

# Utilization of Heart Rate Monitors During Operational Training

Matthew Domyancic, MS and Tricia Sterland, MS, CSCS

s public servants in law enforcement Ait is the responsibility of each officer and operator to develop job specific skills and tactics for whatever a shift may demand. This requires mental and physical preparation that gives us the ability to successfully carry out our skills and tactics necessary for worst case encounters. After foundational skills have been polished they should be integrated synergistically, as close to reality as possible. The purpose of this article is to introduce strength and conditioning professionals as well as law enforcement instructors to the concept of utilizing heart rate data to assess and develop the tactical athlete's physical fitness.

Heart rate monitors are simple tools that allow instructors and strength and conditioning professionals or individuals to track heart rate data during physical training. The use of heart rate monitors allows the user to participate in fitness training, defensive tactics, scenario-based training, and firearms training without compromise. This data assessment will allow for real time monitoring and correction. The use of heart rate monitors can also be used in high liability skills training such as emergency vehicle operations and even live operations. The data assessment in these situations will allow the strength and conditioning professional to better develop more effective metabolic training. The two main elements that are assessed for heart rate elevation are physical exertion and survival stress reaction. If the heart rate remains extremely elevated during operational training, or if it does not recover within a reasonable amount of time, it may be a good indicator that the operator could need more skill training and/or metabolic conditioning. Depending on the context of the operational training session, one can make assumptions as to whether it is the physical or skill conditioning that is in need of improvement, or a healthy combination of both. Using heart rate data in combination with the observational evaluation of a seasoned instructor provides a useful tool in addressing problem areas that may need more emphasis in either individual or group operational training programs.

The first step would be to establish a baseline heart rate without situational stress a day prior to training in a stimulus free environment, or during classroom instruction. This may reduce some of the "lab coat syndrome" participants may experience from being equipped with an unfamiliar piece of gear right before a training exercise. During fitness sessions or scenario-based evolutions, heart rate data may be recorded and analyzed at a later time. To analyze the data it is beneficial to use a heart rate monitor that can be downloaded to a computer and analyzed at your convenience. Graphing the data will show patterns, spikes, max HR, and average HR. These patterns can be an indicator of how physical exertion, stress and hormonal response, or a combination may affect the operator's heart rate. Over

time, improvements in physical and skill conditioning, whether through training or operational experience, may improve heart rate response and stability.

Analyzing the heart rate data using the visual graphs allow the trainer to look at objective data related to the participant's physiological response to training, rather than relying on subjective observation alone. Based on this data, confounding factors are then accounted for such as lack of experience rather than fitness. Elevated heart rate response should not necessarily be viewed as a negative or a strike against them, but rather as a potential need for further skills training and stress inoculation with reality based scenarios.

Analysis of heart rates is not only to assess the operator but the training program as well. Law enforcement trainers and strength and conditioning professionals need to constantly evaluate their own programs. When poor performance is discovered it is important to determine if the law enforcement instructor has provided adequate skills and training necessary and available for the appropriate response to realistic situations. Also, have there been adequate education and training by the strength and conditioning professional to prepare the operator. In any case, it is the responsibility of the individual operator to ensure they are doing everything possible to improve their operational skills and fitness with the training and education they have been provided.

#### NSCA TSAC



### Figure 1

A Patrol Officer training on 5 different reality-based scenarios with potential force on force encounters.

## Figure 2

A SWAT Officer training on 5 different reality-based scenarios with potential force on force encounters.

Monitoring the heart rate allows the law enforcement instructor to determine if the desired intensity is being achieved and also to ensure that safety is the main priority. If unsafe heart rate levels occur it allows the instructor or strength and conditioning professional to discontinue the activity. It may also indicate the need to follow up with the appropriate health care provider.

On duty tragedies are the bottom line reason for all of us as tactical instructors and strength and conditioning professionals to reflect on our own programs, and evaluate whether we are doing all that we can to prepare an operator for realistic encounters. Perhaps we should not be so quick to blame the student. Heart rate spikes could be from a combination of poor physical conditioning, stress/anxiety from lack of competence in particular skills, or lack of experience with those skills under high stress.

