Report

Course VB:Cardio 2023 - Veterinary Bioscience: Cardiovascular System 2023

Lesson ECG Basics

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Electrical conduction pathway

Which component of the electrical conduction system is the primary "pacemaker"?

- ○ AV node
- ○ Bundle of His
- ○ Purkinje fibers
- ◉ SA node

What does an ECG measure?

- ○ An individual cardiac action potential.
- ○ Mechanical events in the heart.
- ◉ The collective electrical activity of the heart.
- ○ The movement of the cardiac muscles.

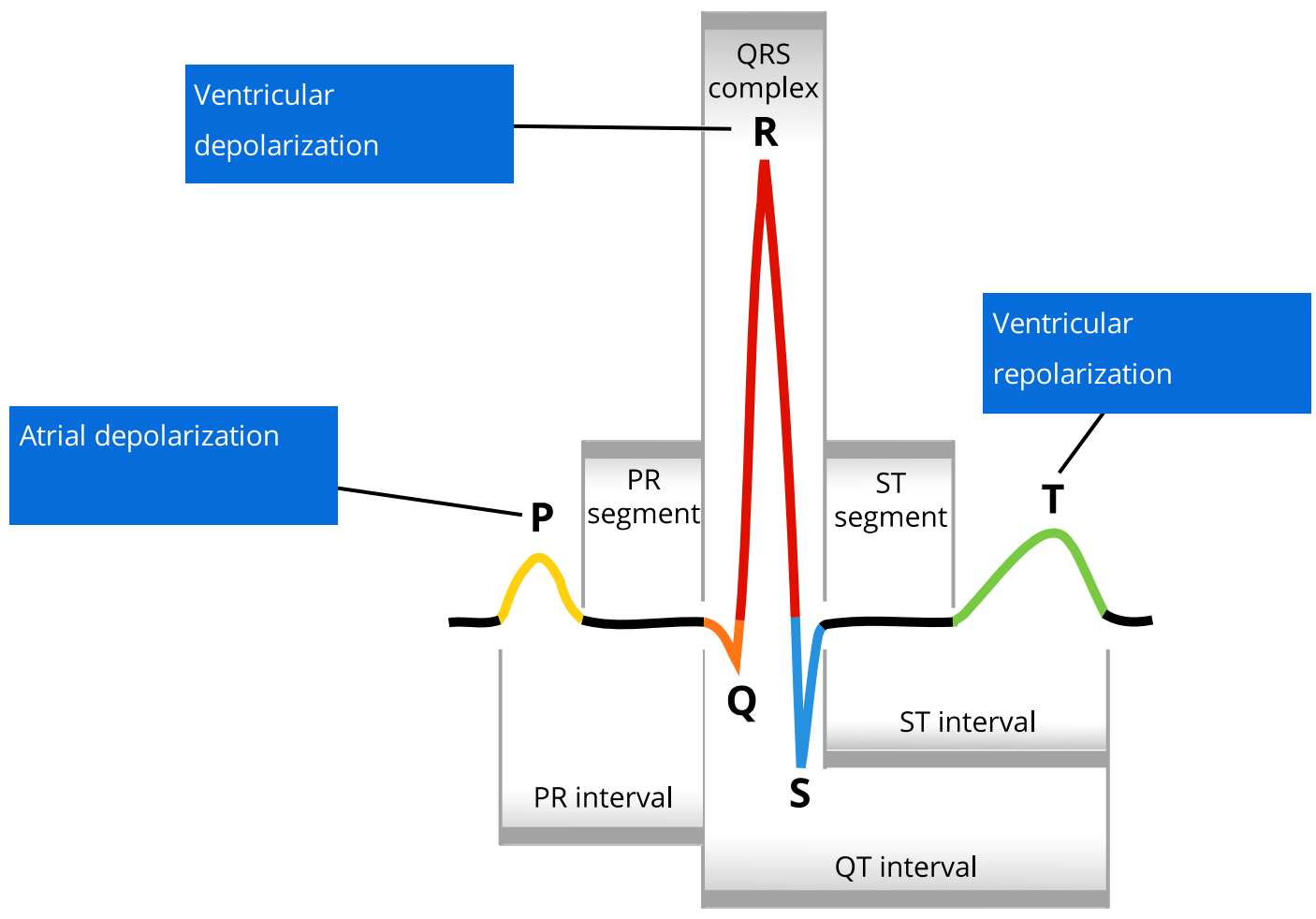
ECG nomenclature

Label the electrical events of the heart on this idealized ECG trace from a lead II recording.

