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SPECIFICITY AND THE TACTICAL ATHLETE

Tactical strength and conditioning using the principle of specificity is an important component in any training program to enhance performance, decrease injuries, and improve functional longevity of a tactical athlete. Having established and specified training goals within the program will aid in direction, motivation, and proper progression over time. Although all tactical athletes should have a varied program, specified performance-based goals may vary from one field to another. Blanket performance standards may not have the same applicability across the tactical athlete spectrum, requiring specified goals to be incorporated into well-balanced tactical or sport-oriented routines to help the athlete excel in their current field. Movement differences and job performance can be observed across the tactical population. Looking at movement patterns (e.g., rucking in soldiers, firefighter ladder climb in urban areas versus line digging in wildland settings, etc.) in each population would benefit from focused exercises specified to their common movement patterns. Adding focus to things such as shoulder mobility and health for wildland firefighters to avoid overuse injuries versus unilateral limb coordination and core stability for urban firemen with ladder climbs can increase physical performance and capabilities (1).

Common movement patterns, grouped injury profiles, and overuse injuries can help determine what areas need to be focused on or added into a program. Being aware of these factors will help develop a routine that can not only increase performance but reduce the rate and severity of common job-related injuries. Injuries, such as lower back/hip problems from an officer's duty belt to the health of a K-9 officer's anterior cruciate ligament (ACL) from tracking a suspect through various terrains, can benefit from focused training of hip and hamstring development, as well as unilateral and unstable surface training to increase tendon integrity (18). By choosing exercises that will more closely relate to day-to-day movements, training specificity can increase the correlation between gym and physical job-related performance (12,19). Tactical athletes have a much higher demand for unilateral function than bilateral function. They run, walk, jog, and move, rarely using both sets of limbs at the same time. Adaptation aligns closely to the exercise that it is focused on, so exercises that more closely mimic the required skill will have a higher rate of performance return (12). Unilateral training favors more core and ankle stability over closed-chain bilateral movements. Therefore, exercises like walking lunges have a higher correlation to increased movement performance as opposed to using something like leg presses due to its closer relation the natural gait and core function (12,18).

When choosing and progressing exercises, especially unilateral or stability oriented, a "risk versus reward" thought process should be used when dealing with high profile athletes to determine if the benefit is worth the associated risk. Using this approach, a progressive resistance program can be incorporated in a safe manner to enhance strength and performance over time. There are many exercises that offer a general carryover in strength, speed, and performance from one exercise to another while assisting in overall progression (2,19). Stability aside, increased bilateral strength will result in increased unilateral gross strength. A higher need for core stability in unilateral versus bilateral exercises would benefit the athlete by decreasing the rate of injury over time, but the prescription of such core focused movements should be determined by the health and phase of the athlete (18). Using the "risk versus reward" mentality, the reward is to increase the unilateral capacity (e.g., a lunge), but there can be a risk in doing too much too quickly when the overall work capacity and health of the athlete is unknown. Keeping safety and ability in mind, instead of increasing the load for unilateral exercises directly, a general strength adaptation can be first observed in bilateral exercises (e.g., squat) while keeping the unilateral (e.g., lunge) load consistent until the athletes ability for increased unilateral stability is known (2).

Using a bilateral movement like the back squat can offer a safer primary load and intensity to enhance overall base strength and power due to increased stability with a direct center of mass (7). This increased strength can carry over to increased unilateral strength and function, granted the unilateral movement is still maintained during the training program (2,13). Observing a strength increase from the squat can show that the tactical athlete has improved enough to progress to an increased load for the unilateral work of a lunge. Using an implied carryover of strength can be a safer option to avoid possible risk. Observing a base strength increase bilateral exercises before increasing load of its unilateral equivalent (e.g., squat versus lunge), may be a better course of action when dealing with the tactical population to mitigate risk. In order to keep a high performance correlation between unilateral and bilateral exercises, movement patterns should stay present throughout the program to avoid the possibility of decreased function (7,13,18). Strength and performance will be increased highest in what is specifically trained, so dropping all unilateral work for extended periods of time to focus on bilateral strength could result in a detraining, or training reversibility. This may lead to a decrease in stability and overall strength of the exercises (13).

