A Division of the Canadian Forces Personnel Support Agency
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Newsletter

Research and Development

Human Performance

May 2007 **Volume 2, Number 1**

In This Issue

Message from DHPHP

In the area of Research and Development (R&D), FY 06/07 proved to be very busy, given the operational tempo of the Canadian Forces (CF) and the increased focus on fitness by the Chief of the Defence Staff (CDS). The projects and initiatives that are outlined in this edition of our Newsletter are all a result of hard work within the Human Performance cell, the strong collaboration within the Canadian Forces Personnel Support Agency Headquarters (CFPSA HQ) including the staff under Director Physical Education (DPE), and the support of PSP in the field. For that, the Human Performance cell at CFPSA HQ genuinely thanks you all for your hard work in FY 06/07 and we look forward to the exciting times that are to come in the area of R&D in the CF in the future. We hope that you will continue to be part of our "Human Performance Research Team" during these exciting times.

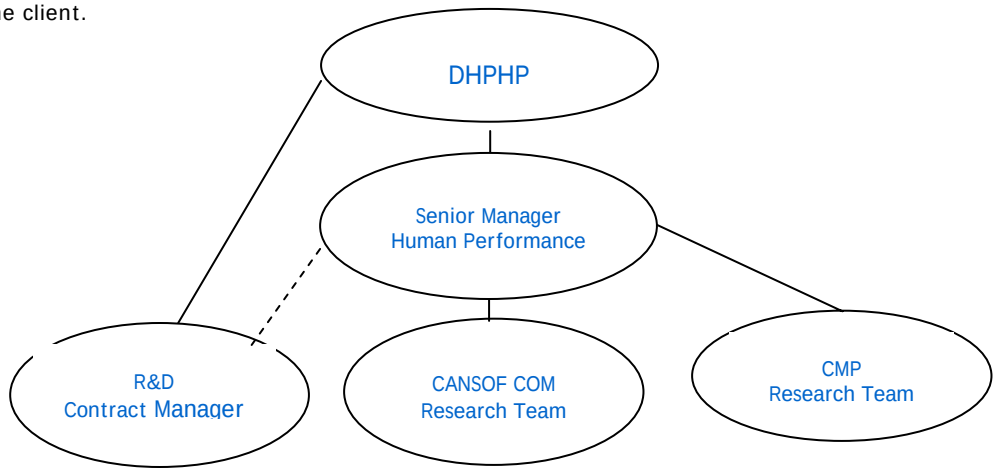
Dr. S. Wayne Lee
Director Human Performance Health Promotion

CFPSA R&D Restructures to Meet DND's Needs for Fitness Standards and Programs

For a number of years research projects at CFPSA in the area of Human Performance have been contracted out to universities or individual contractors. It was not until the last few years that CFPSA developed enough in-house expertise and experience to be able to do more of our own R&D with projects in the area of Occupational Physiology and Bona Fide Occupational Requirements (BFORs).

The reason for the shift is solely to benefit the CF, our "client". Experience has shown that embedding PSP research assets into units or trades helps to serve the client by providing them with quick and easy access to a human performance expert. On the contrary, a university researcher contracted to work on a project is not just doing one project and is, therefore, not a full-time asset to the R&D needs of the client. Another reason for a shift to working on R&D projects in-house is that most universities charge overhead to complete the work. Conversely, little to no overhead is required on in-house projects. As a result client funds can be used to hire a researcher and lab equipment with no hidden fees that are absorbed by the organization.

With this shift in approach, the Human Performance cell has recently begun a restructuring process that will facilitate more in-house research to be completed. The overall concept is to have two research teams – one for CANSOF COM R&D (client funded) and another for CMP R&D (client and baseline funded). Further, there are some human performance R&D needs that CFPSA will not be able to provide, and the University contracting option will always be there, depending on the needs of the client.



