

FITNESS, SPORTS, AND THE



CANADIAN ARMED FORCES

Edited by
Lieutenant-Colonel Jeff Stouffer &
Commander Dave Woycheshin, PhD

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PREFACE

The Canadian Armed Forces remains dedicated to the health and welfare of its personnel. This vigilance is reflected not only in our leadership doctrine and profession of arms constructs, but also through the myriad of diverse national and local health initiatives. These initiatives, aimed at educating and encouraging service personnel to adopt a healthy and balanced lifestyle, include such programs as smoking cessation, diet and weight control, time and stress management, and family coping skills to name a few. Of all these efforts, however, at least in terms of resources utilized, the Canadian Armed Forces fitness and sports program is arguably the main thrust.

Military employment demands that military members be physically fit. Although this simple truth is universally understood, it is clear that to ensure that Canadian Armed Forces personnel are physically fit requires clear guidance, education, and unwavering leadership support. This volume brings together some of the key agencies responsible for the development, execution, and maintenance of fitness and sports programs and it highlights existing and emerging challenges. It is intended to not only report on the Canadian Armed Forces fitness and sports programs and the advantages of having a physically fit force, but to inform leaders on how they can establish the necessary conditions to create a fitness culture. Military members should treat maintaining and improving their physical fitness with the same level of dedication as they do to maintaining and improving their occupational and operational skills.

FOREWORD

Success in operations demands that military personnel be physically fit. Ensuring the physical fitness of Canadian Armed Forces members is both a critical leadership and personal accountability challenge. This challenge cannot be dismissed or ignored; serious consequences, as extreme as mission failure, can result. The requirement for physical fitness resonates throughout our leadership and profession of arms constructs and represents a significant component of our professional identity.

I am extremely pleased to introduce *Fitness, Sports, and the Canadian Armed Forces*. This volume outlines the requirement for the Canadian Armed Forces' fitness and sports programs and their importance to the individual member and to the Canadian Armed Forces overall. The intent of this volume is to bring clarity and understanding of the value of physical fitness in the military context. The benefits of fitness and sports programs, both personal and organizational, are discussed, as are fitness trends in Canadian society and the barriers that can potentially limit the ability of Canadian Forces members to fully engage in physical fitness activities. How such activities can be leveraged to not only promote and develop organizational values, but also personal attributes, also receives attention.

Although it is expected that many of the principles and ideas contained in this volume are already understood and speak to common sense, they do, nonetheless, serve to reinforce the need for a robust and effective fitness and sports program within the Canadian Armed Forces. Equally important, this volume underscores the critical role that leaders must play to ensure the vitality, maintenance and continual improvement of the physical capabilities of both individuals and teams.

Fitness, Sports, and the Canadian Armed Forces is not intended to inform serving members on how to become physically fit; other documents such as the *Army Fitness Manual* are available for that. Rather, through research, lessons learned and personal accounts, this volume demonstrates the importance of physical fitness and outlines what every member of the Canadian Armed Forces, especially its leaders, need to understand to ensure that serving members are prepared physically to meet any challenge, both at home and on operations abroad. Finally, this book also identifies the necessary conditions that leaders must establish to help elicit from their followers an acceptance of the importance of physical fitness and a lifelong commitment to the maintenance of a healthy overall lifestyle.

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CHAPTER 1

PHYSICAL ACTIVITY TRENDS IN CANADIAN YOUTH AND IMPLICATIONS FOR THE CANADIAN ARMED FORCES

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Kimberley Watkins, M.A., and Krystal K. Hachey, Ph.D.*

Empirical evidence and common experience agree that physical activity is an important aspect of healthy living. By the time the landmark report on physical activity and health was published in 1996,¹ Canadian healthy living campaigns had been advocating physical activity for over a quarter of a decade through groundbreaking programs like ParticipAction.² Indeed, a wealth of evidence points to the benefits of physical activity to mental health, the prevention of cardiovascular disease, stroke and cancer, and longevity.³ It therefore comes as no surprise that Canadians identify physical inactivity as one of the top risks to health in the country,⁴ and are less inclined to think about recreational physical activity in terms of its potential risks to health (e.g., through accidents or injury).⁵

In light of the increasing prevalence of obesity revealed in various Canadian population health studies,⁶ concerns have been raised in recent years about whether Canadians are sufficiently active. However, instead of decreasing over time, the proportion of Canadian adults who are sufficiently physically active⁷ increased from 21 percent in 1981 to 37 percent in 1995, and to 41 percent in 2000.⁸ A closer look at research in this area suggests, however, that a large portion of Canadians are not sufficiently physically active. At particular risk are young Canadians: data from the Canadian general population indicate that obesity levels are increasing in the overall population, but that the increase is particularly pronounced among children.⁹ This chapter focuses on key trends in physical activity among Canadian youth and their potential implications for military recruiting and military personnel health. In addition, the report explores the role that military organizations can play in promoting a culture of fitness among their members.

Trends in Physical Activity and Sport Participation in Canadian Youth

For our ancestors, physical activity was more than a pastime or a deliberate means for achieving optimal health; it was an essential component of daily life and survival.¹⁰ The more sedentary nature of modern life, however, has resulted in a notable decrease in the amount of energy individuals must expend to survive. It is estimated that contemporary Westerners expend only 38 percent of the amount of total energy expended by their

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distant ancestors.¹¹ Even within the past few decades, rates of physical activity have been decreasing among adults in industrialized countries, including Australia, the United Kingdom and the United States (U.S.).¹²

Findings on trends in physical activity in Canada, however, have been less consistent. An analysis of Canadian national surveys (e.g., the *Physical Activity Monitor* and *Canadian Community Health Survey* [CCHS]), concluded that there was no convincing evidence of decreasing leisure-time physical activity among Canadian youth from 1981 to 1998, with results even leaning towards an increase.¹³ These findings were echoed in an analysis comparing CCHS cycles 1 (2000/1) and 2 (2002/3) in which an increase in the prevalence of leisure-time physical activity was observed over two years. More recent evidence has indicated that these trends persisted until 2003, and subsequently levelled off in 2005 and 2007/2008.¹⁴

All the same, inconsistencies in the findings may stem from the way physical activity is measured, with researchers noting that the “choice in physical activity threshold has important implications for monitoring trends in physical activity.”¹⁵ The bulk of research pointing to an increase in physical activity has focused on leisure-time physical activity, expressed as an individual’s average daily energy expenditure (estimated from the total of the average frequency and duration of engagement in different types of physical activity, weighted by their metabolic equivalent of task [MET]). However, this may pose a problem since leisure-time physical activity may represent only a fraction of the total physical activity in which individuals engage on a daily basis.

It has been argued that greater reliance on automated devices has contributed to heightened engagement in sedentary behaviour during work and leisure-time, with use of sedentary behaviour-promoting household entertainment devices (e.g., computers, multiple televisions, internet access) increasing from 1981 to 2005.¹⁶ Results from the Canadian Fitness and Lifestyle Research Institute’s (CFLRI) CAN PLAY study have also pointed to the slightly lower average number of daily steps taken by youth of 5 to 19 years of age in 2010/11, compared to previous years (2006/7, 2007/8, and 2009/10).¹⁷ As well, decreases have been observed in participation in organized sports. It was found in the *General Social Survey* (GSS) that 59 percent of Canadian youth between the ages of 15 and 18 regularly participated in sports in 2005 compared to 77 percent in 1992.¹⁸ With the exception of soccer, participation in most sports (e.g., golf, basketball, baseball, volleyball, tennis, swimming) decreased from 1998 to 2005.¹⁹

Other studies show that physical fitness – defined as cardio-respiratory and muscular endurance, muscular strength, body composition (i.e., body mass, body fat, distribution of fat) and flexibility²⁰ – has been decreasing among Canadian adults and youth. In particular, results have pointed to lower fitness in terms of body composition and cardio-respiratory fitness.²¹ These population trends could be of concern to the Canadian Armed Forces (CAF), given the importance of physical fitness in the military.²² Military personnel are required to complete physically demanding tasks, such as heavy lifting, which call for a high level of physical fitness.²³ In addition, high body fat and poor physical fitness have both been found to interfere with the successful performance of military duties (e.g., through their impact on stress management and the ability to perform various military

tasks).²⁴ The principle of Universality of Service indicates that CAF personnel must be physically fit, employable and deployable for operational duties.²⁵

Since military personnel are recruited mainly from this young civilian population, the ability of the CAF to maintain a physically fit force will become increasingly difficult if these negative trends in health and fitness continue. In particular, the pool of potential applicants that meet the CAF's physical standards may shrink in the future. Even among those who meet the standards, unfavourable trends in physical activity and physical fitness may be a cause for concern. A review of research on trends in health among CAF recruits over time is presented in the following sections, along with a discussion of their potential implications.

Trends in Health among Canadian Armed Forces Recruits

Physical Activity and Fitness

Contrary to trends in the general population, trends in leisure-time physical activity among CAF recruits from 2003 to 2009 have revealed a gradual decrease in physical activity among recruits in the three months prior to their arrival at basic training.²⁶ As shown in analyses of recruit fitness test results described below, it appears that trends in fitness among CAF recruits have mirrored those pertaining to physical activity.²⁷

One study, conducted by Defence Research and Development Canada (DRDC),²⁸ looked at trends in fitness levels of military recruits over time, using results from the Canadian Forces Exercise Prescription (CF EXPRES) fitness evaluation. Adapted from the Canadian Standardized Test of Fitness,²⁹ the goal of the CF EXPRES test is to “provide physical fitness evaluations and exercise prescriptions in order to enhance the operational effectiveness of the CAF and the general health of its military personnel.”³⁰ Four aspects of physical fitness, which have been evaluated against common military tasks, are assessed:³¹ the 20 metre shuttle run, measuring cardiorespiratory fitness; push-ups, measuring upper body muscular endurance; sit-ups, measuring abdominal muscular endurance; and the hand grip dynamometer, measuring muscular strength. The minimum standards differ for males and females, and for individuals aged 34 years and younger and 35 and older, based on Canadian norms for age and sex.³² Until October 2006, CAF recruits were required to pass the test, which was carried out by Canadian Forces Recruiting Centres, in order to be considered for acceptance into the military. Since October 2006, physical fitness screening has been carried out through an in-house program at the Canadian Forces Leadership and Recruit School (CFLRS). The policy change was intended to assist recruits who might not have attained the minimum physical fitness standards prior to entry into the CAF, streamline enrolment into basic training, and help meet challenging recruiting targets.

The study by DRDC examined overall pass/fail rates, scores on the four individual components of the test, as well as Body Mass Index (BMI) scores (calculated from self-reported height and weight) from 2002 to 2009. Fitness trends were explored by age group (34 and under or 35 and over) and for each sex. In general, findings revealed that

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levels of fitness have declined over time, with increasing BMI scores for females, and decreasing pass rates and test scores for both sexes in later years. The only exception was the hand grip test, which did not show a clear pattern over time. Furthermore, some of these downward trends were particularly noticeable after the change in the fitness testing policy, with push-up scores, sit-up scores, and male pass rates showing a marked decline after October 2006. Although the fitness test results for all years met the minimum physical fitness standards, it is clear that CAF recruit fitness levels as measured by these tests have declined over time.

These results suggest that the October 2006 policy change may have resulted in a less physically fit recruit population because some low-fit applicants who would not have passed the CF EXPRES test at the recruiting centres were admitted into the CAF. However, it should be noted that all recruits admitted to the CAF before the policy change had passed the recruiting centre's CF EXPRES test, yet 18 percent of these recruits later failed their initial attempt at the CF EXPRES test at CFLRS. This shows that a given individual might pass the test at one point in time and fail it at another. Accordingly, the modification in fitness testing policy may have benefited the CAF, because valuable applicants who may be able to pass the test on another attempt or after some training are not eliminated at the recruiting centres.

In light of their overwhelming consistency with population trends, however, observed trends in BMI and fitness scores among CAF recruits may be a simple reflection of declining fitness levels in the general Canadian population. No matter the root cause, the unfavourable trends reviewed above have a number of important implications for military members, as well as the military organization as a whole. For instance, previous studies have found that recruits with low physical fitness are more likely to be discharged from military service, and more prone to injuries.³³ Cardiorespiratory fitness, in particular, has been linked to success in military training.³⁴ In addition, being overweight and/or obese may place recruits at increased risk of injury³⁵ and an increased probability of a referral to a remedial instructor during basic training.³⁶ In the CAF, obesity has been found to be associated with a greater risk of attrition from basic training.³⁷ Similarly, the U.S. military has found that obese members were more likely to miss work for physical health-related reasons, compared to individuals of normal weight.³⁸ In addition, most of the failures in a military physical readiness tests occurred among overweight or obese members.³⁹

Conversely, a high level of physical fitness may help individuals cope with stress. U.S. Army personnel are less likely to perceive a military survival training exercise as stressful if they are at a higher level of aerobic fitness.⁴⁰ Researchers have suggested that physical fitness can buffer reactions to stress by lowering anxiety, which then allows individuals to cope more effectively with stressful situations.⁴¹ Supporting this finding, a study of women in the Canadian general population found that cardiovascular fitness, self-reported fitness level, sports involvement, and low BMI were all linked to faster recovery of heart rate following a stressful experience.⁴² Cardiovascular fitness, in particular, may help individuals to function in physically demanding, stressful situations.⁴³

Mental Health

In accordance with their hypothesized influence on reactions to stress, physical activity and fitness may play a role in promoting mental health. Indeed, regular participation in physical activity and sports is noted for its positive influence on mental health and well-being.⁴⁴ Physical activity has been consistently linked to higher levels of self-esteem as well as lower levels of anxiety and depression among youth.⁴⁵ In a systematic review, both epidemiological and experimental research provided support for the positive influence of moderate to vigorous physical activity on depression symptoms.⁴⁶ Research has also found that improving mental health can improve physical health and productivity.⁴⁷ It may thus be relevant to consider whether unfavourable trends in physical activity and fitness are reflected in the mental health trends of CAF recruits.

The Recruit Health Questionnaire (RHQ), a survey completed by recruits during basic training since 2003, assesses a wide range of health behaviours and conditions, including various aspects of mental health (e.g., depression, posttraumatic stress disorder [PTSD], panic disorder and other anxiety disorders).⁴⁸ An analysis of data collected using the RHQ revealed that mental health was generally favourable among recruits between from 2003 to 2006.⁴⁹ However, since the change in policy regarding pre-enrolment physical fitness testing that occurred in October 2006, results have pointed to decreases in some aspects of mental health.⁵⁰ Compared to recruits who enrolled in basic training between 2003 and 2006, those who enrolled in basic training between 2007 and 2009 reported more symptoms of depression and PTSD. Specifically, the estimated proportion of probable cases of depression increased from 4.7 percent among recruits who enrolled in basic training between 2003 and 2006 to 6.1 percent among those who enrolled between 2007 and 2009, while the estimated proportion of probable cases of PTSD rose from 2.3 percent to 3.2 percent.⁵¹ At greater risk were younger recruits, those with lower levels of education and non-commissioned member (NCM) candidates. Despite increases in depression and PTSD, no change was observed in the proportion of recruits who screened positive for probable panic disorder or other anxiety disorders over the same period of time.⁵²

Like poor physical fitness, psychological issues have been associated with lower rates of basic training completion among recruits.⁵³ Various facets of mental health are associated with an increased risk of attrition from basic training among NCM candidates in the CAF, including psychiatric symptomatology and depression.⁵⁴ More recent analyses have shown that neuroticism – i.e., a personality trait characterized by emotional instability – is associated with an increased risk of attrition from basic training among NCM candidates even after controlling for cognitive aptitude and fitness test scores.⁵⁵

It is unclear whether the trends in physical activity, fitness and mental health among CAF recruits presented above are related to one another. Nonetheless, research has shown the benefits of improved physical activity and fitness on the overall health and well-being of military recruits. The CAF recognizes that the health and physical fitness of its members is critical to operational readiness and invests considerable resources to ensure the development of strong, healthy and fit personnel.⁵⁶ Accordingly, an estimated 65 percent of Regular Force members endorse exercise as an effective strategy to improve health and well-being. On the other hand, 97 percent of them report that they intend

to exercise more in the next year, suggesting that they perceive that their current levels of physical activity are inadequate.⁵⁷ Such findings raise the important issue of how to promote greater engagement in physical activity. The following section provides a brief synthesis of some theories and models that provide a framework from which the CAF may draw to enhance programs and policies that support physical activity among its members.

Physical Activity Interventions

Theories of Health Behaviour Change

Theories of health behaviour change may provide insight into the reasons individuals choose to or choose not to engage in sufficiently frequent or intense physical activity. One prominent theory, the *Theory of Planned Behaviour* (TPB), posits that engagement in a health-promoting behaviour, such as physical activity, depends on one's intentions to engage in the behaviour. Several factors are believed to contribute to such intentions: subjective norms (the perception that others would approve of one's engagement in the behaviour); a positive attitude toward the behaviour; and perceived behavioural control (i.e., the belief that one has the necessary means to carry out the behaviour).⁵⁸ This model has been shown to be effective in predicting and explaining engagement in physical activity.⁵⁹

The components of TPB, together with psychosocial factors, may be useful in designing interventions to promote physical activity among CAF members. For example, perceived behavioural control has been strongly associated with exercise engagement.⁶⁰ Similarly, the concept of self-efficacy (the belief that one is capable of successfully performing a behaviour)⁶¹ has been associated with engagement in physical activity.⁶² Thus, it might be beneficial to promote perceptions of control, possibly by beginning with small, simple increases in physical activity to facilitate feelings of mastery and accomplishment.⁶³ Exercise prescriptions of moderate intensity have been shown to be more effective in promoting adherence than those with high prescribed intensity.⁶⁴ Further, "modeling" tactics are in line with the subjective norms component of the TPB, in that individuals are more likely to adopt a healthy behaviour if they perceive that eminent others believe in its efficacy.⁶⁵ As such, observing other CAF members in their engagement in regular physical training may serve to increase less active members' confidence and reduce their anxiety surrounding exercise.⁶⁶

Encouraging personal regulation of exercise regimens may be another way to increase CAF recruits' and members' perceptions of control over their engagement in physical activity. Self-regulatory behaviours, such as creating exercise goals, closely monitoring one's progress in achieving these goals, and attending to any obstacles in meeting these goals have been strongly associated with successful engagement in regular physical activity.⁶⁷ In addition, active planning for future exercise objectives has been shown to result in higher rates of physical activity.⁶⁸ For less conscientious individuals, or for self-regulation supplementation, providing prompts or reminders to exercise via phone calls has been shown to increase adherence to an exercise program.⁶⁹ Such a strategy, or one using more recent technology, such as text messages or smartphone applications, might prove beneficial in assisting CAF recruits to adjust to their new physical training schedule.

When exploring strategies to increase physical activity, it is important to consider individuals' personal feelings toward this behaviour. Personal conviction in the positive emotional consequences of exercise (i.e., the perception that engagement in physical activity leads to feelings of fulfillment, relaxation, joy, etc.) is related to not only the adoption, but also the maintenance of regular physical activity.⁷⁰ In fact, positive emotional associations with physical activity are one of the reasons health behaviour theories, such as the TPB, explain engagement in exercise.⁷¹ Therefore, the CAF might benefit from emphasizing the emotional well-being derived from fitness programs, in order to maximize recruit engagement in physical activity.

Social-Ecological Models of Health Behaviour

Health behaviour theories are useful for identifying individual factors that can be targeted to promote physical activity. Social-ecological approaches are also helpful for identifying factors within the social and physical environments that may act as additional barriers to the pursuit of physical activity. As noted there has been a dramatic increase in research and practice based on ecological models of health behaviour.⁷² From this perspective, physical activity is considered to have influences on multiple levels, including “intrapersonal (biological, psychological), interpersonal (social, cultural), organizational, community, physical environmental, and policy.”⁷³ In support of this perspective, factors such as accessibility, opportunities, and aesthetic attributes of the environment have been found to be significantly associated with physical activity.⁷⁴ Moreover, there is evidence that social support can enhance health and fitness by increasing motivation to engage in physical activity.⁷⁵

One study of the relative importance of individual, social and environmental influences on walking found that each contributed to a relatively equivalent degree.⁷⁶ Not surprisingly, proponents of ecological models of health behaviour argue that multi-level interventions aimed at addressing a wider spectrum of influences on physical activity are preferable. Indeed, tailored exercise prescriptions may hold promise for addressing individual factors, but these need to be supported through the provision of adequate resources and the development of health policies. In the 2008/2009 *Health and Lifestyle Information Survey* (HLIS), the vast majority of CAF Regular Force members reported being given time to exercise during work hours (65 percent), being satisfied with the exercise facilities at work (74 percent), and being supported by leadership to be physically active (79 percent),⁷⁷ suggesting that they perceive adequate support from the organization.

Cultural factors may shape both individual and organizational influences. It has been recommended that the importance of physical fitness be made clear at the early stages of military service in order to facilitate its integration into the military culture.⁷⁸ The CAF acknowledges the need to create a culture of health and fitness and the important role of leadership in fostering this culture.⁷⁹ Organized sports programs, such as the CAF Sports Program, may create a supportive environment for physical activity, while enhancing individual motivation to succeed. Hence, such programs may contribute to improving the fitness levels of military personnel and to the culture of healthy and active living.

Summary

There has been a shift in physical activity and fitness trends among Canadians over the past few decades. At one extreme, this has resulted in concerns about the future health and life expectancy of young Canadians, with some researchers arguing that increasing rates of obesity among youth across North America may put an end to the steady rise in life expectancy that has been observed over the past two centuries.⁸⁰ From the standpoint of the CAF, evidence pointing to similar trends in physical activity, fitness and obesity among recruits signals the increasing importance of ensuring that appropriate policies and resources are put in place to promote health and physical fitness in the CAF. There is a vast literature on strategies to enhance physical activity from which the CAF may draw to inform policy, programs, and culture, with approaches focusing on individual and broader socio-ecological influences alike. In addition to the continued monitoring of trends, longitudinal research aimed at examining physical activity, fitness and obesity over the course of basic training and subsequent service could be valuable for identifying and informing future policy needs, assessing progress, and helping to ensure the operational readiness of CAF personnel.

Endnotes

1. U.S. Department of Health and Human Services, *Physical activity and health: A Report of the Surgeon General* (Atlanta, GA: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, The President's Council on Physical Fitness and Sports, 1996).
2. Mark S. Tremblay and Cora L. Craig, "ParticipACTION: Overview and Introduction of Baseline Research on the "New" ParticipACTION", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 6, No. 84 (2009), retrieved on 22 March 2012 from <<http://www.biomedcentral.com/content/pdf/1479-5868-6-84.pdf>>.
3. Public Health Agency of Canada, *The Benefits of Physical Activity*, retrieved on 22 March 2012 from <<http://www.phac-aspc.gc.ca/alw-vat/intro/key-cle-eng.php>>.
4. Daniel Krewski, Louise Lemyre, Michelle C. Turner, Jennifer E.C. Lee, Christine Dallaire, Louise Bouchard, Kevin Brand and Pierre Mercier, "Public Perception of Population Health Risks in Canada: Health Hazards and Sources of Information", *Human and Ecological Risk Assessment*, Vol. 12, No. 4 (2006), 626-644.
5. Jennifer E.C. Lee, Louise Lemyre and Daniel Krewski, "Multi-Method, Multi-Hazard Approach to Explore the Uniqueness of Terrorism Risk Perceptions and Worry", *Journal of Applied Social Psychology*, Vol. 40, No. 1 (2010), 241-272.
6. Wei Luo, Howard Morrison, Margaret De Grog, Chris Waters, Marie DesMeules, Elaine Jones-McLean, Anne-Marie Ugnat, Sylvie Desjardins, Morgan Lim and Yang Mao, "Burden of Adult Obesity in Canada", *Chronic Diseases in Canada*, Vol. 27, No. 4 (2007), 135-144.
7. As defined as the expenditure of 3 or more metabolic equivalent of task (MET)-hours.
8. Cora L. Craig, Storm J. Russell, Christine Cameron and Adrian Bauman, "Twenty Year Trends in Physical Activity among Canadian Adults", *Canadian Journal of Public Health*, Vol. 95, No. 1 (2004), 59-63.
9. Mark S. Tremblay, Peter T. Katzmarzyk and Jon Douglas Willms, "Temporal Trends in Overweight and Obesity in Canada, 1981-1996", *International Journal of Obesity*, Vol. 26, No. 4 (2002), 538-543.
10. Carl J. Casperson, Kenneth E. Powell and Gregory M. Christenson, "Physical Activity, Exercise, and Physical Fitness: Definitions and Distinctions for Health-Related Research", *Public Health Reports*, Vol. 100, No. 2 (1985), 126-131; S. Boyd Eaton and Stanley B. Eaton, "An Evolutionary Perspective on Human Physical Activity: Implications for Health", *Comparative Biochemistry and Physiology Part A*, Vol. 136, No. 1 (2003), 153-159.
11. Loren Cordain, Robert W. Gotshall, S. Boyd Eaton and Stanley B. Eaton, "Physical Activity, Energy Expenditure and Fitness: An Evolutionary Perspective", *International Journal of Sports Medicine*, Vol. 19, No. 5 (1998), 328-335.
12. Casperson et al, (1985), 126-131.

