of this presentation are a) to present several recent developments in aquatic research, and b) to propose several examples of research hypotheses requiring exploration.

Methods

A search of recent aquatic research identified methods and topics suggesting application to water safety. Several are selected, only as examples, with examples of concrete proposals for future research.

Results and Conclusions

a. Examples of newer concepts and methods from various areas of aquatic research having relevance for life saving research:

1. unsteady effects in hydrodynamics, added mass and vortex theory
2. passive & active drag measurements
3. 3D modeling and computational fluid dynamics of aquatic movement
4. energy cost analysis

b. Examples of proposals for future life saving and water safety research:

1. Energy cost of selected rescue towing techniques; the effect of the body position of the victim &/or rescuer; the effect of choice of arm and/or leg strokes; the effect of the choice of equipment.
2. Heat loss/energy expenditure in selected positions in floating &/or treading water. The dilema of heat loss with head submerged vs energy loss with the head above the surface.
3. Passive drag in selected body positions of the victim in towing; effect of various equipment, clothing.
4. Active drag in selected techniques of the rescuer in towing; effect of arm or leg strokes; body position.
5. Risk taking behavior and personality traits.
6. Post traumatic stress syndrome; victim & rescuer? Implications? Treatment?
7. Cross cultural analysis of prevalence of selected life saving techniques; award schemes in swimming & life saving; implications, etc. All areas of aquatic research can benefit from borrowing methodology from others. Life saving and water safety have a rich selection of important hypotheses waiting to be tested. In general, life saving research is under represented both in the aquatic experimental litterature (1,2,3) and at existing centers of aquatic research.

References

1. Stallman, RK; Kjendlie, PL (2008). A Model for Creating a Plan for Research in Life Saving and Water Safety; International Journal of Aquatic Research and Education. 2(1).
2. Kjendlie, PL; Stallman, RK; Cabri, J. (2010). Proceedings of the XIth Int. Symposium for Biomechanics and Medicine in Swimming; Norwegian School of Sport Science, Oslo
3. Kjendlie, PL; Stallman, RK; Cabri, J. (2010). Book of Abstracts of the XIth Int. Symposium for Biomechanics and Medicine in Swimming; Norwegian School of Sport Science, Oslo

Corresponding Author

Robert Keig Stallman
Assoc. Professor
Norw. LS Soc/Nor Sch SS
Sandvollvn. 80
Ski Akershus Norway 1400
Email: robertkeig_stallman@yahoo.com
Telephone: +47 90767299