

# IJULTRASIGHT

---

## READING ASSIGNMENT FOR USERS



# TABLE OF CONTENTS

## Chapter One **BASIC HEART ANATOMY**

- Shape and Location
- The Heart Chambers
- The Great Vessels
- Heart Valves
- Papillary Muscles

## Chapter Two **BASIC ULTRASOUND**

- The Ultrasound Probe
- Image Interpretation
- The Grey Gradient
- Ultrasound Features
- Room Set Up
- Patient Position
- Probe Maneuvers

## Chapter Three **INTRO TO CARDIAC U/S**

- Ultrasound Acoustic Windows
- The 4 Basic Ultrasound Views
  - PLAX
  - PSAX
  - Apical 4c
  - Subcostal 4c
- RnR Protocol



Chapter One

---

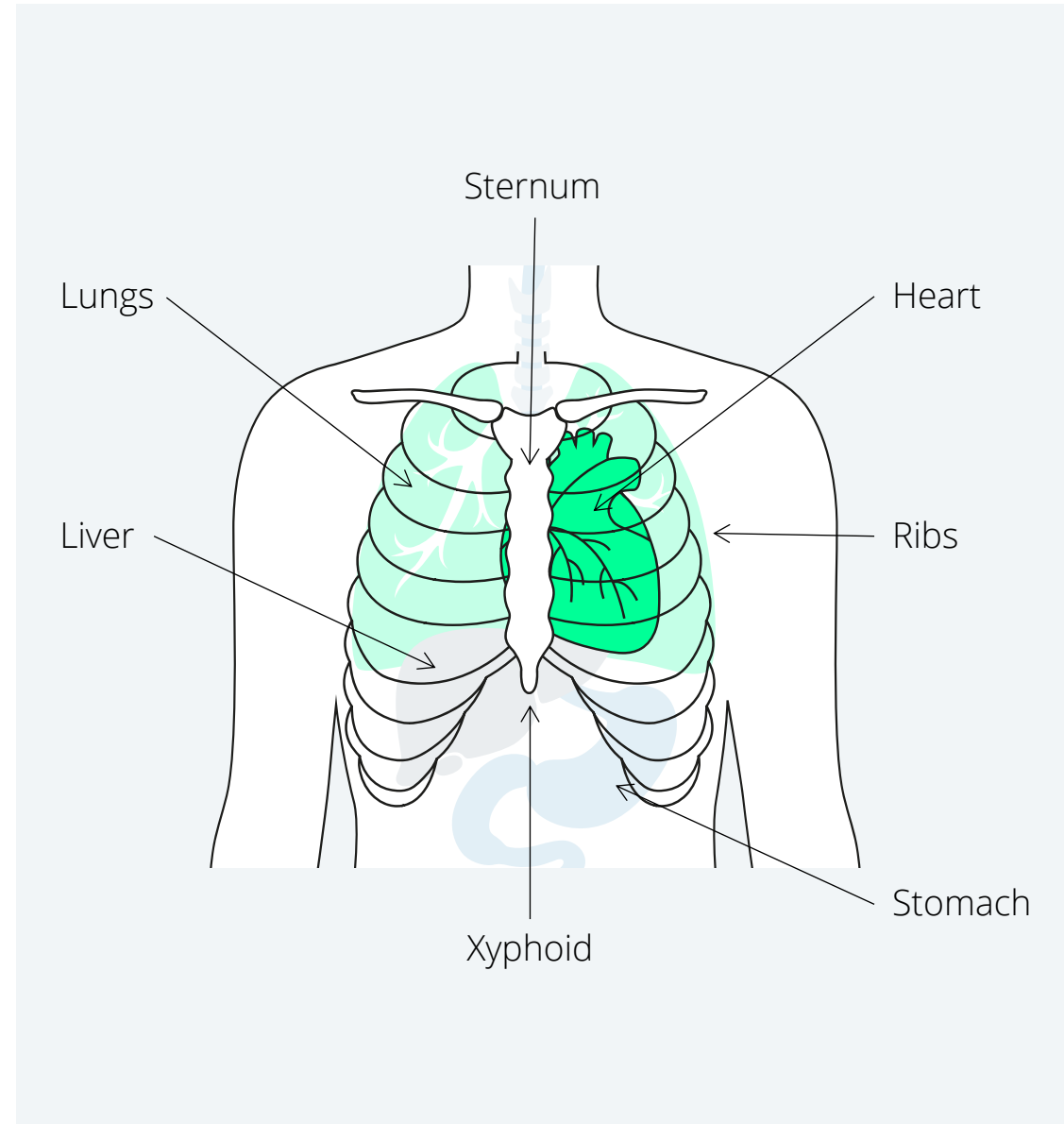
# BASIC HEART ANATOMY

# LOCATION & SHAPE

The human heart is located between the lungs in the middle of the