13. Joey C. Eisenmann, Peter T. Katzmarzyk and Mark S. Tremblay, "Leisure-Time Physical Activity Levels Among Canadian Adolescents, 1981-1998", *Journal of Physical Activity and Health*, Vol. 1, No. 2 (2004), 154-162.
14. Canadian Fitness and Lifestyle Research Institute, "Physical Activity Levels of Canadians", *Let's Get Active! Planning Effective Communication Strategies - 2008 Physical Activity Monitor: Facts & Figures*, retrieved on 2 April 2012 from <http://72.10.49.94/media/node/82/files/PAM2008FactsFigures_Bulletin02_PA_among_CanadiansEN.pdf>.
15. Peter T. Katzmarzyk and Mark S. Tremblay, "Limitations to Canada's Physical Activity Data: Implications for Monitoring Trends", *Applied Physiology, Nutrition and Metabolism*, Vol. 32, Suppl. 2E (2007), S185-S194, retrieved on 15 July 2012 from <<http://www.nrcresearchpress.com/doi/pdf/10.1139/H07-113>>.
16. Ibid.
17. Canadian Fitness and Lifestyle Research Institute, *Bulletin 2: Physical Activity Levels of Children and Youth*, retrieved on 1 February 2012 from <<http://72.10.49.94/media/node/972/files/CANPLAYpercent20Bulletinpercent20percent20Levelspercent20EN.pdf>>.
18. Fidelis Ifedi, *Culture, Tourism and the Centre for Education Statistics - Sport Participation in Canada, 2005 (Catalogue no. 81-595-MIE - No. 60)* (Ottawa, ON: Statistics Canada, 2008), retrieved on 22 March 2012 from <<http://www.statcan.gc.ca/pub/81-595-m/81-595-m2008060-eng.pdf>>.
19. Ibid.
20. Carl J. Casperson et al. (1985), 126-131.
21. Margot Shields, Mark S. Tremblay, Manon Laviolette, Cora L. Craig, Ian Janssen and Sarah Connor Gorber, "Fitness of Canadian Adults: Results from the 2007-2009 Canadian Health Measures Survey", *Statistics Canada, Catalogue no. 82-003-XPE - Health Reports*, Vol. 21, No. 1 (2010), 1-15.; Mark S. Tremblay, Margot Shields, Manon Laviolette, Cora L. Craig, Ian Janssen and Sarah Connor Gorber, "Fitness of Canadian Children and Youth: Results from the 2007-2009 Canadian Health Measures Survey", *Statistics Canada, Catalogue no. 82-003-XPE - Health Reports*, Vol. 21, No. 1 (2010), 1-14.
22. Cynthia L. Ogden, Cheryl D. Fryar, Margaret D. Carroll and Katherine M. Flegal, "Mean Body Weight, Height, and Body Mass Index, United States 1960-2002", *Advance Data*, Vol. 347 (2004), 1-18.; Mark S. Tremblay, Margot Shields, Manon Laviolette, Cora L. Craig, Ian Janssen and Sarah Connor Gorber (2010), 1-14.
23. Clay E. Pandorf, Bradley C. Nindl, Scott J. Montain, John W. Castellani, Peter N. Frykman, Cara D. Leone and Everett A. Harman, "Reliability and Assessment of Two Militarily Relevant Occupational Physical Tasks", *Canadian Journal of Applied Physiology*, Vol. 28, No. 1 (2003), 27-37.
24. R.Y. Mayo, *Fitness in the Canadian Armed Forces, Exercise New Horizons* (Toronto, ON: Canadian Forces Staff College, 1984); Marcus K. Taylor, Amanda E. Markham, Jared P. Reis, Genie Leah A. Padilla, Eric G. Potterat, Sean P.A. Drummond and Lillianne R. Mujica-Parodi, "Physical Fitness Influences Stress Reactions to Extreme Military Training", *Military Medicine*, Vol. 173, No. 8 (2008), 738-742; Mohammad Reza Naghii, "The Importance of Body Weight and Weight Management for Military Personnel", *Military Medicine*, Vol. 171, No. 6 (2006), 550-555.
25. Department of National Defence, *DAOD 5023-0, Universality of Service*, retrieved on 22 March 2012 from <http://admfncs.mil.ca/admfncs/subjects/daod/5023/0_e.asp>; Department of National Defence, *DAOD 5023-2, Physical Fitness Program*, retrieved on 22 March 2012 from <http://admfncs.mil.ca/admfncs/subjects/daod/5023/2_e.asp>.
26. Jennifer E.C. Lee and Robert A. Hawes, *Overweight/Obesity Trends and Risk Factors in Canadian Forces Recruits*, Paper presented at the International Congress on Soldiers' Physical Fitness, Jyväskylä, Finland, May 2011.
27. Kerry Sudom, Nancy Otis and Kimberley Watkins, *Fitness Levels in Canadian Forces Recruits: 2002-2009 (DGMPRA TM 2010-018)* (Ottawa, ON: Director General Military Personnel Research and Analysis, Department of National Defence, 2010).
28. Ibid.
29. Fitness Canada, *Canadian Standardized Test of Fitness* (Ottawa, ON: Ministry of Fitness and Amateur Sport, Government of Canada, 1981).
30. Canadian Forces Personnel Support Agency (CFPSA), *Canadian Forces EXPRES operations manual, 4th ed.* (Ottawa, ON: Canadian Forces Personnel Support Agency - CFPSA, Directorate of Physical Education, 2007).
31. S. Wayne Lee and Major L. Clark, *Task Related Physical Fitness and Performance Standards - A Canadian Forces Approach* (Ottawa, ON: National Defence Headquarters, 1997).
32. In April 2013, the CF EXPRES test was replaced with the FORCE evaluation, which assesses physical fitness for performing common military tasks. The test comprises 20 metre rushes, sand bag lifts, intermittent loaded shuttles, and a sandbag drag. The minimum standards are universal (i.e., not based on age and sex).

Chapter 1

33. Joseph J. Knapik et al. (2001), 641-647.; Joseph J. Knapik et al. (2001), 946-954; David W. Niebuhr, Christine T. Scott, Timothy E. Powers, Yuanzhang Li, Weiwei Han, Amy M. Millikan and Margot R. Krauss (2008), 555-562.
34. Beverly G. Burke, William I. Sauter, Edward R. Kemery and Frederick N. Dyer, "Intelligence and Physical Fitness as Predictors of Success in Early Infantry Training", *Perceptual and Motor Skills*, Vol. 69 (1989), 263-271.
35. Trond Heir and G. Eide, "Age, Body Composition, Aerobic Fitness and Health Condition as Risk Factors for Musculoskeletal Injuries in Conscripts", *Scandinavian Journal of Medicine and Science in Sports*, Vol. 6, No. 4 (1996), 222-227; Bruce H. Jones et al. (1993), 705-710; Robert F. Wallace et al. (2006), 415-421.
36. Sam D. Blacker, David M. Wilkinson, James L.J. Bilzon and Mark P. Rayson, "Risk Factors for Training Injuries Among British Army Recruits", *Military Medicine*, Vol. 173, No. 3 (2008), 278-286.
37. Jennifer E.C. Lee, *Predicting basic training attrition*, Conference Proceedings of the International Military Testing Association, Lucerne, Switzerland, 2010, retrieved on 20 December 2010 from <<http://www.internationalmta.org/Documents/2010/2010073P.pdf>>.
38. C. Keith Haddock, Sara A. Pyle, Walker Poston, Robert M. Bray and Risa J. Stein, "Smoking and Body Weight as Markers of Fitness for Duty Among U.S. Military Personnel", *Military Medicine*, Vol. 172, No. 5 (2007), 527-532.
39. Cynthia J. Gantt, Julie A. Neely, Lan A. Villafana, Chisun S. Chun and Sandy M. Gharabaghli, "Analysis of Weight and Associated Health Consequences of the Active Duty Staff at a Major Naval Medical Center", *Military Medicine*, Vol. 173, No. 5 (2008), 434-440.
40. Marcus K. Taylor et al. (2008), 738-742.
41. Ibid.
42. John J. Jamieson, Karen Flood and Lavoie, Norman, "Physical Fitness and Heart Rate Recovery from Stress", *Canadian Journal of Behavioural Science*, Vol. 26, No. 4 (1994), 566-577.
43. Beverly G. Burke et al. (1989), 263-271.
44. Thomas Stephens, "Physical Activity and Mental Health in the United States and Canada: Evidence from Four Population Surveys", *Preventive Medicine*, Vol. 17, No. 1 (1988), 35-47.
45. James F. Sallis, Judith J. Prochaska and Wendell C. Taylor, "A Review of Correlates of Physical Activity of Children and Adolescents", *Medicine and Science in Sports and Exercise*, Vol. 32, No. 5 (2000), 963-975; Klazine Van der Horst, Marijke J. Chin A. Paw, Jos W.R. Twisk and William Van Mechlen, "A Brief Review on Correlates of Physical Activity and Sedentariness in Youth", *Medicine and Science in Sports and Exercise*, Vol. 39, No. 8 (2007), 1241-1250.
46. Ian Janssen and Allana G. LeBlanc, "Systematic Review of the Health Benefits of Physical Activity and Fitness in School-Aged Children and Youth", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 7 (2010), 40, retrieved on 15 July 2012 from <<http://www.ijbnpa.org/content/7/1/40>>.
47. Helen Herrman, Shekhar Sexena and Rob Moodie (eds.), *Promoting Mental Health: Concepts, Emerging Evidence, Practice* (Geneva, Switzerland: World Health Organization 2005), retrieved on 17 February 2012 from <http://www.who.int/mental_health/evidence/MH_Promotion_Book.pdf>.
48. Jennifer E.C. Lee and Krystal K. Hachey, *Descriptive Analyses of the Recruit Health Questionnaire: 2007-2009 (DGMPRA TM 2011-028)* (Ottawa, ON: Director General Military Personnel Research and Analysis, Department of National Defence, 2011).
49. Jennifer E.C. Lee, Jeff Whitehead and Christine Dubiniecki, *Descriptive Analyses of the Recruit Health Questionnaire: 2003-2004 (DGMPRA TM 2010-010)* (Ottawa, ON: Director General Military Personnel Research and Analysis, Department of National Defence, 2010).
50. Lee and Hachey, (2011).
51. Probable cases of depression and PTSD were identified on the basis of validated self-report screening tools that are embedded in the RHQ, but were not confirmed by a clinician. Screening tools included the 9-item Patient Health Questionnaire depression screening tool (PHQ-9) and the PTSD Checklist for Civilians (PCL-C).
52. Lee and Hachey, (2011).
53. G. Wayne Talcott, Keith C. Haddock, Robert C. Klesges, Harry Lando and Edna Fiedler, "Prevalence and Predictors of Discharge in United States Air Force Basic Military Training", *Military Medicine*, Vol. 164, No. 4 (1999), 269-274; Gerald E. Larson, Stephanie Booth-Kewley and Margaret A. K. Ryan, "Predictors of Navy Attrition II. A Demonstration of Potential Usefulness for Screening", *Military Medicine*, Vol. 167, No. 9 (2002), 770-776.

54. Ronald R. Holden and David Scholtz, "The Holden Psychological Screening Inventory in the Prediction of Canadian Forces Basic Training Outcome", *Canadian Journal of Behavioural Science*, Vol. 34, No. 2 (2002), 104-110.
55. Jennifer E.C. Lee and Nancy Otis, *Incremental Predictive Validity of Baseline Health and Personality Data Over Applicant Tests for Basic Military Qualification Releases (DGMPPRA TM 2011-022)* (Ottawa, ON: Director General Military Personnel Research and Analysis, Department of National Defence, 2011).
56. Hillier, (2009).
57. Robert A. Hawes and Jeff Whitehead (eds.), *Results from the Health and Lifestyle Information Survey of Canadian Forces Personnel 2008/2009– Regular Force version (D2-293/2010E-PDF)* (Ottawa, ON: Directorate of Force Health Protection, Canadian Forces Health Services Group, Department of National Defence, 2010).
58. Icek Ajzen, "The Theory of Planned Behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 (1991), 179-211.
59. Danelle Symons Downs and Heather A. Hausenblas, "Applying the Theories of Reasoned Action and Planned Behavior to Exercise: A Meta-Analytic Update", *Journal of Physical Activity and Health*, Vol. 2 (2005), 76-97; Martin S. Hagger, Nikos L.D. Chatzisarantis and Stuart J.H. Biddle, "A Meta-Analytic Review of the Theories of Reasoned Action and Planned Behavior in Physical Activity: Predictive Validity and the Contribution of Additional Variables", *Journal of Sport and Exercise Psychology*, Vol. 24, No. 1 (2002), 3-32; Heather A. Hausenblas, Albert V. Carron and Dianne E. Mack, "Application of the Theories of Reasoned Action and Planned Behavior to Exercise Behavior: A Meta-Analysis", *Journal of Sport and Exercise Psychology*, Vol. 19, No. 1 (1997), 36-51.
60. Christopher J. Armitage, "Can the Theory of Planned Behavior Predict the Maintenance of Physical Activity?", *Health Psychology*, Vol. 24, No. 3 (2005), 235-245.
61. Albert Bandura, "Self-efficacy", in Vilanayur S. Ramachandran (ed.), *Encyclopedia of Human Behaviour* (New York, NY: Academic Press, 1994), Vol. 4, 71-81.
62. Britta Renner, Nelli Hankonen, Paolo Ghisletta and Pilvikki Absetz, "Dynamic Psychological and Behavioral Changes in the Adoption and Maintenance of Exercise", *Health Psychology*, Vol. 31, No. 3 (2011), 306-315; Urte Scholz, Roger Keller and Sonja Perren, "Predicting Behavioral Intentions and Physical Exercise: A Test of the Health Action Process Approach at the Intrapersonal Level", *Health Psychology*, Vol. 28, No. 6 (2009), 702-708.
63. Albert Bandura, *Social foundations of thought and action* (Englewood Cliffs, NJ: Prentice Hall, 1986).
64. Michael G. Perri, Stephen D. Anton, Patricia E. Durning, Timothy U. Ketterson, Sumner J. Sydean, Nicole E. Berlant, William F. Jr. Kanasky, Robert L. Jr. Newton, Marian C. Limacher and A. Daniel Martin, "Adherence to Exercise Prescriptions: Effects of Prescribing Moderate Versus Higher Levels of Intensity and Frequency", *Health Psychology*, Vol. 21, No. 5 (2002), 452-458.
65. Ajzen, (1991), 179-211.
66. Bandura, (1986).
67. Marijn de Bruin, Paschal Sheeran, Gerjo Kok, Anneke Hiemstra, Jan M. Prins, Harm J. Hospers and Gerard J.P. van Breukelen, "Self-Regulatory Processes Mediate the Intention-Behavior Relation for Adherence and Exercise Behaviors", *Health Psychology*, advance online publication, 5 Mar 2012; Susan Michie, Charles Abraham, Craig Whittington, John McAteer and Sunjai Gupta, "Effective Techniques in Healthy Eating and Physical Activity Interventions: A Meta-Regression", *Health Psychology*, Vol. 28, No. 6 (2009), 690-701.
68. Renner et al, (2011), 306-315.
69. David N. Lombard, Tamara N. Lombard and Richard A. Winett, "Walking to Meet Health Guidelines: The Effect of Prompting Frequency and Prompt Structure", *Health Psychology*, Vol. 14, No. 2 (1995), 164-170.
70. Genevieve F. Dunton and Elaine Vaughn, "Anticipated Affective Consequences on Physical Activity Adoption and Maintenance", *Health Psychology*, Vol. 27, No. 6 (2008), 703-710.
71. Marc T. Kiviniemi, Amy M. Voss-Humke and April L. Seifert, "How Do I Feel About the Behavior? The Interplay of Affective Associations with Behaviors and Cognitive Beliefs as Influences on Physical Activity Behavior", *Health Psychology*, Vol. 26, No. 2 (2007), 152-158.
72. James F. Sallis and Neville Owen, "Chapter 20: Ecological Models of Health Behaviour", in Karen Glanz, Barbara K. Rimer and Frances Marcus Lewis (eds.), *Health Behaviour and Health Education: Theory, Research, and Practice*, 3rd ed (San Francisco, CA: Jossey-Bass, 2008), 465-485.
73. Sallis and Owen, (2008), 466.

Chapter 1

74. Nancy Humpel, Neville Owen and Eva Leslie, "Environmental Factors Associated With Adults' Participation in Physical Activity", *American Journal of Preventive Medicine*, Vol. 22, No. 3 (2002), 188-199.
75. Christine A. Wynd and Nancy A. Ryan-Wenger, "Factors Predicting Health Behaviors Among Army Reserve, Active Duty Army, and Civilian Hospital Employees", *Military Medicine*, Vol. 169, No. 12 (2004), 942-947.
76. Billie Gilles-Corti and Robert J. Donovan, "Relative Influences of Individual, Social Environmental, and Physical Environmental Correlates of Walking", *American Journal of Public Health*, Vol. 93, No. 9 (2003), 1583-1589.
77. Robert A. Hawes and Jeff Whitehead (eds.), *Results from the Health and Lifestyle Information Survey of Canadian Forces Personnel 2008/2009– Regular Force version (D2-293/2010E-PDF)* (Ottawa, ON: Directorate of Force Health Protection, Canadian Forces Health Services Group, Department of National Defence, 2010).
78. Brenda Forman, Vivian T. Hutson, Tami A. Piemonte and James Weinstein, "Nutrition and Weight Control", in Bernard L. DeKoning (ed.), *Recruit Medicine* (Falls Church, VA: Office of the Surgeon General, United States Army, 2006).
79. Hillier, (2009).
80. Kelly K. Leitchm, *Reaching for the Top: A Report by the Advisor on Healthy Children and Youth (HC Pub.: 4552)* (Ottawa, ON: Health Canada, 2007), retrieved on 10 September 2009 from <http://www.hc-sc.gc.ca/hl-vs/alt_formats/hpb-dgpps/pdf/child-enfant/2007-advisorconseillere/advisor-conseillere-eng.pdf>; S. Jay Olshansky, Douglas J. Passaro, Ronald C. Hershov, Jennifer Layden, Bruce A. Carnes, Jacob Brody, Leonard Hayflick, Robert N. Butler, David B. Allison and David S. Ludwig, "A Potential Decline in Life Expectancy in the United States in the 21st Century", *The New England Journal of Medicine*, Vol. 352, No. 11 (2005), 1138-1145.

CHAPTER 2

PHYSICAL FITNESS EVALUATIONS AND PROGRAMS IN THE CANADIAN ARMED FORCES: PURPOSES AND EVOLUTION

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Introduction

Military service, sports and physical fitness have been intertwined as far back in history as the ancient Greeks. In many societies, including ours, the military has influenced sport practices and physical education in general over the course of the last century. Very early on, in military conflicts it was recognized that fitter soldiers were far more effective on the battlefield than less fit ones. Hence, military training included some form of physical activity, calisthenics, or sports, which were aimed at increasing soldiers' combat readiness and stamina. In Canada, most of our early influences came from the British Battle Physical Training model, to which Canadian soldiers were exposed as they were training and fighting alongside British forces during the Boer War and a few years later in the First World War.

Although always present, physical fitness was never regimented by standards linked to service until much later on in the 20th century. At that time, exposure to regular physical activity was sufficient to prepare soldiers for battle. Besides, in times of war, armies could not afford to be too selective on a trainable skill like physical fitness, as they needed more 'boots on the ground'. As the Second World War ended, the awareness of structured physical fitness training seemed to evolve subtly, ultimately realizing the requirement for a more scientific approach. Today, most military forces around the world have sophisticated research capabilities to assess soldiers' physical performance and their interactions with equipment, combat loads, weapons systems, environmental conditions and the fast changing nature of modern warfare.

The RCAF 5BX

In the 1950s, the Royal Canadian Air Force (RCAF) had numerous air bases or stations spread across the entire country as part of the Cold War air defence strategy. It was looking for a simple way to keep its pilots in good physical condition to fly. In 1956, Dr. William Orban, one of Canada's first exercise physiology researchers, was hired by the RCAF to conduct research and development on a physical fitness program designed for RCAF pilots in remote locations.¹ This program had to be short in duration, require no equipment and very little space. Two years later, the RCAF trialed the results of Dr. Orban's work, which

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was a program called the 5BX, which stood for Five Basic eXercises. The 5BX consisted of five body-weight exercises to be performed according to specific numbers of repetitions in a sequence, for total time of 11 minutes per day.² The program was based on a number of charts that progressively took the participants to higher physical demands and exertion. Dr. Orban's philosophy did not necessarily fall in line with the popular trends of the time, which was to work out for longer periods of time at lower intensities. His research at the University of Illinois had demonstrated that shorter duration, more intense exercise could lead to similar results in cardiovascular capacity as other more time-consuming programs.

The program was first published for the general public in 1961. A women's program, which was different from the men's program, had also been developed called the XBX, for ten basic exercises, which were to be completed in 12 minutes.³ Interestingly enough, the 5BX only had a relatively short life in the RCAF, but both programs quickly became world-wide hits, translated into several different languages and adopted by millions as home fitness programs.

Cooper's 1.5 Mile Run

In 1968, Dr. Kenneth Cooper, a physician and former U.S. Air Force Colonel, designed an aerobic fitness test for military use. He found that the distance one could run in 12 minutes was closely related to VO_2 max or maximal aerobic capacity. He created a point system for the distance completed in the 12-minute test, which became a generally accepted benchmark in fitness evaluation.⁴ Although very simple to conduct at first glance, the test was a bit more complex to administer to large groups, such as military personnel. Participants finished at the same time but widely dispersed over a running track or course, which made scoring difficult. Therefore, different versions of the test were created using time as the performance measurement as opposed to distance. In 1972, after the Defence and Civil Institute of Environmental Medicine (DCIEM) completed some validation studies, the Canadian Armed Forces (CAF) adopted a version of the Cooper test. The test consisted of running a mile and a half (2400 metres) in as fast a time as possible, as opposed to running for 12 minutes. CAF members had to complete the distance in a set time, based on age and gender standards. The test was called the Canadian Forces (CF) Basic Aerobic Fitness Test and was combined with a Muscular Fitness Test comprised of push-ups, bent-knee sit-ups and chin-ups. Women serving in the CAF at the time were not required to perform the chin-ups and performed push-ups from their knees as opposed to the men's toe-fulcrum push-up.⁵

Unfortunately many CAF personnel attempted the test every year without proper physical preparation. Although fitness programs were developed for those failing to meet the time standards, they were generally poorly run or even ignored in certain units.⁶ Furthermore, the 1.5 mile run, being a maximal, non-progressive test, turned out to be a relatively risky evaluation from a medical perspective for older, more sedentary personnel, increasing their risk of cardiac issues. At the time, data showed that over 20 deaths from myocardial infarction had been potentially attributed to the CAF aerobic fitness test. For all these reasons, the CAF Surgeon General ordered that the mile and a half run be ceased as of September 1980 as a general aerobic fitness evaluation for CAF members. Nevertheless,

the CF Basic Aerobic Fitness Test was retained for a number of specialized occupations like the Physical Education and Recreation Instructors (PERI) and firefighters for more than 15 years after this decision.⁷

Project Phoenix

As a result of terminating the 1.5 mile test, the CAF Surgeon General stood up *Project Phoenix*. *Project Phoenix* was mandated to find a safe alternative to the former fitness test. A physician, Lieutenant-Commander Shannon, and a representative from the Director of Physical Education, Recreation and Amenities (DPERA), Captain Kimmick, were the project leads.⁸ As a replacement to the aerobic and muscular fitness test, *Project Phoenix* recommended the adoption of Canada's Standardized Test of Fitness (STF), a test developed and promulgated by the Government of Canada's Fitness and Amateur Sport. The first edition of the STF was published in 1979 and consisted of relatively simple fitness components that had been administered to a large sample of Canadians, both males and females, from 15 to 69 years of age, as part of a pan-Canadian fitness survey.⁹ The STF included the Canadian Home Fitness Test, renamed the Canadian Aerobic Fitness Test (CAFT), to measure aerobic capacity.

The home fitness test had been validated in 1976 on over 14,000 subjects and simply used a pair of 20 centimetre steps, the average height of a typical home stair step, as well as a long-play record playing a specific beat or cadence to which participants had to step on or off the steps.¹⁰ As for the other components of fitness, the STF included push-ups, 60-second time for sit-ups, trunk forward flexion, and hand grip strength, as well as number of anthropometric measurements. The test was designed to assess the general public and could easily be performed at home or at work. Individual results of the evaluation could then be compared to the Canadian population based on age and gender deciles.¹¹ It was deemed a safe and efficient test to measure all-around fitness and, consequently, a good choice to replace the more risky 1.5 mile run. The CAF only chose to adopt parts of the STF at the time: the CAFT, the push-ups, sit-ups and the hand grip test. The test was rebranded as the CF EXPRES, which stood for Canadian Forces Exercise Prescription.

