



NOTE: This is an article that I wrote for a SWAT Unit recently. The issue of fitness testing was raised within the unit. I was asked to respond and here it is:

PHYSICAL FITNESS REQUIREMENT FOR SELECTION AND RETENTION OF SWAT PERSONNEL ARE TESTS VALID?

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There has been much controversy over whether it is important and valid for SWAT officers to possess a certain level of fitness in order to fulfill the duties of their job. After reviewing the information and literature collected and distributed by the Cooper Institute (1) and the National Strength and Conditioning Association (2), I have determined that it is indeed valid and important for our SWAT officers to be able to perform and complete a battery of tests. The goal of this paper is to first, show the importance of physical fitness testing for SWAT officers; and secondly, draw parallels to the job requirements of the SWAT officer and the testing protocol.

The following population of our SWAT members will be the area of focus in this position paper:

- Sergeants
- Corporals
- Technicians

It is important to first understand the definition of fitness that is being contemplated and applied when designing this testing protocol. The concept of being "fit" can have many designs and, depending on the subjects goals, can mean many different things. An example of this would be comparing a marathon runner to a football player. Both athletes are fit, but in different ways; and both are prepared mentally, spiritually and physically for their events. We could say that these athletes are operationally ready to handle their respective events, and the same should hold true for SWAT officers. In fact, it could be argued that an officer needs to be prepared mentally, spiritually and physically at a much higher level than the examples just given. It is my professional opinion that these officers should be considered athletes, or more specifically, tactical athletes.

In the world of athletics, physical fitness testing is conducted to help determine physical capabilities and identify areas where the subject may be lacking physical capabilities. This is extremely important in the SWAT officer's job where safety and success of the operation go hand in hand. Physical aptitude is absolutely imperative to possess when the goal is to be successful in physically demanding endeavors.

The National Strength and Conditioning Association have put forth standards and guidelines that should be attained in order to ensure a proper test protocol has been designed. First, the test must contain *construct validity*. Construct validity refers to whether or not a test measures what it is supposed to be measure to a high degree. In other words, does the test analyze the proper physical capability of certain relevant aspects of human movement? The following list is the test protocol that is



being proposed. Please note that each test listed is followed by the physical attribute that is being tested. It should also be noted that the Cooper Institute and the National Strength and Conditioning Association have determined that each test listed does in fact contain construct validity. That is, the protocol tests the physical attributes that it was designed to test to a high degree.

The proposed testing protocol is as follows:

- Vertical jump – this test measures explosive leg strength. The standard for this test is 20 inches.
- Pull-ups with 40 lbs. weight vest, dead hang – this test measures upper body strength. The standard for this test is 2.
- Maximum sit-ups in 1 minute – this test measures core and abdominal dynamic strength and local muscular endurance. The standard is 40 repetitions in a minute.
- 300 meter sprint – this test measures anaerobic power. The officer must complete this test in less than 56 seconds.
- Maximum push-ups in 1 minute – this test measures upper body dynamic strength and local muscular endurance. The officer must complete at least 40 push-ups in 1 minute in order to pass.
- 1.5 mile run – this test measures aerobic fitness and VO₂ capacity. The standard time for this test is 13 minutes and 14 seconds.

Our next focus is to better explain the preceding elements of human movement and how they are useable attributes for the success of SWAT operations. The following is a list of underlying physical attributes that are being tested and the explanation of each:

- Strength –The first test, the vertical jump is a test that measures explosive strength; in this case, lower body strength. It is important to understand the basic definition of strength and how it's different from explosive strength. An older definition of strength suggests that it is the muscle's ability to overcome a resistance without the added component of speed. Recently, the definition of strength has been revised to include the component of speed. As Knuttgen and Kraemer suggest, strength "is the maximal force that a muscle or muscle group can generate at a specified velocity (3)." This definition suggests that strength can be developed at different speeds. I would add that in most real world situations explosive strength is more important to possess than slow speed strength. Conversely, slow speed strength can also be an important component to possess in some situations. It should be noted that anaerobic endurance is another important aspect in the development and sustaining of strength. Anaerobic endurance will be discussed in greater detail shortly.
- Local muscular endurance – Local muscular endurance is the ability to repeat muscular contractions against a low to moderately low load or resistance. In other words, a person possessing this physical attribute would be able to continue low to medium intensity motion in

the same muscular group without a high rate of fatigue. It should be noted that anaerobic and aerobic endurance is another important aspect to the development and sustaining of local muscular endurance. I will discuss both of these energy systems next.

- Aerobic and anaerobic power – The human body has 3 energy systems available to create useable energy for movement. These systems are the phosphagen, glycolysis and oxidative systems. The phosphagen and glycolysis systems fit into the anaerobic energy system. This system is available to the human body without the need of oxygen. It is primarily used during high-intensity, powerful movements. The oxidative system fits into the aerobic energy system and does indeed use oxygen for movement requirements. This system is primarily used during low-intensity, slower movements.

The next section provided is listed to draw the parallels between the test protocols, the underlying physical attributes that are being tested, and how they both fit together with the SWAT Essential Job Functions as described and listed by the National Tactical Officer's Association (4). The first part of the list describes each of the NTOA's listed SWAT essential job functions. Each job function is followed by the corresponding test that parallels the function.