Atrial depolarization

Ventricular depolarization

Ventricular repolarization

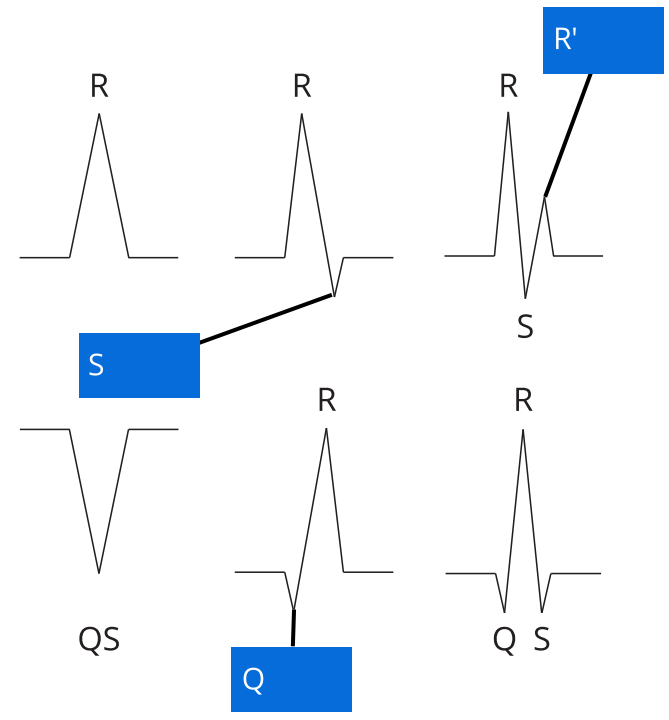


How would these periods change in a person with a heart rate of 120 BPM, such as during exercise?

Less time between event sequences. R R decrease, decrease between events

A few different variants of the QRS complex are shown. Can you complete the missing labels?

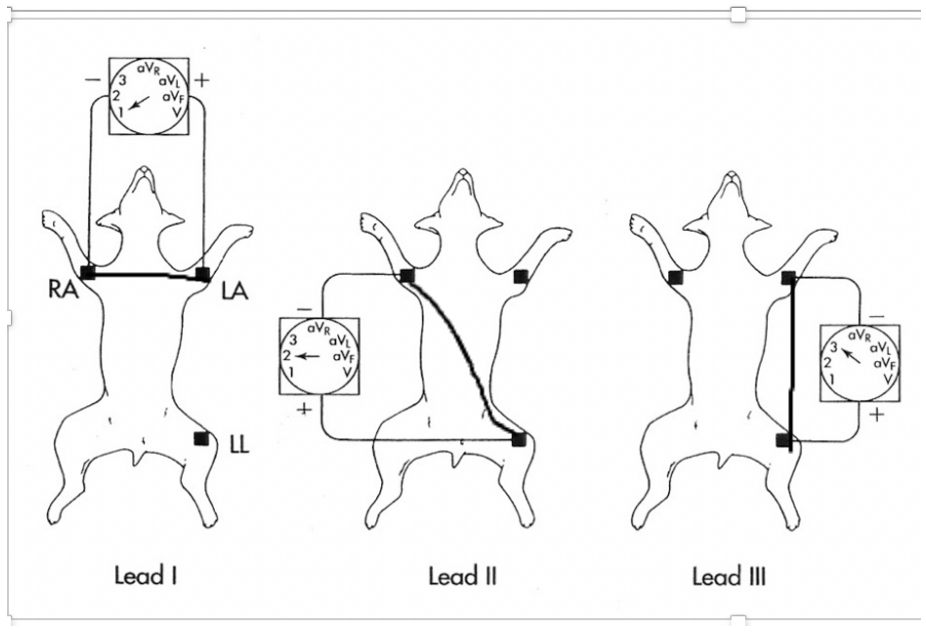
Q
Q'
QS
R
R'
RR
RS
S
S'



A simple lead II recording is performed on a horse that is suffering from atrial fibrillation. Which component of the ECG trace would you expect to look **abnormal**?