The Canadian Human Rights Act

In 1977, the federal government introduced the Canadian Human Rights Act. This Act differed somewhat from the broader Canadian Charter of Rights and Freedoms, in the sense that it was focused on removing unfair and discriminatory practices in federal institutions. It was aimed at removing discrimination based on race, religion, age, gender and sexual orientation.¹² The Act did and still does have exceptions; one of them being that employers can discriminate only if based on a *Bona Fide Occupational Requirement* (BFOR). A BFOR requires that if an employer is to discriminate against employees or applicants, it must show good reasons or cause for having such a practice. More precisely, to qualify as a BFOR, the employer must meet three criteria: it must demonstrate that the employment practice or policy is rationally connected to the job; the employment

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practice or policy was adopted by the employer in an honest and good faith belief that it was necessary in order to fulfill the job; and the employment practice or policy is the least discriminatory way to achieve the purpose or goal related to the job.¹³

The CAF, a major federal employer, was not only subject to the Act but was specifically added to the Act as having an exception. The CAF is subject to the principle of Universality of Service under which “members of the Canadian Forces must at all times and under any circumstances perform any functions that they may be required to perform”.¹⁴ From that point on, this statement became the foundation of any new fitness standards to be set in the CAF. No longer could the CAF impose a physical fitness standard based on arbitrary norms or simply on common practice of other military forces; it had to directly link the tests and standards to the Universality of Service principle.

In 1983-1984, as a first step in abiding by the Human Rights Act, the CAF undertook the task of defining what constituted the physical component of Universality of Service. DPERA, under the leadership and vision of Lieutenant-Colonel Swan, the head of the Physical Education and Recreation branch then in charge of managing and delivering the fitness, sports and recreation programs in the CAF. Lieutenant-Colonel Swan brought together representatives from the Environmental Chiefs of Staff in an attempt to capture and define the common, essential and physically demanding tasks required of sailors, soldiers, airmen and airwomen serving in the CAF.¹⁵ The Navy, the Army and the Air Force respectively provided these tasks and after a review process that removed overlaps and repetitions, seven tasks were retained as being common military tasks. This process led to having brief descriptions of the tasks, but left the CAF short of having an objective test to assess military personnel on their ability to meet the Universality of Service principle.

Minimal Physical Fitness Standards 1988

DPERA made the decision to rely on an external contractor to perform the required scientific work needed to define the physical demands of the common military tasks and determine if and how well the CF EXPRES would predict performance on these tasks. This work was one of the first of its kind in Canada, if not the first of its kind. Queen's University's Ergonomics Research Group (ERG) from Kingston, Ontario, headed by Dr. Joan Stevenson, was awarded the contract to develop Minimal Physical Fitness Standards (MPFS) for CAF members. The ERG was given relatively narrow margins in terms of scientific decision-making. DPERA provided them with the list of common tasks and what it wanted as a predictor, the STF.¹⁶ The work was then to define the correlations or the relationships between the tasks and the CF EXPRES and set minimal standards based on that relationship.

ERG's first task was to develop an objective way to standardize and measure the physical demands of the common tasks. The group assessed these tasks and determined that some would not elicit physical demands that would differentiate between different fitness levels. They therefore proceeded to a first round of refinement of the tasks. The study evaluated 132 CAF participants performing the common tasks in addition to the CF EXPRES and a few other laboratory measurements. Data analysis proved that the prediction was relatively

weak given the high variability in common task performance.¹⁷ The ERG consulted with CAF officials and proceeded to a second study with more precisely developed and altered task simulations to increase likelihood of predictability. This second study used five common “emergency-type” tasks comprised of a land evacuation, sea evacuation, entrenchment dig, low-high crawl and a sand bag carry. The researchers recruited a total of 208 participants, males and females from Canadian Forces Base (CFB) Borden and CFB Uplands, to perform the tests.

Unfortunately, notwithstanding the fact that the number of female participants was very close to the number of males, the proportion of females in older age categories was very limited. This posed a problem for accurate prediction of performance with this particular group.¹⁸ Furthermore, throughout the second phase of the project, males above 35 years of age were limited to exercising up to, but not exceeding, 90 percent of their age-predicted maximal heart rate (which is calculated as 220 minus age in years). This safety precaution was imposed based on guidelines from the American College of Sports Medicine that stipulated that males older than 35 should not exercise at maximal capacity unless directly supervised by a physician. The recommendation was therefore made to conduct subsequent sub-studies to look specifically at performances of females and older males to have higher confidence in the validation of the minimal physical fitness standards.

Consequently, the third phase of the MPFS project was to validate the standards on younger females and older males, as well as develop standards for older females. This part of the research was conducted at Queen’s University with 59 young females, 62 older males, and 28 older females, of various fitness levels. The results of the correlation between the CF EXPRES test items and the common tasks showed that the underlying fitness components differed greatly between males and females. In addition, the stepwise regression analyses showed that, on average, only 40 percent of common task performance could be explained by the fitness scores on the CF EXPRES. This led the researchers to adopt an empirical model, based on a proportion of “passers” and “failers”, to define the minimal physical fitness standards. Although the common military tasks had a single standard for all to begin with, the outcome of the MPFS 1988 study was four different sets of minimal physical fitness standards to achieve on the CF EXPRES: females below 35 years of age, females 35 and above, males below 35 and finally males 35 years of age and above.¹⁹

As part of the validation of the MPFS test of upper body muscular endurance, it was decided that both males and females would complete the standard (toe fulcrum) push-ups. Contrary to popular opinion, the knee fulcrum push-up was not based on physiologic or anatomic male/female differences. Its basis was that the women in the original study (STF) had difficulty doing toe fulcrum push-ups, so an alternative test (the knee fulcrum) provided sufficient numbers upon which normative data could be derived. To develop a toe-fulcrum push-up standard for CAF women, data was collected on 206 women who completed the five common military tasks and the CF EXPRES evaluation. This study was conducted during the period of 1989-1990 at the Canadian Forces School of Physical Education and Recreation (CFSPER), located at CFB Borden. Queen’s University was contracted to analyze women’s performance data and recommend appropriate numbers for use in the MPFS.²⁰

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As the ERG was conducting the last phases of establishing a new physical fitness standard, DPERA was also concerned about creating a comprehensive fitness program that would accompany the new test. A contract was awarded to ParticipACTION, a well-established and credible national non-profit organization created in the 1970s to promote physical activity and active living in Canada.²¹ ParticipACTION was mandated to develop the CF EXPRES Program, a suite of exercise prescription booklets based on commonly used fitness modalities, such as running, cycling, cross-country skiing, nautilus machines, etc.²² The concept revolved around the results of the CF EXPRES evaluation. Each CAF member would, at the end of their test, sit down with a PERI and receive an exercise prescription corresponding to the level of fitness they achieved on the test. Based on their preference of activity type the member would be given one or more exercise booklets containing progressive exercise prescription charts meant to increase the member's fitness level over time.

Given the size of the Regular Force in the late 1980s, one of the major drawbacks of the new CF EXPRES evaluation was the fact that the test required enormous amounts of time to administer. The step-test had to be administered one person at a time and supervised by one PERI. At close to 100,000 personnel to test annually, the PERI's were essentially confined to testing day-in and day-out. In an attempt to reduce the testing workload, DPERA proposed to the CAF leadership the creation of an incentive program based on age and gender norms derived from the Canadian population. The idea was that if an individual demonstrated a higher level of physical fitness, they would be exempt from the following year's test. Based on a positive reception, the bar was therefore set at the 60th percentile of the Canadian population based on the 1983 Canada Fitness Survey. The result of that incentive program, implemented in 1991, was a 30-35% reduction in the number of test administered each year.

Despite the implementation of the incentive program, the CF EXPRES evaluation remained a human resource intensive test. In the years following the incentive program, DPERA was searching for a way to transition from an individual test administration to mass fitness testing. DPERA stood-up "Operation Renaissance", which considered the use of the Université de Montréal Track Test, a continuous running test performed on a 400 metre track, and the Multi-Stage Aerobic Fitness test, also known as the 20 metre shuttle run (20mSR), that could be performed in a gymnasium. Both of these protocols had been developed by Dr. Luc Léger and his collaborators at the University of Montreal and were very accurate progressive tests to assess maximal aerobic speed, which was then translated into maximal oxygen consumption (VO_2 max). For logistical and environmental reasons, the track test was not the preferred option, but the 20mSR was certainly a viable one to replace the step-test. In 1996, after submission of the final report of a feasibility study, DPERA implemented the 20mSR as the aerobic component of the CF EXPRES for CAF personnel below age 35, but kept the step-test (CAFT) for older personnel. Given the fact that the 20mSR was a maximal test versus the sub-maximal step-test, the decision was based on simple risk-management practices. In June 1997, the age limit was raised to include CAF members 39 years old and below, given a positive health questionnaire response profile. As of 1999, the 20mSR was applied to all CAF personnel. The CAFT remained a testing option only for personnel requiring a modified protocol for medical reasons.

Land Forces Command Physical Fitness Standard

Very early on in the MPFS 1988 study, the Army opted not to participate in the research. They expressed their desire to have a more robust occupational fitness evaluation that would be task-based, as opposed to relying on a fitness test predicting work performance.²³ The Army had used different tests or fitness programs in the recent past in spite of the CAF sanctioned programs. The most widely known one was the Battle Efficiency Test (BET), otherwise known as the “2x10”, march-and-shoot-type event comprised of consecutive days of marching for 10 miles (16 km).²⁴ When the Israeli Defence Forces published studies in the late 1980s on the use of weight loaded marching as a fitness measure for infantry soldiers, it certainly caught the Army’s attention. Newly appointed Commander of Mobile Command, Lieutenant-General Kent Foster requested that a research project be conducted to provide Force Mobile Command with such a fitness test. The University of Alberta was selected to conduct the project and Major Wayne Lee, a DPERA officer, was chosen to complete a PhD post-graduate program on the topic. The result of the research led to the implementation of the Land Forces Command Physical Fitness Standard (LFCPFS), also known as the Battle Fitness Test (BFT). The task-based test included a 13 kilometre weight-loaded march, followed by a 100 metre casualty rescue in the form of a “Fireman’s carry”, a trench dig and an ammunition box lift.²⁵

The recommendations for the new test were briefed to Force Mobile Command Council in 1991. The trench dig and ammunition box lift tasks were rejected, as they were believed to be too difficult to administer. Thus, these tasks were never implemented as part of the LFCPFS. However, in later years, the trench dig was added on select Canadian Forces Bases where it could be administered. Members of the Land Forces were required to achieve the age and gender-free standards on the LFCPFS on an annual basis and were exempt from attempting the CF EXPRES unless failing to meet the LFCPFS. The Chief of the Land Staff also chose to impose the BFT on all CAF personnel deploying to an Army-led mission. In 1995, after a Chief of Defence Staff (CDS) visit in the midst of the Peace Keeping mission in Bosnia, Task Force commanders requested that considerations be made to make the LFCPFS the CAF Minimal Physical Fitness Standard in lieu of the CF EXPRES. A Tiger Team was mandated to provide recommendations to the CAF leadership and it concluded that the LFCPFS did not depict an accurate reflection of the Universality of Service principle and therefore the request was turned down.

Commanding Officers and other members in the chain of command had the authority to set training objectives to ensure that personnel were ready to carry out their duties, particularly those in the field. Training Objectives such as a “CO’s challenge” were regarded as progressive gateways through which soldiers were expected to pass prior to going on to other activities. These training objectives were not considered as physical fitness standards like the LFCPFS and/or the MPFS. The Army briefly experimented with another fitness program in the mid-1990s. The Commander of the Land Forces Command Central Area, Brigadier-General Vernon, championed an initiative called the “Warrior Program”, comprised of a 3.2 kilometre run in light fighting order, combined with a marksmanship competition. Although the program initially showed promising results because of its reward system, it was only short-lived.

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Contrary to Canadian Forces Administrative Order (CFAO) 20-1, the 3.2 kilometre run was not developed in conjunction with DPERA or the Chief of Health Services staffs. In fact, both organizations had significant concerns with the test, particularly of running in combat boots. The validity of the 3.2 kilometre run was also being challenged at all levels, from Area Commanders and down, and no research had been completed to support it. In November 1997, the Commander LFC decided to cancel the conduct of the 3.2 kilometre run. He reinstated the LFCPFS as the physical fitness test for deployable Units and the CF EXPRES test for non-deployable Units. The last change to the LFCPFS happened in 2010. Requested by the Chief of the Land Staff and supported by extensive research, the casualty evacuation task was modified from the original “Fireman’s Carry” to a casualty drag. This change reflected more accurately the nature of the task as performed in current combat operations.²⁶

More recently, commercial programs have, in some cases, greatly influenced Army leadership in their perception of what type of training soldiers need to be ready for combat operations. Programs such as Crossfit, developed by Ken Glassman in California, have made their way into many Army units. Crossfit, a mix of Olympic weight lifting, gymnastics and circuit-training, is a high-intensity training program based on random programming of exercises that challenges its participants to compete against time and other training partners.²⁷ The Crossfit training philosophy tapped into the very nature of combat arms soldiers, who thrive on being challenged and being accountable for their performance. Unfortunately, despite having many positive benefits, Crossfit also creates issues. The popularity of Crossfit forced the Personnel Support Programs (PSP) fitness professionals to take an in-depth look at how they were developing fitness programs and to adapt it to a new reality. The nature of Crossfit workouts create a high risk for injuries and potential serious medical conditions such as rhabdomyolysis, which can lead to renal failure. For these reasons, the CAF Surgeon General issued a Canadian Forces general message (CANFORGEN) in 2012 to address concerns with high intensity training programs and urged commanders to use PSP approved training programs.²⁸

Minimal Physical Fitness Standards 2000

Almost eight years after implementation, the CF EXPRES was showing some limitations in addition to its lack of recognition in the Army. There were a number of issues that warranted a revision of the test and the standards. The age and gender differences in the predictive model were certainly not well understood and accepted by the CAF population. The American College of Sports Medicine, in 1991, had revised its position on maximal testing of people above age 35. It no longer precluded maximal testing, which meant that the age differences in the CF EXPRES could potentially be removed. The adoption of the 20-metre shuttle run as replacement to the step test and other slight modifications in testing protocols from the CSTF had not undergone the same validation with the common military tasks. Highly influential Human Rights cases in different parts of the country had contributed to narrowing the guidelines for employers in defining BFORs.²⁹ Finally, it was also perceived that some common military tasks identified and developed towards the end of the Cold War might have evolved or changed in the decade that had passed. All those arguments were made by the newly created Canadian Forces Personnel Support Agency’s

PSP leaders and experts to commission a study to revalidate the findings of the MPFS 1988 project. In 1996, Queen's University ERG was once again chosen to conduct the research, given their experience and knowledge acquired in the initial MPFS study.

After conducting a survey of various CAF missions, the ERG proposed the addition of a sixth common military task: a repetitive jerrican lifting task. It also proposed to include lower-body strength measurements as potential predictors on military task performance. The study recruited more than 600 CAF participants, with equal numbers of males and females, from three separate bases (Halifax, Petawawa and Trenton) representing the three military environments. The outcome of the study was the CF EXPRES components, with the addition of a leg dynamometer test to measure leg and back strength and a vertical jump to measure leg power.³⁰ The most interesting change was in the proposed minimal standards. ERG suggested a compensatory model based on a points system for each test item. This system would have required CAF personnel to meet a given minimal result, based on gender-free and age-free standards, on each of the test item, but also for them to reach an aggregate score that was higher than the addition of each minimal test component score. This essentially meant that participants had to compensate for weaknesses by performing higher in one or more of the other test items in order to achieve success on the fitness evaluation. The recommendations of the MPFS 2000 study were briefed to different levels of leadership in 2001 but never made it to the Armed Forces Council (AFC) for approval. The Army and the Air Force were receptive to the changes but the Navy was reluctant to change the existing CF EXPRES program in light of the high projected female failure rates and potential second-order effect on recruiting practices and intake. Hence, MPFS 2000 was never implemented.

The Canadian Forces Health and Physical Fitness Strategy

Early on in his tenure as the CDS, General Rick Hillier became concerned about the state of physical fitness in the CAF. The 2004 CF Health and Lifestyle Information Survey (HLIS), a self-reported health measure survey conducted every four years, had just been released and the results showed that the CAF population was becoming slowly more sedentary, less deployable, and less fit for the job.³¹ On the other hand, the ongoing combat mission in Southern Afghanistan was a brutal reminder that the physical demands of serving in the CAF can be quite high. General Hillier made physical fitness one of his leadership priorities and tasked the Chief of Military Personnel to develop a guiding strategic document to address the health and physical fitness in the Canadian Forces. After fourteen months of work, the CF Health and Physical Fitness Strategy was launched on 1 April 2008. This strategy was founded on four guiding principles and seven lines of operations, providing direction not only in the realm of physical fitness but on healthy nutrition and weight, addiction-free living as well as addressing issues related to the ownership and governance related to those goals.³²

The CF Health and Physical Fitness Strategy was the first effort of its kind to influence what, where, when and how fitness was being researched, delivered and assessed. Although

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it was launched by the CDS and originally promulgated throughout the upper CAF leadership, it never really made it to the rank and file of the organization and in a sense, fell short of truly influencing the grass-root culture of physical fitness and health in the CAF the way it was originally envisioned. Nonetheless, it brought many positive changes along the way. It led to the creation of a whole new range of adapted specialized programs and services for ill and injured personnel, increased support for personnel serving outside the country (OUTCAN) and clearly articulated the need to focus physical fitness towards increasing operational readiness of the entire force vice simply getting fit to pass a yearly fitness test.

The strategy contained a number of recommendations and action points related to each line of operations. For physical fitness in particular, one of the points it identified was the need to re-validate the annual fitness evaluation. This was to ensure that the premises defining the Universality of Service principle were still relevant and provided an accurate reflection of the physical demands placed on CAF personnel in current types of military operations. Given the fact that the research that led to the adoption of the CF EXPRES program had been conducted more than 25 years earlier, the expectation was that the nature of operations, the doctrine, the equipment as well as the composition of the CAF population itself had potentially changed since the end of the Cold War. A clear mandate was therefore given to the newly created Directorate of Fitness (DFIT) to tackle this project. Initially, the direction was to look at the physical fitness requirements for each environmental command (Maritime, Land and Air), but within the first year of research both the Chief of the Air Staff and Chief of the Land Staff clearly expressed their discontent with the concept. Therefore, the decision was made to develop a fitness evaluation and minimal standards that would encompass common CAF demands and be applicable to all CAF personnel, regardless of the colour of their uniform.

The Strategy also marked a subtle shift in the way research was to be conducted in physical fitness. Past efforts in developing fitness standards were derived either by adopting existing research and methods, such as the Cooper Test, or relying on external contractors to perform the research, like Queen's University for the CF EXPRES evaluation or the University of Alberta for the LFCPFS. For this new direction, the decision was made to create a human performance research team within the Directorate of Fitness to take on this new project. A small PSP internal research capability had proven to be highly responsive, flexible and productive with Joint Task Force Two (JTF2) and with the CAF counter-terrorism unit. The concept was to emulate this model and build a research team that would not only develop a new fitness test for the CAF, but also provide a reliable scientific backbone to maintain a solid knowledge base on cutting-edge, evidence-based information related to physical fitness. This group of scientists would also act as strong and stable assets for a legal defence in the event of a court challenge.

The 'Force' Program

The work on the development of a new fitness test was initiated in 2010 with the publication of a Chief Military Personnel Strategic Initiating Directive (CMP SID 04/10).³³ This directive clearly outlined the mandate, the process, the stakeholders and

their respective responsibilities in order to achieve the goal. The project called FORCE (Fitness for Operational Requirements of CAF Employment) started out with the creation of a project management team (PMT) comprised of representatives from every Command (force generators and employers) and representatives from the medical group, human rights and diversity, military careers, policy and grievances, as well as legal representation from both military personnel law and the CAF legal advisors. This group of stakeholders would serve, over the course of the entire research process, to provide guidance as well as potential facilitators for the research team conducting the project. The PMT also became a final sounding board before the research would be presented to the chain of command.

As was done in 1983 for the original MPFS study, the initial phase of Project FORCE was to fully understand the nature of the physical requirements that reflected the common duties within the CAF. The scope of the initial literature and document review spanned from the Oka Crisis in July 1990 to 2010 and included all missions, either on Canadian soil or abroad, in which CAF personnel had been involved or deployed. This exercise allowed the researchers to collate an extensive list of potentially physically demanding tasks performed by CAF personnel reported in several documents. In addition to what was collected, the team supplemented that list with surveys conducted with personnel who had recently returned from various missions in 2010. These missions were diverse in scope and nature and included humanitarian aid (in the wake of the devastating earthquake in Haiti), security (as part of the 2010 Vancouver Olympics and the G8/G20 Summits), support to civilian authorities (after hurricane Igor in Newfoundland) and the ongoing combat mission in southern Afghanistan.

Based on the survey results, follow-up interviews were conducted with personnel who had been personally involved in demanding tasks during these missions. The result of that data collection was a list of more than 450 tasks that were deemed physically demanding, but not necessarily common to all CAF personnel. In order to determine those common tasks, two separate groups of experts were recruited from Canada Command (CanadaCOM) and Canadian Expeditionary Force Command (CEFCOM) respectively, representing domestic as well as foreign mission planners. They were convened and asked to reduce the list to tasks that had or could be asked of any CAF personnel regardless of age, gender, rank or occupation. At the end of that initial phase of research and after vetting it through the PMT, the team presented a list of 13 common, essential and potentially physically demanding tasks to the CAF leadership.³⁴

Upon receiving approval in principle by the Armed Forces Council in December 2010, Project FORCE continued with the second phase of the process. This phase was to quantify or measure the physical demands of the 13 tasks previously approved by the chain of command. This was done in three steps. First, all of the tasks needed to be clearly defined and validated by subject matter experts (SMEs). To do so, the Navy, the Army and the Air Force each provided participants who would qualify as SMEs for each task, ensuring both male and female representation. In the end, for each task, the research team relied on nine SMEs to create a plausible and realistic operational scenario in which the task had or could be performed. For each scenario, the different groups of experts defined all the variables that needed to be considered for eventually measuring the physical

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demands of the task. These variables included the number of personnel involved, the type of equipment worn or used, the environmental conditions, threat level, work-to-rest ratios, acceptable techniques and work rates.

Once completed, certain tasks were measured in a human performance laboratory and others were simply re-enacted by CAF personnel on two separate bases. As CAF personnel performed the task, researchers would measure physiological parameters such as oxygen consumption and heart rate and collect information on speed and distances covered, weights of equipment, heights, types of material handling, rating of perceived exertion as well as techniques being used. The participants who were recruited to carry out these scenarios were selected based on their gender, body size and level of experience with the task to ensure a wide representation of physical performance and demands. The last step in the second phase was to make sense of the information collected. As all the measurements were compiled and compared, the researchers were able to start by eliminating tasks that simply did not elicit very high physical demands. They then combined tasks that showed similar demands into more generic tasks and finally concentrated tasks to their most demanding components. At the conclusion of the second phase of Project FORCE, the researchers presented a list of six common and physically demanding tasks to Armed Forces Council. Once approved, these tasks essentially became job simulations that all CAF personnel would be required to perform to satisfy the physical component of Universality of Service. These six common military tasks were escape to cover, sandbag fortification, pickets and wire carry, picking and digging, vehicle extrication and stretcher carry. These tasks would therefore become the 'gold standard' evaluation for service in the CAF.³⁵

Although an accurate reflection of the physical demands of service, these six tasks were not conducive to annual mass testing of the entire CAF population. There was a need for simpler proxy or predictive test to assess CAF personnel's fitness. Hence, the last phase of the project was the development of a time and equipment efficient predictive test that would be more accurate than the CF EXPRES in determining who can and cannot do the job. Reliable simulations of the six common military tasks that could be reproduced indoors in a controlled environment were developed. The research team assessed an extensive list of potential field expedient fitness component tests that had been used in the past in military, high performance sports or other areas and chose eight tests that would be considered as potential predictors of performance on the common military tasks. Among the main issues with the CF EXPRES was the lack of face validity of the test (the fact that the test looked nothing like their job) and the separate standards based on age and gender. Even though the former five common tasks had universal standards for age and gender, the optics of the test were not good and the rationale was never really well understood by the CAF population.

One of the mandates of the team was to try to bridge the gap between a relatively complex task simulation and the use of a very simple fitness test, like a push-up. To achieve this, one of the strategies chosen by the research team was to develop a new type of test, using a generic weight or external load as part of the test as opposed to using body weight of the individual as the resistance. The most common weight found in the CAF hovered around 20 kilograms, representing, for example, a jerrycan full of fuel or an ammunition

box. A 20 kilogram multi-purpose sandbag was chosen to represent this load. The team developed five 'simple' simulations custom-designed to replicate CAF tasks. The simple simulations were comprised of a sandbag lift task, a sandbag drag, the farmer's walk, intermittent loaded shuttles, and 20 metre rushes.

Consequently, Phase Three of Project FORCE consisted of assessing a wide sample of CAF personnel performing the six common military tasks, the eight field expedient tests, as well as the five simple simulations, to their maximal capabilities. The two latter categories were considered predictive tests and once data was collected would be analyzed to find the best fitting correlations between those predictive tests and the common tasks. The data collection was conducted at seven different sites to cover all three environments and a wide array of age, gender and occupations. More than 660 CAF personnel participated in the study. Data was collected from CFB Halifax for the Navy, CFB Shilo, CFB Petawawa and Base des Forces canadiennes Valcartier for the Army, and 12 Wing Shearwater and 17 Wing Winnipeg for the Air Force. CF Support Unit Ottawa was used to represent a more senior population as well as occupations not necessarily linked to a specific environment (i.e., 'purple' trades).

