

32 FST 481

Personnel Management for the Fire Service

*Implementing a New Physical Fitness Standard for the
Independence (KY) Fire District*

March 13, 2009

William Scott Breeze

Instructor: Larry Bennett

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

ABSTRACT

The Independence Fire District's prior physical fitness program had no vision or leadership and therefore was not effective. Upon completion of the Fire Service Fitness Specialist course held by the Cooper Fitness Institute a new physical fitness program was initiated to improve the health and wellness of the department. The purpose of this paper is to describe the implementation of a comprehensive physical fitness evaluation along with exercise and nutrition prescription individualized for members of the Independence Fire District. A literature review was completed on fire department physical fitness programs.

TABLE OF CONTENTS

CERTIFICATION STATEMENT	2
ABSTRACT	3
TABLE OF CONTENTS.....	4
INTRODUCTION	5
BACKGROUND & SIGNIFICANCE	6
LITERATUE REVIEW	8
PROCEDURES.....	9
DISCUSSION	11
REFERENCE LIST	13
APPENDIX A.....	14
APPENDIX B	16

Implementing a New Physical Fitness Standard for the Independence Fire District

INTRODUCTION

The fire service is in the midst of an epidemic. Annually, the leading cause of firefighter line of duty deaths (LODD) is attributed to heart attacks and strokes. The United States Fire Administration announced 114 on-duty firefighter fatalities in the United States as a result of incidents that occurred in 2008. Preliminary estimates indicate that heart attacks and strokes were responsible for the deaths of 50 firefighters (43.8%) in 2008. This shows a decrease from 54 of the 118 (45.7%) firefighters in 2007. (Cade, 2009). With this statistical trend not changing, something must be done to protect the lives of those that protect America.

Deaths Caused by Stress or Overexertion

Year	Number	Percent of Fatalities
2007	55	46.6
2006	54	50.9
2005	62	53.9
2004	66	56.4
2003	51	45.9
2002	38	38
2001	43	40.9*
2000	46	44.6
1999	56	49.5
1998	43	46.2

**Does not include the firefighter deaths of September 11th, in New York City*

Figure 1: U.S. Fire Administration; FF Fatalities in the U.S. in 2007

There can be little disagreement with the opinion that firefighting is one of the most dangerous occupations. In fact, “firefighters as a group are more likely than any other American worker to die of a heart attack while on duty” (Federal Emergency

Management Agency, 2002). Due to the inherent danger and stress placed upon firefighters on a daily basis, an answer to the seemingly endless number of health related LODD must be found. Firefighters are not just dying at the fire scene during firefighter operations, but also during training, responding to incidents and also after they have returned back to the fire station (See Figure 2). Physical fitness may very well be that answer.

The current physical fitness program of the Independence Fire District is lacking and does not prepare the members of this institution for the stress and dangers of the job. The objective of this paper is to describe the implementation of a new physical fitness program for the Independence Fire District located in Independence, Kentucky.

Heart Attacks by Type of Duty (2007)

