

A microscopic view of numerous red blood cells, which are biconcave discs, filling the frame. They are set against a dark background, and their reddish-pink color is prominent. The cells are in various stages of focus, with some appearing sharp and others blurred, creating a sense of depth.

Circulatory System

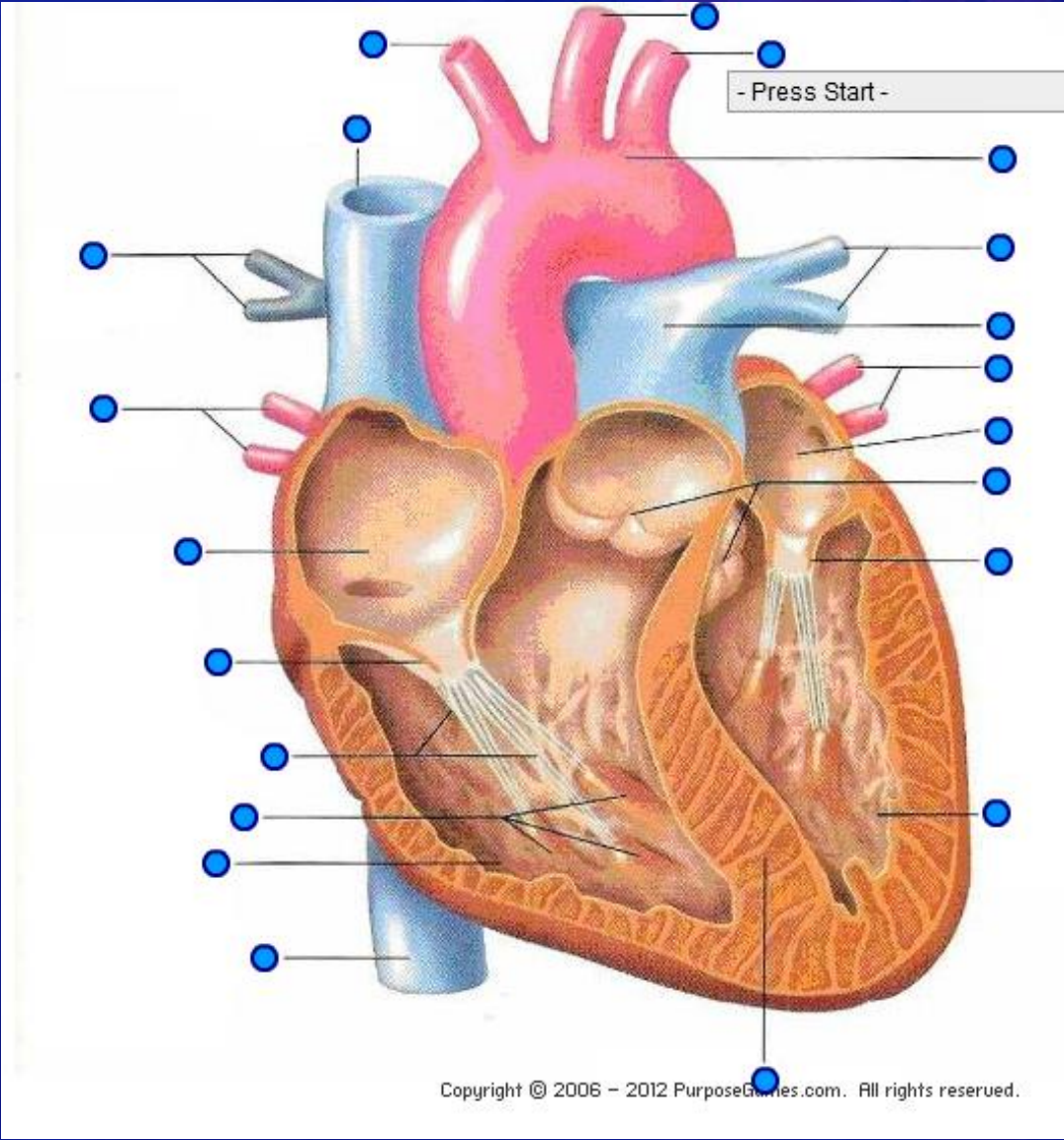
**The Heart, Blood Vessels, and
Blood**

**TO: How does our heart beat and
what are the components of
blood?**

The Heart

- A muscular, hollow organ
- Size of a closed fist
- 3 layers: Endocardium, Myocardium, & Pericardium.
- Septum – A muscular wall dividing heart into right and left halves.
- 4 chambers; R atrium, R ventricle, L atrium, L ventricle.
- 4 valves; Tricuspid, Pulmonary, Mitral, Aortic.



