

# Chapter 20

## PHYSICAL FITNESS: THE NECESSARY FOUNDATION

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“Physical fitness is the basis for all other forms of excellence.”<sup>1</sup>

—President John F. Kennedy

## INTRODUCTION

Operating in today’s services requires exceptional stamina and physical readiness. Service members must be prepared to travel to a variety of environments on short notice and immediately conduct high-tempo and high-intensity operations. Success in this arena requires constant vigilance among individual units and commands to maintain the highest levels of physical fitness among service members to successfully execute missions. Current military directives emphasize total force fitness (TFF), a holistic approach encompassing all domains of the individual, as defined in the 2011 guidance issued by the chairman of the Joint Chiefs of Staff (CJCSI 3405.01).<sup>2</sup> The TFF instruction directs the services to approach readi-

ness and force preservation through eight domains (discussed in Chapter 19, The Evolution of Human Performance Optimization and Total Force Fitness)—physical, nutritional, medical, environmental, spiritual, psychological, social, and behavioral—all of which are critical for ensuring service members have the requisite knowledge, skills, and abilities to perform optimally with maximal resilience.<sup>3</sup> This chapter will examine the physical domain by presenting definitions and a historical background, followed by the physiologic principles and benefits of exercise, the foundational elements of physical fitness, and the vulnerabilities faced in efforts to maintain a fit fighting force.

## DEFINITIONS

- **Balance.** Ability to control or stabilize the body when standing still or moving.
- **Cardiorespiratory fitness.** Efficiency with which the body delivers oxygen and nutrients needed for muscular activity and transports waste products from the cells.  
*Activities to build aerobic capacity: Jogging/running, cycling, climbing, rowing, using the lateral trainer, using the upper-body ergometer, vigorous dance, kickboxing, aerobics, jumping rope, swimming, cross country skiing, inline skating.*
- **Coordination.** Ability to move two or more body parts under control, smoothly and efficiently, to achieve a designated purpose.
- **Exercise prescription.** Specific plans of fitness-related activities designed for a specified purpose.
- **Flexibility.** Ability to move the joints (eg, elbow, knee) or any group of joints through an entire normal range of motion.  
*Activities to build flexibility and mobility: stretching machines, freestyle stretches (or with straps), yoga and Pilates.*
- **Functional fitness.** Exercises that train muscles to work together and prepare them for daily tasks by simulating common movements done at home, at work, or during combat.
- **Intensity.** Level of effort during exercise, from low to high. Increasing intensity allows one to improve a particular component of training.
- **Maximal aerobic power.** The highest level of oxygen that a person can utilize, called the  $Vo_{2max}$ , and reported as mL/kg/min. With improved levels of aerobic fitness, individuals can improve both their sustainable maximum heart rate and their  $Vo_{2max}$ .
- **Overload.** Setting the intensity of the exercise higher than normal to produce physiological adaptations.
- **Periodization.** Systematic planning of training to maximize/optimize performance of a mission or competition at a known point in the future.
- **Progression.** Gradually and consistently escalating a training stimulus to build aerobic capacity, strength, endurance, and mobility.
- **Recovery.** Providing adequate rest period between exercise sessions to achieve optimal performance, particularly when working on strength or endurance. Usually accomplished by alternating fitness components or muscle groups from one day to the next.
- **Specificity.** Tailoring the training stimulus to achieve a desired outcome, such as training and practice for physical tasks that service members will be required to perform as part of their duties.
- **Strength training.** Incorporates muscular strength and muscular endurance.
  - **Muscular strength.** Amount of force a muscle or muscle group can exert in a single effort.

- **Muscular endurance.** Ability of a muscle or muscle group to perform repeated movements with a submaximal force for extended periods of time.  
*Activities to build strength and endurance: working out with free weights, plate-loaded*

*machines, kettle bells, medicine balls, resistance bands/tubing, or suspension straps; doing calisthenics with body weight resistance.*

- **Volume.** Combination of the number of sets and repetitions performed in a workout.