What is also affected by this shift to more in-house research is the need for support from PSP in the field to help with data collection and, on occasion, facility and equipment support. As in the past with the MPFS, Military Police Close Protection, and the JNBCD R&D Projects, call letters will go out to the bases looking for interested people to help with data collection. This will provide the PSP community an opportunity to participate in developing standards and programs at its most infant stages and it also give exposure to the PSP community to perhaps spark an interest in R&D and provide them with experience and skills that can be used in future job opportunities.

The field of research and development at CFPSA HQ is a high paced energetic environment that exposes its employees to military personnel working in a military environment, which really helps to understand the client that PSP is serving and, in turn, helps to foster the relationship between PSP and the CF as a whole.

Academics in Research and Development

Being accepted to a postgraduate program is the first challenge. The second challenge is selecting a thesis topic. For a number of CFPSA employees, this second challenge was made a bit easier by becoming part of a research projects being completed by CFPSA's Human Performance cell. Each of these individuals have been involved in very different ways, which shows how open CFPSA is to the idea of supporting its employees for higher education. For example, Dr. Lindsay Goulet, recently hired by CFPSA in 2006 to head up the research for the Joint Nuclear Biological and Chemical Defence Company (JNBCD Coy) began her Masters Degree at the University of Victoria when she was a fitness instructor at CFB Esquimalt, working on the CF Diver's Physical Fitness Maintenance Standard. She released her position with PSP and continued on with her PhD working on the same topic. In the case of Sarah Flanagan, currently coordinating the research project for developing a Minimum Physical Fitness Standard (MPFS) for CF Members 50 Years of age and Older, she will be using the data collected from her day-to-day work to complete a related topic for her Masters thesis. Similarly, Sue Janen, PSP Manager at Dwyer Hill Training Centre, completed her Masters Degree with Queen's University while working for R&D at CFPSA HQ. Her thesis project related to the development of the Fire Fighter Physical Fitness Maintenance Standard. Other examples include Patrick Gagnon, a long time employee of CFPSA plans to use his work with the Military Police Close Personnel Protection Research Project as data for his PhD Thesis, and Daryl Allard, while working with Health Promotion, completed his Masters Degree using data collected on CF Divers. Daryl is currently working as the Research Director at Dwyer Hill Training Centre, where he puts these research skills to work daily. Each of these people were in different circumstances when they completed their Theses, one thing is for sure; the experiences that they gained, or are gaining, through being part of a CFPSA R&D project has been a good experience and has paid off for them as individuals. Just as important is that each of these individuals continually gives back to R&D at CFPSA HQ. For this reason CFPSA is the real winner!

If you are interested in the idea of using a CFPSA R&D project as a thesis topic for a Masters Degree or PhD, please contact Patrick Gagnon, Senior Manager Human Performance, CFPSA HQ, 613-992-1327.

Fire Fighters Forcible Entry Study in the Works

Forcible Entry Task – University of Alberta Lab.

At the beginning of January in 2007 the Canadian Forces Fire Marshal, LCol Gaetan Morinville, provided CFPSA with research dollars to have a look at the forcible entry task within both the Fire Fighter Physical Fitness Maintenance Standard and the Fire Fighter Physical Fitness Selection Standard (currently being implemented) to find a device that can replace the current forcible entry apparatus.

Both physical fitness standards contain similar forcible entry tasks within their respective protocols. Both use a plywood sheet on a picnic bench with a weighted tire. However, after visiting a large number of the fire halls this past year, the CFFM feels a growing concern as to the reproducibility of the task at different testing sites across the country. As a result, CFFM has asked for the CFPSA's support to review the forcible entry task in both protocols and propose a new scientifically validated substitute for the current set up, using a commercially available apparatus that can be calibrated to aid in controlling implementation. In response to this request CFPSA has contracted Dr. Stewart Petersen at the University of Alberta to complete this small project. The goal is to complete the project in FY 07/08 and equip all fire halls with the new forcible entry apparatus soon thereafter.

