ON-DUTY PHYSICAL TRAINING (PT)

ANNUAL TESTING

Fire fighters not only have a dangerous job, but it's a physically demanding occupation that requires them to stay in shape to safely and effectively perform their duties. At a minimum, fire fighters should complete an annual medical exam with their primary care or department physician. It is recommended that all operational personnel participate in routine physical training (PT) each shift and complete an annual physical fitness exam, such as the Candidate Physical Ability Test (CPAT) or a department-adopted equivalent.

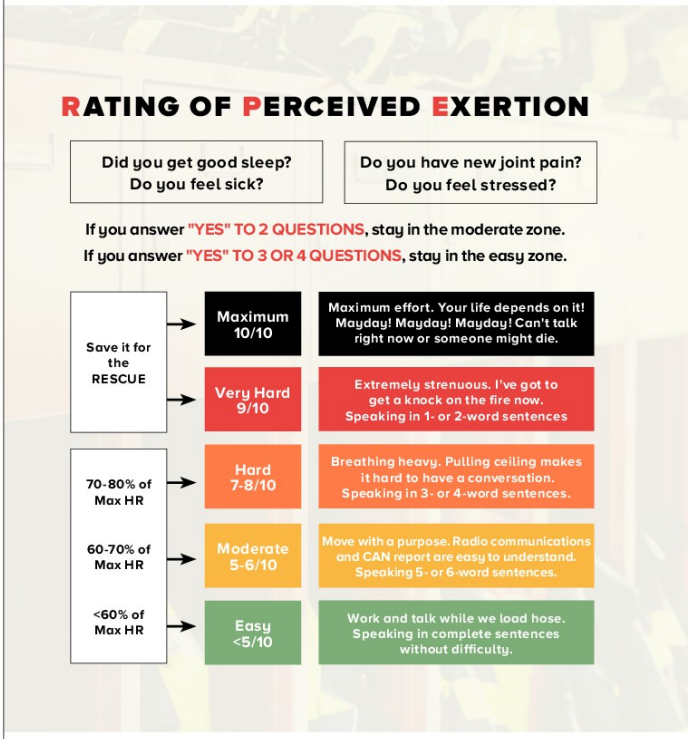
WARMING UP AND COOLING DOWN

When possible, fire fighters should warm up prior to and cool down after participating in PT or training on the drill ground. This will prepare the heart, muscles and joints for exercise by lubricating the joints and pushing blood out to the arms and legs to increase elasticity and motion of muscles and tendons. Large full-motion-based movements are recommended for warmups, such as high-knee marching, lunges, squats, raising arms overhead and trunk rotation for five minutes. If drilling, this should be conducted prior to donning bunker gear to ensure no restrictions of normal movement patterns and to reduce exposure to carcinogens.

GAME DAY

Rating of perceived exertion (RPE) can be used to help personnel stay within appropriate effort levels for on-duty PT so they can respond to a call without compromising their physical capacity. For example, if you knew you were about to go to a structure fire, would you max out on squats and physically destroy your legs prior to the call? Absolutely not—you'd be fatigued and more susceptible to injuries during the call. Professional athletes don't do an intensive workout before they hit the field, court or ice on game day. Fire fighters should consider on-duty as game day with on-duty fitness as their pre-game warm-up. The goal is to not give the gym 100% when 100% is required for the next call or major incident.

> "Working out very hard on shift can be equated to overeating on shift. Always keep in mind: 'You never want to eat any more than your mask can hold ...' Similarly, you should never overexert yourself during PT to the point that you could not pull out a downed person in a structure fire."
>
> —BETH GALLUP



EXERCISE EFFORT

Before training, fire fighters should do a quick assessment to determine the type of workout and how much energy they should exert during on-duty PT. The goal is to maintain conditioning, save some strength and energy for your next "strenuous" call, and still get meaningful exercise in while on-duty. Departments and fire stations have different call volumes, work schedules, time of day when PT may be conducted, training requirements, and different demographics and fitness levels among their assigned personnel. These factors contribute to how fatigued someone is during a shift, which could result in an injury during PT.

Personnel should honestly answer the following questions and adjust their RPE or heart rate goals prior to performing on-duty PT:

- Did you get good sleep?
- Do you feel sick?
- Do you have new joint pain?
- Do you feel stressed?

Heart rate-based training allows you to assess the intensity of the physical exercise, the duration of the exercise and the appropriate recovery time. RPE also can be used to help fire fighters stay within appropriate effort levels for on-duty PT. See RPE Ratings poster above.

