

of the foot, and it is one of the rare elastic ligaments in the body. It is designed to elongate and shorten during locomotion. Another important structure in the foot is the plantar fascia, which lies over the small muscles on the bottom of the foot. **Fascia**, like ligament, is made of tough connective tissue, and it adds additional stability to the area.

Some ligaments provide a great deal of support to the joint, such as the iliofemoral (Y-) ligament at the hip, and other ligaments are not as effective in that role. These joints rely more on their muscles for support and integrity. The next section discusses the role of muscles in stabilization and how they produce movement.

## Muscles

Muscular tissue makes up 35 to 40 percent of body weight (see figure 2.4). The body has three muscle types, but in the context of dance, this text focuses on skeletal muscle—the muscles that move your joints.

The muscles that are most obvious to the observer are on the surface, such as the biceps, pectorals, quadriceps, and gluteals. These visible muscles are the voluntary skeletal muscles; their movements are controlled consciously by the planning areas in the brain. Most skeletal muscles are voluntary, but some, such as those used for swallowing and breathing, are involuntary (controlled without conscious thought). While you can actively and consciously affect these involuntary movements, you do not do so under normal conditions. As with the bones, only the most important muscles for dance function and wellness are described.

## Planes of Movement and Movement Terms

To begin the study of muscles, you need to understand the planes of movement and the movement terminology. For an in-depth description of both, see figure 2.5 and table 2.1.

