

Physical Readiness

“ Physical readiness is the ability to meet the physical demands of any duty or combat position, move lethally on the battlefield, accomplish the mission and continue to fight, win, and come home healthy.”



If the overarching goal of H2F is Soldier readiness, then the overarching physical training goal is movement lethality—the ability to physically engage with and destroy the enemy. Movement lethality is the ability to apply and sustain the right amount of strength, endurance, and speed to meet the demands of training and combat physical tasks. This physical goal is supported by optimal mental function. The goal and the function are inseparable, linked together. The ability to tolerate physical duress is a function of mental toughness. It is generated by training the critical components of physical readiness and the tasks they support.



Physical Component

Occupational Tasks

Muscular Strength

Lift, drag and carry heavy loads

Muscular Endurance

Execute sustained bouts of low intensity resistance.

Aerobic Endurance

Execute sustained bouts of low intensity movement

Anaerobic Endurance

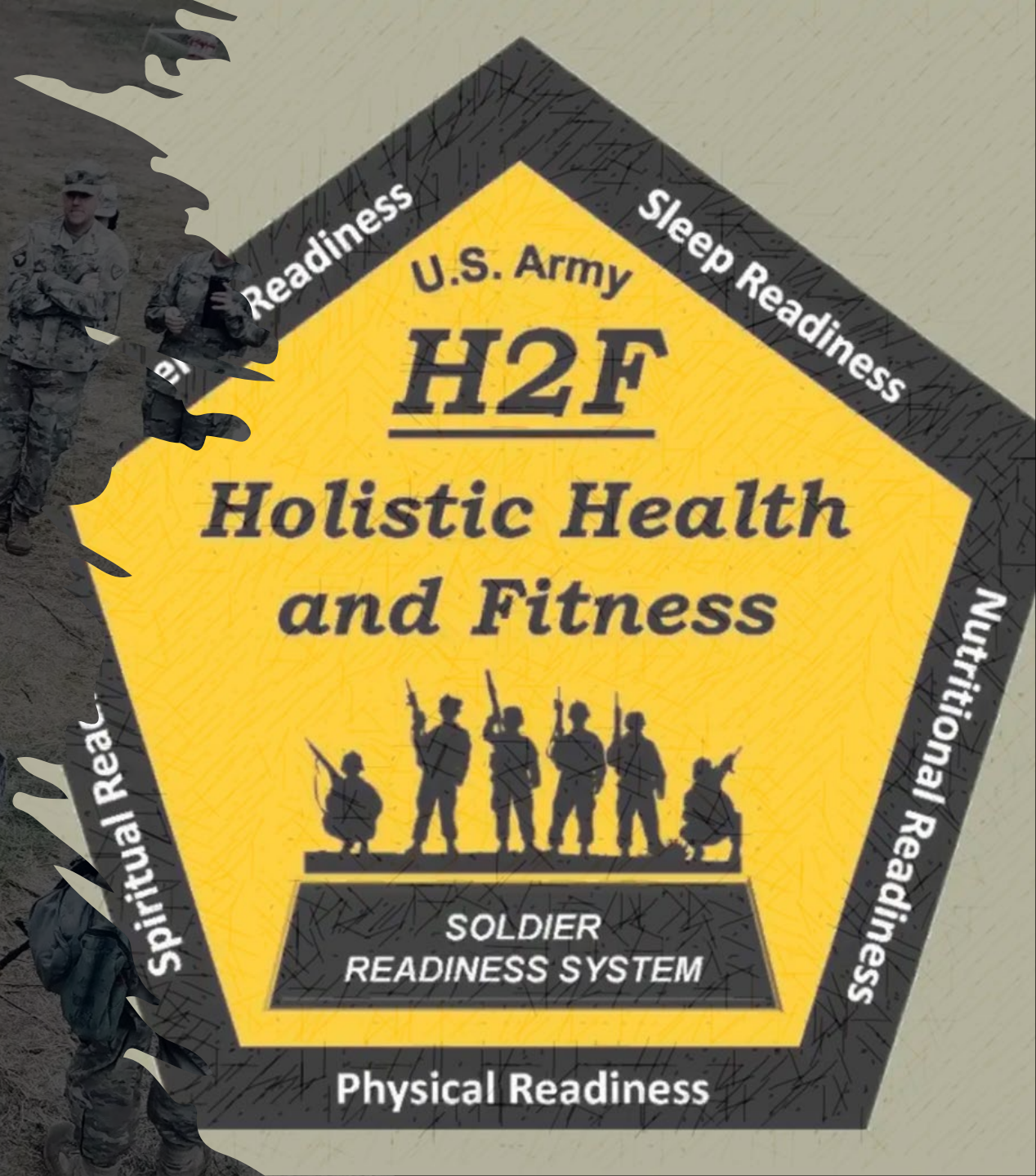
Execute short-duration, high intensity movement

