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

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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.
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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*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Percent of Fatalities</th>
</tr>
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<tbody>
<tr>
<td>2007</td>
<td>55</td>
<td>46.6</td>
</tr>
<tr>
<td>2006</td>
<td>54</td>
<td>50.9</td>
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<td>2005</td>
<td>62</td>
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<td>2004</td>
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<td>2003</td>
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<td>2002</td>
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<tr>
<td>2001</td>
<td>43</td>
<td>40.9*</td>
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<td>56</td>
<td>49.5</td>
</tr>
<tr>
<td>1998</td>
<td>43</td>
<td>46.2</td>
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</tbody>
</table>

*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)**

<table>
<thead>
<tr>
<th>Type of Duty</th>
<th>Heart Attacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onscene Non-Fire</td>
<td>3</td>
</tr>
<tr>
<td>Responding</td>
<td>5</td>
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<tr>
<td>Training</td>
<td>6</td>
</tr>
<tr>
<td>Onscene Fire</td>
<td>9</td>
</tr>
<tr>
<td>Othe On Duty</td>
<td>13</td>
</tr>
<tr>
<td>After an Incident</td>
<td>15</td>
</tr>
</tbody>
</table>

*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.

LITERATUE 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


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
      - Flexibility
      All 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.
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.


References:
- 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
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.

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.

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

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.
Walk whenever you can – get active with your kids. Choose to walk, wheel or observe a physical activity. Get up from the couch and find out about walking and reduce inactivity for long terms. Start with a 10 minute walk – for better health, better self-esteem, relaxation and reduced stress, continued independent living in improved fitness, obesity, heart disease, feeling more energetic, adult-onset diabetes, stronger muscles and bones, depression, colon cancer, stroke, and osteoporosis. Health into your daily life...

Build physical activity. Get active your way – everyone can do it! Every little bit counts, but more is even better. That’s physical activity improves health.

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!

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

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PAR-Q & YOU: Physical Activity Readiness Questionnaire - PAR-Q (revised 2002)

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.

Physical activity does not have to be very hard. Build physical activities into your daily routine. 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:

- 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

Health risks of inactivity:

- premature death
- heart disease
- obesity
- high blood pressure
- adult-onset diabetes
- osteoporosis
- stroke
- depression
- colon cancer

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)."