## HISTORY OF MILITARY PHYSICAL FITNESS

*“Nations have passed away and left no trace, and history gives the naked cause of it—one single simple reason in all cases; they fell because their people were not fit.”<sup>4</sup>*

—Rudyard Kipling

Throughout the course of human history, leaders have recognized that physical fitness has paralleled the rise and fall of empires. From individuals to societies, physical fitness is a key predictor of the success of nations. The Greeks (2,500–200 BCE) embraced physical perfection as an outward expression of health and fitness. The Romans (200 BCE–476 CE) required men to participate in running, marching, jumping, and throwing. In contrast, during the Middle Ages a relative return to the agrarian lifestyle ensued. Physical work in the field was associated with general gains in fitness on a societal level, whereas traditional knightly acts included shooting (bows), swimming, climbing, horsemanship, fighting (mounted and dismounted), and socializing. From then on, a cyclical history of physical fitness and military success began—an onset of war inspired increased physical fitness efforts, which lapsed after the war ended.

The role of physical fitness in the US military follows an annual course cycle, with tests in the spring and fall. Early colonial militias were typically selected based on their enthusiasm, strength, and reliability. In general, colonial Americans were a largely agrarian society with an active physical lifestyle and commensurate levels of fitness. However, by the early 20th century, the urbanization of American society had shifted work from agriculture to factories and offices, resulting in a population that had become significantly less active. In 1912, Woodrow Wilson recognized the value of physical fitness in military performance, and during his tenure as president, the US Army *Manual of Physical Training* was developed.<sup>5</sup> The principles of this first edition were to (a) develop general health and vigor; (b) promote muscular strength and endurance; (c) enhance self-reliance; and (d) improve intellect, activity, and precision.

In 1917, when the United States enacted the Selective Service Act, roughly one-third of all recruits were found to be unfit to fight. Therefore, governmental legislation was enacted to improve physical education within public schools in an effort to improve

“readiness” for the US military. During World War I, the United States undertook physical assessment of recruits using the standards of modern medicine for the first time. However, one-third of the men continued to be rejected for service due to being physically unfit throughout the war.<sup>6</sup>

As the United States prepared to enter World War II, fitness standards intended to enhance screening for military service were introduced. The standards were used to identify individuals who needed remedial fitness work. About half of the first 2 million service members conscripted through the Selective Service were deemed physically unfit. Over the course of the war, 30% percent of draftees were rejected, most for medical issues related to poor physical fitness. Performance requirements and standards were established both for the individual services and for many military operational specialties, including aviation programs (US Army Field Manual [FM] 21-20, *Basic Field Manual, Physical Training* [1941]; *US Marine Combat Conditioning* [1942]; *Physical Fitness Manual for the US Navy* [1943]).<sup>7-9</sup>

Attention to civilian fitness levels also increased over the course of the war. The National Committee on Physical Fitness was created in 1943, and the US “Victory Corps,” featuring a series of exercises specifically designed to promote strength, stamina, endurance, and physical skills, was incorporated into high-school curricula. The War Department pamphlet *Physical Conditioning* (PAM 21-9), published in 1944, defined total military fitness as a composite of:

1. Technical fitness, evidenced by tactical training and a knowledge and skill in the use of arms and equipment.
2. Mental and emotional fitness (more commonly known as morale), characterized by:
  - a. Habits of thinking and feeling which will permit alertness with an economy of energy and rapid relaxation when opportunity is afforded to do so;

- b. A sense of mission, or identification with a cause of great significance shared with others; and
  - c. A will to fight.
3. Physical fitness, evidenced by a body which can retain normal responses to stimuli in the face of fatigue and exhaustion, and continue to function effectively under the physical stresses placed upon it by the routine and emergency tasks of war.<sup>10</sup>

Colonel Leonard G. Rowntree, medical director of the Selective Service during World War II, defined combat-related fitness as the ability to combine power and efficiency with minimal recovery periods in activities that required strength, stamina, agility, endurance, emotional stability, leadership, and a refusal to lose.<sup>11</sup>

In 1946, War Department PAM 21-9<sup>10</sup> was revised and became Army FM 21-20.<sup>12</sup> It defined the principles of exercise training in terms of progression and overload, and also identified functional exercises to develop strength, muscular endurance, anaerobic and aerobic capacity, agility, and coordination (Exhibit 20-1), as well as attainment of “proficiency in certain military physical skills which are essential to personal safety and effective combat performance.”<sup>13</sup> The Army generally enacted these official fitness initiatives. Although the other services often followed suit, they tended to make duty-specific modifications and only rarely formulated written policies for the entire service.

