CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES CANADIENNES

JCSP 34 / PCEMI 34

New Horizons

Tough Enough? Canadian Army Physical Fitness

By /par
Maj/maj A.G. Plater

ABSTRACT

The Canadian Army uses a task-related physical fitness program called the Army Fitness Program (AFP) that does not fully meeting the requirement for physical fitness training of soldiers before they deploy on operations in Afghanistan. The AFP is assessed in order to guide the Canadian Army in selecting a better physical fitness program and to better prepare its soldiers for operations. It is clear from this analysis that improvements should include increased training in physical fitness for leaders, and the addition of functional fitness training for soldiers who have achieved the existing fitness standard. The fitness standard itself should be augmented with an increased weight for the weightload march. The Army should double the number of times a soldier is required to meet the standard annually, and implement measurement of body fat to identify soldiers at risk for cardiovascular disease and diabetes.

INTRODUCTION

Recent combat operations in Afghanistan and Iraq have focused the attention of many Western armies on the physical fitness of soldiers. Recent lessons learned reports from Task Force Afghanistan have identified that soldiers require a high level of physical fitness.[1] The Canadian Army uses a task-related physical fitness program called the Army Fitness Program (AFP). The program contains a structure for physical fitness training, specific workout plans as part of the structure, and a testing standard. Some of the criticisms specific to this program have been that the program is not sufficiently challenging and that the tasks selected for the Army Fitness Standard (AFS) and the levels chosen to represent success are not sufficiently high to prepare Canadian soldiers for modern operations. These criticisms come from a variety of lessons-learned reports and highlight the requirement for a more robust physical fitness program, especially for combat arms soldiers.[2] These criticisms are not unique to the Canadian Army and have also been made of fitness programs used by other Western armies.

To determine if the AFP is deficient in meeting the requirement for physical fitness training, an analysis of the AFP and the Contemporary Operating Environment (COE) is required. The purpose of this paper is to assess the AFP in order to guide the Canadian Army in selecting a better physical fitness regime and better prepare its soldiers for the COE. The first stage of the analysis will be an assessment of the COE, and the

---

[1] LCol R.H. Matheson, *Lesson Synopsis Report 08-005 Reconnaissance Platoon TF 3-07* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 7 April 2008), 2.

[2] The Army Lessons Learned Annual Roll-ups for 2006 and 2007 refer to the requirement for physical fitness and collective training that better represents the conditions in Afghanistan. MGen S.A. Beare, *Army Lessons Learned Centre Annual Roll Up for 2006* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 3 May 2007). and MGen S.A. Beare, *Army Lessons Learned Centre (ALLC) 2007 Roll-up Report* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 14 February 2008).

challenges it poses for modern military operations. The second stage of the analysis will be defining physical fitness and establishing a method to compare programs against the fitness requirements. In the third stage of analysis an assessment of different physical fitness training programs will be completed, to include: the Canadian Army; some key Allied armies; and a civilian program called CrossFit. Finally the paper will compare and contrast these programs based upon the methodology to determine which is better at preparing soldiers for the COE. This paper will show that the AFP provides a strong foundation, but could be improved with a few small modifications.

THE CONTEMPORARY OPERATING ENVIRONMENT

In Canada's Army, the combat mission in Afghanistan has created a renewed awareness of the requirement for a high level of physical fitness because of the harsh and demanding nature of operations.[3] The COE in which this mission is conducted requires that soldiers be prepared to "operate day or night, in close or complex terrain, in all weather conditions."[4] A high degree of physical fitness is required to function in this environment, and many question if the AFP is preparing soldiers sufficiently.[5] This section will examine the physical fitness demands and stresses of the COE.

For the Army, ground operations such as those in Afghanistan remain at the core of Army tasks. The complexity of the terrain, the harsh nature of the environment and the

---

[3] Land Forces Doctrine and Training System, "Army Fitness Manual Coaching and Instruction Module," http://www.army.forces.gc.ca/land_force_doctrine_training_system/ex_aita_trg/acim/courses/acim/acim.swf; Internet; accessed 26 February 2008.

[4] Col Gregory Fontenot, LTC E.J. Degen, and LTC David Tohn, *On Point* (Kansas: Combat Studies Institute Press, 2004), 22.

[5] Capt J.T. Williams, *The Canadian Infantry's Operational Fitness Requirement: The Army Fitness Manual, CrossFit, and Cross Discipline-Fitness Functional Infantry Training* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 10 January 2005), 2.

tenacious nature of the insurgents helped the Army "re-learn," as did our American allies that "ground combat remains physically demanding."[6] The rugged, mountainous terrain in Afghanistan provided the Mujahedeen with protected bases that were hard for Soviet military forces to attack. That same topography provides protection to the Al-Qaida forces facing the Canadian Army today. [7] The sprawl of urban areas allows the insurgent to conceal themselves among the civilian population, negating many of the technological advantages of the Canadian soldier and increasing mental stress. The Chief of Defence Staff has identified that "adherence to a physical fitness program will not only increase strength, energy and endurance, but also improve an individual's ability to cope with mental and emotional stresses."[8]

The harsh summer climate, with daytime temperatures routinely over 50 degrees Celsius, exacts a heavy toll on both sides, but more so on the Canadian soldier wearing the full compliment of equipment, including body armour, that weighs more than 35 kilograms.[9] The Army has taken steps to acclimatize soldiers before deployment with training in southern locations such as Texas, but there are other measures that can be taken. Good physical condition has been identified as a factor in increasing resistance to

---

[6] Col Gregory Fontenot, LTC E.J. Degen, and LTC David Tohn, *On Point* (Kansas: Combat Studies Institute Press, 2004), xxvi.

[7] For a more thorough explanation of these factors see Bard E. O'Neill, *Insurgency & Terrorism* (Washington: Potomac Books, Inc, 2005), 72.