Power

Complete short duration, explosive movements with heavy loads



These components illustrate the prerequisites for movement lethality. Components of fitness, energy systems, occupational skills, and physical skills required for movement lethality must be carefully combined over time with a Soldier's structural capabilities. Structural capabilities are the intrinsic capabilities that allow a Soldier to perform physically.



**Structural
Capability**

Description

Load tolerance The ability of the skeletal system to bear weight.

Flexibility The range of motion across single or multiple joints that allows the body to be positioned for optimal movement.

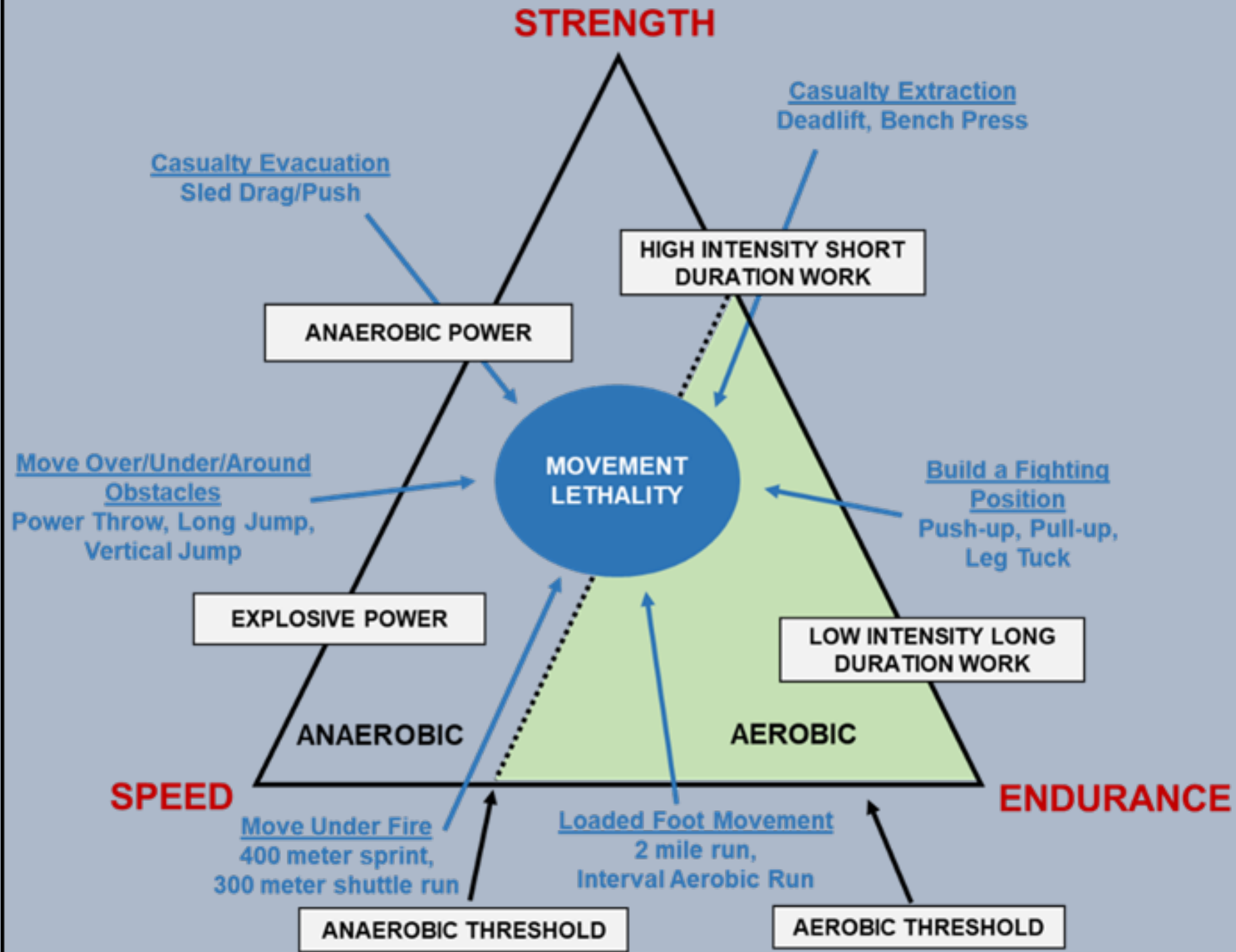
Static balance The ability to maintain a stable position over a base of support.