The entry of the United States into the wars in Korea and Vietnam shifted the focus of military fitness requirements yet again. In 1958 the Army Physical Fitness Service opened at Fort Benning, Georgia, to give physical fitness the same level of importance as technical skill development. In 1962, the principles of balance, variety, and regularity were introduced into military physical training. A 1970 physical fitness symposium at Fort Benning added aerobic activity as a central component and recommended that trained fitness personnel implement physical training pro-

grams.<sup>14</sup> FM 21-20 was revised again in 1973 to define fitness as a “healthy body with the capacity for skillful, sustained performance, ability to recover quickly after exertion, a desire to complete the mission, and confidence to face any eventuality.”<sup>15</sup>

FM 21-20 was again revised again in the 1980s to introduce the three-activity physical fitness test: a 2-mile run (aerobic endurance), plus sit-ups and push-ups (muscular endurance).<sup>16</sup> In 1981, Department of Defense (DoD) Directive 1308.1 was published,<sup>17</sup> stipulating further that physical fitness training activities should enhance both combat readiness and unit cohesion, and that personnel trained in fitness methods must plan and supervise the programs according to uniform methods and standards for performance and weight control. As the United States shifted to an all-volunteer force after the end of the Vietnam War, civilian fitness experts began to take military metrics as their model. In 1998, an American College of Sports Medicine position statement used military readiness standards to establish exercise minimums for health and fitness in the civilian population.<sup>18</sup>

The eighth revision of FM 21-20 (1985) had shifted focus from combat readiness to health-related fitness, and troops began to focus on fitness test scores rather than combat performance.<sup>16</sup> However, once active military engagement increased in the early 1990s, Army Regulation 350-41, published in 1993, shifted the focus back to combat readiness, emphasizing nine elements of fitness: (1) cardiorespiratory endurance, (2) muscular strength and endurance, (3) anaerobic conditioning, (4) flexibility, (5) body composition, (6) competitive spirit, (7) self-discipline, (8) ability to cope with psychological stressors, and (9) healthy lifestyle choices.<sup>19</sup> In summary, although the components of military physical fitness have changed over time, battlefield conditions have always imposed strenuous demands even on physically fit, resilient combatants. As conditions of future engagements unfold, physical fitness will remain a significant factor in individual, unit, and force readiness.

## BENEFITS OF PHYSICAL FITNESS

The demands of modern warfare require physically fit combatants: they must be able to train consistently even when not actively engaged in warfighting; demonstrate reliable performance in missions; manage the stressors presented during conflict; and endure the longer-term consequences for mental and physical health.<sup>20</sup> Meeting these standards has important benefits beyond the immediate. The fit service member is less likely to miss days due to musculoskeletal injury or illness and will reap significant psychological ben-

efits.<sup>18</sup> Physically fit service members have been shown to have better mental health, more positive outlooks, greater happiness, and greater ability to withstand stressful environments.<sup>21,22</sup>

Evidence strongly suggests that both all-cause mortality and many chronic disease rates decrease as physical activity increases.<sup>23-26</sup> The psychological benefits of fitness and exercise in decreasing stress and modifying the symptoms of stress-related illnesses are also well established.<sup>27</sup> A Cochrane review

## EXHIBIT 20-1

## ARMY TRAINING PRINCIPLES DURING THE 1950s

- **Running.** Distance and sprint running on road and cross country.
- **Jumping.** Broad jumping and vertical jumping downward from a height.
- **Dodging.** Change of body direction rapidly while running.
- **Climbing and traversing.** Vertical climbing of rope, poles, walls, and cargo nets. Traversing horizontal objects such as ropes, pipes, and ladders.
- **Crawling.** High crawl and low crawl for speed and stealth.
- **Throwing.** Propelling objects such as grenades for distance and accuracy.
- **Vaulting.** Surmounting low objects such as fences and barriers by use of hand assists.
- **Carrying.** Carrying objects and employment of man carries.
- **Balancing.** Maintaining proper body balance on narrow walkways and at heights above normal.
- **Falling.** Contact with the ground from standing, running, and jumping postures.
- **Swimming** (in specialized situations). Employment of water survival techniques.