[8] Department of National Defence, CANFORGEN 198/05 CDS 104/05 *CDS Direction for Physical Fitness* (Ottawa: DND Canada, 211441Z DEC 05).

[9] "It was late morning now, and the withering sun – temperatures were between 57 and 60 degrees Celsius – was taking its toll. Both platoon signalers, who carry the radios, batteries, and heavy coms gear on their backs, in addition to the usual seventy pounds [approximately 35 kgs] of ammo, body armour, and weapons, had collapsed with heat stroke." Christie Blatchford, *Fifteen Days* (Canada: Doubleday, 2007), 24.

heat stress.[10] Superior physical condition has been highlighted as key to allowing soldiers to function in the harsh weather of Afghanistan.[11] Therefore every effort to improve a soldier's physical fitness will contribute to making them more effective on operations.

All training should be structured to prepare a soldier for combat and this includes using his equipment in a similar manner during training and operations. The equipment load used for the AFP is 24.5 kilograms (kgs), but the common load quoted for soldiers in Afghanistan is approximately 35 kgs.[12] Soldiers should train and be tested in Canada using the same weight load as they will be expected to carry during operations. Army Lessons Learned reports stress that wearing full equipment during training is an essential part of preparations. [13] As yet no measures have been taken to increase the weight for the weightload marches in the AFP to better reflect current demands.

As described, the COE of the Canadian Army soldier includes routinely operating for long periods of time, in extremely demanding physical circumstances, in close proximity to large civilian populations that may or may not conceal the enemy preparing for an attack. This creates a large physical and psychological stress on the soldier, some of which can be mitigated with improved physical fitness training. In training it is difficult to provide the same psychological stress that soldiers will experience in the COE

---

[10] Department of National Defence, DAOD 5021-2 *Heat Stress* (Ottawa: DND Canada, 1997), 1.

[11] LCol R.H. Matheson, *Lessons Learned Annual Roll-up Report 2007* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 1 February 2008).

[12] "The operating environment combined with very heavy soldier loads (80 pounds) [approximately 35 kgs] and operations lasting over 48 hours of sustained offensive operations place a heavy demand on soldier fitness. Collective Training in Canada should seek to replicate this as closely as possible." LCol R.H. Matheson, *Lesson Synopsis Report 07-015 Op Keeping Goodwill (Cbt Tm) 8 to 10 Sep 07* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 5 October 2007).

[13] LCol R.H. Matheson, *Lessons Synopsis Report – 06-029 Troops in Contact June and July 2006* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 25 September 2006).

however improvements to physical fitness and fitness training will reduce the physical stress and allow the solder to better handle the psychological stress.

DEFINING PHYSICAL FITNESS

Physical fitness has been defined in many ways over the years and is still widely misunderstood in the military due to poor theoretical instruction to leaders.[14] In order to examine the issues related to physical fitness, it is important to establish a common understanding of what is meant by the term. As well, it is important to understand the tasks demanded of soldiers. This section will explore some recent definitions of physical fitness and the tasks common to soldiers. As well, some of the benefits to the individual and the organization of physical fitness will be described to assist in understanding the value for the Canadian Army.

The United States Marine Corps recently described physical fitness as possessing the physical skills required for combat. They determined that these skills are core strength, endurance, speed, and coordination.[15] CrossFit makes use of three different standards or models for evaluating physical fitness. [16] The first is based on ten general physical skills: cardiovascular/respiratory endurance, stamina, strength, flexibility, power, coordination, agility, balance, and accuracy. The Army Fitness Manual defines physical fitness as being fit to fight and this includes a high aerobic capacity, muscular

---

[14] Capt J.T. Williams, *The Canadian Infantry's Operational Fitness Requirement: The Army Fitness Manual, CrossFit, and Cross Discipline-Fitness Functional Infantry Training* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 10 January 2005), 15.

[15] LGen James F. Amos, *A Concept for Functional Fitness* (Marine Corps Combat Development Command, 9 November 2006), 4..

[16] CrossFit is a program that has recently garnered a great deal of attention through trials at the Canadian Infantry School. The CrossFit definition of fitness is available at: CrossFit, "What is Fitness," *The CrossFit Journal* (October 2002) [journal on-line]; available from http://www.crossfit.com; Internet; accessed 26 March 2008.

strength, endurance and power, flexibility, and a healthy body weight.[17] For simplicity, the Army definition and these five skills/aspects will be used in the analysis.

Someone is evaluated as being fit by their performance of the skills or tasks used to judge fitness. In the case of soldiers it means having the physical capacity to perform the tasks of a soldier. It is therefore important to understand the physical tasks that will be required of the soldier in order to evaluate his or her level of physical fitness.

FIT TO DO WHAT? PHYSICAL TASKS

This author contends that physical tasks can be divided into four groups and correspond to four progressively higher levels of required physical fitness. It is important to understand the four groups to appreciate the building blocks of a physical fitness program, and why certain programs are not sufficient for all occupations in the Army. The first group of tasks is that required of all adults in Canadian society. The tasks themselves are activities such as opening doors, lifting groceries, walking on slippery sidewalks, climbing stairs.[18] The second group of tasks is required of all members of the Canadian Forces (CF) and was established most recently by the Minimum Physical

---

[17] Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006), 1.

[18] The potential list of these types of tasks is virtually endless, but they can be thought of generally as physical activities such as pushing, pulling, reaching, bending, running and walking. Being fit for these tasks is part of everyday life for most adults in our society including soldiers in our military. These are related to overall wellness and the ability to function normally in day-to-day life. These tasks require no training in order to perform them other than a general fitness program similar to that recommended for all Canadians. For example, Canada's Physical Activity Guide to Healthy Active Living states that "for optimal health benefits, Canadian adults need 30-60 minutes of physical activity every day" including a mix of endurance, flexibility and strength activities. Public Health Agency of Canada, "The Business Case for Active Living at Work," available from http://www.phac-aspc.gc.ca/pau-uap/fitness/work/main_c_e.html; Internet; accessed 15 March 2008.