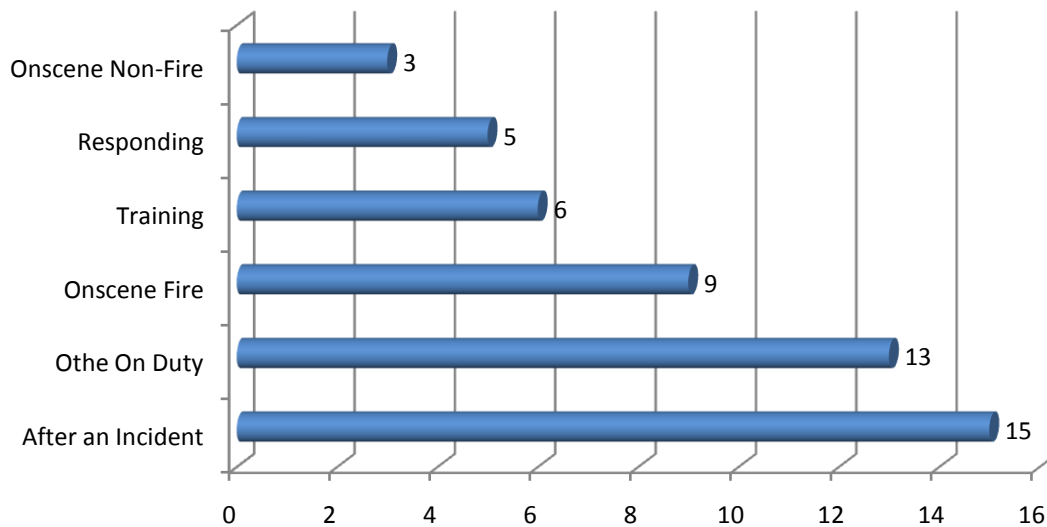


Figure 2: U.S. Fire Administration; FF Fatalities in the U.S. in 2007

BACKGROUND & SIGNIFICANCE

The Independence and Community Volunteer Fire Department was first established in 1937. In 1979, under Kentucky Revised Statute 75 the Independence Fire

District was established. The Independence Fire District has evolved into a combination department which employs forty-one career firefighters, ten part-time firefighters and fifteen volunteers. These personnel cover forty-three square miles and a population of more than 22,000 citizens. The Independence Fire District provides fire and advanced life support emergency medical services to its citizens along with neighboring communities through the use of mutual aid contracts.

The career staff is made up of thirteen personnel per shift that work a 24/48 schedule. Three fire stations are staffed by career personnel. The average age of the members of the Independence Fire District is thirty-seven years with nine members older than fifty years.

The Fire District implemented a mandatory physical fitness period each shift for the paid personnel in 2000. This physical fitness program was monitored only for completion while on shift. There were no guidelines set up to measure current physical fitness level of the members or how to improve their physical fitness levels. While this program was mandated for all paid personnel, there was little to no incentive to participate other than to not be disciplined. Each fire station is equipped with free weights, dumb bells and either a treadmill or elliptical machine. A minimum of thirty minutes was to be completed each shift by each member.

In February of 2009, three members of the Fire District attended the Cooper Fitness Institute located in Dallas, Texas. The Cooper Institute conducts research in epidemiology, exercise physiology, behavior change, hypertension, children's health issues, obesity, nutrition, aging, and other health issues. Papers from The Cooper Institute are among the most frequently cited references in the scientific literature on

topics related to physical fitness, physical ability, and health (The Cooper Institute, 2009).

The three members attended a five day educational course for Fire Service Fitness Specialist. During this thirty-three hour course topics were covered such as; Fire Service Joint Labor Management Wellness-Fitness Initiative, NFPA 1582 and 1583, coronary risk factors, medical screening, exercise and safety, goal setting, and exercise prescription (The Cooper Institute, 2009).

Upon returning from this course, a program was set up to begin implementing a new physical fitness standard for all Fire District members. A new standard operating guideline was established which adopted NFPA 1583. Each member will be assessed using the Cooper Five Step process which includes medical screening, fitness and nutrition assessment, goal setting, exercise and nutrition prescription, and adherence.

LITERATURE REVIEW

The literature review for this paper began with visiting the Learning Resource Center (LRC) of the National Fire Academy. The LRC on-line catalog was used to search for relevant publications addressing physical fitness evaluations and firefighter wellness.

A personal interview was conducted with Independence Fire District Chief R.A. Messingschlager (March 1, 2009). Chief Messingschlager was selected since any change to the current fitness evaluation system would need his support. Chief Messingschlager was adamant that the fitness evaluation should be non-punitive and flexible enough to meet the needs of each individual member.

Multiple national standards have been written and adopted to deal with the issue of physical fitness. NFPA standards 1500, 1582, and 1583 were researched for this paper. According to NFPA 1500 (2002), “the fire department shall develop physical performance requirements for candidates and members who engage in emergency operations” (p. 25). This standard also requires members to be evaluated annually. The standard also discusses that departments need to establish and provide a health and fitness program.

