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EXERCISE PRESCRIPTION RECOMMENDATIONS FOR THE CORRECTIONAL OFFICER

The physiological effect of chronic stress on the body’s neurological, cardiovascular, immune, and metabolic systems is well documented, and is no stranger to the correctional officer. A correctional officer’s occupational environment is often described as lonely and boring, with an occupational outlook frequently filled with anxiety. On any given day, a correctional officer may experience a physical confrontation with an inmate, or group of inmates, which may result in injury or worse, a fatality. Given the perceived mundane nature of the job, high anxiety levels, and the dangers present at any given time, a correctional officer may face a higher risk for developing serious medical conditions and/or disease. Overstimulation of the sympathetic nervous system can decrease the ability of the parasympathetic nervous system to regulate heart rate and blood pressure. Prolonged elevated heart rate and blood pressure are well known risk factors for heart disease, acute myocardial infarction, and stroke (7). Metabolic dysfunction can cause an increase in cortisol levels, blood glucose levels, inflammatory agents, and the hormone ghrelin, which increases appetite (4).

The demands of the job and the effects on the body may result in a correctional officer undergoing several key behavioral changes to their lifestyle. For example, shift work and a shift change can affect the correctional officer both physiologically and psychologically, and put them at risk for developing risk factors for disease (5). The nature of shift work and a shift change may facilitate the acquisition of unhealthy habits that negatively impact the correctional officer’s health and well-being. Habits such as poor sleeping patterns, poor nutrition, a sedentary lifestyle, and even possible drug and alcohol abuse over the course of several years can lead to a deterioration of physiological and psychological processes (6).

Exercise specialists that work with law enforcement officers, particularly correctional officers, should implement exercise programs that include nutritional counseling and stress management techniques to minimize or reverse negative health effects that often accompany the occupation. In many cases, an exercise specialist that works with correctional officers must play the role of a life coach and address the issues that specifically affect health and facilitate job-specific functions. Exercise prescriptions for this population should include comprehensive and individualized programs with emphasis on cardiovascular disease prevention, stress management, and injury prevention. These prescriptions should focus on multi-joint exercises to build strength and power. Exercises such as the back squat and the bench press will help develop a strong base of support necessary for engaging in hand-to-hand combat, or for self-defense, in close quarters.

Building strength and developing power may translate to an increase in job-specific skill sets such as defensive tactics needed for officer safety. Packing on muscle mass has its advantages psychologically, but solely taking this approach to training leads to the neglect of effectively training the cardiovascular system. Prescribing cardiovascular conditioning will increase general conditioning in the correctional officer, and will assist in reducing risk factors for disease (8). In addition to exercise programming and stress reduction, nutritional counseling can educate officers in making sound food choices that help improve their health and reduce risk factors for disease. Exercise specialists may work with their department’s kitchen staff to offer healthy cooking workshops to provide the officers with a hands-on approach to healthy eating (3).

The goal for this population, given the negative health effects related to the job, is program adherence. One strategy for improving program adherence would be for the exercise specialists to work with their department to offer incentives for those officers who participate regularly in an exercise program. The California Department of Corrections and Rehabilitation, for example, offers its officers an annual physical fitness pay as an incentive for passing the annual physical fitness test, which can be used as a model for exercise specialists seeking to incorporate this type of incentive in their department (1). It is imperative that exercise specialists motivate this population by using as many resources available to them by their department (9). Creating individual and group fitness challenges specific to occupational needs and overall health will keep the correctional officers motivated, and it can boost morale. The exercise specialist, for example, may use petty cash provided by their department as a prize awarded to the winner of a challenge which measures overall weight loss over a specific amount of time, for example. Gift certificates from the community’s local health and wellness industry can also be used as an effective motivational tool for program adherence (2). In closing, offering correctional officers exercise programming, nutritional counseling, and effective stress management techniques are effective strategies which may limit the risk factors for disease often seen among this profession. ■
REFERENCES