Data source: US Department of the Army. *Physical Training*. Washington, DC: DA; 1950. Field Manual 21-20.

of research on depression shows that exercise is moderately more effective than a control intervention for reducing symptoms of the disease.<sup>28</sup> There has also been strong evidence regarding the benefits of lowering anxiety levels via exercise.<sup>29,30</sup> Perhaps of most significance to healthy military individuals, attaining higher levels of physical fitness confers higher levels of well-being and decreases reactivity to psychosocial stressors.<sup>31,32</sup>

Recent research suggests that physical fitness has important consequences for resilience—a key characteristic of the effective combatant. Resilience reinforces higher levels of both mental and physical function in stressful situations, and supports more effective recovery after the initial stressors are removed. Several literature reviews have demonstrated that aerobic exercise has positive effects on self-efficacy, self-esteem, and mental toughness—physically fit individuals demonstrate higher levels of resilience than those who are unfit.<sup>33-35</sup>

Because higher levels of physical and mental resilience contribute to improved unit cohesion as well as higher levels of individual and unit confidence, these relationships have significance for military units as well as individuals. Unit fitness schedules should alternate endurance-activity days with strength- or mobility-training days to ensure a training frequency that enables units to improve and sustain individual aerobic capacity without increasing the risk of over-use injuries.

The service member who exhibits a high level of aerobic fitness can also perform activities at intensity levels lower than his or her maximum ability

for longer periods of time than those less fit. This type of fitness is especially beneficial during long tactical marches, loading and unloading trucks, preparing fighting positions, maneuvering at high altitudes (>15,000 ft), and land navigation over a prolonged time period. Thus, individuals with greater aerobic fitness can perform tasks at a higher intensity levels and are less likely to succumb to fatigue. They are also able to recover faster and to move more quickly to the next task at hand. Specific physiologic benefits of endurance/aerobic training are listed in Exhibit 20-2.

Strength and power are critical components for the functional fitness of service members. Most military occupational specialties require heavy physical lifting. Many service members repetitively lift heavy machine parts, weapons, or combat gear while performing their daily duties. The US Department of Labor rates over half of Army military occupational specialties as entailing “very heavy” lifting, which means that they require the capacity to lift 50 pounds frequently and 100 pounds occasionally (Technical Bulletin 592).<sup>36</sup> The demands these tasks impose on today’s soldiers warrant careful attention to both strength and power training to optimize both safety and performance in performing combat-specific tasks. Load-bearing tasks in particular can put significant physical stress on the individuals who perform them. Fortunately, resistance training has been shown to improve both physical-readiness testing and performance of load-bearing maneuvers.<sup>37</sup> Specific physiologic benefits of resistance training are listed in Exhibit 20-3.

## EXHIBIT 20-2

### BENEFITS OF ENDURANCE TRAINING

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- Increased stamina due to central and peripheral adaptations.
- Lower respiration (minute ventilation) at a given submaximal intensity.
- Lower heart oxygen cost for a given absolute submaximal intensity.
- Lower heart rate and blood pressure at a given submaximal intensity.
- Lower risk of injury.
- Increased blood supply (capillary density) in skeletal muscle.
- Increased maximum work capacity and power output.
- Increased capacity for prolonged work.
- Increased serum high-density lipoprotein cholesterol and decreased serum triglycerides.
- Reduced total body and intraabdominal fat.
- Reduced insulin needs; improved glucose tolerance.
- Heat acclimation.

Data sources: (1) Franklin B, ed. *ACSM's Guidelines for Exercise Testing and Prescription*. 6th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2000. (2) American College of Sports Medicine. *ACSM Fitness Book*. 3rd ed. Champaign, IL: Human Kinetics; 2003. (3) Myers J. Exercise and cardiovascular health. *Circulation*. 2003;107(1):e2–e5.

## EXHIBIT 20-3

### BENEFITS OF RESISTANCE TRAINING

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- Increased muscle strength.
- Increased size of muscle fibers.
- Increased speed with movement.
- Improved anaerobic capacity.
- Increased bone strength.
- Increased bone mass and mineral density.
- Increased size and strength of tendons, ligaments, and fascia.
- Increased work capacity and power output.
- Decreased muscle soreness from heavy work.

Data sources: (1) Baechle TR, Earle RW. *Essentials of Strength Training and Conditioning*. Champaign, IL: Human Kinetics; 2000. (2) Conroy BP, Kraemer WJ, Maresh CM, Dalsky GP. Adaptive responses of bone to physical activity. *Med Exerc Nutr Health*. 1992;1:64–74. (3) Hather BM, Tesch PA, Buchanan P, Dudley GA. Influence of eccentric actions on skeletal muscle adaptations to resistance training. *Acta Physiol Scand*. 1991;143(2):177–185. (4) Kraemer WJ, Mazzetti SA, Nindl BC, et al. Effect of resistance training on women's strength/power and occupational performances. *Med Sci Sports Exerc*. 2001;33(6):1011–1025. (5) Sale DG. Neural adaptation to resistance training. *Med Sci Sports Exerc*. 1988;20(5 Suppl):S135–S145. (6) Staron RS, Leonardi MJ, Karapondo DL, et al. Strength and skeletal muscle adaptations in heavy-resistance trained women after detraining and retraining. *J Appl Physiol*. 1991;70(2):631–640. (7) Wilmore JH, Costill DL. *Physiology of Sport and Exercise*. Champaign, IL: Human Kinetics; 1994.