Body composition The percentage of lean muscle and other body tissues.

Bone density The thickness and quality of the bone that provides its strength.



This graph illustrates the different training techniques that collectively contribute to the ideal equilibrium. That being a soldier's Movement Lethality.

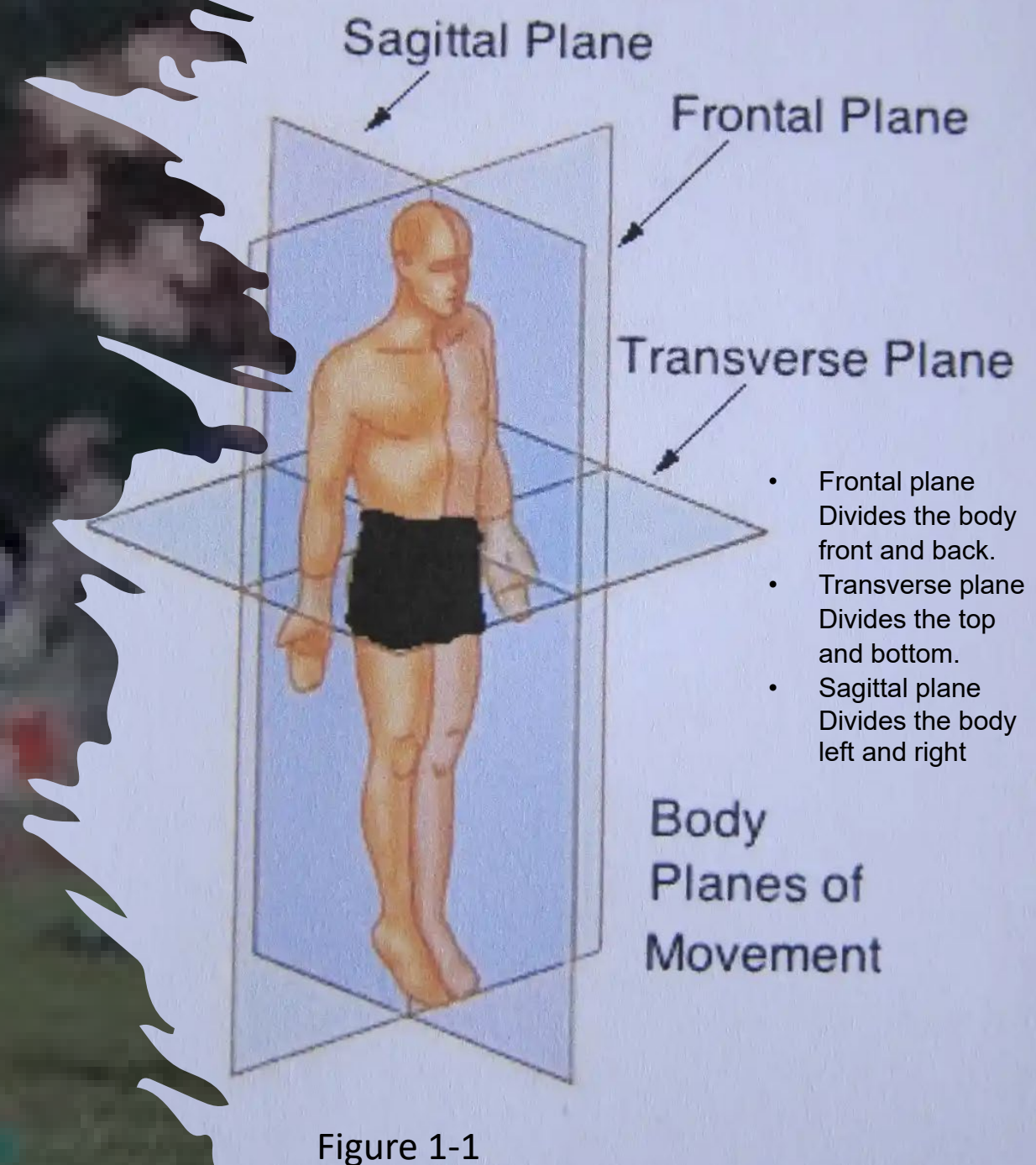


Tasks and physical components of movement lethality.