chest, behind and slightly to the left of the Sternum. A double-layered membrane called the pericardium surrounds the heart like a sac. The outer layer of the pericardium surrounds the roots of the heart's major blood vessels and is attached by ligaments to the spinal column and diaphragm. The heart is protected by the rib cage.

The human heart has a pyramidal shape. It lies at a slight downward angle from right to left, just posterior to the sternum. It is somewhat centered within the rib cage but biased to the left side.

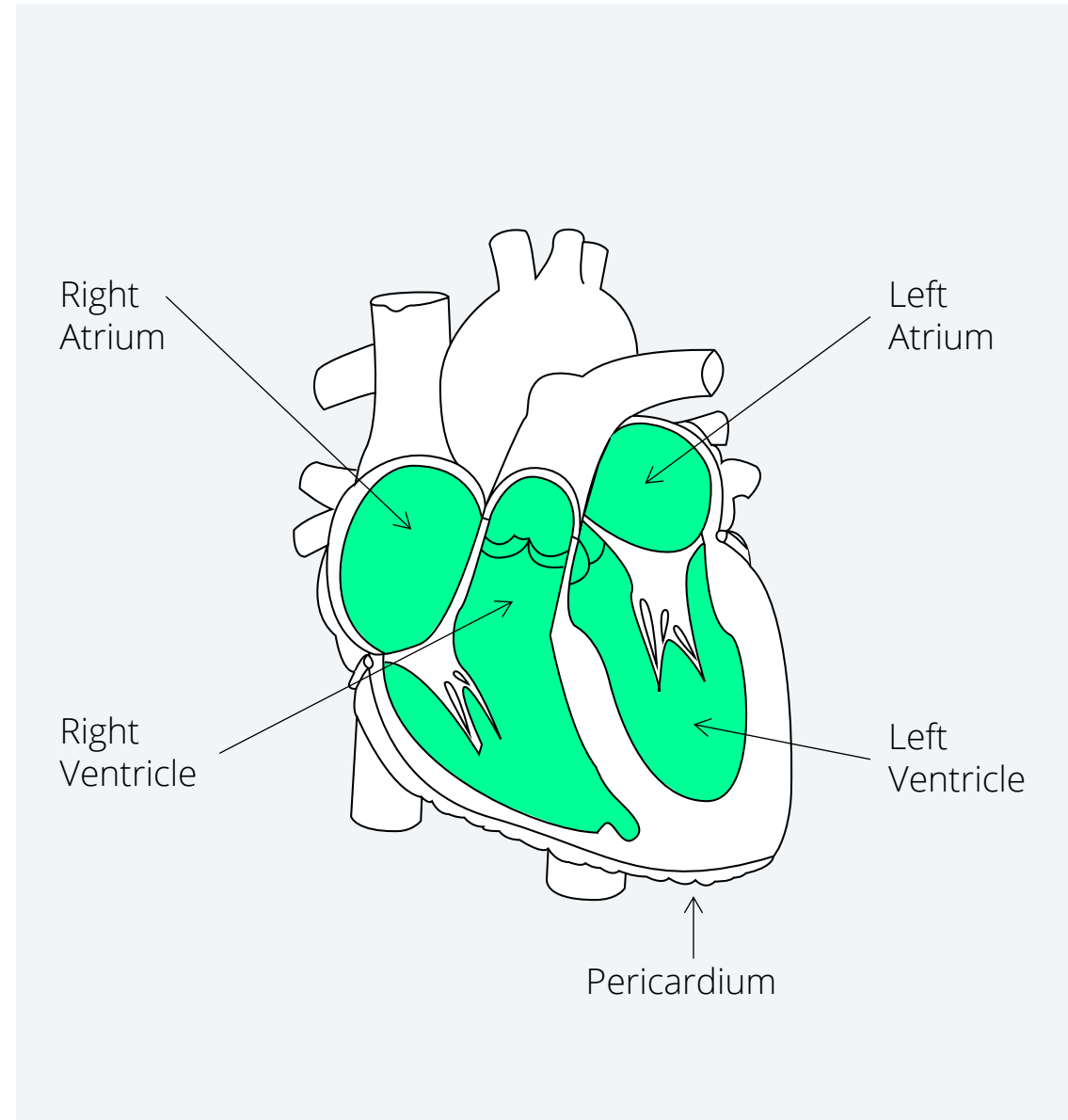
The position of the body influences the angle of the heart's position, as well as the space between the ribs, which will in turn influence image quality (or lack of).