Fitness Standard study.[19] These tasks, called Common Emergency Tasks are: the entrenchment dig, land evacuation, low/high crawl, sandbag carry, sea evacuation, and jerry can lift.[20] [21]

The third group of tasks is that required of all soldiers in the Army and those from other environments that deploy with the Army on missions outside of Canada. Some of these tasks are already included in the Common Emergency Tasks. The four Army tasks are: the weightload march, the casualty evacuation, the ammunition box lift and the trench dig.[22] This group of tasks and the testing standards is included in the Army Fitness Manual and "was developed to ensure that [Army soldiers] are capable of

---

[19] The second group of tasks is mandated in section 15(9) of the Canadian Human Rights Act under the heading of Universality of Service for Canadian Forces. The policy states that "members of the Canadian Forces must at all times and under all circumstances perform any functions that they may be required to perform." The existence of these tasks and the requirement of members of the CF to be ready at all times to perform them has been supported indirectly by the decision of the Canadian Human Rights tribunals in their decisions relating to members of the CF with physical restrictions. While the tribunal supported the Universality of Service clause based upon the idea of bona fide occupational requirements (BFORs) for members of the CF, it has always been left to the CF to establish the BFORs, including those related to physical performance of tasks. J.M. Deakin, *Development and Validation of Canadian Forces Minimum Physical Fitness Standard (MPFS 2000*), (Kingston: Ergonomics Research Group Queen's University, 31 March 2000), Chapter 3.

[20] The existing DAOD refers to the five tasks of the original MPFS of 1988 and does not include the Jerry Can Lift as recommended by the MPFS Study. Department of National Defence, DAOD 5023-2 *Physical Fitness Program* (Ottawa: DND Canada, 2006), 5.

[21] The basis for this selection of tasks was the existing tasks in the MPFS 1988 and a review of tasks common to participants in domestic and international operations between 1990 and 2000. Given that some of the tasks are difficult to test directly, MPFS 2000 also evaluated fitness tests to see which ones best predicted performance of these common emergency tasks. It is these predictive tests that form the basis of the Canadian Forces Exercise Prescription Programme (CF EXPRES). The study also recommends standards of achievement for members of the CF in order to evaluate their physical fitness to perform the common emergency tasks. J.M. Deakin, *Development and Validation of Canadian Forces Minimum Physical Fitness Standard (MPFS 2000*), (Kingston: Ergonomics Research Group Queen's University, 31 March 2000), Chapter 6.

[22] Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006), 3.

enduring the rigors of operations and, if necessary, combat."[23] It uses a task performance model to determine fitness levels, which means that every soldier is held to achieving the same minimum standard without accommodation for or consideration of demographic, physical or other variables.

The fourth group of tasks is that required of soldiers in the Army to perform their specific occupational duties in the COE. The tasks required of an infantry soldier are different from those required for another occupation such as an engineer and therefore physical training and evaluation needs to be appropriate to the tasks required of the individual. Lessons learned have shown certain common recommendations for many Army occupations.[24] The Infantry Corps has also recognized that being physically fit to perform the common Army tasks is not an indication that the soldier is physically fit to conduct infantry operations.[25] The fitness of a soldier to perform occupationally-specific tasks is trained and evaluated by the supervisors in the soldier's chain of command. Therefore, without an actual fitness directive, the soldier's actual fitness is limited by the experience and ability of his supervisors.

So if an individual soldier is determined to be physically fit, it is because they are able to successfully perform the tasks required of them. The Army defines fitness as being made up of a high aerobic capacity, muscular strength, endurance and power, flexibility, and a healthy body weight. The groups of tasks for which Army soldiers must

---

[23] Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006), 4.

[24] MGen S.A. Beare, *Army Lessons Learned Centre Annual Roll Up for 2006* (Canadian Forces Base Kingston: file 3333-1 (ALLC), 3 May 2007).

[25] Capt J.T. Williams, *The Canadian Infantry's Operational Fitness Requirement: The Army Fitness Manual, CrossFit, and Cross Discipline-Fitness Functional Infantry Training* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 10 January 2005), 2.

be fit are: those common to all adults, those common to all members of the CF, those common to all members of the Army, and those common to the soldier's occupation when deployed in the COE.

FITNESS TRAINING PROGRAMS

For comparative analysis, this paper will examine various military fitness programs against the Canadian Army's definition of physical fitness for each of the group of tasks. All programs consist of a variety of training scenarios or workouts aimed to provide general fitness and to prepare the soldier for the fitness test. Tests like the AFS are task-based and demand that soldiers perform an actual task similar to an expected combat task. Tests like the CF EXPRES are predictive in that performance in the test predicts the ability to perform a combat task. Generally task-based tests are more resource intensive for training and testing, but test "the fitness requirements of the job itself."[26] The standard for performance in all tests is either established as an absolute in that all participants must achieve the same minimum or may be based upon differential standards adjusted for gender and age. The first fitness program to be examined will be the CF EXPRES which forms the heart of the program for the CF and the minimum which Army personnel must achieve.

CF EXPRES

The Army doesn't exist in isolation from the rest of the Canadian Forces and physical fitness is no different from many other programs. Physical fitness training and testing in the Canadian Army is based upon direction from three sources. The sources are

---

[26] S. Wayne Lee and Maj L. Clark, *Task Related Physical Fitness and Performance Standards – A Canadian Forces Approach*, For Briefing to Human Rights Commission on CF Physical Fitness Standards (Ottawa: Directorate of Physical Education, National Defence Headquarters, 1997), 3.

strategic guidance such as policies and direction from the Chief of Defence Staff (CDS), strategic direction such as programs from the Director of Fitness like the CF EXPRES, and specific Army direction such as the Army Fitness Program.