CSEP Support Moving from DHPHP to DPE at CFPSA HQ

There is a lot of work being done with the CFPSA CSEP Program at CFPSA HQ.

Beginning FY 07/08 the R&D Coordinator Position under DHPHP will no longer be the Office Manager for CSEP matters within CFPSA. This responsibility will fall to the National Physical Fitness Manager under DPE. Please note that this change in program management at CFPSA HQ will not result in changes to the program and how it is delivered.

The CSEP Program at CFPSA has been busy over the last 5 months providing CSEP CPT upgrades to PSP Staff across the country. To date, clinics have been completed at Halifax, Gagetown, Saint John's, Winnipeg, Edmonton, Trenton, and Petawawa. A special thanks goes out to the Course Conductors and Assistants, which include Mary-Beth McGinn (CFPSA HQ, R&D), Marie Danais (CFPSA HQ), Renee Nuttall (London), Dwayne Farrell (PSA Trg Centre, Borden), and Andrea McIntyre (Petawawa). CPT clinics and exam re-writes will be ongoing over the next few months with March 2008 being the deadline for all PSP instructors to be updated.

Army Fitness Manual Updates

In a meeting at CFPSA HQ in December 2006, Dr. Howie Wenger presented a report, which provided a review of both the Army Fitness Manual (AFM) and the CrossFit Training Method. In this report Dr. Wenger assessed both programs from the standpoint of how well they include all fitness principles and how successful they are at employing exercise prescription principles. The report finished with a list of recommendations to CFPSA for consideration if and when the CrossFit Training Method is employed as a tool in the CF.

Photo courtesy of Combat Camera

From this report, DHPHP provided the client (The Infantry School Gagetown and Doctrine Army Training) with an overall recommendation through a "position statement" that a CrossFit-type program could be used in the CF provided that it follows a number of recommendations provided in Dr. Wenger's Report.

The second part of this meeting was focused on implementation and delivery. The overall proposed approach included the following points. It was recommended that:

- ✓ a "CrossFit type" program be included as extra chapters in the Army Fitness Manual, and will act as another tool for the Army Community in the area of fitness.
- ✓ the CFPSA Training Centre Staff, Army PSP Instructor Staff, and RMC Phys Ed. Instructor Staff be given priority in receiving CrossFit Training and experience to allow them to be a resource on CrossFit and related programs for the Army personnel that they serve on their bases.
- ✓ CFPSA begin to take the lead on coordinating the training of CrossFit to PSP and the CF. Specifically this means that CFPSA Training Centre will develop Course Training Plans (CTPs) to allow for the delivery of CrossFit training to new as well as experienced PSP Instructors and develop CTPs to allow for CrossFit training of Army Personnel who will be in a fitness leadership role.

Since this meeting the Human Performance Cell has been working with a Team of people including both PSP and CF members to develop the new chapters for the AFM. Further, the National Physical Fitness Manager, Marie Danais, and the CFPSA Training Centre Manager, Paul Poirier are finalizing the details on the implementation plan. More information on this will be coming out in the May/June 2007 timeframe.

Fire Fighter Physical Fitness Selection Standard Pilot Testing Complete

The Fire Fighter Physical Fitness Selection Standard Pilot Implementation project is complete. After having been trialed at a DND Fire Hall in Valcartier and at the CF Fire Academy in Borden, it is clear that the Selection test will be a useful screening tool for both DND Fire Halls and the CF to select fire fighter candidates with sufficient levels of physical fitness to complete their training as a Fire Fighter.

The provide some insight into the test, the Fire Fighter Physical Fitness Selection Standard consists of two parts. The first evaluates an applicant's aerobic capacity with a treadmill graded aerobic test in full bunker gear (not breathing on the Self Contained Breathing Apparatus (SCBA)). The second part of the evaluation has the applicants complete a number of fire fighter related tasks, also completed in bunker gear. These tasks include charged hose advance, rope pull, forcible entry, victim rescue, ladder climb, and equipment carry/vehicle extrication.