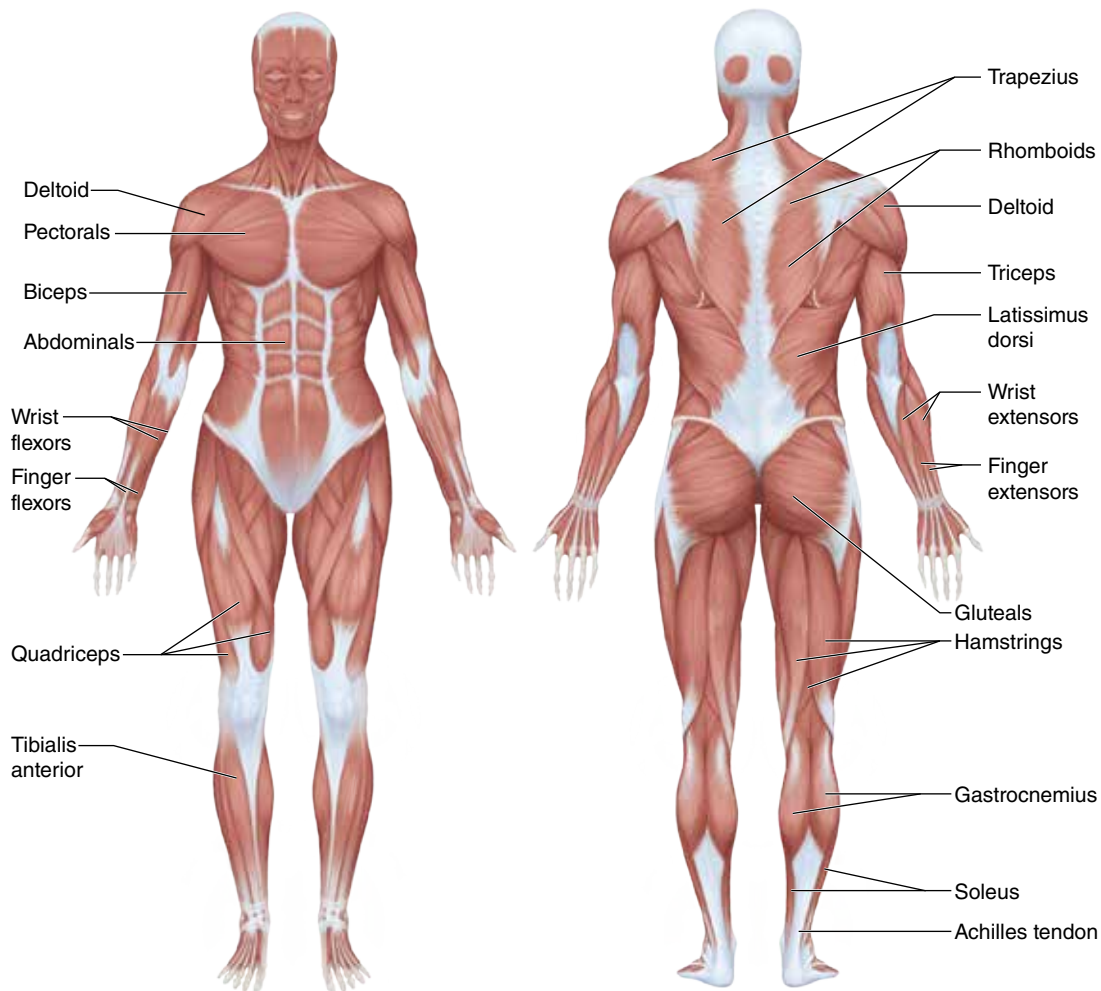


Figure 2.4 Muscular system.

Planes of movement are as follows (see figure 2.5):

The **sagittal plane** is the vertical plane that divides the body into right and left sides; it is sometimes called the *wheel plane*.

The **frontal (coronal) plane** is the vertical plane that divides the body into front and back portions; it is sometimes called the *door plane*.

The **transverse plane** is the horizontal plane that divides the body into upper and lower portions; it is sometimes called the *table plane*.

All of the movements in the joints of the body can be described in terms of the muscles that produce these movements. Sometimes muscles act as the prime movers; other times they are only assisting. However, this text does not go to that level of detail.

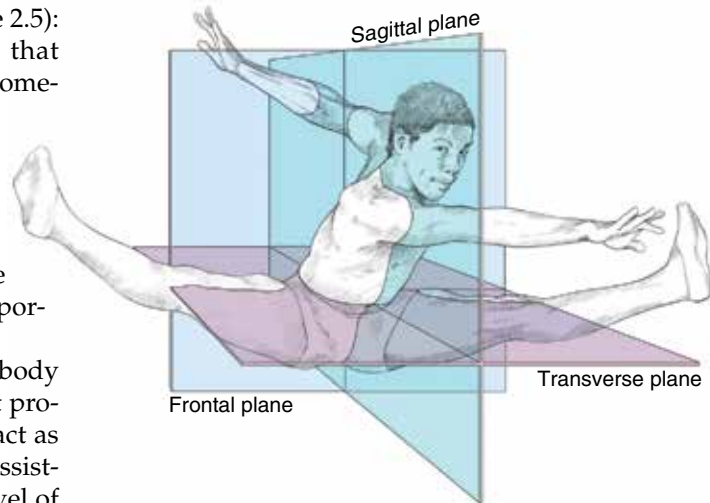


Figure 2.5 Planes of the body.

Table 2.1 **Movement Terms**

Movement	Definition	Dance example
Flexion	The decrease in the angle of two articulating bones, in the sagittal plane	From standing position, lifting one leg to a parallel passé involves flexion of both the hip and the knee joints. Curving forward is flexion of the spine.
Extension	The increase in the angle of two articulating bones, in the sagittal plane, the return to neutral from the flexed position	Bringing the leg from parallel passé back to standing position is extension of the hip and the knee.
Hyperextension	Continuing of extension beyond anatomical neutral	Arabesque involves hyperextension of the hip and the low back, which arches to achieve the full range of motion.
Abduction	The movement of a bone in the frontal plane away from the midline of the body	Lifting the arms out to second position, or moving the leg directly to the side away from the body are examples of abduction.
Adduction	The movement of a bone in the frontal plane toward the midline of the body	Lowering the arms from second position to straight down, or moving the leg from side to neutral standing position are examples of adduction.
Outward rotation	The movement of a bone around its own axis, away from the midline of the body; also called lateral or external rotation	Standing in classical first is a position of outward rotation at the hip joint. In the arms, Graham second position with the palms facing up involves outward rotation at the shoulder joint.
Inward rotation	The movement of a bone around its own axis, toward the midline of the body; also called medial or internal rotation	Standing with the toes pointing toward each other is a position of inward rotation at the hip joint. In the arms, classical second position involves inward rotation at the shoulder joint.
Pronation	A movement term used for both the forearm (radioulnar joint) and for the foot. In the forearm, the palm is turned to face backward. In the foot, the outside edge moves toward the lateral ankle bone.	When standing, the foot rolls inward, placing most of the weight onto the inside of the foot and lowering the arch. In gesture, when the foot is "winged," it is pronated and everted (moving the sole of the foot away from the midline).

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