NFPA 1582 (2002) states that, “the fitness evaluation shall be conducted on an annual basis,” (p. 15), and that it includes specific components. These components are an aerobic capacity evaluation; a body composition evaluation; a muscular strength evaluation; a muscular endurance evaluation; and a flexibility evaluation.

NFPA 1583 (2002) has similar points to the above mentioned standards. This standard states that, “fire departments shall require the structured participation of all members in the health related fitness program” (p.6), and that fitness assessments need to be conducted annually. It includes the same evaluation components as NFPA 1582.

The fire department’s greatest asset is not equipment, apparatus, or stations, but rather is its personnel. An increased physical fitness level will also decrease the incident of soft tissue and musculoskeletal injuries in the workforce. This decrease of injuries will then correlate to a more physically efficient workforce.

PROCEDURES

All employees have previously been given annual physical evaluations through a local general practitioner’s office. A contract has since been signed to host a company to

perform on site physical examinations fully compliant with NFPA 1582. These physicals will continue to be performed on an annual basis.

The physical fitness standards for each member of the Fire District will be individualized. Each member will be evaluated by a medical screening performed by a Fire Service Fitness Specialist. The medical screening consists of three levels. Level one will involve the member completing a medical history questionnaire, a physical activity readiness questionnaire (PAR-Q) and a general medical screening involving a resting heart rate, resting blood pressure and body composition/waist circumference measurement. Level two will consist of a three minute step test. For level three each member will be evaluated by performing a push up and sit up test, one repetition maximum bench press, sit and reach flexibility test and either a one mile walk or a one and a half mile run. (Kenneth H. Cooper, 2009).

One purpose of this fitness assessment is to identify potential health risks. Through this screening, an individual may be referred to their primary physician if they cannot pass the examination. The second purpose of this fitness assessment is to determine and classify an individual's fitness level. This will allow for the appropriate exercise prescription to take place as well as provide a motivational tool. All data accumulated will be compared with gender and age norms to finish the assessment. A nutritional assessment will also be performed on each member. The purpose of the nutritional assessment is to make the individual aware of what they are eating along with educating them on a proper balanced diet. Each person will be educated on not only what they are putting into their bodies, but also the importance of eating appropriate portion sizes. Each member will then begin utilizing the online tools developed by the United

States Department of Agriculture's food pyramid web site (www.mypyramid.gov). This web site allows individuals to track their daily food intakes. It also gives valuable resources for healthy lifestyle changes (U.S. Department of Agriculture).

DISCUSSION

In light of the current state of the fire service, it is imperative that physical fitness is approached proactively to meet the health needs of today's fire personnel. Research has shown that firefighters work at near-maximal heart rates for prolonged periods of time with little warm up or preparation time. Considering this and the fact that firefighters have an increased risk of pulmonary disease, heart disease and cancer, and firefighters are routinely exposed to carbon dioxide and other toxic substances that stress the respiratory and cardiovascular system, the fire service needs the benefits of a comprehensive wellness program (Pearson, 1995).

With the statistics mentioned previously in this text, approximately 50 firefighters are losing their lives every year due to cardiovascular disease. Physical fitness programs can reduce this deadly statistic. As Billy Goldfeder lectured in his Everybody Goes Home series, "And the beat goes on!" (Goldfeder, 2007). There is no reason why the fire service cannot learn from its own history and stop the monotony of physical fitness related LODD.

A comprehensive wellness plan must include corrective measures to reverse unhealthy lifestyles and alleviate or minimize the risks found in the individual firefighter/s physical assessment. Through an appropriate exercise and nutrition prescription process, not only will corrective measures be instituted to help any

immediate physical fitness shortcomings, but more importantly a foundation is being set that a new healthier lifestyle can be built upon.

Whereas a comprehensive wellness program incorporates not only physical fitness and nutrition but also smoking/tobacco cessation, high cholesterol and obesity, the Independence Fire District is beginning to make positive strides toward a healthier department. With beginning a new physical fitness program the Independence Fire District is laying its foundation. This new program covers all employees including all line officers, administrative officers, medical director and board of directors. All volunteer members are encouraged to cooperate as well. With this cornerstone in place, the remainder of a comprehensive health and wellness program can begin to be instituted.

