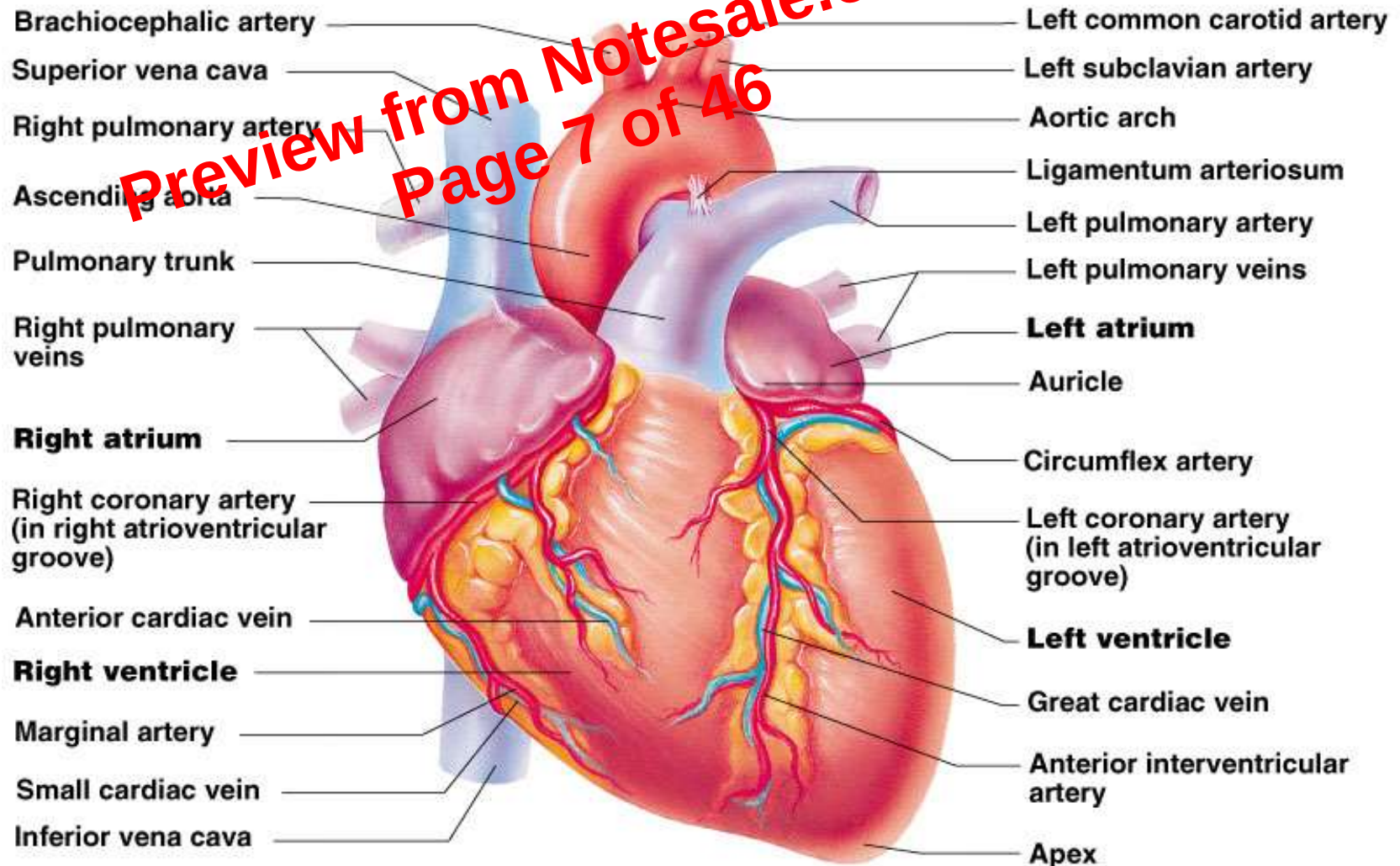


# The Heart: Heart Wall

- Three layers
  - Epicardium
    - Outside layer
      - This layer is the parietal pericardium
      - Connective tissue layer
  - Myocardium
    - Middle layer
    - Mostly cardiac muscle
  - Endocardium
    - Inner layer
    - Endothelium

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# External Heart Anatomy



(a)

# The Heart: Associated Great Vessels

- Aorta
  - Leaves left ventricle
- Pulmonary arteries
  - Leave right ventricle
- Vena cava
  - Enters right atrium
- Pulmonary veins (four)
  - Enter left atrium

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# The Heart: Cardiac Cycle

- Atria contract simultaneously
- Atria relax, then ventricles contract
- Systole = contraction
- Diastole = relaxation

# The Heart: Regulation of Heart Rate

- Stroke volume usually remains relatively constant
  - Starling's law of the heart – the more that the cardiac muscle is stretched, the stronger the contraction
- Changing heart rate is the most common way to change cardiac output

# Blood Vessels: The Vascular System

- Taking blood to the tissues and back
  - Arteries
  - Arterioles
  - Capillaries
  - Venules
  - Veins

# Blood Vessels: Anatomy

- Three layers (tunics)
  - Tunic intima
    - Endothelium
  - Tunic media
    - Smooth muscle
    - Controlled by sympathetic nervous system
  - Tunic externa
    - Mostly fibrous connective tissue

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