Definitions

Beginner: Untrained or several years of no resistance or cardiovascular training

Intermediate: Six months to several years of consistent resistance or cardiovascular training

Advanced: Several years of consistent resistance or cardiovascular training

ON-DUTY PHYSICAL TRAINING

On-duty PT may include training that involves cardiovascular exercise, strength training, balance, mobility or dynamic stretching. On-duty cardiovascular training should be aerobic and last from 10 to 60 minutes; work at 60% to 80% of maximum ability with an RPE of 5 to 8, "moderate" to "hard." Cardiovascular training includes treadmill, stairs, cycling, rowing and swimming.

On-duty strength training should require roughly 50%–70% of maximum effort or an RPE of 5–7 out of 10 on the RPE chart. Strength training includes the use of one's body weight, dumbbells, resistive tubing, cable machines, stability balls and kettlebells. During strength training, exercise selection and order of performance should move from large muscle groups early in the session to smaller muscle groups later in the session. Powerful, multi-joint movements should be performed earlier in a training session than slower, less powerful, single-joint movements. Higher-intensity exercises should be performed before lower-intensity exercises.

WHAT TO AVOID ON-DUTY

To prevent on-duty exercise-related injuries:

- Avoid competitions between personnel, which can lead to injuries. Instead, compete with yourself.
- Avoid basketball and volleyball games (or similar), as these types of games also lead to injuries and become competitive.
- Avoid barbells overhead. Dumbbells are safer than barbells because they allow for differences in strength between the right and left side of your body.
- Academy recruits should avoid any additional workouts outside of the Academy. Use days off for recovery, which will result in improved performance.

RESOURCES

Armstrong DP, Ferron R, Taylor C, McLeod B, Fletcher S, MacPhee RS, Fischer SL. Implementing powered stretcher and load systems was a cost-effective intervention to reduce the incidence rates of stretcher related injuries in a paramedic service. **Applied Ergonomics. 2017; 62:34-42.**

Centers for Disease Control and Prevention. (2020). Work-Related Musculoskeletal Disorders & Ergonomics. Retrieved from cdc.gov/workplacehealthpromotion/health-strategies/musculoskeletal-disorders/index.html

EMS1. (2017). Study: Powered stretchers could reduce injuries, keep paramedics on the job. Retrieved from ems1.com/ems-products/stretchers-and-stair-chairs/articles/study-powered-stretchers-could-reduce-injuries-keep-paramedics-on-the-job-3M9cRGMC6QzlpTia/

Ergonomic Focus. (2019). Ergonomics major concern for fire fighters, EMTs, NIOSH says. Retrieved from ergonomicfocus.com/ergonomic-focus/ergonomics-major-concern-for-firefighters-emts-niosh-says/

Federal Emergency Management Agency. (2020). Emergency Services Ergonomics and Wellness. Retrieved from usfa.fema.gov/downloads/pdf/publications/emergency-services-ergonomics-and-wellness.pdf

Firefighter Injury and Illness Reduction. (2021). FF/EMS Musculoskeletal Injury Prevention On-Duty Fitness Best Practices. Retrieved from lni.wa.gov/safety-health/grants-committees-partnerships/FIIRE/_docs/FIIRE_OnDutyFitness.pdf

Fire fighter Injury and Illness Reduction. (n.d.). Patient Transport Best Practice. Retrieved from lni.wa.gov/safety-health/grants-committees-partnerships/FIIRE/_docs/Stair-chairs-with-tracks-best-practice.pdf

Fredericks TK, Butt SE, Harms KS, Burns JD. **Evaluation of Medical Cot Design Considering the Biomechanical Impact on Emergency Response Personnel. 2013.** The XXVth Annual Occupational Ergonomics and Safety Conference, June 6-7, 2013.

Lavender SA, Conrad KM, Reichelt PA, Gacki-Smith J, Kohok A. **Designing ergonomic interventions for EMS workers, Part I: transporting patients down the stairs.** Applied Ergonomics. 2007; 38(1):71-81.

Lucas. (2023). Chest compression system. Retrieved from lucas-cpr.com/why_lucas/

National Fire Protection Association. (2012). Understanding and implementing standards: NFPA 1500, 1720, and 1851. Retrieved from nvfc.org/wp-content/uploads/2015/09/Standards_Guide_1500_1720_1851.pdf

National Fire Protection Association. (2018). Standard on fire department occupational safety, health, and wellness program (standard no. 1500). Retrieved from nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/ detail?code=1500