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**Applying the CrossFit Concept to
Law Enforcement Physical Fitness Training**

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ABSTRACT

The purpose of this paper is to provide comprehensive information on why the CrossFit model of physical fitness is superior for police job performance when compared to the common fitness programs encouraged in most law enforcement agencies. The CrossFit model of fitness applies constantly changing routines across a broad range of functional skills, and prescribes very high intensity output to gain results. To obtain information for this paper, a review was conducted of literature that was submitted as articles and research information to the CrossFit Journal website. Also, interviews were conducted with police trainers who had at least partially implemented the CrossFit concept of fitness. It was found that after implementing a physical fitness program based on the CrossFit model of fitness in a Florida police academy, scores on physical fitness tests improved and injuries were reduced (Cooper & Canto, 2007).

Because of the physical needs of law enforcement officers to effectively do their job, police agencies should use the CrossFit model of fitness for their academy physical fitness programs. There are critics of the CrossFit concept due to its high impact, high stress routine. The critics say this type of workout can increase injuries because of its dynamic nature. However, the research showed that with proper coaching and proper programming by a trained instructor, injuries can be decreased and physical performance will increase.

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INTRODUCTION

According to Cooper and Canto (2007), "For police academy physical fitness instructors, the core mission has been and always will be the production of high-caliber functionally fit police officers, irrespective of innate athletic talent or fitness background" (p. 6). To accomplish this, instructors are looking for new ways to improve fitness that will increase performance on many job tasks and prevent injury. Many years ago, it was taught that lifting heavy weights was the answer because police officers need to be strong. Then there is the need of endurance, so long distance running became a staple of fitness. While each of these exercise routines has a legitimate place, there is too large of a performance gap between the two, which often goes unaddressed for the day to day needs of law enforcement officers. The CrossFit model of fitness attempts to cover these areas by using functional movements in constantly changing workouts in an attempt to increase work capacity across broad time and modal domains (Glassman, 2011).

In an effort to decrease injuries and to ensure professionalism in the accomplishment of every task, it makes sense that an officer should train like he/she may fight. This realistic training should not stop at shooting and defensive tactics but should include fitness. Because law enforcement officers have a broad spectrum of physical needs to effectively do their job, police agencies should use the CrossFit model of fitness for their academy physical fitness programs.

POSITION

The police officer's daily job is unique in the fact that after sitting still for several hours, they may be required to engage in an immediate explosion of physical activity.

Most of this activity would be short, but it can be very intense. The lists of these activities are endless, from the extreme, like fighting a suspect who has attacked, to the not so deadly, such as pushing a disabled SUV from an intersection. Each example is realistic and probably happens every day in law enforcement environments around the world. It is the position of the author that traditional law enforcement physical training, standard lifting weights (especially machines that lock joints into place), and long distance running does not effectively prepare an officer for this work environment. In its place, a program based on the CrossFit concept of fitness should be introduced.

CrossFit was developed over many years by personal trainer Greg Glassman. CrossFit's core concept is based on "constantly varied, functional movements, executed at high intensity" (Glassman, 2007, p.1). CrossFit defines functional movements as those movements that are categorically unique in their ability to express power (Glassman, 2011). The CrossFit concept pulls together as many skills and routines as possible from all facets of fitness. By always changing workouts and not having a routine, like some Bodybuilding routines, such as "Monday/Wednesday/Friday- Chest and Back, an athlete does not become proficient in only those few movement patterns in which they train.

Instead, overall or general physical fitness is increased, which makes the participant ready for any challenge. Attempting to define physical fitness in a manner that is capable of giving guidance to an athlete can be difficult. The U.S. Department of Health & Human Services (1996) defined physical fitness as "A set of attributes that people have or achieve relating to their ability to perform physical activity" (p. 21). Hoffman and Collingwood (1995) stated that physical fitness is "the ability to perform

physical activities, such as job tasks, with enough reserve for emergency situations and enjoyment of recreational pursuits” (as cited in Paske, 2010, p. 3). While these definitions are general and all inclusive in their statement, they do not take into account all of the components of true fitness, especially the type of fitness required by law enforcement officers. Implementing a CrossFit model of fitness would cover those areas neglected by more traditional workout programs.