REFERENCE LIST

Cade, G. (2009, January 7). Retrieved March 1, 2009, from United States Fire Administration: <http://www.usfa.dhs.gov/media/press/2009releases/010709.shtm>

Federal Emergency Management Agency. (2002). *Firefighter Fatality Retrospective Study*. Arlington, VA: FEMA.

Kenneth H. Cooper, M. M. (2009). Cooper 5 Step Process. *The Cooper Institute Participant Manual*. Dallas, TX: The Cooper Institute.

National Fire Protection Agency. (2002). *Fire Department Occupational Safety and Health Program (NFPA 1500)*. Quincy, MA: NFPA.

National Fire Protection Association. (2000). *Comprehensive Occupational Medical Programs for Fire Departments (NFPA 1582)*. Quincy, MA: NFPA.

National Fire Protection Association. (2000). *Health Related Fitness Programs for Firefighters (NFPA 1583)*. Quincy, MA: NFPA.

The Cooper Institute. (2009). Retrieved March 1, 2009, from The Cooper Institute: <http://www.cooperinstitute.org>

U.S. Department of Agriculture. (n.d.). *My Pyramid*. Retrieved March 1, 2009, from www.mypyramid.gov

**APPENDIX A
WELLNESS AND FITNESS****102.70
MARCH 2009 PAGE 1 OF 2****PURPOSE**

The purpose of this Standard Operating Guideline is to establish a standard for maintaining total body fitness and wellness among all Independence Fire District members.

PROCEDURE

1. Fitness & Wellness Initiative
 - A. By means of this policy, the Independence Fire District adopts The Cooper Institute Fire Service Fitness Specialist 5 Step Process as its recommended guidelines for fitness and wellness programs and assessments.
 - B. Additionally, the department uses all or part of NFPA 1583: Standard on Health Related Fitness Programs for Firefighters, 2008 Edition as a resource for fitness and wellness programs and NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments, 2007 edition.
2. Personal Fitness Training
 - A. All uniformed members of the Independence Fire District shall accomplish a minimum of two hours cardiovascular and strength training per calendar week.
 - B. The required fitness training will be completed while on-duty.
 - C. Issued work-out clothing will be provided by the Independence Fire District and shall be worn during fitness training.
3. Fitness Assessments
 - A. Fitness Assessments will be conducted quarterly based on The Cooper Institute Fire Service Fitness Specialist 5 Step Process.
 - B. Certified Fire Service Fitness Specialist (CFSFS) will conduct the annual fitness assessments.
 - C. All uniformed members shall participate in a mandatory, quarterly, non-punitive, and confidential fitness assessment, following medical clearance.
 - D. All members must read, understand and sign an informed consent form prior to beginning the wellness fitness program.
 - E. Medical Clearance will be obtained based on the member's annual physical and further screened using the PAR-Q.
 - F. Once the Fitness Assessment is completed, the CFSFS will provide personalized feedback including the individual's current level of fitness, level of improvement since past assessments, and a suggested exercise prescription.
 - G. The Fitness Evaluation will evaluate four specific areas.
 - Aerobic Capacity
 - Muscular Strength
 - Muscular Endurance
 - FlexibilityAll necessary protocols for the fitness evaluation are referenced in the Cooper Institute Fire Service Fitness Specialist Handbook.
4. Medical Assessments/Physicals
 - A. All uniformed members shall receive an annual medical assessment and physical by the department's contracted physician.

WELLNESS AND FITNESS

102.7

MARCH 2009 PAGE 2 OF 2

- B. The annual exam is a mandatory physical to be conducted every twelve months.
- C. The annual exam will be conducted in two groups, testing either in May or November.
- D. All necessary components of the annual exam are referenced in NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments, 2007 Edition.