- (●) P wave
- ( ) QRS complex
- ( ) T wave

ECG leads



Complete the table below to show how an ECG recording will look for each of the given conditions. Some of the cells have been completed for you.

	Deflection on ECG trace
Direction of the vector relative to the negative electrode	
Toward	Downward
Right angle	Isoelectric
Away	Upward
Direction of the vector relative to the positive electrode	
Toward	Upward
Right angle	Isoelectric
Away	Downward

Standard limb leads

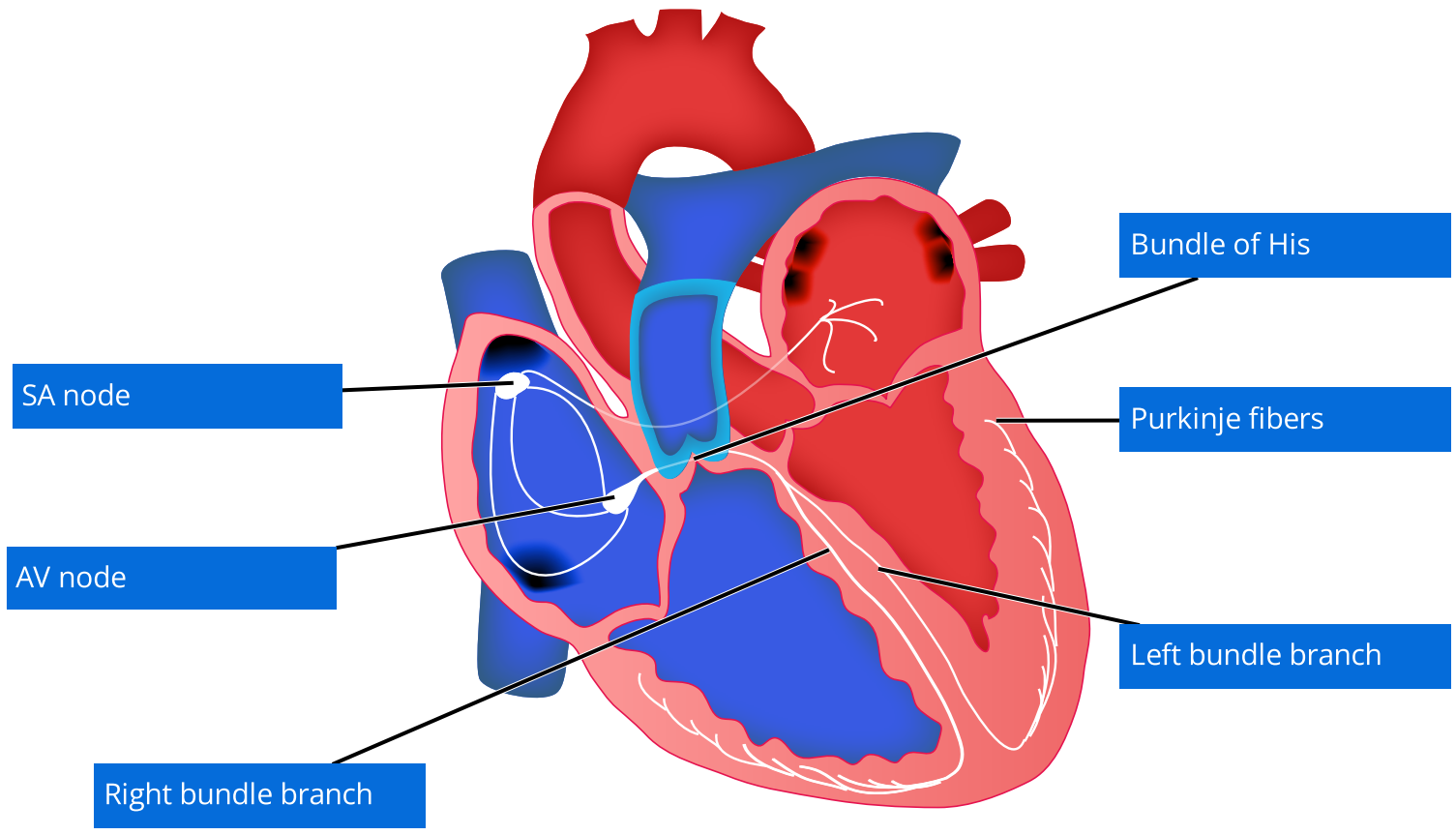
Which lead is most closely aligned with the direction of ventricular depolarization?

