NSCA Tactical Strength and Conditioning

TSAC REPORT

Contents

Fitness Operation Order

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Within the ranks of tactical operators a task is set forth and operationorder (OPORD) is created to identify the situation, mission, execution, service support, and command and signal to successfully complete an operation. This same basic concept can be applied to the tactical operators strength and conditioning program to prepare physically for a mission. A leader will take the OPORD and develop a fitness operation order (FOPORD). A FOPORD should contain the necessary information that leads to a needs analysis and an exercise prescription that is most appropriate for the mission. To do so, the mission would be analyzed for the best possible way to physically train and enhance combat operations, just as an OPORD would be.

Situation

Breakdown of the OPORD to include: environment (weather and elevation), terrain (mountains, dessert), equipment (gear, armor, weapon), transportation (mounted, on foot), types of movements involved (kicking in doors, fast dismounts), distance, and duration of the mission.

Mission

Needs analysis. Who are the soldiers being trained (past injuries, body types, position within the team, physical strengths and weaknesses)? What are the principle movements, how long do they last (e.g. short high-intensity movements with short rest intervals), and what are the aerobic and anaerobic variables involved? Anaerobic variables include power, speed, agility, and anaerobic endurance. Where is the mission taking place? When does the mission begin and end (duration of mission)? Will the plan meet the mission/commander's requirements?

Execution

Exercise prescription. Before putting together an exercise prescription it is ideal to first determine which of the primary energy/metabolic system(s) is going to be dominant when performing the mission, i.e. phosphogen, glycolytic, and oxidative. At no point in exercise or at rest does any single energy system work alone; it is a gradual transition (1). With that in mind, it is important to train all three energy systems, but focus training on the primary energy system to be utilized. However, exercise intensity and duration determine the primary energy system to be utilized. Exercise intensity and duration are inversely related, meaning if intensity is increased, the duration is decreased; causing a shift from the aerobic energy system to an anaerobic system.

The first energy system is the phosphogen energy system, also known as ATP-PC (phosphocreatine). This system provides energy for three to fifteen seconds of high-intensity activity for short-duration and is not oxygen dependent (2) (e.g. a three-to-five second rush or plyometics).

It uses ATP-PC as the primary fuel source for energy and is readily available. The phosphogen system needs approximately 1:12 to 1:20 (10 sec work: 2 min rest) work to rest ratio (1). The rest interval will allow the energy system to replenish and prepare for the next bout of activity. The glycolytic (anaerobic) energy system is the next system utilized. The glycolytic system provides the primary source of energy for activities that last between approximately fifteen seconds – two minutes (2) (e.g. chase on foot or 400-meter run). It uses a combination of carbohydrates (glycogen and glucose), as the primary fuel source and, like the ATP-CP system, is not oxygen dependent. For training purposes, a 1:3 to 1:5 work to rest ratio is appropriate to allow for adequate recovery between sets (1). Lastly, the oxidative, or aerobic, energy system provides energy for activities lasting longer than two minutes in which steady state is met (2) (such as a ruck march or two-mile run). Unlike the phosphogen and glycolytic systems, the oxidative system is dependent on oxygen to continue energy production. This system is reliant mostly on carbohydrates and fats. And in some instances protein is also used as an alternative fuel sources when glycogen stores have been significantly depleted. The protein then cannot be properly utilized replacing the amino acid pool, meaning you are at a caloric deficit and it will decrease performance, tissue repair, and nitrogen balance (1). It has a 1:1 to 1:3 work to rest ratio (1).

After determining the primary energy systems to be used, it is time to tailor an exercise program that is specific for the situation and mission Specificity is the key to developing an effective FOPORD. The concept of specificity states that the most effective way to improve performance and increase functional ability via training is to perform exercises that are similar to the activity biomechanically, physiologically, and metabolically (1). Develop a pool of exercises with the mission in mind. Implement variations with exercises, frequency, rest intervals, load, and intensity as you develop a periodized exercise plan.

Service and Support

Fitness facilities (equipment available or that can be improvised), nutrition available (DFAC or MRE) and the nearest medical support (in case of injury).

Command and Signal

Have the contact information available of a certified professional to assist with any issues with questions and problems that may arise with workouts and to supervise overall development of program.