Structural capabilities support the training and improvement of the movement skills.

Movement skills: *Movement Skill Description*

- Agility - The ability to bend, rotate and twist in the frontal, transverse, and sagittal planes and use that ability to change direction. (See Figure 1-1)
- Coordination - The ability to synchronize limb, torso and head movements at varying speeds of motion.
- Dynamic balance - The ability to move under control at speed and under load.
- Kinesthesia - The perception of the body's position in space during movement.
- Pace - The ability to set the correct speed of an activity to manage fatigue.
- Perception - The understanding of correct technique and effort that builds skill.
- Reaction time - The interval between an external stimuli and the Soldier's response.



Movement lethality has to be taught and learned with meticulous attention to the precise replication of the movements required in occupational tasks and combat. Movement skill must be deliberately and purposely progressed until it becomes a natural part of Soldier performance in training and in contact with the enemy.

One characteristic of movement—speed—serves as an example. Speed improves with the proper development of aerobic and anaerobic energy systems along with muscular strength and endurance. Drills and exercises are the means to cultivate this improved end state.

Some drills such as 30:60s, 300 Meter Shuttle Runs, and Hill Repeats promote fast speed. Others such as the Lateral, the Lunge Walk, and the Soldier Carry develop precise, slower movement competencies.

The movement skill associated with speed, therefore, is pace—the ability to control the rate at which you move.





Pace can be deliberately progressed by ensuring that a Soldier is exerting himself or herself correctly. This requires an understanding of effort. Soldiers can train and measure effort while executing these drills by using the RPE scale—a Soldier's estimate of how hard he or she is working.

This training integrates into the Soldier's ability to avoid fatigue or arrive too soon at an objective.



COMPONENTS OF PHYSICAL FITNESS

Fitness is often broken down into and measured by commonly accepted parts often labeled components. These components have evolved with advances in exercise science and technology. The H2F System's physical readiness training enhances the components of physical fitness and measures them in the OPAT and ACFT. Higher raw scores due to improved performance on the ACFT give commanders information about the absolute capacity of each of their Soldiers' components of fitness. Leaders who know about fitness components understand how to regulate and apply training intensity. Soldiers need to train across all components to meet an infinite range of operational challenges and physiological demands.

STRUCTURAL REQUIREMENTS

Structural requirements are the physical and cognitive characteristics that provide the foundation for increased work capacity. They allow work capacity to increase through regular systematic participation in physical training that creates a healthy body composition, optimal weight to height ratios, strong bone density, good static flexibility and balance, quick reaction time, and perception. In short, Soldiers need these structural requirements to start and complete more work. Without structural integrity, training cannot commence or proceed.



PHYSIOLOGICAL CAPACITY

The H2F System is designed to progress a Soldier through regular and progressive training that builds movement lethality and mental toughness. Soldiers should aspire to achieve their absolute best. Some may achieve world-class performance levels and will inspire others to do the same, but it is the maximal physiological capacity (strength and endurance) of the whole formation that primarily concerns the commander, not the exemplary performance of a single Soldier.