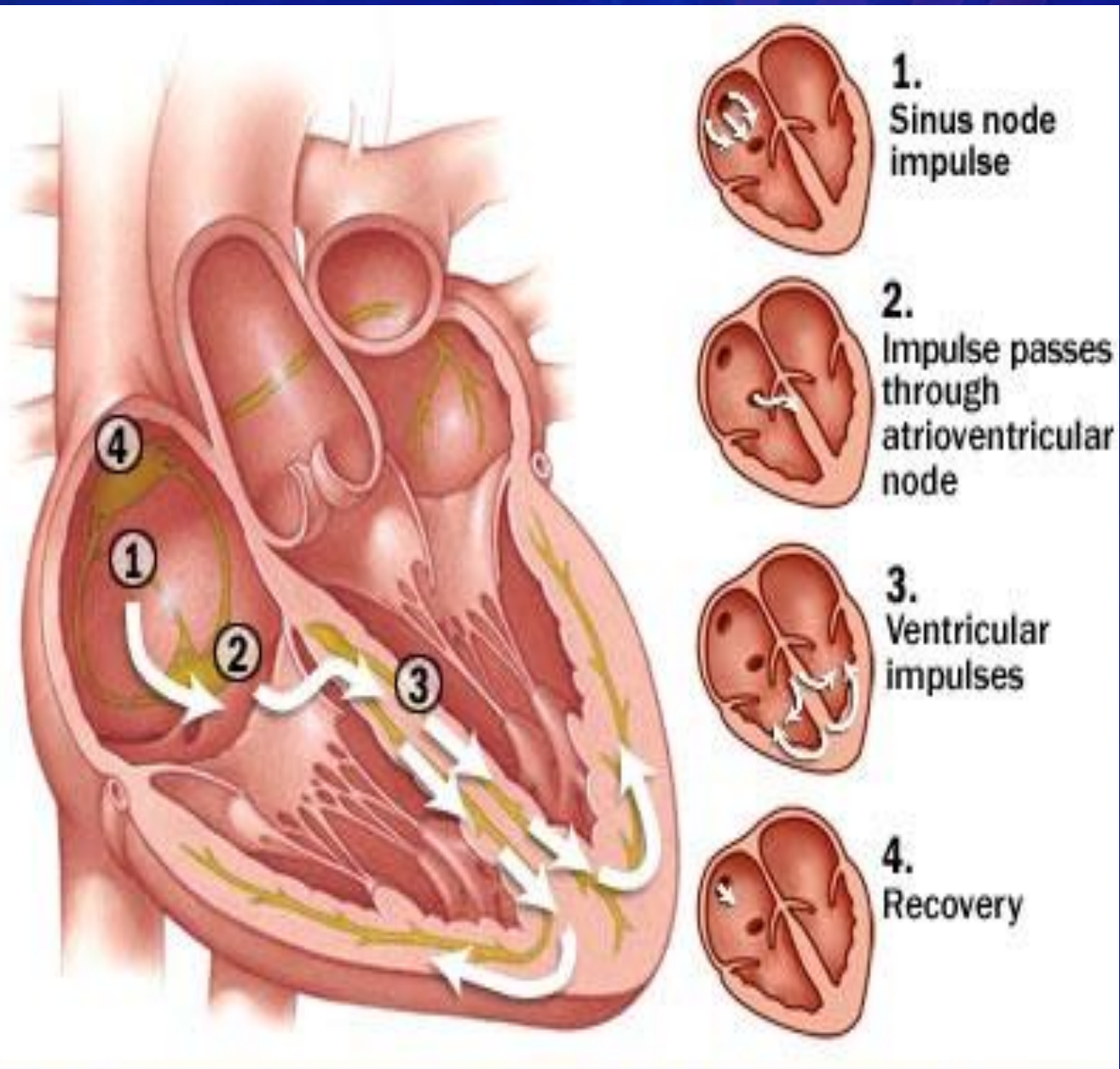


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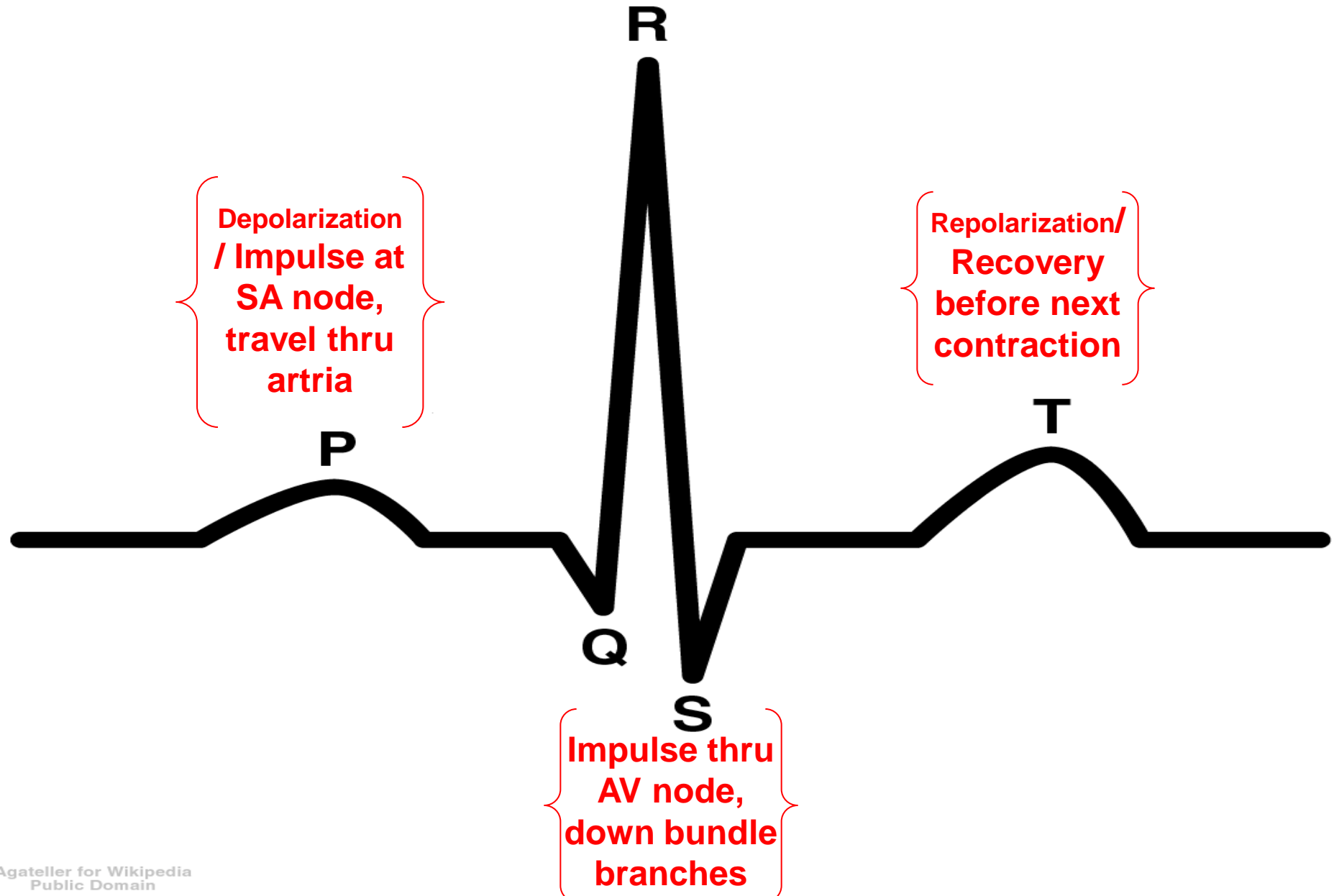