References:

- NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments, 2007 Edition
- NFPA 1583: Standard on Health Related Fitness Programs for Firefighters, 2008 Edition
- The Cooper Institute Fire Service Fitness Specialist Program, 2009
- Informed Consent Form
- PAR-Q Physical Activity Readiness Questionnaire
- Annual Physical Health Questionnaire

APPENDIX B

PAR-Q & YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	1. Has your doctor ever said that you have a heart condition <u>and</u> that you should only do physical activity recommended by a doctor?
<input type="checkbox"/>	<input type="checkbox"/>	2. Do you feel pain in your chest when you do physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	3. In the past month, have you had chest pain when you were not doing physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
<input type="checkbox"/>	<input type="checkbox"/>	5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
<input type="checkbox"/>	<input type="checkbox"/>	7. Do you know of <u>any other reason</u> why you should not do physical activity?

If
you
answered

YES to one or more questions

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

NO to all questions

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

- start becoming much more physically active — begin slowly and build up gradually. This is the safest and easiest way to go.
- take part in a fitness appraisal — this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

DELAY BECOMING MUCH MORE ACTIVE:

- if you are not feeling well because of a temporary illness such as a cold or a fever — wait until you feel better; or
- if you are or may be pregnant — talk to your doctor before you start becoming more active.

PLEASE NOTE: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

No changes permitted. You are encouraged to photocopy the PAR-Q but only if you use the entire form.

NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

NAME _____

SIGNATURE _____

DATE _____

SIGNATURE OF PARENT _____

WITNESS _____

or GUARDIAN (for participants under the age of majority)

Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.



PAR-Q & YOU

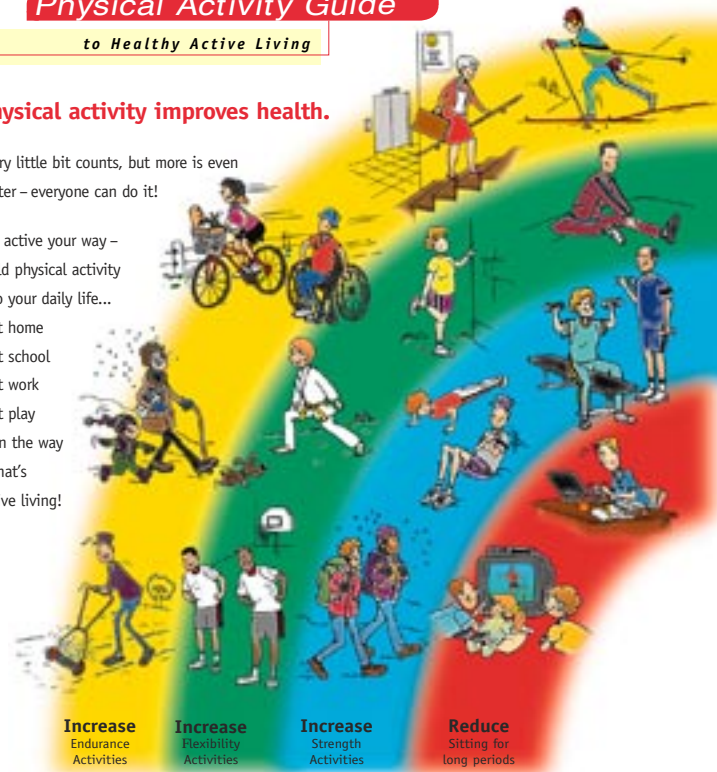
CANADA'S
Physical Activity Guide
to Healthy Active Living

Physical activity improves health.

Every little bit counts, but more is even better – everyone can do it!

Get active your way – build physical activity into your daily life...

- at home
 - at school
 - at work
 - at play
 - on the way
- ...that's active living!



- Increase** Endurance Activities
- Increase** Flexibility Activities
- Increase** Strength Activities
- Reduce** Sitting for long periods

Choose a variety of activities from these three groups:

Endurance
4-7 days a week
Continuous activities for your heart, lungs and circulatory system.

Flexibility
4-7 days a week
Gentle reaching, bending and stretching activities to keep your muscles relaxed and joints mobile.

Strength
2-4 days a week
Activities against resistance to strengthen muscles and bones and improve posture.

Starting slowly is very safe for most people. Not sure? Consult your health professional.

For a copy of the *Guide Handbook* and more information: **1-888-334-9769**, or www.paguide.com

Eating well is also important. Follow *Canada's Food Guide to Healthy Eating* to make wise food choices.