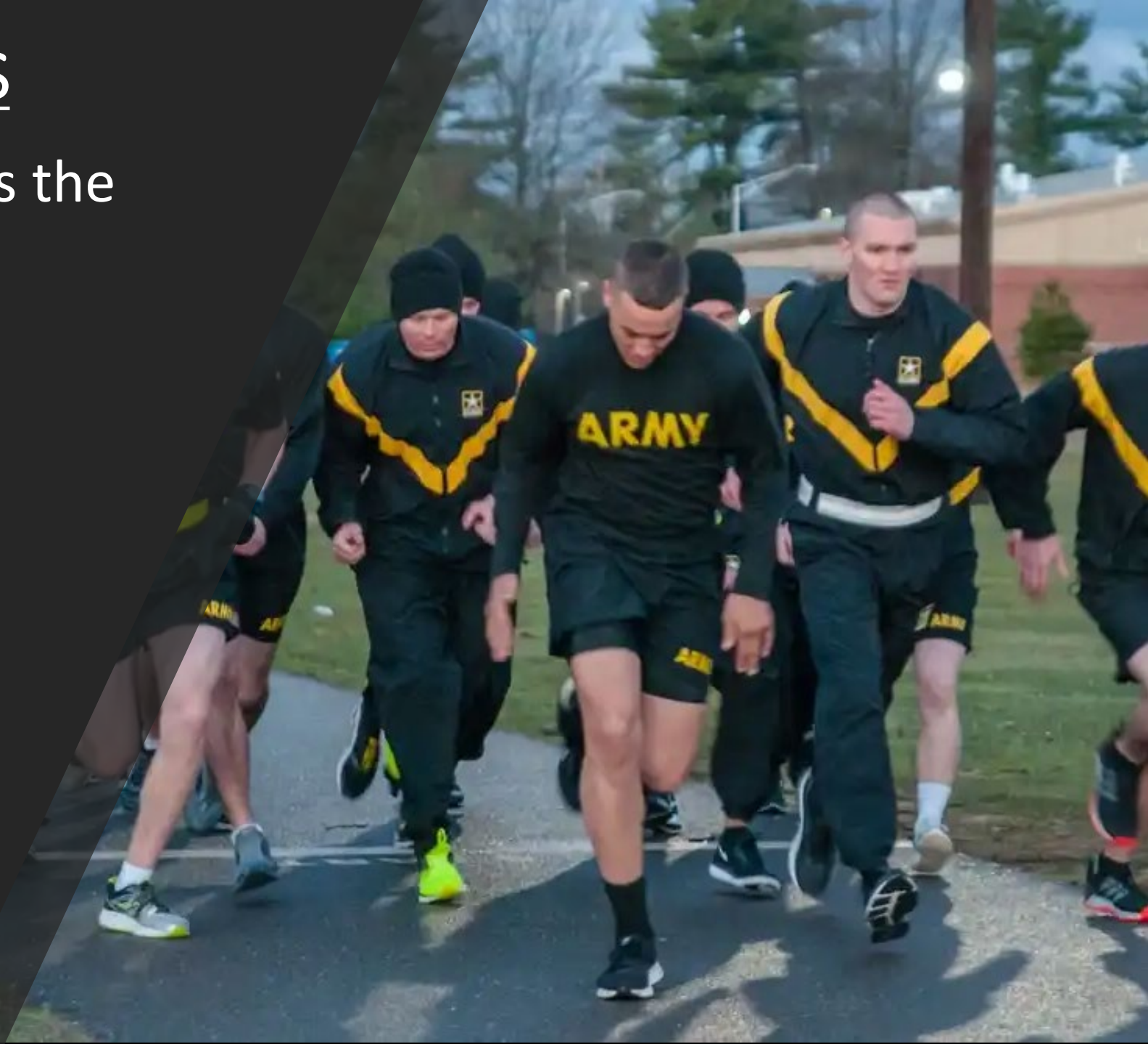
A lift that requires movement of 150 pounds is relatively easy for a Soldier who can carry 350 pounds—his or her absolute workload. This high level of strength allows the Soldier to use relatively less effort to complete the task so that he or she can conserve energy for next effort. That same lift is harder and much more intense for someone whose absolute workload is 200 pounds. As relative work capacity approaches a Soldier's absolute workload, the risk of injury is much higher. Leaders have to differ individualize—the training program to improve absolute workload to avoid injury. Commanders who understand and apply the concepts of absolute workload and relative workload can better direct their H2F personnel and align resources to meet their units' missions.



PHYSICAL COMPONENTS

Physical readiness includes the following components:

- Muscular strength.
- Hypertrophy.
- Muscular endurance.
- Aerobic endurance.
- Anaerobic endurance.
- Power.





Muscular strength is the amount of force a muscle or a group of muscles can generate. Examples include a Flexed Arm Hang for fifteen seconds, one repetition of a Bench Press at maximum weight, or extracting a casualty from a turret. The gold standard for measuring muscular strength is the one repetition maximum. It is the heaviest weight a Soldier can lift and is best calculated with weight training exercises such as the Bench Press, Squat, or Deadlift. High levels of strength that support the mission can certainly be achieved without lifting this amount of weight. In fact, leaders need to use the one repetition maximum approach sparingly. Leaders can use the repetition maximum formula (paragraph 4-25) to calculate one repetition maximum without complete a one repetition maximum testing. The heaviest weight a Soldier can lift 3 times, or 10 times would be a three repetition maximum or ten repetition maximum, respectively.

Hypertrophy is increase in muscle size, which can be achieved through a blending of muscular strength and muscular endurance training. When Soldiers use moderate to heavy loads (65–85 percent of one repetition maximum), a greater number of repetitions and a variety of speeds, they are building muscle mass.

