

FIRST RESPONDER RESEARCH COLUMN – STATE OF LAW ENFORCEMENT – PHYSICAL TRAINING INTERVENTIONS

OVERVIEW

Law enforcement officers (LEOs) work in environments where prolonged periods of sedentary activity can be interrupted by high-intensity occupational tasks such as foot pursuits, suspect control, lifting and carrying loads, and negotiating obstacles. These tasks require aerobic capacity, anaerobic power, muscular strength and endurance, and the ability to move and change direction efficiently (2,3,5,7,10,13,14,18,19). However, much of a LEO's shift is sedentary and influenced by work stress, likely contributing to elevated rates of obesity, adverse body composition, and cardiovascular and metabolic risk (4,8,13,14). Further, lower fitness and higher body fat are associated with inferior occupational performance, whereas higher aerobic capacity and muscular fitness are related to superior occupational performance and successful completion of academy training (1,2,3,4,5,6,7,9,13,14,16,17,18). Therefore, physical training (PT) should be considered a core operational requirement to enhance health and readiness outcomes. As such, this article describes factors that influence training outcomes in LEOs.

COMMON TRAINING MODELS IN LAW ENFORCEMENT

Bottom Line Up Front (BLUF): Generic, endurance-based academy PT, structured strength and conditioning, short high-intensity, or self-directed programs improve aerobic fitness and muscular endurance in recruits and officers, but their suitability depends on training status, fitness, and resources (2,4,6,16).

Across academies, the most common PT model remains endurance-based group training largely utilizing formation runs and calisthenic circuits (1,3). These sessions typically improve aerobic capacity and muscular endurance, especially in less fit recruits, but offer a modest stimulus for maximal strength and power and treat diverse fitness cohorts similarly (1,3,7). In practice, this non-scaled approach means that lesser trained recruits may receive too large of a stimulus, whereas higher trained recruits may receive too small of a stimulus (1,7).

Structured strength and conditioning approaches deliberately add resistance training, which is critical for strength and power development, and targeted metabolic conditioning that mirrors tasks such as pursuits, fence climbs, and drags (7). Cross-sectional research indicates that LEOs possessing greater lean mass, strength, and power tend to demonstrate better performance on vertical jump, pursuit runs, and upper body endurance tests, whereas greater fat mass is associated with slower run performance and decreased muscular and aerobic endurance

(5,7,9). These contrasting relationships support concurrently training endurance and strength/power, particularly for patrol and tactical roles that regularly involve load carriage, obstacle negotiation, and defensive tactics (7,17). In practical terms, this can be achieved by scheduling separate strength versus metabolic conditioning sessions on different days or by combining heavier resistance exercises with short, high-intensity conditioning bouts in the same session, while considering time, staffing, and equipment constraints. Comparisons of calisthenic, functional fitness, and strength-focused academy programs similarly show that strength-oriented models tend to elicit greater gains in lean mass, whereas calisthenic and functional approaches produce larger improvements in endurance and flexibility (20).

Brief, high-intensity and self-directed training models offer a practical option where time and equipment are limited. Supramaximal, bodyweight exercises using brief work intervals improve aerobic capacity, arterial stiffness, and body composition in LEOs without requiring dedicated facilities or long training sessions (7). Similarly, LEOs may participate in autonomous, brief, structured programs to improve aerobic capacity, grip strength, and reaction performance (2). These findings show that when intensity is appropriately high and adherence is maintained, short, flexible sessions can improve health and performance markers that are critical for occupational readiness (2,6,16).

Scaling training stimuli based on fitness level is important to optimize adaptations and mitigate injury risk. Specifically, grouping recruits by baseline test scores and prescribing distances, loads, and intensities within each group is a practical way to scale training stress relative to capacity (1,3,7,16). This can be applied using simple academy entry tests, such as the 20-m multistage fitness test, 30-15 intermittent fitness test, 2.4-km run, push-ups, and sit-ups. Grouping in this manner may help to form collaborative training groups, set appropriate running paces and resistance targets, and can be readily used in academy and career settings (1,3,19).

