4 Overview of Physical Fitness

In this chapter you will learn:

- The definition of physical fitness.
- The benefits of being physically fit and its relation to military readiness.
- The FITT Principle.
- The Physical Fitness Pyramid.
- Fuel used during exercise.
- Exercise Sequence.
- Training and Detraining.

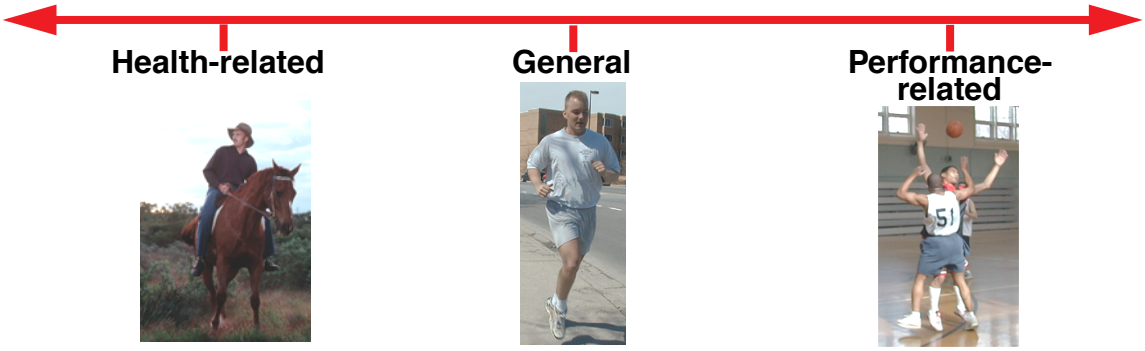
In the military, physical fitness is emphasized because of its role in military readiness and force health protection. Many jobs in the Navy require personnel to handle heavy equipment, to adapt quickly to harsh environments, and to work in limited quarters. Training for these situations ensures that you are physically able to perform these tasks repeatedly, without fail, whenever the need arises. In short, this is the rationale for optimizing your physical fitness levels and for performing PRT tests every six months! (See OPNAV6110.1E at http://www.bupers.navy.mil/services under "New Navy PRT Program" for the PRT standards).

"Fitness, which has been defined as the matching of an individual to his physical and social environment, has two basic goals: health and performance [which lie on a continuum]. Physical fitness requirements in the military consist of a basic level of overall fitness required for health of all individuals and a higher level of fitness that is required for the performance of occupational activities...In addition to this, the military must address the need for ongoing, job-specific performance training."
IOM (1998) Physical Fitness Policies and Programs, in Assessing Readiness in Military Women, p. 64.

What is Physical Fitness?

What does it mean to be physically fit? The American College of Sports Medicine (ACSM) has defined physical fitness as a set of characteristics (i.e., the work capacity of your heart and lungs, the strength and endurance of your muscles, and the flexibility of your joints) that relate to your ability to perform physical activities. Regular physical activity leads to improved physical fitness and many other physiologic, cosmetic, and psychological benefits. Depending on personal goals and job requirements the level of physical fitness to attain can range from basic, health-related to more specific, performance-related fitness (Figure 4-1).

Figure 4-1. The Fitness Continuum



FITT Principle

There are four basic components in all physical fitness programs. These are frequency of exercise, intensity of the exercise, time spent exercising, and the type of activity. These are outlined in the Physical Activity Pyramid in Figure 4-2 and are called the **FITT Principle** guidelines.

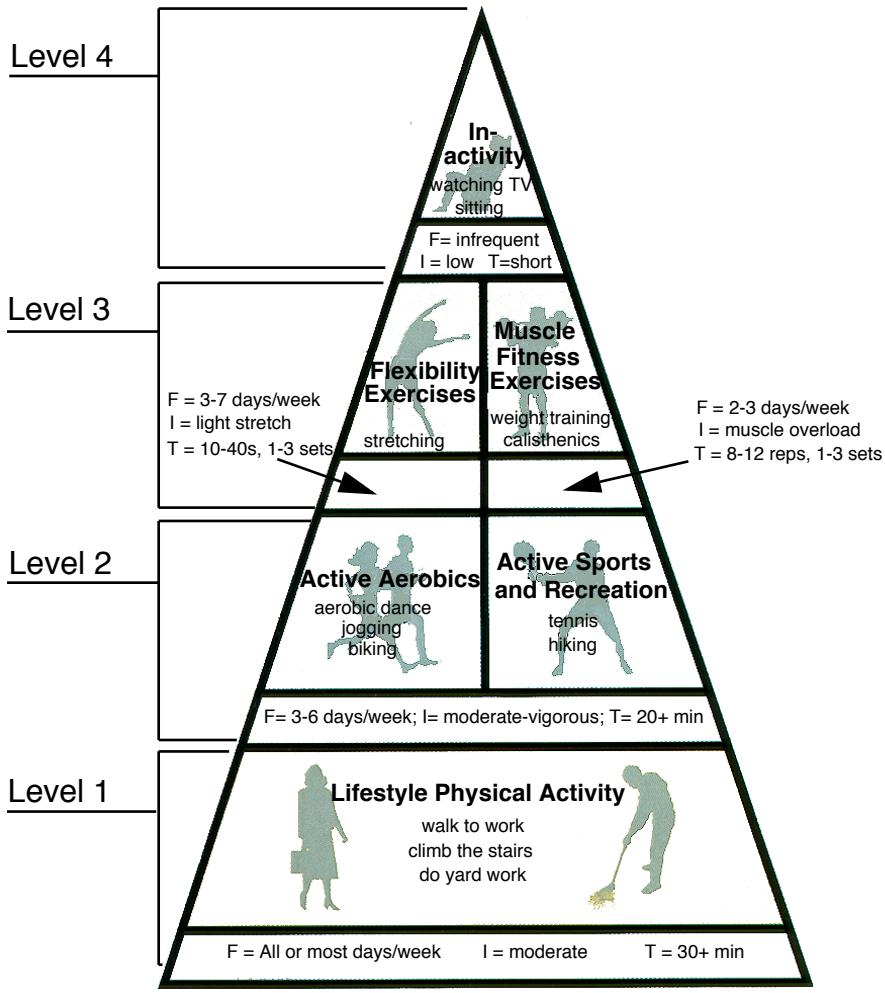
FITT = Frequency, Intensity, Time & Type