The enemy is always changing, as do our tactics. It is the job of a tactical operator to always be prepared for the mission. A FOPORD allows the tactical operator to be physically ready to adapt with the mission. Whether it is deploying overseas or in your local community, a true tactical operator must lead from the front. To do so they must be prepared and ready at all times when called to duty. This can be done by breaking down the mission and training accordingly with a fitness operation order (FOPORD). A FOPORD can be developed for an individual or a team. It can also be used to develop personal goals in everyday life. A FOPORD is about taking a goal/mission, developing ideas for the best training method, and training accordingly for optimal results.

References

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Core Activation and Balance Training For Firefighters

Nico Rithner, NSCA-CPT and Todd Lacey

Due to the physical demands on the fire ground, it is extremely important that firefighters strengthen their core muscle groups as well as improve balance as a preventative measure against injuries. Injuries are of great concern for all fire departments, since it takes several months and thousands of dollars to develop a recruit fire fighter, in addition to the financial burden of the fire department to pay for backfill overtime while the injured fire fighter is recovering on a modified duty assignment.

The firefighting and rescue profession presents constant challenges to an individual's core musculature strength, specifically the muscles from the torso to the knees. It can involve moving loads in all planes while wearing a self-contained breathing apparatus (SCBA), Personal Protective Equipment (PPE), and likely carrying tools. This creates a challenge due to the body being pulled off balance. For example, in a test setting such as the Candidate Physical Ability Test (CPAT), one of the hardest tasks to be completed is the stair climb. Candidates are required to maintain balance and stability while loaded with a weighted vest, keeping pace with the stair climb simulator without utilizing their hands for support. This challenging task is not nearly as difficult as performing at an actual incident, where the stakes can be much higher, and a hose pack, tools, and SCBA are being carried. In full PPE a firefighter is working with an extra load of approximately 75 lbs. This additional weight is mostly distributed on the upper body which accelerates fatigue in the core musculature and changes the body's center of gravity. When these muscles are left untrained and not prepared for muscular endurance the likelihood of injuries increases exponentially during prolonged incidents.

In addition to developing core muscle strength and endurance, it is also important to encourage functional training of the core "system" as a unit. This involves training muscle groups to activate as a whole. Training for strong abdominals and lower back by isolating them can still create the risk of injury when handling lateral forces, since the lower layers usually remain untrained (i.e. transverse abdominal muscle). Core strength is only as strong as the weakest muscle group in the unit.

The following exercises will help by enlisting the core muscles that are required for proper body positioning during your duties on the fire ground, while also improving your ability to recover from situations where you need to resist being pulled off balance. We chose a kettlebell exercise because this training implement lends itself to rotational movements that easily activate the core system. In addition to developing core strength these movements aid with ankle and knee stability. These exercises can be practiced often and can be easily used as part of a warm up with moderate loads (to achieve core activation) or as part of the resistance training session with heavier kettlebells. Timed intervals are encouraged rather than repetitions for this type of exercise.

One Leg Kettlebell Drills

The One Leg Around the Body Pass

The kettlebell is held by the side at arm's length. Lift a foot off the ground so that you are supported solely by one foot. The lifted leg can be used for counterbalance and it is encouraged to maintain balance by compensating with other parts of the body such as arms or lifted leg to regain/maintain balance. From this position swing the kettlebell around the waist, exchanging hands in front and behind you (Figure 1). The purpose of this movement is to create forces that pull sideways. The combination of a smaller support base plus the rotational movement makes it very challenging to remain upright. To be able to do so, the core muscles work heavily contracting and relaxing to adjust the body position and stabilize. There is a timing component as well because if our body movements are "out of sync" with the kettlebell we are sure to lose balance and be forced to lower the other foot.

Figure 1. The One Leg Around the Body Pass

The One Leg Clean and Press

The "one leg clean and press" is also done balancing on one foot only. The difference is that in this particular movement we create front to back forces and a "tight" frame must be achieved to press the kettlebell overhead while in a one foot stance.