Muscular endurance is the ability of a muscle or muscle group to repetitively perform work for an extended period. Examples include lifting duffel bags onto truck beds, loading 155-millimeter rounds, or performing Climbing Drill 1. Muscular endurance, in combination with aerobic and anaerobic endurance, is required to tolerate carrying progressively heavier loads over greater distances on uneven and steeper terrain and at faster speeds.

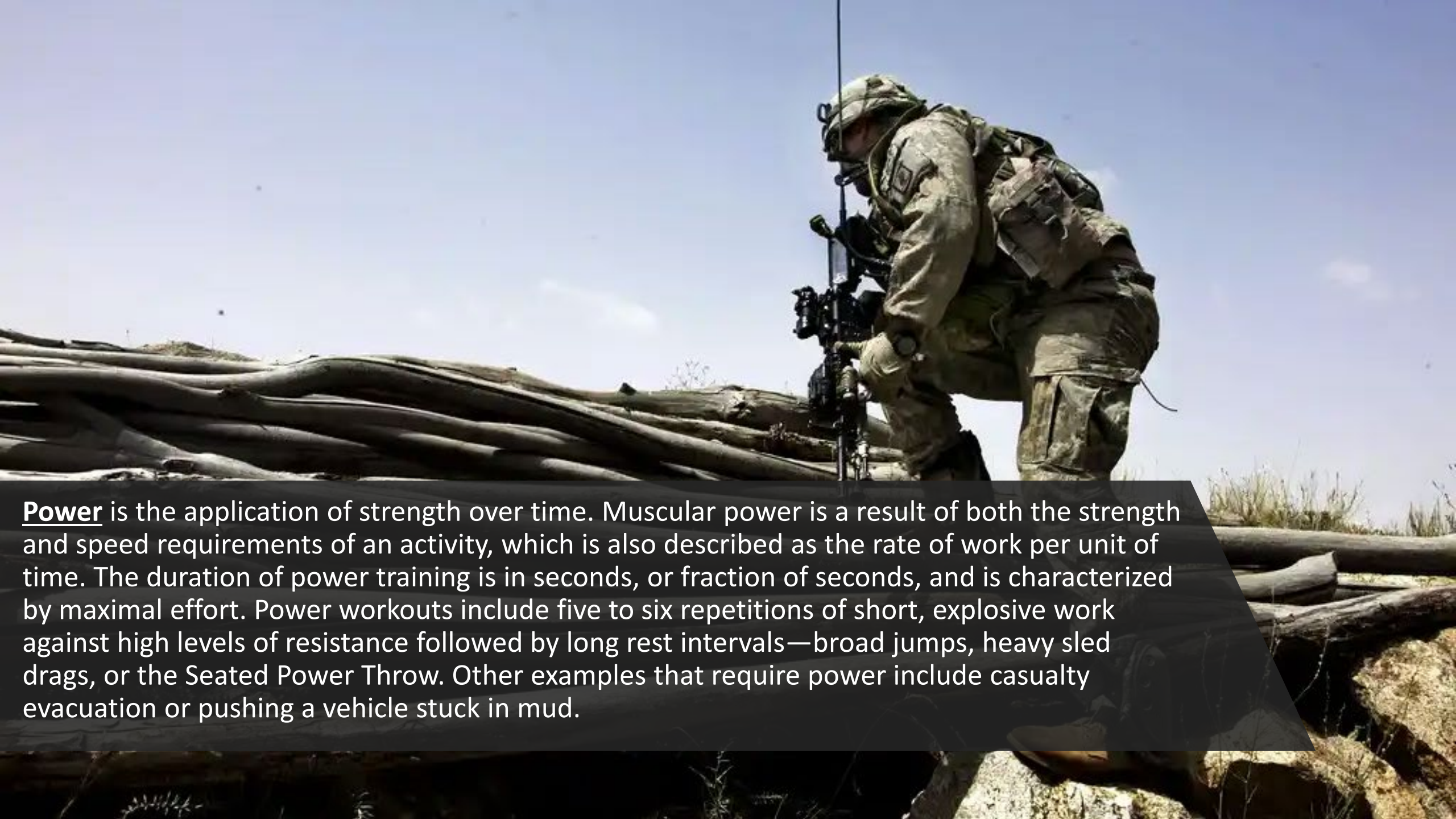


Aerobic endurance is the ability to exercise large muscle groups for sustained durations of time longer than a few minutes. At this level of effort, slow-twitch muscle fibers use oxygen to produce energy while conserving glycogen and glucose through greater metabolism of fat (fatty acids or triglycerides) for energy needs. Examples include long-distance triathlons, long Foot Marches, patrols, and Unit Formation Runs. Although aerobic training is low intensity, high volumes of aerobic training without the proper progression and balance of strength training can cause overtraining. High loads carried during aerobic activity tend to shift the fitness component from aerobic to anaerobic if the same pace is maintained. Soldiers, first the untrained and then the trained, will begin to slow down when carrying heavier loads. This significantly decreases the aerobic training effect and increases injury risk.