After analyzing the data, the DFIT human performance research team proposed three separate predictive test options to the chain of command. The first was a test comprised of four of the five simple simulations, the second was three field expedient tests and the third was a hybrid version combining some simple simulations with some field expedient tests. When considering logistical imperatives such as time to administer, resources and personnel requirements along with the scientific strength of the statistical relationships, the first option was put forward as the preferred option. Therefore, the leadership of the CAF decided that the new annual fitness test, to be called the FORCE Evaluation, was going to be a simple simulation test comprised of 20-metre rushes, a sandbag lift, intermittent loaded shuttles and a sandbag drag, all with age and gender-free standards. This represented a radical shift from what had been used previously to assess fitness in the CAF. By choosing this option, the CAF was now adopting a functional test and a unique physical employment standard more adequately designed to meet its BFOR needs.

As part of the CF Health and Physical Fitness strategy, the DFIT team developed a new model for exercise prescription concurrently with the development of the FORCE evaluation. The exercise prescription was intended to support both a more operationally-focused culture of fitness and the new annual fitness evaluation based on the demands of the job. The team was inspired by the 'tactical athlete' concept, where incumbents working in physically demanding jobs like the military, firefighting and law enforcement are viewed as tactical athletes requiring well laid out training programs similar to high performance athletes. Using the task analyses conducted in all three environments coupled with the one conducted as part of project FORCE, researchers, strength and conditioning specialists, and seasoned PSP fitness instructors created an exercise prescription algorithm. The algorithm aligned traditional physical fitness workouts to more functional training and operational simulations in a well-planned mix of all components deemed essential for ensuring optimal operational readiness. The algorithm was then incorporated in an interactive and comprehensive web platform that would allow CAF personnel to

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generate personal or group exercise programs, customized to their schedules, timelines and equipment availability.³⁶ In doing so, the exercise prescription tool was now available to Regular and Reserve Force personnel anywhere in the world, accessible from either their work or home computer. This tool was primarily designed to help CAF personnel in charge of setting up physical training for their sections or units, those without direct PSP fitness professional support, OUTCAN personnel and Reserve units. These military members often have limited resources and equipment to conduct fitness training, hence this program was deemed an excellent tool to support the Health and Physical Fitness Strategy.

Other Canadian Armed Forces Physical Fitness Tests

One of the oldest tests used in the CAF is the Royal Military College Physical Performance Test (RMCPPT). Rich in tradition with the College's culture and curriculum, the RMCPPT has now been utilized for more than 40 years.³⁷ It is a comprehensive fitness evaluation that also evolved with the times and various organizational military changes. Some of its components have changed, from the chin-ups to the push-ups and the 1.5 mile run to the 20mSR, but the test continues to demand a high level of physical fitness from the officer cadets attending the military colleges.

Over the course of the last two decades, a number of other types of fitness evaluations have been adopted or developed to suit particular needs within the CAF. Certain specialized courses, such as the basic parachutist course, still require its applicants to demonstrate specific attributes related to aerobic capacity and upper body strength. Combat arms soldiers attending the U.S. Army Ranger course must also achieve higher levels of physical fitness assessed, in this case, by a U.S. Army test applied to CAF members. As of 2005, Close Personal Protection (CPP) course candidates have had to achieve a fitness standard on a test derived from British Royal Military Police and Special Air Service (SAS). That being said, the research work completed by DFIT in 2016 to scientifically validate these course demands and amend the fitness tests accordingly. More demands have surfaced for the development of physical fitness evaluations for specialized trades like Firefighters and Search and Rescue Technicians. In both instances, Queen's University continued to be involved in the development of these trade-specific evaluations that were implemented in 1996 and 1999 respectively.³⁸ With the implementation of the FORCE Evaluation in 2013, some of these specialized trades now utilize modified versions of FORCE to suit their needs and ensure that their incumbents not only achieve the requirements of Universality of Service but also the specific demands of their occupational specialty.

Another group of specialists believed to require high levels of fitness was CAF divers, which encompass combat divers, clearance divers, ship's team divers and port inspection divers. They had requested a similar type of test in 2000 and more than four years of research was devoted to the project by researchers at the University of Victoria and a modest trial was conducted across a few units. However, in 2007 the Director of Diving Safety rejected the proposed task-based test, judging that the logistics of the test would be too difficult to

manage, and had reverted back to using the CF EXPRES until DFIT proposed a modified FORCE Evaluation designed to assess diving physical demands in 2014.

In 1993, when the CAF took over the counter-terrorism mandate from the Royal Canadian Mounted Police (RCMP) and created JTF2, it maintained the fitness standards previously utilized by the RCMP, referred to as the Cooper Test (for its use of the 1.5 mile run). In 2000, after in-depth research was completed, the unit adopted a customized physical fitness maintenance standard applied to its primary operators, the special operations assaulters. This was to be the first of a number of subsequent projects to provide the new Canadian Special Operations Forces Command (CANSOFCOM), with operationally relevant fitness tests and standards. Since then, the Canadian Special Operations Regiment (CSOR), Special Operations Coxswains and the Canadian Joint Incidents Response Unit (CJIRU) have completed efforts to develop and adopt Job Specific Tests (JST) specifically designed and validated to meet their operational mandates.

The Future of Fitness Testing in the Armed Forces

The CAF has come a long way in the past 40 years in its approach to physical fitness. It has evolved from using fitness standards borrowed from different organizations and set on population norms, to developing linkages between common military tasks and specific fitness constructs measured by easily administered fitness tests like the CF EXPRES, to now using more functional evaluations that strengthen the connection between the job and fitness. With tests such as the FORCE evaluation that include loads and movements reflective of true operational tasks, when CAF members maintain their fitness and prepare for their yearly evaluation, they now also prepare for the demands of their work. This evolution has been driven primarily by the unique Canadian legal framework and the considerable investments made in physical fitness research and development. Operationally relevant fitness programming and the qualified professionals who deliver fitness programs at Bases and Wings across the country have certainly contributed to establishing the CAF as a world-leading organization in operational, tactical physical fitness. The Canadian Human Rights Act has forced Canada to adopt rigorous and innovative approaches to scientifically link fitness requirements to the job. The CAF's proactive and forward-thinking approach is recognized by the U.S. military, who are seeking advice following the opening of their combat occupations to women.

The CAF will certainly go through a number of adjustments to the FORCE program in the near future. The very nature of how, and more precisely why, fitness evaluations are developed in Canada is bound to be criticized by many. In particular, the joint nature of the organization and the definition of Universality of Service tend to exclude some of the more demanding tasks on the premise that they do not apply to all environments. This results in certain groups voicing concerns that the test does not meet entire needs. One other major shortcoming of the process of establishing a BFOR is the necessity to directly link physical fitness to performance on the job. This limits the employer to only consider physical ability to do specific tasks and excludes more long-term effects of physical fitness on employer costs such as sick days taken, prevalence of diseases, and productivity. As a matter of fact, what the CAF has used in the past 30 years as a fitness model is much more

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akin to a Physical Employment Standard than a physical fitness test. Results on the yearly evaluation have been, and will likely continue to be, driven by the level where the standard is set. CAF personnel, in large part, do not perform to the level of their maximal physical capabilities but simply aim to 'pass' the test. Unfortunately, this does not provide a true assessment of physical fitness.

In consideration of these potential issues, DFIT worked on a number of initiatives to address some of the gaps that the new FORCE program left unanswered. As in the early days of the EXPRES program, the Army adopted the FORCE evaluation but expressed some concerns that the minimal standards were not sufficient for its members. After analysis of all essential physical tasks of every Army occupation published in the Occupational Fitness Standards Project reports, this is not necessarily accurate. The vast majority of Army trades are well served by the FORCE evaluation, but it is true that combat-specific occupations such as Infantry, Combat Engineers and Artillery and some combat support specialties such as signalers and combat medics, which typically operate alongside front line troops, do experience higher aerobic demands as well as require heavy load bearing capabilities.

DFIT researchers anticipated these concerns and proposed some modification to the FORCE evaluation to the Army senior leadership in the Spring of 2015. Based on Army-specific task analyses conducted in 2009-10 on load bearing requirements and predominant urban operations, a modified FORCE comprised of a loaded march preceding the FORCE evaluation performed as a circuit wearing fighting order (helmet, weapon, ballistic protection and tactical vest) was tested in laboratory settings as well as in the field with operational units. FORCEcombat as it is called, is in its final stages of research and development and will be implemented in April 2017 to specific units/groups within the Army. This approach ensures that personnel achieving this modified FORCE evaluation will not only meet their specific occupational demands, but also satisfy Universality of Service in a single test. This concept is also applicable to most other specialized trades in the CAF and the future of the FORCE evaluation might very well be a suite of different versions of the same test, with modifications to certain standards or with the addition of supplementary components.

As the CAF terminated the use of the CF EXPRES, it also ended the incentive program and the evaluation exemption. When the FORCE Evaluation was approved by the Armed Forces Council, General Tom Lawson, the CDS, mandated the team to develop a new incentive program to motivate CAF members to perform above the minimal standards. DFIT worked on a comprehensive evidence-based fitness profile comprised of an Operational Fitness score based on performance on each component of the evaluation and a Health-Related Fitness score, based on predicted aerobic capacity and measure of their waist circumference, a proxy for measuring body composition. The health-related scores are based on medical recommendations: longitudinal study results linking low aerobic capacity and body composition to higher risk of developing certain types of chronic diseases such as cardiovascular disease and type 2 diabetes.³⁹

The FORCE Fitness Profile, introduced on 1 April 2016, is now being used to measure the CAF's fitness status at the individual level, but can also be used at any level of the organization. In April 2017, the incentive program will be implemented with a suite

of individual rewards, ranging from merit points counting towards promotion, material rewards and, for the most fit, a pin to be worn on the dress uniform. A system of group rewards will also be adopted by each Command to reinforce that fitness is not just an individual responsibility but a collective one as well. The FORCE Fitness Profile is one of the new measures introduced to contribute to building and sustaining a strong culture of health and physical fitness in the CAF.

The CAF has, in the last decade, taken a very proactive and innovative approach to physical fitness for its members. It has led the way in terms of research in occupational physiology and certainly influenced a number of our allies in their attempts to modernize their fitness standards and programs. It has also influenced other government agencies within Canada and has taken a leadership role in helping many of them to establish new evaluations and programs for both selection and maintenance of their workforces. Among them are the Royal Canadian Mounted Police (RCMP), the Canadian Border Services Agency (CBSA), and the Canadian Space Agency (CSA). The CAF continues to develop its approach to physical fitness. A new CAF Health and Fitness Strategy is planned to be released in 2017-2018. The conceptual framework guiding this new strategy will be based on a whereby efforts will be made at multiple levels of the organization to ensure congruence and support for an active and healthy lifestyle throughout the CAF.

Endnotes

1. Wikipedia, <http://en.wikipedia.org/wiki/Bill_Orban>, accessed 18 July 2013.
2. CBC Digital Archives, <<http://www.cbc.ca/archives/categories/lifestyle/fitness/getting-physical-canadas-fitness-movement/5-basic-exercises.html>>, accessed 18 July 2013.
3. Royal Canadian Air Force, *XBX Plan for Physical Fitness*, (Ottawa: Queen's Printers, 1967).
4. Wikipedia, <http://en.wikipedia.org/wiki/Kenneth_H._Cooper>, accessed 18 July 2013.
5. National Defence, *Physical Fitness Training in the Canadian Forces – Volume 1* (DPERA: 1982).
6. S. Wayne Lee & Major L. Clark, *Task Related Physical Fitness and Performance Standards – A Canadian Forces Approach*. Brief to the Human Rights Commission on Canadian Forces Fitness Standards (National Defence, Ottawa: 1997).
7. *Ibid.*, 5.
8. Interview Maj (ret'd) S. Wayne Lee, PhD (31 July 2013).
9. Fitness and Amateur Sports Canada, *Canadian Standardized Test of Fitness Operations Manual - 2nd edition* (Ottawa: 1981).
10. Maurice Jetté, John Campbell, Jean Mongeon, & Richard Routhier, "The Canadian Home Fitness Test as a Predictor of Aerobic Capacity", *Canadian Medical Association Journal*, Vol. 114 (1976), 680-682.
11. In descriptive statistics, a decile is any of the nine values that divide sorted data into ten equal parts, so that each part represents 1/10 of the sample or population.
12. <<http://www.mapleleafweb.com/features/canadian-human-rights-act-introduction-canada-s-federal-human-rights-legislation>>, accessed 21 July 2013.
13. Government of Canada, Justice Laws website, <<http://laws-lois.justice.gc.ca/eng/acts/H-6/page-4.html#s-15>>, accessed 21 July 2013.
14. *Ibid.*, 12.
15. *Ibid.*, 8.
16. Joan M. Stevenson, George M. Andrew, J. Timothy Bryant, John M. Thomson, *Development of Minimal Physical Fitness Standards for the Canadian Armed Forces – Phase I*, Final report to DCIEM contract # 8SE85-00017 (School of Physical and Health Education & Department of Mechanical Engineering, Queen's University, 1985).

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17. Ibid., 15.
18. Joan M. Stevenson, George M. Andrew, J. Timothy Bryant, John M. Thomson, Sheryl L. French, & Leslie L. Langley, *Development of Minimal Physical Fitness Standards for the Canadian Armed Forces – Phase II* (School of Physical and Health Education & Department of Mechanical Engineering, Queen's University, Final report to DCIEM, 1987).
19. Joan M. Stevenson, George M. Andrew, J. Timothy Bryant, John M. Thomson & Sheryl L. French, *Development of Minimal Physical Fitness Standards for the Canadian Armed Forces – Phase III* (School of Physical and Health Education & Department of Mechanical Engineering, Queen's University, Final report to DPERA, 1988).
20. Suzanne Jaenen & N. McKenzie, *Validation on toe-fulcrum push-ups for women* (Ottawa: DPERA, 1995).
21. ParticipACTION History Timelines, *The ParticipACTION Archive Project*, <<http://scaa.sk.ca/gallery/participation/english/structure/timeline.html>>, accessed 5 August 2013.
22. CF ExPRES Programme, DFIT resources webpage, <<https://www.cfmws.com/en/AboutUs/PSP/DFIT/Documents/Publications%20and%20Reports/Exercise%20Prescription%20Program.pdf>>, accessed 25 July 2013.
23. National Defence, “Physical Fitness Training”, *The Dispatches*, Vol 6, No. 1 (May 1999).
24. Ibid., 5.
25. Mohan Singh, S. Wayne Lee, Garry Wheeler, Paul Chanal, Margret Oseen & Roger Couture, *Task Related Physical Fitness and Performance Standards for the Canadian Army* (University of Alberta, 1991).
26. Tara Reilly & Simone Olinek (2013). “Predicting casualty evacuation performance for the Canadian land forces command”, *Occupational Ergonomics*, Vol. 11 (2013) 1-9.
27. Howard A. Wenger, *The AFM – CrossFit Report*, Final Report submitted to CFPSA (2006).
28. National Defence, CANFORGEN 160/12 CMP 071/12 311442Z AUG 12, Exertional Rhabdomyolysis and Intense Exercise/Conditioning Programs.
29. Canadian Human Rights Commission, *Bona Fide Occupational Requirements and Bona Fide Justification under the Human Rights Act - The Implications of Meiorin and Grismer* (2007), <http://www.chrc-ccdp.ca/sites/default/files/bfore_0.pdf>.
30. J.M. Deakin, R. Pelot, J.T. Smith & C.L. Weber, *Development and Validation of the Canadian Forces Minimum Physical Fitness Standards (MPFS 2000)*, Final report to CFPSA (Ergonomics Research Group, Queen's University, 2000).
31. National Defence, *Health and Lifestyle Information Survey of CF Personnel – 2004 Regular Force Version* (Canadian Forces Health Services, 2004), <<http://cmp-cpm.forces.mil.ca/health-sante/pub/hlis-sssv/pdf/HLIS-SSSV-2004-Reg-eng.pdf>>.
32. National Defence, *Canadian Forces – Health and Physical Fitness Strategy* (Ottawa, ON, 2008).
33. Chief Military Personnel Strategic Initiating Directive 04/10, <<http://cmp-cpm.forces.mil.ca/sid-dis/doc/ssid-edmcs-0410.pdf>>.
34. Michael Spivock, Tara Reilly, Philip Newton, Rachel Blacklock, Suzanne Jaenen, *Project FORCE Phase I Report: Identification of common, essential, physically demanding tasks in the CF* (Ottawa: Department of National Defence, Assistant Deputy Minister (Science and Technology), 2010).
35. Tara Reilly, Rachel Blacklock, Philip Newton, Simone Olinek, Katherine O'Hearn & Michael Spivock, *Project FORCE Phase II Report: Physical Demands of common, essential, physically demanding tasks in the CF* (Ottawa: Department of National Defence, Assistant Deputy Minister (Science and Technology), 2013).
36. Ibid., 35.
37. See <[https://www.cfmws.com/en/AboutUs/PSP/DFIT/Fitness/Pages/Royal-Military-College-\(RMC\).aspx](https://www.cfmws.com/en/AboutUs/PSP/DFIT/Fitness/Pages/Royal-Military-College-(RMC).aspx)>.
38. J.M. Deakin, R. Pelot, J.T. Smith, J.M. Stevenson, J.M. & L.A. Wolfe, *Development of a Bona Fide Physical Maintenance Standard for CF and DND Fire Fighters*, Final report to CFPSA (Ergonomics Research Group, Queen's University, 1997); J.M. Deakin, R. Pelot, J.T. Smith, & C.L. Weber, *Development of a Bona Fide Physical Maintenance Standard for CF Search and Rescue Technicians*, Final report to CFPSA (Ergonomics Research Group, Queen's University, 1999).
39. Tara Reilly, Michael Spivock & Audrey Prayal-Brown, *The Fitness Profile – A case for assessing aerobic fitness and body composition within the FORCE Evaluation* (Ottawa: Department of National Defence, Assistant Deputy Minister (Science and Technology), 2013).

CHAPTER 3

PHYSICAL FITNESS IN THE CANADIAN ARMED FORCES: THE BENEFITS TO INDIVIDUALS

Craig Leslie Mantle, PhD

Physical activity is one of the most important components of successful health promotion and disease prevention for individuals and communities.¹

The positive correlation between high levels of fitness and overall physical and mental health is indisputable.² Medical organizations in North America and Europe, ranging from the Canadian Medical Association to the Mayo Clinic, from the Centers for Disease Control and Prevention to the World Health Organization, all agree that engaging in some form of physical activity has numerous beneficial effects. Despite its well-publicized and widely acknowledged benefits however, fewer and fewer Canadians are pursuing an active lifestyle as compared to the past. As a result, the prevalence of obesity in Canada is reaching alarming proportions;³ the situation in both the United States and the United Kingdom, and elsewhere as well, is no less dire with obesity rates doubling, and in some cases tripling, over the past 30 years.⁴

The Benefits to Individuals of Physical Fitness

Numerous advantages can be gained through participation in some form of physical activity. While physical benefits are perhaps the most obvious and easy to identify, exercise also imparts a range of psychological and social benefits that likewise aid in the establishment and maintenance of good overall health. As a result, it can honestly be said that physical fitness positively affects one's "mind, body and spirit." A note of caution, however, is required. Although physical activity has many benefits and is advantageous to health, it does not confer *immunity* against physical and mental ailments. Amateur and professional athletes alike can still suffer from serious medical challenges despite a sometimes impressive commitment to maintaining health through physical activity.⁵ Rather, with the correct frequency and intensity,⁶ exercise would seem to *reduce the risk* for the premature development of chronic health conditions and mortality.

Physical Benefits⁷

There are a number of general health benefits associated with physical fitness. Some of the most important include:

- a more ideal blood pressure;
- improved cholesterol levels (increased HDL (high-density lipoprotein) or “good” cholesterol and lowered LDL (low-density lipoprotein) or “bad” cholesterol);
- reduced risk of developing certain cancers, most notably of the colon and breast, although research has suggested that increased levels of physical fitness may also help protect against cancers of both the lung and, in women, the endometrium (the lining of the uterus);
- increased endurance and resilience to injury;
- increased life expectancy;⁸
- lowered risk of developing functional limitations (a loss of the ability to do everyday activities);⁹
- improved cardiovascular fitness, which equates to a reduction in the likelihood of suffering from heart disease or stroke;
- stronger muscles, which equates with an increased ability to perform physical tasks;
- increased energy and less fatigue overall;
- stronger bones and the slowing of the loss of bone density (osteoporosis), an especially important consideration in post-menopausal women; and,
- for individuals suffering from arthritis, an improved ability to manage pain.

Perhaps the most significant advantage of physical activity is the prevention of unhealthy weight gain that, if left uncorrected, can lead to obesity and premature death.¹⁰ Western nations generally have become so inactive (including the members of the military forces of those countries) that rates of obesity are reaching epidemic proportions. This puts increased strain on already taxed health care systems, contributes to the general weakening of society, and even threatens national security by limiting the number of “employable and deployable” personnel. In and of itself, obesity can lead to a range of health problems such as an increased risk of heart disease, metabolic syndrome,¹¹ type 2 diabetes (non-insulin-dependent or adult-onset), high blood pressure, arthritis and cancer, in addition to a reduction in life expectancy. By maintaining a healthy weight and preventing obesity, one can significantly reduce the risk of developing such associated challenges to health.

Ideally, to obtain the maximum benefit from an exercise program, an individual should combine a number of diverse activities that not only increase cardiovascular endurance (such as running), but also build strength (such as lifting weights). The benefits listed

above tend to result primarily, but not exclusively, from activities that work the heart and lungs. Numerous health benefits result from strength training, the most important among them being:

- increased flexibility, coordination and balance, which in older age reduces the likelihood and severity of falls;
- increased bone density, thus lessening the chances of fractures and breaks;
- weight control, since individuals with more muscle mass have a higher metabolic rate (muscle is an active tissue that consumes calories while stored fat uses very little energy);
- improved cardiac health, as the risk of developing heart disease is significantly lower when the body is lean;
- greater overall muscular strength, which leads to better joint support, improved posture and a reduction in the risk of sustaining an injury from everyday activities;
- improved muscle tone and appearance;
- retention of muscle tissue, as a degree of loss normally accompanies aging; and,
- improved performance in sport, whether recreational or competitive.

Strength training can also limit the impact of numerous diseases and chronic conditions such as arthritis, diabetes, osteoporosis, obesity and back pain. With respect to arthritis specifically, strength-building activities can decrease pain, increase both muscle strength and general physical performance, and decrease overall disability. With respect to diabetes, lifestyle changes, of which strength training is a component, can help in the management of the disease. by lowering the chances of developing heart and renal (kidney) conditions, delaying the onset of blindness, and reducing the need for amputation in extreme cases. Strength training not only imparts a number of advantages that are not to be found in other activities, but also contributes to the overall efficiency of the human body.

Psychological Benefits¹²

Physical activity helps to promote more than physical health; it can have a positive effect on mental health, too. Although public health organizations and their representatives have tended to emphasize the relationship with physical health,¹³ the relationship with mental health is no less important and must also be acknowledged. An increasing body of evidence suggests that regular exercise is linked to a lessening of the impact of depression and a range of both anxiety and mood disorders, while at the same time improving overall emotional well-being.¹⁴ Although there is some debate within the scientific literature as to whether or not physical activity mitigates the effects of such diseases, delays their onset or prevents them altogether, it seems clear that individuals who engage in regular exercise suffer less mental illness on the whole, whatever the ultimate mechanism may be.

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Physical activity imparts a range of mental health benefits that include, but are not limited to:

- relieving stress by helping the daily irritations to be forgotten and expending excess energy;
- increasing the brain's production of endorphins (so-called "feel good" neurotransmitters such as dopamine, serotonin and norepinephrine that can lead to what is known as "runner's high," a temporary feeling of euphoria);
- improving sleep quality (falling asleep more quickly, sleeping more deeply, waking less often and sleeping longer);
- increasing self-confidence, self-esteem and self-image;
- helping to keep thinking, learning and judgement skills sharp;
- helping one to remain optimistic, calm and clear in the face of adversity;
- for team sports, offering the opportunity to socialize and interact with others; and,
- improving overall mood.

Exercise is truly a healthy source of relaxation, fun and recreation, all of which contribute to a positive mental outlook. In one way or another, physical activity contributes to mental robustness and resiliency. It is an important consideration for military personnel who are frequently called upon to operate in complex and highly stressful environments. Individuals who are physically fit, in both mind and body, are better able to confront and overcome challenges.

With so many physical and psychological benefits to be gained through an active lifestyle, it seems needless to state that a sedentary way of life jeopardizes health, but the point is worth reinforcing. Individuals who engage in little or no physical activity are susceptible to greater and more severe risks to their health, in addition to a shorter lifespan overall. The statistical evidence is shocking. According to the World Health Organization, approximately one-quarter of breast and colon cancers, one-quarter of all cases of diabetes and one-third of all cases of ischaemic heart disease (reduced blood supply to the heart muscle) are caused by physical inactivity. Furthermore, six percent of global deaths are attributable to physical inactivity, somewhat less than tobacco use (at nine percent) and high blood pressure (at thirteen percent).¹⁵ A sedentary lifestyle is, simply put, dangerous.