At this time, the Standard, along with an operator's manual has been passed over to DPE for implementation and delivery. Timelines for its roll out are not known at this time, as DPE and CFFM will be engaging in discussions as to how to roll out this tool to both CF and DND firefighting communities in the most feasible manner.

A special thanks goes out to the Borden PSP Fitness Staff and the CFPSA Training Centre for their support in the most recent Borden Pilot testing. These two groups really stepped up to the plate to help support DHPHP in completing the pilot testing on time.

CF Firefighter Combat Challenge Program

Once again, the Canadian Force Fire Marshal is spending resources to improve the level of physical fitness of both CF and Department of National Defence (DND) Firefighters by supporting a CF Combat Challenge Team that Competes at the National Championships annually. This year the season begins in June 2006 with a training camp. Interested Firefighters are welcome to attend the training camp at the University of Alberta in Edmonton, and Fire Fit Competition in Vermillion, Alberta with the hopes of posting a fast enough time to be selected on this year's National Team representing the CF. This year, different from previous ones, firefighters are NOT required to complete the FF Maintenance Test as a pre-camp test. Each Firefighter, however, is being provided a fitness program developed by Dr. Stewart Petersen at the University of Alberta, which will help them get into top shape for the training camp. Any PSP instructors that are interested in supporting the firefighters with the fitness program may get a copy of the program from their PSP Fitness and Sports Directors/Coordinators.

The Beginnings of a SAR TECH Physical Fitness Selection Standard

Photo from courtesy of Combat Camera

It was just recently announced that Dr. Stewart Petersen from the University of Alberta has won the bid for proposals to develop a Physical Fitness Selection Standard for the Search and Rescue Technician (SAR TECH) Trade. The scope of this project will include a physical demands analysis of the 11 month long training that a SAR TECH does in both Jarvis Lake, Alberta and in Comox, British Columbia.

The project is anticipated to take 2 years to complete. The impact on PSP, during roll out, is unknown at this time. Updates, with photos of the research will come in future Newsletters. Keep an eye open for details on this very interesting project.

Developing a Tool to Help Improve CF Women with Upper Body Muscular Strength and Endurance

Participant at the Army Ironman CFB Petawawa

Recently Dr. Howie Wenger, author of the Army Fitness Manual and Web EXPRES training programs has been contracted to provide a review of literature on the trainability of women and the effects of aging and menopause on fitness and trainability. Further, Dr. Wenger will be developing a comprehensive tool for women that can be used to improve women's upper body muscular strength and endurance.

The intent is to create a tool that women in the CF and PSP instructors can use in conjunction with the programs from the Web EXPRES to help women in their quest, as they age, to maintain sufficient upper body muscular strength and endurance for the physical demands requirements of a CF member. The estimated completion time of this documents is mid FY 07/08.

Divers Maintenance Standard is Developed!

The Divers Final Report containing a Maintenance Physical Fitness Test for the CF Diving Community is complete. The test protocol has been created to test four diving groups, including clearance divers, combat divers, port inspection divers and ship's team divers. The test has two different components with a pass standard being either time based or pass/fail based, depending on the task. The tasks in the protocol are as follows:

Courtesy of Combat Camera

Land-based Components

- ✓ Pre/post dive circuit that involves the divers manipulating, lifting, and carrying a selected set of CF diver related equipment 3 times around a 100mcircuit including over and around obstacles.
- ✓ Diver casualty simulation (simulated stretcher carry) around a 100m circuit.
- ✓ Line pull that requires pulling weighted milk crate (equivalent to 45.25 kg of force) a distance of 20 m two times.