Each job has specific required skill sets that may differ substantially from one field to another. These skills are not only important to train on their own, but to also add to the program. Dexterity and fine motor skills can be compromised under times of stress and fatigue, so it is important to mimic stress induced

situations while incorporating these skill sets (1,11). The ability to accurately fire a pistol or rifle on the range, as opposed to firing under pressure of return fire, can present two different scoring results (1). Other than skill training under mimicked stress, drills and exercises focusing on breath control, as well as mindful breathing activities, may also help mitigate higher stress situations. Gaining perfect scores in optimal situations are important training goals, but those required skills should also be able to be completed during suboptimal circumstances. Subjecting tactical athletes, such as police officers, to times of mimicked stress using high energy demand movements immediately followed by high fine skill and dexterity drills can assist in the ability to manage endorphins, breathe control, and fine motor skills required to accurately fire their pistol, or other reactionary and decision-making drills (1,11). Using paired exercises such as power cleans, burpees, or box jumps into up-and-over walls, then immediately having to reload a magazine and fire for time can be an example to mimic both external and internal stressors. Using weighted vests, or bunker and turnout gear, along with resistive breathing masks for firemen during strength and conditioning work or obstacle training can assist in developing specified motor units and energy systems that may not be taxed during non-resistive free-weight training. Inspiratory muscles are subject to detraining and reversibility the same way as other skeletal muscles, so the inclusion of mask training with resistance training can provide a desired adaption (16). Swat officers or riot control agents may benefit from single-arm stationary kettlebell racking while requiring opposing dynamic free arm work to mimic shield and baton use.

A more appropriate programming style for the tactical and sport athlete today is non-linear or undulating periodization. In this programming, strength and conditioning professionals incorporate some, if not all, of each of our traditional linear mesocycle training style into each week. Each day and week differ in intensity, volume, load, rest, and choice and order of exercises (10). With correct non-linear programming and incorporated recovery, the trainee can both maintain and improve all aspects throughout the entire cycle. Rest between fiber type training (i.e., power/strength/strength-endurance) and duration of training cycles is manipulated in such a fashion that adaptation of each aspect is both triggered and revisited frequently enough for consistent improvement. This allows for continuous growth and adaption that can build upon each other while reducing detraining that may occur when certain movements or intensities are diminished for too long (13). Rest should be incorporated into these overall non-linear training cycles in the form of deload weeks. Deload weeks may look slightly different from person to person, with either volume, load, intensity, or all three decreasing for upwards of a week. This programmed recovery time will allow for central nervous system and muscular recovery before reaching a point of overtraining. Deload weeks, or days, may also be incorporated into programming leading up to a specific event where increased recovery may offer a performance benefit.

A proper and realistic timeline for programs and goals is important to have. Unrealistic timeframes and expectations can lead not only to disappointment and failure, but also to injuries. Establishing overall outcome goals, with smaller goals (behavioral and step goals) can help lead through a goal-driven program. Progression in terms of intensity and loading can be incorporated into behavioral or step goals. Setting a timeline to be able to complete a job-specific task, or setting a behavioral goal, such as increasing resistance when meeting a certain perceived intensity, can mark when and how to manipulate programming.

Tracking performance progress over the course of the program via weight, repetitions, rest, or time of completion will allow establishment of new goals or modification of current goals. It is important to take note of the weights and implements used, rest taken, and overall volume when recording training variables. Noting things such as weight used and recovery between sets for week one versus week four can show improvement, maintenance, or detraining. It is expected to have an increase in performance over the course of a program, whether that be more repetitions at a given weight, more weight at a given repetition count, or decreased time to completion unless the goal for the program is to maintain current performance standards. Noting actual performance outcomes can reveal if improvement is adequate, and if not, if there are any underlying reasons for maintenance or detraining. Recorded information is not only meant to guide progress, but to also track other training and performance standards. Variables such as rest periods and recovery can determine if the energy systems are being targeted and improving, as well as markers of approximate lactate and anaerobic thresholds.

It is important to not only track daily performance, but also test a baseline before and after each cycle. The end of the program should mark a fresh starting point for the following training cycle and should include basic testing required by the tactical athlete, both job- and training-specific. These baseline specific tests can range from strength and power, to speed and agility, of both gross and fine motor skills, such as change of direction (COD) and up-and-over (gross) versus draw and fire (fine). If a proper training program is followed, the overall performance of the athlete should increase from start to finish. When tracking or programming load used on strength-based exercises, the use of percentages or ratings of perceived exertion (RPE) from training specific testing outcomes can allow more precise and personalized intensities, rather than generalized weight recommendations. Future programming may use the same relative intensities or percentages varied throughout the program, but would be reflective on the new tested performance base. For example, if a strength athlete that can squat 300 lb in cycle one, and 375 lb in cycle two, the 80% relative intensity is the same for each program even though the overall weight numbers will be different. This type of tracking and testing will push the individual towards proper and manageable work throughout the entirety of their program.