Physical Fitness in a Military Context

For members of the Canadian Armed Forces (CAF), a high standard of physical fitness is absolutely essential in all occupations. It is sometimes heard in support units, like headquarters establishments where staff are primarily tied to a desk and computer, that being fit is not necessarily important. As discussed previously, robust physical fitness

confers both physical *and* psychological advantages that aid human performance in a diversity of settings and under a variety of circumstances. Even though an individual might spend his/her working day in a cubicle rather than in the field, being physically fit remains essential as it helps facilitate task completion, enhances mental concentration, increases endurance, and allows for the better handling of stress. Regardless of one's military duties, whether it is behind a rifle or behind a desk, "everyone in uniform must be sufficiently able-bodied to work for prolonged periods of intense physical and mental strain."¹⁶

The battlefield of today remains a physically demanding one despite the prevalence and use of technology. The digital age has not rendered physical fitness meaningless. Recent high-intensity combat operations in Afghanistan prove as much, where harsh and unforgiving terrain, soaring temperatures, thin air at high elevations, and the need to carry heavy loads over long distances demanded much of Canadian soldiers and their North Atlantic Treaty Organization allies. The importance of physical activity to the profession of arms, the warrior ethos, and ultimately to success on the battlefield, cannot be overstated. As one document relates:

In essence, physical fitness is the capacity to perform those physical activities required of the body. The higher the level of fitness, the greater the threshold of activity an individual can undertake. In the military context, fitness is essential to completing operations, particularly in demanding, harsh environments (whether in terms of climate, terrain, or combat) and those conducted with heavy loads and at a high tempo.¹⁷

In other words, but still evincing the same message:

High levels of physical fitness allow individuals to carry heavy combat loads longer and farther despite harsh climatic conditions and difficult terrain. High levels of physical fitness allow those same individuals to operate with less sleep and to cope better with stress. Equally important, high levels of physical fitness allow those individuals to endure all of the above and still think clearly and make timely decisions in conditions where lives may be at risk. In the end, physical fitness leads to mission success.¹⁸

Positive operational outcomes result, at least in part, from the robust physical fitness of personnel; the opposite, however, is just as true.¹⁹

The personal testimony of soldiers who have benefitted from high levels of physical fitness supports what has been said above. Rick Hillier, a former chief of the defence staff, found many advantages in fitness, so much so that exercise of one form or another became part of his daily routine. As he progressed in his military career from junior officer to the head of Canada's profession of arms, he consistently maintained that fitness was of seminal importance, an absolute priority that could never be neglected. In his estimation, the benefits accrued through exercise allowed one to "weather long and difficult days, monstrous amounts of travel, broken hours and the pressure to always get it right." Not only that, but the various types of exercise in which he engaged "broke up my day" and

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provided “a break from endless routine.” Returning to the office after a brisk run along the Ottawa River or on the frozen Rideau Canal in wintertime, he experienced less stress, felt more invigorated and was consequently more productive. The change of setting and activity also allowed him to think differently about complex problems; he often arrived at solutions and answers while running, not sitting immobile behind a desk.

Hillier also found that physical activity conferred other benefits that ultimately helped him lead at the highest levels of command in the CAF. For him, exercise was an activity that facilitated social interaction across the rank spectrum that, in turn, allowed him to keep a finger on the pulse of the units and formations that he was commanding. As he recalled, “I had a chance to meet and talk to people whose tracks I was unlikely to cross if I hadn’t gone for a workout. I learned what was going on, how things were being done and how people felt about everything, which was all important.” Being responsible for thousands of soldiers, where the possibility for a stovepipe mentality was very real, exercising *en masse* with all the units of his command built for him “an awareness of and appreciation for the bigger team.” Undoubtedly, everyone else who participated gained similarly. Finding time for physical activity allowed him to combine work with play, with obvious benefits both to him and the larger organization of which he was a part.²⁰

Not surprisingly, soldiers at the sharp end echo Hillier’s sentiments. Reflecting on his time in Afghanistan, specifically his actions on 3 August 2006 that earned him the Star of Military Valour, Master Warrant Officer (Retired) William MacDonald saw physical fitness as an absolute essential. Without it, it is arguable, the day would have turned out differently. In his opinion:

It had been hot and we’d been doing a lot of fighting during the day. You don’t ever get used to the heat, but you learn to deal with it. Physical fitness is a huge part of it. If you’re not in good shape, you’re done. You’ll never survive. Your body just starts to eat itself away.²¹

Fitness was for him, and his fellow soldiers, a key enabler of success.

Conclusion

Physical activity clearly provides numerous physical and psychological benefits for the active individual. Taken together, the advantages conferred through exercise lead to an improved quality of life through better and more robust overall health. However, physical fitness is but one of many positive lifestyle choices that ultimately contribute to well-being and longevity.²² Through exercise, people are better able to meet the demands of their environment. Individuals who neglect to make physical activity an important element of their day do so at their own risk.

Endnotes

1. Steven K. Galson, Acting Surgeon General of the United States, “The Importance of Being Active Your Way,” *Public Health Reports* 124 (November–December 2009), 772.
2. Darren E.R. Warburton et al., “Health Benefits of Physical Activity: The Evidence,” *Canadian Medical Association Journal* 174, no. 6 (14 March 2006), 801–809.
3. The Public Health Agency of Canada [PHAC] and the Canadian Institute for Health Information, Obesity in Canada (2011), Executive Summary, 1, at <<http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/oic-oac/index-eng.php>>, accessed 12 March 2013.
4. M.L. Baskin et al., “Prevalence of Obesity in the United States,” *Obesity Reviews* 6, no. 1 (February 2005), 5–7; K.L. Rennie and S.A. Jeff, “Prevalence of Obesity in Great Britain,” *Ibid.*, 11–12; and V.D. Yumuk, “Prevalence of Obesity in Turkey;” *Ibid.*, 9–10. More current documents have reached similar conclusions. See Mission: Readiness. Military Leaders for Kids; *Too Fat to Fight. Retired Military Leaders want Junk Food out of America’s Schools* (Washington, 2010), <http://cdn.missionreadiness.org/MR_Too_Fat_to_Fight-1.pdf> last accessed 12 March 2013, and National Obesity Observatory, International Comparisons of Obesity Prevalence (June 2009), <http://www.noo.org.uk/uploads/doc799_2_International_Comparisons_Obesity_Prevalence2.pdf>, accessed 12 March 2013.
5. For instance, Lance Armstrong, the now-disgraced cyclist, developed testicular cancer despite his underlying fitness and athleticism.
6. Numerous guidelines for physical activity are available, with many countries and prominent health organizations producing statements of their own. Although the specific recommendations offered by each may differ, all further the general idea that physical activity is positively correlated with better overall health. See, for example, Canadian Society for Exercise Physiology, *Canadian Physical Activity Guidelines* (2011), <<http://www.csep.ca/english/View.aspx?x=587>>, accessed 12 March 2013; World Health Organization [WHO], *Global Recommendations on Physical Activity for Health* (2010), <http://www.who.int/dietphysicalactivity/factsheet_recommendations/en/index.html>, accessed 12 March 2013; United States Department of Health and Human Services, *2008 Physical Activity Guidelines for Americans* (2008), <<http://www.health.gov/paguidelines>>, accessed 12 March 2013; Russell R. Pate et al., “Physical Activity and Public Health – A Recommendation from the Centers for Disease Control and Prevention [CDCP] and the American College of Sports Medicine,” *Journal of the American Medical Association* 273 (1995), 402–407; William L. Haskell et al., “Physical Activity and Public Health. Updated Recommendation for Adults from the American College of Sports Medicine and the American Heart Association,” *Circulation – Journal of the American Heart Association* 116 (2007), 1081–1093; and Gary O’Donovan et al., “The ABC of Physical Activity for Health: A Consensus Statement from the British Association of Sport and Exercise Sciences,” *Journal of Sports Sciences* 28, no. 6 (April 2010), 573–591.
7. Rather than cite each benefit individually, all of the documents consulted for the purposes of this section are listed here: Haskell et al., “Physical Activity and Public Health;” WHO, “Physical Activity a Key in Preventing Some Cancers” (7 February 2011), <http://www.who.int/mediacentre/multimedia/podcasts/2011/cancer_20110207/en>, accessed 12 March 2013; CDCP, “Health Benefits of Water-Based Exercise” (19 September 2012), at <http://www.cdc.gov/healthywater/swimming/health_benefits_water_exercise.html>, accessed 12 March 2013; CDCP, “Why Strength Training?” (24 February 2011), at <<http://www.cdc.gov/physicalactivity/growingstronger/why/index.html>> last accessed 12 March 2013; PHAC, “Benefits of Physical Activity” (20 January 2011), <<http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/02paap-eng.php>>, accessed 12 March 2013; and CDCP, “Physical Activity and Health” (16 February 2011), <<http://www.cdc.gov/physicalactivity/everyone/health/index.html>>, accessed 12 March 2013. As a point of note, each document listed above usually provides a “further reading” section or a bibliography, thus enabling interested readers to pursue the association between fitness and good health according to their own inclinations and interests.
8. The CDCP noted in one of its documents that “Swimmers have about half the risk of [premature] death compared with inactive people.” See CDCP, “Water-Based Exercise.” Likewise, it noted elsewhere, “Only a few lifestyle choices have as large an impact on your health as physical activity. People who are physically active for about 7 hours a week have a 40 percent lower risk of dying early than those who are active for less than 30 minutes a week.” See CDCP, “Physical Activity and Health.”
9. The PHAC noted that “as much as half the functional decline between the ages of 30 and 70 is due not to aging itself but to an inactive way of life.” See PHAC, “Benefits of Physical Activity.”
10. Robert Winnett, “Number of people dying as a result of obesity doubles in 10 years,” *The Telegraph* (1 January 2010), <<http://www.telegraph.co.uk/health/healthnews/6875091/Number-of-people-dying-as-a-result-of-obesity-doubles-in-10-years.html>>, accessed 12 March 2013.
11. Metabolic Syndrome is a combination of medical disorders that, when they occur together, increase the risk of developing cardiovascular disease and diabetes.
12. Mayo Clinic, “Exercise and Stress: Get Moving to Combat Stress” (23 July 2010), <<http://www.mayoclinic.com/health/exercise-and-stress/SR00036>>, accessed 28 October 2011.

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13. In the sense that the material consulted for this chapter seems to include more physical than mental health benefits, an admittedly non-scientific and completely personal judgement.
14. S. Saxena et al., "Mental Health Benefits of Physical Activity," *Journal of Mental Health* 14, no. 5 (October 2005), 445-451.
15. WHO, "10 Facts on Physical Activity" (September 2011), Fact 1, <http://www.who.int/features/factfiles/physical_activity/en/index.html>, accessed on 18 October 2011.
16. Lieutenant-Colonel Michael J. Goodspeed, "It's Time for a Fitness Transformation," *Canadian Military Journal* 6, no. 1 (Spring 2005), 67.
17. Colonel Bernd Horn and Dr. Robert W. Walker, *The Military Leadership Handbook* (Toronto: Dundurn / CDA Press, 2008), Chapter 31, "Physical Fitness," 430.
18. *Ibid.*, 434.
19. Duncan Gardham, "Overweight soldiers holding the Army back in Afghanistan, leaked memo claims," *The Telegraph* (2 August 2009), <<http://www.telegraph.co.uk/news/uknews/5960686/Overweight-soldiers-holding-the-Army-back-in-Afghanistan-leaked-memo-claims.html>>, accessed 12 March 2013.
20. General Rick Hillier, *Leadership. 50 Points of Wisdom for Today's Leaders* (Toronto: HarperCollins, 2010), Chapter 47, "Fitness Counts," 303-309.
21. Craig Leslie Mantle, CPO2 Paul Pellerin (Ret'd), Tom Douglas, Justin Wright and Mélanie Denis, eds., *In Their Own Words: Canadian Stories of Valour and Bravery from Afghanistan, 2001-2007* (Kingston: CDA Press, 2013), 142-143.
22. Others include, but are not confined to, a balanced diet that de-emphasizes processed foods and emphasizes fresh fruits, vegetables and whole grains; a healthy sex life; minimal or no use of alcohol; and abstinence from all forms of tobacco and other drugs.

CHAPTER 4

PHYSICAL FITNESS IN THE CANADIAN ARMED FORCES: ORGANIZATIONAL BENEFITS

Captain Ian Miller

It is well known that members of the Canadian Armed Forces (CAF) need to maintain a high level of physical fitness. This requirement is necessary given the concept of Universality of Service and the need to maintain an employable and deployable force. Yet, the importance and value in physical fitness extends beyond these obvious combat related benefits and complements organizational goals above and beyond mission success. These overarching organizational benefits can range from tangible economic gains to intangible leadership improvements. This chapter will highlight and describe each of these far-reaching benefits. First, it will address how they apply directly to the profession of arms and then move to the broader general organizational advantages.

The Military Profession: Universality of Service and Mission Success

Soldiers are expected to be among the most physically fit population segment in the country. The stressful, dangerous and demanding environments characteristic of the military experience required this high level of physical fitness. In fact, in combat operations an individual soldier's health and level of physical fitness is often the critical and limiting factor in performing his/her job effectively. Put simply, high levels of overall physical fitness give soldiers enhanced warrior abilities and resiliency to the wide range of crippling stressors they may face.

The complex and perilous environments of today's conflicts require soldiers to perform gruelling and physically demanding roles, where their lives and the lives of their comrades depend on their ability to perform optimally. Therefore, a number of specific soldier qualities are demanded, with high levels of strength, endurance, and mobility being among the most important.¹ These qualities contribute to virtually all the tasks soldiers are charged with performing. Strength, an individual's ability to move an object, is needed to perform a variety of routine military tasks, such as marching, lifting heavy equipment or ammunition, and carrying a wounded soldier to safety. Endurance refers to the ability to sustain activity and can be broken down into two categories, aerobic and anaerobic. Aerobic endurance, the ability to sustain long periods of activity, is an important part of running and lengthy cross-country foot marching. Anaerobic endurance, the ability to sustain short intervals of higher intensity of activity, helps soldiers sprint, leopard crawl, and move a wounded casualty.

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The last of these core warrior requirements, mobility, is perhaps the most important. Components of mobility are agility, balance, coordination, flexibility, posture, stability and power. What is unique about mobility is that it requires the application of strength and endurance in a coordinated manner. For example, lifting a heavy weapon requires good mobility to bend low and support a good stance, but, strength is essential for achieving the end result. Nevertheless, in order to execute proper soldiering one must be able to effectively execute all three components simultaneously.

Entering and clearing a house or a fortified compound is an example of using these three components. This activity requires agility, coordination, and all the other elements of mobility to manoeuvre around the building as well as a great deal of strength and endurance to kick down barriers and carry weapons and ammunition with speed and persistence. Although different individuals have varying physical abilities, each member has the capacity to significantly improve these abilities through physical training and high levels of physical fitness. Therefore, a soldier who embraces an appropriate physical fitness routine will significantly improve strength, endurance, and mobility, ultimately making him/her a more effective soldier and in a broader sense, a contributing member to a more effective force.

Contemporary research has revealed the link between physical fitness and resiliency in the battlefield. Resiliency has a number of meanings within the military context. First, it refers to an individual's capacity to resist infection, virus, or injury. The more physically fit the soldier, the stronger his/her immune system or muscular skeleton is and, consequently, the more resilient he/she is against sickness and injury. Such ailments and injuries can have a severe negative impact on both peacetime and combat operations.² During peacetime, injuries and sickness can hamper training and military readiness. Meanwhile, in the midst of battle, injuries and sickness tend to diminish capabilities.

Resiliency also refers to an ability to prevent or avoid stress induced psychological and psychosomatic diseases and disorders. Post Traumatic Stress Disorder (PTSD) is an example of particular interest to combat veterans. Exercise has been shown to enhance stress resilience, significantly decreasing the likelihood of developing various types of stress-induced psychopathology. As well, a growing consensus is emerging around the success of using exercise to treat these disorders. A number of theories have been proposed to explain the relationship between resiliency against these ailments and exercise. One theory argues that exercise suppresses the flow of anxiety causing chemicals, whereas another contends it increases anxiety fighting endorphins.³ Another explanation is that exercise improves the expression of an individual's genes, which has a profound influence over stress hormones.⁴ Lastly, it could be a matter of exercise strengthening the neural structure of an individual's brain, similar to the way bicep curls strengthen and improve the strength of one's arm.⁵ Regardless of the reason, irrefutable evidence has demonstrated that regular exercise confers enduring resilience against the various psychological and psychosomatic disorders caused by stress exposure.

Exercise has a direct effect on improving an individual's resilience to severe environmental stressors that tend to affect the body both psychologically and physiologically. Soldiers are often exposed to extreme environments that take a serious toll on their physical and

cognitive functioning. Extreme temperatures can lead to dire physiological consequences. For example, in conditions of uncompensable heat, the body stores heat until dangerously high levels are reached, leading to collapse or death. Fortunately, conditioning and high levels of physical fitness improve the body's tolerance of higher core temperatures.⁶ As well, thermal stress (heat and cold) impose impairments in various cognitive processes.⁷ These cognitive impairments have shown to degrade performance in a number of contexts including attentive processes, performing psychomotor and/or perceptual-motor tasks, and problem solving. Poor performance on these types of activity has far reaching negative effects on the performance and effectiveness of a soldier. Again, high levels of physical fitness appear to bolster cognitive performance during and after the physical and mental stress extreme temperatures can create.⁸

Soldiers can be subjected to chronic and acute episodes of sleep deprivation. Sleep deprivation leads to fatigue, which has many negative effects on physical and mental performance. Fatigue is:

a state of an organism's muscles, viscera, or central nervous system, in which prior physical activity and/or mental processing, in the absence of sufficient rest, results in insufficient cellular capacity or system wide energy to maintain the original level of activity and/or processing by using normal resources.⁹

Hence, similar to extreme temperature stress, fatigue causes a reduction in physical capacity and decrements in mental and cognitive processing. Again, just like temperature stressors, these impairments have dire consequences for the profession of arms. One study conducted on military performance during extended periods of sleep deprivation causing fatigue revealed that within a period of three days soldiers were considered ineffective.¹⁰ Not surprisingly, exercise and high levels of physical fitness have been proven to help combat the effects of fatigue. According to a study conducted at the University of Georgia, individuals can increase their energy level by 20% and decrease the effects of fatigue by 65% through regular exercise.¹¹

Another environmental stressor characteristic of military service is the threat to life. Immediate danger to one's life can create intense surges of anxiety and panic. These episodes of intense anxiety can impair a soldier's judgement, communication ability, and situational control. In many cases, a soldier can actually "freeze" in place, preventing any action at all. This poses danger not only to the individual soldier but also to his comrades and the mission. Again, physical fitness and exercise can help curb these harmful short-term stress-induced psychological consequences.¹² Various explanations for this relationship have been proposed. For example, some believe that the exhaustion achieved during exercise desensitizes an individual to anxiety and panic. Another theory holds that exercise facilitates attrition of stimulus pertinent to the arousal of anxiety. What is clear is that exercise and maintained high levels of physical fitness are proven effective countermeasures to environmental stressors common to the soldier and consequently lead to a more resilient fighting force.

Non-Combat Related Organizational Benefits of Physical Fitness

There is no denying that the CAF is a unique organization that imposes physically and mentally demanding work on its personnel. As a result, military personnel require a higher level of physical fitness than the general population to ensure they are able to perform these unique duties. However, there are other non-combat related organizational social and economic benefits that the CAF can draw from a healthy and physically fit workforce. These benefits include improvements in productivity and performance, increased employee job satisfaction, reduced rate of absenteeism, enhanced corporate image and public relations and significant economic savings.

Workforce productivity and performance has become a critical factor in the strength and sustainability of organizations' overall performance. Success hinges on the employees' ability to produce quality work on time. Organizations are constantly devising performance and productivity improving techniques or approaches. Of the different methods, health and physical fitness initiatives and programs rank high on the list. For example, the American National Association for Health and Fitness identifies physical fitness programs as significant contributors to worker productivity and performance.¹³ The World Health Organization (WHO) calculated that workplace physical fitness promoting activities can increase productivity by up to 52%. Such programs affect employees by increasing well-being, improving self-image and self-esteem, enhancing mood, and strengthening positive attitudes, all of which have been demonstrated to have a profound effect on employee work quality and timeliness. For example, research has shown mood improvements lead to better and more original problem-solving; greater helpfulness and generosity; and, more positive attitudes to other people.¹⁴ This may be related to an associated increase in confidence. Additionally, just as stress affects combat soldier's performance, it can negatively affect an employee's performance and productivity in the office. Occupational stress has proven to have a detrimental impact on physical and mental health, consequently affecting productivity and performance.¹⁵ Physical fitness promotion can help mitigate the negative physical and mental health effects of occupational stress. In turn, they create a more productive and better performing employee.

An additional physical fitness related benefit is the potential for an improvement in employees' level of job satisfaction. It has been demonstrated that programs which help employees be active during their workday contribute to overall job satisfaction.¹⁶ Increased job satisfaction has been correlated with many desirable work behaviours, improving organizational efficiency and effectiveness. For example, high levels of job satisfaction have tended to be correlated with higher levels of team work, cohesiveness, and problem solving.¹⁷ As well, satisfied employees tend to engage more in a variety of 'good citizenship' behaviour. These include being more punctual, dependable and helpful. Moreover, they also typically engage in less undesirable work behaviour, such as sabotage, stealing, doing work badly on purpose, and spreading rumours or gossip to cause trouble.¹⁸

Another significant advantage to having a physically fit workforce is a reduction in absenteeism. A study conducted on American law enforcement officers revealed that

sedentary officers were absent 9.8 days per year compared to officers who adhered to a physical fitness routine who took 5.8 sick days per year, nearly a 100% increase.¹⁹ Similarly, in 1995, Toronto's municipal government introduced a physical fitness promotion program called "Metro Fit" and employees, on average, missed 3.5 less days within the first six months of implementation.²⁰ There are a number of possible explanations for this staggering difference. These may include physical fitness's effectiveness in strengthening the immune system or its positive impact on self image. Regardless of reason, a lower absenteeism rate benefits an organization by decreasing the cost associated with it.²¹ Clearly, there is a direct cost of absenteeism (i.e., payments to the ill employee).

Apart from this direct cost, a number of indirect costs exist. Absenteeism decreases organizational productivity. Further, sickness 'presenteeism' (i.e., coming to work while you are sick) is just as common as sickness absence and "it is estimated that the costs of productivity losses due to sub-par performance are higher than the costs of sickness absence."²² Lastly, absenteeism can create reduced quality of work and services provided to clients. Poor quality costs manufacturing and service companies between 5 to 30 percent of their gross sales.²³ Similarly, the CAF can incur costs due to poor quality performance in the millions of dollars.²⁴ These manifest in the form of work redundancies and wasteful uses of resources and time. Therefore, improving the level of physical fitness within the CAF will likely lower the absenteeism rate, save costs, and improve performance.

Having a physically fit force can also have an effect on an organization's corporate image and public relations.²⁵ This can play a key role in addressing a number of human resource priorities. Most organization leaders understand that being successful largely depends on attracting, motivating and retaining a talented pool of workers.²⁶ Promoting physical fitness can help a company attract and retain high-calibre employees.²⁷ There is a growing body of evidence indicating that physical fitness promotion initiatives represent excellent ways to demonstrate corporate social responsibility. Consequently, this positive corporate image comprises a legitimate, compelling and increasingly important way to attract and retain good employees.

The Conference Board of Canada suggests that wellness and physical fitness programs can become a component of a larger corporate initiative to attract and retain top talent. The Board also points out that some Canadian businesses view these programs "as a key component of their business strategy for identification as an employer of choice."²⁸ To illustrate, the Canadian Fitness and Lifestyle Research Institute found that 16 percent of working Canadians admit that workplace physical fitness opportunities significantly influenced their decision to accept a position with their current employer, and more importantly, 45 percent have been influenced by these opportunities to remain with a company.²⁹ The potential impact on recruiting and retaining talent is considerable, adding benefits to the organization at every level.