- Lead I
- Lead II
- Lead III

Knowledge check

The heart's electrical conduction pathway determines the shape of the ECG trace. Where are each of the following components located in the conduction system?

AV node
Bundle of His
Left bundle branch
Purkinje fibers
Right bundle branch
SA node



When a wave of **depolarization** travels toward a positive electrode, how is this represented on an ECG tracing?

- Downward from the baseline
- No change from the baseline (horizontal)
- Upward from the baseline

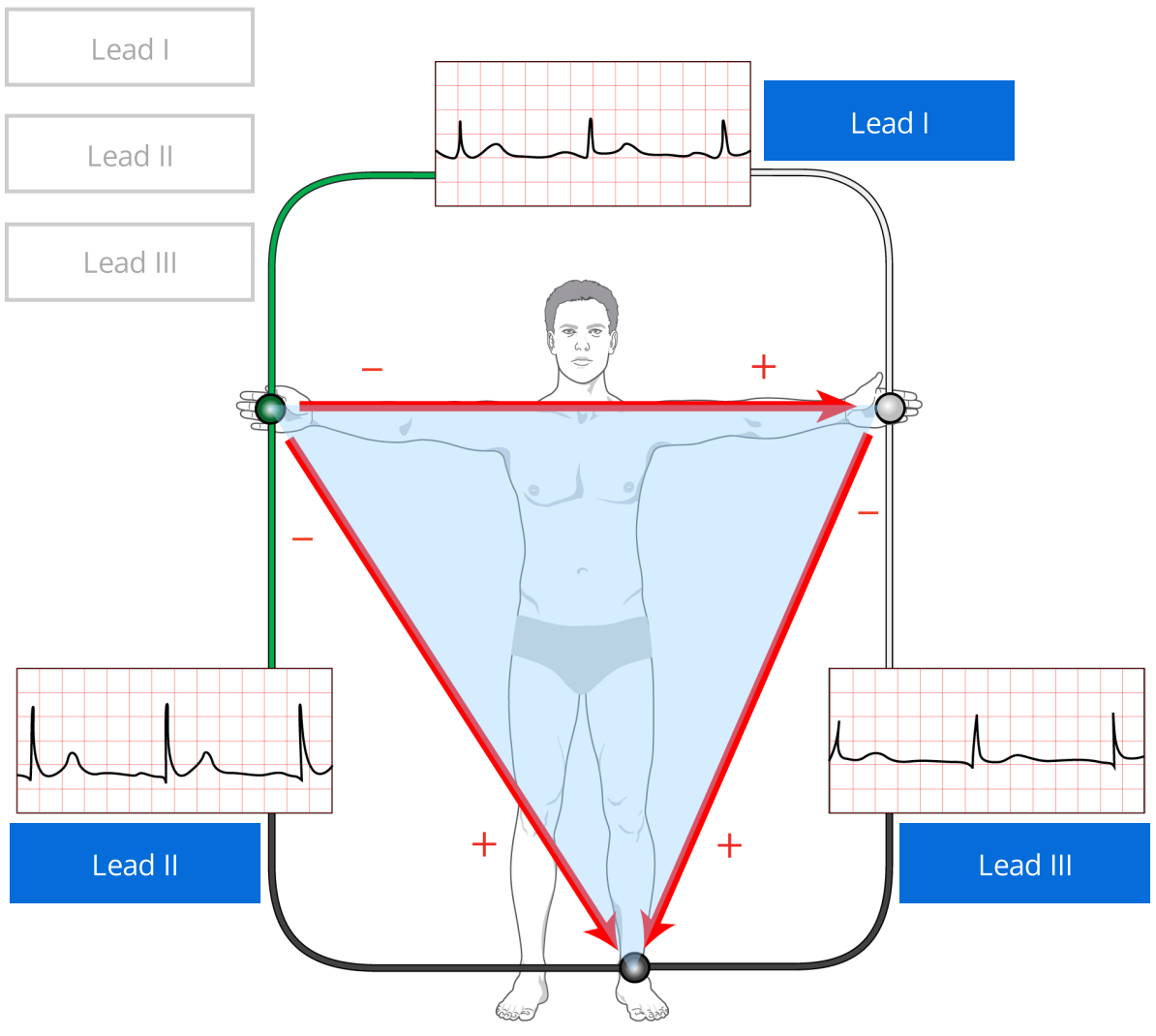
When a wave of **repolarization** travels toward a negative electrode, how is this represented on an ECG tracing?

