

فیزیولوژی دو، جلسه اول:

نگرشی کلی بر دستگاه قلبی عروقی

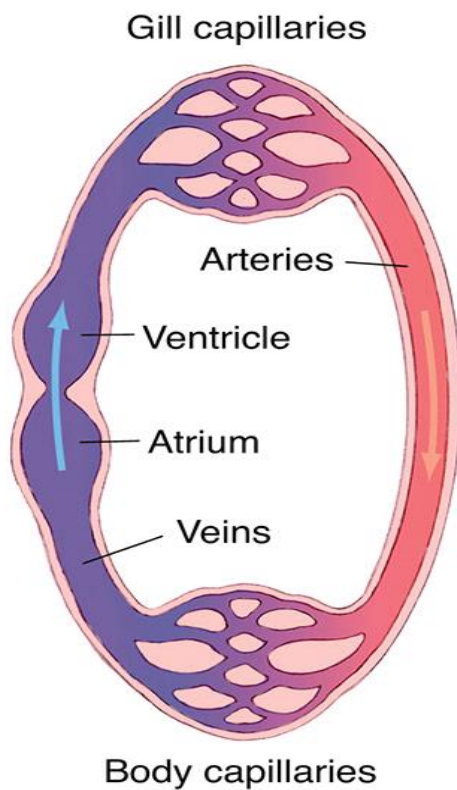
اهمیت گردش خون

نیروهای موثر بر جریان خون

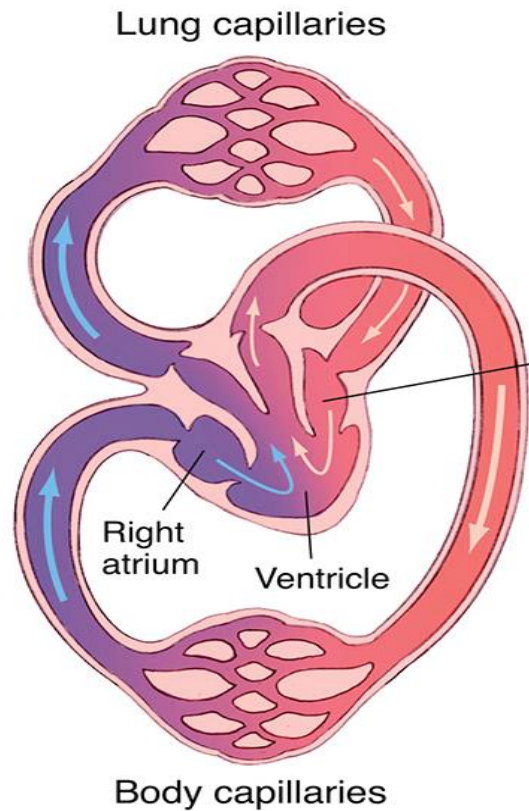
مروری بر تشریح فیزیولوژیکی قلب

نقش دریچه های قلب و عضلات پاپیلر

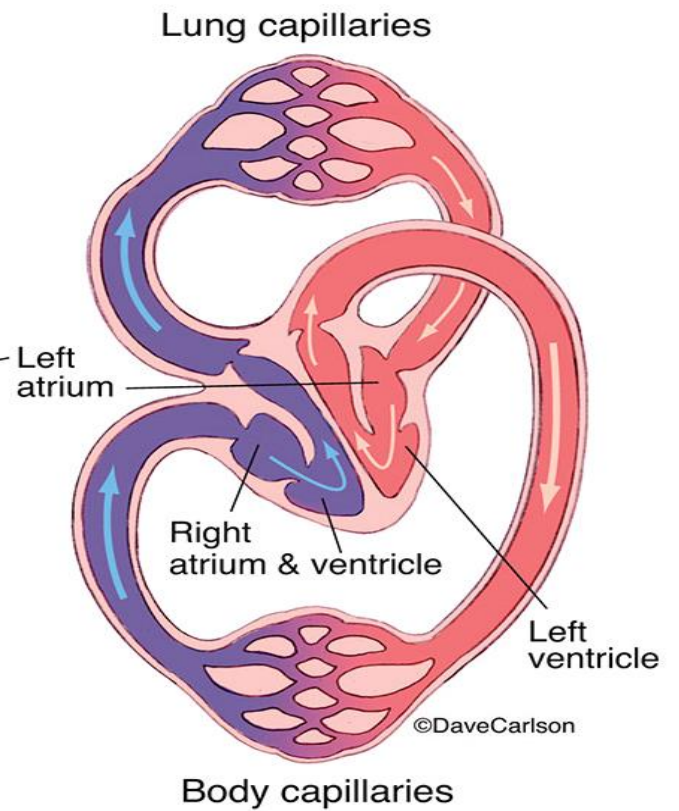
اهمیت عروق کرونر و گردش خون جانبی



A. Fish (2 chambers)

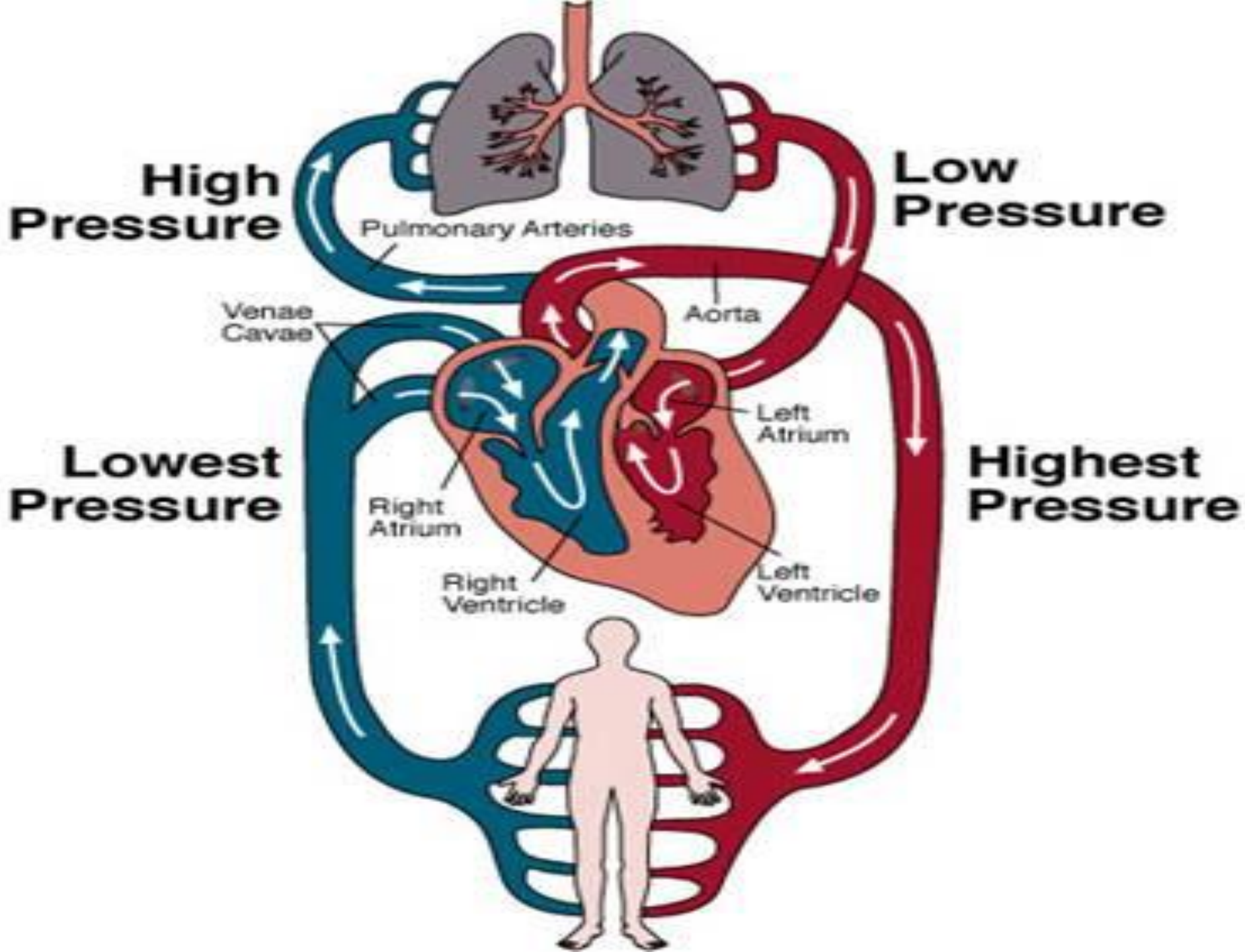


B. Amphibians and most reptiles (3 chambers)



C. Birds and mammals (4 chambers)

©DaveCarlson



Blood circulation:

1- Transport

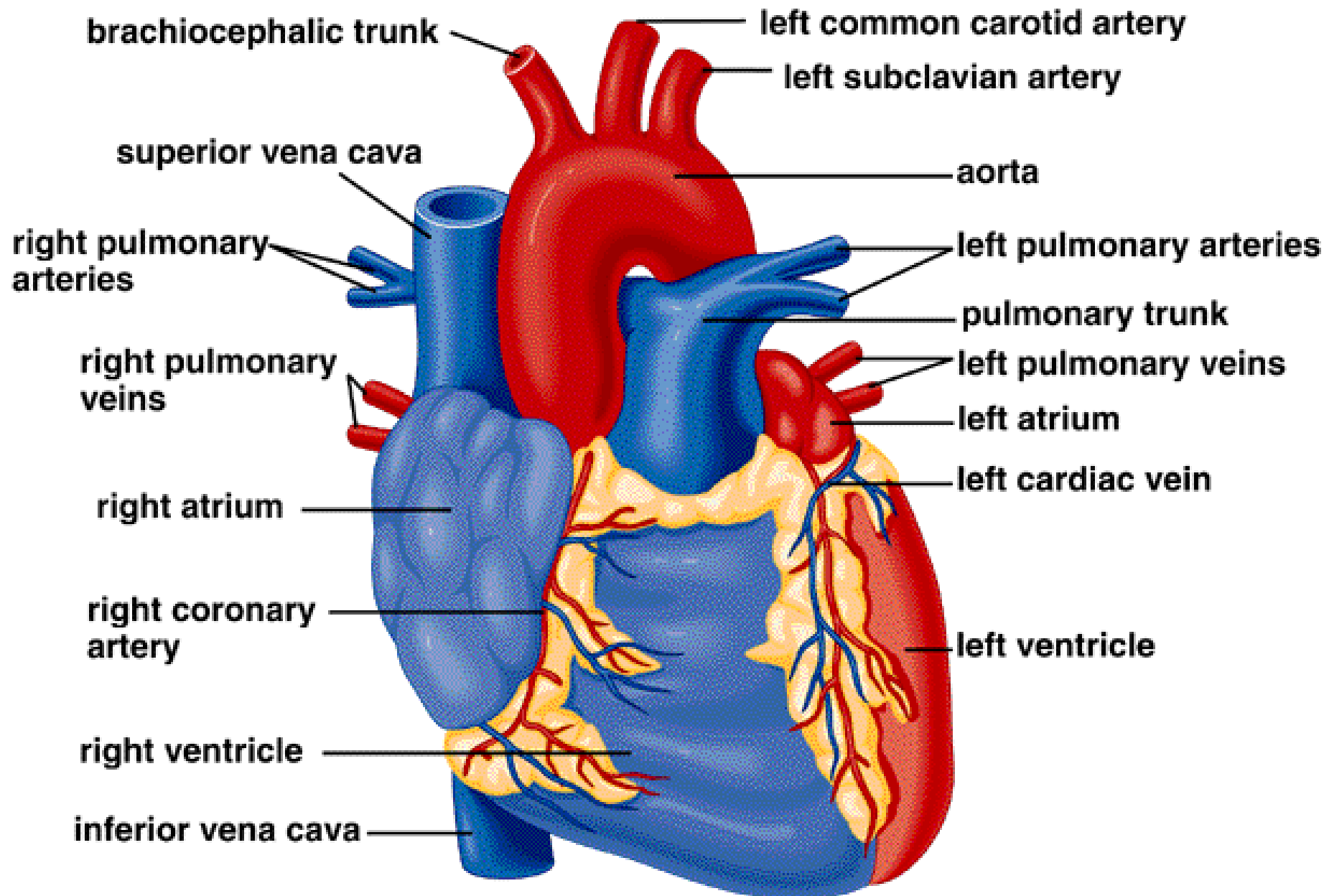
**Oxygen, Nutrients,
Wastes**

2- Temperature regulation

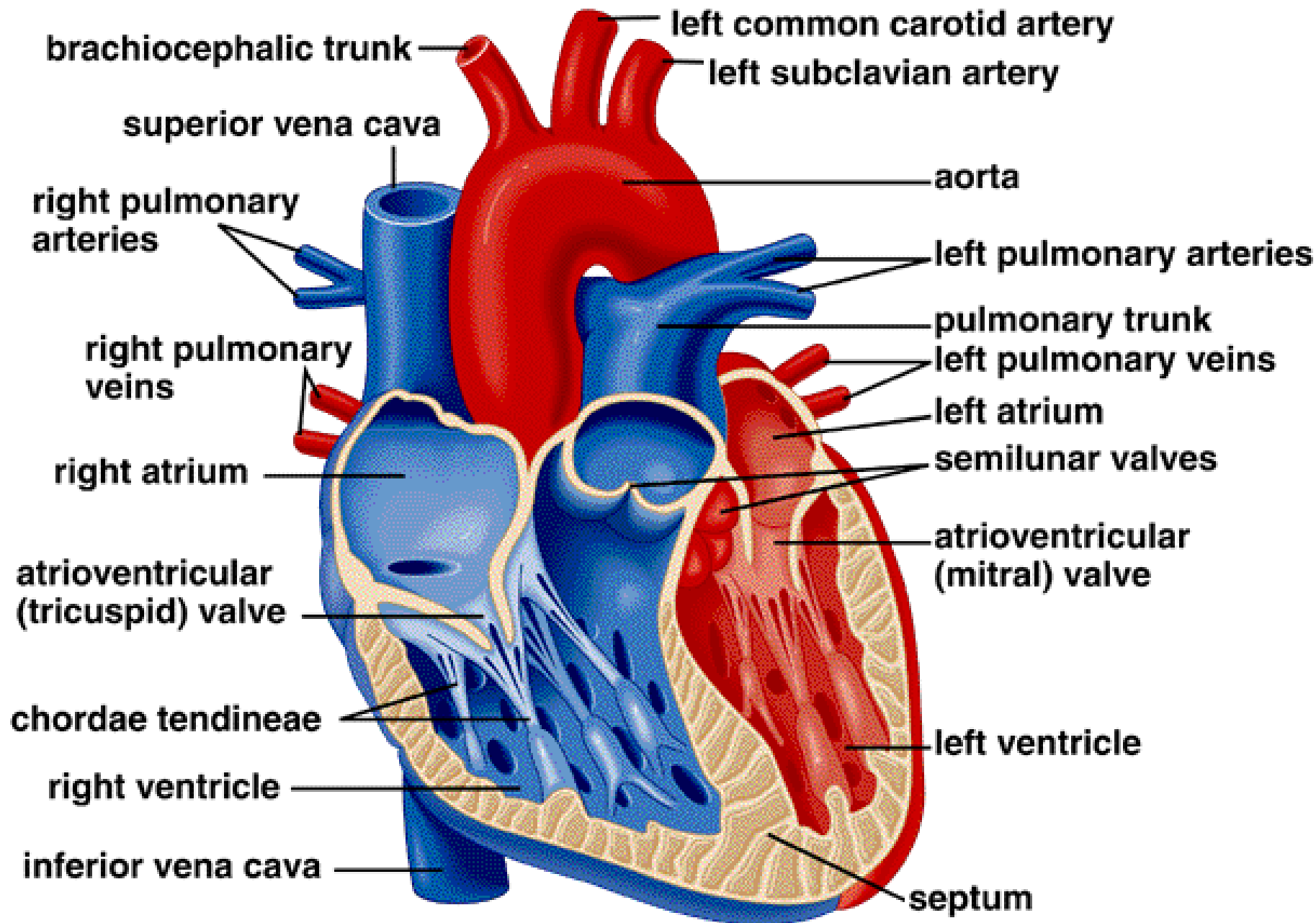
3- Immunity & defence

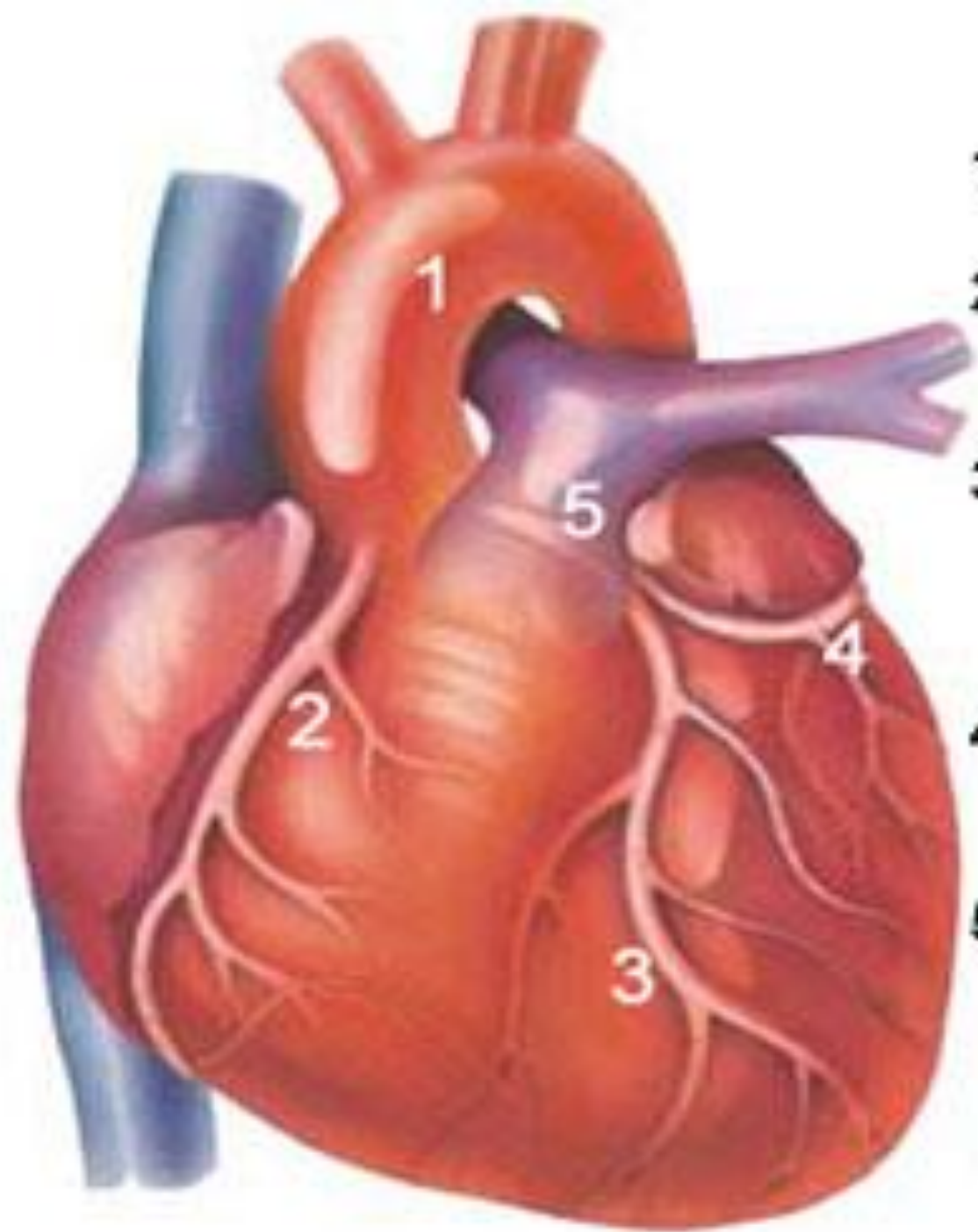
4- Communication

External Heart Anatomy



Internal View of Heart





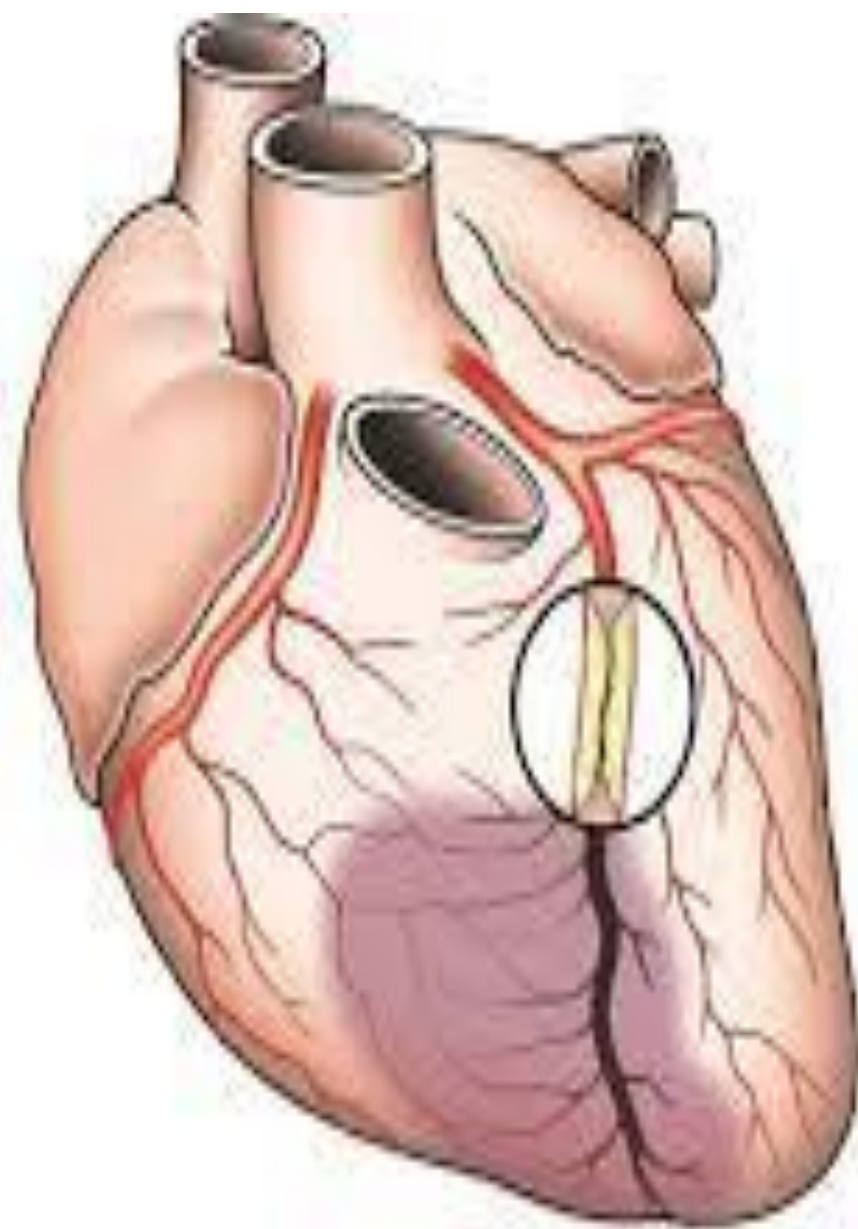
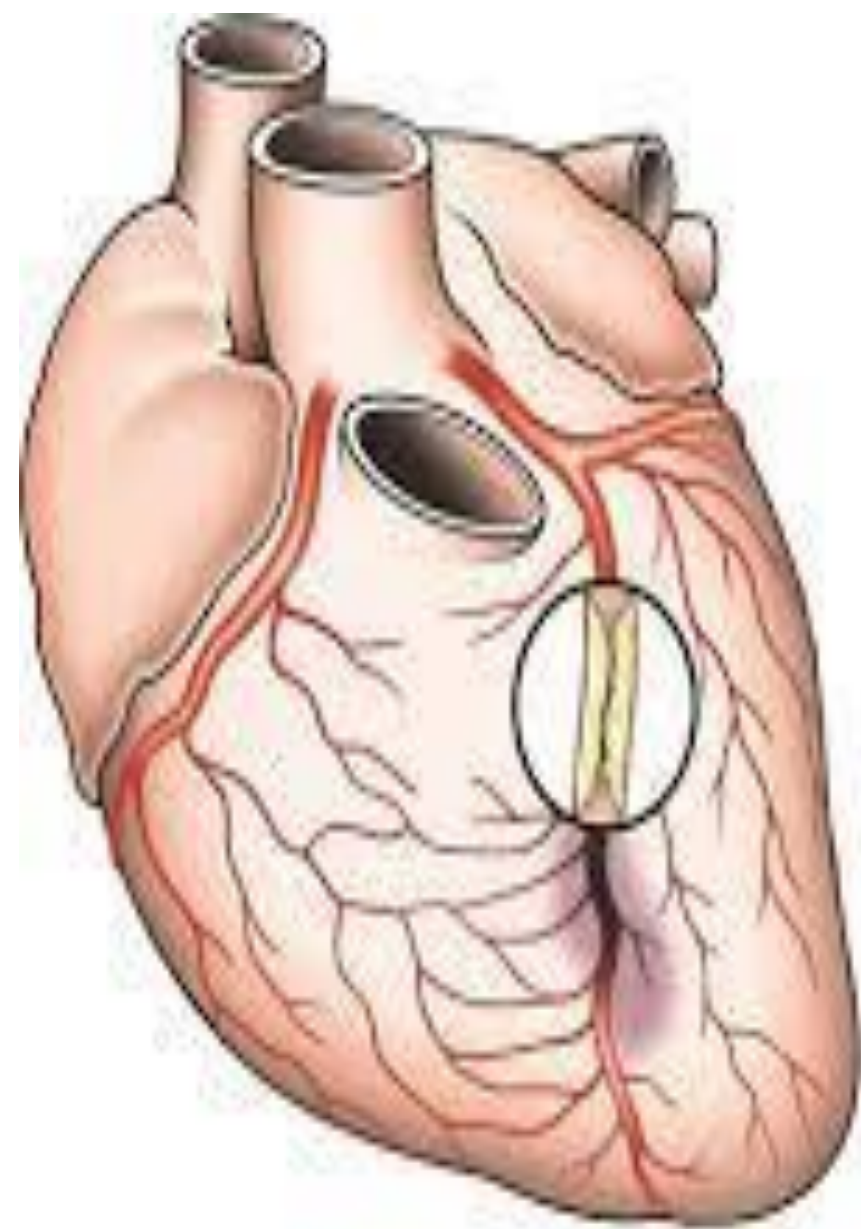
1. Aorta