CrossFit uses three standards to determine fitness. The first is based on the degree of mastery of ten physical skills focused on by physical trainers and exercise physiologist. The ten skills are cardiovascular/respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy (Glassman, 2002). The second standard of fitness is based on the performance of athletic ability in the area of sports. The third fitness model is based on the energy systems that drive all human actions. In the CrossFit description of fitness, each of the three models are important. Glassman (2002) stated “Each area has a specific function in evaluating overall fitness of an athlete” (p. 1).

The CrossFit concept of fitness encompasses three areas of energy usage or “metabolic pathways” within the human body (Glassman, 2002, p. 2). The medical explanation into these pathways is extremely complex and outside the scope of this writing. However, a very brief description is provided for each pathway in layman’s terms. The human body uses energy that is given off by the breakdown of a substance known as adenosine triphosphate and commonly referred to as ATP (Uberti, 2004). Metabolic pathways are the locomotion that provides energy for athletic movement. The three “metabolic engines” are known as the phosphagen pathway, the glycolytic

pathway, and the oxidative pathway. These systems recover ATP in an attempt to provide enough energy for the required demand (Uberti, 2004). A police department's fitness program should ensure all three of the pathways are worked to obtain optimal job performance.

The phosphagen pathway is the energy system used for short bursts of high intensity activity. The body's cells have a small store of ATP in the system and are able to use this storage to fund the intense activity. However, the available energy cannot be replaced quickly enough. This metabolic imbalance of high intensity can only be maintained for approximately ten seconds (Freudenrich, n.d.). An example of this would be lifting a heavy object or carrying a person from a burning vehicle.

The glycolytic pathway receives its name from glycolysis. It is a process in which sugar glucose is oxidized and split, and, eventually, energy is derived from the ATP produced. Energy taken from this pathway will not have the high output of the phosphagen pathway, but effort in this area can be sustained for a longer time (Croston, n.d.). Physical output in this area can last up to a few minutes. An example here would be an officer pushing a vehicle up an incline to get it out of the roadway or chasing a suspect over a short distance.

The oxidative pathway is a stage in which only low amounts of lactic acid are produced by the muscles during movement. Oxygen provided through the respiratory system meets the exercise demands of the muscles. Activity in this area can be continued over a long period of time (Freudenrich, n.d.). Here, a law enforcement-related example would be following a long distance track over several miles by a canine unit.

To obtain complete fitness, the type that CrossFit promotes, an athlete (or police officer) should be skilled and competent in all three pathways. This means that police officers and other professions who have similar needs should ensure they train for strength, power, and endurance. An attempt to balance the effects promoted by each of the three pathways largely determines the metabolic conditioning or “cardio” that is done at CrossFit. According to Glassman (2002), “Favoring one or two to the exclusion of the others and not recognizing the impact of excessive training in the oxidative pathway are arguably the two most common faults in fitness training” (p. 2).

Police officers may be asked to complete many tasks on any given day, the concept of high intensity, functional fitness fills any void other workout programs leave open. From the beginning, CrossFit was designed to create a generalized workout that includes many fitness challenges. As an underlying concept, CrossFit strives to prepare a person for any physical contingency. The CrossFit prescription is fairly simple; it is constantly varied, high-intensity, functional movements (Glassman, 2007). The reason for functional movements and not the more commonly seen movements, especially those restricted by weight machines is that natural movement uses musculoskeletal components as a system. When engaged, recruitment patterns throughout the body are activated. These are done in a successive series of contractions. They task the body from core to extremity, and they are movements that require more than one of the body's joints to be involved - i.e. they are compound movements. The movements advocated by CrossFit are effective and natural for the human body. Glassman (2007) said, “But no aspect of functional movements is more important than their capacity to move large loads over long distances, and to do so quickly” (p. 1).