Strategic guidance begins with the Defence Administrative Orders and Directives that indicate when a member of the CF is tested for fitness.[27] Commanding officers are also directed, by the CDS, to ensure that they implement a physical fitness program for their subordinates and monitor subordinate fitness to ensure they meet CF and Environmental requirements. The CDS is clear in the directive to Commanding Officers that implementing physical fitness training is an essential element of their responsibilities for preparing their personnel for operations.[28]

The CF EXPRES programme is strategic direction and was introduced to the Canadian Military in 1999. [29] It uses a foundation based upon scientific trials of CF members to determine minimum physical fitness standards. These standards, called the CF Minimum Physical Fitness Standard (CFMPFS) were delivered to the CF in 1988, based upon a study done by Queen's University.[30] These standards were re-evaluated in the year 2000 and form the basis for the existing CF EXPRES programme which every

---

[27] Department of National Defence, DAOD 5023-2 *Physical Fitness Program* (Ottawa: DND Canada, 2006), 2.

[28] Department of National Defence, "CDS Guidance to Commanding Officers," Available from http://www.cda-acd.forces.gc.ca/CDSGuidance/engraph/home_e.asp; Internet; accessed 14 April 2008, Section 2204.1.

[29] MGen M.K. Jeffery, *Physical Fitness Training*, Dispatches Volume 6 Number 1 (Canadian Forces Base Kingston: April 1999), 5.

[30] . J.M. Deakin, *Development and Validation of Canadian Forces Minimum Physical Fitness Standard (MPFS 2000*), (Kingston: Ergonomics Research Group Queen's University, 31 March 2000).

member of the CF must complete annually unless medically excused or tested by another recognized standard, such as the Army Fitness Standard.[31]

"The CFMPFS uses a predictive test model including the 20-metre shuttle run, hand grip, push-up and sit-up to determine the fitness levels required, by age and gender."[32] Successfully reaching the required level predicts that the soldier would be able to perform any of the five common military tasks described in the CFMPFS. The standard for women over 35 years of age was evaluated as the lowest acceptable level of performance on the predictor tests that would ensure acceptable performance of the emergency tasks. Every other level was then based upon the results of the participants in the trial to establish a framework of acceptable performance. An incentive standard also exists which, if achieved allow the member's physical fitness evaluation to be valid for a period of two years.[33]

The CF EXPRES programme is designed to provide each member of the CF with an individualized exercise prescription to guide them in the conduct of their own physical fitness training. Participation in the training will then prepare them to successfully complete the annual physical fitness evaluation. This approach is designed to keep members of the military physically fit so they can be operationally ready and "get more

---

[31] Department of National Defence, DAOD 5023-2 *Physical Fitness Program* (Ottawa: DND Canada, 2006), 5.

[32] Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006), 4.

[33] Department of National Defence, DAOD 5023-2 *Physical Fitness Program* (Ottawa: DND Canada, 2006), 3.

out of life."[34] The Army requires a more concrete evaluation of a soldier's fitness for specific tasks.

CANADIAN ARMY FITNESS PROGRAM

In 1991, task-related physical fitness evaluation standards were adopted for the Army. These standards, known as the Land Force Command Physical Fitness Standards, included a common minimum performance level for all soldiers in the Army. This standard is now called the Army Fitness Standard (AFS), and the field tests are: a weightload march; casualty evacuation; maximal dig; and ammunition box lift.[35] Soon after introduction the Army realized that some of the tests were administratively difficult to implement.[36] It also recognized that not all soldiers could readily meet the standards even with the assistance of a formal program.[37]

The University of Alberta was contracted in 1992 to develop training programs that would enable achievement of the AFS by the majority of soldiers. This study actually produced four training programs called respectively: the Army Fitness Program (AFP);

---

[34] "The personal benefits of physical fitness are also important. Fit people get more out of life. They sleep and rest easily, manage stress well and have energy left for positive family relationships." Department of National Defence, *The Canadian Forces Exercise Prescription Programme* (Ottawa, DND Canada, n.d.), 1.

[35] The actual standards for the four events are: Weightload March a distance of 13 km in full fighting gear and rucksack (for a total of 24.5 kg) in under 2 hr 26 min 20 s. Casualty evacuation (fireman's carry) another soldier of similar weight and height a distance of 100m, with both soldiers wearing a helmet and carrying ammunition and a weapon, in under 60 seconds. Ammunition box lift of 48 boxes (20.9 kg) from the floor to a height of 1.3 m, completing the task in less than 5 minutes. Trench Dig using a shovel, to move .486 cubic metres of standard pea gravel from one trench box to another, completing the task in under 6 minutes. Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006), 3.

[36] MGen M.K. Jeffery, *Physical Fitness Training*, Dispatches Volume 6 Number 1 (Canadian Forces Base Kingston: April 1999), 7.

[37] Mohan Singh, *Task Related Physical Fitness Training Modules for the Canadian Army*, (Edmonton: Faculty of Physical Education and Recreation, University of Alberta, 1998), 130.

the Field Training Program; the Six-Week Rapid Deployment Program; and the Three-Week Rapid Deployment Program.[38] The principle program is the twelve week AFP structured to take soldiers with good overall fitness and prepare them to meet the AFS. The program uses a variety of exercise formats to train the soldier's physical fitness in aerobics, strength, power and speed. For example to improve aerobic condition, the routine includes a variety of continuous aerobic exercise, interval training and weightload marching. All members of Army units are required to successfully complete the AFS annually.[39]

Despite the decades of research invested in the AFP, there are still problems with the implementation of physical fitness training in the Army and in achieving the minimum standards. In addition to the general tendency of CF members to become progressively more sedentary, obesity is also on the rise.[40] Physical fitness training and testing has suffered from four factors. The first has been the overall lack of clarity in the policies. Army Lessons Learned reports highlight the frustration of many soldiers at the frequent changes to physical fitness policies over the decades of the 1980s and 1990s. The second factor has been with the frequency of testing. "The requirement to achieve physical fitness standards only once per year does not provide incentive for all soldiers to

---

[38] Mohan Singh, *Task Related Physical Fitness Training Modules for the Canadian Army*, (Edmonton: Faculty of Physical Education and Recreation, University of Alberta, 1998), 133.