# THE HEART CHAMBERS

The human heart has four chambers. The upper chambers, the right and left atria, receive incoming blood. The lower chambers, the more muscular right and left ventricles, pump blood out of the heart. The heart valves, which keep blood flowing in the right direction, are gates at the chamber openings.

The left ventricle is responsible for pumping oxygenated blood to tissues all over the body and has the thickest wall. By contrast, the right ventricle solely pumps blood to the lungs.

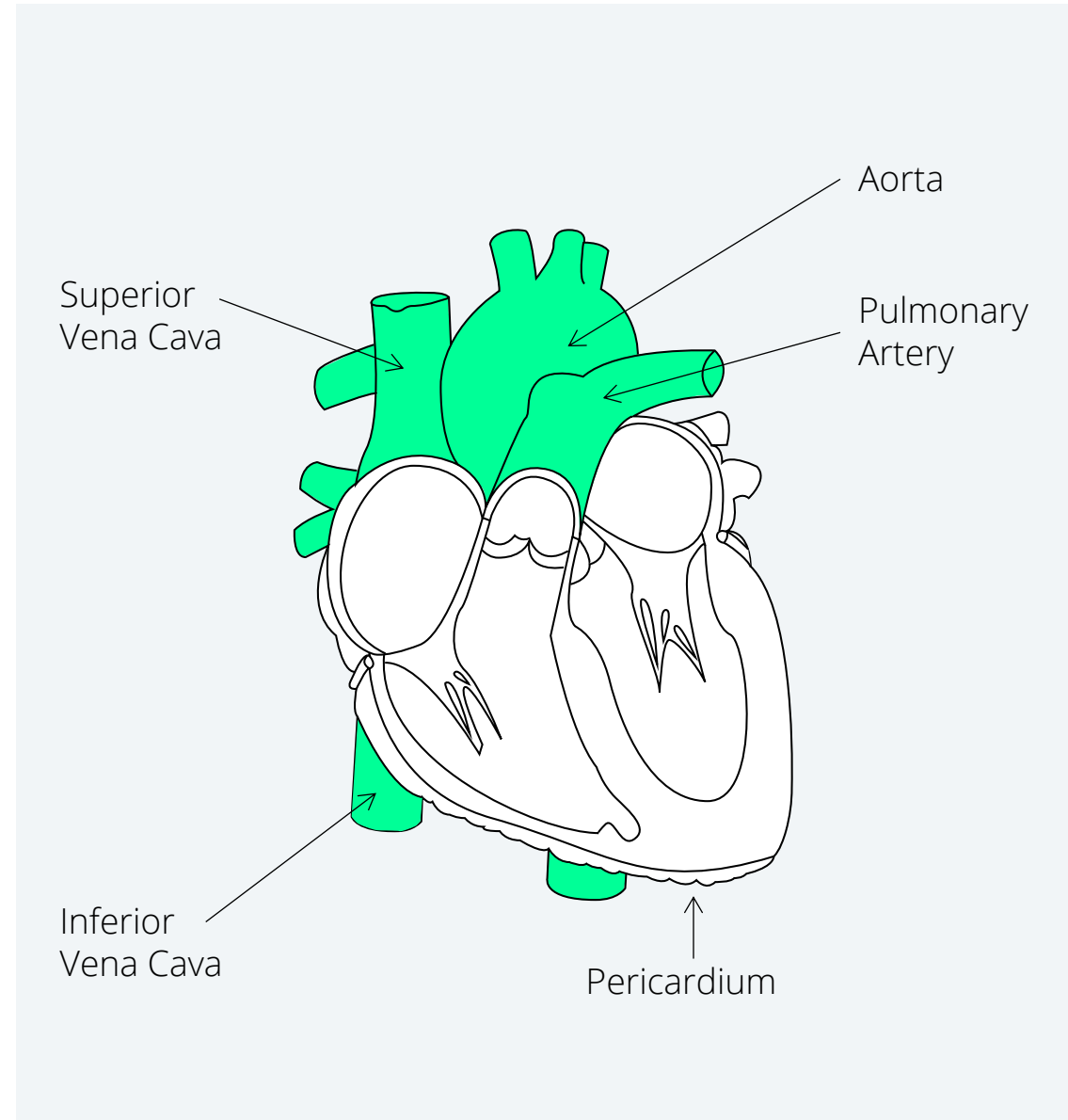


# THE GREAT VESSELS

The great vessels are channels that convey blood to and away from the heart.

Blood enters the heart through two large veins, the superior & inferior vena cava (SVC & IVC), emptying oxygen-poor blood