- Downward from the baseline
- No change from the baseline (horizontal)
- Upward from the baseline

If the overall electrical activity vector of the heart points superiorly (upward, toward the head) for a short time, how will this look on an ECG recording?

- It depends on which "lead" records the electrical activity.
- The "upward" vector means the ECG recording will show a downward deflection.
- The "upward" vector means the ECG recording will show an upward deflection.

Label the three types of electrode configurations (leads I–III).



The ECG is a useful tool for detecting which of the following?

Abnormal heart valves

Abnormal plasma sodium

An enlarged left ventricle

Ventricular arrhythmias

Useful	Not useful
An enlarged left ventricle	Abnormal heart valves
Ventricular arrhythmias	Abnormal plasma sodium

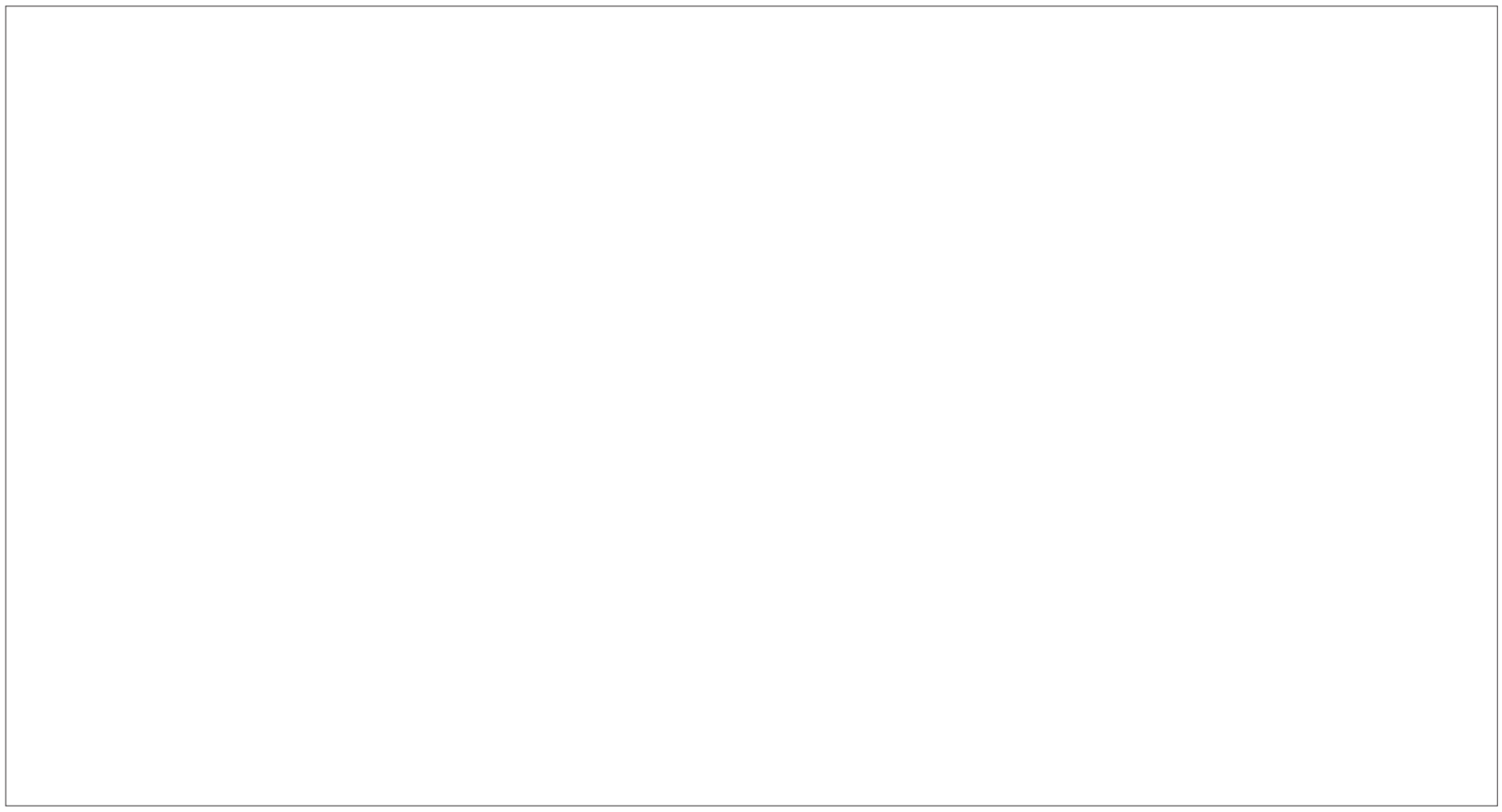
Which of the following heart rates in a resting dog do you think would be described as a bradycardia?