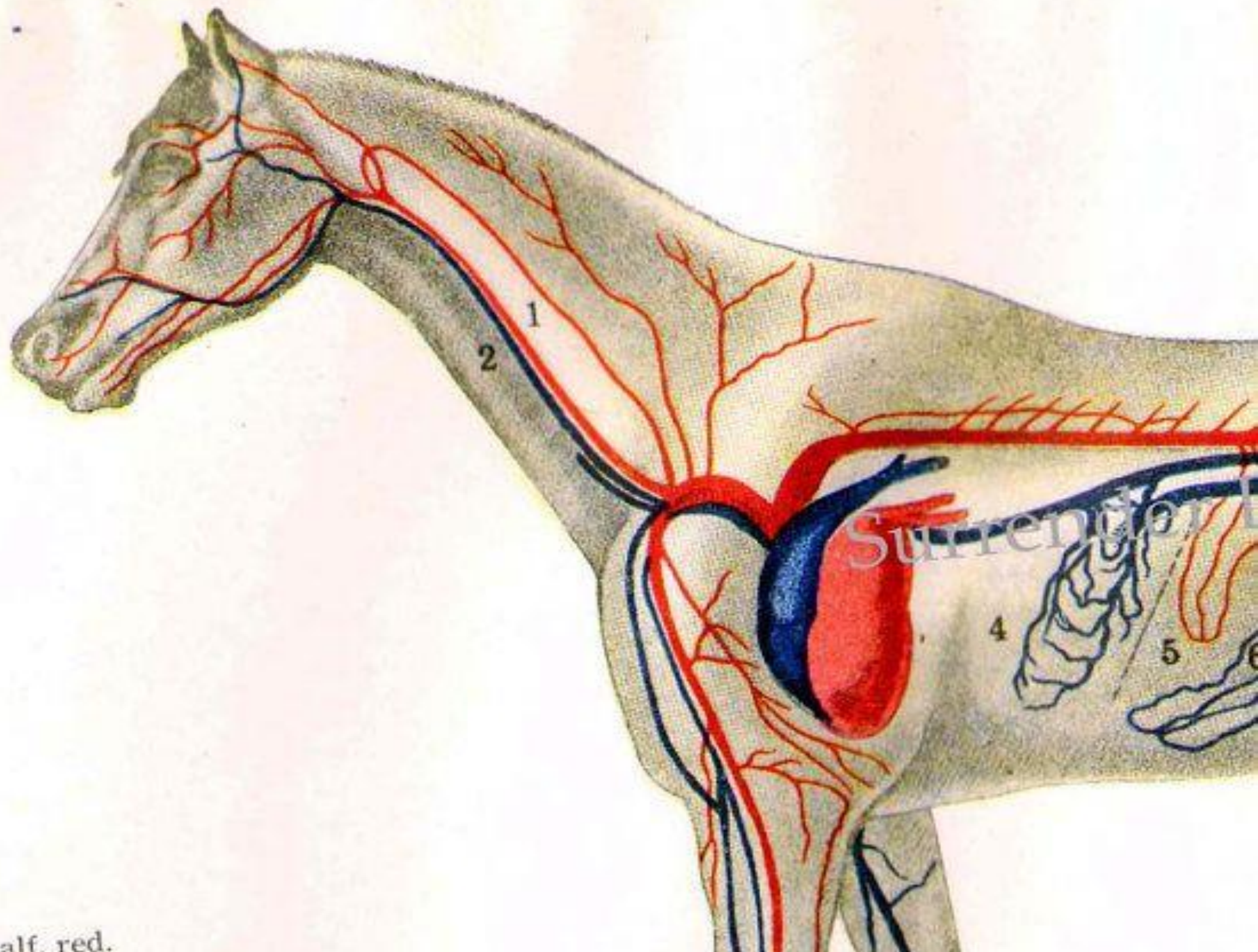
**2. Right Coronary
Artery**

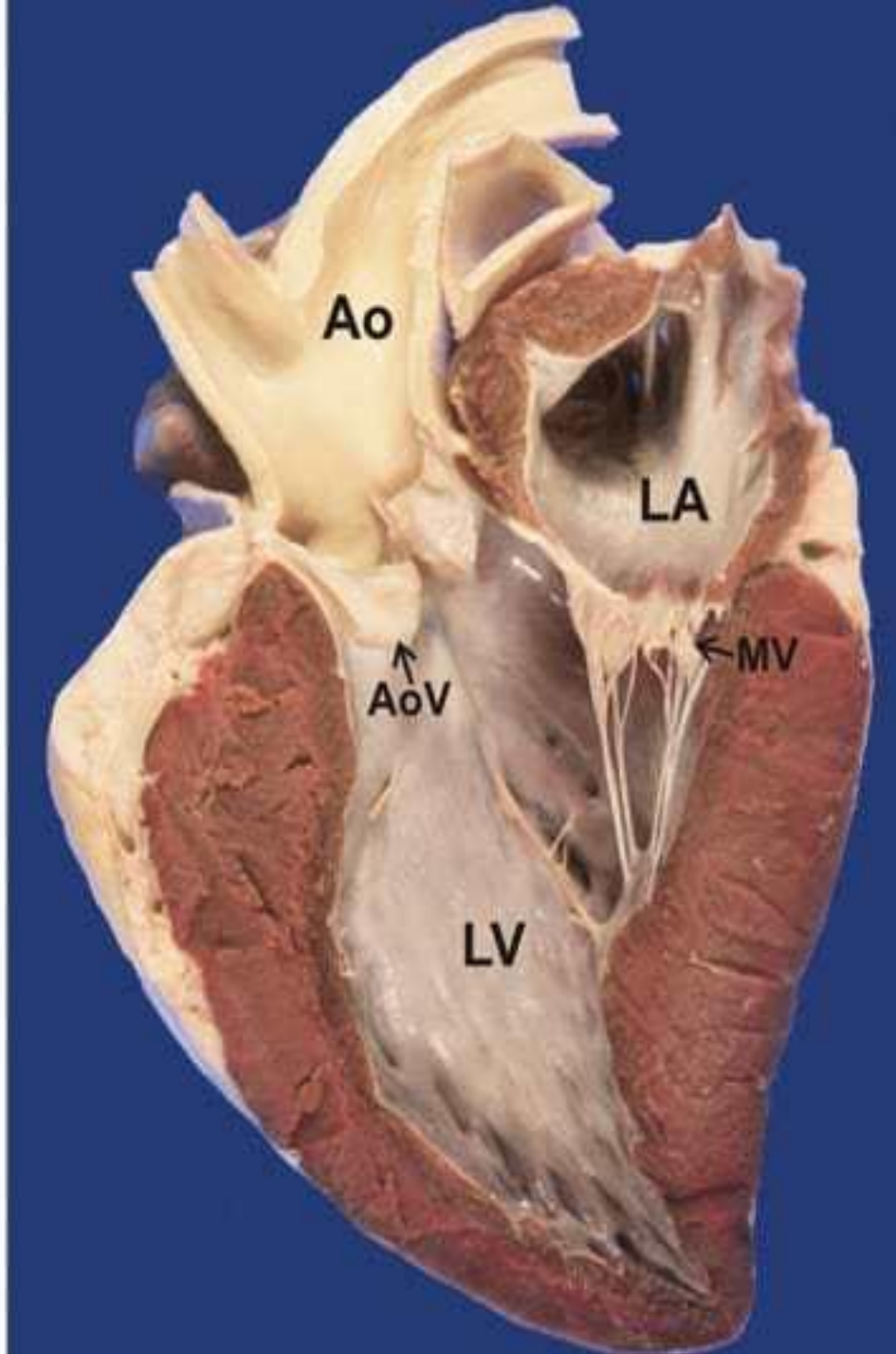
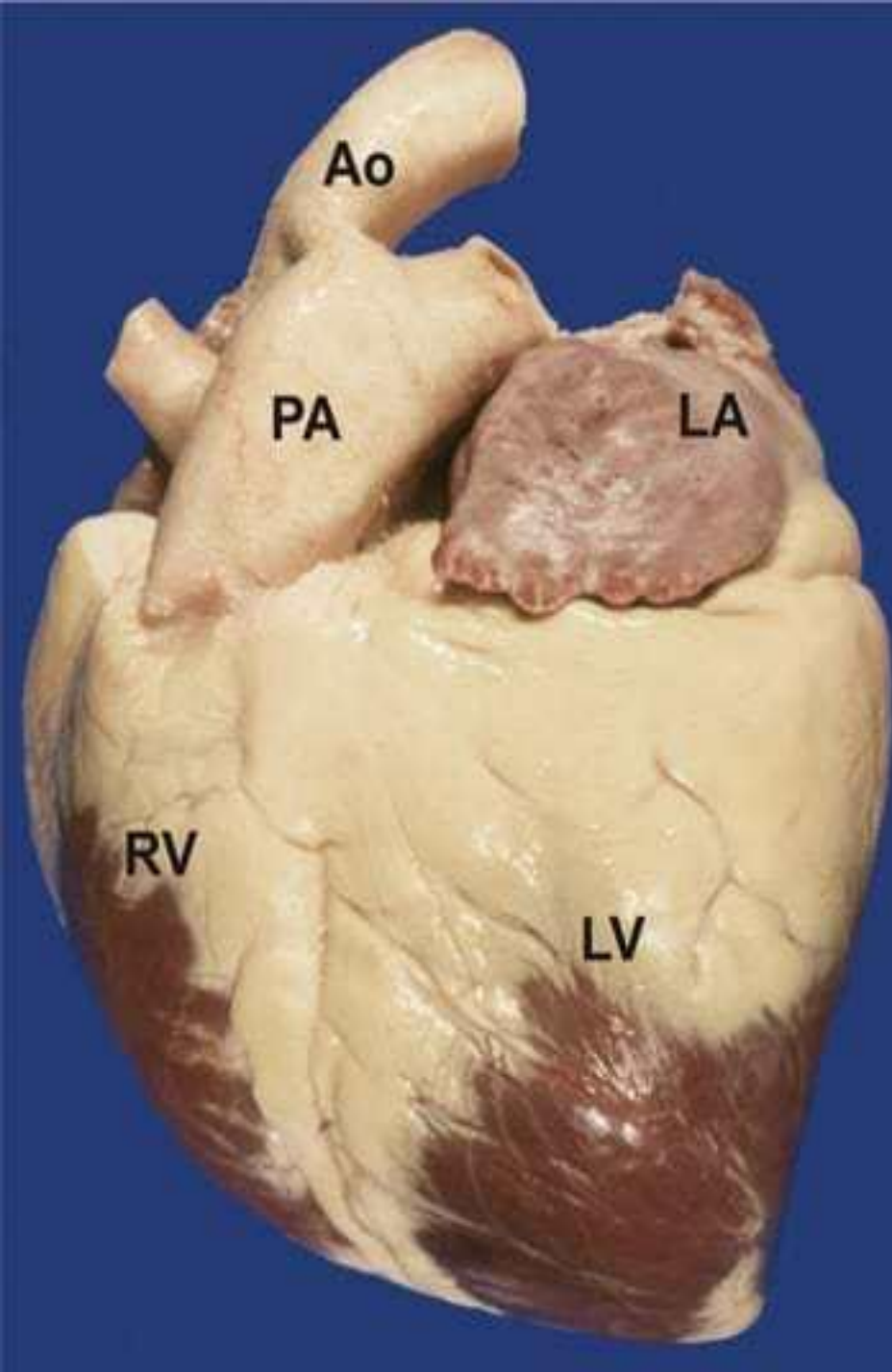
**3. Left Anterior
Descending
Coronary Artery**