from the body into the right atrium. As the atrium contracts, blood flows from your right atrium into the right ventricle. As the ventricle contracts, blood leaves the into the pulmonary artery and to the lungs where it is oxygenated.

The pulmonary vein empties oxygen-rich blood from the lungs into the left atrium. As the atrium contracts, blood flows from the left atrium into the left ventricle. As the ventricle contracts, blood leaves the into the Aorta and to the body.



# HEART VALVES

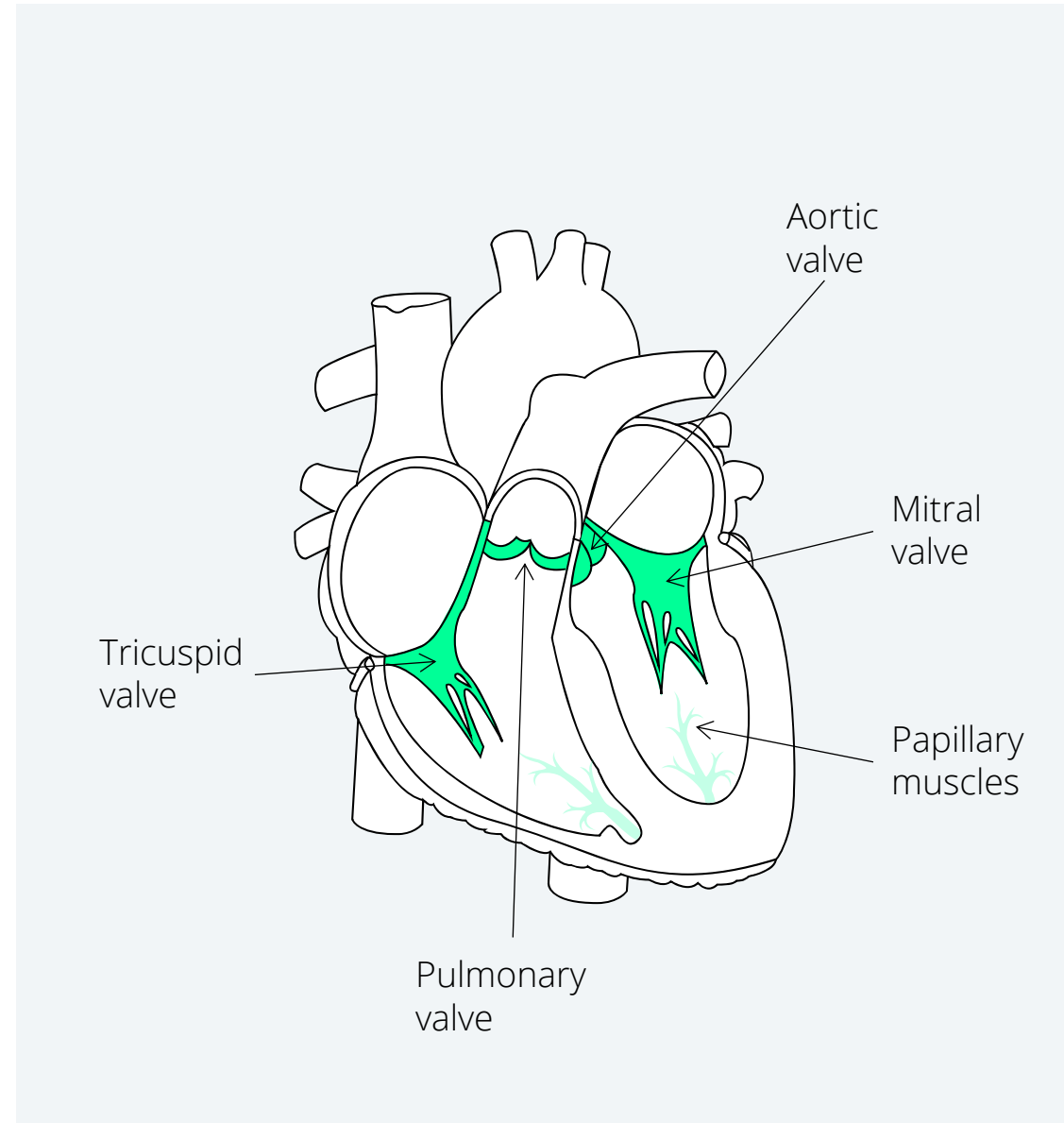
The heart has four valves - one for each chamber of the heart. The valves keep blood moving through the heart. The heart valves are like doors between the heart chambers, opening and closing to allow blood to flow through in one direction.