Get Active Your Way, Every Day – For Life!

Scientists say accumulate 60 minutes of physical activity every day to stay healthy or improve your health. As you progress to moderate activities you can cut down to 30 minutes, 4 days a week. Add-up your activities in periods of at least 10 minutes each. Start slowly... and build up.

Time needed depends on effort				
Very Light Effort	Light Effort	Moderate Effort	Vigorous Effort	Maximum Effort
• Strolling • Dusting	60 minutes • Light walking • Volleyball • Easy gardening • Stretching	30-60 minutes • Brisk walking • Biking • Raking leaves • Swimming • Dancing • Water aerobics	20-30 minutes • Aerobics • Jogging • Hockey • Basketball • Fast swimming • Fast dancing	• Sprinting • Racing
Range needed to stay healthy				

You Can Do It – Getting started is easier than you think

Physical activity doesn't have to be very hard. Build physical activities into your daily routine.

- Walk whenever you can – get off the bus early, use the stairs instead of the elevator.
- Reduce inactivity for long periods, like watching TV.
- Get up from the couch and stretch and bend for a few minutes every hour.
- Play actively with your kids.
- Choose to walk, wheel or cycle for short trips.
- Start with a 10 minute walk – gradually increase the time.
- Find out about walking and cycling paths nearby and use them.
- Observe a physical activity class to see if you want to try it.
- Try one class to start – you don't have to make a long-term commitment.
- Do the activities you are doing now, more often.

Benefits of regular activity: Health risks of inactivity:

- | | |
|--|--|
| <ul style="list-style-type: none"> • better health • improved fitness • better posture and balance • better self-esteem • weight control • stronger muscles and bones • feeling more energetic • relaxation and reduced stress • continued independent living in later life | <ul style="list-style-type: none"> • premature death • heart disease • obesity • high blood pressure • adult-onset diabetes • osteoporosis • stroke • depression • colon cancer |
|--|--|

Source: Canada's Physical Activity Guide to Healthy Active Living, Health Canada, 1998 <http://www.hc-sc.gc.ca/hppb/paguide/pdf/guideEng.pdf>

© Reproduced with permission from the Minister of Public Works and Government Services Canada, 2002.

FITNESS AND HEALTH PROFESSIONALS MAY BE INTERESTED IN THE INFORMATION BELOW:

The following companion forms are available for doctors' use by contacting the Canadian Society for Exercise Physiology (address below):

The **Physical Activity Readiness Medical Examination (PARmed-X)** – to be used by doctors with people who answer YES to one or more questions on the PAR-Q.

The **Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for Pregnancy)** – to be used by doctors with pregnant patients who wish to become more active.

References:

- Arraix, G.A., Wigle, D.T., Mao, Y. (1992). Risk Assessment of Physical Activity and Physical Fitness in the Canada Health Survey Follow-Up Study. **J. Clin. Epidemiol.** 45:4 419-428.
- Mottola, M., Wolfe, L.A. (1994). Active Living and Pregnancy. In: A. Quinney, L. Gauvin, T. Wall (eds.), **Toward Active Living: Proceedings of the International Conference on Physical Activity, Fitness and Health**. Champaign, IL: Human Kinetics.
- PAR-Q Validation Report, British Columbia Ministry of Health, 1978.
- Thomas, S., Reading, J., Shephard, R.J. (1992). Revision of the Physical Activity Readiness Questionnaire (PAR-Q). **Can. J. Spt. Sci.** 17:4 338-345.

For more information, please contact the:

Canadian Society for Exercise Physiology
202-185 Somerset Street West
Ottawa, ON K2P 0J2
Tel. 1-877-651-3755 • FAX (613) 234-3565
Online: www.csep.ca

The original PAR-Q was developed by the British Columbia Ministry of Health. It has been revised by an Expert Advisory Committee of the Canadian Society for Exercise Physiology chaired by Dr. N. Gledhill (2002).

Disponible en français sous le titre «Questionnaire sur l'aptitude à l'activité physique - Q-AAP (révisé 2002)».