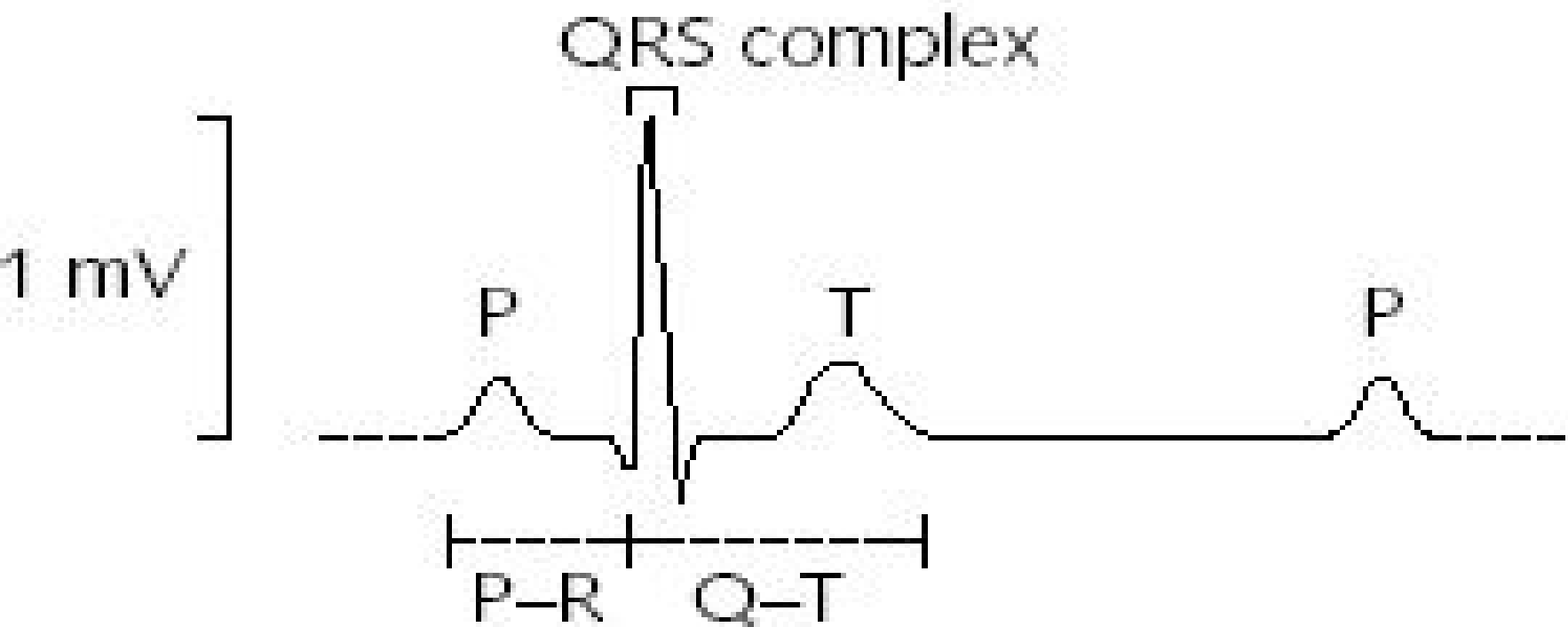
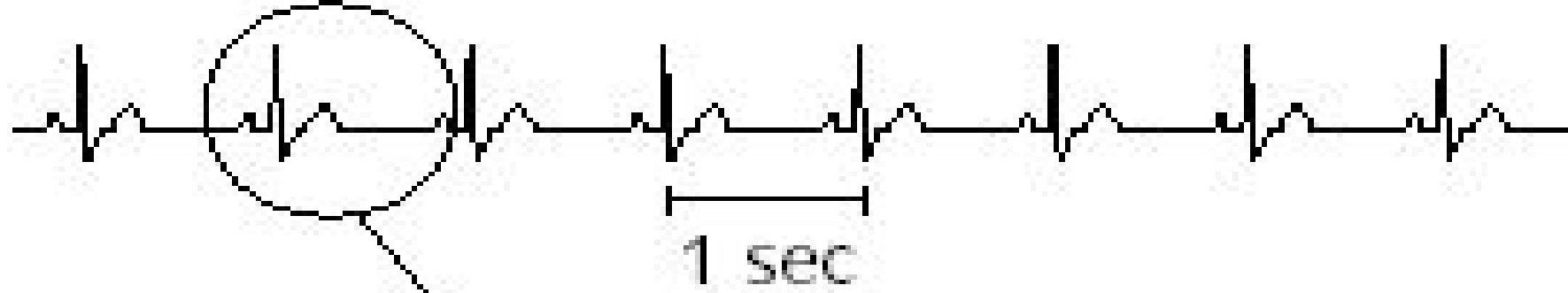
Cardiac Cycle