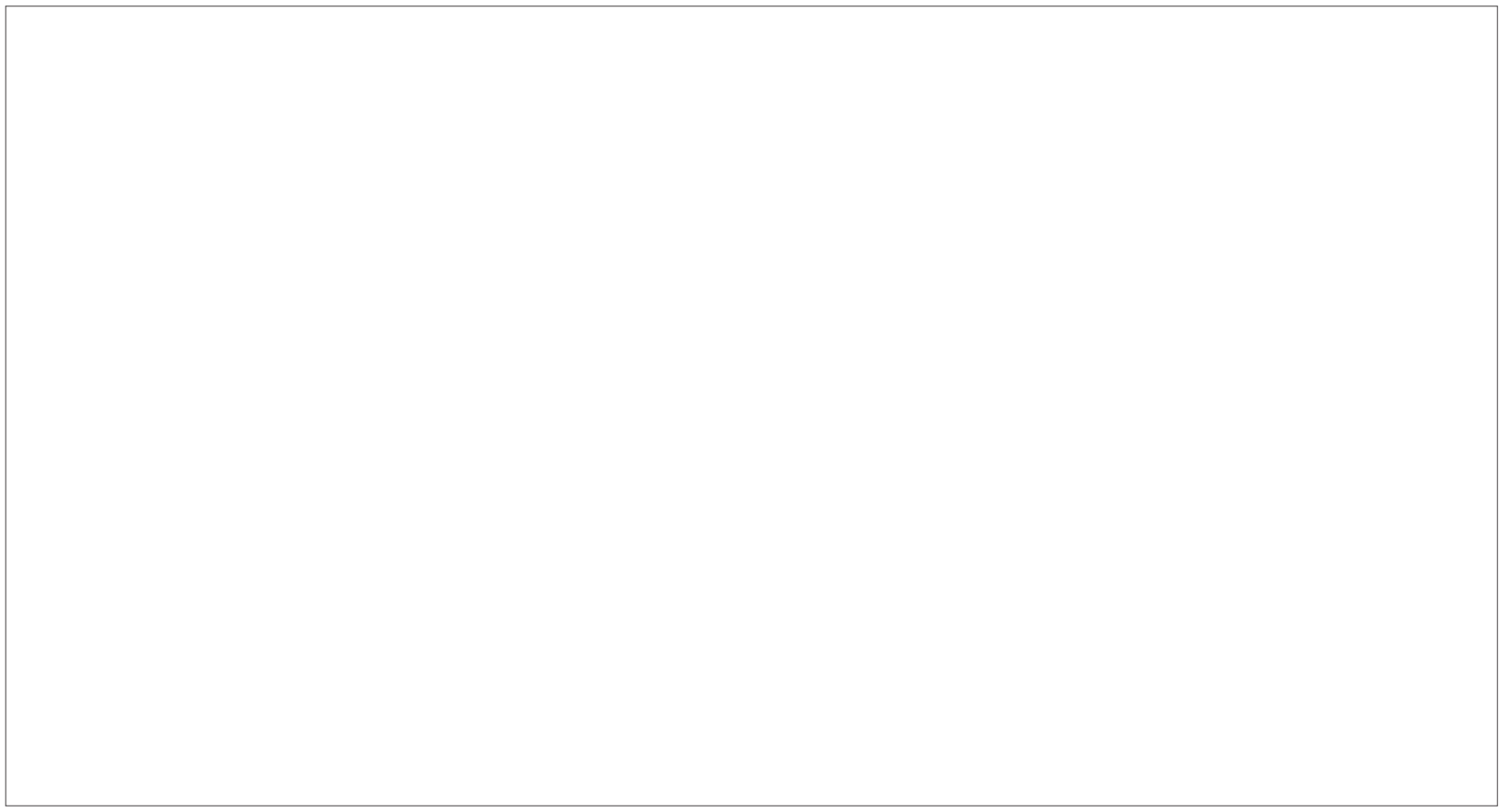
- A heart rate of less than 80 beats per minute.
- A heart rate of more than 100 beats per minute.
- A heart rate of more than 120 beats per minute.
- a heart rate of less than 40 beats per minute