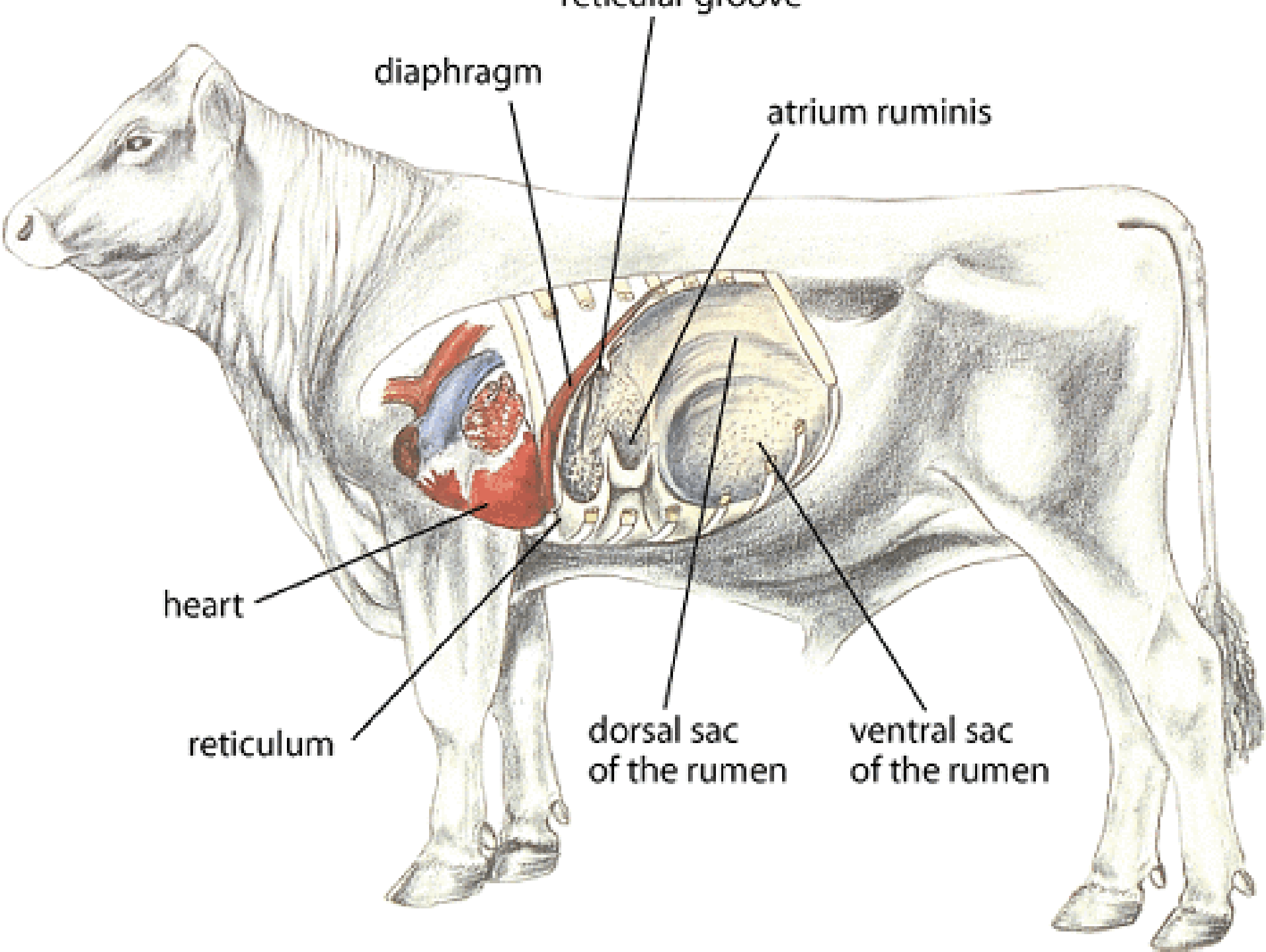
**4. Circumflex Coronary
Artery**

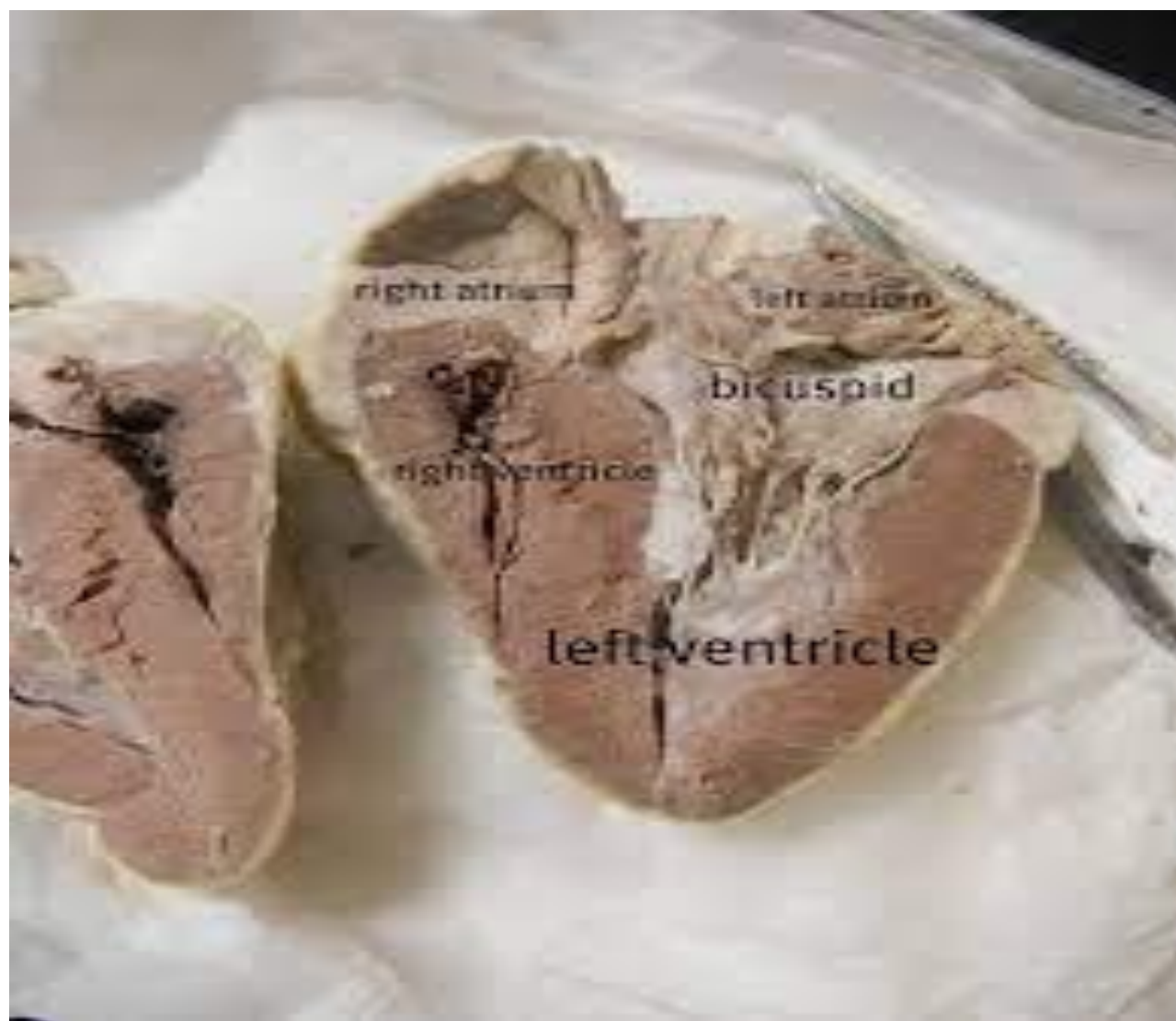
**5. Left Main
Coronary Artery**



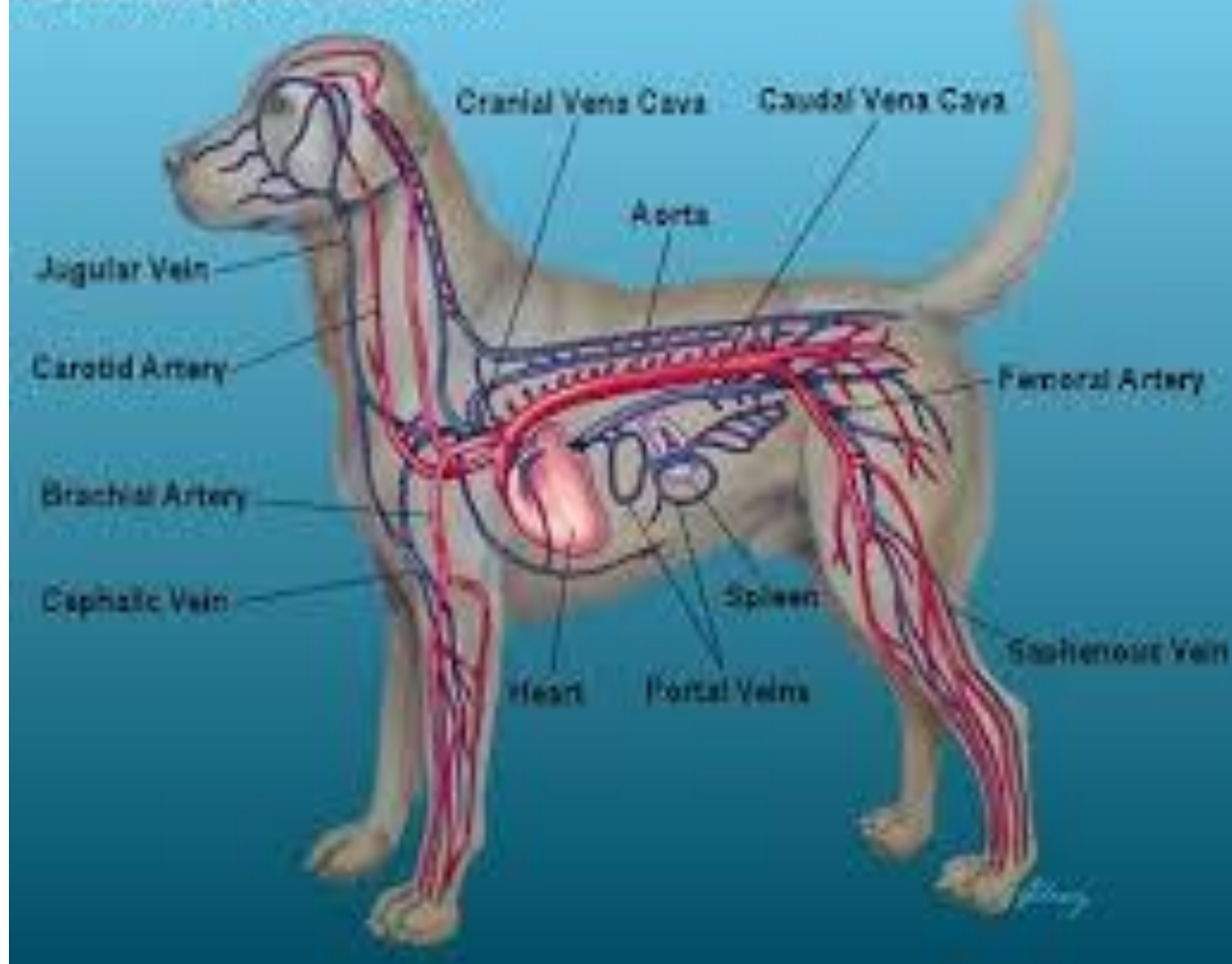


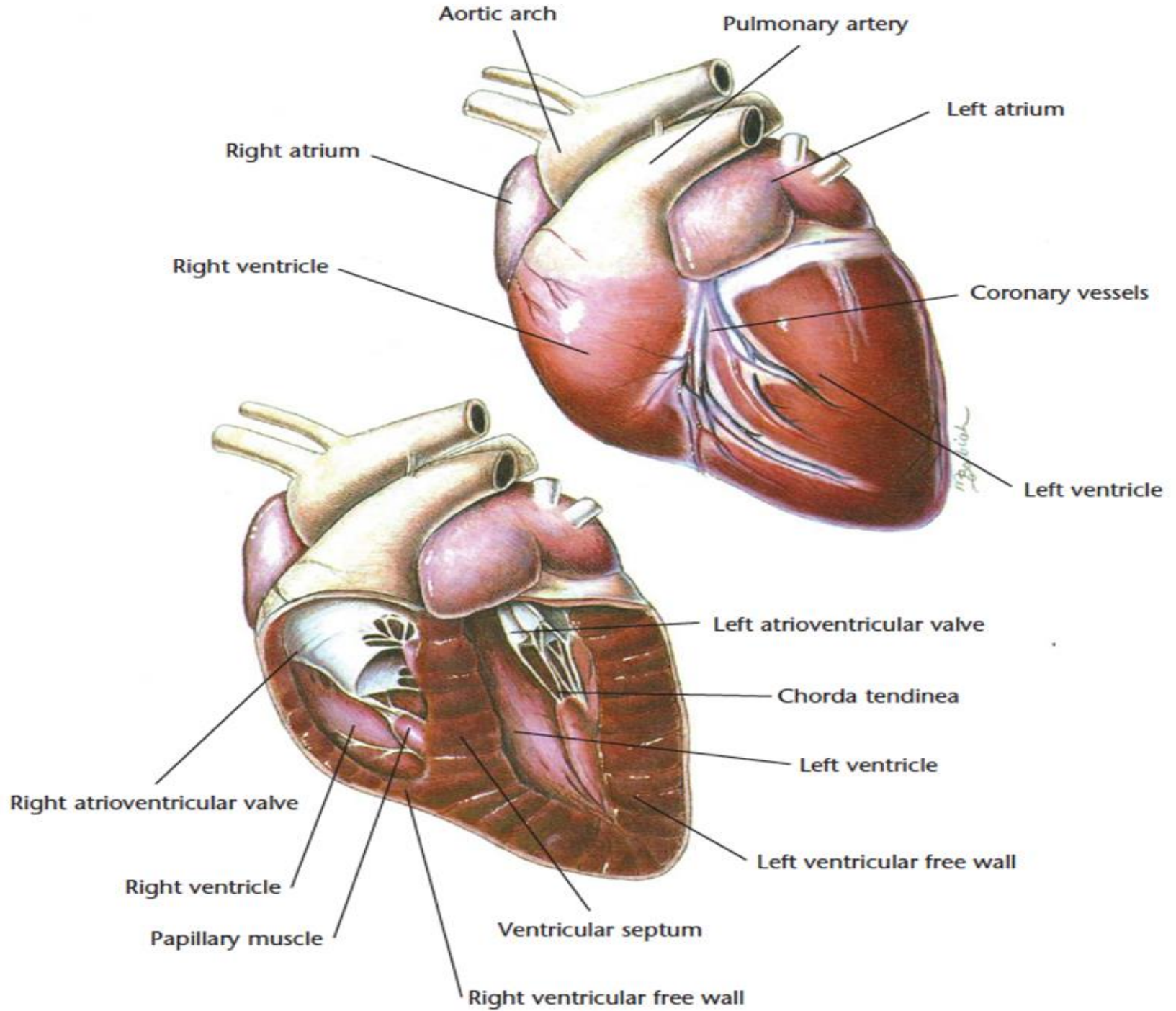


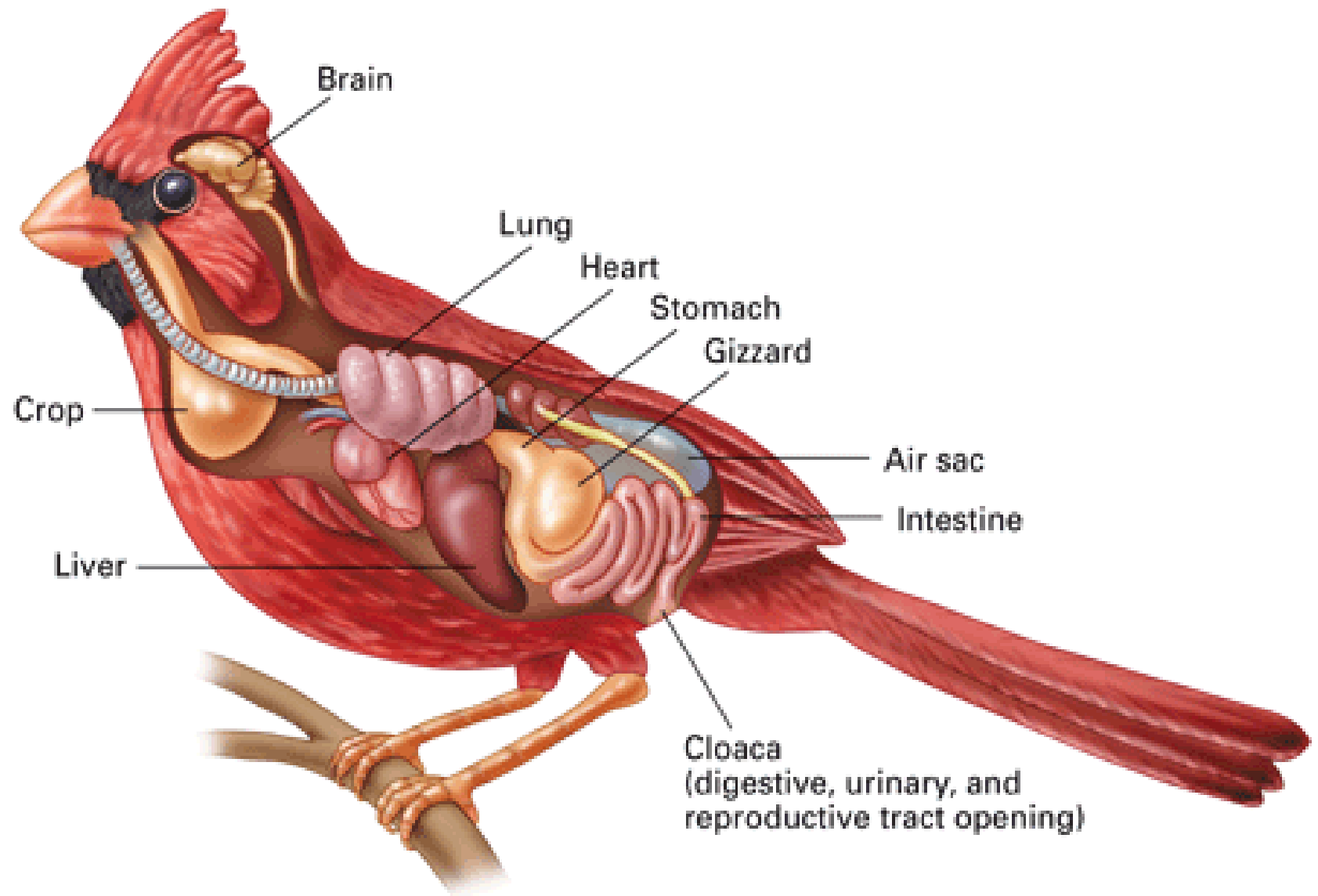


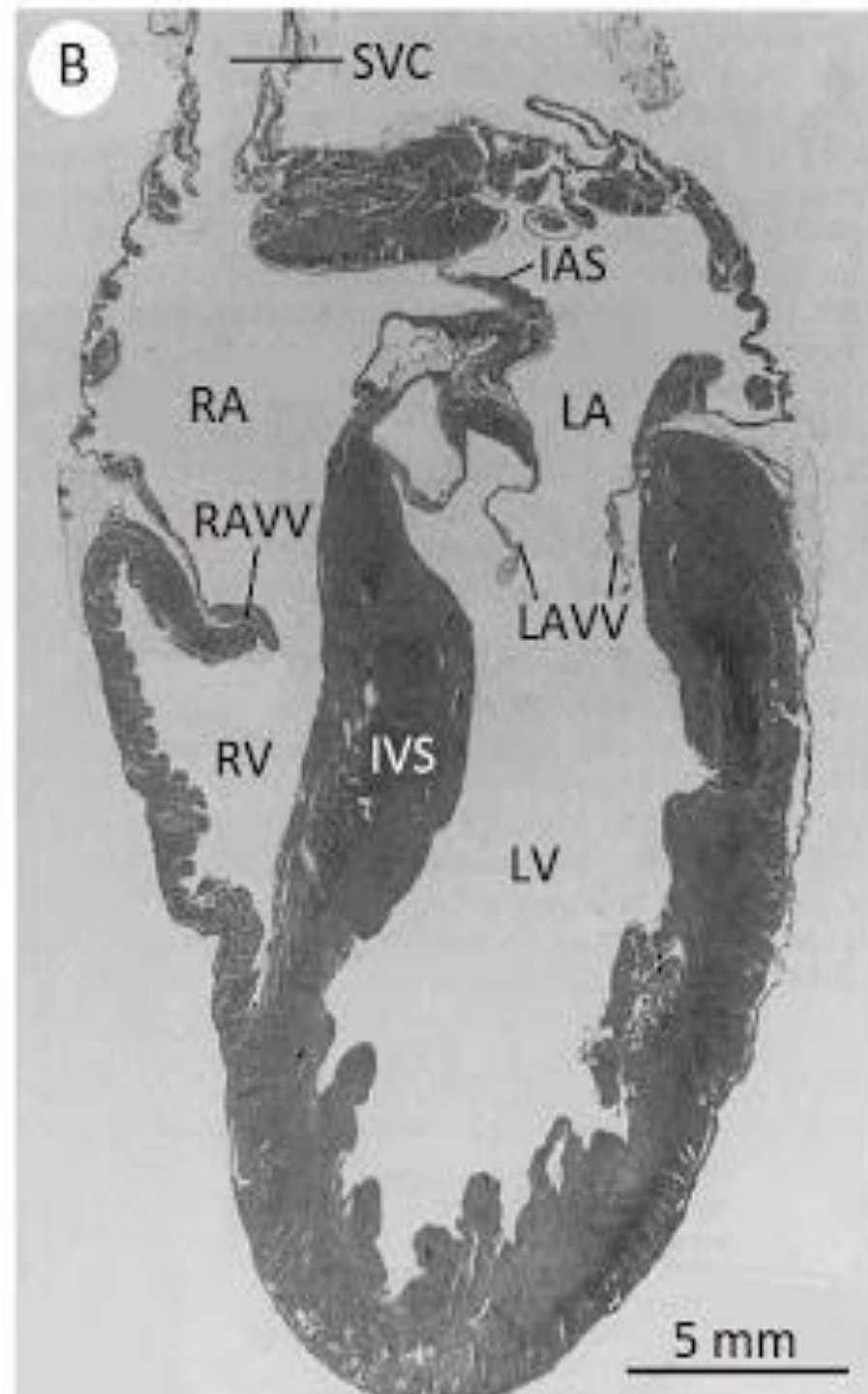
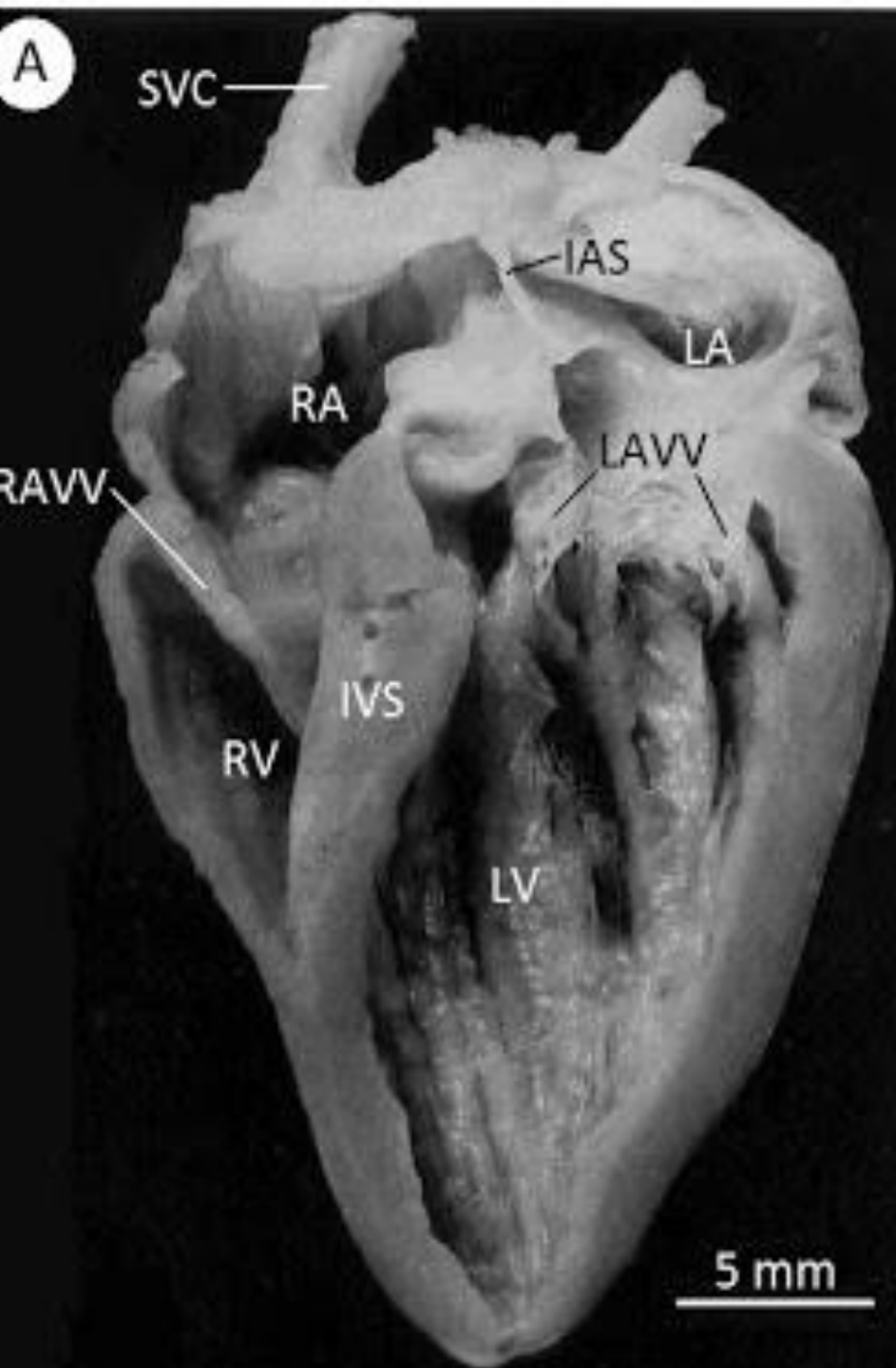


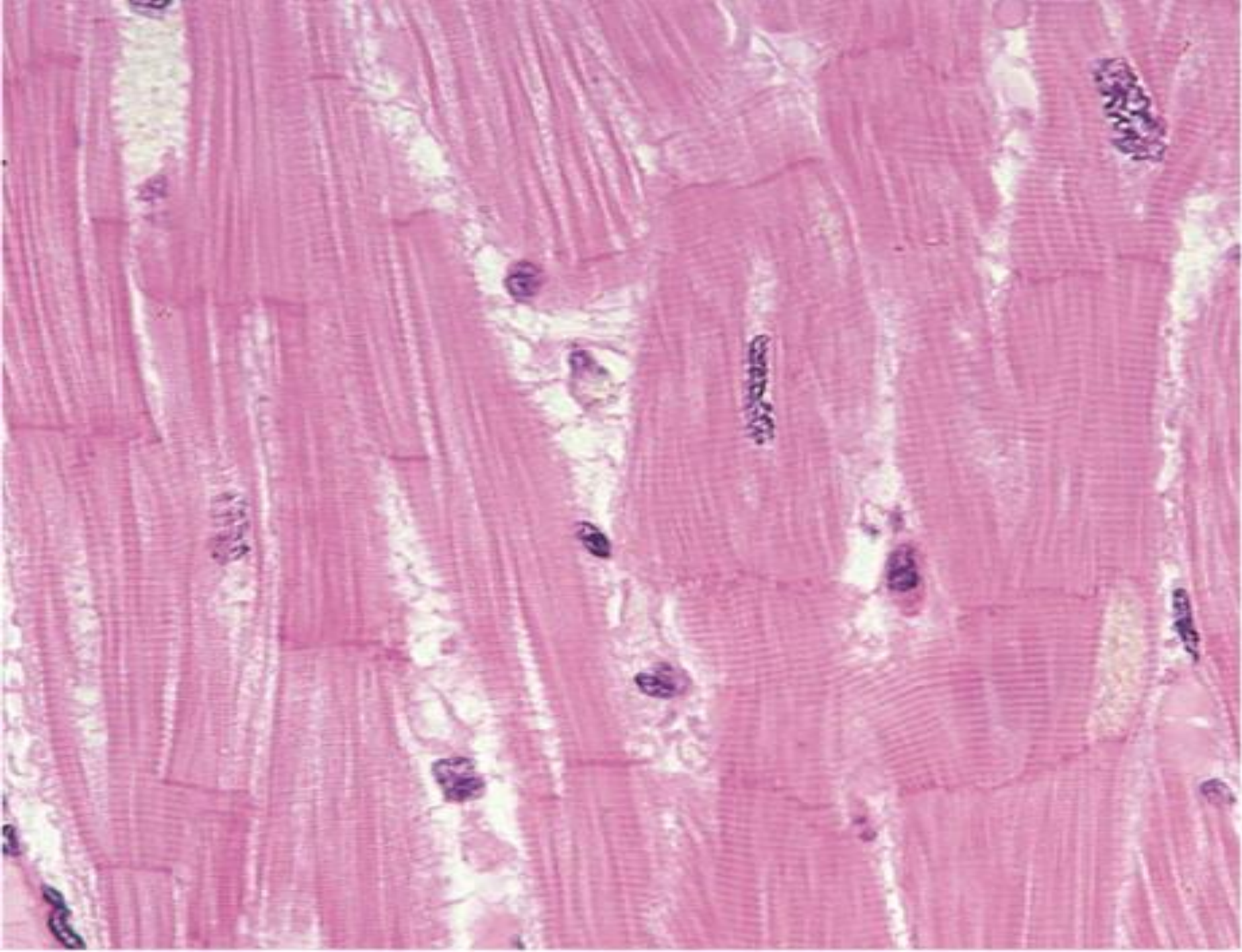
Heart and Blood Vessels











فیزیولوژی دو، جلسه دوم:

چرخه قلبی و شرح کامل وقایع آن

صداهاى قلبی

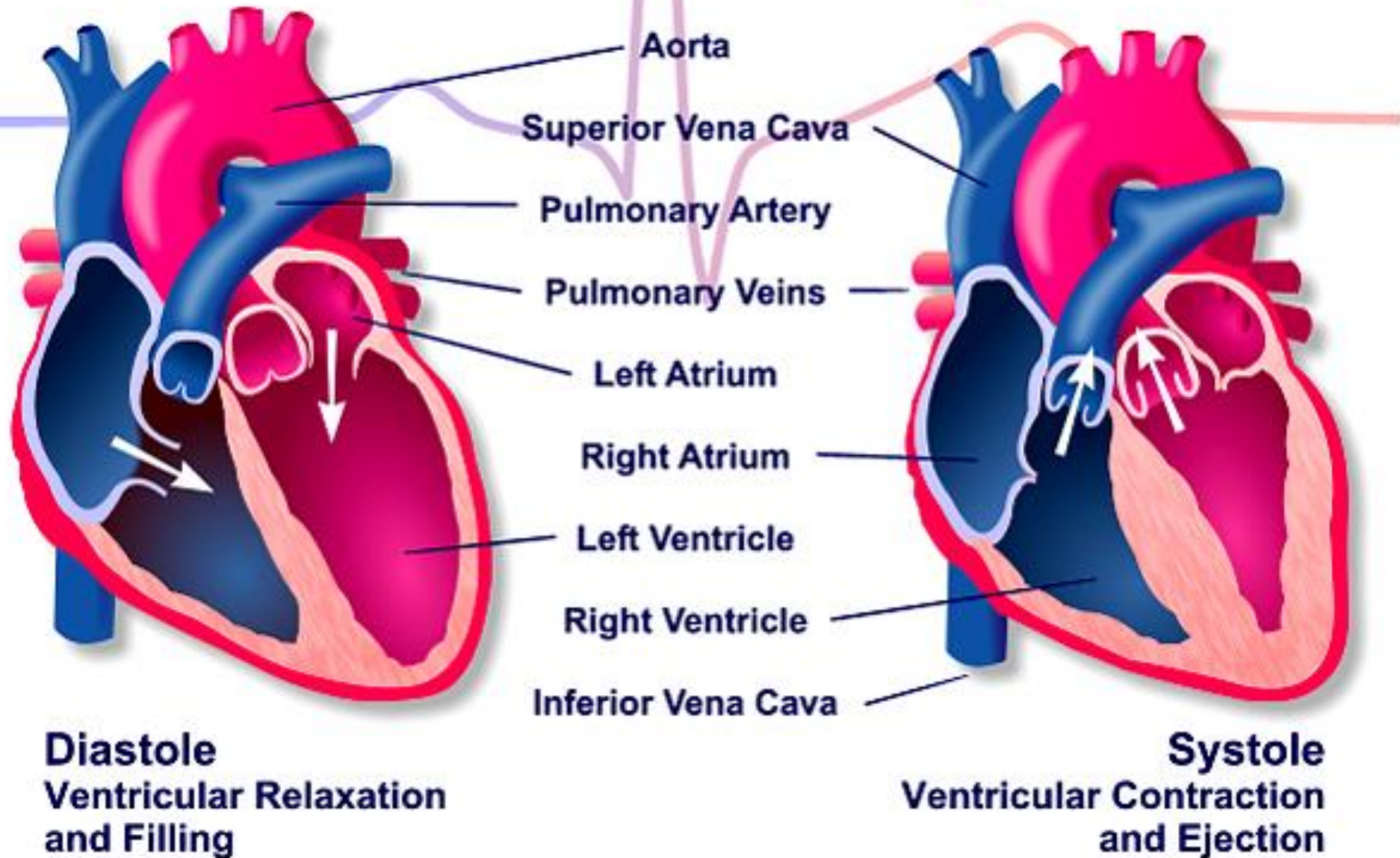
حجم های ضربه ای، پایان دیاستولی و سیستولی، کسر
تخلیه

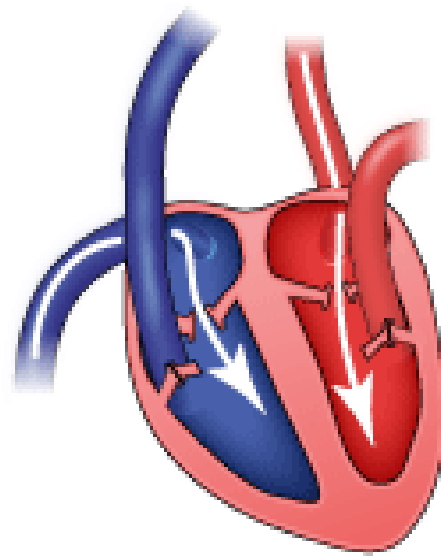
برون ده قلبی و بازگشت وریدی

قانون فرانک و استارلینگ

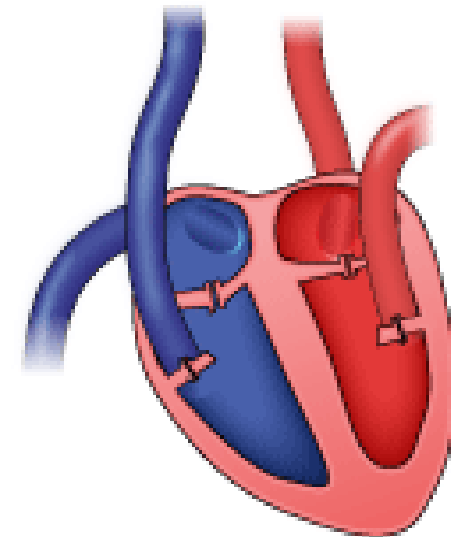
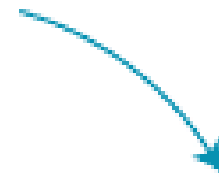
نقش دستگاه عصبی خودمختار در تنظیم فعالیت قلب

The Cardiac Cycle

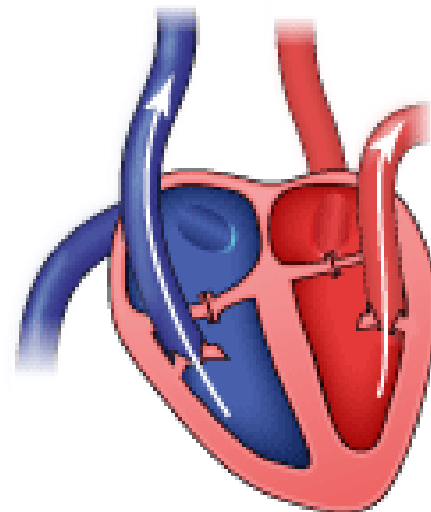
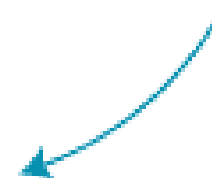




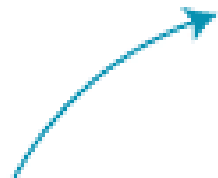
Atrial systole



Isovolumic
ventricular
contraction

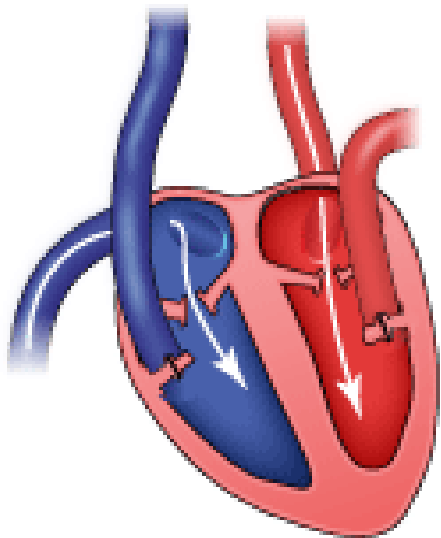
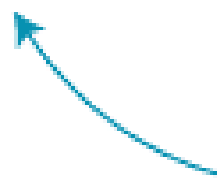


Ventricular
systole



1

Ventricular
diastole

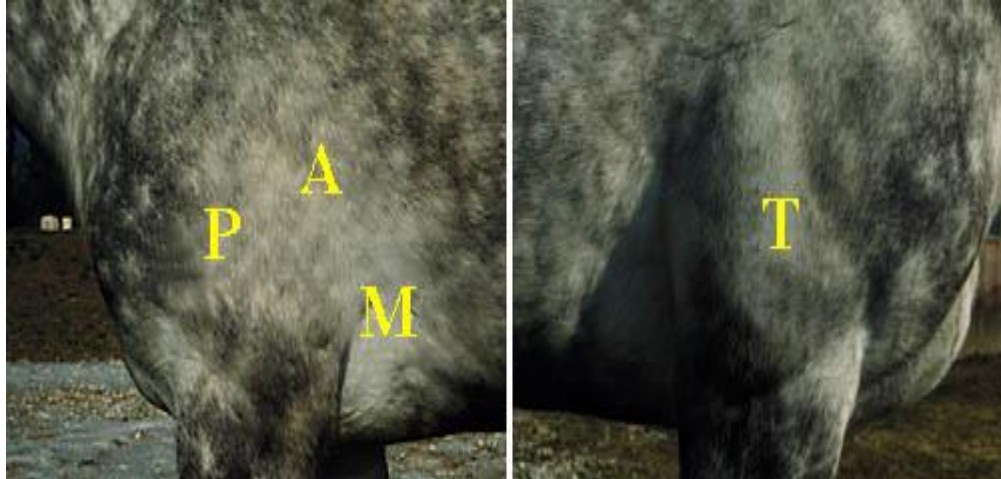




Laminar Flow



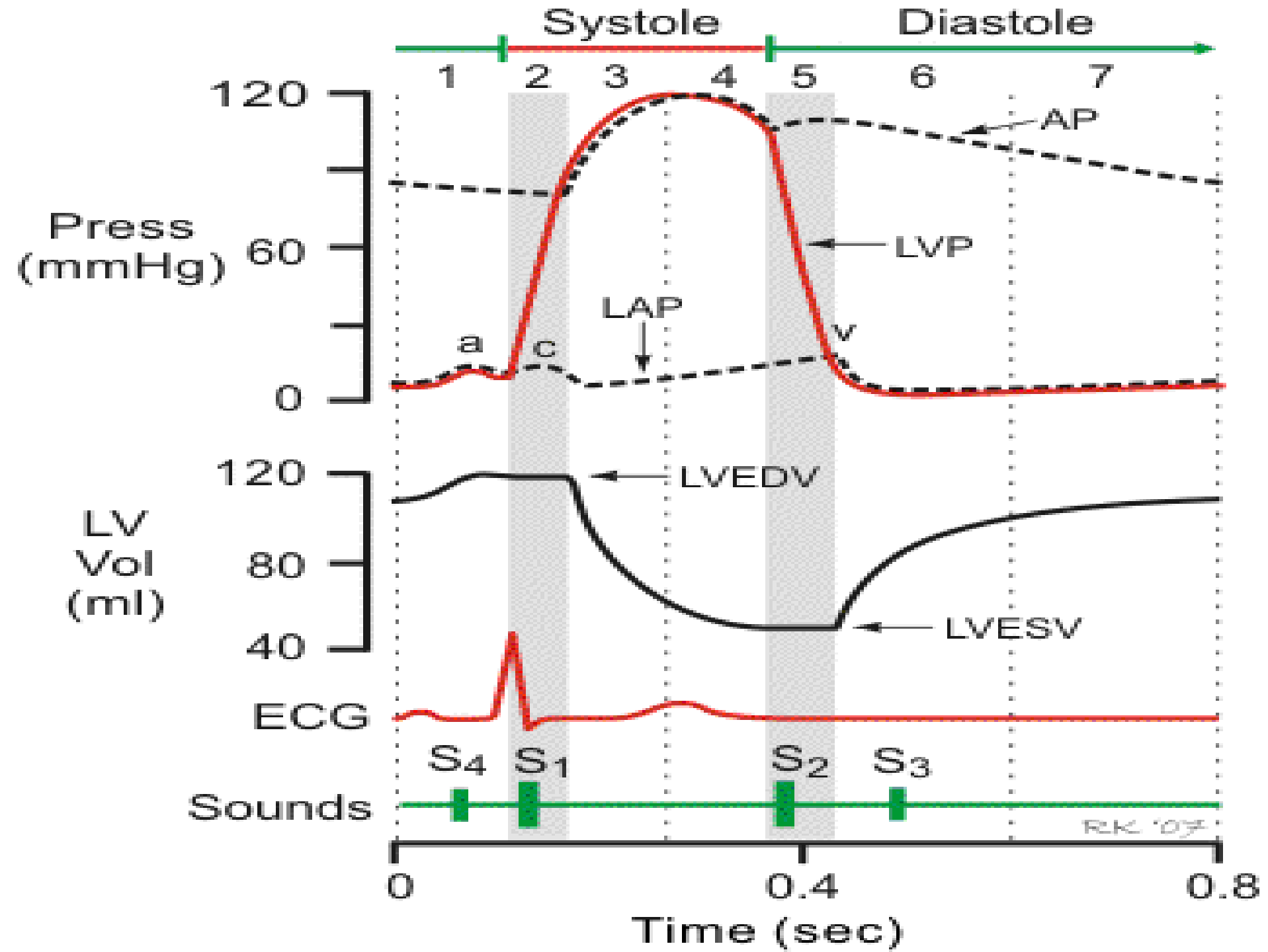
Turbulent Flow

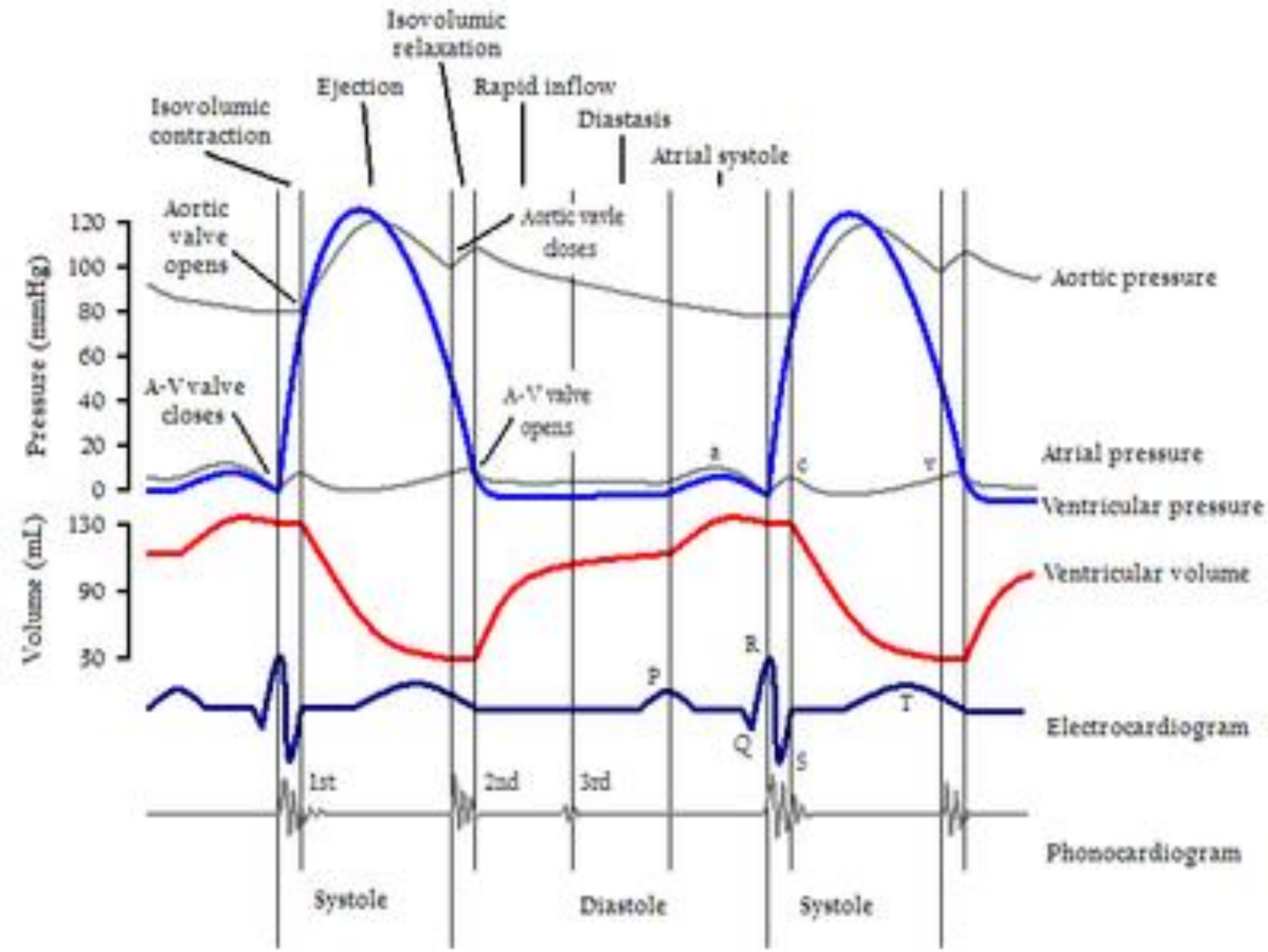


فیزیولوژی دو، جلسه سوم:

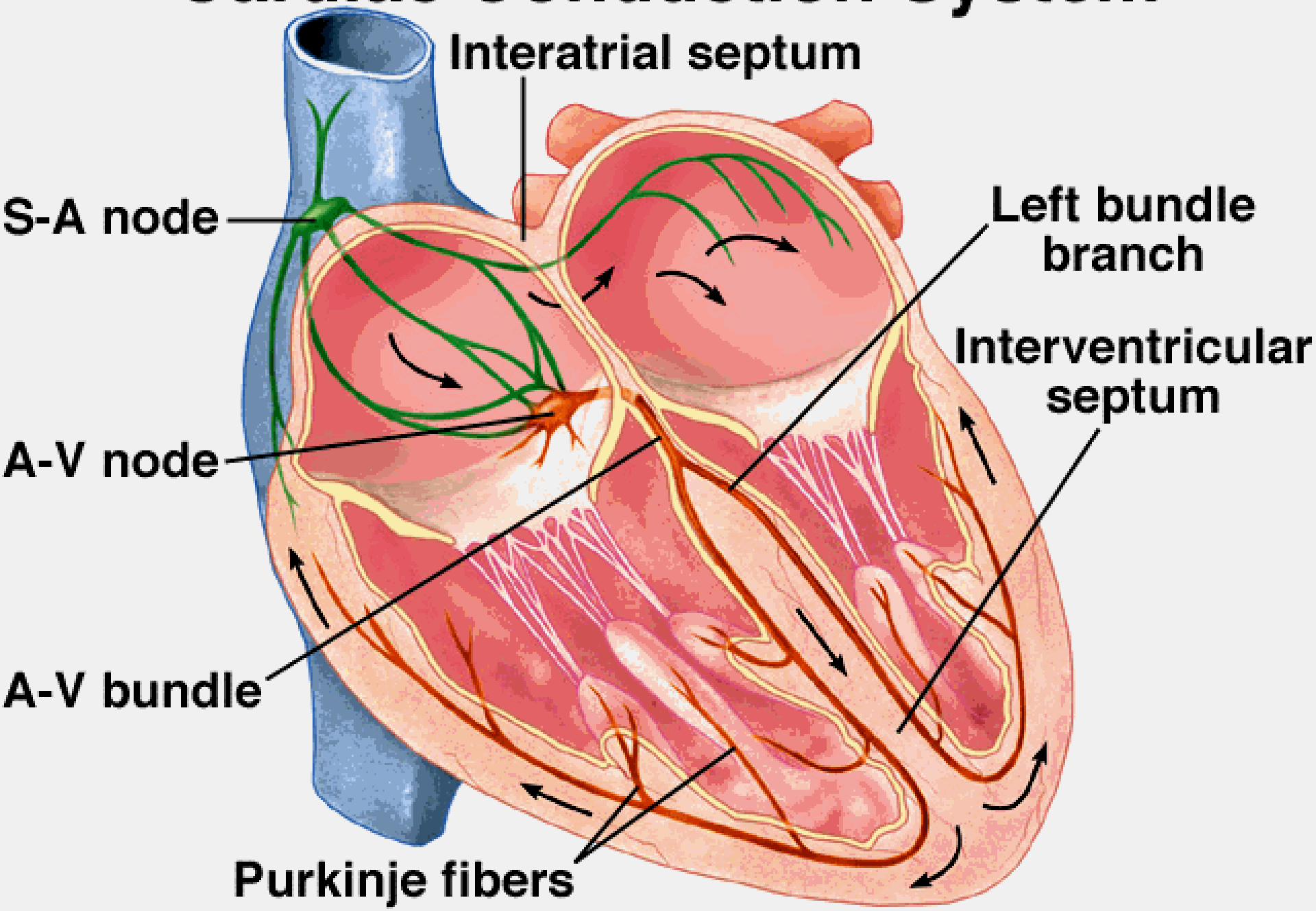
تفسیر منحنی های حجم و فشار در جریان چرخه قلبی

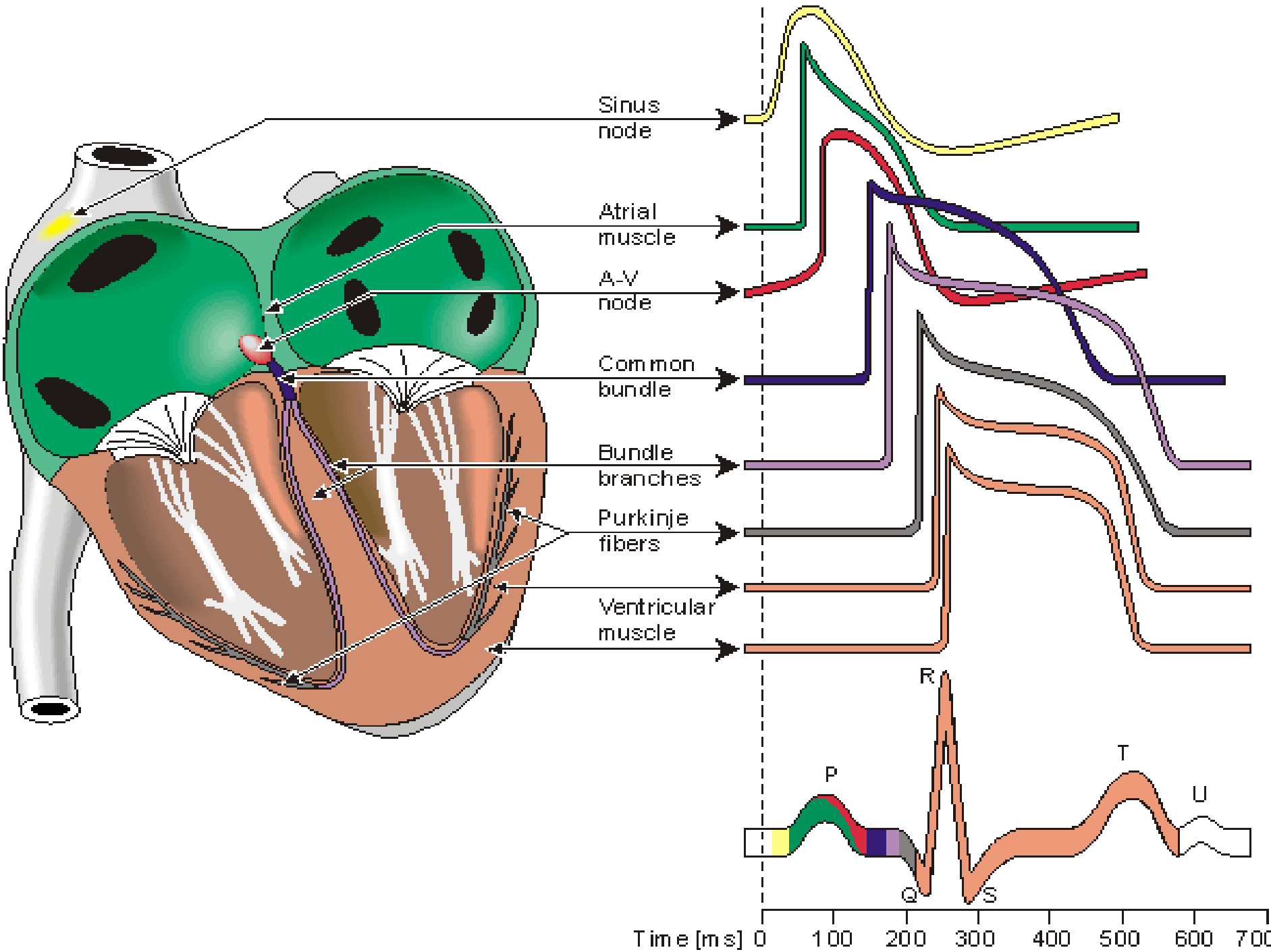
بافت تخصصی تحریکی و هدایتی قلب در پستانداران و پرندگان

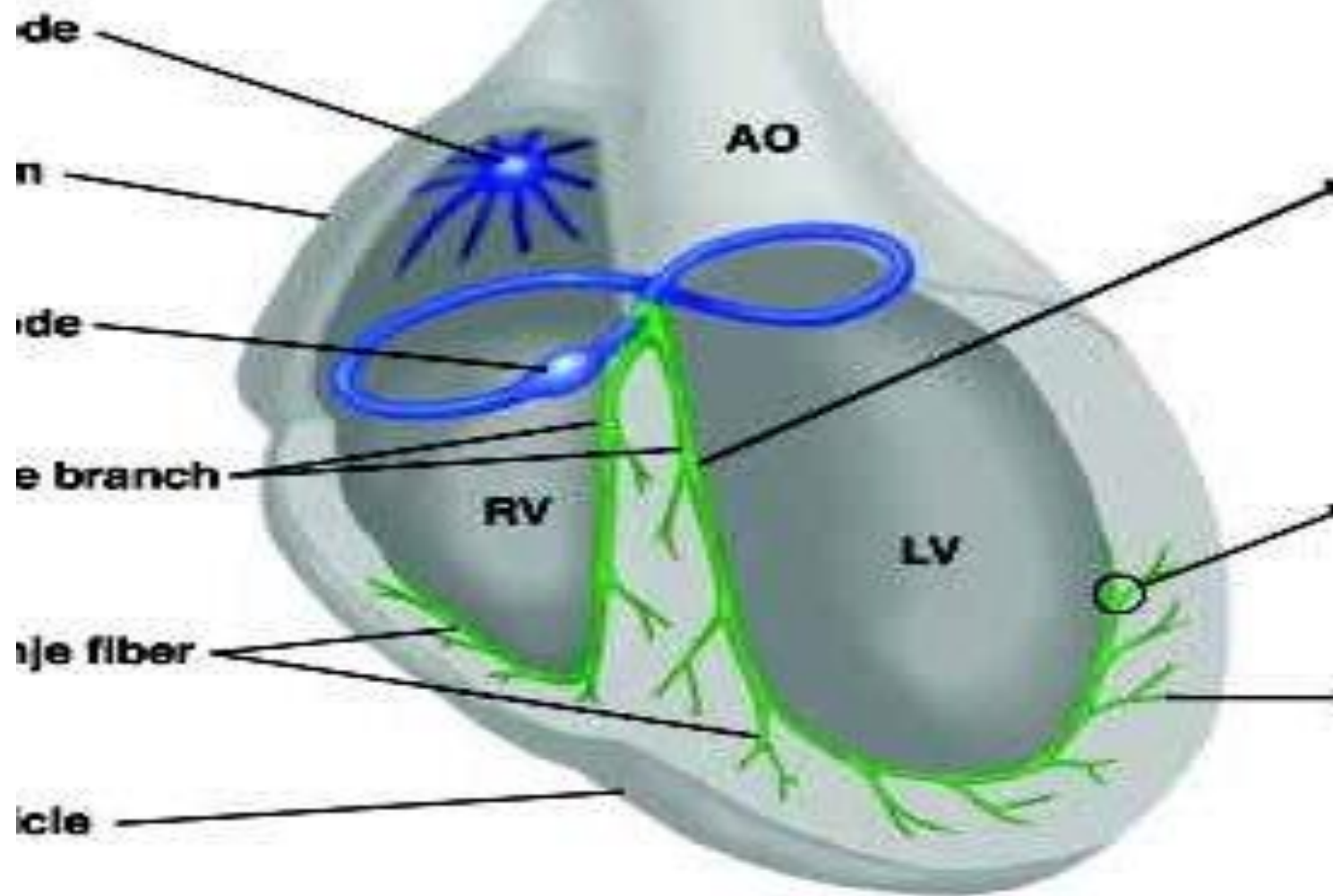




Cardiac Conduction System







فیزیولوژی دو، جلسه چهارم:

مبانی الکتروکاردیوگرافی

اشتقاق های دوقطبی و تقویت شده تک قطبی اندام ها و اشتقاق های سینه ای

اصول تفسیر الکتروکاردیوگرام

معرفی امواج، قطعات و فواصل طبیعی در الکتروکاردیوگرام

مقایسه الکتروکاردیوگرام طبیعی در پستانداران و پرندگان

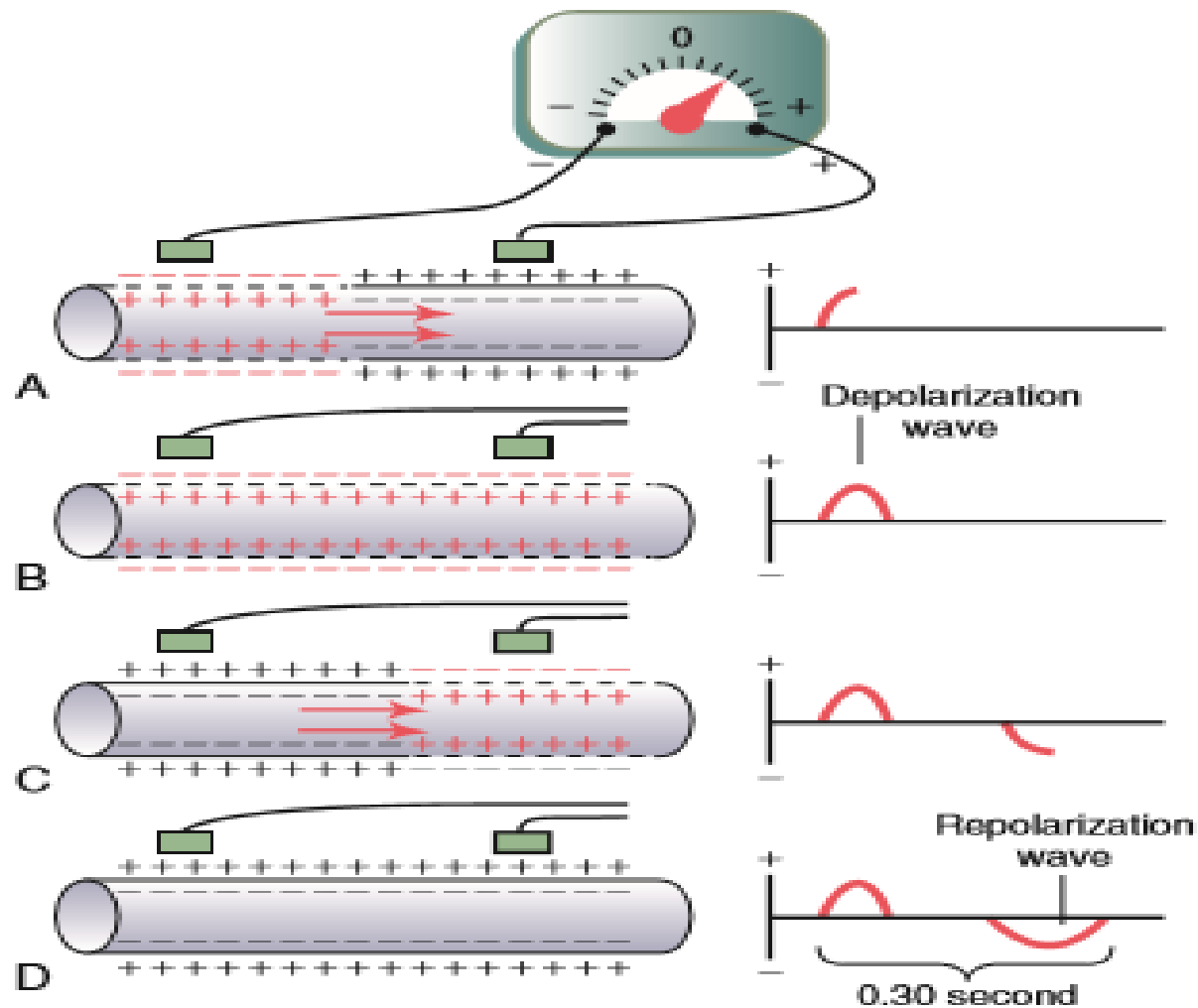
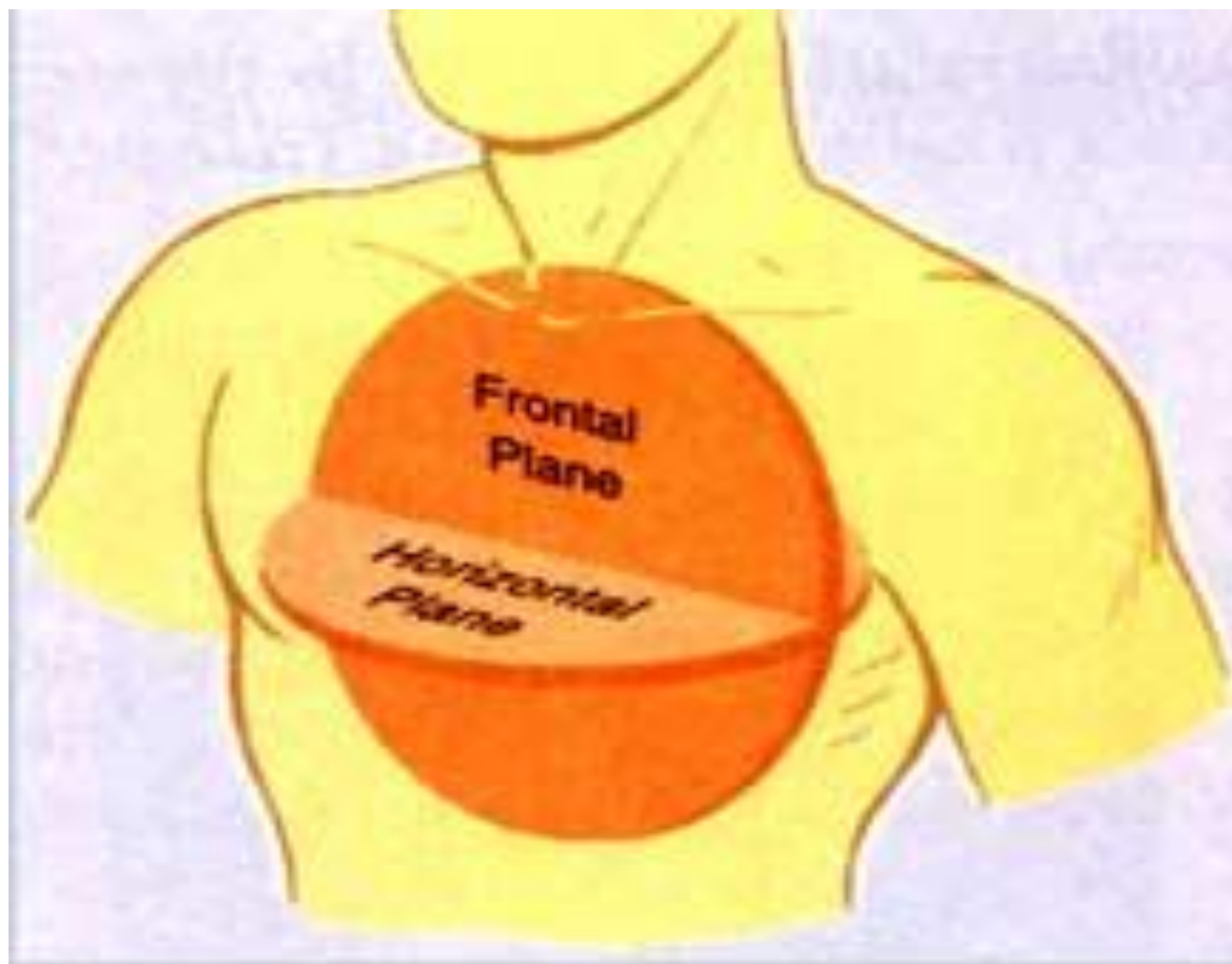
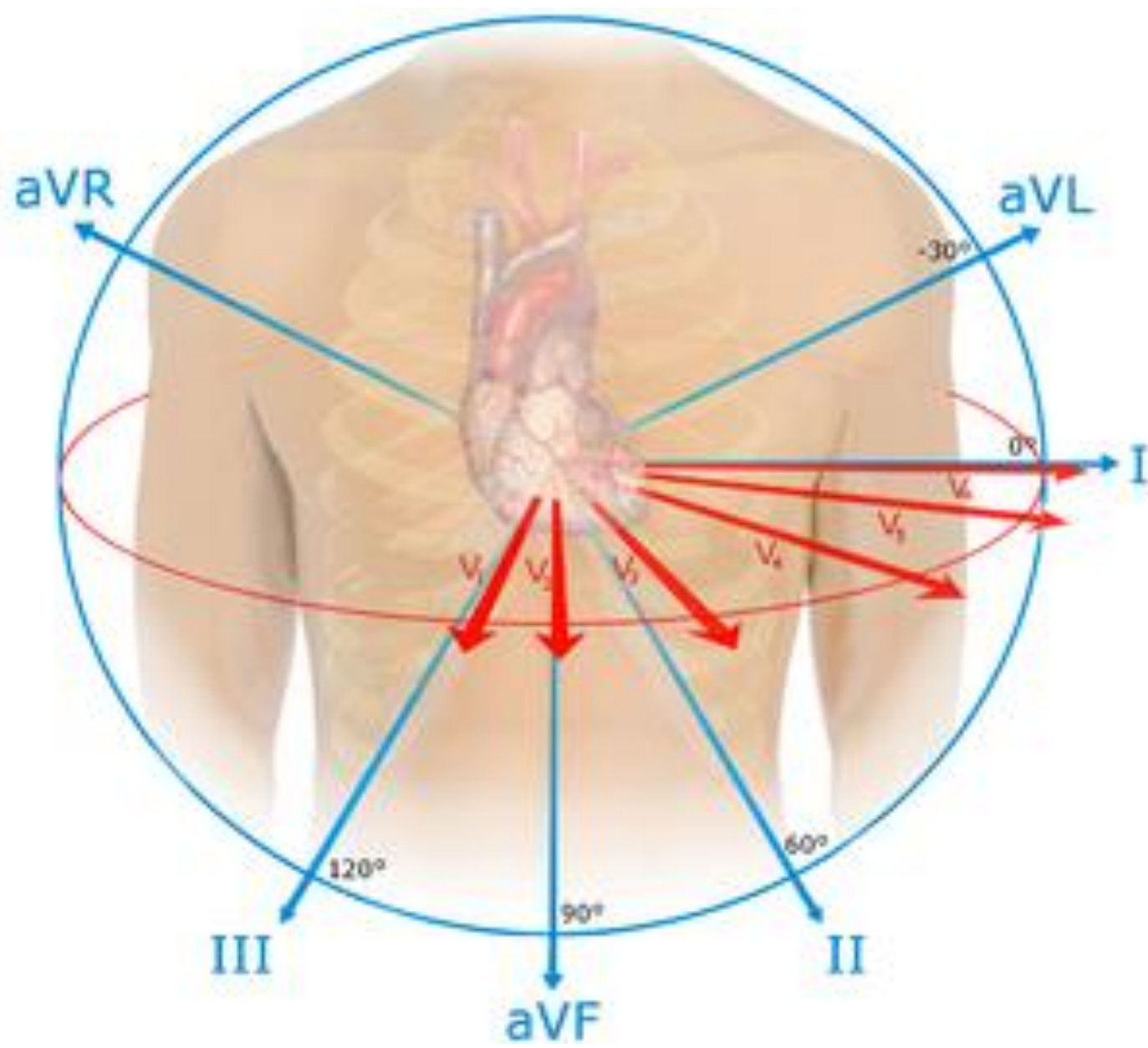


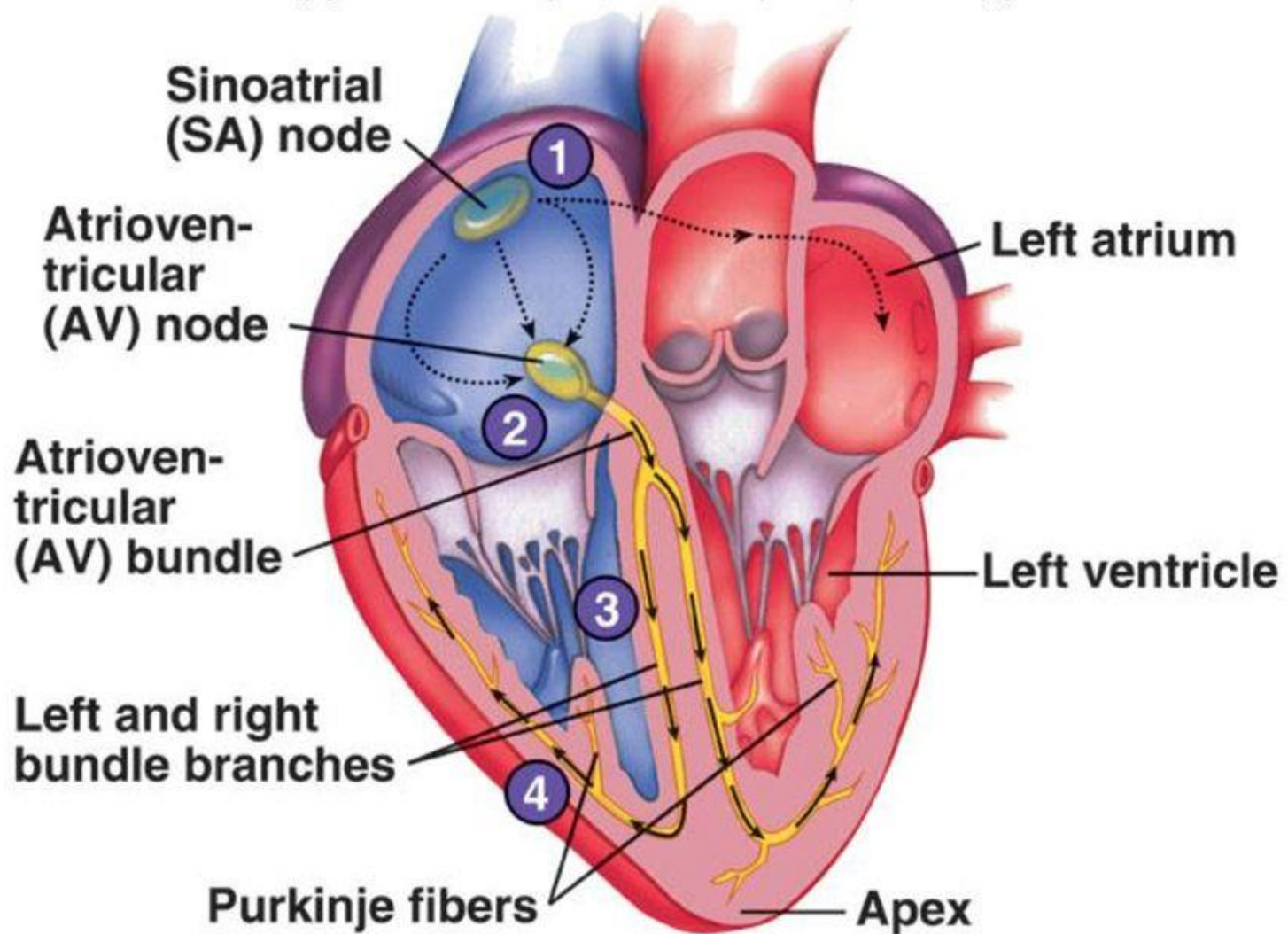
Figure 11-2. Recording the depolarization wave (**A** and **B**) and the repolarization wave (**C** and **D**) from a cardiac muscle fiber.