The Physical Activity Pyramid

Just as the nutrition guidelines are outlined in the Food Guide Pyramid (Chapter 3), the guidelines for physical activity are diagrammed in the

Physical Activity Pyramid (Figure 4-2). This pyramid was designed to help people live an active lifestyle, reap the fitness and performance benefits of routine exercise, reduce the health risks associated with inactivity, and reduce the injury risks associated with too much activity.

Figure 4-2. The Physical Activity Pyramid



F = frequency; I = intensity; T = time; exercise Type is in bold

Adapted from CB Corbin and RP Pangrazi. Physical Activity Pyramid Rebuffs Peak Experience. *ACSM's Health and Fitness Journal* 1998; 2(1): pages 12-17.

The four levels are arranged according to their FITT principle recommendations. Activities at the base of the pyramid should be performed more frequently than the activities found at the top of the pyramid. Level 1 activities include household chores, walking to work, and walking up and down stairs. Level 2 activities include aerobic exercises and participation in sports and recreational activities. Level 3 consists of strength and flexibility exercises, while Level 4 includes sedentary activities, such as watching TV. Do Level 1-3 activities each day to get the most health benefits.

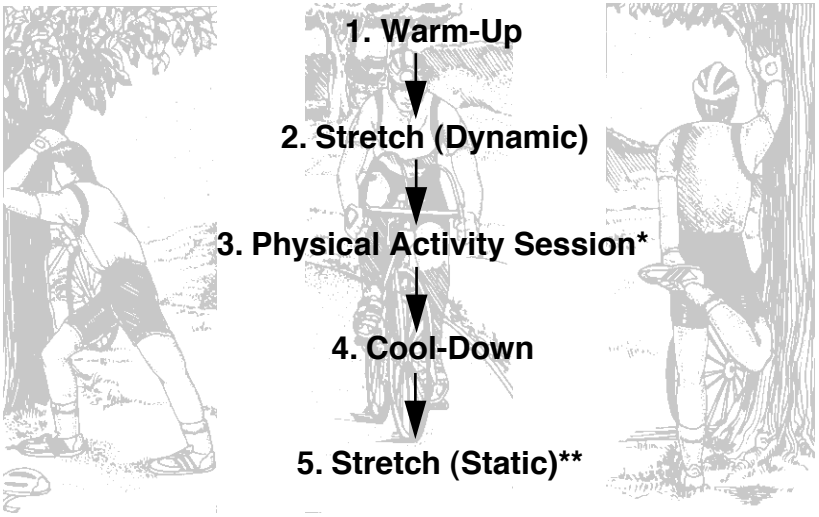
Fuel Used During Exercise

Before discussing the various exercise guidelines in the following chapters, here is an overview of how your body makes fuel for exercise. Your body uses the CHO, fats, and proteins you eat to make a chemical called **adenosine triphosphate (ATP)**. You need ATP to contract your muscles during exercise. ATP can be made two ways. The first makes ATP without using oxygen and is called the **anaerobic energy system.** The second requires oxygen to make ATP and is called the **aerobic energy system**. Both of these systems are required during most activities but, depending on the duration and intensity of the activity, there is a greater reliance on one system over the other. Exercises lasting less than 5 minutes rely most on the anaerobic energy system, while exercises lasting more than 5 minutes rely most on the aerobic energy system.

Exercise Sequence

An exercise sequence to follow to improve exercise performance and reduce the risk of injury is outlined in Figure 4-3. Note that it includes warming-up, stretching, and cooling-down.

Figure 4-3. Recommended Exercise Sequence



*Refer to the exercises found in Levels 2 and 3 of the Physical Activity Pyramid.
**For more information on stretching see Chapter 9.

- A **warm-up** gradually increases muscle temperature, metabolism, and blood flow to prepare you for exercise and lengthen short, tight muscles. Warm-up for at least 5 minutes before exercise.

- A **cool-down** is important because it may help reduce muscle soreness after your workout. Cool-down for at least 5 minutes by exercising at a light pace using the same muscles just exercised.
- **Rest** is an exceedingly important factor in recovery from strenuous workouts. Hard workout days should be followed by easy workout days or rest to give your body time to fully recover.

Training and Detraining

Training and detraining are responsible for gains and losses, respectively, in fitness levels. Training according to the FITT Principle guidelines will lead to optimal fitness benefits. On the other hand, decreases in fitness due to detraining occur at twice the rate of training gains when physical activity stops completely (Table 4-1).

Table 4-1. Training vs. Detraining

Training	Fitness Component	Detraining
↑	Heart and lung function	↓
↓	Resting heart rates	↑
↑	Muscle strength and endurance	↓
↑	Resting metabolism	↓
↑	Muscle fuel (glycogen) stores	↓
↑	Ability to sweat and dissipate body heat	↓

Detraining can be minimized by maintaining your usual exercise intensity, even if the frequency and duration of workouts is decreased. This concept is important for you to understand, as you may have limited time and fitness equipment available while deployed for extended periods. Ironically, it is in these situations that you depend most on your physical fitness to perform your duties. Therefore, learn the basic training principles and how to work around equipment, space, and time limitations (see Chapter 10).