ABOUT THE AUTHOR
Ivan Saavedra has a Baccalaureate degree from Florida International University in Exercise and Sport Science. He is CSCS® certified and is a TSAC Facilitator. Saavedra is employed by one of the largest law enforcement departments in the country. He has worked for Miami Dade County Police Department and is currently heading the Miami Dade County Department of Corrections and Rehabilitation’s Wellness Center. His specialty is in Exercise Physiology, and has trained hundreds of officers and conducted numerous lectures on fitness and nutrition. Saavedra has physically tested over 1,000 recruits and in-service officers over the span of six years. He also served under the direction and tutelage of Dr. Kelly Kennedy while at Miami Dade County Police Department.
STARTING A FIREFIGHTER FITNESS PROGRAM

There are two types of fire departments; those with fitness programs and those without fitness programs. To complicate the situation, some departments have access to state-of-the-art equipment while others have little or no equipment. Numerous departments are in dire need of starting or restarting their fitness programs. However, they may lack clear direction or a tangible starting point of where and how to begin. These issues cloud and can paralyze departments from not moving forward with a fitness program. Solutions to starting a firefighter fitness program should start with decisions based on equipment feasibility and validated training methodologies.

Many firefighters must deal with physically demanding tasks that involve awkward positions and awkward ergonomics. Firefighting is a particularly hazardous profession with exposure to a host of chemical, biologic, and physical hazards including musculoskeletal trauma or overexertion soft tissue injuries. Firefighters perform physically demanding tasks such as forcible entry and rescue. These tasks compromise trunk stability and include ergonomically hazardous conditions. Because of the nature of firefighting, these physical conditions are often difficult to control.

There are over one million firefighters in the United States and the injury rates of firefighters are among the highest in all occupations (3). In 2007, U.S. firefighters sustained 88,500 injuries while on duty (2). Forty four percent of all firefighters have suffered from sprains and strains while on duty (3). Low back, knee, and shoulder soft tissue injuries account for over 50% of all firefighter injuries (2). Out of the over one million firefighters who work in the United States, more than 45% are over the age of 40 (1). This data shows the need for fire departments to implement a training program, but it can be difficult to determine what the program should include.

Based on the data available, specific program needs for fire-rescue personnel should incorporate soft tissue overexertion injury reduction principles with the ability to accommodate exercise for their aging workforce. The program should also accommodate for equipment availability.

The following simple exercise program incorporates inexpensive and readily available equipment that any department on any budget should be able to afford. Additionally, the exercises chosen in this sample program require very little floor space. These exercises are affordable and highly portable which meets the differing needs of various fire departments. By using a resistance band and a kettlebell (KB), departments will be able to train flexibility, stability, strength, and power.

This sample program will help departments accomplish a number of different goals. First, firefighters that have poor flexibility or limited torso stability will be able to increase range of motion while building job-specific strength without encountering excessive mechanical fatigue that can contribute to on-the-job injury. Second, departments with limited equipment and limited exercise experience can easily adapt these exercises and tools into their budget and existing facility.

REFERENCES

ABOUT THE AUTHOR
Bryan Fass is an expert on public safety injury prevention, fitness and wellness, speaker, consultant, author of the “Fit Responder” and column writer for officer.com, firerescue1.com, and ems1.com. Fass works nationally with departments, corporations, and state and local governments to design and run targeted injury prevention and wellness programs for public entities and private organizations. He is frequently contacted for expert opinion and content contribution for all aspects of public safety. President and founder of Fit Responder, Fass also functioned as a paramedic for over eight years.
STARTING A FIREFIGHTER FITNESS PROGRAM

PHASE 1: PROGRESSION 1

<table>
<thead>
<tr>
<th>FOAM ROLL WARM-UP</th>
<th>FULL BODY</th>
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</thead>
<tbody>
<tr>
<td>KB Sumo Squat</td>
<td>Focus on foot position and neutral spine</td>
</tr>
<tr>
<td>Single-Leg Row</td>
<td>Focus on hip hinge, neutral spine, and scapula retraction</td>
</tr>
<tr>
<td>KB Single-Leg Reach</td>
<td>Focus on hip hinge in neutral spine</td>
</tr>
<tr>
<td>KB (static) Split Squat</td>
<td>Active flexibility with neutral spine and scapular retraction/depression</td>
</tr>
</tbody>
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PHASE 1: PROGRESSION 2