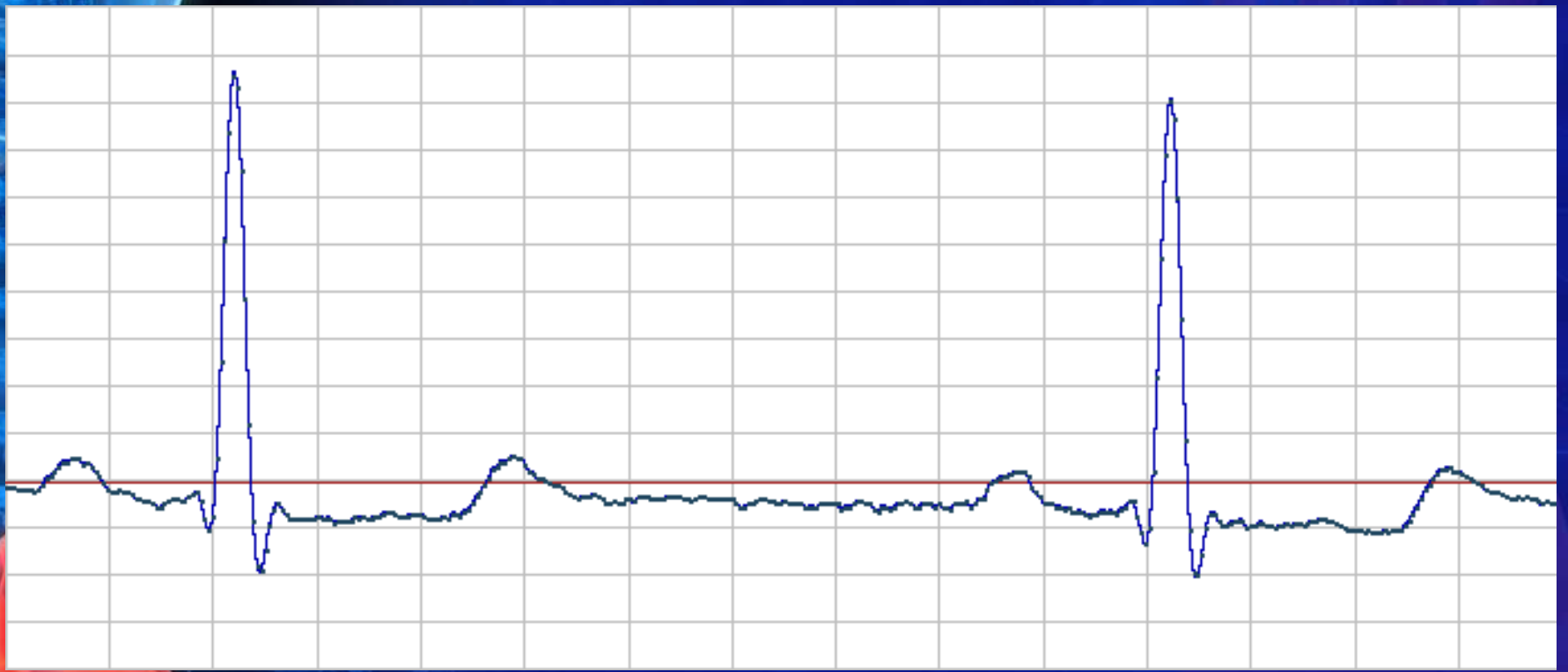
- **Diastole:** cycle of rest (in b/w beats)
- **Systole:** ventricular contraction
 - **Sinoatrial (SA) node** – “Pacemaker”; Atrium
 - **Atrioventricular (AV) node** – Ventricle
 - **Arrhythmia** – Abnormal heart rhythms
 - **Defibrillator** – A device that shocks the heart with an electrical current to stop the uncoordinated contraction and allow the SA node to regain control



Contraction **Relaxation**







Ventricular Fibrillation



Pacemaker – A small battery-powered device with electrodes. Monitors the heart's activity and delivers an electrical impulse through the electrodes to stimulate contraction.