It is a police administrator's, as well as a police trainer's, responsibility to ensure that the officers on the street have the most advanced and proficient training available. This includes firearms, verbal judo, and physical fitness. What should be at the forefront of a physical fitness program is its ability to give an officer immediately needed performance on demand. The CrossFit concept is able to nurture this needed performance by not repeating the same fitness patterns time and time again (Glassman, 2007).

The key components for the police officer in the CrossFit model of fitness is the functional movements executed at high intensity (Glassman, 2007). This area of functional movement is so important because it mimics real life situations. The intensity is a necessity because without it, the human body will not effectively increase its capacity to complete the tasks or demands placed on it in day-to-day situations. By combining both the functionality and the intensity, the CrossFit program covers those ten general skills that can prepare an officer for any situation. By constantly mixing workouts, the human body will continue to adapt and not become complacent (Glassman, 2007).

Many current physical fitness recommendations do not promote this type of complete fitness. Police trainers should ensure their agencies do not implement physical fitness programs that may not meet the needs of the street officer. As a profession, police trainers should determine if they are applying the most current fitness standards for their trainees.

It is prudent at this point to review a short history of how the traditional fitness routine became prevalent in police academies. It is possible that fitness experts and

police trainers could have been misguided for many years. Intense, functional movements from the time of the first Olympics gave way to a fitness industry fueled by money. This industry promoted “bodybuilding” and designed machines which locked joints in place and isolated muscle movement patterns (Glassman, 2002). The theory was that by breaking down a movement and attempting to apply focused stress and isolating a specific muscle, one could make the muscle stronger and bigger. While the theory may seem valid, what it lacks is that most real life movement, especially in law enforcement is usually dynamic and does not have the luxury of a padded surface to stabilize or isolate that movement. The human body is designed to work together as a complete system and isolated movements can cause an imbalance within the muscular system (Amos, 2006). An imbalance within the structure of the body could leave it vulnerable when placed under demand from the law enforcement job requirement.

A second noted problem was that the workout routines were very specific for exercise but lacked any sort of increased performance standards to allow a person to start the next phase of exertion when they were well rested and ready. Again, as in the real life of a police officer, physical demands are seldom done with moderate effort and adequate rest periods in between. The CrossFit model attempts to cover all of these shortcomings by conducting functional movements within the three different metabolic pathways for increased performance and injury prevention (Glassman, 2007).

Law enforcement officers need a fitness system that can prepare the body for the demands of the “unknown and the unknowable” (Glassman, 2007, p.1) situations that may occur in the law enforcement realm. This is where the CrossFit piece fits into the puzzle. By using the idea of high intensity exercise and constantly changing routines

across a broad spectrum of tasks, officers can be prepared for any challenge they are confronted with.

Before someone can recommend to a chief to change the physical fitness program in the academy, they need to ensure that this is the right way to train. Since police departments are often called para-military, it makes sense to look to the military to see what their training regimen is like. As it turns out, the United States military has been researching the CrossFit concept for a few years, and it appears to be a valid training option for combat operations for all branches of the service (other nations militaries have also studied the CrossFit concept for several years).

According to a 2006 report from the Marine Corps Combat Development and Integration Unit, titled A Concept for Functional Fitness, and endorsed by Marine Corps Lieutenant General Amos, stated, "Physical fitness has been associated with professional performance, especially performance in combat. An unsophisticated exercise routine based almost entirely on mono-structural metabolic conditioning cannot provide the sort of training stimulus necessary to build General Physical Preparedness" (p. 2). It is interesting to note the term "General Physical Preparedness" used by the Marine Corps. It is this broad area of fitness needed by those in combat and those in law enforcement. This report spoke of the need to change the current Marine Corps training program to further accommodate the needs of a combat type environment. The "Marine Corps' Physical Fitness Program, as it is currently focused and structured, does not properly prepare Marines for combat" (Amos, 2006, p. 1). Unfortunately, as noted by the Combat Development and Integration unit, "the Marine Corps' current Physical Fitness Program may not meet the needs of the organization. The program over-

emphasizes aerobic training (long distance running) and gives very little attention to strength training” (Amos, 2006, p. 2).