Start as you did for the "one leg around the body pass", with the bell by your side. It is easier to do so with the kettlebell being held on the same side as the supporting foot. A progression is to do this exercise on the opposite side of the body. From this position (Figure 2), swing the kettlebell front to back alongside your body (not between your legs) to generate momentum (Figure 3). Use this momentum to raise the kettlebell to the rack hold position (kettlebell at chest level supported with the torso and arm, Figure 4). From the rack position the kettlebell can be pressed overhead to arms length (Figure 5). A more complex variation to this movement is to jerk the kettlebell and then get under with a shallow knee-hip flexion to catch it. This last variation requires more coordination and a certain degree of skill with timing and balance since the whole movement is much more dynamic than the clean and press variation.

Figure 2. The One Leg Clean and Press *Start Position*

Figure 3. The One Leg Clean and Press *Swing Position*

Figure 4. The One Leg Clean and Press *Rack Position*

Figure 5. The One Leg Clean and Press *Overhead Press*

Rotational Medicine Ball Exercise Progression

*Mark Roozen MEd, CSCS,*D, NSCA-CPT, FNSCA*

Medicine balls (MB) are extremely versatile pieces of equipment and very effective for building core strength and joint integrity. Building core strength, where all movement begins, is now recognized as one of the key elements when setting up a training program because movement patterns of arm and leg strength originate from this area.

The drills featured in this article show a series of rotational medicine ball drills that begin from the seated position and end with the tactical athlete in a standing position. This progression follows the concepts of progressing from general or simple to more specific and complex exercises.

Rotational Toss Series

With a partner, begin by sitting on the ground, holding an MB in both hands. Extend the arms to the side, holding the MB away from the body. Rotate the torso as much as possible. With as much force as possible, throw the ball to a partner who is in the opposite direction as the MB. Progress from the seated position (Figures 1 and 2), to being on the knees (Figures 3 and 4), and then standing (Figures 5 and 6).

Progressions

As the tactical operator progresses in body position (sitting to standing), other forms of progression can be incorporated into the program:

- Increase the weight of the MB
- Using a MB with a handle to use one arm movements
- Using a MB with a rope, which changes the forces of the exercise and changes the dynamics of the drills

Doing "Repeats"

Instead of using a partner, position yourself next to a wall—throwing the MB into the wall and catching it on the rebound and repeat for desired number of reps. This works the acceleration and deceleration of movement patterns.

Medicine ball rotations are an easy, yet effective, way to add a rotational component of training into a program and help to develop explosive power.

Figure 1. Seated Rotational Toss

Starting Position

Figure 2. Seated Rotational Toss

Finish Position

Figure 3. Kneeling Rotational Toss

Start Position

Figure 4. Kneeling Rotational Toss

Finish Position

Figure 5. Rotational Toss

Start Position

Figure 6. Rotational Toss

Finish Position

Assigning Initial Strength Training Loads Based on Percentages of Bodyweight

*Robb Rogers, MEd, CSCS and Jay Dawes, MS, CSCS,*D, NSCA-CPT,*D*

It is often very difficult to determine an athlete's initial training load as they begin a resistance training program them. However, prior to loading the body with external resistance it is critical to make certain the tactical operator is able to first control their own bodyweight. If an operator is unable to effectively control their own bodyweight, not only will they hinder future performance due to improper technique, but they also significantly increase their risk of both acute and chronic injury. For this reason it is recommended that the tactical operator demonstrate a certain level of strength and stability utilizing body weight as the primary form of resistance prior to loading with external resistance.

One method to determine the initial training load is to use the 20 repetition rule a guidelines. To apply this concept an individual must be able to do 20 quality repetitions of a specific movement with their own bodyweight before external loading the movement. This equates to20 total repetitions when performing bilateral movements and 10 per side or limb for unilateral movements. If the tactical operator is able to demonstrate proficiency performing these movements and the patterns are controlled and stable, it is now acceptable to add external resistance in the form of barbells, dumbbells, kettlebells, etc.

Tables 1 – 4 list suggested loads for some specific exercises and movements. Since individuals will vary greatly from exercise to exercise based on maturity, injury history, and training age no set or repetition guidelines are provided. Each athlete must be evaluated on an individual basis to determine their current health and fitness levels and the total volume of training can be adjusted according to meet their specific needs and current abilities. As previously stated, this is simply a guide to determine a starting point for the individual. If the individual is overweight, then it may be more appropriate to set the initial training load as a percentage of fat free body weight. A functional screen, movement assessment, flexibility test and strength evaluation is highly recommended to assist the strength and in determining an actual abilities of the athlete.