## KEY CONCEPTS

Below are a variety of key concepts relating to overall physical fitness. This list is not complete but provides an overview of key ideas.

### Components of Physical Fitness

Components of physical fitness include both health- and skill-related attributes. The health-related components include:

- body composition
- cardiovascular fitness
- muscular endurance
- muscular strength
- flexibility

In contrast, the skill-related components include:

- agility
- power
- balance
- reaction time
- coordination
- speed

Each of these components is important for the physical fitness of service members and mission performance. Some of the components have been defined above and others require no real definition. For example, although flexibility has been defined above, it is important to note that exercises to maintain flexibility should be incorporated into any standard program to help ensure all muscles maintain their proper length and movements are performed with proper mechanics. This is key to preventing injury. Incorporating flexibility training can also improve muscle imbalances by maintaining the appropriate length-tension relationship.

The US armed forces use body composition (a measure of a person's body fat) as one component to determine a service member's physical fitness. If a service member is "overfat," it can adversely affect his or her career, including the ability to be promoted and even stay in the military. Each service branch has its own standards within DoD Instruction 1308.1.<sup>17</sup> The Human Performance Resource Center (see **Resources**, below) provides a chart that compares one service's standards to another. Because the standards change, it is important to keep

up with one's own service, but the chart is useful for service members and healthcare providers.<sup>38</sup>

### *Power*

Power is a very important concept for military readiness and performance. Simply stated, power is the ability to perform muscular work per unit of time (power = work/time). If strength is defined as the ability to exert force, power is the ability to exert force quickly: being able to move a heavy weight quickly, being able to move quickly when carrying a heavy load, or being able to quickly carry an injured service member from one place to another. Power is related to strength, aerobic capacity, and speed.

### *Mobility*

Mobility is the ability to perform functional movement patterns with no restrictions in range of motion: it involves multiple elements that influence performance. Warm-up mobility exercises (eg, posterior hip mobilization, shoulder extension, external rotation, anterior hip mobilization, ankle dorsiflexion, deep squats, couch stretch) allow the service member to prepare for performing jumping, climbing, and sprinting activities and maneuvering around obstacles more efficiently. These exercises also limit the risk of injury as they reinforce proper technique. Strength in the extremities directly relates to the ability to perform mobility tasks, which means that mobility overlaps with the strength component of fitness. Optimized mobility training can increase a service member's capacity for strength and endurance and minimize the possibility for injury.<sup>39</sup>

### **Plyometrics**

Plyometrics are exercises performed so that muscles exert maximum force in short intervals of time to achieve increasing power (speed-strength). Designed to improve lower-body mobility and power, these exercises include jumping up onto a higher surface and back down. Data suggest that plyometric training benefits service members in terms of increased maximal strength, power output, coordination, and overall performance. Combining plyometrics with lower-body strength training appears to greatly improve strength performance.<sup>40,41</sup> Thus, current evidence supports incorporating several types of plyometrics with other types of training into fitness programs.

### Physical Readiness/Fitness Tests

All of the services require some type of physical fitness assessment. Table 20-1 presents each of the tests service members must pass (unless they are on a physical profile). Currently they all include a run and sit-ups, plus either push-ups or pull-ups, and all of the services have body composition standards. The Marine Corps was the first service to develop a functional test designed to evaluate combat fitness. Thus, Marines perform two semi-annual fitness tests, a physical readiness test and a combat fitness test. The other services are developing functional tests to assess operational/combat fitness, and in 2017, the Army rolled out the Occupational Physical Assessment Test (OPAT) for all recruits and soldiers. This requirement resulted from the Army’s effort to integrate women into its previously closed combat specialties. The OPAT consists of four events: a medicine-

ball throw, standing long jump, deadlift, and interval run. It will eventually be used to determine which jobs recruits are qualified to perform.