<table>
<thead>
<tr>
<th>FOAM ROLL WARM-UP</th>
<th>FULL BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>KB Empty Goblet Squat</td>
<td>KB held off the chest, bell down, neutral spine</td>
</tr>
<tr>
<td>Band Squat to Row</td>
<td>Focus on triple extension</td>
</tr>
<tr>
<td>Basic KB Swing</td>
<td>Focus on hip drive</td>
</tr>
<tr>
<td>Band (static) Split Squat Row</td>
<td>Active flexibility, torso stability</td>
</tr>
<tr>
<td>KB Single-Arm Farmer’s Walk</td>
<td>Contralateral torso stiffness, job specific</td>
</tr>
</tbody>
</table>

PHASE 1: PROGRESSION 3

<table>
<thead>
<tr>
<th>FOAM ROLL WARM-UP</th>
<th>FULL BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>KB Full Goblet Squat</td>
<td>KB held on the handle with bell up, off the chest</td>
</tr>
<tr>
<td>Band Split Squat to Row</td>
<td>Active flexibility with power generation</td>
</tr>
<tr>
<td>Single-Arm KB Swing</td>
<td>Focus on hip drive</td>
</tr>
<tr>
<td>Full Goblet Single-Arm Walk</td>
<td>Arm held at 90°, and elbow 45° from midline</td>
</tr>
<tr>
<td>Single-Leg KB Row</td>
<td>Focus on hip hinge, neutral spine, and mid-thoracic retraction</td>
</tr>
</tbody>
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COMMON MISTAKES AND QUICK TIPS WHEN TRAINING FOR SWAT SCHOOL

While working with the SWAT population for over ten years, I have observed several common mistakes made by candidates as they prepare for the tryout for SWAT school. Below I have identified some of the biggest mistakes that I have observed and included helpful hints to make the school.

COMMON MISTAKES

Training for the school and not the tryout—Do not make the common mistake of practicing your calisthenics and training on the range without knowing you can pass the tryout first. For many candidates, the anticipation of the school is very high. This can make it easy to start training for the school on a daily basis, and assuming that as your fitness level improves your likelihood of passing the tryout will automatically take care of itself— but this is not the case. Remember, if you cannot pass the tryout, you will not get invited to the school. Make sure to get the entire list for the tryout and practice those tasks often.

Training for the tryout in the wrong order—it seems obvious, but a common mistake in training for a tryout is omitting the exercises you assume you will pass. For example, if you think you can pass the sit-ups portion of the tryout, and chose to omit that exercise during preparation in order to practice another test like the bench press, you may risk failing the sit-ups portion. This is because the order of testing will change the intensity of every exercise and not all tryouts are the same. Omitting simple exercises during preparation can affect performance of certain tasks during the tryout. This increases the importance of practicing the entirety of the tryout regimen, and not omitting any of the tasks during training.

Not knowing tryout instructions and requirements—Make sure you know the tryout instructions entirely and practice the tasks exactly as they will be administered. For example, if you train handgrip with a 90° arm angle and the tryout requires your arms to be straight, your performance will likely be negatively affected. It is important to know exactly how the tryout will be administered including the actual location and specific equipment used. Training with the same equipment and in a similar environment to what will be used in the tryout may provide surprisingly positive results in your performance.

Not planning training properly—it is important to train and become stronger before the tryout. However, improperly planning your training can negatively affect performance during the tryout. If you train too hard, you may risk an injury from the training and not have enough time to recover before the tryout. Also, if the training progression is not designed to allow you to perform at your maximal potential at the time the tryout is administered, it could affect your performance. In order to help replicate the training, build up to training five days a week in a row with two rest days during the week. Give yourself at least 3 or 4 days rest before the start of the school.