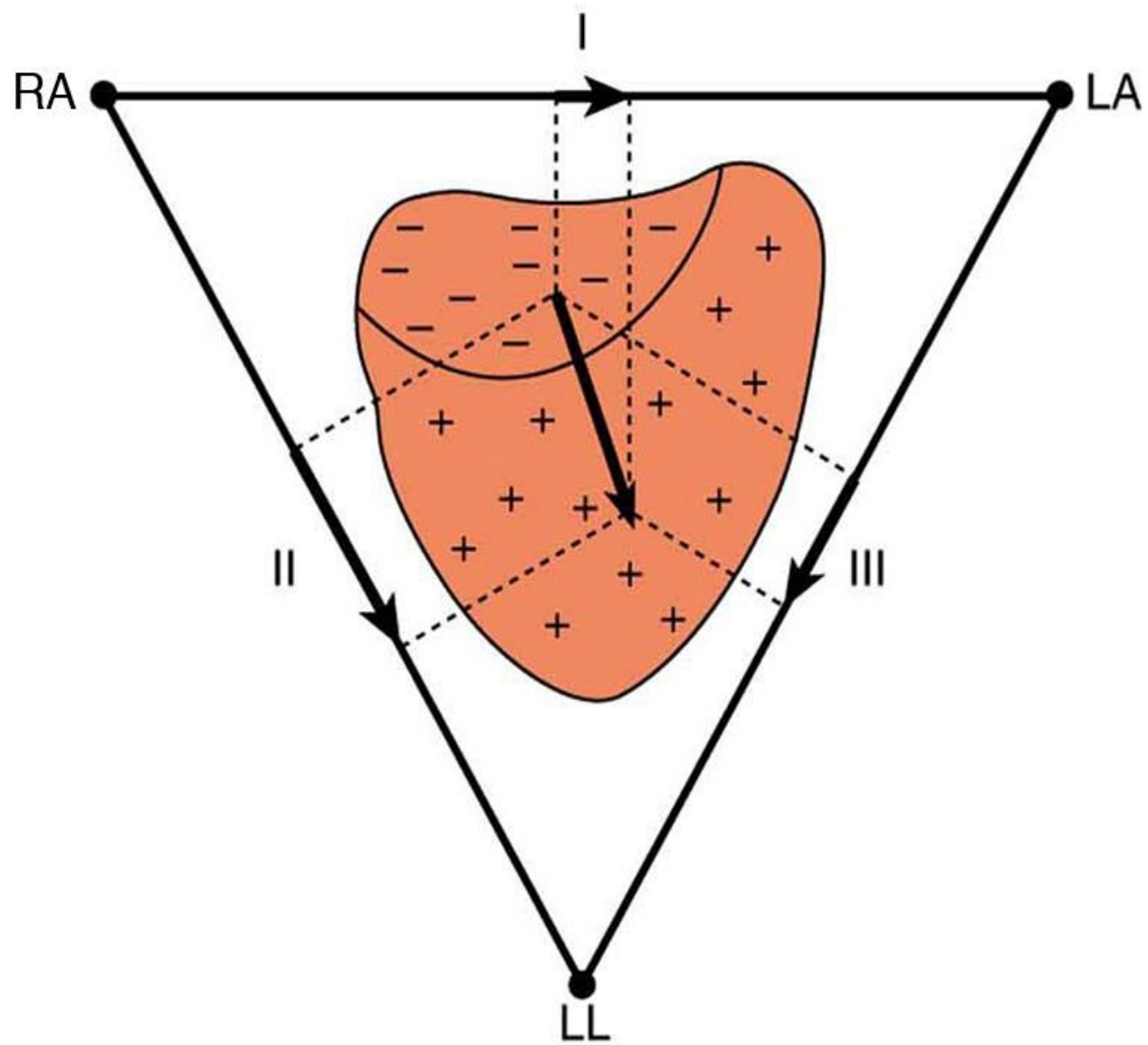


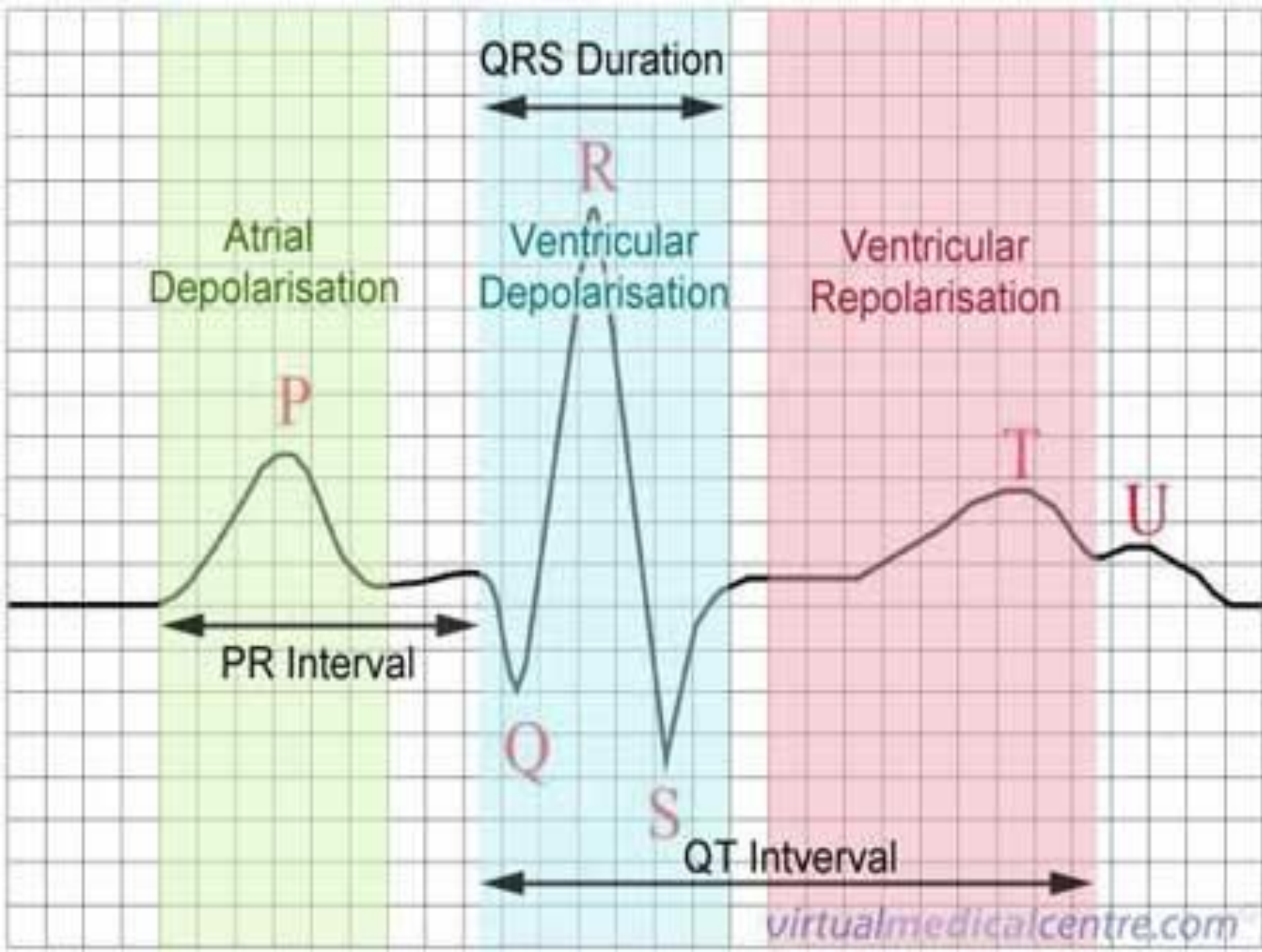


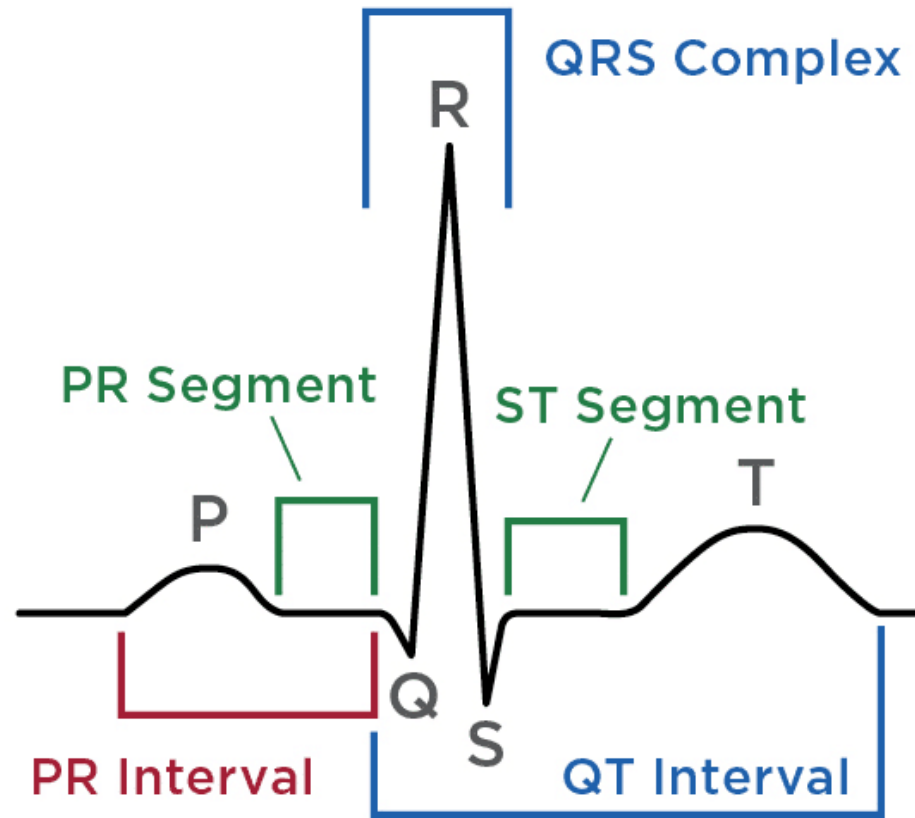
Conducting System of Heart

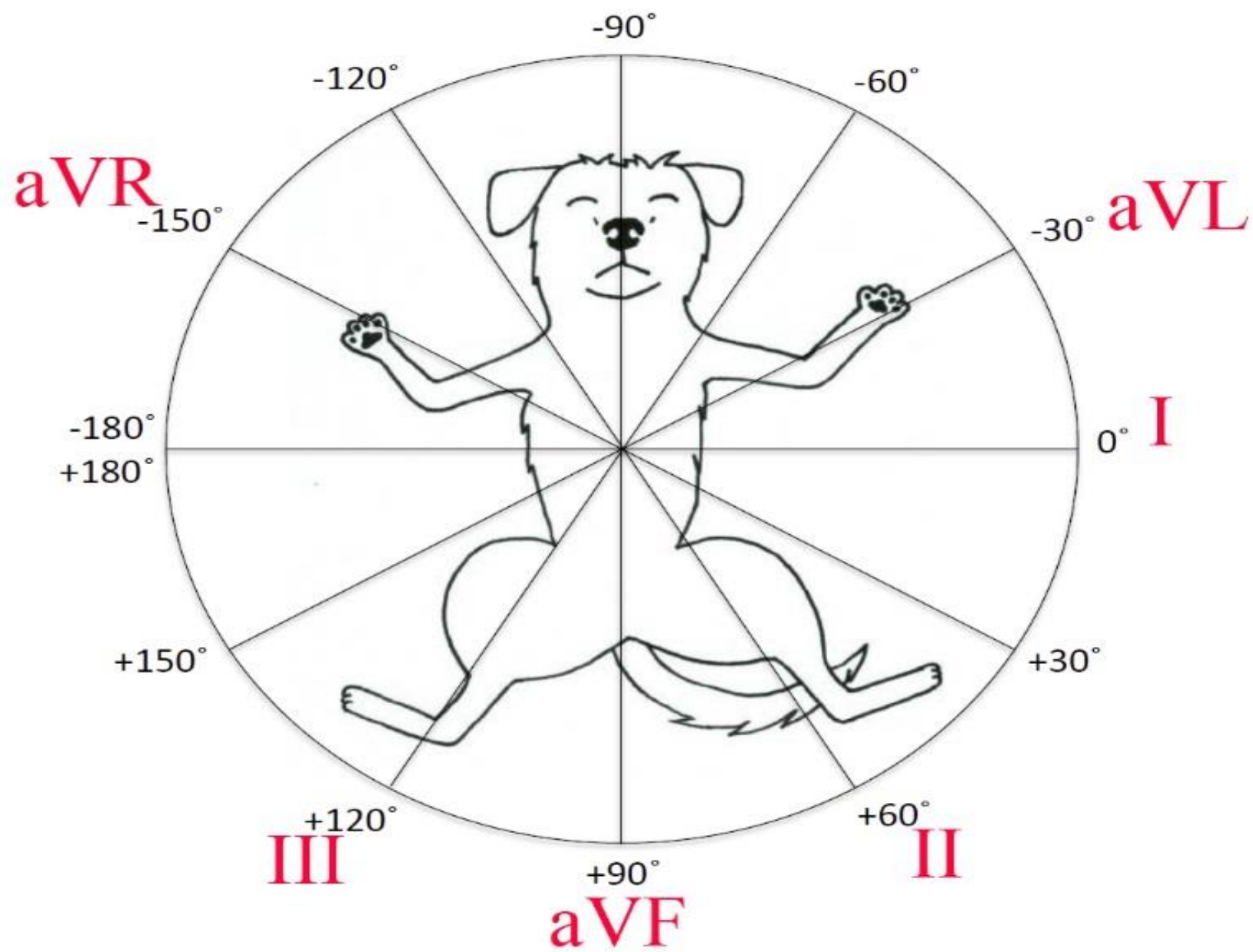
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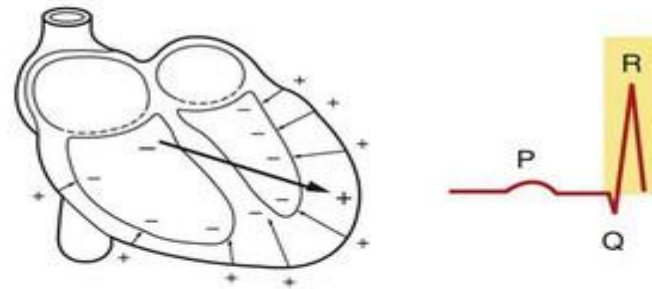
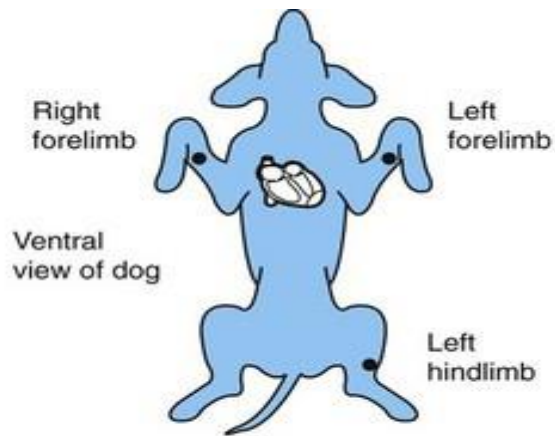




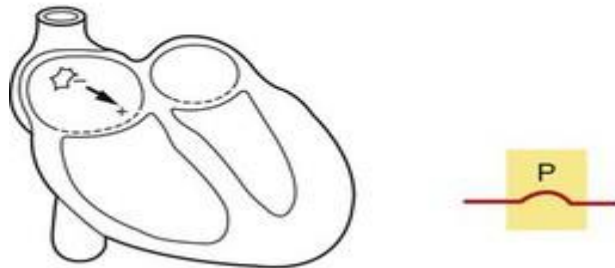








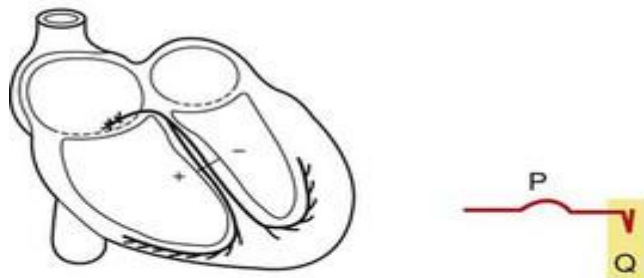
C Ventricular depolarization



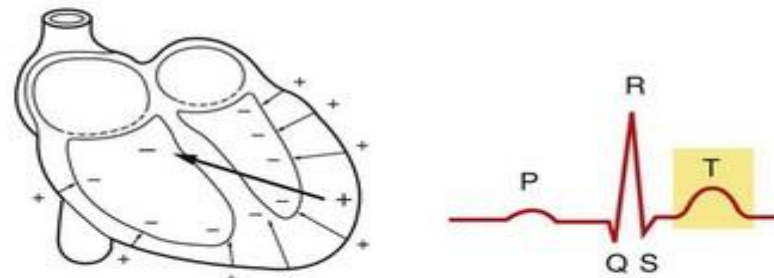
A Atrial depolarization



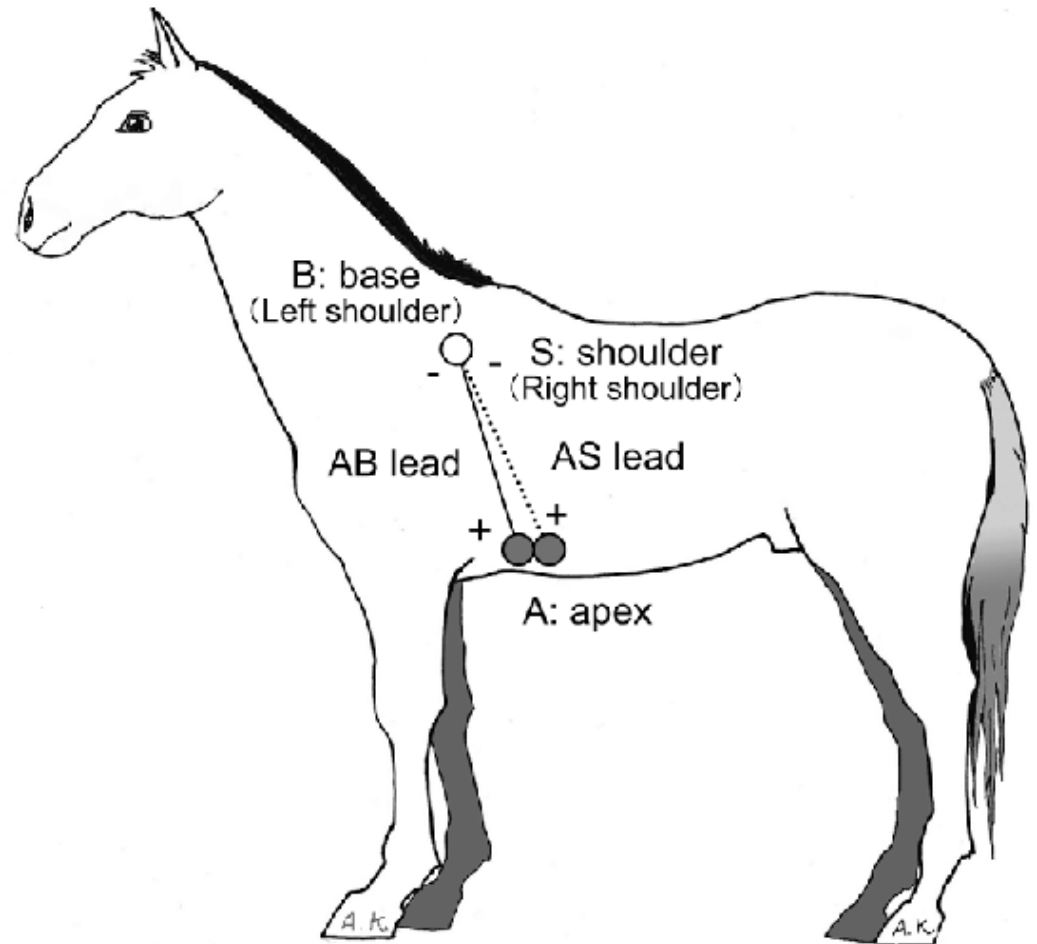
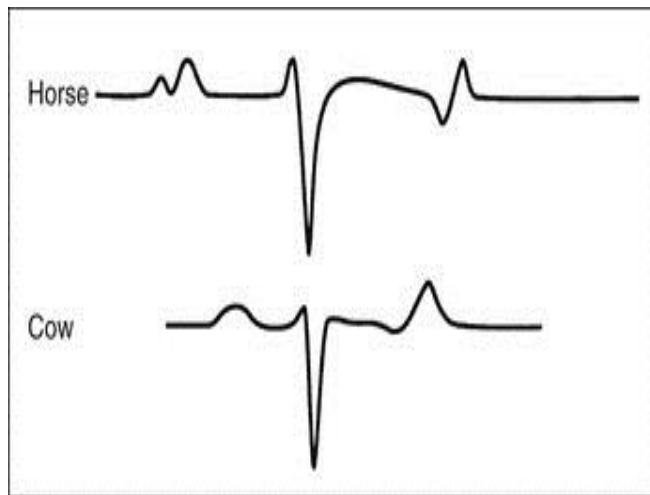
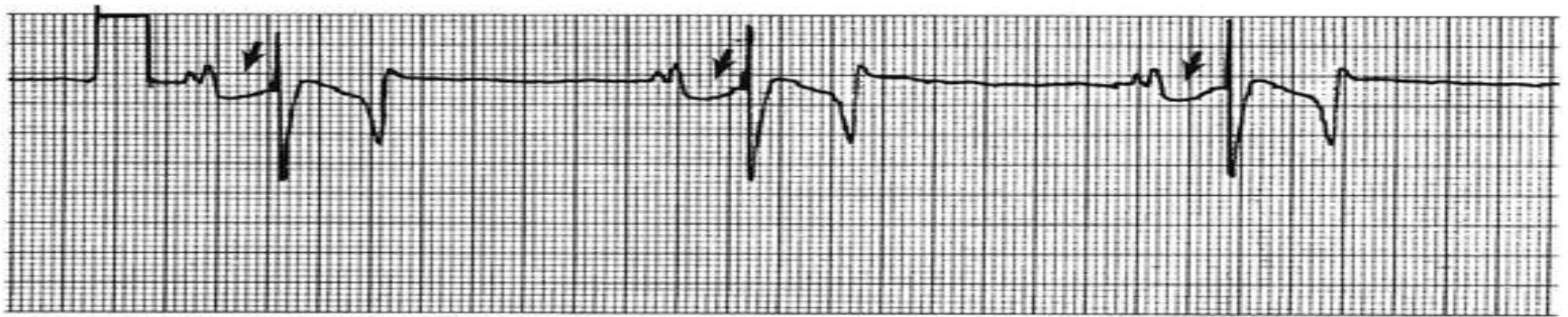
D Late ventricular depolarization