The U.S. Army also has data on the CrossFit model of fitness as it applies to combat operations and improved physical fitness. While deployed to Afghanistan to support the current war on terror campaign of Enduring Freedom, elements of a helicopter aviation unit were given the standard Army Physical Fitness Test (APFT). The test consisted of push-ups and sit-ups. Soldiers were given two minutes to complete as many repetitions as possible. The third test was a timed two mile run. Scores were given based on age and gender. The results of the APFT showed that approximately 75% of the soldiers did not pass the test (Lopez, 2010).

It was theorized by officers of the unit that the failure rate was so high because of the approximately 7000 foot elevation the unit was operating in (Lopez, 2010). A physical fitness program based on the CrossFit model of fitness was introduced to two platoons while a third platoon conducted traditional Army programs of physical fitness. After two months, another APFT was given to both groups.

Both groups increased their number of push-ups and the statistical differences were negligible. However, the two platoons that used the CrossFit model of fitness increased their number of sit-ups and decreased the time of their two mile run an average of 57 seconds per soldier. The traditional training group actually decreased their number of sit ups and dropped the average time of their two mile run by an average of only 11 seconds per individual (Lopez, 2010). These findings indicate an increased performance in the APFT, using the CrossFit concept, which used constantly

changing routines, even though traditional military training focuses specifically on push-ups, sit-ups, and long distance running.

Since a police officer's job could simulate the functional movement patterns and respiratory needs of military combat situations, police departments all over the world should take notice. The shortcomings of most exercise programs are, as stated above, that they dwell too much on aerobic training and not enough on building strength and power (Glassman, 2007). Police administrators should consider introducing the CrossFit model in the fitness program of police academies.

From the beginning, CrossFit set out with a scientific approach to fitness. It is intended to provide the "performance on demand" needed in a world of unknown and unknowable stressors. An important aspect of the CrossFit model of fitness is that it is more than a "workout program." The early pioneers of CrossFit were able to bring experts from all facets of fitness together. The knowledge was filtered and combined, bringing together the best of Olympic style weightlifting, long distance running, sprinting, power lifting, gymnastics, nutrition, swimming, throwing, combat, and sports.

CrossFit is designed with a global aspect of overall wellness in mind. CrossFit recognizes that its success is from more than just the design of the workouts. Optimum performance comes from ensuring the body is properly fueled and muscles are free from restrictions. To obtain top performance, there is a nutrition aspect that is based on The Zone Diet (for more information on this nutritional plan visit www.zonediet.com). Beyond normal stretching, there is an entire component dedicated to mobilizing the body, which focuses on soft tissue manipulation. The end product of the CrossFit concept is that the results are observable, measurable, and repeatable. Because of

these attributes, the CrossFit model of physical fitness should be considered all inclusive, and it provides the best opportunity to train the police cadet and have them ready for the real world needs of law enforcement.

COUNTER POSITION

Some in the fitness industry may conclude that because of the dynamic nature of the CrossFit style of movements, an increase in the injury rate among police cadets will occur. According to Dr. Edward G. McFarland, Professor of Orthopedics and Shoulder Surgery at Johns Hopkins Medicine in Baltimore, injuries are divided into two categories: traumatic injuries and overuse injuries (as cited in Laino, 2011). These injuries include, but are not limited to, tears in the muscles or ligaments, sprains, strains, or damage to cartilage. He described traumatic injuries as occurring because of poor conditioning, poor surfaces, or poor equipment. Overuse injuries are almost always due to increasing the stress on the tissues too rapidly (as cited in Laino, 2011). For example, the squat movement has long been criticized for causing knee and back problems. By looking at the squat movement, with the deep knee bend, it is no wonder people look upon it with scorn. However, this functional movement is a staple of the CrossFit concept of fitness and being effective in this movement is beneficial to everyday life. While there is potential for injury in any exercise program, there are factors that can lessen the chances.