Often overlooked, day-to-day function, or biofeedback, is an important aspect of training and can affect daily performance. This does not only include how one feels psychologically, but also how they feel physiologically. Common biofeedback trackers can be sleep, mood, energy levels, hydration, diet, hunger, and soreness. It is easiest to rank these categories with a 1 – 10 scale, with "1" being very poor and "10" being great. Soreness, lack of sleep, poor eating, as well as overall negative mentality can all have a negative training effect. Poor sleep can lead to decreased mental focus, which in turn can cause lower motor unit response times and can lead to a performance deficit (4,6). Acute poor nutrition and lack of proper calories, along with hunger, can lead to decreased mental and physical performance (8,9,15). Improper hydration and volume losses as little as 2% can lead to decreased metabolism as well as improper muscular hydration, which could lead to fatigue and increased injury (14). Soreness resulting from microtrauma of prior training can reduce power and strength output, resulting in an acute loss in performance (5). These factors are important for more than just a daily performance standard, but also increased program longevity, allowing the body to have optimal performance and recovery.

Noting daily feedback can require an adjusted training load for the day in order to achieve the proper training stimulus. Having poor diet, inadequate sleep, and body soreness can manifest itself over time and cause overtraining syndrome (3,17). If programming calls to train at 80% of a given lift for the day with sleep being minimal and body soreness high, this overall percentage may need to be reduced or modified to perform at 80% for "the day," and not the 80% of peak training. Using an example of a squat day that requires 80% of the previously recorded one-repetition maximum (1RM); for illustration purposes, we will say 400 lb for the 1RM. Using the correct percentage would require the tactical athlete to use 320 lb for each set of squats. However, by using biofeedback and noting that soreness is a "10" and sleep is a "2," we can assume that acute performance may be diminished, and for a safety and performance aspect will reduce the required load for the day. Taking the adjustment into place, we may choose to lower the overall percentage by 10% (more or less) and instead squat with 280 lb for the day to get the desired response and performance outcome. Biofeedback can not only help improve performance over time by making one more aware of how their daily actions and recovery effect their training, but also reduce the likelihood of overtraining and overuse injuries.

Specificity for the tactical athlete can look different across the various fields, but basic unilateral function and programming can encompass the vast majority. Determining commonalities in a needs-based analysis and adding in specific tasks and drills into a diversified strength and conditioning program can offer optimal results to excel in the field of choice. Stress-induced situations, or physical training while performing specific drills and skills, will increase the performance carry-over of gym function and real-life tactical situations. Testing and tracking basic performance standards as well as specified skills can show the direction the programming should take. Taking note of the tactical athlete's daily feedback and performance will assist in analyzing testing results to optimize future planning and programming. Using proper timelines to achieve set goals can establish an appropriate pace for program progression and should be revisited as the tactical athlete moves throughout their training cycles. Using these basic programming points will allow the facilitator to develop personal and specified programs for the tactical athlete.

REFERENCES

1. Anderson, GS, Andersen, JP, Di Niota, PM, and Metz, GAS. The impact of acute stress physiology on skilled motor performance: Implications for policing. *Frontiers in Psychology* 10: 2501, 2019.

2. Appleby, B, Cormack, S, and Newton, R. Specificity and transfer of lower-body strength: Influence of bilateral or unilateral lower-body resistance training. *Journal of Strength and Conditioning Research* 33(2): 318-326, 2019.

3. Carfagno, DG, and Hendrix, JC the 3rd. Overtraining syndrome in the athlete: Current clinical practice. *Current Sports Medicine Report* 13(1): 45-51, 2014.

4. Charest, J, and Grandner, MA. Sleep and athletic performance: impacts on physical performance, mental performance, injury risk and recovery, and mental health. *Sleep Medicine Clinics* 15(1): 41-57, 2020.

5. Cheung, K, Hume, P, and Maxwell, L. Delayed onset muscle soreness: Treatment strategies and performance factors. *Sports Medicine* 33(2): 145-164, 2003.

6. Fullagar, HH, Skorski, S, Duffield, R, Hammes, D, Coutts, AJ, and Meyer, T. Sleep and athletic performance: The effects of sleep loss on exercise performance, and physiological and cognitive responses to exercise. *Sports Medicine* 45(2): 161-186, 2015.