BLOOD VESSELS

Arteries

Carry blood **away** from the heart

Aorta

Arterioles

Capillaries

Connect arterioles with venules

Thin walls; Only one layer of cells

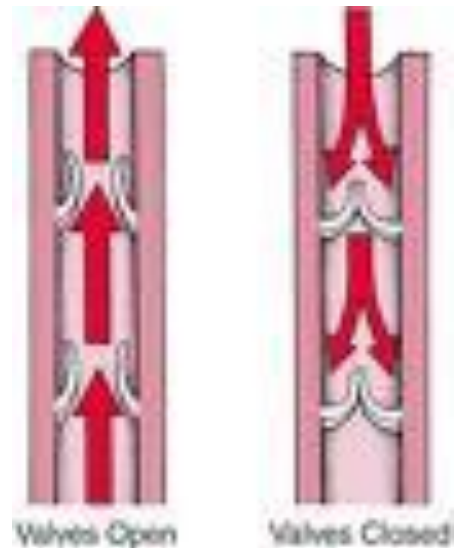
Veins

Carry blood **towards** the heart

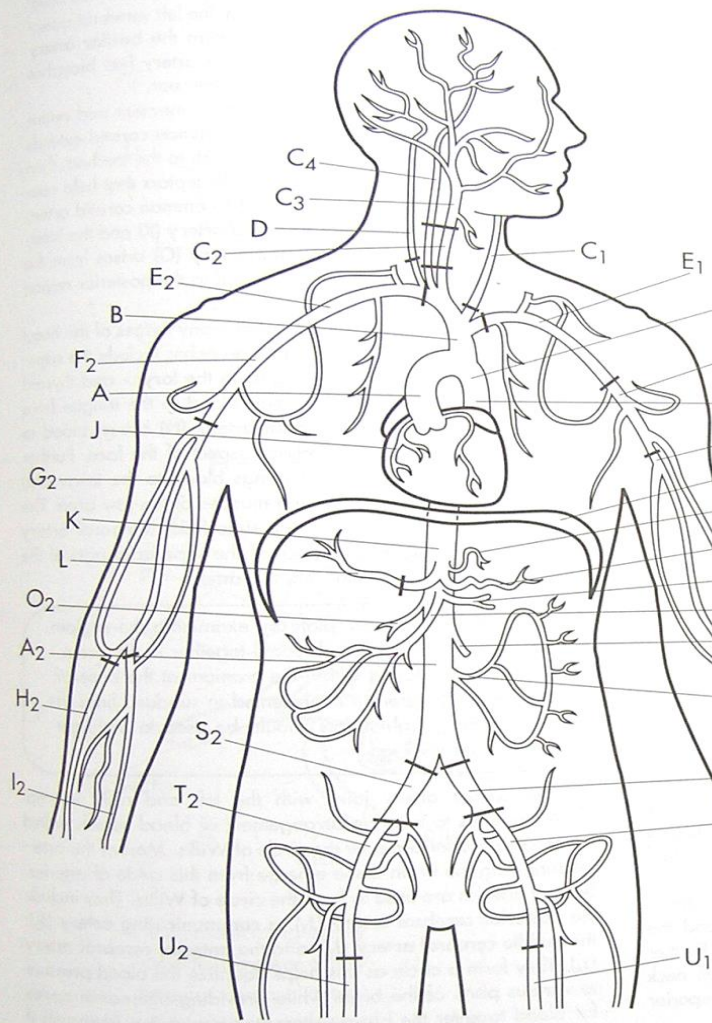
Venules

Superior & Inferior Vena Cava

Valves (p.149)