[39] The second program is meant for soldiers who deploy on training away from normal athletic facilities in order for them to maintain fitness in austere conditions. The last two programs are meant to fine-tune fitness before a deployment on operations and are focused at soldiers who are already in satisfactory to high physical condition and need only improve their resilience to the rigors of life in a field environment. Further details of each program are available in the Army Fitness Manual. Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006).

[40] Department of National Defence, "CDS Guidance to Commanding Officers," Available from http://www.cda-acd.forces.gc.ca/CDSGuidance/engraph/home_e.asp; Internet; accessed 14 April 2008, Sections 2202.1 and 2202.2.

maintain a good level of physical fitness throughout the year."[41] It does not encourage maintenance of good physical fitness if members with good test results can skip every other year. The Ergonomics Research Group of Queen's University recommended that the exemption incentive be removed and that incentives based upon rewards for top performers is implemented.[42]

The third factor has been one of education. Unfortunately, while the programs have evolved, the education and training given to the leaders of the Army has not. This results in poorly planned physical fitness training across much of the Army and inconsistency in applying existing regulations on training and remedial exercise.[43] Army leaders are taught the rudiments of conducting physical fitness training as part of Basic Officer Training in the various corps and branches, or on the Primary Leaders Qualification (PLQ), but they are never taught any theory on developing a successful program for their soldiers. The trial report on fitness training conducted by the Canadian Infantry School recommends that junior officer should receive 40 hours of instruction before being qualified to conduct this training for soldiers.[44] This recommendation is supported and should expand to include junior non-commissioned members on the PLQ.

---

[41] MGen M.K. Jeffery, *Physical Fitness Training*, Dispatches Volume 6 Number 1 (Canadian Forces Base Kingston: April 1999), 6.

[42] J.M. Deakin, *Development and Validation of Canadian Forces Minimum Physical Fitness Standard (MPFS 2000*), (Kingston: Ergonomics Research Group Queen's University, 31 March 2000), section 9.6.

[43] MGen M.K. Jeffery, *Physical Fitness Training*, Dispatches Volume 6 Number 1 (Canadian Forces Base Kingston: April 1999), 3.

[44] Capt L.W. Rutland, *Canadian Infantry School Army Fitness Manual/ CrossFit Trial* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 27 January 2006), 26.

The final factor explaining why physical fitness training has suffered is that modern weapons systems now do a great deal of work previously done by the physical strength of the soldiers. This has blurred the link between physical fitness and the tasks of the soldier. Recent operations in the COE have renewed the requirements of soldiers to be physically fit, in particular soldiers in the combat arms that operate on foot in terrain that is inhospitable to vehicles. As well, combat operations in extreme climates that run for days on end are physically demanding even for soldiers in modern combat vehicles.[45]

ALLIED MILITARY TRAINING

Many of our Allies conduct physical fitness training in a manner similar to the Canadian Army and many use programs and evaluations that are similar to the CF EXPRES. Examples of allies that use task-based testing like the Canadian Army are the Royal Netherland's Army and the British Army. The Royal Netherlands Army developed their general fitness standards from common soldier tasks such as a weightload march, a repetitive lifting test, a digging test and a load-carrying test.[46] The British Army also uses four-representative tasks in order to test soldiers for physical fitness.[47]

---

[45] In describing the 11th Marine Expeditionary Unit's combat operations in Najaf, Iraq in 2004, Bing West describes armoured operations. "The tankers fought with IV needles inserted in their arms. Every three hours they got out of their tanks and lay on stretchers while pints of liquid flowed back into their veins. Once rehydrated, they went back into the fight." Bing West, No True Glory (New York: Bantam Books, 2005), 239.

[46] LTC Karl E. Friedl, *Summary Report: Research Workshop on Physical Fitness Standards and Measurements within the Military Services* (Military Operational Medicine Research Program, Fort Detrick, Maryland, 30 December 1999), 9.

[47] LTC Karl E. Friedl, *Summary Report: Research Workshop on Physical Fitness Standards and Measurements within the Military Services* (Military Operational Medicine Research Program, Fort Detrick, Maryland, 30 December 1999), 14.

Examples of allies that use predictive testing are the United States Marine Corps (USMC), the US Army and the Australian Defence Force (ADF). The Marine Corps Fitness Evaluation is conducted semi-annually and involves a weigh-in, pull-ups (flex arm hang for females), sit-ups and a three-mile run.[48] The weigh-in is used along with standard height vs. weight tables know as Body Mass Index (BMI) to see if the member has an acceptable body weight.[49] The ADF Army uses a shuttle run, push-ups and sit-ups as a predictive test.[50] These two allies use differential testing standards which work well for large populations from diverse backgrounds, especially in programs focused on developing and maintaining general fitness.[51]

The USMC physical fitness program merits greater attention because it provides a comparative program from an ally of the Canadian Army. The USMC is an expeditionary force with a stellar reputation in combat and one of our closest allies under both NATO and ABCA alliances. The Marine Corps Fitness Program is governed by two documents; Marine Corps Order 6100.3J Physical Fitness (1988) and Marine Corps Order 61001B Weight Control and Personal Appearance (1993). It stresses that physical fitness is essential for daily effectiveness and combat readiness with standards adjusted for age and gender. The program requires every Marine to be tested bi-annually and to participate in

---

[48] Department of the Navy, P6100.12 *Marine Corps Physical Fitness Test and Body Composition Program Manual* (Washington: Headquarters United States Marine Corps, 2002), 2.

