17.1C: Layers of the Heart Walls

The heart wall is comprised of three layers: the outer epicardium, the middle myocardium, and the inner endocardium.

Learning Objectives

• Distinguish between the epicardium, myocardium, and endocardium layers of the heart wall

Key Points

• The epicardium is a thin layer of connective tissue and fat serving as an additional layer of protection for the heart. It is considered a continuation of the serous pericardium.
• The myocardium is the muscle tissue of the heart, composed of cardiac muscle cells called cardiomyocytes that receive nervous stimulation from the sinoatrial (SA) and atrioventricular (AV) nodes via the Purkinje fibers.
• Cardiomyocytes are shorter than skeletal myocytes, and contain fewer nuclei. Cardiac muscle is striated.
• The endocardium is composed of endothelial cells that provide a smooth, non-adherent surface for blood collection and pumping and may help regulate contractility.
• An infection or inflammation of the endocardium is called infective endocarditis.

Key Terms

• **Purkinje fibers**: A bundle of nerve fibers located under the endocardium, which supply nervous impulses to the myocardium’s cardiac muscle tissues.
• **endocardium**: A thin serous membrane that lines the interior of the heart and valves.
• **cardiomyocyte**: A cardiac muscle cell (or myocyte) in the heart, which makes up the cardiac muscle tissue.
The heart wall is comprised of three layers, the epicardium (outer), myocardium (middle), and endocardium (inner). These tissue layers are highly specialized and perform different functions. During ventricular contraction, the wave of depolarization from the SA and AV nodes moves from within the endocardial wall through the myocardial layer to the epicardial surface of the heart.

### Epicardium

![Epicardium Image](https://med.libretexts.org/Bookshelves/Anatomy_and_Physiology/Book%3A_Anatomy_and_Physiology_(Boundless)/17%3A_...)

**The Heart Wall:** The wall of the heart is composed of three layers, the thin outer epicardium, the thick middle myocardium, and the very thin inner endocardium. The dark area on the heart wall is scarring from a previous myocardial infarction (heart attack).

The outer layer of the heart wall is the epicardium. The epicardium refers to both the outer layer of the heart and the inner layer of the serous visceral pericardium, which is attached to the outer wall of the heart. The epicardium is a thin layer of elastic connective tissue and fat that serves as an additional layer of protection from trauma or friction for the heart under the pericardium. This layer contains the coronary blood vessels, which oxygenate the tissues of the heart with a blood supply from the coronary arteries.

### Myocardium

The middle layer of the heart wall is the myocardium—the muscle tissue of the heart and the thickest layer of the heart wall. It is composed of cardiac muscle cells, or cardiomyocytes. Cardiomyocytes are specialized muscle cells that contract like other muscle cells, but differ in shape. Compared to skeletal muscle cells, cardiac muscle cells are shorter and have fewer nuclei. Cardiac muscle tissue is also striated (forming protein bands) and contains tubules and gap junctions, unlike skeletal muscle tissue. Due to their continuous rhythmic contraction, cardiomyocytes require a dedicated blood supply to deliver oxygen and nutrients and remove waste products such as carbon dioxide from the cardiac muscle tissue. This blood supply is provided by the coronary arteries.
Endocardium

The inner layer of the heart wall is the endocardium, composed of endothelial cells that provide a smooth, elastic, non-adherent surface for blood collection and pumping. The endocardium may regulate metabolic waste removal from heart tissues and act as a barrier between the blood and the heart muscle, thus controlling the composition of the extracellular fluid in which the cardiomyocytes bathe. This in turn can affect the contractility of the heart.

This tissue also covers the valves of the heart and is histologically continuous with the vascular endothelium of the major blood vessels entering and leaving the heart. The Purkinje fibers are located just beneath the endocardium and send nervous impulses from the SA and AV nodes outside of the heart into the myocardial tissues.

The endocardium can become infected, a serious inflammatory condition called infective endocarditis. This and other potential problems with the endocardium may damage the valves and impair the normal flow of blood through the heart.