PRINCIPAL ARTERIES OF THE BODY

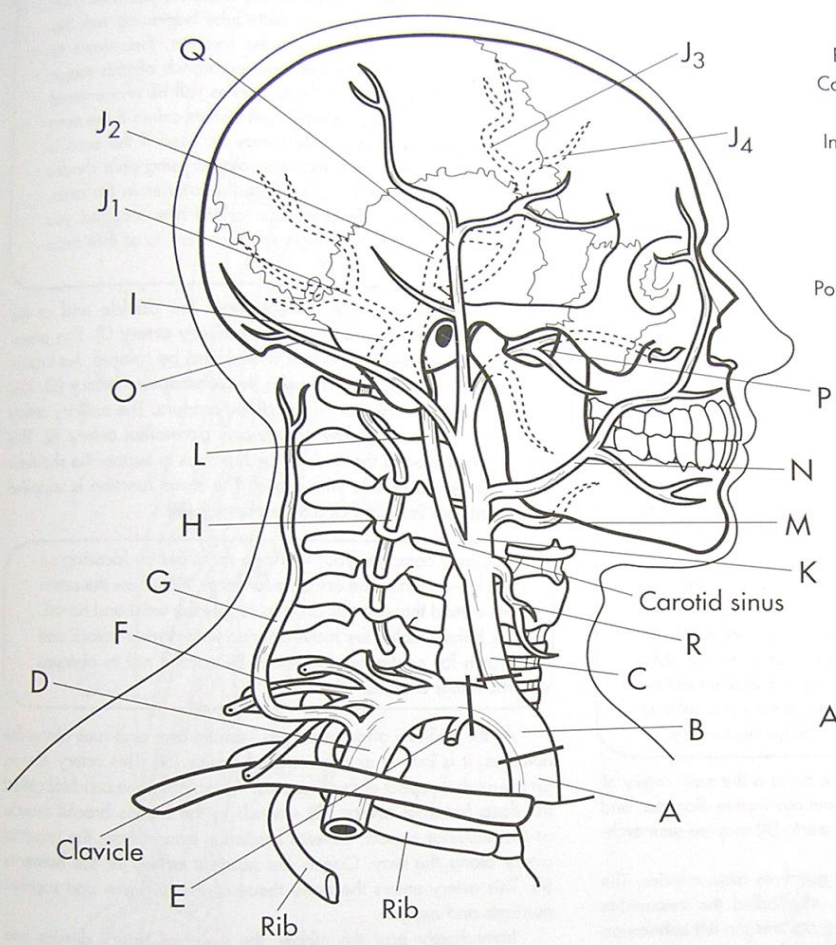


Anterior view

- | | | |
|-------------------------------|----------------|---|
| Aorta | A | ○ |
| Thoracic aorta | A ₁ | ○ |
| Abdominal aorta | A ₂ | ○ |
| Brachiocephalic trunk | B | ○ |
| Left common carotid artery | C ₁ | ○ |
| Right common carotid artery | C ₂ | ○ |
| Right external carotid artery | C ₃ | ○ |
| Right internal carotid artery | C ₄ | ○ |
| Vertebral artery | D | ○ |
| Left subclavian artery | E ₁ | ○ |
| Right subclavian artery | E ₂ | ○ |
| Left axillary artery | F ₁ | ○ |
| Right axillary artery | F ₂ | ○ |
| Left brachial artery | G ₁ | ○ |
| Right brachial artery | G ₂ | ○ |
| Left radial artery | H ₁ | ○ |
| Right radial artery | H ₂ | ○ |
| Left ulnar artery | I ₁ | ○ |
| Right ulnar artery | I ₂ | ○ |
| Coronary arteries | J | ○ |
| Celiac trunk | K | ○ |
| Hepatic artery | L | ○ |
| Gastric artery | M | ○ |
| Splenic artery | N | ○ |
| Left renal artery | O ₁ | ○ |
| Right renal artery | O ₂ | ○ |
| Superior mesenteric artery | P | ○ |
| Gonadal artery | Q | ○ |
| Inferior mesenteric artery | R | ○ |
| Left common iliac artery | S ₁ | ○ |
| Right common iliac artery | S ₂ | ○ |
| Left external iliac artery | T ₁ | ○ |
| Right external iliac artery | T ₂ | ○ |
| Left femoral artery | U ₁ | ○ |
| Right femoral artery | U ₂ | ○ |



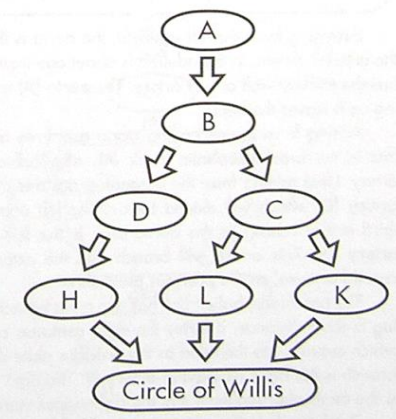
ARTERIES OF THE HEAD AND NECK



- Aorta A ○
- Brachiocephalic trunk B ○
- Common carotid artery C ○
- Subclavian artery D ○
- Internal thoracic artery E ○
- Thyrocerical trunk F ○
- Costocervical trunk G ○
- Vertebral artery H ○
- Basilar artery I ○
- Posterior cerebral artery J1 ○