[49] Department of the Navy, MARADMIN 139/03 Change 1 to MCO 6100.12 *Marine Corps Physical Fitness Test and Body Composition Program Manual* (Washington: Headquarters United States Marine Corps, 261530Z MAR 03).

[50] The Australian Defence Force Academy, "Fitness in the ADF," http://www.defencejobs.gov.au/campaigns/fitness/; Internet; accessed 7 April 2008.

[51] Maj S.W. Lee, P. Chahal, M. Singh, and G. Wheeler, "Physical Fitness and Performance Standards for the Canadian Army," Canadian Defence Quarterly (April 1990): 33.

at least three hours of physical training every week with five hours being recommended.[52] The semi-annual testing approach of the USMC contributes to a culture of maintaining physical fitness due to the increased frequency of testing.

of course. Marines do not know the exact game they will be playing and they do not know the climate for the game. They do not know the rules. Marines do not even know when they will be 'playing.'"[55] The paper reinforced the idea that simply training for the Marine Corps Physical Fitness Test would leave the Marine with unbalanced fitness. The paper stopped short of providing direction on how to build a functional fitness program or how to test the functional fitness of Marines and left this to the discretion of individual commanders.

CROSSFIT

The Canadian Army examined an alternate training program called CrossFit to see if it provided a better level of functional fitness for Combat Arms soldiers. Functional fitness is described as the fitness required "throughout a wide spectrum of environments, using complex body movements."[56] CrossFit is a strength and conditioning program[57] that has become very popular with military, police and paramilitary organizations looking to improve the fitness of their members. It was one of several examined by the Canadian Infantry school and was the one that held the most promise.[58] In the trial of the CrossFit program conducted against a control group using the Army Fitness Program it was found that even over a relatively short time, the CrossFit group made equal or greater strength

---

[55] *Ibid*.,1.

[56] The fully criticisms are described in a study conducted for the Canadian Infantry School on the requirement for operational fitness. Capt J.T. Williams, *The Canadian Infantry's Operational Fitness Requirement: The Army Fitness Manual, CrossFit, and Cross Discipline-Fitness Functional Infantry Training* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 10 January 2005), 8.

[57]CrossFit, "What is Fitness," *The CrossFit Journal* (October 2002) [journal on-line]; available from http://www.crossfit.com; Internet; accessed 26 March 2008.

[58] Capt L.W. Rutland, *Canadian Infantry School Army Fitness Manual/ CrossFit Trial* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 27 January 2006), 2.

gains. The gains were not sufficient to justify the wholesale replacement of the Army Fitness Program but instead showed that CrossFit principles should be incorporated as a module of the Army Fitness Program for high-intensity training.[59] This trial was subsequently reviewed for the organization responsible for physical fitness training, the Canadian Forces Personnel Support Agency, confirming the value of incorporating a CrossFit-type of program.[60]

ANALYSIS

The Canadian Army defines fitness as being made up of a high aerobic capacity, muscular strength, endurance and power, flexibility, and a healthy body weight. The groups of tasks for which Army soldiers must be fit are: those common to all adults; those common to all members of the CF; those common to all members of the Army; and those common to the soldier's occupation when deployed in the COE. For comparative analysis, this paper will examine four fitness programs against the Canadian Army's definition of physical fitness for each of the group of tasks except those common to all adults. This group of tasks will be assumed to be met by any of the evaluated programs as they all meet the governmental guidelines of 30-60 minutes of physical activity daily.[61] The comparison will be presented in tabular format (Table 1) with a 'yes' rating only assigned where success is achieved. Any program that only partially succeeds in preparing soldiers for a particular task will be given a 'no' rating.

---

[59] *Ibid*., 26.

[60] Howard A. Wenger, *The AFM-CrossFit Final Report*, Submitted for the Canadian Forces Personnel Support Agency (Ottawa, 2006), 65.

[61] Public Health Agency of Canada, "The Business Case for Active Living at Work," available from http://www.phac-aspc.gc.ca/pau-uap/fitness/work/main_c_e.html; Internet; accessed 15 March 2008.

Table 1- Comparison of Fitness Programs to Essential Tasks

		CF EXPRES	AFP	USMC	CrossFit
CF Tasks	High Aerobic capacity	Yes	Yes	Yes	Yes
	Strength	Yes	Yes	Yes	Yes
	Endurance & Power	Yes	Yes	Yes	Yes
	Flexibility	No	No	No	No
	Healthy Body Weight	No	No	Yes	No
Army Tasks	High Aerobic capacity	No	Yes	Yes	Yes
	Strength	No	Yes	No	Yes
	Endurance & Power	No	Yes	No	Yes
	Flexibility	No	Yes	No	Yes
	Healthy Body Weight	No	No	Yes	No
Occupational Tasks in the COE	High Aerobic capacity	No	Yes	No	Yes
	Strength	No	No	No	Yes
	Endurance & Power	No	No	No	Yes
	Flexibility	No	No	No	No
	Healthy Body Weight	No	No	Yes	No

The ratings for Table 1 were chosen based upon the lessons learned reports, the trial report on the comparison of the AFP to CrossFit, and the USMC paper on functional

fitness, all of which have been previously cited. Some of the results that can be drawn from these tabular comparisons are on: body weight management, strength training, power training and flexibility.