### Overtraining

Overtraining is the end result of excessive training. The most common signs are a decline in physical performance with continued training, pronounced fatigue, and changes in mood. The condition involves a complex interplay among the neuroendocrine, immune, and central nervous systems, as well as psychological and social stressors in response to prolonged strenuous training without sufficient recovery.<sup>42</sup> Military training can be intense, and overtraining can occur particularly in the absence of adequate sleep and nutrition. The mechanisms of overtraining have not been adequately elucidated.

## SPECIAL POPULATIONS

Within the military, physical fitness standards may vary depending on the population. Brief discussions about pregnancy and postpartum physical fitness; aging; and the wounded, ill, and injured are provided.

### Pregnancy and Postpartum Physical Fitness

Pregnant service members constitute an important subgroup of the military population, and fitness requirements must be tailored to this condition. The American College of Obstetricians and Gynecologists recommends that pregnant women perform moderate-intensity exercise for a total of 150 minutes, spread over the course of a week.<sup>43</sup> Despite these recommendations, many service members do not maintain optimal physical training during pregnancy.<sup>44</sup> It

is recognized that some women may not be able to maintain fitness due to a variety of complications, but in general, physical fitness can and should be maintained during pregnancy across the services. Service members who participate in a pregnancy wellness program (see the American College of Sports Medicine, Army Pregnancy Postpartum Physical Training, and the Human Performance Resource Center websites, under **Resources**, below) have been shown to have shorter labor durations and a lower incidence of premature delivery.<sup>45</sup> Likewise, physical fitness in the postpartum period remains a challenge for a large percentage of service members. Service-led physical fitness programs for postpartum service members have been shown to improve participants’ overall physical capacity.<sup>46</sup>

**TABLE 20-1**  
**PHYSICAL READINESS TESTS, BY SERVICE**

Service	Task 1	Task 2	Task 3
Air Force	Sit-ups (1 min)	Push-ups (1 min)	1.5-Mile run
Army	Sit-ups (2 min)	Push-ups (2 min)	2.0-Mile run
Marines*	Crunches (2 min)	Pull-ups (males); flex-arm hang (females)	3.0-Mile run
Marines†	880-Yard run	Ammo lifts—30 lb (2 min)	Maneuver under fire (300 m)
Navy	Curl-ups (2 min)	Push-ups (2 min)	1.5-Mile run

\*Marine Corps Performance Fitness Test

†Marine Corps Combat Fitness Test

## Aging

Service members 40 years and older typically serve as senior military leaders. Leaders must set good examples and serve as positive role models for those under their command; this includes maintaining and demonstrating a high level of physical fitness. Even if their normal duties are stressful (but nonphysical), these service members must regularly partake in physical exercise so their fitness is maintained and does not degrade with age.

Service members who are fit at age 40 and continue to exercise show smaller decreases in many fitness-related physiological functions compared to those who exercise less often.<sup>47</sup> Those who have been exercising regularly can continue to exercise at the same level. Those aged 40 and over who have not been exercising regularly should start at a lower level of intensity and progress slowly. Long periods of inactivity cannot be corrected in a few weeks or even months.

## Wounded, Injured, and Ill Service Members

DoD Directive 1308.1 requires that “those personnel identified with medically limiting defects shall be placed in a physical fitness program consistent with their limitations as advised by medical authorities.”<sup>17</sup> AR 350-15 states, “For individuals with limiting profiles, commanders will develop physical fitness programs in cooperation with health care person-

nel.”<sup>48</sup> Medical treatment and rehabilitation should be aimed at restoring these service members to a suitable level of physical fitness. Such treatment should use appropriate, progressive physical activities with medical or unit supervision (see the American College of Sports Medicine, Building the Soldier Athlete—Reconditioning [Profile] Physical Training Supplement, the Human Performance Resource Center, National Strength and Conditioning Association, and US Army Physical Readiness Training Information websites, under **Resources**, below). The activity levels of service members usually decrease while they are recovering from sickness or injury. With medical supervision, proper diet, and the right physical training programs, service members should be able to overcome their physical profiles more quickly and return to their normal routines and fitness levels.

All profiled service members should complete as much of the unit’s regular fitness program as possible. The Office of the Surgeon General of the Army developed DA Form 3349 to facilitate the exchange of information between healthcare personnel and their units.<sup>49</sup> On this form, healthcare personnel list the service member’s physical limitations along with activities the individual can perform to maintain his or her fitness level. Based on this information, the unit should direct profiled service members to participate in appropriate activities to replace those they cannot participate in.