QUICK TIPS

Have a partner that is in charge of your training for that day—There is a psychological advantage the lead instructor has over all students—they know when they are stopping. When you do not know how many exercises you are going to do, it makes training much more difficult. Try to incorporate training with a partner where only one of you knows the workout plan for that day. This type of training is more realistic to what you should expect in the school, and can help you get used to not anticipating when you finish.

Know your calisthenics—Complete a list of all the calisthenic exercises that might be used during the tryout and rotate through them during preparation. Make sure you are comfortable performing all of those exercises.

Vary your training order—Some days you should run before practicing calisthenics, other days do your calisthenics before running, and on another day practice intermittent bouts of calisthenics between your runs. Training with a partner, as previously mentioned, can help vary training order and keep training challenging and more beneficial.

Use tools and equipment randomly while training—It can be advantageous to train with various equipment on different days, like training in your boots, your battle dress uniforms, or your helmet during different tasks. It is important to remember to start training conservatively at first to prepare your body for the change in resistance of various pieces of equipment. Then, gradually increase the distance and repetitions for training, and prepare for the tryout.

Do not experiment with new foods—Taking a new energy supplement or trying a new, “much healthier” breakfast the day of the tryout can cause problems and be a detriment to your performance. Make sure you eat foods that will not make you sick or cause any sort of digestive distress.

When you train for something as dynamic as a tryout for SWAT school, it takes a good amount of observation to know how to train smart and avoid the common mistakes that can require a repeat attempt the following year. These are just some of the things you can do to keep your training specific and dynamic all at the same time.
ABOUT THE AUTHOR
Kelly Kennedy is one of the nation’s leading experts in fitness training for police. While working for the largest Police Department in the Southeast United States, she has physically trained and tested over 2,000 police recruits and officers since 1999. After graduating with a Masters degree in Health Education with a specialization in Exercise Physiology, she worked as an adjunct instructor at Florida International University. She has a consulting business called Fit-to-Enforce.com and an iphone app called iEatnburn. Kennedy is certified with ACSM as a HF/I; NSCA as a CSCS; CISSN, as a certified CrossFit Instructor, Defensive Tactics Instructor; and earned a PhD in Educational Leadership from Lynn University.
FUNCTIONAL MOVEMENT SCREENING AND THE TACTICAL ATHLETE

The views expressed in this article are those of the author, and do not necessarily reflect the official position or policy of the Air Force, the Department of Defense, or the U.S. Government.

Musculoskeletal injuries (MSI) exact a high toll on military populations on mission readiness, lost duty days, direct/indirect medical costs and premature retirement from the services (24). Physical training and exercise-related MSIs constitute 30% of hospitalizations and 40 – 60% of outpatient visits (27). It was reported that in Operation Iraqi Freedom and Operation Enduring Freedom, 24% of medical evacuations were the result of MSIs (10). One study at Marine Corps Recruit Depot in San Diego, CA found that the 12-week basic training program resulted in 53,000 lost training days due to MSIs, at an estimated cost of $16.5 million per year (20).

Because of the substantial cost of MSIs on military operations, considerable research has been conducted to determine the cause of MSIs and ways to prevent these injuries. As a result, several risk factors for MSIs have been identified, and evidence-based recommendations for prevention of MSIs have been published (24). Recent research has also focused on the development/evaluation of physical screening assessments, with the goal of identifying service members at risk of MSIs. Such a screening tool, administered as part of basic training, could hypothetically reduce MSIs by first identifying potential biomechanical deficiencies. Once validated, specific training regimens could be implemented to correct those deficiencies, and thereby reduce MSIs.

One screening tool that has garnered much interest is the Functional Movement Screen (FMS). The FMS is comprised of seven fundamental movement patterns that require a balance of mobility and stability. These fundamental movement patterns are designed to provide observable performance of basic locomotor, manipulative, and stabilizing movements. The FMS places the individual in extreme positions where weaknesses and imbalances become noticeable if appropriate stability and mobility is not utilized (5). The FMS utilizes a four-point scoring system, with zero given if a subject experiences pain during performance of a movement, and a three if the movement is completed with correct form. The seven movements which constitute the FMS are the deep squat, hurdle step, in-line lunge, shoulder mobility, active straight-leg raise, trunk stability push-up, and rotary stability (5,6). Some FMS research has tested the degree of interrater (degree of agreement among raters) and intrarater (degree of agreement by a single rater) reliability. For both interrater and intrarater reliability, most studies have found good to high marks, with some indicating that familiarity with FMS scoring can improve reliability (11,19,21,26).