Aggregated, the organizational benefits of having a physically fit force will lead to direct and indirect savings. These economic benefits are both ubiquitous and profound. Increases in productivity and performance inevitably render financial gains.³⁰ Reductions in absenteeism can save a company millions of dollars. Statistics Canada estimated that in 1997, the cost of absenteeism for organizations for every 1,000 employees was in

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the vicinity of \$1.4 million per year (this figure would be substantially higher today.)³¹ Moreover, an enhanced corporate image and the proceeding sharpened recruitment can significantly improve a company's financial performance.³²

A regular physical fitness regimen can substantially lower an individual's risk of developing chronic diseases such as heart disease or cancer.³³ According to The Public Health Agency of Canada, 56% of Canadians are not active enough, "leaving them at risk for premature death, chronic illness, disease and disability."³⁴ Reducing chronic disease through physical fitness lengthens employees work-life expectancy and reduces turnover. Employee turnover can become extremely expensive, simply from training and administrative perspective. It is also expensive, however, when you consider the loss of intellectual capital.³⁵ The cost of losing invaluable tacit knowledge and corporate wisdom in the organization can be considerable. Boeing, the world's largest aerospace engineering and manufacturing company, incurred a 1.6 billion dollar hit to their earnings after a loss of intellectual capital forced them to halt production.³⁶ Second, helping prevent, or limit, the development of chronic disease can abate military health care costs. Average annual direct medical care costs for physically active individuals are estimated to be 25 percent less than those of physically inactive individuals.³⁷ Lastly, chronic diseases tend to contribute to premature disability pensions and compensations. Helping curb the onset of chronic diseases through physical fitness will help soften these costs. Research has indicated that physical fitness and health promotion can reduce these costs by slightly more than 25 percent.³⁸

Physical Fitness, Leadership and the Canadian Armed Forces

Whether it is on the battlefield or in garrison, being physically fit can improve leadership performance. Research has shown engaging in regular exercise largely effects how others rated the leadership qualities of their executives.³⁹ This is especially true for the military. Retired General David Petraeus made physical fitness the number one leadership priority of his Brigade.⁴⁰ Typically, a leader is subjected to a demanding schedule with relatively large workloads, high levels of stress, and the stress and pressure resulting from dangerous missions. Higher levels of physical fitness assist leaders to effectively accomplish their work. Followers are more likely to follow a leader who leads by example; great inspiration comes from leaders who routinely share in team hardships and dangers.⁴¹ Equally important, subordinates assess their leaders on the following criteria: actions, words, demeanor, and how they look.⁴² A fit leader projects a strong image, creates the impression of capability and establishes an example. If the standard, or desired norm, is a physically fit, healthy, and capable soldier, then the leader should at least meet these prescriptions. A leader who exhibits the self-discipline to take control of and maintain his/her physical fitness sets a good example for his/her subordinates.

Summary

The benefits of having a physically fit force are irrefutable. In addition to the obvious benefits of having a more resilient and effective fighting force, physical fitness has been

demonstrated to generate important social and economic organizational benefits, as well. Clearly, fitness matters. Ensuring that all members of the CAF are fit has tremendous implications that simply cannot be ignored.

Endnotes

1. William R. Rieger and Shawn J. Scott, "Physical Fitness in Initial Entry Training" in Bernard L. DeKoning, ed., *Textbooks of Military Medicine. Recruit Medicine* (Washington, DC: Office of The Surgeon General at TMM Publications, 2006), 111-124.
2. Beau J. Freund, G.C. Lindsay and Ross E. Lipton, "Sustaining the Health and Performance of Soldiers/Warfighters Deployed to Harsh Environments" (Natick, MA: US Army Research Institute of Environmental Medicine Ad-A286270, November 1994).
3. George Shannon, "Running to Fight Fatigue & Anxiety", *Livestrong.com* (10 Jun 2011), retrieved on 2 Dec 2011 from <<http://www.livestrong.com/article/451436-running-to-fight-fatigue-anxiety/>>.
4. Andrew Collins, Louise E. Hill, Yalini Chandramohan, Daniel Whitcomb, Susann K. Droste and Johannes M.H.M. Reul, "Exercise Improves Cognitive Responses to Physiological Stress Through Enhancement of Epigenetic Mechanisms and Gene Expression in the Dentate Gyrus", *PLOS ONE* (30 Jan 2009), retrieved on 11 March 2013 from <<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0004330>>.
5. Daniel P. McCloskey, David S. Adamo and Brenda J. Anderson, "Exercise Increases Metabolic Capacity in The Motor Cortex and Striatum, but not in the Hippocampus", *Brain Research*, Vol. 891, No. 1-2 (2001) 168-175.
6. Tom M. McLellan, "The Importance of Aerobic Fitness in Determining Tolerance to Uncompensable Heat Stress", *Comparative Biochemistry and Physiology, Part A, Molecular & Integrative Physiology*, Vol. 128, No. 4 (2001), 691-700.
7. Mark Staal, *Stress, Cognition, and Human Performance: A Literature Review and Conceptual Framework - NASA/TM—2004–212824* (Moffet Field, CA: National Aeronautics and Space Administration, August 2004).
8. Carlyle H. Folkins and Wesley E. Sime, "Physical Fitness Training and Mental Health", *American Psychologist*, Vol. 36, No. 4 (1981), 373-389.
9. Soames Job and James Dalziel, "Defining Fatigue as a Condition of the Organism and Distinguishing it from Habituation, Adaptation, and Boredom" in Peter A. Hancock and Paula A. Desmond, eds., *Stress, Workload and Fatigue* (Mahwah, NJ: Lawrence Erlbaum Associates, Inc., 2001), 466-512.
10. Collins & al. (2009).
11. *University of Georgia*, "Low-intensity Exercise Reduces Fatigue Symptoms By 65 Percent, Study Finds", *ScienceDaily* (2 March 2008), retrieved on 9 Nov 2011 from <<http://www.sciencedaily.com/releases/2008/02/080228112008.htm>>.
12. Mayo Clinic, "Depression and Anxiety: Exercise Eases Symptoms", *Depression (Major Depression) – In-Depth*, (1 Oct 2011), retrieved on 22 Dec 2011 from <<http://www.mayoclinic.com/health/depression-and-exercise/MH00043>>.
13. National Association for Health and Fitness, *NEHF - What is Employee Health & Fitness Month*, retrieved on 10 Nov 2011 from <<http://www.physicalfitness.org/nehf.php>>.
14. Michael Argyle, "Do Happy Workers Work Harder? – The Effect of Job Satisfaction on Work Performance" in Runt Veenhoven, ed., *How Harmful is Happiness?: Consequences of Enjoying Life Or Not* (Rotterdam, Netherlands: Universitaire Pers Rotterdam, 1989), chapter 9.
15. Cary Cooper and Sue Cartwright, "Healthy Mind; Healthy Organization – A Proactive Approach to Occupational Stress", *Human Relations*, Vol. 47, No. 4 (1994), 455-471.
16. Alberta Centre for Active Living, "Physical Activity @ Work > Bottom-Line Benefits of Physical Activity @ Work", retrieved on 5 Dec 2011 from <<http://www.centre4activeliving.ca/workplace/beforestart/benefits-bottom-line.html>>. The findings in this report are adapted from the Public Health Agency of Canada. It also lists additional organizational benefits not listed in the text such as: improved mental concentration, stamina, reaction time and memory, greater alertness, better relations with co-workers, and more enjoyment of work.
17. Collins & al. (2009).
18. Ibid.
19. Adrian Davis and Marcus Jones, "Physical Activity, Absenteeism and Productivity: An Evidence Review", *Travel Demand Management team Transport for London* (2007).

Chapter 4

20. Public Health Agency of Canada, *The Business Case for Active Living at Work*, Power Point Presentation retrieved on 17 Nov 2011 from <http://www.phac-aspc.gc.ca/alw-vat/ppt/business_case_e.ppt>.
21. Corne A. Roelen and Johan W. Groothoff, "Rigorous Management of Sickness Absence Provokes Sickness Presenteeism", *Oxford Journals Occupational Medicine*, Vol. 60, No. 4 (2010), 244-246.
22. Alberta Centre for Active Living.
23. Metricstream, "What is Your Company's Cost of Poor Quality (CoPQ) – Tools for Calculating and Reducing It", *Insights*, retrieved on 19 Nov 2011 from <http://www.metricstream.com/insights/costofPoorQuality_home.htm>.
24. Collins & al. (2009).
25. City of Toronto 1998-2013, "Physical Activity in the Workplace - Health Options at Work: Physical Activity Physical Activity is Your Active Business Partner", *Living in Toronto*, retrieved on 4 Nov 2011 from <http://www.toronto.ca/health/wc_index.htm>.
26. C.B. Bhattacharya, Sankar Sen, Daniel Korschun, "Using Corporate Social Responsibility to Win the War for Talent", *MIT Sloan Management Review*, Vol. 49, No. 2 (2008), retrieved on 22 Nov 2011 from <http://psykol.org/nos/images/d/d2/SCR_win_talent.pdf>.
27. Cooper and Cartwright (1994).
28. Canadian Fitness and Lifestyle Research Institute. *Perceived Barriers and Benefits*, retrieved on 28 Nov 2011 from <http://www.cflri.ca/media/node/272/files/pam2006_sec2_en.pdf>.
29. Metricstream.
30. Thomas Group, "Asset Productivity", retrieved on 6 Jan 2012 from <<http://www.thomasgroup.com/Services/Operations-Management/Asset-Productivity.aspx>>. Thomas Group is a global operations management consulting firm that creates value for clients by delivering results using experienced professionals and proven methods.
31. Metricstream.
32. Margarita Tsooutsoura, *Corporate Social Responsibility and Financial Performance* (Berkeley, CA: Haas School of Business, University of California at Berkeley, 2004), retrieved on 12 Jan 2012 from <<http://scholarship.org/uc/item/111799p2>>. This is an interesting and informative research study; not only does it delve into the effectiveness of positive corporate social image and its significant increase to a company's bottom line, but it also discusses important corporate ethical issues and obligations.
33. Frank Kelly, *Guideline on Improving the Physical Fitness of Employees* (Copenhagen: World Health Organization Regional Office for Europe, 1999), retrieved on 13 March 2013 from <http://www.who.int/occupational_health/regions/en/ocheurfitness.pdf>.
34. Cooper and Cartwright (1994).
35. Brooks C. Holtom, Terence R. Mitchell, Thomas W. Lee and Edward J. Inderrieden, "Shocks as Causes of Turnover: What They Are And How Organizations Can Manage Them", *Human Resource Management*, Vol. 44, No. 3 (Fall 2005), 337-352.
36. David W. DeLong, *Lost Knowledge – Confronting the Threat of an Aging Workforce* (Oxford, NY: Oxford University Press, 2004).
37. Pratt Michael, Caroline A. Macera and Guijing Wang, "Higher Direct Medical Costs Associated With Physical Inactivity", *The Physician and Sportsmedicine*, Vol. 28, No. 10 (2000), 63-70.
38. Larry Chapman, "Meta-Evaluation of Worksite Health Promotion Economic Return Studies", *Art of Health Promotion Newsletter*, Vol. 6, No. 6 (January/February 2003), 1-23, retrieved on 13 March 2013 from <http://dorncompanies.com/work_site_health_promotion_Evaluation.pdf>.
39. Sharon L. McDowell-Larsen, Leigh Kearney and David Campbell, "Fitness and Leadership: Is there a Relationship?: Regular Exercise Correlates With Higher Leadership Ratings in Senior-Level Executives", *Journal of Managerial Psychology*, Vol. 17, No. 4 (2002), 316-324.
40. Harvey Mackay, "Physical Fitness is a Key to Leadership, and Not Just for Soldiers", *Star Tribune – Business* (10 January 2010), retrieved on 22 Nov 2011 from <<http://www.startribune.com/business/80964807.html?page=1&c=y>>.
41. U.S. Army Field Manual (FM) 6-22, *Army Leadership* (Washington, DC: U.S. Government Printing Office [GPO], October 2006.), chapter 5.
42. Holtom et al. (2005).

CHAPTER 5

LEADERSHIP AND THE PROFESSION OF ARMS: THE ROLE OF FITNESS

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Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it.¹

Plato

Introduction

Physical fitness is a key component of the profession of arms. The need for a physically fit force, however, has not always garnered the necessary attention it deserves. The Canadian Armed Forces (CAF) *Health and Fitness Strategy*,² coupled with what appears to be a growing institutional campaign that highlights the advantages of leading an overall healthy lifestyle, serve to, at the very least, promote the indisputable requirement to be a fitness-conscious organization. These initiatives, beyond establishing basic awareness, compel all CAF personnel to take the necessary action to develop and maintain a high degree of personal fitness.

Despite its importance, physical fitness received little attention in several key publications related to CAF leadership and the profession of arms.³ For example, physical fitness was not discussed in any detail in the first version of *Duty with Honour: The Profession of Arms in Canada*, which was published in 2003.⁴ It was very likely the case that the inherent value of fitness was so obvious, that it was simply overlooked; being taken as understood, it did not require explanation. The second edition of *Duty with Honour*, which was published in 2009,⁵ corrected this omission; an entire section was added that linked physical fitness to the military ethos. Further, in 2008, a chapter on the value of physical fitness was included in *The Military Leadership Handbook*,⁶ a document that “provides an applied and readable compendium of ideas, concepts, and practices related specifically to military leadership.”⁷ While such publications are a marked improvement, paying increased attention to the importance of fitness, the many linkages between fitness and core military leadership and profession of arms doctrinal concepts remains to be fully enunciated. That is the purpose of this chapter.

With the publication of *Duty with Honour*,⁸ which largely resulted from the longstanding requirement for the CAF to clearly articulate its standing as an institution and define its place within Canadian society, the military claimed for itself status as a legitimate profession. As explained in that document, professions emerged in response to the societal

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imperative to ensure their continued responsibility to the community at large, as well the functional imperative to ensure the quality and relevance of their acquired body of knowledge. A profession is defined as:

an exclusive group of people who possess and apply a systematically acquired body of knowledge derived from extensive research, education, training and experience. Members of a profession have a special responsibility to fulfill their function competently and objectively for the benefit of society. Professionals are governed by a code of ethics that establishes standards of conduct while defining and regulating their work. This code of ethics is enforced by the members themselves and contains values that are widely accepted as legitimate by society at large.⁹

From this definition, the CAF's claim to professional status is based on four fundamental attributes: **responsibility** to society; **expertise** (acquired through formal training and education, in addition to self-study and experience); an **identity** that permits unique standing within society; and, a **vocational ethic** that represents the values and obligations of the profession. Below, Figure 5.1 demonstrates the theoretical construct of the profession of arms in Canada, encapsulating as it does the above concepts. For the CAF, the vocational ethic is referred to as the **military ethos**. In essence, the military ethos reflects "how military professionals view themselves (identity), how they fulfil their function (expertise) and how they relate to their government and to society (responsibility)."¹⁰

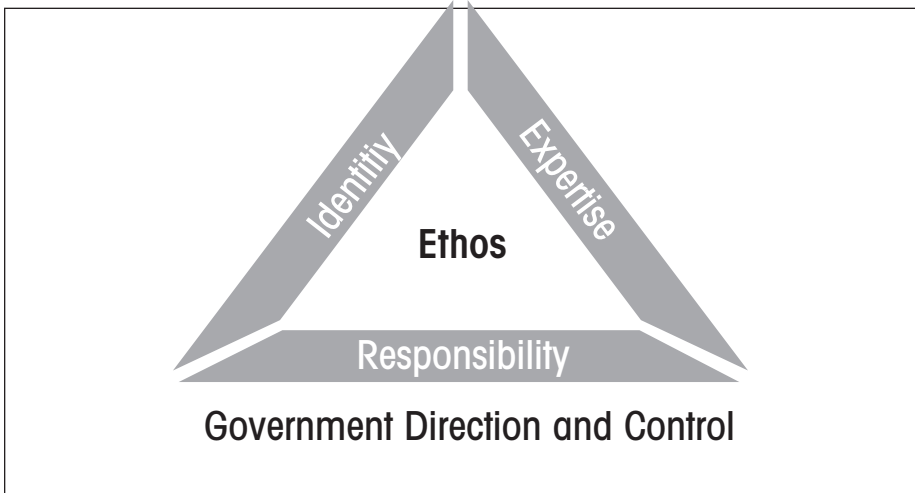


Figure 5.1 – Theoretical Construct of the Profession of Arms in Canada¹¹

Physical Fitness and the Profession of Arms Construct

The four attributes of the profession of arms construct (expertise, identity, responsibility and military ethos), if satisfied, enable the CAF to lay claim to, as well as maintain, a

professional status. Without any doubt, physical fitness represents a component of this construct. Where and how physical fitness fits into this theoretical paradigm, however, requires articulation. Physical fitness, like other essential CAF qualities (e.g., leadership), represents a key element of each of the four pillars that comprise the theoretical construct of the profession of arms as follows:

Expertise

As stated in *Duty with Honour*, the “foundation for this expertise resides in a deep and comprehensive understanding of the theory and practice of armed conflict.”¹² For the CAF, expertise naturally entails the use of military force, specifically the skills, knowledge and abilities required to exercise that force. A broad range of military knowledge, both technical and conceptual, is required in order to ensure that force is employed effectively. This domain also includes not only a physical expertise or competence that enables one to meet the physical demands required of military employment, but also an understanding of the professional knowledge required to develop and maintain one’s physical robustness and resilience. There is a massive body of scientific, technical and practical knowledge particular to fitness as well as an understanding of the dynamics of fitness and how it impacts all other aspects of service life. This fitness knowledge represents a critical component of military expertise; to varying degrees, all military occupations require that their personnel be physically fit and physically resilient.

Identity

The unique functions performed by military personnel are what separates CAF members from the civilian populace. These differences, which are particular to only the military, provide the CAF with a separate and distinct identity. The conceptual links between military identity and physical fitness are easily demonstrated. If identity is thought of as the process through which individuals make meaning of the world around them and of their unique place in it,¹³ then it can be argued that fitness is another frame of reference for making this meaning.

As physical fitness impacts the manner in which a person can interact with their environment, their process of making meaning of that interaction is also impacted. Put simply, physical fitness becomes a part of “who you are” and how you understand your environment. As it relates to organizational identity, physical fitness can be conceptualized as one of the ways in which military personnel relate to and take on organizational norms, values and desired behaviours. Part of this identity, or what makes the CAF unique, has to include the absolute requirement to be physical fit, fit in terms of being able to execute military operations.

Responsibility

As *Duty with Honour* makes clear, “The core responsibility of the Canadian Forces is the defence of Canada and Canadian interests, and the country’s military professionals are

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collectively accountable to the government and the people of Canada for the successful execution of this primary task.”¹⁴ Successfully meeting these important responsibilities demands that all CAF personnel maintain the appropriate level of physical fitness. Physical fitness is, after all, a key enabler of successful military operations. Military personnel have a responsibility to the Canadian public to maintain a high degree of physical fitness in order to successfully complete assigned tasks. As such, there is a societal expectation that our serving members be physically fit. Arguably, this is part of our social contract. The Canadian government has invested considerable resources and effort to provide facilities, equipment, fitness and sports programs, and fitness experts, to ensure that CAF personnel receive the best possible opportunity and means to maintain the necessary levels of fitness. In turn, it is each CAF member’s responsibility, regardless of rank or position, to optimize the use of these resources.

Military Ethos

As defined in doctrine relating to professionalism, the CAF’s military ethos comprises the values, beliefs and expectations that reflect core Canadian values, the imperatives of military professionalism and the requirements of operations.¹⁵ In essence, the military ethos is what unifies all members of the CAF and is intended to, among other things, guide the development of military leaders, create and shape the desired military culture and establish trust with Canadian society.¹⁶ In this sense, the ethos highlights the beliefs and expectations about military service, that is, our professional identity.¹⁷ Key beliefs and expectations include:

- accepting unlimited liability – the expectation that “all military members accept and understand that they are subject to being lawfully ordered into harm’s way under conditions that could lead to the loss of their lives;”¹⁸
- fighting spirit – “the moral, physical, and intellectual qualities necessary to operate in conditions of extreme danger, to endure hardship and to approach their assigned missions with confidence, tenacity and the will to succeed;”¹⁹
- discipline – “to help ensure self-assurance and resiliency in the face of adversity;”²⁰
- teamwork – “to prevail in the most complex and dangerous situations;”²¹ and,
- physical fitness – “operations in any environment (sea, land or air) demand the highest levels of fitness.”²²

Although physical fitness is a separate expectation, it is most obviously linked to fighting spirit. Beyond these immediate connections, however, each of the remaining beliefs and expectations are also strongly associated with physical fitness. For example, all CAF members understand that they may be placed in harm’s way (unlimited liability). They also understand that they have been provided with the best available resources to help ensure mission success, and ultimately, their survival. Included in this are the opportunity and resources required to maintain the necessary levels of physical fitness, that when placed in harm’s way, will help to ensure personal and collective safety. Similarly, discipline

“is generated from an understanding of the demands of combat.”²³ This includes physical demands – the discipline to maintain the necessary fitness levels that enable military personnel to face physical adversity. Discipline, in terms of the fortitude to maintain a personal and collective physical fitness program, thus represents an essential component of the military ethos. Lastly, teamwork largely refers to working well with others within one’s team or in joint, combined or inter-agency operations. Participation in unit sports and fitness activities represents one of the best tools available to leaders, if properly planned and executed, to develop teamwork, cohesion and morale.

The concept of the CAF’s ethos also suggests that military identity is a social identity.²⁴ As it relates to the early socialization of new recruits, for example, recent research has suggested that individuals tend to identify most with their proximal or immediate social group.²⁵ To put it simply, organizational newcomers tend to be less concerned with learning the abstract principles of the larger (distal) organization, and are much more concerned with learning the social norms, values and behaviours of their immediate (proximal) peers in any given social context.²⁶ Thus, social identification with the immediate group, team, section or unit is more meaningful (at least in the early stages of socialization), and leads to key outcomes including: feelings of in-group affect (i.e., emotional attachment) and in-group ties (i.e., strength of bond between group members);²⁷ group cohesion or camaraderie; and affective commitment to the immediate group, which is ideally an indicator of emerging commitment to the organization.²⁸ In other words, as the team or group goes, so goes the new recruit in trying to adapt to and make meaning of life in the military and in the immediate social situation which they face. Thus, if the newcomer encounters a social situation in which value is placed on physical fitness, then it may be argued that being physically fit is a potentially significant part of their overall integration into the social group. By cultivating physical fitness, the individual creates a stronger link with the spirit of the organization; that is, the CAF’s ethos. Developing an understanding of the ethos requires personnel to become knowledgeable, organizationally committed, meaningfully self-identified and civically engaged.²⁹ All of these elements underlying the experience of the CAF’s ethos at the individual level have important links to physical fitness.

Canadian Armed Forces Effectiveness Model

In addition to establishing physical fitness within the CAF profession of arms construct, it is also useful to demonstrate how it fits within the CAF Effectiveness Model (see Figure 5.2 below). This model depicts the key components that, if adhered to or practiced, will help facilitate CAF effectiveness. This model puts mission success as the primary outcome or objective; it also recognizes, however, that in order to achieve mission success, other very important enabling objectives must be considered, that is to say, member well-being, internal integration and external adaptability. The military ethos has been discussed above. Physical fitness is intrinsically related to each dimension of the effectiveness model as follows:³⁰



Figure 5.2 – Canadian Armed Forces Effectiveness Model³¹

Mission Success

Mission success is the primary objective of all leaders; it is their core responsibility. To achieve mission success, leaders, among other things, must achieve professional competence (intellectually, technically and physically). Mission success also demands that military personnel be trained and prepared to work under physically demanding and austere conditions. In the end, each CAF member must be physically prepared for any challenge that he/she may face.

Member Well-Being and Commitment

The health and well-being of CAF personnel is directly related to physical health and fitness level. Physical fitness directly feeds into member well-being and commitment and can be viewed as an underlying factor of this enabling outcome. For leaders, this concept refers to ensuring that personnel have the opportunity to physically prepare themselves for missions. It means giving them time to maintain their fitness and providing the means and resources to do so. Participation in fitness and sports programs can also build member well-being and commitment through fostering cohesion and teamwork. As was discussed earlier, fitness can also be linked to group and organizational commitment through the expression of CAF ethos and the development of military identity.

Internal Integration

According to the doctrinal manual *Leadership in the Canadian Forces: Leading People*,³² internal integration is about fostering teamwork and cohesion. As was discussed above,

if the social/organizational environment places emphasis on fitness such that it becomes an integral part of successful integration into the social group and socialization into the organization, then fitness can be viewed as a contributing factor to the emergence of teamwork, cohesion and, therefore, internal integration.

External Adaptability

Leading People defines external adaptability as the capacity and willingness to adapt to shifting and changing circumstances, operational environments and roles. As missions change and the environments and circumstances in which military members find themselves exposed shift, the CAF has to be able to adjust the manner in which it trains and prepares its personnel for new environments. At the most basic level, being physically fit represents an important means to enable CAF personnel to rapidly adapt, sometimes in hazardous conditions; it helps to ensure capability across divergent tasks and increased resilience under stress that is often experienced during change.

The effectiveness model, in essence, depicts the duty of leaders across these objectives, but also delineates the interaction or influences that each objective, if dismissed or over-emphasized, can have on the others. For instance, if too much attention is devoted to mission success, in time there will be a cost to personnel (e.g., fatigue, burnout, etc). Conversely, if looking after personnel needs is over-emphasized, this will, in time, have a detrimental effect on mission success. Thus, the model is very much one of competing interests, the clear message being that although leaders must give primacy to mission success, they must also balance this demand against the other enabling objectives that in turn contribute to mission success.

Summary

Physical fitness has not necessarily garnered the attention it merits. This however, does not diminish its importance. The requirement to maintain the necessary level of physical fitness to achieve assigned tasks resonates throughout CAF leadership and profession of arms doctrine. It is clear that a concerted effort is underway to promote an understanding and awareness of the need for CAF members to be fit and healthy. Equally important is the need to ensure that all CAF personnel appreciate the fact that fitness represents a key factor in the military's ability to be effective as an organization, as well as its ability to claim status as a profession. Fitness represents a clearly visible and critical part of our identity and who we are as a profession of arms. It represents part of the expertise required to perform military tasks and, for serving members, the responsibility to oneself, the team, and to society to maintain the necessary level of fitness to perform the varied, difficult and complex tasks that are assigned.