## PHYSICAL FITNESS AND THE MILITARY MEDICAL OFFICER

### Role of the Military Medical Officer

Military medical officers (MMOs) serve critical roles in supporting achievement and maintenance of physical fitness and readiness considerations at the unit level. They are responsible for being a role model, but must first build relationships with their unit. The MMO should support human performance optimization and provide the highest level of preventive healthcare. The MMO must be able to effectively communicate with and translate medical and scientific knowledge into actionable plans that support ongoing physical training activities and military operations. The MMO should be familiar with concepts related to physical fitness and competent in key topics such as functional movement, strength and resistance training, overtraining, and exercise prescription. Additionally, knowledge about service-specific and DoD regulations and guidance regarding body composition and physical fitness are critical. Lastly, the MMO must identify physical fitness subject matter experts (SMEs) they

can contact to obtain additional reliable information when necessary.

### Guidance to the Commanding Officer

The MMO serves as the primary consultant to the commander regarding the overall health status of the unit. As such, the MMO is responsible for:

- Monitoring physical fitness levels and advising the unit commander on profiling those who are ill, injured, or wounded. The MMO must also ensure that standard physical fitness programs are consistent with their service’s requirements and understand both the commander’s intent and the mission goals. This information will allow the MMO to correctly identify the unit’s physical training and fitness needs.
- Monitoring musculoskeletal injuries and physical profiling of service members. This task requires a full understanding of the

physical requirements of service members' jobs, the physical fitness guidelines for the service, and the current health status of each service member. Physical limitations should protect service members from further injury while encouraging alternative activities that sustain their overall fitness level.

- Working closely with physical fitness SMEs to review the training program intended to develop individual service members at the high-

est level of fitness for their specific specialty.

- Ensuring the physical training program is safe and limits the risk of injuries.
- Keeping the commander updated about the physical readiness of individual service members and reviewing training plans for those with special fitness considerations such as pregnancy, illness, or injury. These tailored plans should draw on advice from fitness SMEs.

## RESOURCES

- American College of Sports Medicine: <http://acsm.org/>
- Building the Soldier Athlete—Reconditioning (Profile) Physical Training Supplement: [http://army-medicine.mil/Documents/R2D-Building\\_the\\_Soldier\\_Athlete\\_Reconditioning\\_profile\\_Supplement\\_-\\_7\\_Oct\\_09.pdf](http://army-medicine.mil/Documents/R2D-Building_the_Soldier_Athlete_Reconditioning_profile_Supplement_-_7_Oct_09.pdf)
- Air Force Fitness Program: <http://www.afpc.af.mil/affitnessprogram/>
- Army Comprehensive Soldier and Family Fitness: <http://csf2.army.mil/>
- ARMYFIT—Comprehensive Soldier and Family Fitness: <https://armyfit.army.mil/>
- Army Pregnancy Postpartum Physical Training: <https://phc.amedd.army.mil/topics/healthyliving/al/Pages/ArmyPregnancyPostpartumPhysicalTrainingProgram.aspx>
- Commander, Navy Installations Command—Fitness, Sports and Deployed Forces Support: <http://www.navyfitness.org/fitness/>
- Human Performance Resource Center: <http://hprc-online.org/>
- National Strength and Conditioning Association: <https://www.nsc.com/>
- US Army Public Health Center—Army Physical Fitness: <https://phc.amedd.army.mil/TOPICS/HEALTHYLIVING/AL/Pages/ArmyPhysicalFitness.aspx>
- US Army Physical Readiness Training Information: <http://www.armyprt.com/>
- US Coast Guard Office of Work-Life Programs—Physical Fitness Program: [http://www.uscg.mil/worklife/physical\\_fitness\\_program.asp](http://www.uscg.mil/worklife/physical_fitness_program.asp)
- US Marine Corps Physical Fitness Program: <http://www.fitness.marines.mil/>

## SUMMARY

Accurate assessment of strengths and vulnerabilities in the quest for optimal fitness is essential in guiding both individuals and units to peak military performance. Understanding the physiologic construct of fitness and how the factors of military fitness requirements may change

can help an MMO make better decisions and recommendations to the unit commander. Appreciation of the interrelatedness of the components of physical fitness can help the MMO tailor better individual fitness plans and ensure optimal fitness for every member of the unit.

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