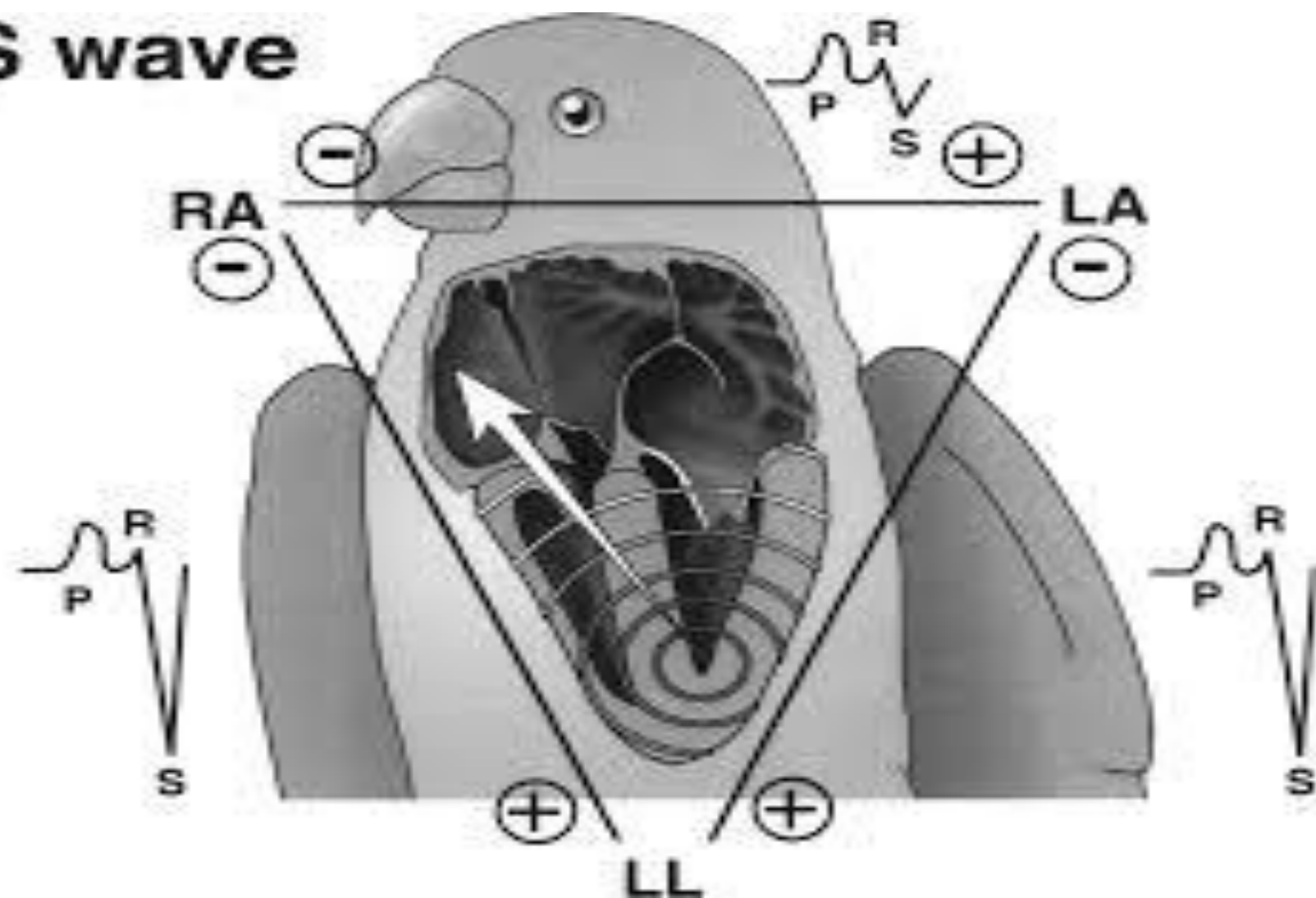
B Early ventricular depolarization

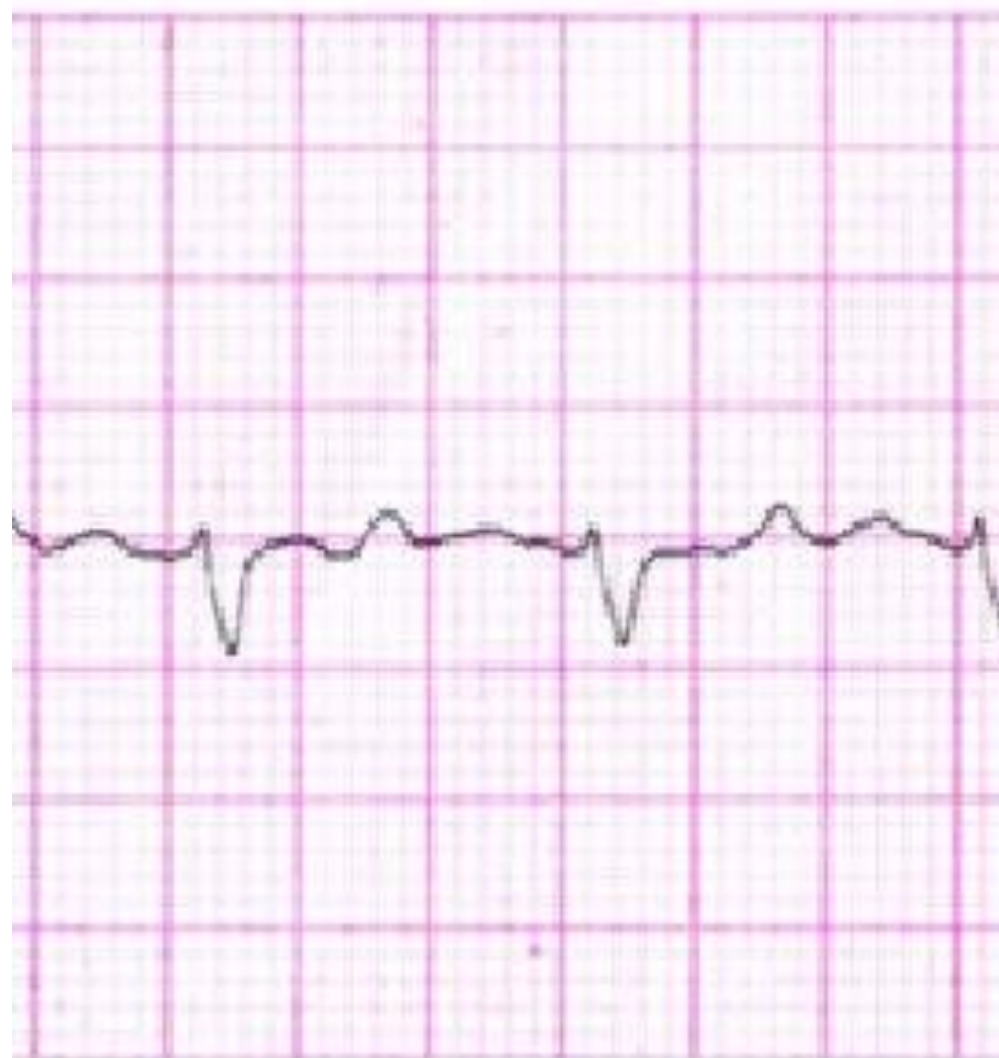


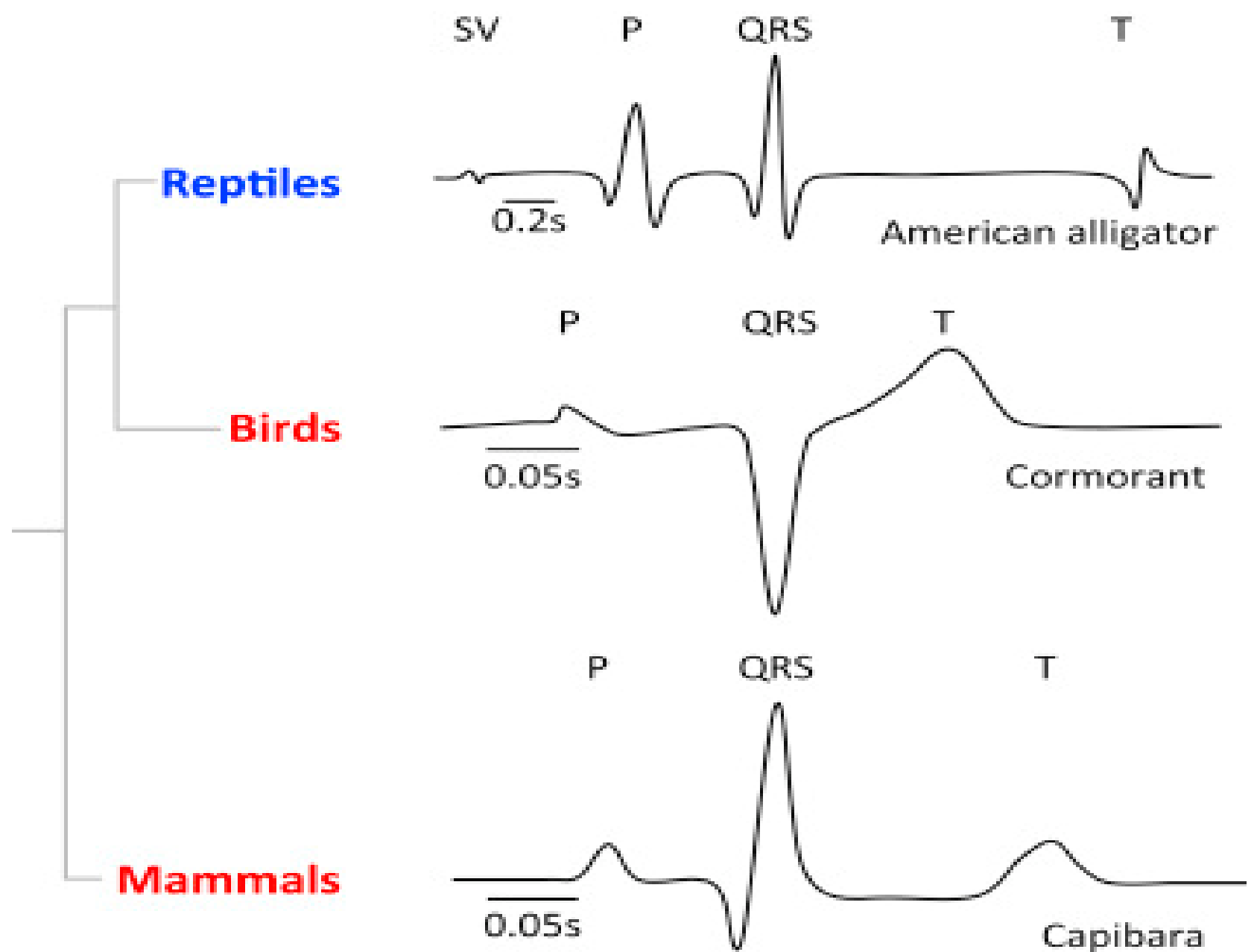
E Ventricular repolarization



S wave







فیزیولوژی دو، جلسه پنجم:

کاربردهای الکتروکاردیوگرافی

تفسیر الکتروکاردیوگرافیک در:

تاکی کاردی و برادی کاردی سینوسی

اکستراسیستول های دهلیزی و بطنی

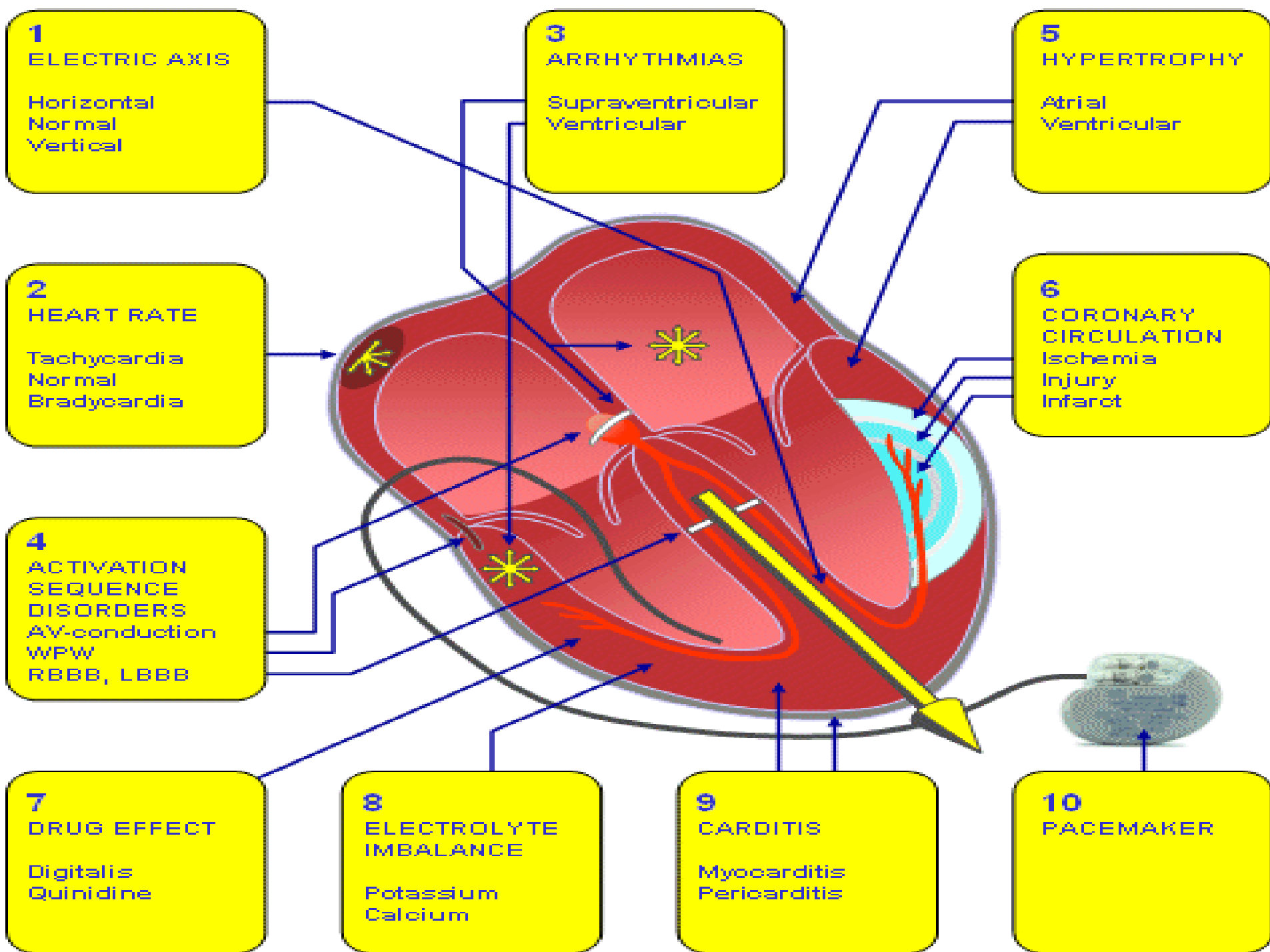
فلوتر و فیبریلاسیون دهلیزی

تاکی کاردی و فیبریلاسیون بطنی

بلوک های دهلیزی-بطنی

بلوک های شاخه ای چپ و راست

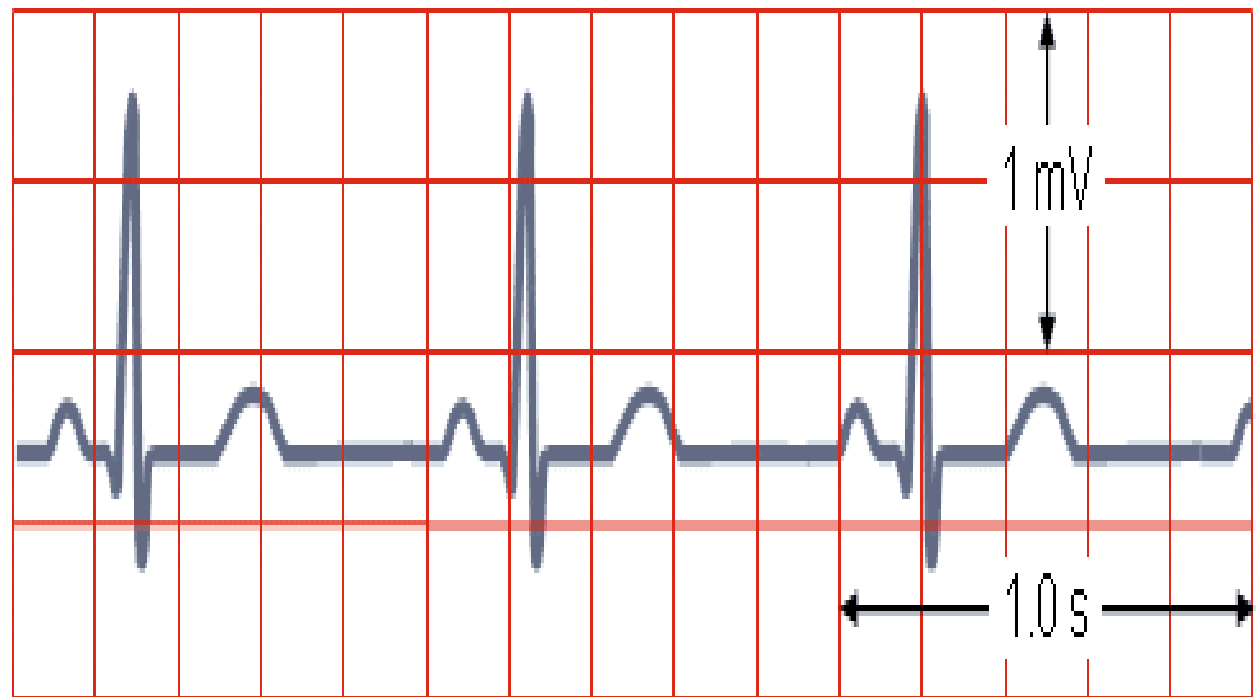
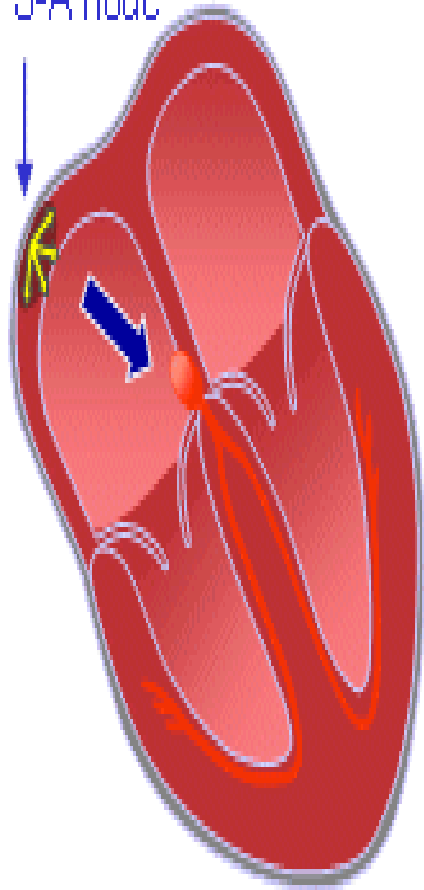
هیپرتروفی های دهلیزی و بطنی



NORMAL SINUS RHYTHM

Impulses originate at S-A node at normal rate

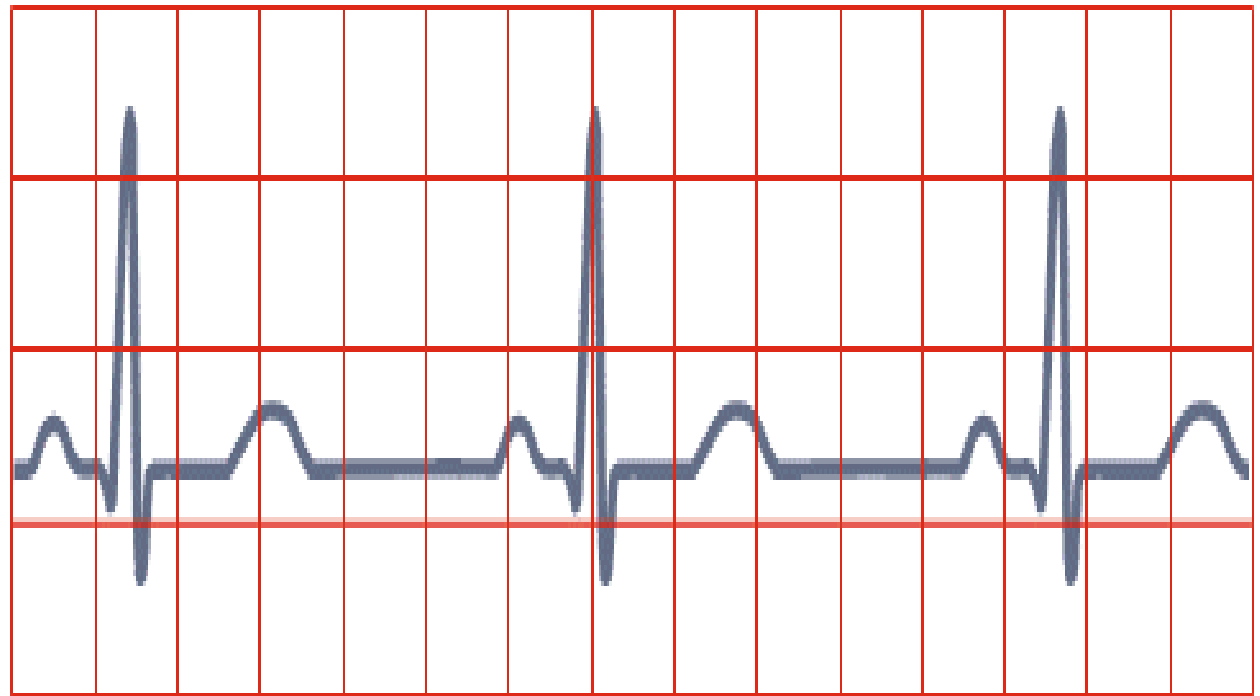
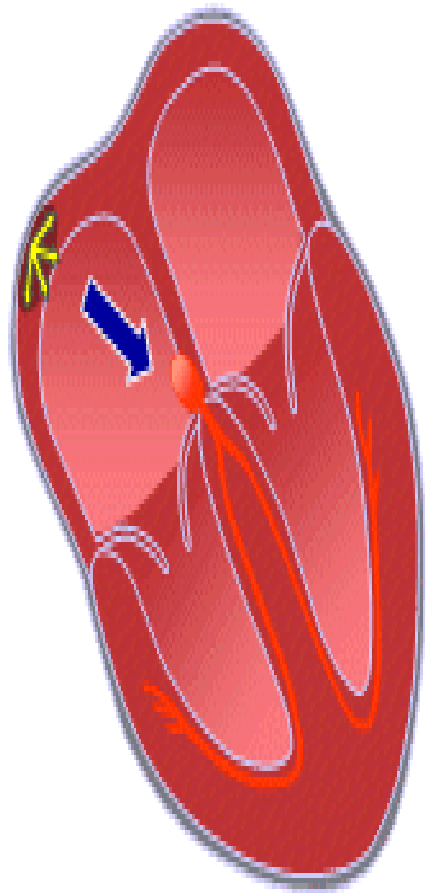
S-A node



All complexes normal, evenly spaced. Rate 60 – 100/min.

SINUS BRADYCARDIA

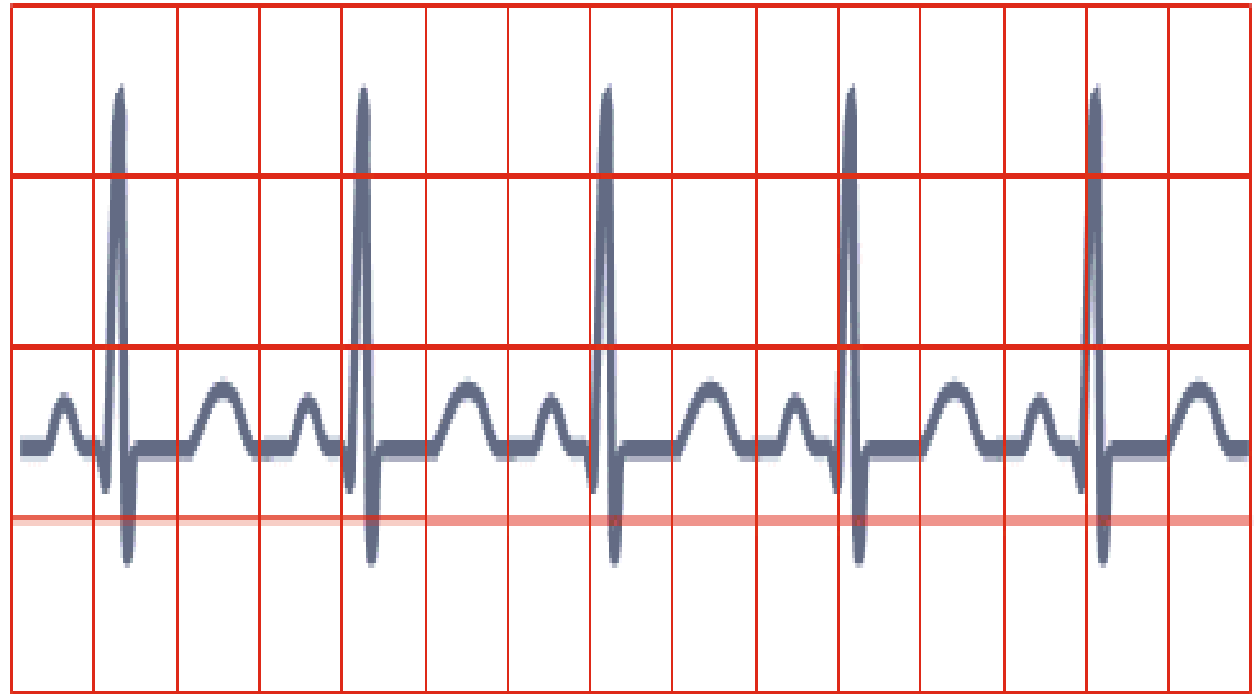
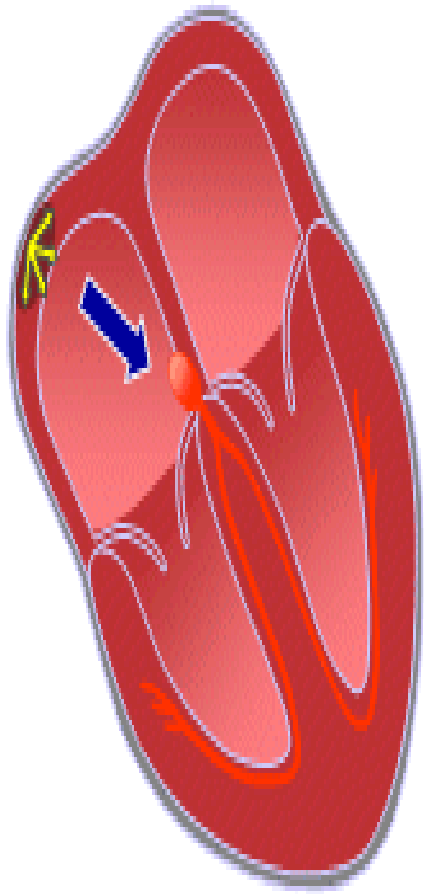
Impulses originate at S-A node at slow rate



All complexes normal, evenly spaced. Rate $< 60/\text{min}$.

SINUS TACHYCARDIA

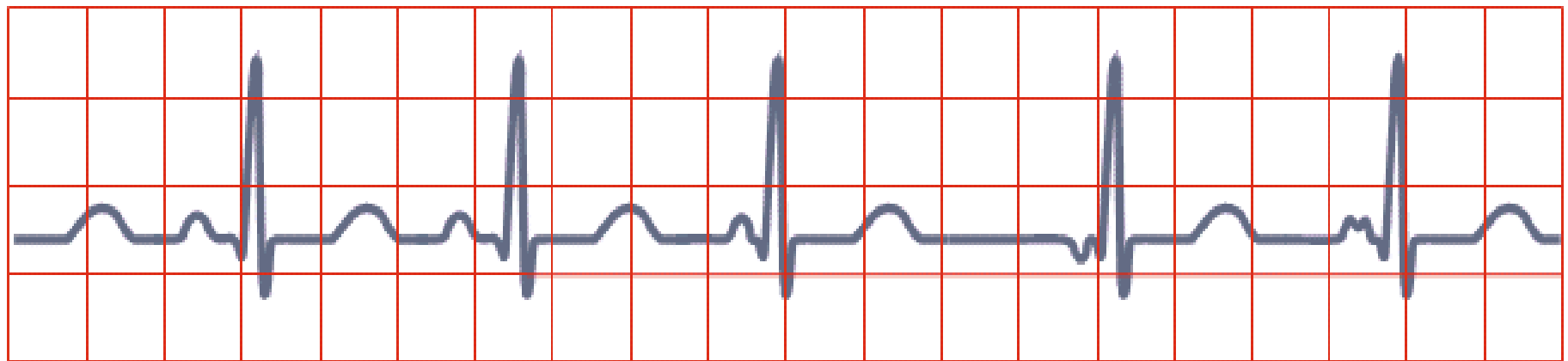
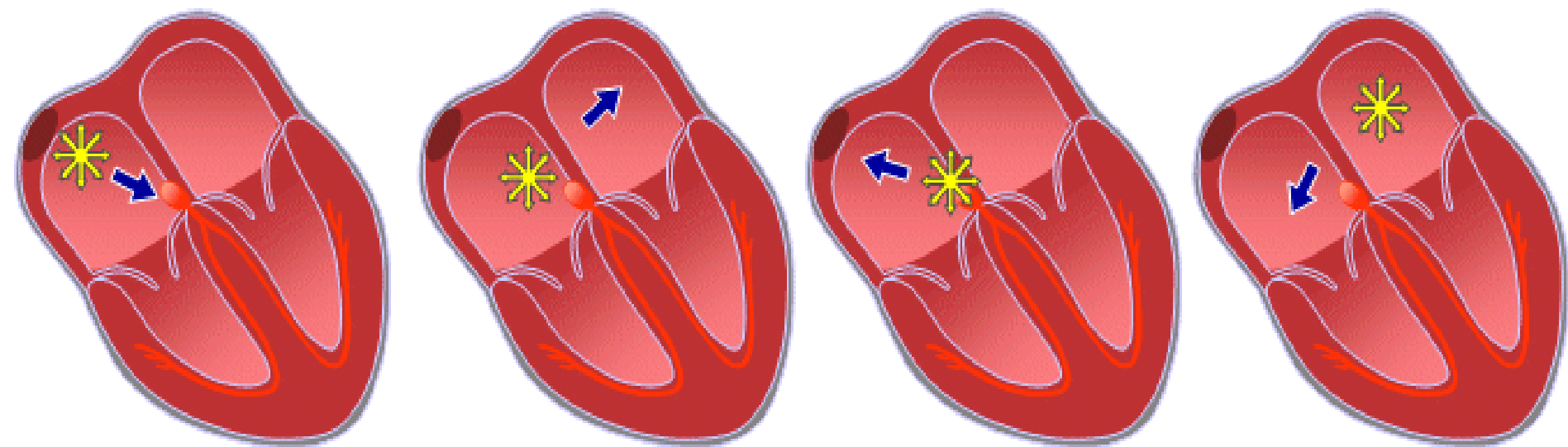
Impulses originate at S-A node at rapid rate



All complexes normal, evenly spaced. Rate $>100/\text{min}$.