7. Jones, MT, Ambegaonkar, JP, Nindl, BC, Smith, JA, and Headley, SA. Effects of unilateral and bilateral lower-body heavy resistance exercise on muscle activity and testosterone responses. *Journal of Strength and Conditioning Research* 26(4): 1094-1100, 2012.

8. Kerksick, CM, Arent, S, Schoenfeld, BJ, Stout, JR, Campbell, B, Wilborn, CD, et al. International Society of Sports Nutrition position stand: Nutrient timing. *Journal of International Society of Sports Nutrition* 14: 33, 2017.

9. Kimura, M, Moriyasu, A, and Makizako, H. Positive association between high protein food intake frequency and physical performance and higher-level functional capacity in daily life. *Nutrients* 14(1): 72, 2021.

10. Kraemer, WJ, and Fleck, S. *Optimizing Strength Training: Designing Nonlinear Periodization Workouts*. Champaign, IL: Human Kinetics; 158, 2007.

11. Mann, DL, Abernethy, B, and Farrow, D. Action specificity increases anticipatory performance and the expert advantage in natural inceptive tasks. *Acta Psychologica* 135: 17-23, 2010.

12. Morrissey, MC, Harman, EA, and Johnson, MJ. Resistance training modes: Specificity and effectiveness. *Medicine and Science in Sports Exercise* 27: 648-660, 1995.

13. Mujika, M, and Padilla, S. Muscular characteristics of detraining in humans. *Medicine and Science in Sports Exercise* 333: 1297-1303, 2001.

14. Murray, B. Hydration and physical performance. *Journal of the American College of Nutrition* 26: 542S-548S, 2007.

15. Naharundin, MN, Yusof, A, Clayton, DJ, and James, LJ. Starving your performance? Reduced preexercise hunger increases resistance training exercise performance. *International Journal of Sports Physiology and Performance* 1: 1-7, 2021.

16. Romer, LM, and McConnell, AK. Specificity and reversibility of inspiratory muscle training. *Medicine and Science in Sports Exercise* 35(2): 237-244, 2003.

17. Stellingwerff, T, Heikura, IA, Meeusen, R, Bermon, S, Seiler, S, Mountjoy, ML, and Burke, LM. Overtraining syndrome (OTS) and relative energy deficiency in sport (RED-S): Shared pathways, symptoms and complexities. *Sports Medicine* 51(11): 2251-2280, 2021.

18. Willardson, J. Core stability training: Applications to sports conditioning programs. *Journal of Strength and Conditioning Research* 21(3): 979-985, 2007.

19. Young, WB. Transfer of strength and power training to sports performance. *International Journal of Sports Physiology and Performance* 1(2): 74-83, 2006.

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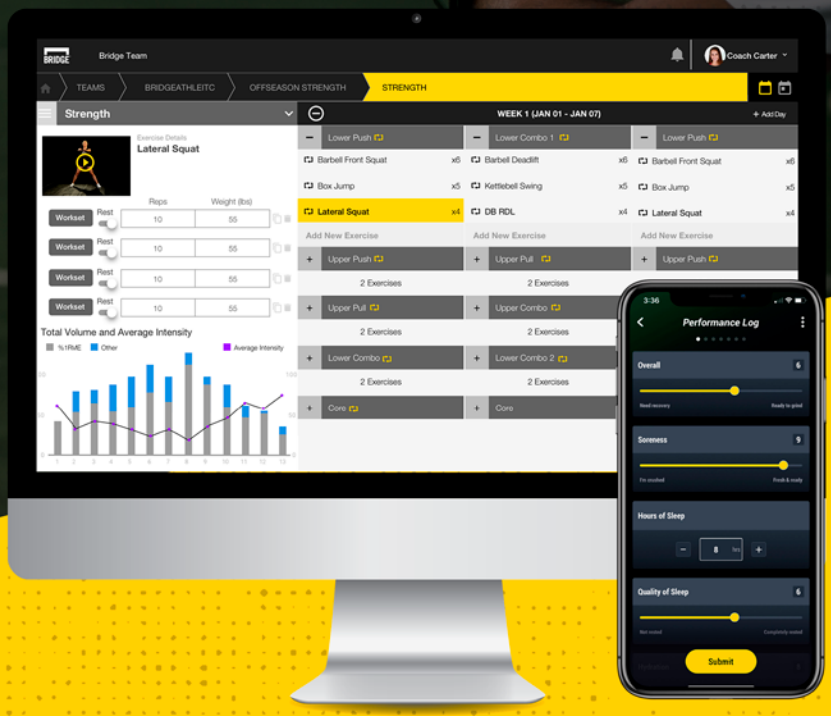

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