The two atrioventricular (AV) valves open between the atrium and the ventricle:

- **Tricuspid valve:** between the right atrium and right ventricle
- **Mitral valve:** between the left atrium and left ventricle.

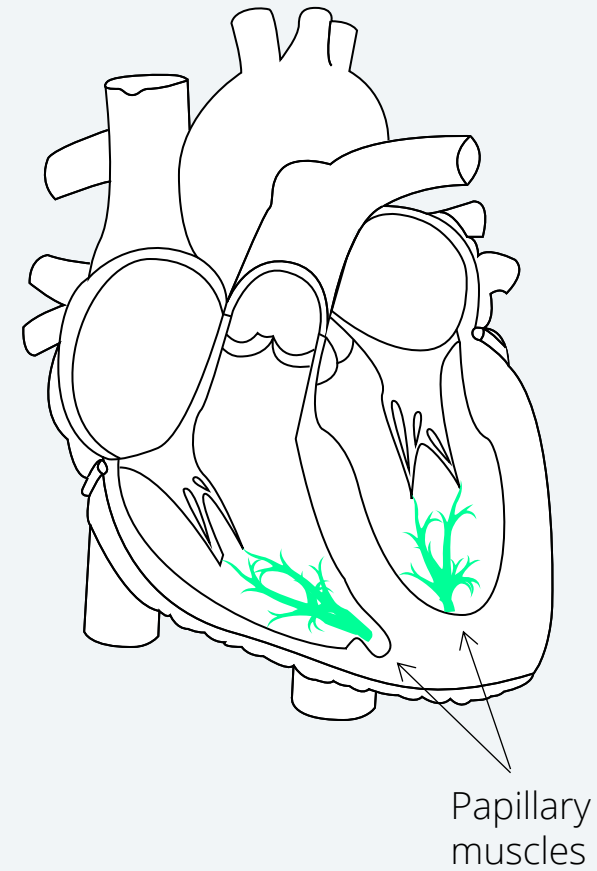
The semilunar (SL) valves open when blood flows out of the ventricles:

- **Aortic valve:** Opens when blood flows out of the left ventricle to the aorta
- **Pulmonary valve:** lies between the right ventricle and the pulmonary artery



# PAPILLARY MUSCLES

The papillary muscles are muscles located in the ventricles of the heart. They attach to the cusps of the mitral and tricuspid valves and contract to prevent inversion or prolapse of these valves on systole (or ventricular contraction).



# ULTRASIGHT

---

CONTINUE TO  
CHAPTER 2