Endnotes

1. Lexi Yoga 101 Fitness Quotes, retrieved 5 Dec 2011 from <www.lexiyoga.com/fitness-quotes>.
2. National Defence, *Canadian Forces – Health and Physical Fitness Strategy*, (Ottawa, ON: Canadian Forces, 2012), retrieved on 12 Feb 2012 from <http://www.cmp-cpm.forces.gc.ca/pub/hpfs-sscp/hpfs-sscp-epng.as>.
3. The Canadian Forces Leadership Institute has produced several doctrinal manuals on leadership and profession of arms. These manuals, however, speak little to the importance of fitness. These manuals include: Canada, *Duty with Honour: The Profession of Arms in Canada 2009* (Ottawa, ON: National Defence, 2009); Canada, *Leadership in the Canadian Forces: Conceptual Foundations* (Ottawa: National Defence, 2005); Canada, *Leadership in the Canadian Forces: Doctrine* (Ottawa: National Defence, 2005); Canada, *Leadership in the Canadian Forces: Leading People* (Ottawa, ON: National Defence, 2007); and Canada, *Leadership in the Canadian Forces: Leading the Institution* (Ottawa: National Defence, 2007).
4. Canada, *Duty with Honour: The Profession of Arms in Canada* (Ottawa: National Defence, 2003).
5. Canada, *Duty with Honour: The Profession of Arms in Canada 2009* (Ottawa: National Defence, 2009), 29.
6. Colonel Bernd Horn, “Physical Fitness”, in *The Military Leadership Handbook*, Colonel Bernd Horn and Dr. Robert Walker, eds. (Toronto: Dundern Press, 2008), 429-435.
7. Major-General Daniel Gosselin, “Foreword”, *The Military Leadership Handbook*, Colonel Bernd Horn and Dr. Robert Walker, eds. (Toronto: Dundern Press, 2008), 9.
8. Canada, *Duty with Honour* (2003).
9. Canada, *Duty with Honour* (2009), 6.
10. Canada, *Duty with Honour* (2003), 8.
11. Canada, *Duty with Honour* (2003), (2009).
12. Canada, *Duty with Honour* (2009), 17.
13. Robert Kegan, *The Evolving Self: Problems and Processes in Human Development*. (Cambridge: Harvard University Press, 1982); and Philip Lewis, George B. Forsythe, Patrick Sweeney, Paul Bartone, Craig Bullis and Scott Snook, “Identity Development during the College Years: Findings from the West Point Longitudinal Study”, *Journal of College Student Development*, Vol. 46, No. 4 (July/August 2005), 357-373.
14. Canada, *Duty with Honour* (2009), 14.
15. Ibid., 25.
16. Ibid., 27.
17. Ibid., 27-29.
18. Ibid., 27.
19. Ibid.
20. Ibid., 28.
21. Ibid., 29.
22. Ibid.
23. Ibid., 28.
24. Canada, *Duty with Honour* (2009).
25. Tonia S. Heffner and Paul A. Gade, “Commitment to Nested Collectives in Special Operations Forces”, *Military Psychology*, Vol. 15, No. 3 (2003), 209-224; and Justin C. Wright, *Towards the Development of a Measure of Military Ethos: Review and Analysis of Theory and Measures Related to Early Socialization and Training Delivery in the CF*. (Kingston: Canadian Forces Leadership Institute, Technical Memorandum 2011-02, 2011).
26. Heffner and Gade, (2003), 209-224; and Alan M. Saks, Krista L. Uggerslev and Niel E. Fassina, “Socialization Tactics and Newcomer Adjustment: A Meta-Analytic Review and Test of a Model”, *Journal of Vocational Behaviour*, Vol. 70, No. 3 (2007), 413-446.
27. James E. Cameron, “A Three-Factor Model of Social Identity”, *Self and Identity*, Vol. 3, No. 3 (2004), 239-262.
28. Heffner and Gade (2003), 209-224; and John P. Meyers, Thomas E. Becker and Rolf Van Dick “Social Identities and Commitments at Work: Toward an Integrative Model”, *Journal of Organizational Behavior*, Vol. 27, No. 5 (2006), 665-683.

29. Wright, (2011).
30. Canada, *Leadership in the Canadian Forces: Conceptual Foundations* (2005); Canada, *Leadership in the Canadian Forces: Leading the Institution* (2007); Canada, *Leadership in the Canadian Forces: Leading People* (2007); Canada, *Duty with Honour: The Profession of Arms in Canada 2009* (2009).
31. Canada, *Leadership in the Canadian Forces: Leading People* (2007), 3.
32. Canada, *Leadership in the Canadian Forces: Leading People* (2007).

CHAPTER 6

PHYSICAL FITNESS IN THE CANADIAN ARMED FORCES: BARRIERS AND LEADERS RESPONSIBILITIES

Lieutenant-Colonel Jeff Stouffer, Captain Ian Miller, Corporal Andrew Holmes

Building and sustaining a strong, healthy and fit CF (Canadian Forces) is a shared responsibility between leadership and all CF personnel. This begins with officers and senior non-commissioned members who are fully committed to a culture of health, who lead by example and who provide training opportunities for personnel to adopt a lifestyle dedicated to eating well, engaging in regular physical activity, maintaining a healthy weight, building effective coping skills for stress and anger, and living addiction-free.

General Walt Natynczyk, Former Chief of the Defence Staff¹

Both the personal and financial success of amateur and professional athletes is hinged on their degree of fitness excellence, and of course, their innate or developed talent. For such athletes, the consequences of not being fit could include losing a competition or championship, a loss of pride, injury (from temporary to the career-ending), reduced monetary compensation or even the loss of employment altogether. Failure to be physically fit in a military context has the added consequence of increased risk of either serious injury or death, not only for oneself, but fellow team members or those whom we are charged to protect. As such, military personnel must have “a higher degree of health and fitness than the general Canadian population to function in complex and demanding environments where strength and endurance could be the difference between success and failure of an operation.”²

The relationship between physical fitness and soldiering is fundamental: “it impacts soldier well being, unit morale and cohesion, operational effectiveness, and mission success.”³ Major-General Michael Day (former Commander Special Operations Forces Command), commented: “The physical robustness that is required allows you to carry on without having to devote your mental energies to keeping your body going. That’s why we’re fit.”⁴ Nowhere is fitness as critical to effective performance, and at times to survival itself, as in the military. Put simply, mission success and survival demands that members of the Canadian Armed Forces (CAF) be physically fit.

Being physically fit, or in some cases becoming physically fit, within a military context requires clear support, guidance and effort at both the individual and organizational level. The Canadian military is “committed to providing the ways and means for every CAF Regular and Primary Reserve member to attain and maintain their personal health and

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physical fitness sufficient to meet CAF operational requirements and in keeping with the principle of Universality of Service.”⁵ To accomplish this, the CAF invests considerable resources through the provision of fitness facilities, exercise and sports equipment, and diverse national and recreational sports programs. It also employs professional fitness trainers and applies scientific fitness research to its many health and fitness initiatives. Equally important, the military affords service personnel with the opportunity, during their normal work routine, to take full advantage of the many facilities and programs that are designed to improve overall fitness levels. Further, senior leadership continues to emphasize, support and endorse existing and emerging CAF fitness and sports programs, as well as a battery of other health initiatives. Most service personnel appreciate, based on the above efforts, the opportunity to participate in the robust fitness and sports programs that the military offers.

Despite the support available to CAF members, many choose to not maintain an appropriate level of physical fitness. For some, this may be due to barriers to achieving physical fitness. The Canadian Fitness and Lifestyle Research Institute (CFLRI) defines physical fitness barriers as perceived hindrances or impediments that prevent one from being active.⁶ A few examples include lack of support, a permissive fitness environment, an overall decline in general fitness levels in the Canadian public, environmental and personal factors. Each of these factors is explained in greater detail below.

Barriers to Physical Fitness

Lack of Support

Although strategic guidance and senior leadership messaging is clear, the military often falls short in guaranteeing that service personnel are afforded the fullest opportunity to participate in fitness and/or sports programs. All too often, when resources become strained, time for fitness, like professional development, is sacrificed. Similarly, as most serving members who participate in fitness and sports programs can attest, the opportunity to participate in such activities is at times denied. Some have come to learn that there may be negative repercussions for requesting time to participate in fitness and sports programs. Others would argue that support for participation is at times used as a coercive tool with which to shape the behaviour of subordinates; it becomes a reward of sorts, to be either conferred or denied.

Being physically fit is a fundamental requirement of military service and should be treated as such. It is not an option: it represents a requirement of employment. In addition, participation in activities intended to ensure military success should not be dependent on where you happen to be employed, who you work for, or how you are performing. To members who have been denied the chance to engage in fitness activities, in the absence of clear operational constraints, the message often received is that fitness and sports programs are not valued. In such cases, supervisors need to appreciate that such decisions can be perceived as disregarding the well-being of their subordinates; a fundamental premise of our leadership and profession of arms doctrine. The resulting impact on morale, organizational commitment and respect for leadership should not be underestimated.

However, operational requirements clearly trump participation in athletic programs. It must also be acknowledged that physical fitness activities enhance operational capacity: “it is a timeless truth that physical fitness is vitally essential to soldier effectiveness.”⁷ As such, every possible measure must be considered to facilitate access to fitness programs. When approached with a fitness or sports request, leaders should first consider how it can be supported vice denied. At times, a compromise may be required, such as adjusting schedules, in order to make it work. In most instances, a solution can be found with a little bit of effort and creative thinking. Great fitness programs, facilities and equipment are of no value if a concerted effort is not made to ensure their use.

Beyond organizational support, the degree of social and family support also influences an individual’s willingness to participate in physical fitness activities. Social support systems are groups or communities of people joined together in a common cause who encourage and aid each other in achieving their goals (e.g., walking/running groups or pick-up sports programs). Without social support groups, many individuals will deviate from physical fitness initiatives. Family support is also important, especially for those who train or participate in sports programs during off-duty hours. The CAF goes to great lengths to encourage the families of service members to utilize the many facilities and programs that are offered.

Permissive Fitness Environment

Being physically fit is both an organizational and individual responsibility. It has been suggested by certain observers, however, that the CAF has created a “permissive fitness environment”, owing to “binding judicial pronouncements that have effectively disallowed legally enforceable fitness standards.”⁸ At face value, this argument may hold some merit. On the whole, it seems reasonable to suggest that the CAF has not been as vigilant as it could be in ensuring that its personnel achieve and maintain adequate levels of fitness. Because fitness standards cannot or are not always enforced, it could be argued that an attitude persists that it is not a mandatory requirement for CAF employment. As indicated in the *CAF Health and Fitness Strategy*, the military has placed too much emphasis on fitness testing, the result being that its members focus on passing the test rather than being physically active and leading a healthy lifestyle. The advantages of creating a culture of fitness as opposed to the fear of dismissal should be the emphasized.

An Overall Decline in Fitness Levels

Although not a direct barrier to participating in a physical fitness program, the resulting impact of an overall decline in fitness levels does present a considerable challenge – both on the organizational level and at the individual level. Research has demonstrated that Canadian society as a whole has become less fit. As a result, the CAF should expect that new recruits will be less fit today than in the past. Such a scenario has certainly been the case as the percentage of new recruits passing the Canadian Forces Exercise Prescription (CF EXPRES) fitness standards (as measured from 2002 to 2009) has declined.⁹ In particular, this research found that shuttle run, push-up, and sit-up results were on the decline. All of these findings have obvious implications for CAF leadership: efforts to get new recruits to an acceptable level of fitness must be bolstered; a culture that supports fitness must be

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promoted; a lifelong commitment to fitness must be instilled in new members; and, more generally, the potential anti-fitness behaviours and mindsets of existing personnel must be challenged and changed for the better.

Environmental Factors

For some, maintaining a regular physical fitness program can represent a daunting task. It requires effort, dedication and discipline in the face of an often hectic and stressful daily schedule. Such a scenario is especially true for individuals who have not previously led a physically active life. Therefore, any added environmental inconveniences can further impede an individual's attempt to become physical fit. Barriers specific to the environment generally include cost, availability (e.g., lack of facilities and programs), and access. Environmental barriers can be difficult to manage. The inconvenience they pose can discourage and prevent individuals from engaging in meaningful physical activity. In addition, they are often beyond one's control. That said, it is safe to suggest that only under exceptional circumstances (i.e., isolated postings or certain deployments) should these types of barriers persist for military personnel.

Personal Factors

Individual determinants such as injury and illness and/or the lack of time, motivation, and energy, can influence one's participation in physical fitness activities. These barriers are quite common and their debilitating nature tends to make them the most problematic.

Injury and Illness

Injury and illness can represent significant barriers in preventing or hindering individuals from engaging in meaningful physical activity. This is especially true for individuals at each end of the physical fitness spectrum: elite athletes who engage in intense exercise¹⁰ and beginners who lack the knowledge and/or skills to exercise properly.¹¹

Lack of Time

It is not clear to what extent a lack of time is dictated by individuals' life circumstances, by their inability to properly manage time, or if fitness is low on their overall list of priorities. As reported in the 2004 CF Health and Lifestyle Information Survey, CAF members cited "not having enough time" as a significant obstacle to improve their lifestyle.¹²

Lack of Energy

There is a perception that adding exercise to an already tiring workday will only further decrease energy levels and exacerbate fatigue. However, overwhelming evidence indicates that exercise "plays a significant role in increasing energy levels and reducing fatigue."¹³ As little as fifteen minutes a day of walking can drastically improve one's energy levels.

Lack of Motivation

Lack of motivation can stem from, among other things, a lack of confidence in one's ability.¹⁴ Those who do not believe they can become fit, or compete in a sport, may find it difficult to muster the necessary motivation to participate.

While environmental barriers should have a limited impact within a CAF context, personal barriers can represent considerable and substantial obstacles. Eliminating or, at the very least, significantly reducing the impact of these barriers is a leadership challenge. Leaders must first understand the barriers at play and then take the necessary action to reduce their detrimental influence. Such an approach requires leaders to be informed of the needs of their subordinates, have knowledge of the science of fitness, and be imaginative in terms of how to implement effective fitness and sports programs that appeal on both the individual and group level. The CAF *Health and Fitness Strategy* can assist in this regard.

Canadian Armed Forces Health and Fitness Strategy

The CAF *Health and Fitness Strategy* was created to raise both awareness and the level of health and physical fitness within the CAF in order to better meet operational requirements. It was intended to guide activities that support and improve the level of physical fitness and the lifestyle behaviours of military members and to clearly enunciate that “every CF member must be committed to the implementation of this strategy.”¹⁵ The *Health and Fitness Strategy* identifies four guiding principles to raise health and fitness awareness throughout the CAF:

- Accountability and Responsibility – leaders at all levels are accountable and responsible for individual and unit health and physical fitness – CAF personnel are also responsible to maintain a healthy lifestyle and a personal fitness regimen;
- Operational Focus – the CAF will establish and maintain physical fitness standards for success in operations;
- Measurable – that fitness performance measure standards are established that are scientifically based and consistently applied; and
- Integrated Total Force – that physical fitness applies equally to all military personnel, Regular and Primary Reserve.¹⁶

Beyond these four guiding principles, the strategy also includes seven lines of operation. While each is intended to contribute to the overall health and well-being of CAF members, three have particular relevance to this volume: shared ownership; lifelong lifestyle commitment; and regular physical activity. The other guiding principles, while important, are beyond the scope of this chapter; they are healthy nutrition, healthy weight, addiction-free lifestyle and effective governance.

Shared Ownership

The CAF demonstrates its commitment to physical fitness through supporting policies and the provision of fitness facilities and programs, fitness educators, and the opportunity to participate in fitness activities during work hours. The *Health and Fitness Strategy* clearly indicates, through Chief of Defence Staff direction, that the chain of command is responsible for the widespread support of physical fitness. Leadership is expected to lead by example as well as provide the time for personnel to participate, during working hours, in a fitness program. At the same time, each member has the personal responsibility to ensure their participation in a fitness or sports regime. In this sense, shared ownership refers to both leadership and personal accountability for one's physical fitness.

Lifelong Lifestyle Commitment

As indicated by Lieutenant-Colonel Michael Goodspeed, the CAF:

has the means to engineer a genuine cultural transformation in which rigorous levels of fitness become a central feature across the CAF. In creating this new culture, our approach should be scrupulously fair-minded, enthusiastic, supportive, and above all else, determined.¹⁷

Instilling in military members the interest to both develop and sustain a lifelong commitment to physical fitness is paramount. Any regular fitness centre participant can attest to the increased number of people engaging in fitness activities in January. In fact, initiating a regular fitness program is consistently reported as being a top new year's resolution.¹⁸ All too often, however, this participation is short-lived. That said, such behaviour, even if sporadic, continues to speak to a general willingness to achieve a level of fitness; the key for leaders is to turn this motivation into a sustained lifelong commitment.

Regular Fitness Activity

The *Health and Fitness Strategy* makes recommendations for regular physical activity. It makes the point that the requirement for CAF members to be operationally fit demands a higher level of physical fitness. For CAF members, "regular physical fitness activity" is defined as being "engaged in physical fitness activity a minimum of one hour per day".¹⁹ While CAF members reported "not having enough time" as a barrier to physical fitness, 90 percent of participants who identified concerns with their level of fitness activity intended to make changes in their lives.²⁰ The lack of time, coupled with the intention to change, suggests that improvements in the level of physical activity can be achieved if leaders provide the time and flexibility for members to participate in fitness programs. To do so, fitness activities must be built into daily work routines.

Physical Fitness – Leader Requirements

The primary goal of group fitness/sports activities is to build fitness, cohesion and morale. These goals, however, are often defined poorly or not at all. At times, the activity itself or the way in which it is conducted can achieve the opposite to the intended effect.

People become annoyed that they have to participate in an activity that does not appeal to them and thus participate half-heartedly or not at all. When such a scenario occurs, the fitness and other potential benefits are at best minimized. Thought and imagination in designing fitness activities is therefore required. Stimulating and maintaining interest in fitness activities requires innovation, creativity and flexibility. Group activities must not simply be planned and executed without thought, merely so that it can be said that a group activity was performed.

Identifying and clearly defining the intended objective and designing a program to get there requires careful thought. Leaders need to recognize that when developing or approving fitness activities, that there are a variety of other valued organizational and personal benefits that can be achieved. Beyond the obvious cohesion and morale, fitness and sports programs can also be used to develop leadership skills, character, and teamwork and team coordination. Fitness and sports activities also provide opportunities to learn about co-workers, what motivates them, and equally important, under what conditions they will require assistance or motivation to push them forward. Such activities also provide the opportunity to learn more about ourselves, what we can achieve, what we can endure, and help us to identify our psychological and physical limitations. It is important to get beyond thinking about fitness as fitness only – participation in fitness and sports programs can be used to build leaders, build character, instil a measure of personal pride and confidence, and help to solidify those “soft” skills and competencies that any fighting force values.²¹

Fitness and sports also have implications for professional development. Most notably, they provide the opportunity to interact with subordinates, peers and supervisors on an equal footing. They create interactions across rank, age, experience and military profession, thus allowing more junior members to benefit from the insights and knowledge of more seasoned participants. Physical activities also provide an excellent venue for more seasoned participants to get a better understanding of what motivates and is important to junior members. In this sense, considerable informal learning that is often not attainable through formal experience or daily routine is achieved through participation in fitness/sports activities.

The following suggestions will assist leaders in inculcating a fitness culture within their areas of responsibility:

- be familiar with the *CAF Health and Fitness Strategy*, as well as other CAF policies on health and fitness;
- make physical fitness a leadership priority;
- communicate, at every opportunity, the requirement to be physically fit through an active and deliberate communication strategy;
- understand the benefits and value of fitness – both organizational and personal;
- understand that physical fitness activities can be used to develop valued military qualities;

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- work to identify and remove any barriers that prevent participation in fitness activities;
- lead by personal example, by not only supporting fitness activities, but also participating in them;
- create an environment that supports fitness activities and provide the opportunity during the normal work routine for personnel to participate in a regular physical fitness routine;
- be creative in the selection of fitness and sports activities in order to make certain that the personal fitness needs and desires of subordinates are met;
- reward fitness; and
- accept accountability for the physical fitness levels of subordinates.

Summary

Military personnel face considerable physical and mental demands related to their employment. Benefitting from high levels of physical fitness will help to provide the confidence, ability and endurance to better meet these demands. Concerted efforts are required, however, to ensure that the value of physical fitness is truly understood and that all barriers to participation are minimized, if not eliminated altogether. Guidance from senior leadership is essential, although not entirely sufficient on its own, to ensure that CAF personnel adopt a healthy and fitness-conscious lifestyle. Every service member needs to understand the benefits of being physically fit and be provided with the resources and time to do so. Understanding the importance of physical activity and finding time to fit it in a busy schedule is only half the battle. Fitness must be rewarded and leaders need to be held accountable for the fitness levels of their subordinates.

Endnotes

1. This comment by the former Chief of the Defence Staff, General Walt Natynczyk, appeared as the opening statement to an article on fitness that appeared in *The Maple Leaf*. See "Recommit to Be Fit," *The Maple Leaf*, Vol.14, No. 27 (September 2011), 11.
2. *Canadian Forces Health and Physical Fitness Strategy*, 1, retrieved on 6 December 2011 from <<http://www.cmp-cpm.forces.gc.ca/pub/hpfs-sscp/hpfs-sscp-eng.asp>>. This discussion was extracted from the Introduction statement provided by General R.J. Hillier, the then-Chief of the Defence Staff.
3. Colonel Bernd Horn, "Physical Fitness Chapter 31", in Colonel Bernd Horn and Dr. Robert W. Walker eds., *The Handbook of Military Leadership* (Toronto: Dundern Press, 2008), 433.
4. Comment made by Major-General Michael Day on a video produced by the Canadian Forces Leadership Institute. The DVD is titled *Warrior's Honour*, produced by Dr. Joe MacInnis in collaboration with the Canadian Forces Leadership Institute (Government of Canada / Department of National Defence 2012).
5. *Canadian Forces Health and Physical Fitness Strategy*, 6.
6. The Canadian Fitness and Lifestyle Research Institute (CFLRI) has produced several reports covering a wide range of "fitness and sports" topics. This particular information was extracted from a CFLI report - 2004 Physical Activity and Sport Monitor Section E: Barriers to Participation," retrieved 7 December 2011 from <http://72.10.49.94/pub_page/117>.
7. Horn, (2008), 429.

CHAPTER 7

THE CANADIAN ARMED FORCES SPORTS PROGRAM: PARTICIPATION, PERCEPTION, AND RESULTS FROM THE 2011 SURVEY

Krystal K. Hachey, Ph.D.

“The CF Sports Program is definitely an asset to a career in the CF.”¹

Physical fitness is an essential requirement for serving in the Canadian Armed Forces (CAF). The CAF offers programs for CAF personnel that enable them to meet and maintain this important requirement. One of these programs is the CAF Sports Program, which allows personnel to participate in sports at the base, regional, national and international levels. In addition to the maintenance of physical health, sports participation also acts as protection against psychological issues such as depression and suicidal ideation² and also serves to enhance social cohesiveness.³ The CAF Sports Program promotes both physical and psychological health in an environment that encourages fun and competitive physical activity. It not only supports the CAF in keeping its personnel physically fit, but it is also a mechanism that promotes both the development of desirable social qualities and skills, including unit cohesion and teamwork, as well as individual attributes, such as self-esteem, self-sacrifice and leadership. Overall, the CAF Sports Program provides a means for CAF members to participate in competitive sports, while giving them the opportunity to further develop important characteristics integral to the CAF and its success.

Despite the potential benefits associated with the CAF Sports Program, it was not evaluated until 2011. The *Canadian Forces (CF) Sports Program Survey* aimed to examine the following:

1. the characteristics of those who participate in the CAF Sports Program;
2. the reasons individuals participate in the CAF Sports Program;
3. the overall benefits of the CAF Sports Program; and,
4. participants’ overall satisfaction with the CAF Sports Program.

The study also sought CAF personnel’s perceptions of the program, including whether participation enabled participants to maintain health and fitness and develop personal characteristics such as teamwork and leadership. In addition, the study assessed the potential link between sports participation and retention and recruitment. This chapter will provide an overview of the results and present general recommendations regarding the CAF Sports Program.

The Survey

An online survey was developed to collect information on participants and non-participants in the program. Non-participants were included to provide a comparative basis. The participants included Regular Force personnel who participated in sports at the base, regional, national and international level, as well as coaches and individuals who participated in out-service and extreme sports.⁴ Non-participants included Regular Force members who were not part of the CAF Sports Program and who were matched to participants with respect to gender and rank. The survey was sent to a random sample of 6,150 participants and non-participants in June 2011. A total of 2,108 respondents completed the survey including 1058 (50.2 percent) participants and 1050 (49.8 percent) non-participants, yielding a response rate of 34.3 percent.

Survey respondents

The majority of participants and non-participants who completed the survey were Anglophones (69.3 percent participants; 67.9 percent non-participants), male (75.9 percent participants; 73.1 percent non-participants), junior non-commissioned members (NCMs) (44.5 percent participants; 42.3 percent non-participants) and from the army (45.3 percent participants; 46.8 percent non-participants). In addition, the CAF Sports Program participants who completed the survey were slightly younger than non-participants, their average age being 37 as compared to 39.