Two recent studies have determined normative FMS values for middle-aged adults and young, active individuals. For middle-aged adults (mean age of 50.91 years), the mean score was 14.1, with no variances due to gender (1,25). Lower FMS scores were correlated with increased age and higher body mass index (BMI), whereas higher FMS scores were correlated with high levels of physical activity. A study of primary school children in Great Britain also found negative associations between FMS scores and BMI, as well as positive associations between high FMS scores and physical activity (8). For young, active adults (18-40 years), the mean score was 15.7 (25). Although there was no gender variance in the overall score, scores on certain individual FMS tests did exhibit gender variances in scoring. Gender variances in individual FMS tests were also reported in one study of middle school children (3).

Another study of the FMS used 46 professional football players as subjects (14). The FMS scores were collected before the start of the season, before any activity or training took place. Over the course of the season, the mean score for injured players was 14.3, while the mean score of uninjured players was 17.4, with the mean scores significantly different. The authors of the study concluded, "this retrospective descriptive study demonstrated that professional football players with a lower composite score (<14) on the FMS had a greater chance of suffering a serious injury over the course of one season," (14). The authors cautioned that these values may be sport-specific, and may not apply to all athletes (14).

Recent research tested whether FMS scores may be predictive of injury in a variety of sports. One study found a FMS score of 14 or less predicted lower extremity injury in female collegiate athletes without a history of anterior cruciate ligament reconstruction (ACLR). If ACLR athletes were included in the dataset, the relationship between injury risk and FMS scores was no longer significant (4). Several other studies, utilizing basketball players, triathletes, recreational runners, and collegiate athletes from seven different sports have found no relationship between FMS scores and injury risk (12,13,18,28).

Studies testing the ability of the FMS to predict injury risk in military personnel have also been published. One recent study looked at 874 Marine officer candidates during Officer Candidate
School training (20). The mean FMS score was 16.6 and a score of 14 or less significantly predicted injury in this population. However, the sensitivity (ability to predict individual injury) was low (45%) as scores 18 or more also significantly predicted injury (20). The study also used physical fitness test (PFT) scores to predict injury, and found scores <280 (300 being the maximum) were significantly more likely to sustain a MSI. Candidates with scores <280 were 2.2 times more likely to have FMS scores significantly more likely to sustain a MSI. Candidates with scores ≤14 were significantly more likely to have FMS scores significantly more likely to sustain a MSI. Candidates with scores ≤14 were significantly more likely to have FMS scores significantly more likely to sustain a MSI. Candidate scores 18 or more also predicted injury (20).

Another study examined whether the FMS could be used to predict injury for the U.S. Army. In this study, FMS scores were applied to 807 male soldiers from a non-deploying unit (2). Soldiers with low FMS scores (≤14) were found more likely to suffer an injury, but intermediate scores (15 – 18) were not associated with prior injury. Individuals who experienced pain scored zeros and had significantly higher risks of injury relative to soldiers who scored higher (2). Comparing this to the Marine officer candidate study, the sensitivity of the FMS to detect injury in soldiers who scored ≤14 was low (28.5%). The authors concluded that the low sensitivity of FMS (28.5%) suggests that such screening may not be useful for identifying individuals with prior injuries that score below 14 (2).

A limited number of studies have explored possible relationships between FMS scores and functional athletic performance. One study compared FMS scores with max squat strength (assessed by a one repetition maximum [1RM]), then with athletic performance on sprint times, vertical jump, agility tests, and club head velocity in collegiate golfers (22). The FMS scores did correlate with a 1RM squat, but did not correlate with the other athletic performances tested. Yet, the 1RM scores correlated with four athletic performance test results. The authors concluded that the FMS should not be used to assess athletes, and strength and conditioning coaches should use the 1RM squat as an assessment tool and component for the determination of athletic performance (22).