Body weight management is an espoused requirement of all programs and yet only the USMC model actually takes steps to measure body weight. Some sort of screening would contribute significantly to monitoring health risks for soldiers. BMI and waist circumference are proven predictors of cardiovascular disease and type 2 diabetes and easy to measure.[62] Simple measurements by height and weight have been criticized repeatedly, but recent studies show that an accurate determination of healthy body weight is determined by a combination of BMI and abdominal measurements.[63] In order to assist soldiers in achieving a healthy body weight, it is recommended that BMI and abdominal measurements be added to fitness testing.

Strength training is an important part of all the programs and yet only the AFP and CrossFit contribute significantly to developing strength as an integral part of the training regime. The trials conducted by the Canadian Infantry School showed that the CrossFit program produced greater strength gains than the AFP and improved functional fitness, therefore more fully preparing soldiers for the COE.[64] It is recommended that CrossFit-style training be added to the AFP to improve strength training.

---

[62] Ian Janssen, Steven B. Heymsfield, David B. Allison, Donald P. Kotler, and Robert Ross, "Body Mass Index and Waist Circumference Independently Contribute to the Prediction of Nonabdominal, Abdominal Subcutaneous, and Visceral Fat," The American Journal of Clinical Nutrition Volume 75, No. 4 (April 2002) [journal on-line]; available from http://www.ajcn.org/cgi/content/full/75/4/683; Internet; accessed 7 April 2008.

[63] *Ibid*.

[64] Capt L.W. Rutland, *Canadian Infantry School Army Fitness Manual/ CrossFit Trial* (Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 27 January 2006), 26.

Power training is another desired element and yet the CF EXPRES and USMC programs provide no specific guidance on developing this aspect. CrossFit is the only program to address this aspect of training and gives it a high priority.[65] The AFP uses explosive plyometric[66] exercises but does not use any power lifts or Olympic lifts which have been proven to be extremely beneficial. [67] It is recommended that CrossFit-style training be added to the AFP to improve power training.

Flexibility training is an aspect that is under-emphasized in all programs. The two that provide the most direction are the AFP and CrossFit which provide a list of warm-up exercises that also contribute to the flexibility of the soldier, but mostly in the short-term.[68] Given that flexibility improves resistance to injuries and that more than 50% of all injuries in the CF are attributable to physical training, improved flexibility training would significantly improve any of the programs.[69] It is recommended that the AFP be augmented with specific routines to improve flexibility training.

While all the programs evaluated receive poor marks in certain areas, it is important to realize that the CF, the Army and the USMC are not failing in their missions. An important aspect is the overall physical condition of the soldiers, sailors,

---

[65] *Ibid*., 61.

[66] "Plyometrics involves exercises which rapidly stretch a muscle followed quickly by an explosive contraction of the same muscle. This is a very effective way to train for explosive power." Department of National Defence, B-GL-382-003/PT-001 *Army Fitness Manual* (Ottawa: DND Canada, 2006), 21.

[67] Howard A. Wenger, *The AFM-CrossFit Final Report*, Submitted for the Canadian Forces Personnel Support Agency (Ottawa, 2006), 36.

[68] *Ibid*., 34.

[69] Department of National Defence, *Canadian Forces Health and Physical Fitness Strategy* (Ottawa: DND Canada, n.d. (Final copy awaiting reproduction and distribution, cited with permission from Director of Physical Fitness)), 19.

airmen and marines. Even programs that do not provide all elements, serve as a starting point for further improvement and individual soldiers and leaders have and will continue to build upon this to reach desired levels. It is important to understand from this analysis that small improvements in these programs can help ensure that soldiers are better prepared for the COE.

CONCLUSIONS

The AFP is not fully meeting the requirement for physical fitness training of soldiers before they deploy on operations. The purpose of this paper was to assess the AFP in order to guide the Canadian Army in selecting a better physical fitness regime and better prepare its soldiers for the COE. It is clear from this analysis that improvements should include increased training for leaders in the theory of physical fitness. The AFP should be enhanced with modules on functional fitness training to improve flexibility, strength and power training. The fitness standard should be modified with an increased weight for the weightload march, to more appropriately reflect the demands of the COE. The CF in general and specifically the Army should eliminate the possibility of an exemption, and double the number of times a soldier is required to meet the standard annually. The Army should also implement measurement of body fat to help soldiers understand their risks for cardiovascular disease and diabetes.

Continued study of physical fitness is required, especially in operational settings to validate standards and to re-adjust programs as required in the future. This analysis of the AFP and the COE showed where the deficiencies are most glaring, but also that the AFP is largely acceptable in achieving a basic level for physical fitness for a broad variety of Army tasks. The Canadian Army has a long history of success on operations

and the rigor of the development of the current fitness program is testament to the desire for soldiers with good physical fitness. To ensure success in the future, the current program must grow to incorporate the recent lessons learned in order to better prepare our soldiers for success in future operations.

Bibliography

Amos, LGen James F. *A Concept for Functional Fitness.* Marine Corps Combat Development Command, 9 November 2006.

Australian Defence Force Academy, The. "Fitness in the ADF." http://www.defencejobs.gov.au/campaigns/fitness/; Internet; accessed 7 April 2008.

Beare, MGen S.A. *Army Lessons Learned Centre Annual Roll Up For 2006.* Canadian Forces Base Kingston: file 3333-1 (ALLC), 3 May 2007.

Beare, MGen S.A. *Army Lessons Learned Centre (ALLC) 2007 Roll-up Report.* Canadian Forces Base Kingston: file 3333-1 (ALLC), 14 February 2008.

Blatchford, Christie. *Fifteen Days.* Canada: Doubleday, 2007.

Canada. Department of National Defence. B-GL-382-003/PT-001 *Army Fitness Manual*. Ottawa: DND Canada, 2006.

Canada. Department of National Defence. *Canadian Forces Health and Physical Fitness Strategy*. Ottawa: DND Canada, n.d. (Final copy awaiting reproduction and distribution, cited with permission from Director of Physical Fitness).