The tables provided are examples of continuums that can be implemented with respect to the abilities of the tactical operator. By manipulating the volume (sets x repetitions x training load) of training the overall physical demand of the activity can be increased or decreased to challenge individuals of varying levels of fitness, as well as meet the specified needs or goals of the athlete (e.g. strength, hypertrophy, endurance, etc.). For example, at the same relative load 3# sets of 10 repetitions (30 total repetitions) will be much more difficult than 3# sets of 5 repetitions (15 total repetitions) due to an increased volume of training.

In conclusion, at the NSCA World Headquarters we have found this method very beneficial for determining initial training loads for the tactical operator. In addition, it also provides the strength and conditioning professional with a solid foundation to qualitatively access the tactical operators overall movement abilities.

TABLE 1. LEG EXERCISES

Exercise	Untrained Load	Novice Load	Intermediate Load	Advanced Load	Athletic Load
Squats	Bodyweight (20)	35% of BW	65% of BW	100% of BW	125% of BW
Increment Change of –10%					
Leg Press	50% of BW	75% of BW	100% of BW	125% of BW	150% of BW
Increment Change of –15%					
Single Leg Press	25% of BW	50% of BW	65% of BW	80% of BW	95% of BW
Increment Change of 10%					
Step-Up	Bodyweight (20)	10% of BW	25% of BW	40% of BW	55% of BW
Increment Change of –5% of Bodyweight					
Lunge	Bodyweight (20)	10% of BW	25% of BW	40% of BW	55% of BW
Increment Change of –5% of BW					
Jump Squat For Power	Bodyweight (20)	2.5% of BW	5% of BW	7.5% of BW	10% of BW
Increment Change of –2.5%					
Jump Squat For Strength	Bodyweight (20)	5% of BW	10% of BW	15% of BW	20% of BW
Increment Change of –5%					

TABLE 2. BENT OVER EXERCISES

Exercise	Untrained Load	Novice Load	Intermediate Load	Advanced Load	Athletic Load
Dead Lift	20% of BW	40% of BW	60% of BW	80% of BW	100% of BW
Increment Change of 5% of BW					
RDL or St. Leg DL	10% of BW	30% of BW	50% of BW	70% of BW	90% of BW
Increment Change of 5% of BW					

TABLE 3. UPPER BODY "PUSH" EXERCISES

Exercise	Untrained Load	Novice Load	Intermediate Load	Advanced Load	Athletic Load
Bench Press	Push-Ups (20)	25% of BW	50% of BW	75% of BW	100% of BW
Increment Change of 5%					
Incline PRess	20 Ft. Up Push-Ups	20% of BW	40% of BW	60% of BW	80% of BW
Increment Change of 5%					
Behind Neck Press	5% of BW	15% of BW	35% of BW	50% of BW	65% of BW
Increment Change of 2.5 – 5%					
DB Bench Press	Push-Ups (20)	15% of BW	35% of BW	50% of BW	65% of BW
Increment Change of 2.5 – 5%					
DB Incline Press	20 Ft. Up Push-Ups	10% of BW	20% of BW	30% of BW	40% of BW
Increment Change of 2.5 – 5%					
DB Shoulder Press	5% of BW	10% of BW	17.5% of BW	25% of BW	32.5% of BW
Increment Change of 2.5%					

TABLE 4. UPPER BODY "PULL" EXERCISES

Exercise	Untrained Load	Novice Load	Intermediate Load	Advanced Load	Athletic Load
Pull-Ups	Assited 50% of BW	Assisted 25% of BW	Bodyweight (5)	Bodyweight (15)	Bodyweight +5%
	Increment Change Assisted of 10 – 15%		Reps +5 per set	Weight 2.5% or Pause each 1/4 rep	
Pulldowns	25% of BW	40% of BW	60% of BW	80% of BW	100%+ of BW
	Increment Change of 5%				
DB Rows (1 Arm)	10% of BW	17.5% of BW	25% of BW	30% of BW	40%+ of BW
	Increment Change of 5%				

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Nico is the founder and Head Coach of Colorado Kettlebell Club. In addition to teaching at the club, Coach Rithner is the Strength and Conditioning Coach for Glendale Rugby men team, the Raptors. This is a Division 1 team based in the Denver metro area.

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NSCA Tactical Strength and Conditioning

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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

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