WANDERING PACEMAKER

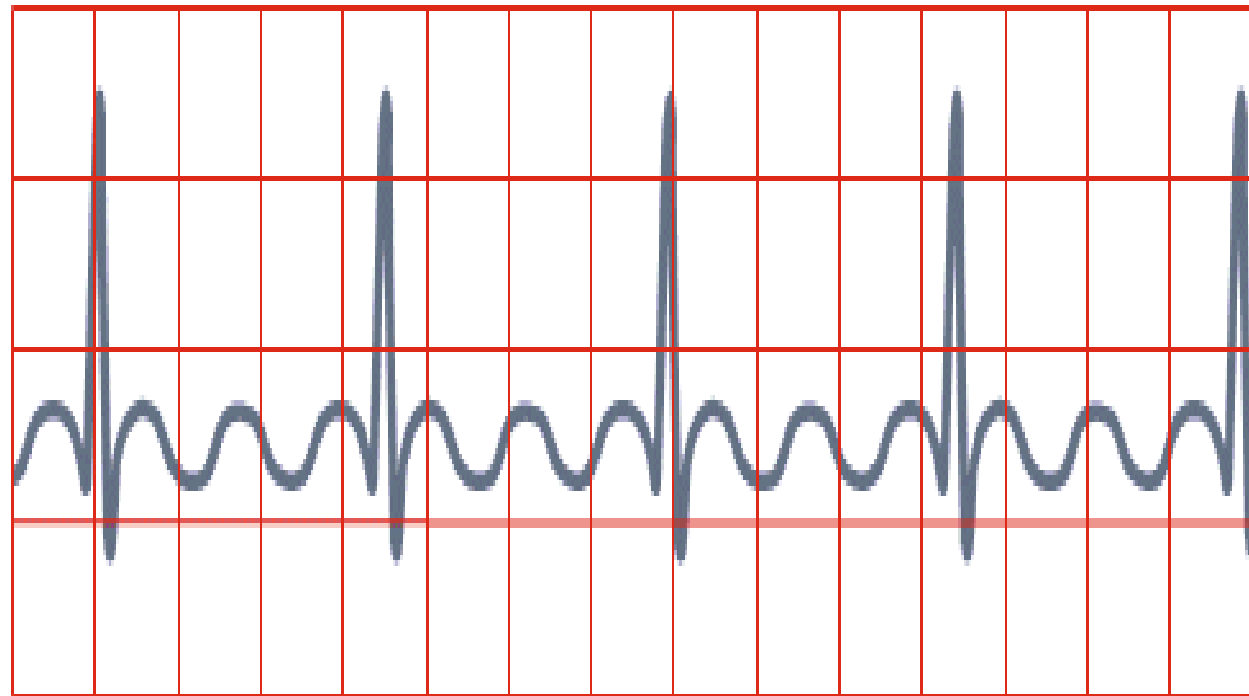
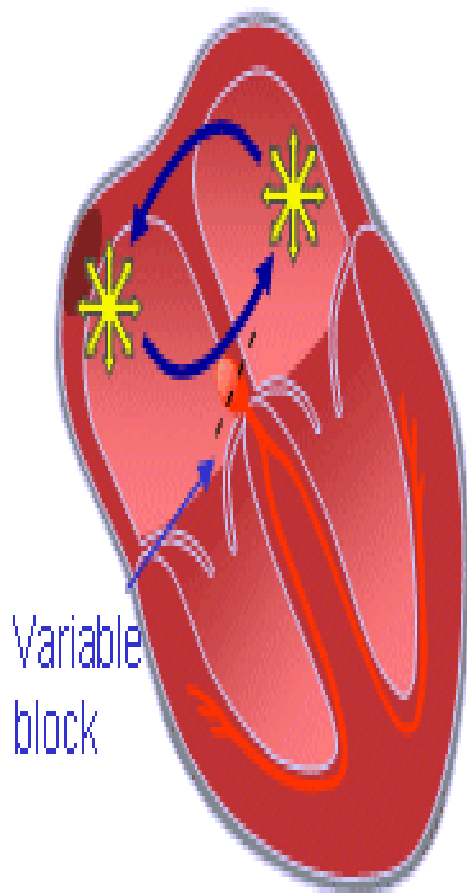
Impulses originate from varying points in atria



Variation in P-wave contour, P-R and P-P interval and therefore in R-R intervals

ATRIAL FLUTTER

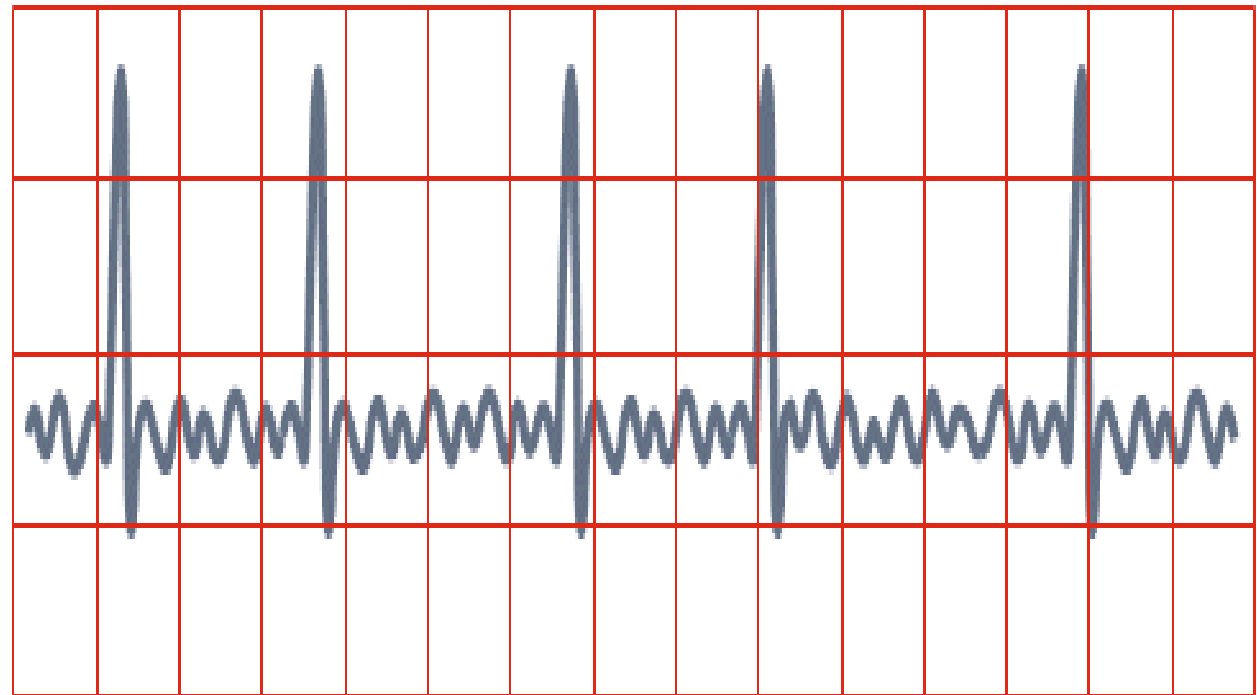
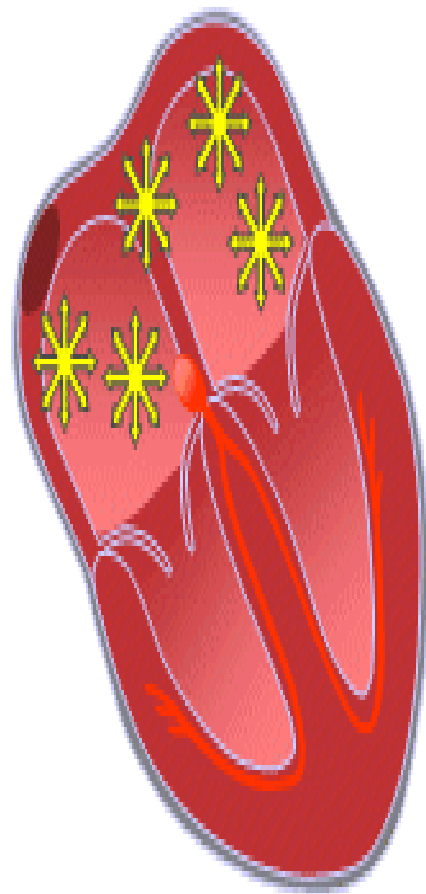
Impulses travel in circular course in atria



Rapid flutter waves, ventricular response irregular

ATRIAL FIBRILLATION

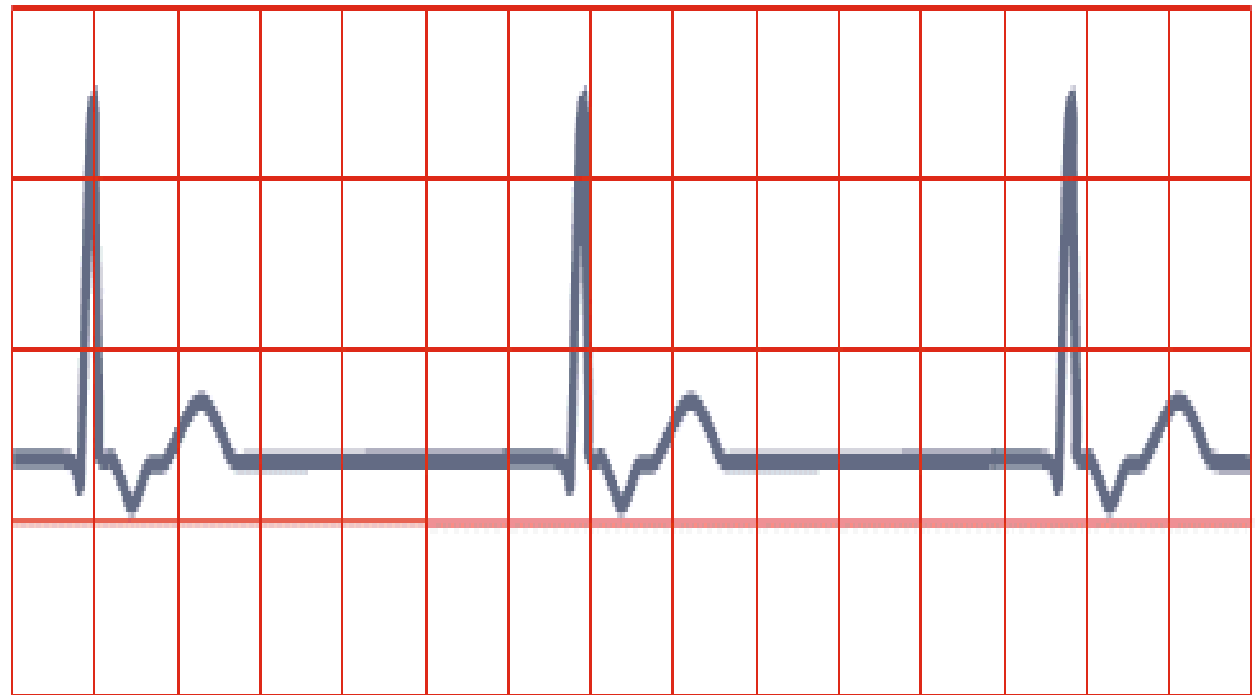
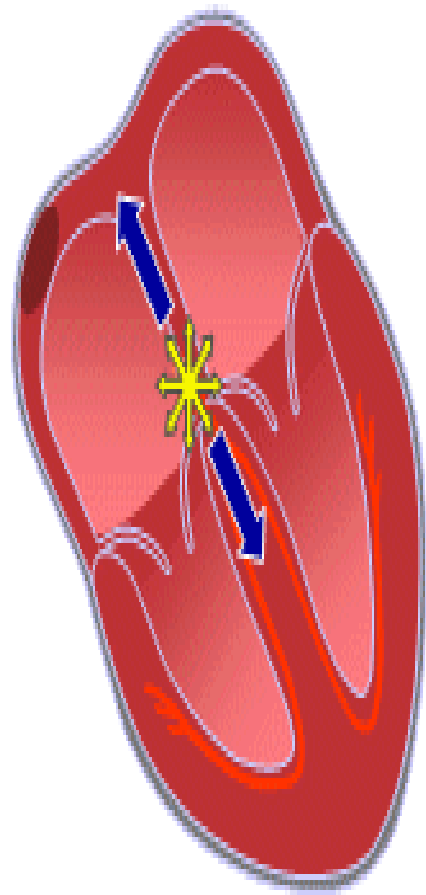
Impulses have chaotic, random pathways in atria



Baseline irregular, ventricular response irregular

JUNCTIONAL RHYTHM

Impulses originate at AV node with retrograde and antegrade direction

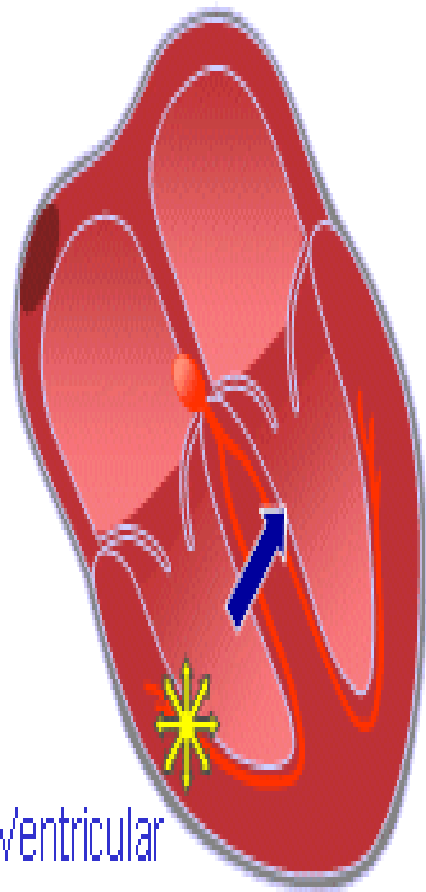


P-wave is often inverted, may be under or after QRS complex

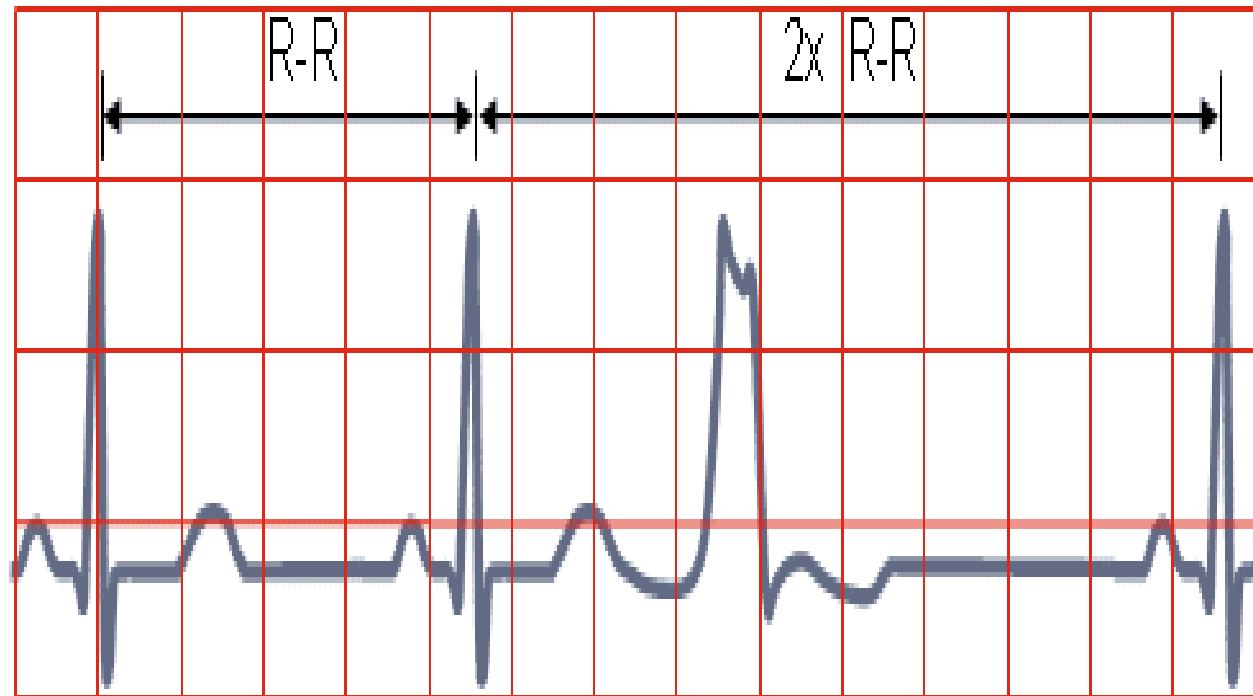
Heart rate is slow

PREMATURE VENTRICULAR CONTRACTION

A single impulse originates at right ventricle



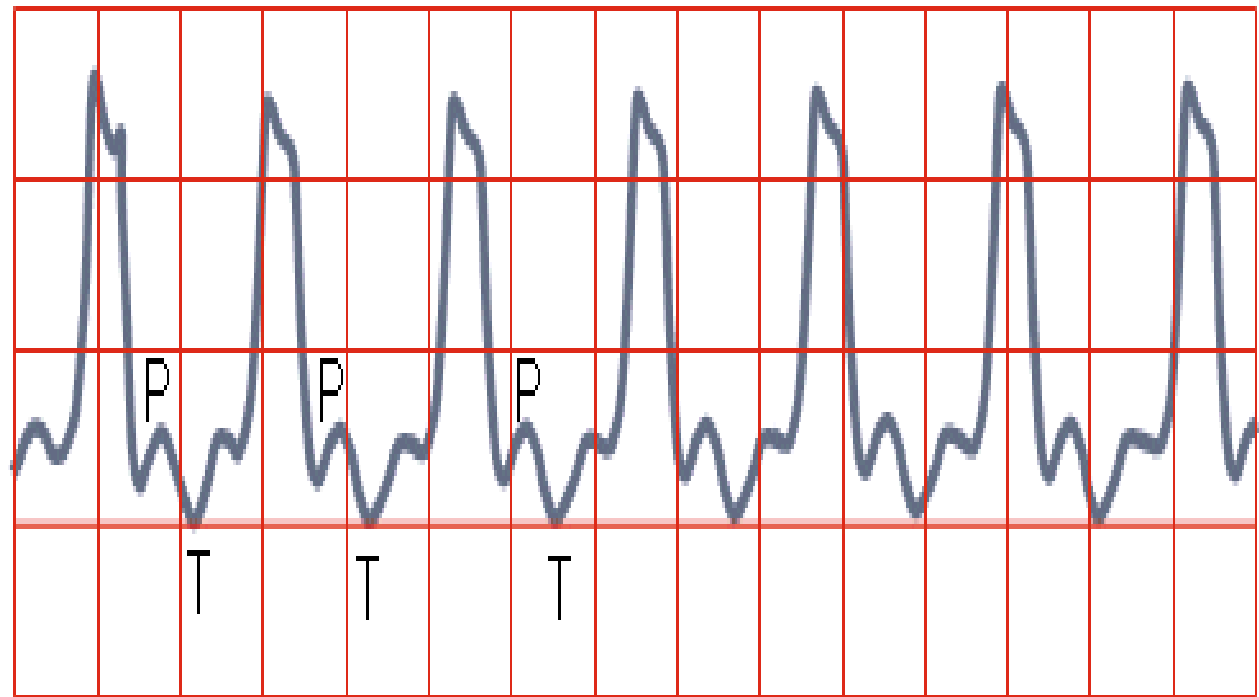
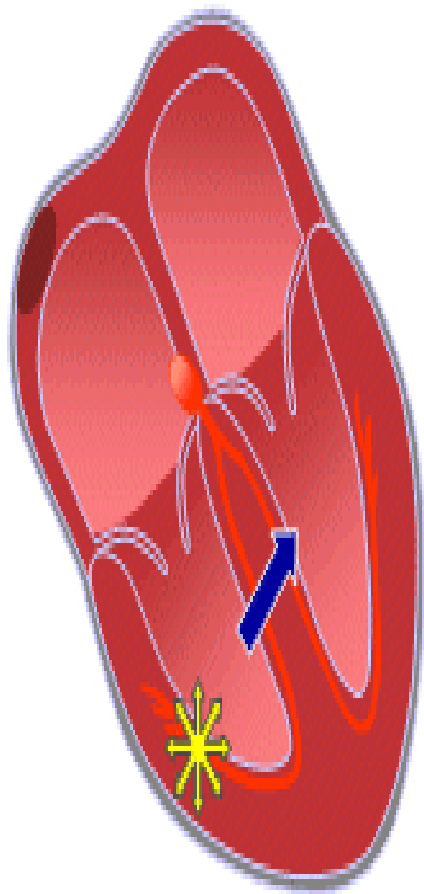
Ventricular
pacemaker



Time interval between normal R peaks is a multiple of R-R interval

VENTRICULAR TACHYCARDIA

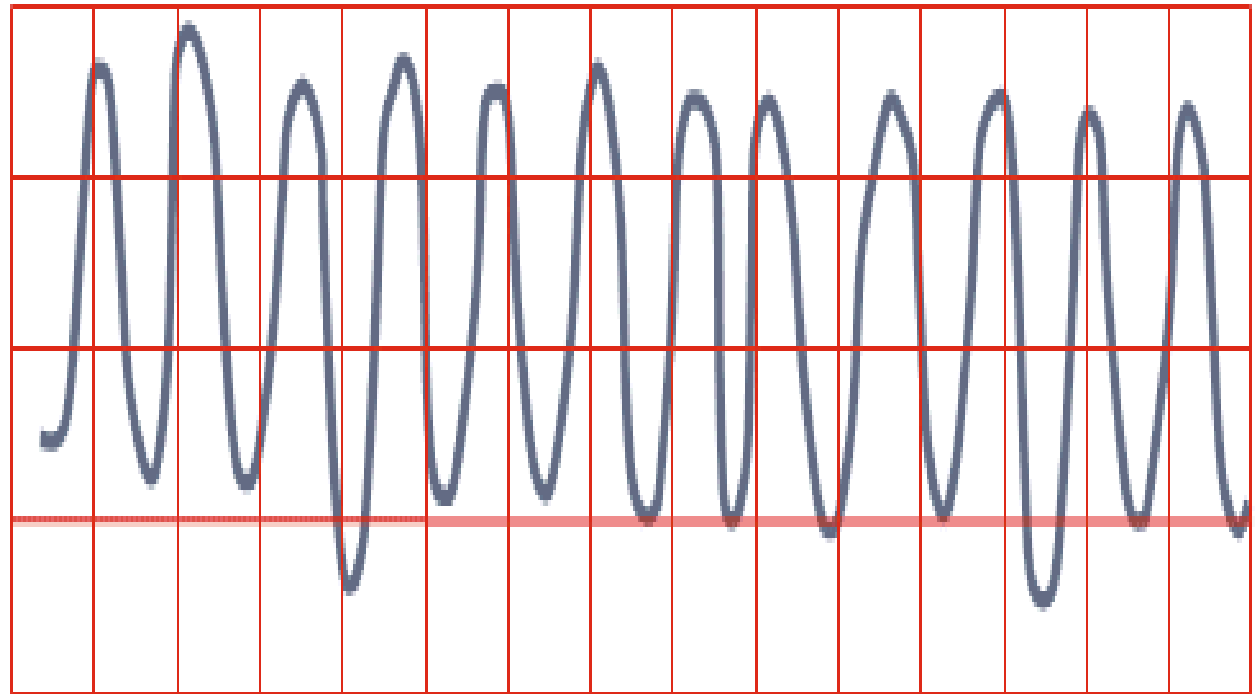
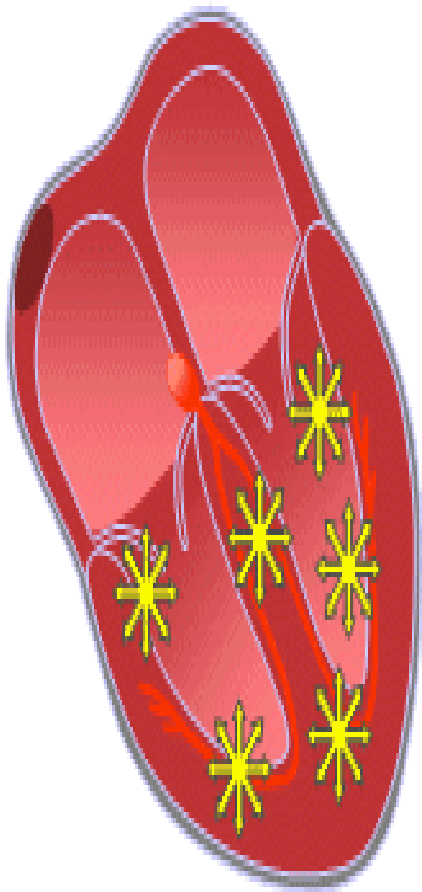
Impulses originate at ventricular pacemaker



Wide ventricular complexes. Rate $> 120/\text{min}$

VENTRICULAR FIBRILLATION

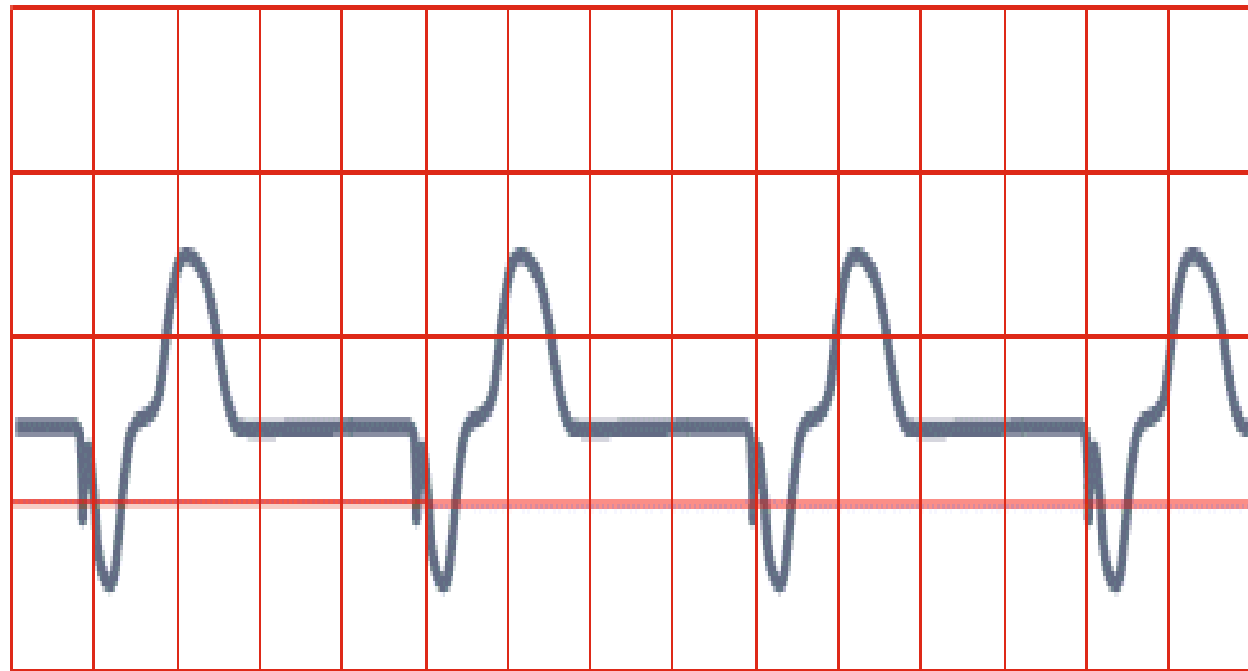
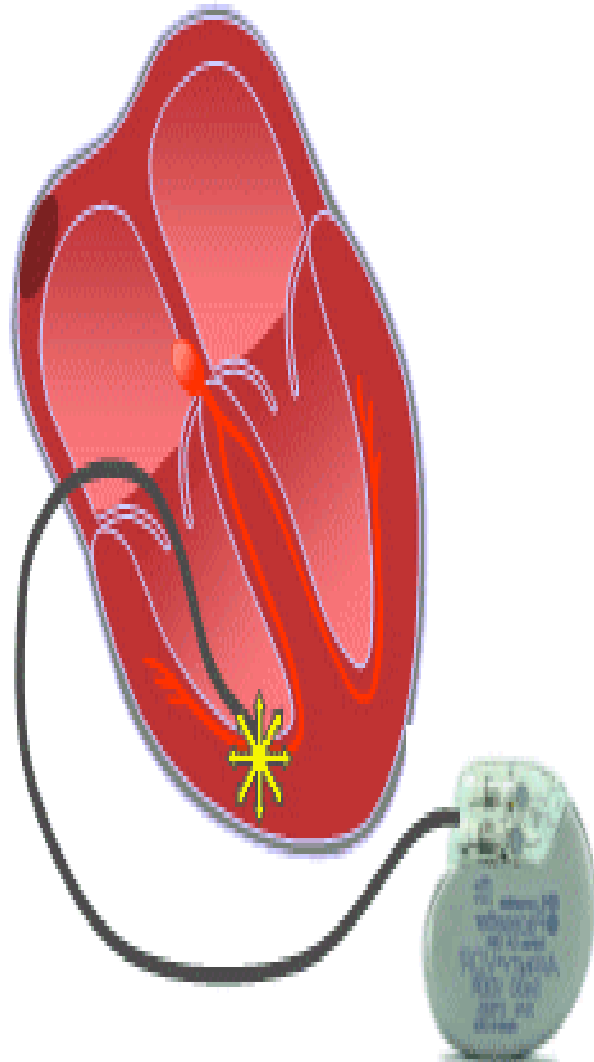
Chaotic ventricular depolarization