SWAT Essential Job Functions and corresponding test:

- Crawling and running.
 - 1.5 mile run – aerobic endurance
 - Maximum push-ups in 1 minute – upper body strength and endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - 300 meter sprint – anaerobic endurance
- Jumping over, off or across obstacles.
 - Vertical jump – lower body explosive strength
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Pull-ups with 40 lb. weight vest, dead hang – upper body pulling strength
- Maintaining balance while traversing a narrow object or wall.
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Pull-ups with 40 lb. weight vest, dead hang – upper body pulling and gripping strength
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
- Maintaining a tactical position for an extended period of time and remaining alert.
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance

- Vertical jump – lower body explosive strength
- Climbing fences, walls, elevator shafts, and multiple flights of stairs, ladders, fire escapes, ropes, poles and trees to gain an objective or tactical position.
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Vertical jump – lower body explosive strength
 - Pull-ups with 40 lb. weight vest, dead hang – upper body pulling strength
- Lifting and carrying necessary equipment – rams, breaching tools, ladders, shields over rough terrain (snow) a reasonable distance (400 yards??)
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Pull-ups with 40 lb. weight vest, dead hang – upper body pulling strength
- Lifting/dragging wounded officers/citizens to safety in a reasonable time across a reasonable distance.
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Vertical jump – lower body explosive strength
 - Pull-ups with 40 lb. weight vest, dead hang – upper body pulling strength
- Running to escape an area of danger or to cross an open area. Running to pursue a suspect or rescue a hostage.
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Vertical jump – lower body explosive strength
- Functioning up on roof tops, ledges and high positions.
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Vertical jump – lower body explosive strength
 - Pull-ups with 40 lb. weight vest, dead hang – upper body pulling strength
 - Maximum push-ups in 1 minute – upper body pushing strength and endurance
- Functioning in crawl spaces, tunnels, vents, shafts, etc.
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Vertical jump – lower body explosive strength

- Pull-ups with 40 lb. weight vest, dead hang – upper body pulling strength
- Maximum push-ups in 1 minute – upper body pushing strength and endurance
- Low and high crawling to objectives (100 yards?)
 - 1.5 mile run – aerobic endurance
 - 300 meter sprint – anaerobic endurance
 - Maximum sit-ups in 1 minute – core, abdominal strength and endurance
 - Vertical jump – lower body explosive strength
 - Maximum push-ups in 1 minute – upper body pushing strength and endurance

As I have outlined, the attributes of human movement has been laid out and explained; I have shown that those attributes can be tested to a high degree of validity; and, I have drawn parallels to the essential job duties of a SWAT officer. It is my professional opinion that the test protocol designed is indeed valid and important to the overall training and development of the SWAT officer.

We next need to discuss the possible legal issues that may arise regarding the test protocol and the standards set forth by its nature. This concern is based on the Civil Rights Act of 1964 and 1991, the Americans with Disabilities Act (ADA), and the Age Discrimination Act in Employment ACT (ADEA). These acts state that a test cannot discriminate against protected classes, i.e. females, minorities, and handicapped or older adults. However, if job relatedness is established, then the fitness tests, standards, and programs are not discriminatory. I feel that the aforementioned arguments are logical and prove that a SWAT officer has a responsibility to himself/herself, his/her team and the people they are sworn to protect. Furthermore, I recommend that age and gender standards not be included because the operational nature of the SWAT officer is the same for all.

This leads us to the decision to incorporate the use of absolute standards for the testing protocol. Please refer to the above mentioned list to see the standards put forth by the protocol. These standards are being implemented as cut points. In other words, the applicant, recruit or active officer must be able to complete the tests within the parameters mentioned, or it is considered a failed test. I feel that these standards fit all criterion needed to meet the scientific requirements that has been set forth by the National Strength and Conditioning Association and the Cooper Institute.

One last issue to discuss is the field tests that were chosen. There are many other tests that could be used to test the exact aforementioned elements of human movement. For example, a bench press could be used in place of the push-up test to determine the level of upper body strength and local muscular endurance the officer possesses. Or, a 12 minute run test could also be used for the testing of aerobic endurance instead of the chosen 1.5 mile run. The preceding examples represent all valid tests. However, the National Strength and Conditioning Association recommend that testers should choose the test that is easier and quicker to administer. This would also alleviate equipment, funding and staff problems that may arise with the administration of the tests.



In conclusion, I believe this testing protocol is scientifically valid and reliable. Each test represents underlying physical abilities that are important for the SWAT population discussed in this paper. Furthermore, I believe that the above mentioned arguments will make it very difficult for anyone to legitimately disagree that these tests are not scientifically valid and defensible.

References:

1. *Law enforcement/public safety* [online]. (2008). [Accessed 15 December 2008]. Available from World Wide Web: <www.cooperinstitute.org>.
2. Harman, E. Principles of Test Selection and Administration. In: *Essentials of Strength Training and Conditioning*. T.R. Baechle, R.W. Earle, ed. Champaign, IL: Human Kinetics, 2008. P. 238-241.
3. Harman, E. Biomechanics of Resistance Exercise. In: *Essentials of Strength Training and Conditioning*. T.R. Baechle, R.W. Earle, ed. Champaign, IL: Human Kinetics, 2008. P. 74.
4. NTOA SWAT Essential Job Functions. [online]. Message to: M. Sanders. 18 December 2008. [Accessed 18 December 2008]. Personal communication.