In one major metropolitan area we were able to look at heart rate responses from experienced and inexperienced police officers during scenario training including active shooter situations. The correlation between heart rate and physical fitness has yet to be determined. The data that has been collected is currently being analyzed in an ongoing research project. However, we are able to share some of the data that we have observed using Polar heart rate monitors and software, specifically the Polar RS 400.

Figures 1 and 2 include data from Patrol officers v. SWAT officers. The SWAT officers were from a full time team that trains and operates every day. As you can see from Figures 1 & 2, heart rates were much higher for the Patrol Officer vs. the SWAT officer. One reason for this result could be that the SWAT officers have more firearms and tactical training than



- 210

90

Figure 3

the Patrol officers. The Patrol officers also receive less scenario-based training than the SWAT officers. Additional factors could be fitness and hydration levels.

NSCA TSAC

210

190

Figure 3 is an example of a "Train to Win" class which includes physical exertion as well as scenario-based training. This particular officer exhibited an increase in heart rate (HR) on both the physical side (defensive tactics and indoor obstacle course) as well as from stress in the scenario training. One reason for this observation may be lack of "operational fitness" and a closer look at his current physical fitness program may be warranted to ensure he is working at the correct physical demands which he may encounter in his job.

Interval training involving high intensity activities followed by short rest periods help prepare the body for the immediate demands that may be encountered while on duty. An example being a foot pursuit that turns into a violent physical engagement while taking the subject under arrest.

Figure 4 shows an example of a Police Cadet physical training session which mimics all levels of heart rate that may be achieved as a patrolman. Interval training is a must to prepare police officers for their jobs. Do your PT sessions look like this?

#### NSCA TSAC

#### SEPTEMBER 2008

Heart rate monitors are a simple tool that can provide objective data for your scenario training, physical training, defensive tactics, and many additional applications. Be sure that when choosing a heart rate monitor that it has the ability not only to download the data but also analyze and graph the results. This will make assessing both your scenario training and physical fitness training much easier and legible.  $\oplus$ 

## Authors

#### Matthew Domyancic, MS

Matthew Domyancic is a police officer with Fairfax County Police in Chantilly, VA. He is currently assigned to the Law Enforcement Training Unit at the Fairfax County Criminal Justice Academy where he is responsible for Strength and Conditioning as well as Officer Survival Training. Matt is a member of the supplemental SWAT team and in addition to his law enforcement experience, he has four years as an assistant strength and conditioning coach at Yale University in New Haven, CT, and three years as a volunteer assistant at Georgetown University in Washington, DC. Matt can be reached at <u>matthew.domyancic@fairfaxcounty.gov</u>.

#### Tricia Sterland, MS, CSCS

Tricia Sterland is an exercise physiologist with Polar Electro, Inc. She is currently the National Accounts Manager for Special Projects. She is responsible for military and law enforcement projects. Tricia can be reached at <u>tricia.sterland@</u> <u>polarusa.com</u>.

Article reprinted from the NSCA's *TSAC Report* (Issue #7, September 2008). Printing generously donated by  $POLAR_{\Re}$ 

**PLAR** LISTEN TO YOUR BODY

TSAC Training manuals available for online purchase. PDF E-Book Downloads

**\$25**/ea. + tax

www.nsca-lift.org/TSAC/





### **NSCA Mission**

As the worldwide authority on strength and conditioning, we support and disseminate research-based knowledge and its practical application, to improve athletic performance and fitness.

#### **TSAC Editorial Review**

Jay Hoffman, PhD, CSCS,\*D, FNSCA

Doug Kleiner, PhD, ATC, CSCS,\*D

Dave Sandler, MS, CSCS,\*D

Stew Smith, CSCS

#### Staff

Managing Editor Keith Cinea, MA, CSCS,\*D, NSCA-CPT,\*D

**Copy Editor** Brian Newman, MS, CSCS

**Content Editor** Mark Stephenson, ATC, CSCS,\*D

### Contact

NSCA TSAC 1885 Bob Johnson Drive Colorado Springs, CO 80906 phone: 800-815-6826 email: TSAC@nsca-lift.org

#### TSAC powered by...



