

HFM: Combat Integration: Implications for Physical Employment Standards

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ABSTRACT

This series of papers reviews the outputs of RTG HFM 269 Combat Integration: Implications for Physical Employment Standards (PES). The aims of the group, and the outputs for the final report are to identify best practices for the development of Physical Employment Standards in Combat Integration. Specifically:

- (1) Develop research advice for designing PES to minimize inherent sex bias and agreed definition of terminology;*
- (2) Provide advice and guidance on injury prevention strategies with Combat Integration by:*
 - a. Facilitating international research efforts to monitor musculoskeletal injury (MSKI) risk in longitudinal investigations;*
 - b. Identifying female specific training strategies for achieving and maintaining PES.*
- (3) Produce a final technical report with a framework and practical recommendations for designing PES considering Combat Integration, supported by a comprehension compendium of all available related research, and current military PES.*

The views expressed in this abstract are those of the authors and do not reflect the official policy of the Department of Army, Department of Defense, or the U.S. Government.

1.0 OVERVIEW

In 1995 a NATO DRG Panel 8 Workshop entitled *Optimizing the Performance of Women in the Armed Forces of NATO* was held in the United Kingdom (UK). No further working groups had focused on this topic until this research technical group convened in 2016. In 1999 the British Army implemented gender free physical employment standards (PES) testing, but ground close combat (GCC) roles were closed to females at that time. Given that USA, UK, and Australia have or are planning to lift exclusions of females in combat roles, and given that Canada was the first to develop, and implement a sex free PES for which there are no “neutralised” standards for all roles within the Armed Forces, a TAP and an ET was created for the topic of Combat (sex) integration and PES. The resulting NATO RTG HFM 269 includes 10 countries and the group has completed five of their six scheduled meetings.

2.0 PRESENTATIONS

A review of current PES practices across NATO nations and a “best practice” for the development of Physical Employment Standards, with consideration of Combat Integration. (Dr Sam Blacker and Dr Tara Reilly)

The goal is to provide an “off the shelf” guide for a defense scientist or military member to develop protocol(s) for the development of a sex free PES based on lessons learned and scientific and practical experiences primarily from Canada, UK, USA, and Australia.

Physical employment standards often become a contentious issue for females joining combat roles due to the literature indicating that there are differences in male/female physical strength and endurance capabilities (Miller et al 1993). However, these differences are irrelevant provided the demands of the occupation are being met (Friedl 2016).

Bias can arise from instrumentation and test methods of predictive fitness tests through a lack of validity or cultural artifacts. Bias can also be introduced by participants and/or Subject Matter Experts (SME). This HFM will develop guidelines with regard to the diversity required of the research sample in face of the challenges of a very small sample pool of females in combat roles. Topics will include recommendations on best practices for implementation of PES (accommodation by means of practice trials, training, or technique), and ways to facilitate success without compromising standards.

A Compendium of male and female performance data on both predictive physical selection type tests and occupational task/work samples. (Mrs. Marilyn Sharp)

This presentation will highlight sex differences in physical fitness tests in military members, as well as in performance of physically demanding military occupational tasks. The hypothesis being that for many of these fitness tests, which are designed to predict occupational tasks, the sex differences in maximal performance are at a level above that which is required for success on the task. These data will identify tests with the least bias for assessing occupational fitness, while still considering their predictive capability. While some predictive tests are maintained for historical/cultural reasons, they may result in falsely identifying females as incapable of performing an occupational task to a minimal standard. Existing training data for these tests and tasks will be presented to allow the researcher to identify the tests with the most potential for improvement to minimize a sex differential through physical training.

Facilitate international research efforts to monitor MSkI risk for female military members in longitudinal investigations; including an exploration of the role of PES in musculoskeletal injury risk. (Dr Jace Drain and Dr Keith Hauret)

Little data are available regarding injury rates specific to female Combat Arms personnel which could advise on if there is a cause and effect relationship with sex and injury rate. The data for non-combat arms personnel show higher risks associated with females, however, there are many confounding factors such as physical fitness. When female participants are compared to male participants, often their modifiable characteristics such as body mass, lean body mass, training status, and experience are not matched. Likewise, factors as simple as stature are not later analysed for interactions or effects. Recent findings of research from the US Army indicates that with a well-controlled analysis of injury risks of women compared to men controlling for age, race, and several components of measured entry level physical fitness, the only factor that remained significant in the logistic regression was run time (aerobic fitness). Therefore, women of the same level of physical fitness as men, in particular aerobic weight bearing fitness assessed by run times can be expected to experience similar risks of injury as men (Nindl et al. 2016).

The introduction of females into the combat arms in Australia, the US and the UK Armed Forces will provide an international opportunity to study the evolution of females throughout training and deployment, and advise on the best methods to prepare them physically for best performance on occupational tasks, with injury reduction being a major aim.

In addition, it is important to distinguish between “injuries” and “incidents”. Furthermore, information on the “impact” of the injury (time loss, temporary medical category modified duties, etc.) is crucial information for the organization and should be considered in any injury tracking/prevention program. These concerns have been expressed with involvement in the NATO RTG 283 on musculoskeletal injuries.

Military training strategies for achieving and maintaining PES. (Dr. Jace Drain, Dr. Sam Blacker, Mrs. Marilyn Sharp)

Physical training in the military has often not kept pace with known best practices due to resource limitations (i.e. time, space, equipment, trained supervision). A number of studies have shown that combined resistance and aerobic training programs can be used to improve the performance of females in physically demanding occupations. A recent review of the programs used to improve female performance of military occupational tasks concluded that a minimum of six-months training using job-task specific exercises for load carriage, with an emphasis on upper body strength and power were necessary to prepare females for combat occupations (Nindl, et al 2015). The performance gap for females and males on both occupational tasks and traditional predictive tests may narrow as females evolve their training from a callisthenic model to a mixed strength and endurance model with increased emphasis on higher intensity effort (Nindl et al. 2016). Research has demonstrated females are capable of significantly improving performance of physically demanding military tasks. A review these findings and advice on how to best evolve the female soldiers’ training program will be included in the NATO RTG HFM 269 report.

Incentives for improved performance to achieve or exceed PES standards with considerations for bias. (Dr Tara Reilly)

The PES for the Canadian Armed Forces (CAF) has been established as bias free and best practice at the minimal acceptable performance standard. The implementation of an incentive to encourage performance beyond the minimal standard is being examined for effectiveness and potential bias. To prevent bias, or maximise the number of females who will be incentivised and therefore inspired to excel, normative referencing in sex and age categories are applied. This practice is debatable as it provides females with an advantage over their male age matched counterparts. However, the highest incentive (top 5th percentile) may be unachievable by females. Normative physical performance data are used in the CAF to incentivise females, given the inherent sex differences in maximal physical capacities at an elite level.

The final goal of the NATO RTG HFM 269 is to produce a technical report with practical recommendations for designing PES considering Combat Integration, supported by a comprehensive compendium of all available related research.

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