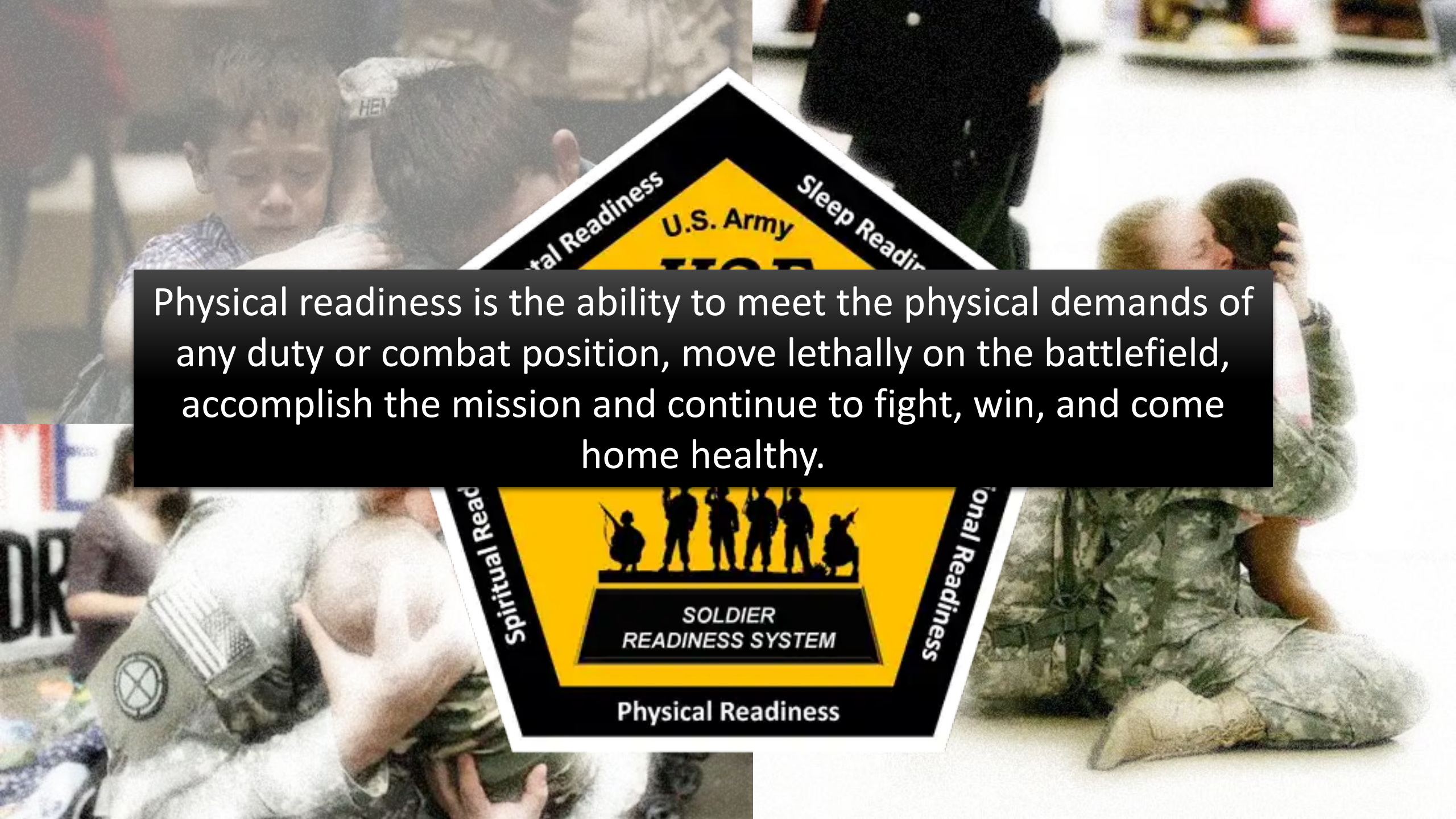




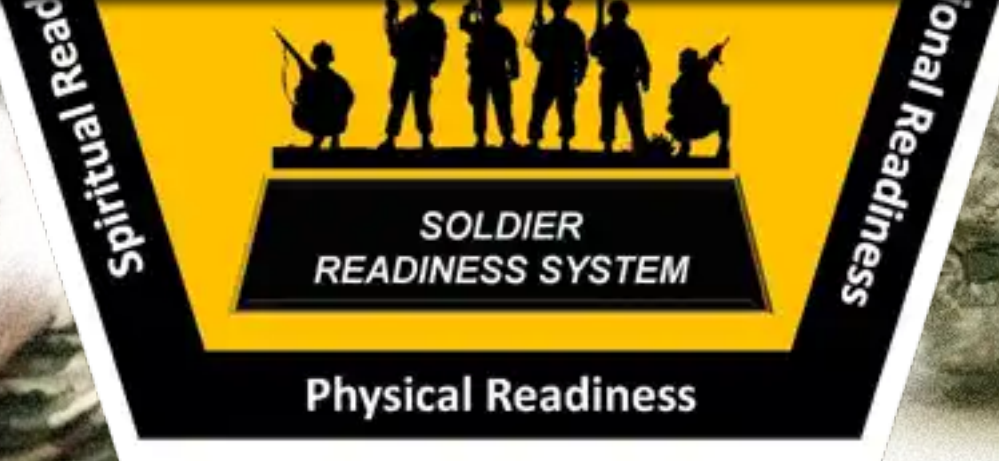
Anaerobic endurance is the ability to tolerate short bursts of high-intensity activity. At this level of effort, fast-twitch muscles are the greatest contributors. Examples include moving rapidly with a heavy ruck, sprinting, heavy lifting, and combatives. Fuel for this level of intense exercise is primarily derived from glycogen. Anaerobic endurance is finite and therefore associated with complete fatigue. High levels of anaerobic endurance are essential for carrying heavy loads.



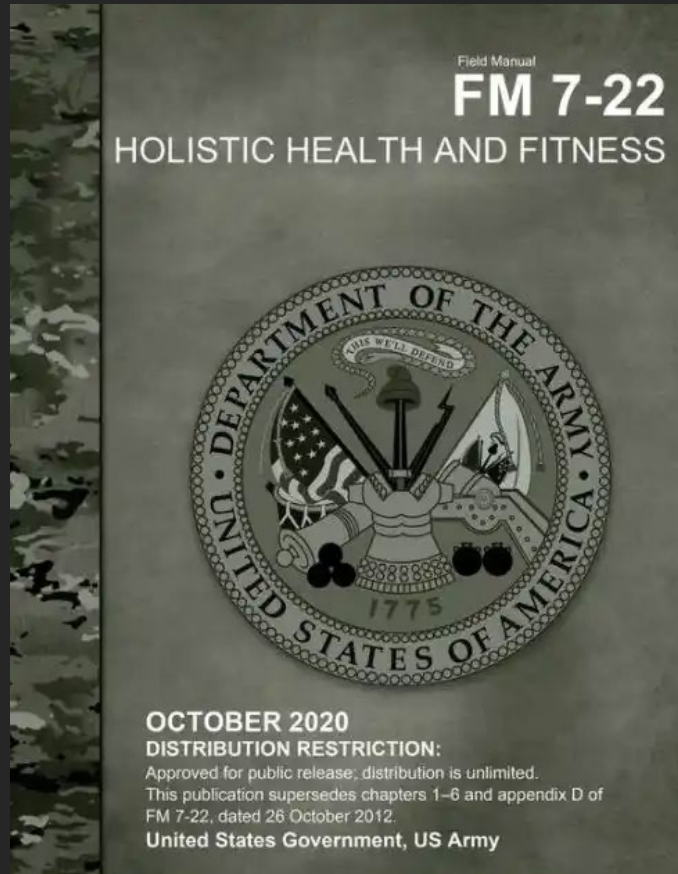
Power is the application of strength over time. Muscular power is a result of both the strength and speed requirements of an activity, which is also described as the rate of work per unit of time. The duration of power training is in seconds, or fraction of seconds, and is characterized by maximal effort. Power workouts include five to six repetitions of short, explosive work against high levels of resistance followed by long rest intervals—broad jumps, heavy sled drags, or the Seated Power Throw. Other examples that require power include casualty evacuation or pushing a vehicle stuck in mud.



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Health and Holistic Fitness section on Physical Readiness.



For more information visit:
<https://www.army.mil/acft/>