Canada. Department of National Defence, CANFORGEN 198/05 CDS 104/05 *CDS Direction for Physical Fitness.* (Ottawa: DND Canada, 211441Z DEC 05.

Canada. Department of National Defence. "CDS Guidance to Commanding Officers," Available from http://www.cda-acd.forces.gc.ca/CDSGuidance/engraph/home_e.asp; Internet; accessed 14 April 2008, Section 2204.1.

Canada. Department of National Defence. *The Canadian Forces Exercise Prescription Programme.* Ottawa, DND Canada, n.d.

Canada. Department of National Defence, DAOD 5021-2 *Heat Stress.* Ottawa: DND Canada, 1997.

Canada. Department of National Defence, DAOD 5023-2 *Physical Fitness Program.* Ottawa: DND Canada, 2006.

Canada. Public Health Agency of Canada. "The Business Case for Active Living at Work," available from http://www.phac-aspc.gc.ca/pau-uap/fitness/work/main_c_e.html; Internet; accessed 15 March 2008.

CrossFit. "What is Fitness." *The CrossFit Journal* (October 2002). Journal on-line; available from http://www.crossfit.com; Internet; accessed 26 March 2008.

Deakin, J.M. *Development and Validation of Canadian Forces Minimum Physical Fitness Standard (MPFS 2000*). Kingston: Ergonomics Research Group Queen's University, 31 March 2000.

Fontenot, Col Gregory, LTC E.J. Degen, and LTC David Tohn. *On Point.* Kansas: Combat Studies Institute Press, 2004.

Forman, Mark R. "Too Fat to Fight – Too Weak to Win, Soldier Fitness in the Future." Kansas: United States Army Command and General Staff College, School of Advanced Military Studies, 1996.

Friedl, LTC Karl E. *Summary Report: Research Workshop on Physical Fitness Standards and Measurements within the Military Services.* Military Operational Medicine Research Program, Fort Detrick, Maryland, 30 December 1999.

Howes, J.G.J. "An Investment in Capability: The Canadian Forces Physical Fitness Program Needs Repair." Toronto: Canadian Forces College Command and Staff Course New Horizons Paper, 2005.

Janssen, Ian, Steven B. Heymsfield, David B. Allison, Donald P. Kotler, and Robert Ross. "Body Mass Index and Waist Circumference Independently Contribute to the Prediction of Nonabdominal, Abdominal Subcutaneous, and Visceral Fat." The American Journal of Clinical Nutrition, Volume 75, No. 4 (April 2002) [journal on-line]; available from http://www.ajcn.org/cgi/content/full/75/4/683; Internet; accessed 7 April 2008.

Jeffery, MGen M.K. *Physical Fitness Training*. Dispatches Volume 6 Number 1. Canadian Forces Base Kingston: April 1999.

Land Forces Doctrine and Training System. "Army Fitness Manual Coaching and Instruction Module." http://www.army.forces.gc.ca/land_force_doctrine_training_system/ex_aita_trg/acim/courses/acim/acim.swf; Internet; accessed 26 February 2008.

Lee, Maj S.W., P. Chahal, M. Singh, and G. Wheeler. "Physical Fitness and Performance Standards for the Canadian Army." Canadian Defence Quarterly (April 1990): 33.

Lee, S. Wayne and Maj L. Clark., *Task Related Physical Fitness and Performance Standards – A Canadian Forces Approach*, For Briefing to Human Rights Commission on CF Physical Fitness Standards. Ottawa: Directorate of Physical Education, National Defence Headquarters, 1997.

Matheson, LCol R.H. *Lesson Synopsis Report 08-005 Reconnaissance Platoon TF 3-07.* Canadian Forces Base Kingston: file 3333-1 (ALLC), 7 April 2008.

Matheson, LCol R.H. *Lesson Synopsis Report 07-015 Op Keeping Goodwill (Cbt Tm) 8 to 10 Sep 07.* Canadian Forces Base Kingston: file 3333-1 (ALLC), 5 October 2007.

Matheson, LCol R.H. *Lessons Synopsis Report – 06-029 Troops in Contact June and July 2006*. Canadian Forces Base Kingston: file 3333-1 (ALLC), 25 September 2006.

O'Neill, Bard E. *Insurgency & Terrorism*. Washington: Potomac Books, Inc, 2005.

Rutland, Capt L.W. *Canadian Infantry School Army Fitness Manual/ CrossFit Trial.* Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 27 January 2006.

Singh, Mohan. *Task Related Physical Fitness Training Modules for the Canadian Army*. Edmonton: Faculty of Physical Education and Recreation, University of Alberta, 1998.

Sport Journal, The. "Descriptive Comparisons of United States Military Physical Fitness Programs." http://www.thesportjournal.org/article/descriptive-comparisons-united-states-military-physical-fitness-programs; Internet; accessed 28 March 2008.

United States. Department of the Navy. P6100.12 *Marine Corps Physical Fitness Test and Body Composition Program Manual.* Washington: Headquarters United States Marine Corps, 2002.

United States. Department of the Navy. MARADMIN 139/03 Change 1 to MCO 6100.12 *Marine Corps Physical Fitness Test and Body Composition Program Manual.* Washington: Headquarters United States Marine Corps, 261530Z MAR 03.

Wenger, Howard A. *The AFM-Crossfit Final Report*. Submitted for the Canadian Forces Personnel Support Agency. Ottawa, 2006.

West, Bing. *No True Glory*. New York: Bantam Books, 2005.

Williams, Capt J.T. *The Canadian Infantry's Operational Fitness Requirement: The Army Fitness Manual, CrossFit, and Cross Discipline-Fitness Functional Infantry Training.* Combat Training Centre Gagetown, Canadian Infantry School: file 4640-1, 10 January 2005.