WORKSITE PROGRAMS AND ON-DUTY TRAINING

BLUF: Law enforcement worksite and on-duty exercise programs can preserve or improve aerobic fitness, muscular endurance, and basic movement qualities in incumbent officers, but their impact depends heavily on supervision, program design, and organizational support.

It is critical that LEOs maintain fitness upon graduation from the academy, as declines in aerobic capacity and muscular fitness are associated with increased injury risk, reduced ability to perform physically-demanding tasks, and poorer long-term health outcomes (5,9). Cross-sectional data demonstrates that LEOs who are more physically active tend to have higher aerobic capacity, which is associated with superior occupational readiness (5,9). However, the job is largely sedentary with long periods of sitting, administrative demands, and high psychological stress (4,8). These factors likely contribute to deleterious body composition and cardiovascular fitness (4,8,17). Many LEOs do not engage in regular exercise due to lack of time, fatigue from shifts, limited access to facilities or equipment, and inconsistent support from administrators (8). Given these realities, recommendations from the literature emphasizes simple, repeatable approaches that can be delivered in or near the workplace with minimal equipment. Brief bodyweight or light-load circuits and moderate- to high-intensity intervals can be performed around calls and tailored by adjusting work-to-rest ratios and exercise intensity (2,6,8). Periodic use of basic field tests (e.g., push-ups, sit-ups, shuttle run VO_2max estimates), and valid occupational assessments (e.g., short obstacle courses, body or dummy drags) can be used to track changes, guide progression, and provide objective data to support continued investment in wellness and fitness programs. Agencies are responsible for supporting the occupational readiness of their personnel through exercise and/or hiring tactical strength and conditioning facilitators to manage and implement programming.

AGE AND SEX CONSIDERATIONS IN LAW ENFORCEMENT PHYSICAL TRAINING

BLUF: Generic PT models may be limited in ability to scale training stimuli relative to LEO's fitness level, age, and sex. Thus, lesser fit, older, and female personnel may experience higher relative training loads and subsequent health risk, whereas more fit officers may be undertrained. Scaling training to current capacity rather than age or sex alone more appropriately aligns training stimuli for all personnel.

Longitudinal and cross-sectional data show that aerobic capacity, lower body power, and push-up performance tend to decline with age; whereas body mass, body mass index (BMI), and body fat percentage increase (4,17). These age-related changes occur against a background of shift work, sedentary duties, and cumulative musculoskeletal load, and are accompanied by elevated cardiometabolic risk compared with population norms (4,8,11).

Regarding sex, upon entrance to the academy, male recruits generally possess higher absolute strength, power, and aerobic capacity than female recruits (3,7,13). These differences highlight the recommendation for female LEOs to utilize scaled

load progressions that target strength development (4,10,15). Collectively, these findings support a shift toward physical training models that scale workload to capacity, using simple measures such as run performance, muscular endurance tests, and body composition indicators, rather than using chronological age or sex alone. For example, scaled load progressions for lower fit or female recruits might begin with reduced external loads, fewer sets or repetitions, or shorter running distances, and then systematically increase volume and/or intensity as capacity improves, while higher fit recruits start with greater loads and progress more rapidly. Such an approach can lower excessive workload in more vulnerable subgroups (e.g., lower fit, LEOs with higher adiposity) while still providing sufficient stimulus to maintain and enhance fitness in more highly fit personnel across the career span.

ACUTE FATIGUE AND OCCUPATIONAL READINESS

BLUF: When PT is scaled to LEOs' fitness level and planned around operational demands, LEOs can train hard while minimizing the likelihood that short-term fatigue compromises occupational performance.

LEOs performing exercise prior to or while on duty should use caution to ensure that acute fatigue does not degrade subsequent occupational readiness, particularly for high-risk or cognitively-demanding tasks. It is reasonable to recommend performing less fatiguing exercise (e.g., mobility, low to moderate volume aerobic exercise, low volume power) before or during shifts and to reserve more fatiguing training (e.g., high-volume anaerobic intervals, hypertrophy work, high-intensity functional circuits) for after a shift or off-duty days so that fatigue does not interfere with operational readiness. Furthermore, it is important for the LEO and tactical facilitator to understand how a LEO responds to exercise stimuli and to program accordingly. Direct evidence on how a single bout of PT affects subsequent occupational performance in LEOs is limited. However, across law enforcement studies, higher aerobic fitness and muscular endurance are consistently associated with better performance on occupationally-relevant assessments, lower injury risk during academy training, and more favorable health and fitness profiles (1,6,7). Together, these findings support the development of aerobic fitness and muscular endurance so that LEOs are better able to tolerate exercise-induced fatigue in or around shifts.