Survey Results

The next section will review some pertinent findings from the survey. It will review individuals' awareness of the program, their reasons for joining or not joining the CAF Sports Program, their assessments of their general health, mental health and physical fitness, as well as their assessment of program benefits related to camaraderie, leadership, recruitment, and retention.

Awareness of the program

The study sought to determine awareness of the CAF Sports Program. It was found that half of the non-participants had not heard of the program (51.3 percent), yet most of them (84.9 percent) would have liked to have heard about it. Those who had heard of the program indicated that they had heard about it through friends, followed by Personnel Support Program (PSP) staff, the base newspaper, and base wide e-mail broadcasts.

Reasons for Participating or Not Participating in the Program

Previous research has identified a variety of reasons that drive individuals to participate in physical activities,⁵ as well as other unique motivators associated with participation in group sports.⁶ These include the ability to socialize, compete, and the opportunity to learn a new skill.⁷ In the current study, the most frequent reasons for joining the CAF Sports Program, as indicated by participants, were camaraderie (85.0 percent) and

stress reduction (81.9 percent). While the reduction in stress is a reason to participate in general physical fitness,⁸ enhancing camaraderie is specifically associated with sports participation.⁹ Another top reason reported for participating in the CAF Sports Program was the chance to participate in high-level competition (76.5 percent). Figure 7.1 presents the most frequently cited reasons for participating in the CAF Sports Program.

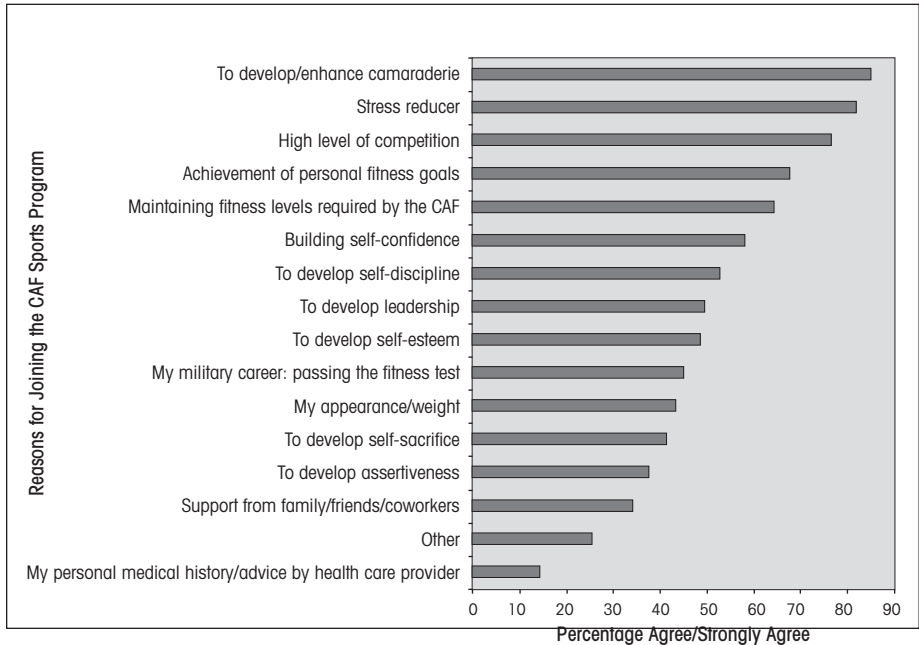


Figure 7.1 – Reasons for joining the CAF Sports Program

Comments collected through the survey revealed the benefits of socializing in a group. One individual stated, for example, “I feel the CF sports program is very valuable to the CF for morale and camaraderie and [I] would like to see it continue.” Another revealed the value of the program for meeting new people. “It is my opinion,” one individual wrote, “that the CF sports program is a great tool for anyone who wishes to play sports for fun or for competition in higher levels. It has allowed me to meet several individuals over the years and remain friends with them throughout my career.”

As illustrated in Figure 7.2, non-participants indicated that being too busy (61.2 percent), followed by preferring to do exercise or sports on their own time (54.1 percent) were reasons for not participating. Additional reasons mentioned by non-participants included injuries, cost, level of athletic abilities required (i.e., sports only geared to the elite athlete), and other sport commitments. Overall, respondents recognized the many social and personal benefits that could be accrued from participating in the CAF Sports Program.

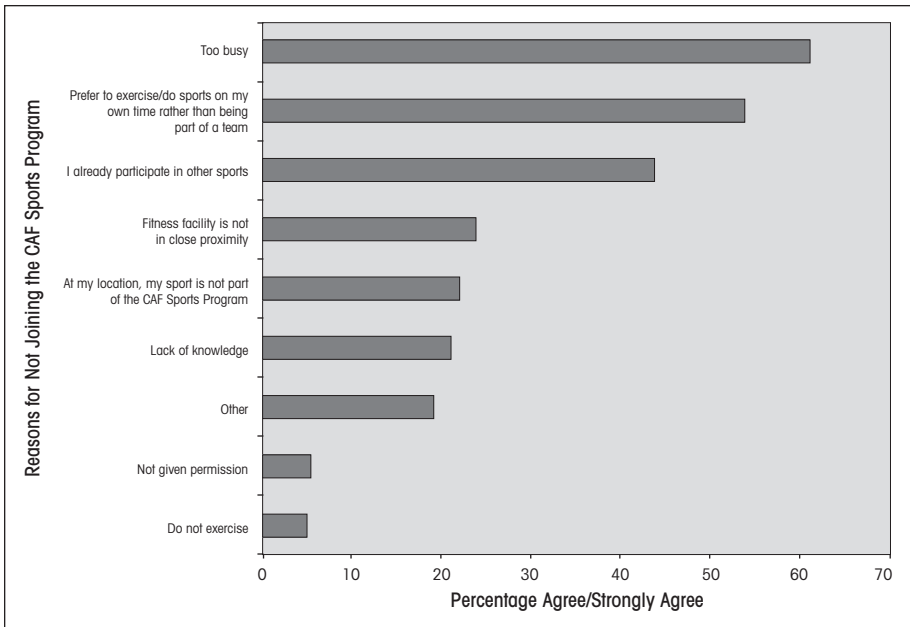


Figure 7.2 – Reasons for not joining the CAF Sports Program

General and Mental Health

The survey asked respondents about their general health, both physical and psychological, in order to gauge the health-related benefits of participating in the program. There were significant differences between participants and non-participants with regard to their self-reported mental and physical health. Participants reported better general and mental health than did non-participants. Also, written comments from participants emphasized the value that the CAF Sports Program has for the mental and physical health of CAF personnel. For instance, one respondent wrote, “The CF Sports program is a valuable tool to engage all CF members and needs to [be] encouraged at all levels; CF members who are engaged in CF Sports Programs are generally physically and mentally healthier soldiers.” Similarly, another individual stated, “I have really enjoyed the last couple of years with respect to the CF Sports Programs. I have had a lot of stress with both my personal life and career so this has benefited me a great deal [by] allowing me a positive way of venting my stress.” Furthermore, some participants in the CAF Sports Program felt that the benefits associated with sports participation provided them with a way to enhance their mental health. For example, one individual stated, “As my mood improves because of the sports, I feel more confident and happier to interact with people around me.”

Physical Fitness

CAF personnel are required to maintain physical fitness standards. They must annually meet the Minimum Physical Fitness Standards (MPFS).¹⁰ Respondents were asked how

they maintained their physical fitness. A large portion of participants (34.1 percent) indicated that the CAF Sports Program was their only way of maintaining physical fitness. Other ways in which participants maintained their physical fitness included weight lifting and cardiovascular training at the gym (e.g., running, biking and spinning), personal training programs, outdoor activities (e.g., hiking) and daily physical training (PT).

Participants and non-participants were also asked about their height and weight in order to calculate Body Mass Index (BMI). Although close to half of participants and non-participants were considered overweight (51.8 percent participants; 44.2 percent non-participants), and 18.1 percent of participants and 26.5 percent of non-participants were considered obese, these results were similar to other health-related research conducted with CAF Regular Force personnel.¹¹ Approximately one-third of participants (29.8 percent) and non-participants (29.0 percent) were considered in the normal weight range.

Both participants and non-participants were asked about what they do to train for the CAF Exercise Prescription (EXPRES) test, which has now been replaced by the FORCE Evaluation,¹² the results of which are reported in Figure 7.3. The majority of participants and non-participants indicated fitness training (50.5 percent participants; 69.2 percent non-participants). A large proportion of participants, however, also indicated that participation in sports (39.0 percent) was a way to prepare for the CAF EXPRES test. Other ways to prepare for the test, mentioned by both participants and non-participants, included running, cycling, elliptical, equestrian, spinning, weight training, crossfit, and rucksack marching.

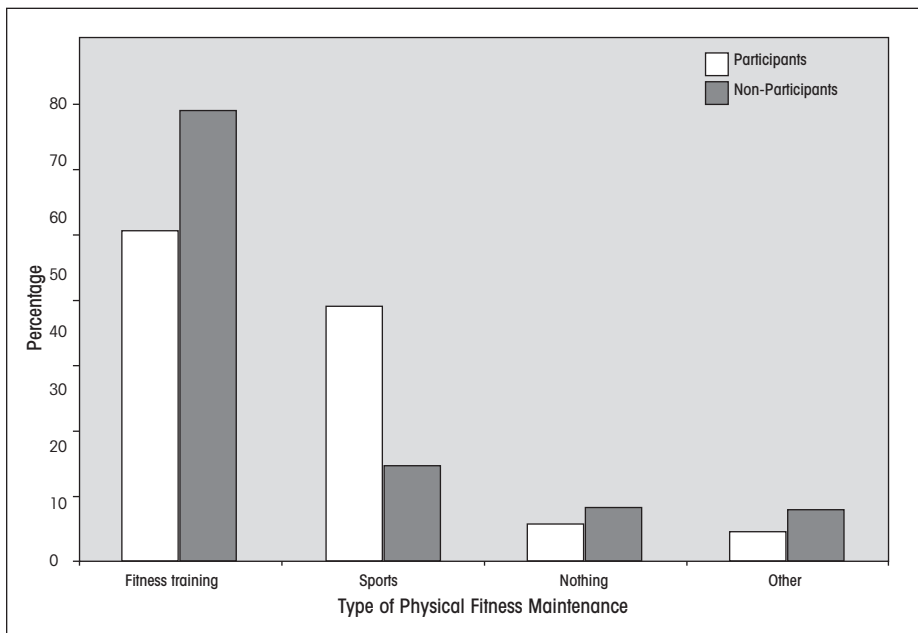


Figure 7.3 – Types of physical fitness maintenance performed by participants and non-participants

Unit Cohesion and Leadership

Participants were asked whether being part of the CAF Sports Program improved their leadership abilities and whether it contributed to how they interacted with individuals in their unit. The majority felt that participation did contribute to their interactions with their unit. For example, one participant who completed the survey explained:

The informal nature of team sports breaks down rank barriers and you get to know people of different ranks and backgrounds. These people have become my friends and we socialize in a “non-work” setting where the pressure of the military rank hierarchy does not exist, but the shared experience of military life brings us together using sports as a shared interest. It broadens your perceptions and the attitudes of the people who you work for, as well as the people who work for you.

The majority of participants stressed the importance of the sports program in enabling them to socialize with other individuals outside of work and without the rank structure. The participants felt that the CAF Sports Program ultimately helped build teamwork skills. On the other hand, only a small number of individuals felt that participation helped improve their leadership abilities. Some participants’ comments, however, suggested the value of sports in providing the opportunity to demonstrate their leadership abilities. For example, one respondent wrote:

It provides an opportunity for individuals to take a leadership role in a less formal environment, allowing them to develop leadership skills they may not have the chance to exercise in the workplace. It allows me personally to mentor younger players in life and sport skills in a situation where the officer/subordinate relationship is more relaxed and individuals may be more open to new ideas.

In addition, some participants detailed how participating in the CAF Sports Program had enhanced their interpersonal skills and ability to lead a group outside of the normal rank structure. For example, one individual stated, “Interpersonal relationship building is much easier when you are a member of a group/team with common interests and goals outside of the office, ship or unit.”

Support

One theme that arose from participants’ and non-participants’ comments, which was not explicitly addressed in the survey, was the need to support the CAF Sports Program, both financially and within the chain of command. One individual stated, for example, that, “It would be better if more supervisors supported their subordinates’ sports ventures. It is always sad to hear of individuals wanting to play sports and supervisors saying ‘no,’ even when the operational tempo would allow members to participate.” Another individual stated:

[I would] like to encourage the CF Sports Program to communicate the necessity to supervisors at all levels that participation in the CF Sports Program, although

voluntary, is something extremely worthwhile for the CF and the person's career. Too often these days there is a lack of understanding or support at the supervisory levels within an organization that prevents sports teams from either being able to effectively compete or just field a team ... Too often now the 'operational' requirement card is played that prevents people from participating because supervisors feel it unfair to 'grant' permission for someone to have time away from work to compete in CF Sports. This philosophy is flawed because in most cases, your strongest workers are those who are participating in CF sports.

Support tended to be a common theme, and thus points to the need for consistent guidelines across CAF bases to support this program.

Recruitment and Retention

Over the years, the CAF has initiated several projects to bolster recruitment and retention, focusing on diversity and stressed occupations (i.e., occupations with severe shortages of personnel). These projects examined retention strategies and pointed to areas where attrition may be occurring.¹³ The CAF Sports Program survey included questions about the link between recruitment, retention, and participation in the sports program. These questions focused on career intentions, reasons for joining the CAF, perceptions about the use of the CAF Sports Program as a recruitment tool and the extent to which the CAF Sports Program was a motivator to stay in the CAF. Only a small proportion of participants indicated that they would leave the CAF if another job became available (8.6 percent). With that being said, however, 19.3 percent indicated that they would leave the CAF if the CAF Sports Program was terminated. This suggests the relative importance of the program to participants as a whole.

Overall, the majority of participants indicated that the program could be used as a recruitment tool (64.2 percent). Likewise, almost half of participants indicated that the CAF Sports Program had been a motivator for them to stay in the CAF (45.8 percent). In addition, the importance of the program was emphasized in several of the comments. One participant wrote, "I believe that the CF would suffer in retaining personnel and in recruitment should the CF Sports Program be withdrawn." Another claimed, "Loss of the sports program would not lead [me to] immediately leave the CF, but it would be a significant dissatisfier." Additional comments also exposed the need for greater awareness about the program on the grounds that it could be used for the retention of CAF personnel. For example, as one individual stated:

The sports program is an amazing thing for members of the military. It definitely helps with the retention of recruits awaiting training. It should probably be more advertised to them. Also it's a great place to learn leadership, organization and dedication. Experienced members pass on these skills through leading by example during games.

Based on participants' perceptions that greater awareness of the program is required, it is recommended that additional information on the program be supplied through other media, including recruitment centres and CAF websites. The CAF Sports Program should

be marketed in a way that makes CAF members aware of the benefits of the program for maintaining physical fitness.

Satisfaction with the CAF Sports Program

The CAF Sports Program survey was used to examine the extent to which the participants were satisfied with the CAF Sports Program, the results of which are presented in Figure 7.4. Participants were relatively satisfied with all levels of sports (i.e., base to international), but indicated the need for more financial support, more advertising, and better equipment. Additional comments revealed that participants wished they had more time for certain sports (e.g., ice time), better support from the chain of command, more variety of sports, more teams, and sport-specific training advice.

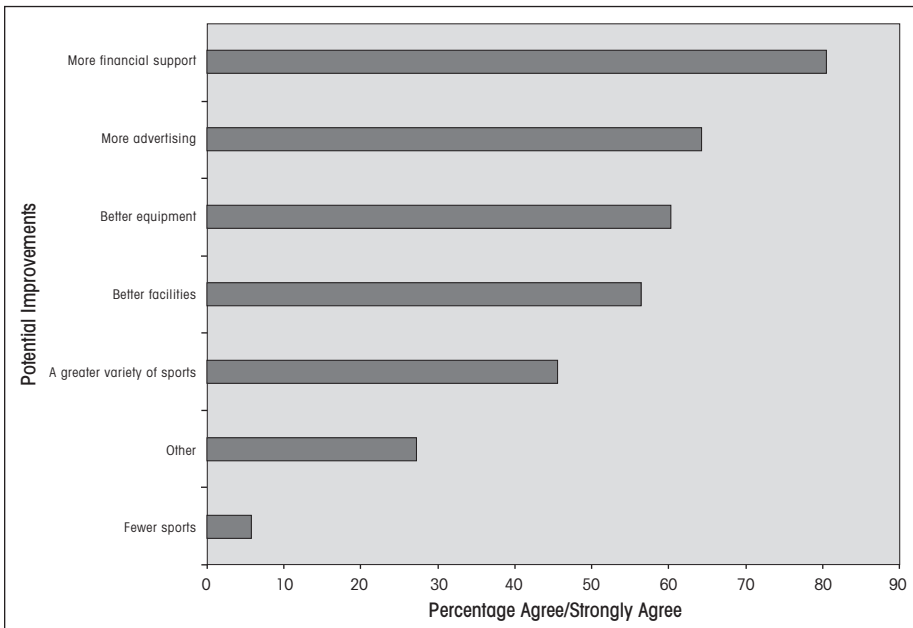


Figure 7.4 – Suggested improvements for the CAF Sports Program. Participants’ and Non-Participants’ Personal Views

At the end of the survey, both participants and non-participants were invited to provide additional comments. Five themes emerged from participants’ comments:

1. **Facilities** – the importance of having better access to facilities, as well as updated facilities;
2. **Program information** – the need for providing more information and creating more awareness about the program;
3. **Program changes** – the need for PSP staff to be more knowledgeable, for more sports, for equality of men’s and women’s sports, and for equality of higher and lower level sports;

4. **Support** – the importance of having both financial and chain of command support for the program; and,
5. **Importance of the program** – the extent to which the CAF Sports Program had impacted their military careers and its overall value.

Five themes also emerged from non-participants' comments:

1. **Reasons for not participating** – time commitments and work ethic pressures;
2. **Criticisms of the program** – valuable resources were being taken away from operational and support units;
3. **Program changes** – the absence of a variety of sports;
4. **Support** – the importance of having chain of command support; and,
5. **Importance** – non-participants, like participants, stressed the value of having a sports program.

As was mentioned earlier, there were also several non-participants who had not even been aware of the CAF Sports Program in the first place, further supporting the greater need for better awareness. Although non-participants may have reported some negative comments, they also stressed the value of having a CAF Sports Program, even if they were not interested in participating.

Overall, the open-ended comments provided greater insight into the perceptions of the CAF Sports Program from both participants and non-participants alike. The comments indicated the importance of the program, but also the changes that should be considered in the future. Some of these changes included providing more information and more sports, and ensuring equality for both men's and women's sports and for national- and base-level sports. These comments point to the importance of clarifying how, where and when individuals are able to participate in the CAF Sports Program. Participants expressed the importance of the program in promoting skills, such as leadership and teamwork, and providing an avenue for CAF personnel to socialize with other members.

Conclusion and Recommendations

The *CAF Sports Program Survey* provided the first real look at general perceptions of the CAF Sports Program from the standpoint of participants and non-participants, while addressing specific topics such as health, fitness, recruitment, and retention. Overall, the program was seen as beneficial in providing CAF members with avenues to further develop personal characteristics and physical fitness. Also evident were the physical and psychological benefits associated with participating in group sports. Although the survey was the first to examine general and mental health benefits of participating in the program, it is difficult to ascertain whether the program is enhancing mental and physical health or whether the participants who completed the survey are more likely to have better general and mental health overall.

Chapter 7

Several recommendations can be made based on the findings of this survey. First, there is a need to provide better awareness of the program through various media, such as CAF-related internet sites and through recruitment videos and centres. The program could, for instance, be marketed to both potential recruits, as well as to those who are already in the military. The purpose and extent of the program – what it provides, the benefits to participants (e.g., mental and physical health), how and where to participate, and so on – should be clarified. Since there are many bases across Canada, it is also necessary to streamline the information so that it is consistent across all locations.

Endnotes

1. Comment from a participant in the *CAF Sports Program Survey*, translated from French.
2. Lindsay Babiss and James Gangwisch, "Sports Participation as a Protective Factor Against Depression and Suicidal Ideation in Adolescents as Mediated by Self-Esteem and Social Support," *Journal of Developmental & Behavioural Pediatrics*, Vol. 30, No. 5 (2009), 376-384. Michael Bahrke and William Morgan, "Anxiety Reduction Following Exercise and Meditation," *Cognitive Therapy and Research*, Vol. 2, No. 4 (1978), 323-333.
3. Nathalie Koivula, "Sport Participation: Differences in Motivation and Actual Participation Due to Gender Typing," *Journal of Sport Behavior*, Vol. 22, No. 3 (1999), 360-380.
4. Out-service and extreme sports fall outside the regular CAF Sports Program. Out-service sports include activities such as civilian competitions, whereas extreme sports include activities such as power lifting or cycling (i.e., sports that are not usually offered by the CAF Sports Program).
5. David Chinn, Martin White, Denise Howel, Jane Harland and Christopher Drinkwater, "Factors Associated With Non-Participation in a Physical Activity Promotion Trial," *Public Health*, Vol. 120, No. 4 (2006), 309-319. Lavon Williams and Diane Gill, "The Role of Perceived Competence in the Motivation of Physical Activity," *Journal of Sport & Exercise Psychology*, Vol. 17, No. 4 (1995), 363-378.
6. Koivula, (1999). Christina Frederick and Richard Ryan, "Differences in Motivation for Sport and Exercise and Their Relations With Participation and Mental Health," *Journal of Sport Behavior*, Vol. 16, No. 3 (1993), 124-146.
7. Koivula, (1999).
8. Chinn et al., (2006).
9. Koivula, (1999).
10. Canada, Department of National Defence / Canadian Forces, *Canadian Forces Physical Fitness Standards* (2009), retrieved on 9 July 2010 from <<http://www.forces.gc.ca/site/news-nouvelles/news-nouvelles-eng.asp?cat=00&cid=2848>>.
11. Jennifer Born, Laura Bogaert, Elspeth Payne and Miriam Wiens, *Health and Lifestyle Information Survey (HLIS) – 2008/9 – Regular Force Report* (Ottawa: Directorate of Force Health Protection, 2010).
12. Vice Chief of the Defence Staff (2013). Launch of the new CAF fitness evaluation. CANFORGEN 038/13.
13. Fariya Syed and Rob Morrow, *Recruiting and Retention of Military Personnel: Canada* (2007), retrieved on 12 October 2010 from <<http://www.rta.nato.int/pubs/rdp.asp?RDP=RTO-TR-HFM-107>>.

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GLOSSARY

OF ABBREVIATIONS AND ACRONYMS

20mSR	20 metre shuttle run
BET	Battle Efficiency Test
BFOR	Bona Fide Occupational Requirement
BFT	Battle Fitness Test
BMI	Body Mass Index
CAF	Canadian Armed Forces
CAFT	Canadian Aerobic Fitness Test
CanadaCOM	Canada Command
CANSOFCOM	Canadian Special Operations Forces Command
CCHS	Canadian Community Health Survey
CEFCOM	Canadian Expeditionary Force Command
CF	Canadian Forces
CFAO	Canadian Forces Administrative Order
CF EXPRES	Canadian Forces Exercise Prescription
CFLRI	Canadian Fitness and Lifestyle Research Institute
CFLRS	Canadian Forces Leadership and Recruit School
CFMWS	Canadian Forces Morale and Welfare Services
CFRC	Canadian Forces Recruiting Centre
CISM	<i>Conseil international du sport militaire</i>
CJIRU	Canadian Joint Incidents Response Unit
CPP	Close Personal Protection
CSOR	Canadian Special Operations Regiment
DCIEM	Defence and Civil Institute of Environmental Medicine

Glossary

DFIT	Directorate of Fitness
DPERA	Director of Physical Education, Recreation and Amenities
DRDC	Defence Research and Development Canada
ERG	Ergonomics Research Group
FORCE	Fitness for Operational Requirements of CAF Employment
FSD	Fitness and Sports Director
GSS	General Social Survey
HDL	High-density lipoprotein
HLIS	Health and Lifestyle Information Survey
JTF2	Joint Task Force 2
LDL	Low-density lipoprotein
LFCPFS	Land Forces Command Physical Fitness Standard
MET	Metabolic equivalent of task
MPFS	Minimum Physical Fitness Standards
MWG	Military World Games
NATO	North Atlantic Treaty Organization
NCM	Non-Commissioned Member
OUTCAN	Outside Canada
PERI	Physical Education and Recreation Instructors
PMT	Project management team
PSP	Personnel Support Programs
PTSD	Posttraumatic stress disorder
RCAF	Royal Canadian Air Force
RCMP	Royal Canadian Mounted Police
RHQ	Recruit Health Questionnaire
RMCPPT	Royal Military College Physical Performance Test

RSD	Regional Sports Director
SAS	Special Air Service
STF	Standardized Test of Fitness
TPB	Theory of Planned Behaviour
VO ₂ max	Maximal aerobic capacity, maximal oxygen consumption
WHO	World Health Organization

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