Before a specific exercise movement is criticized, its components need to be examined for proper technique. The squat, for example, is a natural movement that children might do every day without injury. When this movement is performed improperly, it can, in fact, cause serious injury. There are ways to decrease the

chances for injury with this movement. According to Dr. Starrett (2009), if the lower leg is kept as close to vertical as possible through the movement, the knee joint will be free to roll, slide, and glide across its surfaces and lessen the effect of sheer across the meniscus.

The intense explosive demands of functional fitness training also seem to allow an athlete ample room to incorrectly perform a movement. This observation is not unwarranted. This breakdown in proper technique could leave the muscles and tendons open to injury. Injury, especially serious injury, is of major concern and one that should not be taken lightly. Therefore, it is imperative to ensure that correct technique is taught before any officer is allowed to attempt CrossFit. Proper technique taught by a certified instructor and applied to a complex movement can lessen the chance of injuries. It should be pointed out that injuries were reduced by 80% in the first year when a CrossFit model was implemented in the Florida Police Corps (Cooper & Canto, 2007). Any instructor applying the CrossFit concept of fitness would educate the student in the movements before any exercises are actually done. The police cadet should be introduced to the movements gradually, and the intensity can be increased when the participant has become more proficient.

Another criticism of the CrossFit concept is that since it is “constantly varied,” there is not enough cardiovascular endurance training or “cardio.” To put it another way, there is not enough long distance running. During the 1980s, the term aerobics or “cardio” became popular. Both of these terms came to mean cardio vascular endurance training. This evolved to mean spending a great deal of time on a treadmill or elliptical machine, repeating the same movement at low intensity. According to Miller (2011), it is

recommended to complete a cardiovascular routine of 30 minutes a day for five days a week at a moderate intensity level. The article also stated that up to 90 minutes of “cardio” may be needed for weight loss (Miller, 2011). A moderate intensity level is described as completing exercise but still being able to talk without losing one’s breath. There are many articles and medical personnel who advocate this type of workout routine.

A problem with this fitness advice is that it does not take into account the body’s adaptive response to exercise. It has been known that for more than one hundred years that “the human body, when presented with a sub-lethal physical, psychological or chemical stress, can adapt to the source of that stress, allowing the body to tolerate incrementally larger similar stresses” (Kilgore, 2010, p. 2). The body’s adaptive response to long distance exercise is to become more efficient and downsize the heart and skeletal muscles (Sears, 2010). The body’s response to downsize the muscle fibers responsible for powerful movement is to make them weak. This increases the chance of injury and makes functional movements more difficult. By repeating the same low intensity movement pattern over and over again, a person becomes vulnerable to overuse injuries in all parts of the body. This recommendation to do repeated episodes of extensive durational exercise leaves too large a gap between the low intensity linear movement and the explosive multi-directional needs of a police officer. While the CrossFit concept includes long distance running, its main focus is not this type of cardiovascular endurance training. Much of the cardio programming of CrossFit is anaerobic, which implies short intense bursts of energy. Anaerobic activity, “when

properly structured, can develop a high level of aerobic fitness without the muscle damage of long duration exercise” (Glassman, 2002, p.4).

A third criticism is that exercising at such high intensity could result in Rhabdomyolysis. According to Ray (2010), this is a medical condition that can arise when tissues from the muscles break down and the contents from the muscle cells enter the bloodstream. One molecule in particular, myoglobin is toxic to the kidneys and can cause kidney failure and even death. Symptoms include severe muscle pain, nausea, vomiting, cramping, and dark colored urine. Rhabomyolysis is a serious issue, but police trainers should not panic over this information. While Rhabomyolysis has been seen in athletes after high intensity exercise, it is rare. It is more commonly found in victims who have received major trauma, such as a crushing of body parts or electrocutions. Rhabomyolysis can be prevented with education and awareness. The steps are pretty simple. A participant should drink plenty of water, and intensity should be introduced gradually. Water will assist the body in ridding itself of potential toxins and a gradual increase in intensity gives the body a chance to adapt. According to Ray (2010), “there may be an adaptive effect to regular high-intensity exercise that allows the body to somehow protect itself from Rhabdo in a manner similar to how a person will become acclimatized to altitude upon regular exposure” (p. 3).