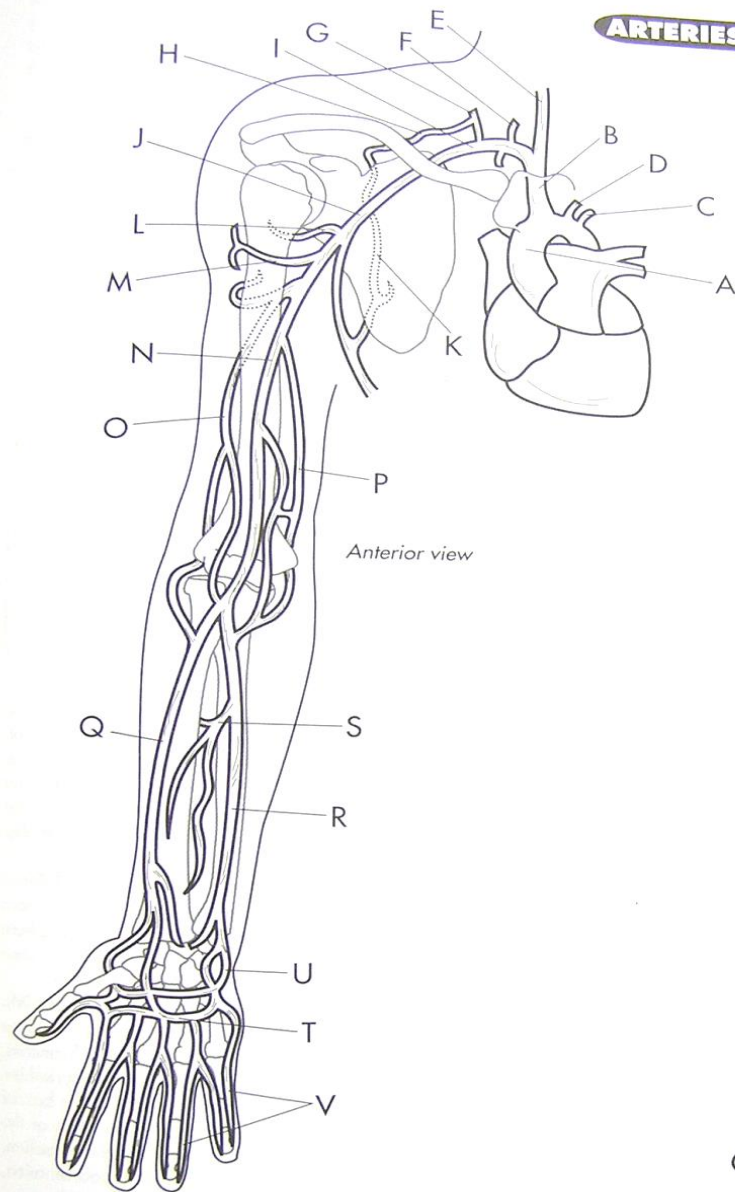
- Communicating artery J2 ○
- Middle cerebral artery J3 ○
- Anterior cerebral artery J4 ○
- External carotid artery K ○
- Internal carotid artery L ○
- Lingual artery M ○
- Facial artery N ○
- Occipital artery O ○
- Maxillary artery P ○
- Superficial temporal artery Q ○
- Superior thyroid artery R ○

Arterial Flowchart



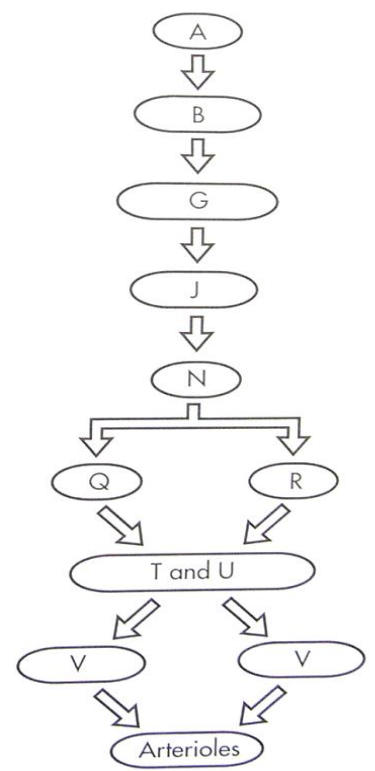


ARTERIES OF THE UPPER EXTREMITY



- | | | |
|-------------------------------------|---|---|
| Aorta | A | ○ |
| Brachiocephalic trunk | B | ○ |
| Left subclavian artery | C | ○ |
| Left common carotid artery | D | ○ |
| Right common carotid artery | E | ○ |
| Right vertebral artery | F | ○ |
| Thyrocervical trunk | G | ○ |
| Suprascapular artery | H | ○ |
| Right subclavian artery | I | ○ |
| Axillary artery | J | ○ |
| Subscapular artery | K | ○ |
| Posterior humoral circumflex artery | L | ○ |