RELEVANCE FOR THE TACTICAL FACILITATOR – KEY TAKEAWAYS

For the tactical facilitator, the goal is to organize training so that core physical qualities are developed systematically while accommodating academy and station constraints. The following key takeaways outline how to structure periodized strength and conditioning, incorporate multimodal circuits that reflect job tasks, scale training parameters using simple field assessments,

and sustain fitness beyond the academy. In general, foundational strength and aerobic conditioning should be prioritized first with an emphasis on movement quality. Then, circuits emphasizing loaded carries, drags, and other occupationally relevant tasks can be incorporated. Collectively, this approach will help the agency develop its playbook to facilitate occupational readiness and health throughout the career span. Such agency level planning aligns with international perspectives that emphasize structured, career-long strategies to sustain police fitness and readiness (21).

PERIODIZED STRENGTH AND CONDITIONING

- Performing mixed resistance and conditioning over 16 – 18 weeks can produce significant gains in muscular endurance, power, agility, and aerobic performance. Improvements tend to be greatest in the first half of an academy, with plateaus occurring when PT volume is not progressively overloaded and skill blocks dominate academy time (4,15,18).
- Observations across recruit cohorts suggest that generic PT loads have differential effects based on fitness level (4,15). That is, lesser fit recruits realize greater improvements, whereas higher fit recruits experience less improvements, supporting a need for scaled loading and monitoring of high-risk groups.

MULTIMODAL TRAINING FOR JOB TASKS

- Strength, power, agility, and anaerobic capacity are associated with superior performance on pursuit runs, explosive tasks, and defensive tactics; whereas programs dominated by long, slow runs and high-repetition calisthenics primarily improve aerobic endurance (3,7,13,14).
- Utilizing circuits that integrate loaded carries, drags, jumps, and push/pull tasks may be feasibly implemented within academy and in-service settings and may more directly translate to occupational tasks.

INDIVIDUALIZATION AND RISK MANAGEMENT

- Lower aerobic fitness and less favorable body composition at academy entry are associated with lesser occupational performance and worse health and functional risk over time (3,4,6). This supports the use of simple field measures (e.g., shuttle run performance, run times, push-ups, sit-ups) to identify higher risk recruits and use of scaled progressive overload principles to facilitate beneficial adaptations.

STATION-LEVEL SUSTAINMENT

- On-duty and voluntary programs that promote regular conditioning around shifts using brief, structured aerobic and resistance training sessions improve or maintain numerous measures including aerobic capacity, muscular endurance, and selected neuromuscular qualities in LEOs (2,6,17).
- Without the requisite infrastructure, LEOs can become less fit than recruits, exhibiting lower aerobic fitness and muscular power. They also may display higher cardiometabolic risk than expected for their age, underscoring the need for department level sustainment strategies (4,8,12).

DEPARTMENT PLAYBOOK IMPLICATIONS

- Use entry field tests (e.g., 20-m multistage fitness test, 30-15 intermittent fitness test, 2.4-km run) and simple strength/endurance assessments (e.g., push-ups, sit-ups, vertical jump, grip), to set ability-based PT groups, progressions, and thresholds for training.
- Departments can use a linear periodized model in academy and early career PT by prescribing 2 – 3 weekly sessions that gradually increase total load over time while emphasizing strength, power, anaerobic intervals, and aerobic conditioning in a planned sequence, rather than relying solely on long distance running and calisthenics.
- Build academy-to-incumbent training habits by linking common field tests and job task simulations (e.g., obstacle-style runs, drags, fence climbs). This could be done across career phases by providing simple, scalable circuits and conditioning templates utilized on-duty with minimal equipment.
- Regular monitoring with these tests throughout the academy and career allows departments to track progress, identify at-risk individuals, guide scaling of training stimuli, and demonstrate program effectiveness to leadership.

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