One important element of FMS research is to assess whether training interventions can improve FMS scores, and therefore theoretically reduce injury risk. A firefighter study compared FMS scores before and after a six-week yoga training program, and reported significant improvements (7). Another study tested the possible benefits on FMS scores utilizing an off-season training program for professional football players (15). Researchers examined whether indices of left-right movement asymmetry were altered for training of 32 linemen and 30 non-linemen (15). The mean pre-test score for the linemen was 11.8 and 13.3 for the non-linemen. Despite the training intervention, 20 subjects’ scores remained below 14. However, after intervention, the post-test scores demonstrated significant improvements of 14.8 and 16.3, respectively (15).

Unfortunately, this study, like most other FMS investigations, did not include a separate control group. Without a control group, it is difficult to demonstrate cause/effect relationships between interventions and improvements in FMS scores. Likewise, another study found FMS scores to significantly improve by year two of pre-season training camp compared to year one (16). The same study noted a 33% reduction in injuries and missed practice days from year one to year two. A reduction of less severe injuries (0 – 22 practices missed) and an increase in severe injuries (>22 practices missed) was also observed (16).

A study of firefighters compared FMS scores before and after an 8-week occupational therapy program. In this study, FMS scores significantly improved over the course of the intervention, lost time injuries were reduced by 62%, and reductions were seen in the amount of back/upper extremity injuries (23). Lower extremity injuries did not change during the study. One study that utilized members of Special Operations forces found that those who participated in a six-week functional training program demonstrated improvements in FMS scores by an average of 2.5 points (10). The functional training program utilized in the study was a combination of plyometric, core, balance, and resistance training. As with previous studies, no separate control group was included.

One recent study differed from most FMS research in that it did include a separate control group. This study examined the effectiveness of two 12-week training interventions in 60 firefighters (9). The FMS scores were evaluated before and after the 12-week training period. Two separate exercise interventions, coached by strength and conditioning professionals, were utilized. The interventions “differed with regard to exercise selection and the emphasis placed on movement quality,” (9). The post-test results revealed no significant changes in FMS scores in the intervention groups. Surprisingly, there was a significant 85% change in the control group scores in the post-assessment period (9). The authors concluded that “the findings of this research raise questions about the ability of the FMS to characterize meaningful changes in movement quality over multiple testing sessions.” (9).

In summary, studies of military personnel do seem to indicate an FMS score ≤14 may predict injury risk, but the persistently low sensitivity scores do not inspire confidence. FMS scores can be used to predict injury on an individual level. The observation that PFT scores and run times predict injury risk at least as well as FMS scores also calls into question whether FMS scores provide additional information on injury risk beyond that obtained from knowing a service member’s PFT score. It is possible that
improving general physical fitness will also result in improvements in FMS scores in parallel, so that low FMS scores may be a proxy for low fitness. This is consistent with research documenting associations with high PFT scores and high FMS scores. In addition, poor design of most FMS studies handicaps efforts to analyze research results critically. Based on the evidence to date, it does not appear as though the FMS is a useful option for strength and conditioning professionals to detect/assess injury risk in individual tactical athletes accurately.

REFERENCES


**ABOUT THE AUTHOR**

Guy Leahy is currently serving as the exercise physiologist at Davis-Monthan Air Force Base in Tucson, AZ. Leahy is a member of the ACSM (American College of Sports Medicine), NSCA (National Strength and Conditioning Association), and is CSCS® certified. Leahy is the author/co-author of over 30 professional articles, including original research which has appeared in publications such as the Journal of Strength and Conditioning Research, TSAC Report, Medicine and Science in Sports and Exercise, Nature, Science, and Scientific American. Leahy is also a columnist for the TSAC Report. He has presented at several conferences, most recently at the 2012 NSCA and ACSM Annual Meetings. He was also a guest speaker at the 2012 TSAC Conference. Leahy holds a Master of Education degree from Western Washington University and a Bachelor of Science degree from the University of Oregon.