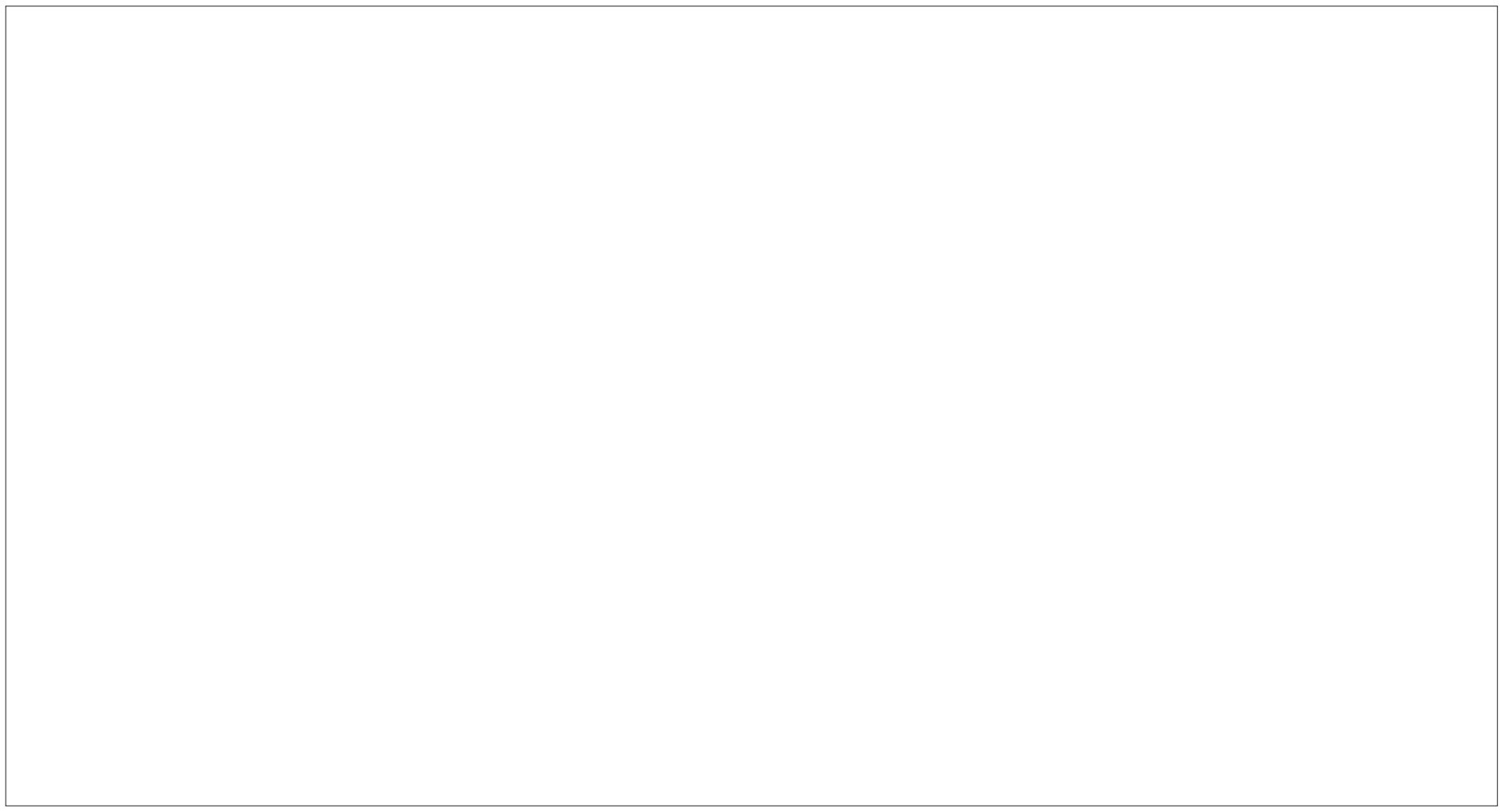
Which of the following statements most accurately describe the events that leads to the production of heart sounds

- Heart sounds are the result of the closure of heart valves. The valves close due to relaxing of the chamber and a subsequent fall in pressure the chamber preceding the valve, and higher pressure in the chamber or vessel after the valve
- Heart sounds have nothing to do with the heart and is an artefact of blood flowing through the great vessels in the thorax
- Heart sounds are due to the active contraction of the heart muscles against the thoracic cavity. The contraction of the heart chambers causes vibrations in the thoracic cavity.
- Heart sounds are the result of the closure of heart valves. The valves close due to relaxation of both chambers on either side of the valve. This results in a fall in pressure on both sides of the valve causing it to close.

Popup - Notes







Popup - Conduction system questions

Which region of the heart generates electrical activity the fastest?

- AV node
- Internodal tracts
- Purkinje fibers
- SA node

Why is it important that there is slower conduction of the electrical signal through the AV node (and its extension, the bundle of His)?

- (●) The delay allows the atria to contract completely before ventricular contraction begins.
- ( ) The delay allows the left atrium to contract completely before the right atrium starts to contract.
- ( ) The delay gives time for the blood to travel from the ventricles to the atria.

Popup - ECG leads questions

Which lead usually has the largest R wave?

- ( ) Lead I
- (●) Lead II
- ( ) Lead III

Are the chest leads bipolar or unipolar?

- ( ) Bipolar
- (●) Unipolar

Popup - Chest lead question

In which leads are T waves always positive?

- ( ) V_1 and V_2
- ( ) V_1, V_3, and V_4
- ( ) V_2, V_3, V_4, and V_5
- (●) V_3, V_4, V_5, and V_6