PROFILING INTERNATIONAL 'SCHOOL – CLUB – INTERCOLLEGIATE – ELITE' ROWING TECHNIQUE AND BOAT PERFORMANCES DURING TRAINING AND RACING

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INTRODUCTION: Rowing is a strength endurance sport - technical proficiency will ensure strength, endurance and other physiological capabilities are translated into maximising boat speed. Rower, blade, boat and water are in continual interaction during the rowing stroke and must be highly coordinated during its continuous, cyclic and 'closed skill' movement under changing external (wind, weather, temperature) and internal conditions (stroke frequencies, boat velocity, mutual influence in a team boat and progressive fatigue).
For success in any level of competitive rowing, athletes must use their technical skills and entire performance capacity (e.g. physical, condition, coordination) to achieve and retain a high average boat velocity throughout the race (Mattes, 2012).
Monitoring and analysing boat and athlete-specific aspects of rowing technique and performance during training and racing, is seen as an area of opportunity to assist coaches and athletes at any rowing level to monitor the progress (short/ long-term) during training and towards a well prepared race design.

METHOD: In a fast growing and easily accessible (and affordable) technology market, it has become more common that there are miniaturised devices widely available, which assist coaches to objectively assess athlete and boat performances. While the stroke/speed coach has been a standard monitoring and racing tool in most rowing boats, GPS tracking and on-water rowing measuring systems are starting to become more attractive to the wider rowing community. Utilising these miniaturised technologies and placing it either on the athlete and/ or on the equipment (i.e. boat, rigger, oars) is enabling frequent monitoring of athletes' training and competition performances. Ensuring precise positioning and calibration of the measuring devices is a prerequisite for recording accurate data. Utilising the advantages of precision (data is measurable) – as the 'objective eye' for the coach - underlines the importance of how data should be carefully analysed and presented. The information provided to the coach has to be meaningful and applicable to the level of athlete and to their training and racing approach.

RESULTS: On-water training and racing results were obtained in various nations from different rowing levels (school, club, intercollegiate and high performance). Different visualisation techniques and feedback platforms offered a greater variety and understanding for monitoring and analysing boat-and athlete-specific aspects of rowing technique and performance. While the common graphical curve profiles (i.e. gate force) assess the technical skill level of rowing-specific variables ((Kleshnev V, Nolte V, 2011, Smith R & Loschner C, 2002), the 'stroke by stroke (sbs)' discrete values (i.e. handle power/ str; average boat velocity/ str) and multi-dimensional colour-coded time-scatter plots quantifiy and profile comprehensive sbs changes during training and racing and show significant differences between the various rowing skill levels. (Draper C, Ting KM, et al, 2009).

DISCUSSION: Different visualisation techniques in combination with benchmark parameters for each level of athlete offer a greater variety and understanding for monitoring boat-and athlete-specific aspects of rowing technique and performance during training and racing. The information utilised can become crucial in assisting coaches and athletes profiling individual performance (technical skill level/ physical capacity) and fine-tuning racing strategies for

given/ selected crew combinations and towards a stable and efficient boat performance over the race.
Although on-water data gathering is now more easily accessible, only a precise handling of the information and then providing an adjusted analysis (based on the level of athlete and the program) will ensure that the individual and boat related results can be applied towards technique improvements and performance gains.

REFERENCES:

Mattes K (2012). Rowing Technique. In Altenburg D. Mattes K. Steinacker J. (eds.). *Manual for Rowing Training: Technique, High Performance and Planning.* Limpert Verlag GmbH, 53-108.

Kleshnev V, Nolte V (2011). Learning from Racing. In: Nolte V. (ed.). *Rowing Faster-2*. Human Kinetics. 251-265.

Draper C, Ting KM, et al (2009). Profiling Rowing races and crews using visualisation techniques to assess multi-dimensional boat motion. *14th Annual Congress of the European College of Sport Science*, Oslo/ Norway.

Smith R. & Loschner C. (2002). Biomechanics feedback for rowing. *Journal of Sports Sciences*, 20, 783-791.