Rapid, wide irregular ventricular complexes

PACER RHYTHM

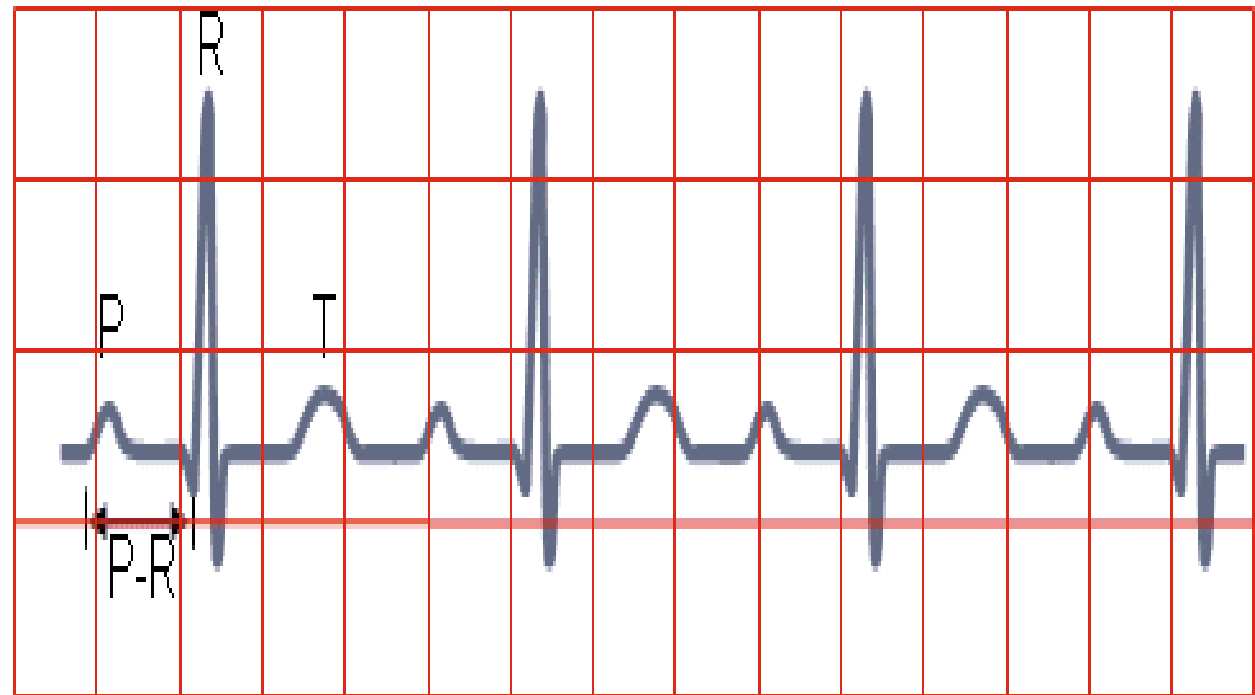
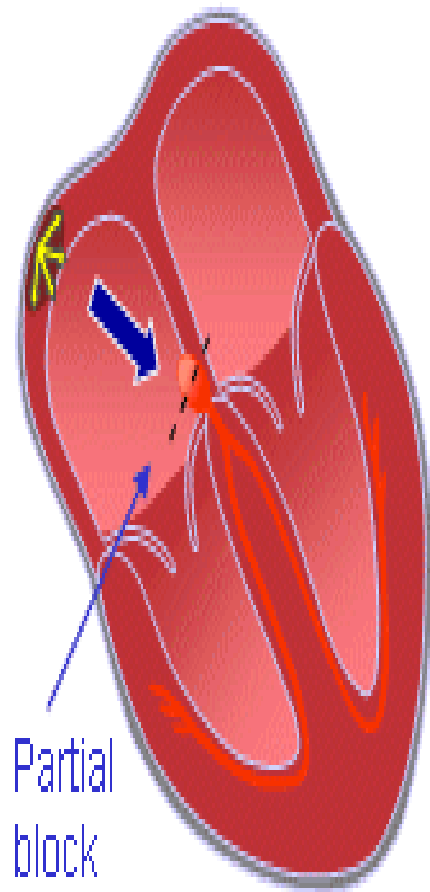
Impulses originate at transvenous pacemaker



Wide ventricular complexes preceded by pacemaker spike.
Rate is the pacer rhythm.

A-V BLOCK, FIRST DEGREE

Atrioventricular conduction lengthened



P-wave precedes each QRS-complex but interval is > 0.2 s

Sudden dropped QRS-complex

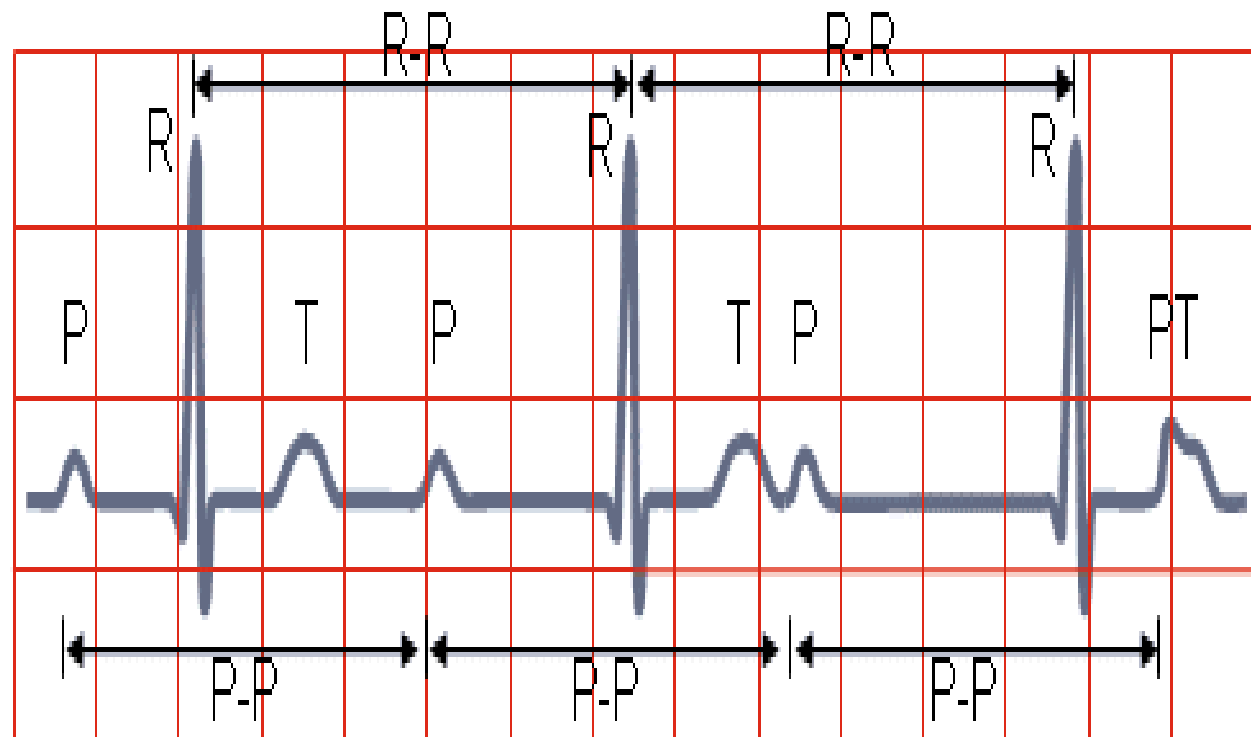
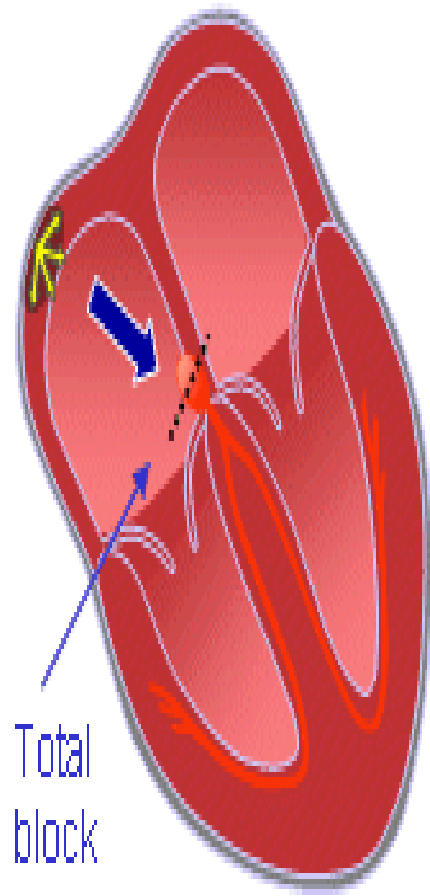
A diagram of a blood vessel with a partial blockage. A blue arrow points to the narrowing of the vessel lumen, labeled "Partial block". A yellow arrow points to the vessel wall. A red arrow points to the blood flow downstream of the blockage.



A-V BLOCK, THIRD DEGREE

Impulses originate at AV-node and proceed to ventricles

Atrial and ventricular activities are not synchronous



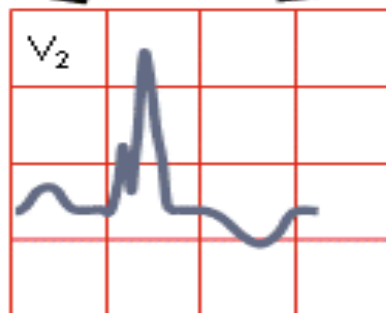
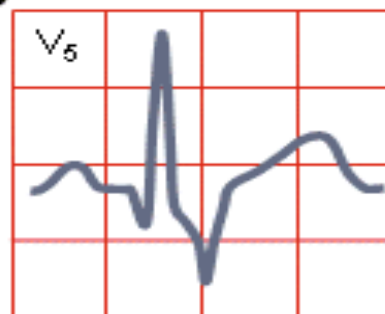
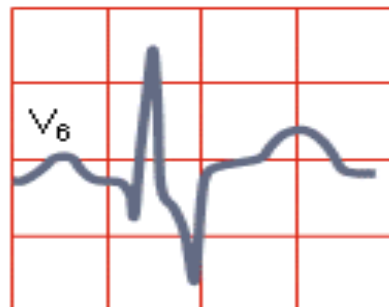
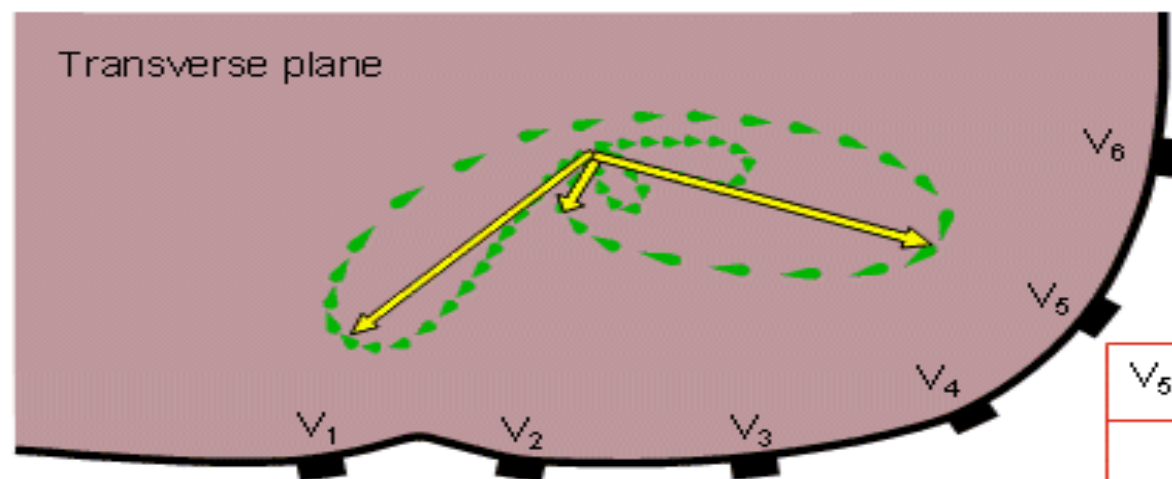
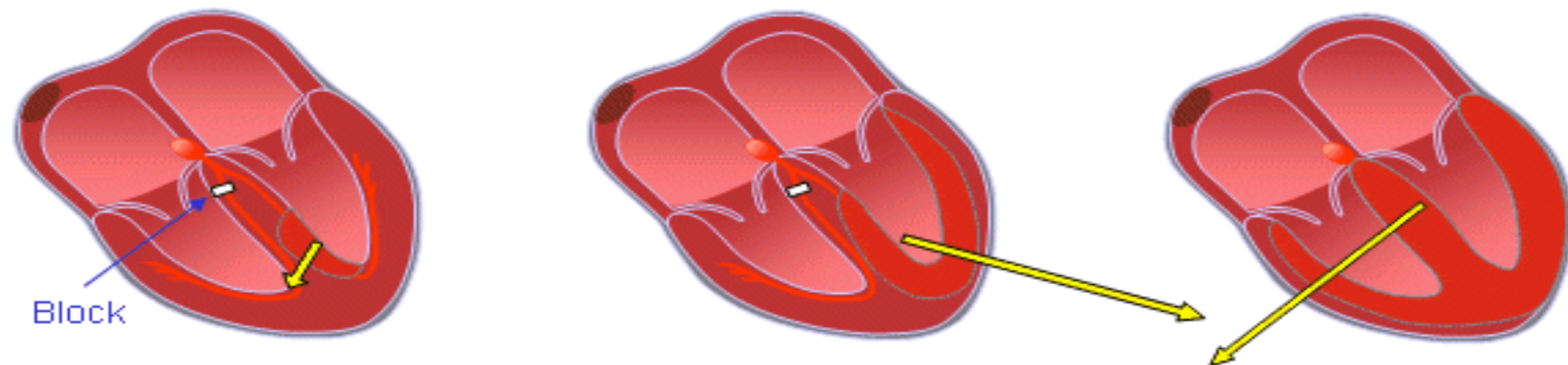
P-P interval normal and constant,

QRS complexes normal, rate constant, 20 – 55 /min

RIGHT BUNDLE-BRANCH BLOCK

QRS duration greater than 0.12 s

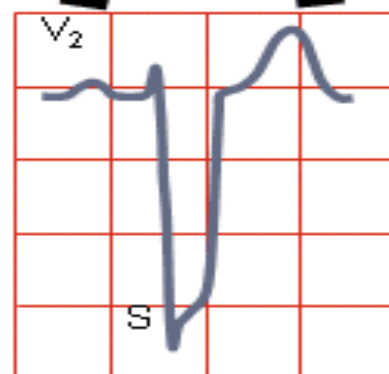
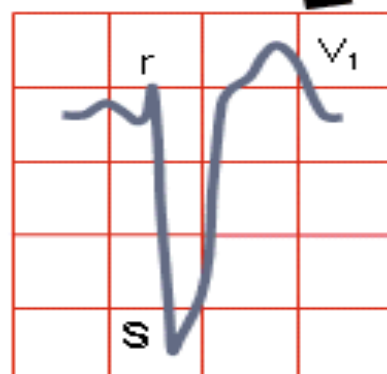
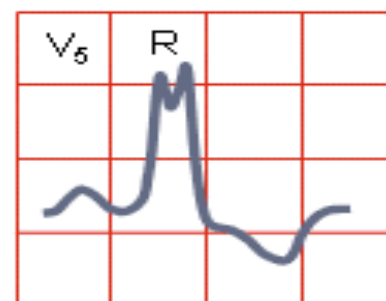
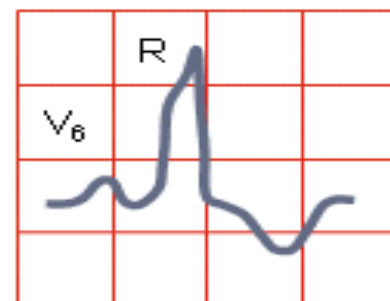
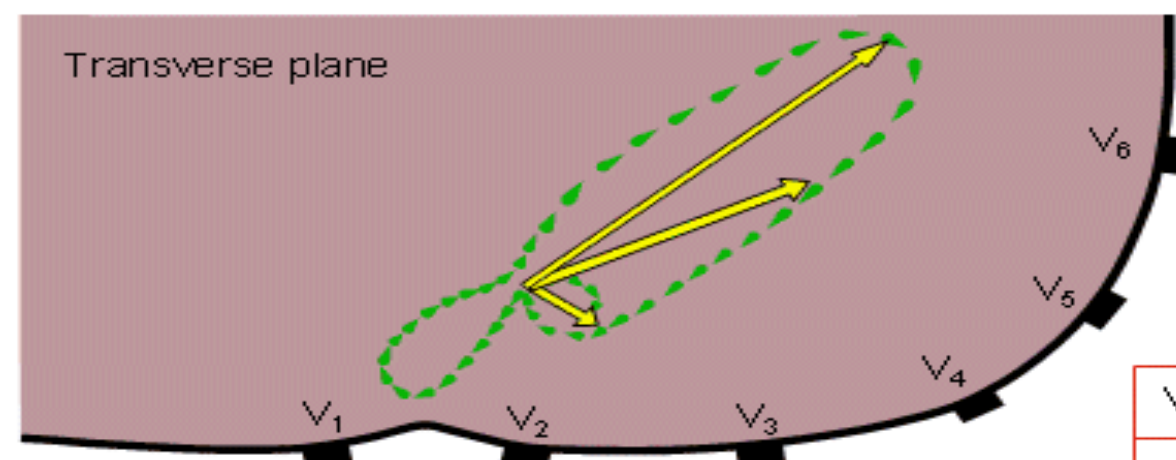
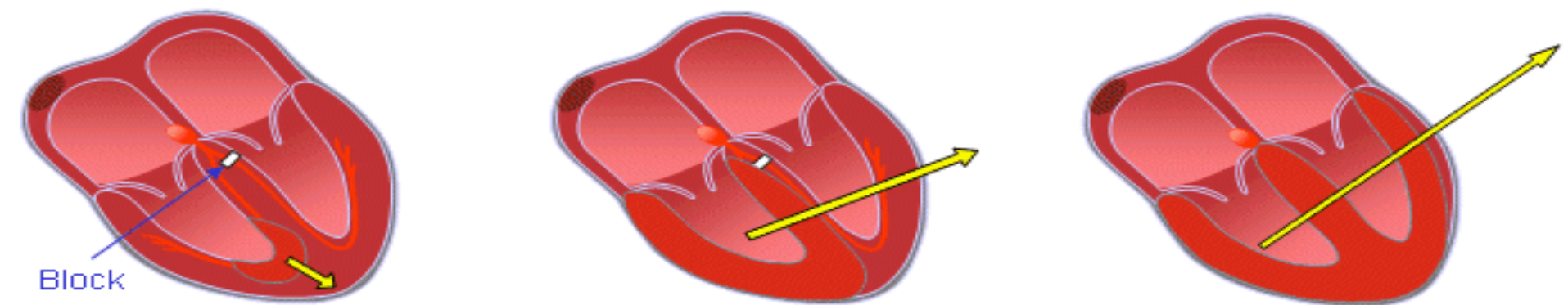
Wide S wave in leads I, V5, and V6



LEFT BUNDLE-BRANCH BLOCK

QRS duration greater than 0.12 s

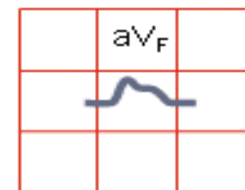
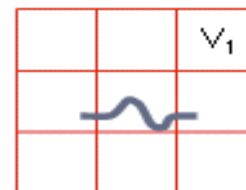
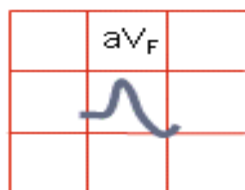
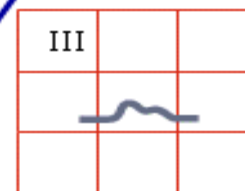
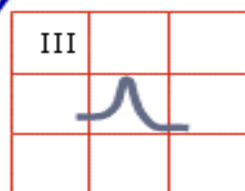
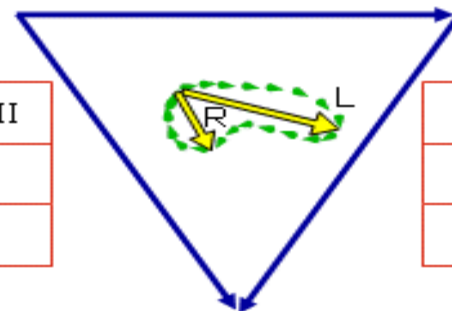
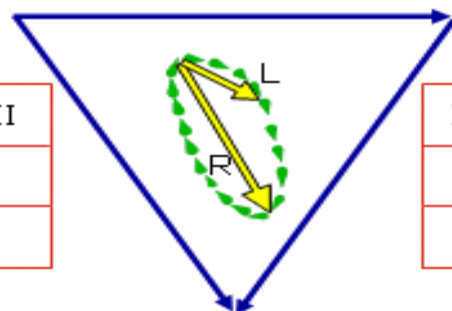
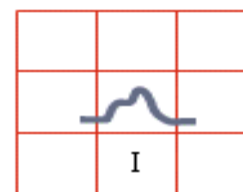
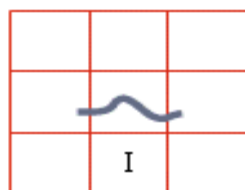
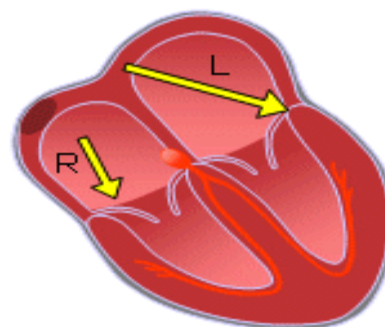
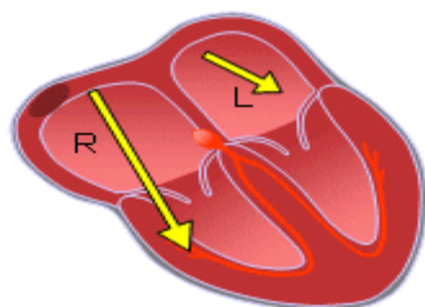
Wide S wave in leads V1 and V2, wide R wave in V5 and V6



RIGHT ATRIAL HYPERTROPHY LEFT ATRIAL HYPERTROPHY

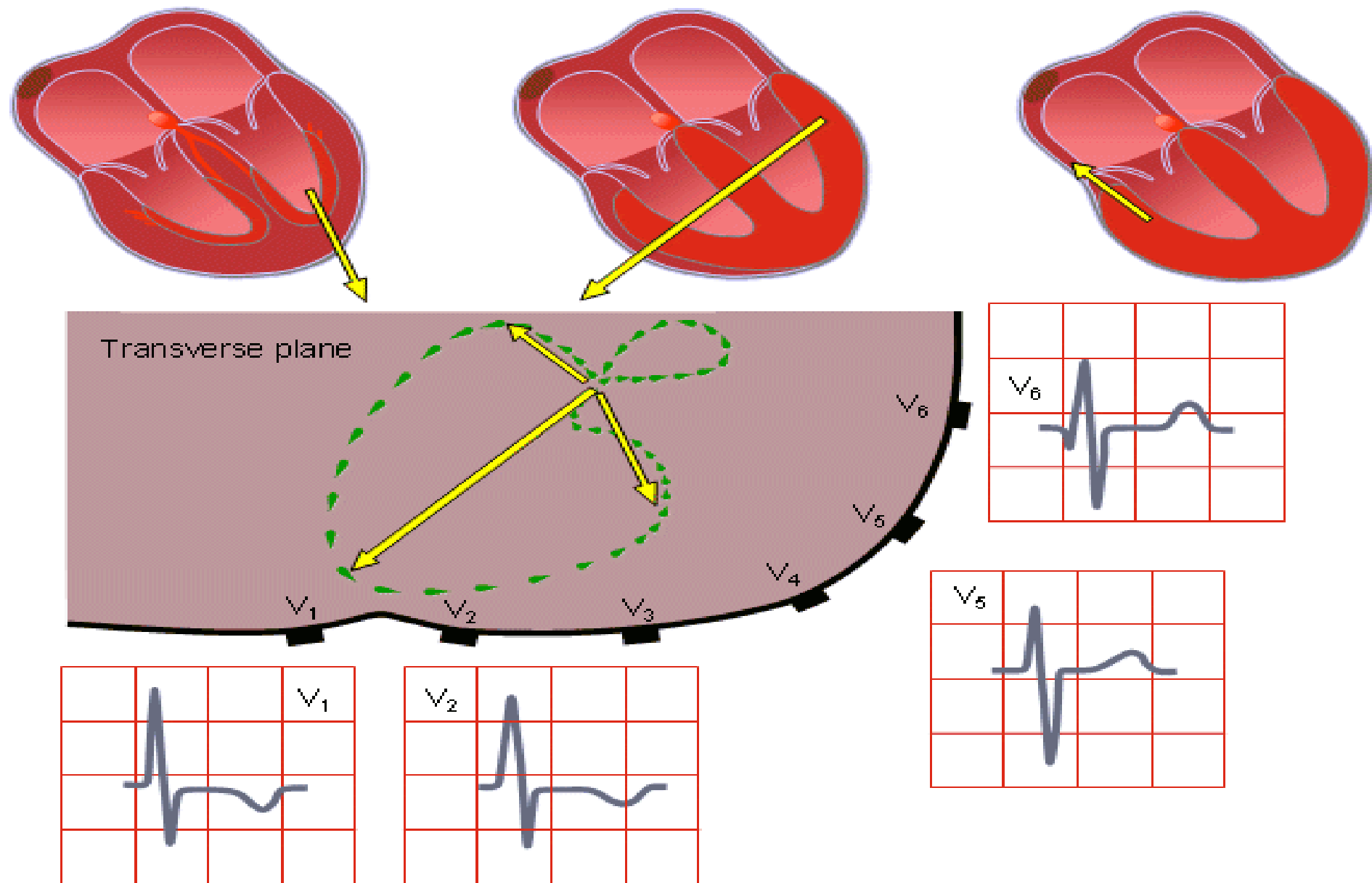
Tall, peaked P wave in leads I and II

Wide, notched P wave in lead II. Diphasic P wave in V1



RIGHT VENTRICULAR HYPERTROPHY

Large R wave in leads V1 and V2,
Wide S wave in leads V1 and V2, wide R wave in V5 and V6



LEFT VENTRICULAR HYPERTROPHY

Large S wave in leads V1 and V2, large R wave in V5 and V6