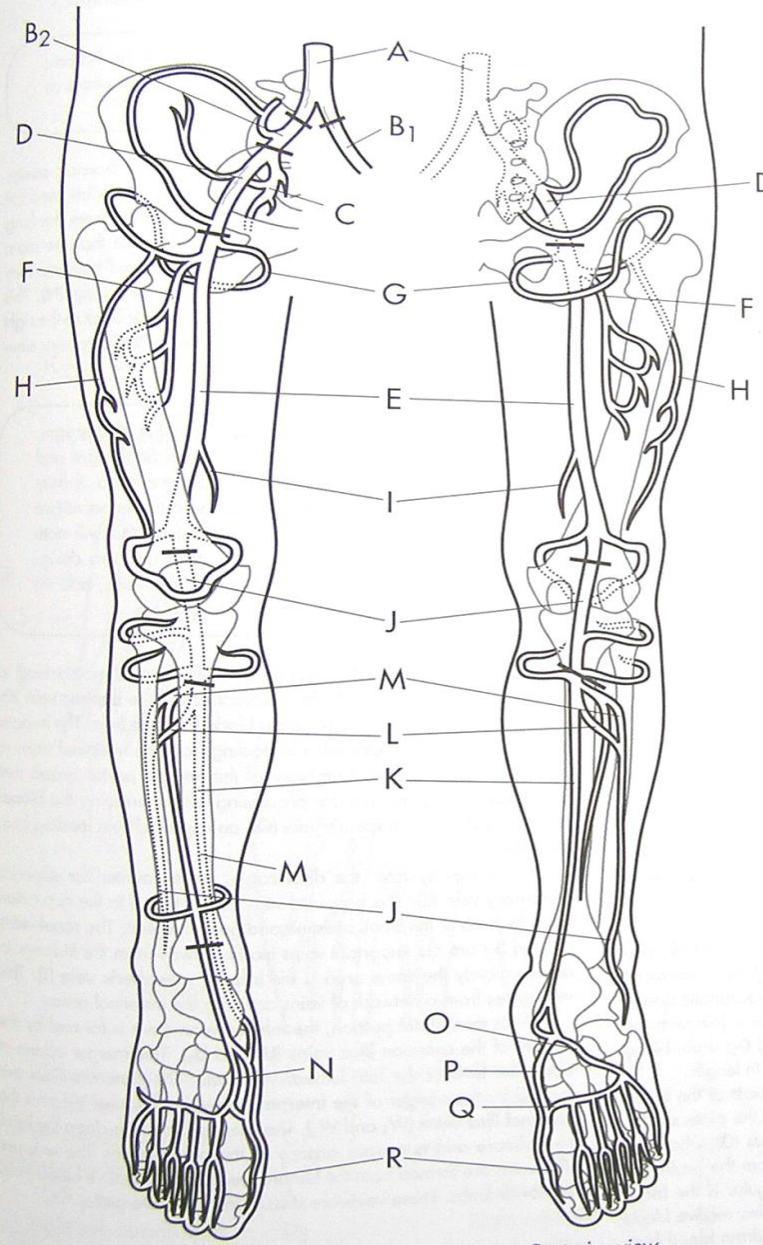
Arterial Flowchart



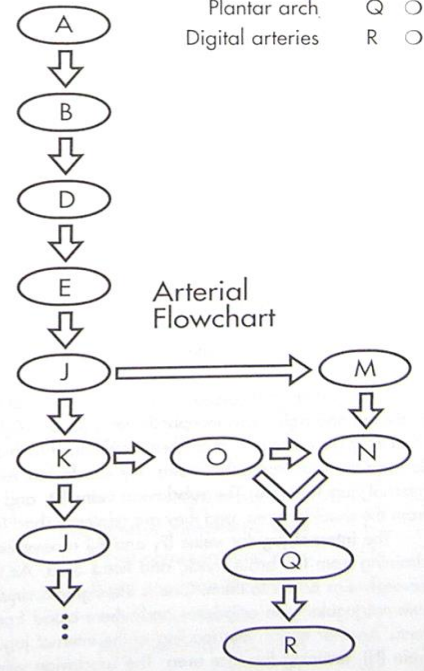
- | | | |
|------------------------------------|---|---|
| Anterior humoral circumflex artery | M | ○ |
| Brachial artery | N | ○ |
| Deep brachial artery | O | ○ |
| Nutrient artery of the humerus | P | ○ |
| Radial artery | Q | ○ |
| Ulnar artery | R | ○ |
| Interosseus artery | S | ○ |

- | | | |
|-------------------------|---|---|
| Superficial palmar arch | T | ○ |
| Deep palmar arch | U | ○ |
| Digital arteries | V | ○ |

ARTERIES OF THE LOWER LIMB



- Aorta A ○
- Left common iliac artery B₁ ○
- Right common iliac artery B₂ ○
- Internal iliac artery C ○
- External iliac artery D ○
- Femoral artery E ○
- Deep femoral artery F ○
- Medial femoral circumflex artery G ○
- Lateral femoral circumflex artery H ○
- Descending genicular artery I ○
- Popliteal artery J ○
- Posterior tibial artery K ○
- Peroneal artery L ○
- Anterior tibial artery M ○
- Dorsalis pedis artery N ○
- Lateral plantar artery O ○
- Medial plantar artery P ○
- Plantar arch Q ○
- Digital arteries R ○



Anterior view

Posterior view





BLOOD

- **4 to 6 quarts of blood** in the avg adult.
- Carries...oxygen, carbon dioxide, nutrients, waste products, heat, & hormones.

3 Parts of Blood:

- **Plasma** – the fluid part of the bld.
 - 90% water
- **Erythrocytes – RBC**
 - Formed in bone marrow
 - 4.5 to 5.5 million in a gtt of bld
 - 25 trillion in body
 - Contains **Hemoglobin**
 - carries O₂ and CO₂.
- **Leukocytes – WBC**
 - Formed in bone marrow & lymph tissue
 - 5,000 to 10,000 in a gtt of bld
 - Fight infection - **Phagocytosis**



BLOOD

- Thrombocytes (Platelets)
 - Formed in bone marrow
 - 250,000 to 400,000 in a drop of blood
 - CLOTTING process!
 - Very effective for smaller blood vessels