RECOMMENDATION

If agencies are interested in implementing a CrossFit approach to physical fitness, it is important for police trainers to educate themselves. The CrossFit website (www.crossfit.com) has valuable information on beginning a program. Instructors can review the many CrossFit level one instructor's certifications to see which one is an

appropriate location for the agency based on travel or other financial issues. An agency can expect to pay approximately \$1,000 per student (as of this writing) and should prepare to send at least two officers for certification. There is a specific certification designed for military and law enforcement. This course will teach proper form for the exercises and the suggested programming for implementing a CrossFit style program.

Most police academy gyms should have enough equipment to get started and conduct a good introduction workout session. Along with the standard weight room equipment, other equipment should be made available. To gain all the benefits of the CrossFit concept, an agency should ensure it obtains at least an appropriate number of Olympic style barbells and weights. Olympic style weights made with a rubber coating are recommended because weights often get dropped during workouts. Also, a pull-up bar, Olympic style gymnastic rings, a climbing rope, kettlebells or dumbbells, different sized truck tires, and “plyo boxes,” or benches for plyometric exercises, are recommended. Other items that increase the results of the CrossFit model of fitness are sandbags of different weights, sleds, and just about any object that would simulate any task a police officer would be required to do.

The basic programming is to incorporate Olympic lifting, along with metabolic conditioning, gymnastics and other functional movements. The participant should vary the workouts each day. CrossFit instructors recommend a three day on and one day off routine as this has been shown to give the greatest fitness gains. The participant also needs to ensure the workouts cover the ten general physical skills. Crawley and Evans of Dynamax defined these skills, and this list can be seen in Appendix A (as cited in Glassman, 2002).

It is the position and recommendation of the author for police departments to implement a physical fitness program based on the CrossFit model of elite fitness in their academy training. Cooper and Canto (2007) stated, "The training norm of 70 percent effort may be acceptable for the general population, but if an officer's standard of fitness is essentially their ability to live and respond in times of crisis this level of output is not acceptable" (p. 7). This model of fitness is all inclusive and can be tailored to meet the demands of every community. The assertion that this type of training is more dangerous and will increase injuries does not hold merit. While no exercise program can absolutely guarantee 100% safety and no injury rate, the CrossFit model of fitness is structured with three levels of certification classes for instructors. These classes teach proper technique as well as proper workout scheduling. CrossFit uses an online open community to provide feedback through an internet-based portal in order to make the program as safe as possible.

The criticism about the lack of repeated long distance running causing a decrease in a cadet's aerobic capacity is also not valid. Research has shown that bouts of intense anaerobic exercise can increase the aerobic conditioning of an individual although no repeated long distance exercise is done. The research evidence appears to be clear that a physical fitness program based on the CrossFit model of fitness is superior to the traditional strength/cardio workouts often done in most police academies. The CrossFit model of fitness should be implemented into all police academy physical fitness programs to prepare officers for duty.

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APPENDIX

Cardiovascular/Respiratory endurance-The ability of body systems to gather, process, and deliver oxygen.

Stamina-The ability of body systems process, deliver, store and utilize energy.

Strength- The ability of a muscular unit or combination of muscular units to apply force

Flexibility- The ability to maximize the range of motion of a given joint.

Power- The ability of a muscular unit or combination of muscular units to apply maximum force in minimum time.

Speed-the ability to minimize the time cycle of a repeated movement.

Coordination-The ability to combine several distinct movement patterns into a singular distinct movement

Agility- The ability to minimize transition time from one movement pattern to another.

Balance-The ability to control the placement of the body's center of gravity in relation to its support base.

Accuracy- the ability to control movement in a given direction or at a given intensity.

(Crowley/Evans, as cited in Glassman, 2002)