Water-based Components

- ✓ Vertical weighted fin kick
- ✓ 400m underwater swim
- ✓ 100m surface swim

The University of Victoria, under the lead of Dr. David Docherty, will be officially presenting the final report to members of CFPSA HQ and Director of Dive Safety (D Dive S) at the end of FY 06/07. From this meeting details on implementation and delivery of this test and protocol will be discussed between D Dive S and the DPE staff at CFPSA HQ.

JNBCD Data Collection Begins

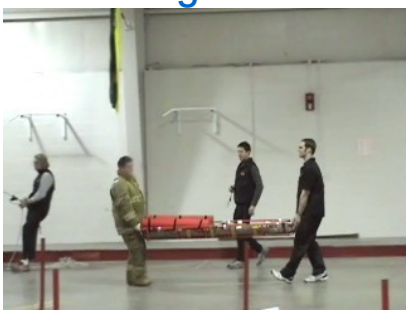
The project for developing and validating a physical fitness maintenance standard for the JNBCD Coy is well underway. Baseline fitness measurements were assessed during a two-week trip to Trenton. The test battery included skinfolds measurements, a VO_{2max} treadmill test, grip strength, push-ups, sit-ups, a back extension endurance test and a flexibility assessment. Sixty-nine members of the JNBCD Coy were assessed and the overall fitness of the Company was determined from these results. In addition, data such as maximal heart rate and maximal VO_2 will also be used to help determine physically demanding tasks required of the members as they complete required tasks in the field.

Trenton PSP Fitness Instructor, Matt Cassidy puts a participant through a VO2max test

A preliminary survey was developed to provide further information and clarification on tasks deemed physically demanding, or essential, by members of the JNBCD Coy. The results of these surveys will be used to develop work samples for physiological assessments, scheduled to take place in the summer of 2007. As an initial step towards developing these work samples, Lindsay Goulet and Mary-Beth McGinn were invited to participate in the "Steel Response IV" exercise, which was a multi-agency exercise involving the Hamilton Police and the RCMP in Hamilton, Ontario in February. Heart rates were monitored daily on 18 subjects and the data is currently being analyzed. A number of exercises are scheduled for the spring and summer of 2007, in which further physiological data and observations will be gathered.

Much work is still to come, but the project is moving along smoothly. Our many thanks to Lisa Refausse, Amy Dawson and Matt Cassidy at CFB Trenton for aiding in the maximal testing and to the members of the JNBCD Coy for accommodating our many requests.

MPFS 50 Years and Older Research Study in the Final Stages



PSP Instructors from CFSU(O) and a participant complete the Sea Evacuation Task.

A PSP Instructor from Petawawa times a participant during the low/high crawl

In early December 2006, the final data collection session was completed. This session proved to be our most successful session as a total of 96 new participants completed the Five Common Tasks while an additional 29 CF members completed V02max testing and maximal protocols for the Five Common Tasks. This was the largest group of older CF members ever tested in such a short period of time and thus the support of PSP staff from the field was crucial.

During this testing session the Research & Development section of CFPSA HQ was privileged to have the support of 27 PSP staff who came from BFC Valcartier (1), CFB Goose Bay (2), CFSU(O) (1), CFB Winnipeg (2), CFB Wainwright (1), CFPSA HQ (4), and of course our host base of CFB Petawawa who allowed all of their Fitness staff and some of their Recreation staff the opportunity to participate in this research (16). All of these staff provided outstanding support, leadership, and demonstrated excellent customer service. They were outstanding examples of the physical capabilities and knowledge experiences of PSP staff.

The MPFS 50 Years and Older Research Study is now in the final stages. More than 10,000 pieces of data must be analyzed and interpreted, so that CFPSA can make some recommendations to the CF regarding the physical fitness standards and programs for its older members. It is estimated that a final report with recommendations will be forwarded to the CF in late May / early June of 2007.

Contact Us

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Comments and Questions are greatly appreciated.

We hope that this has been informative for you. DHPHP looks forward to working with you in the future on R&D initiatives.