Report

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

Lesson Heart and ECG – Lab

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Group Activity

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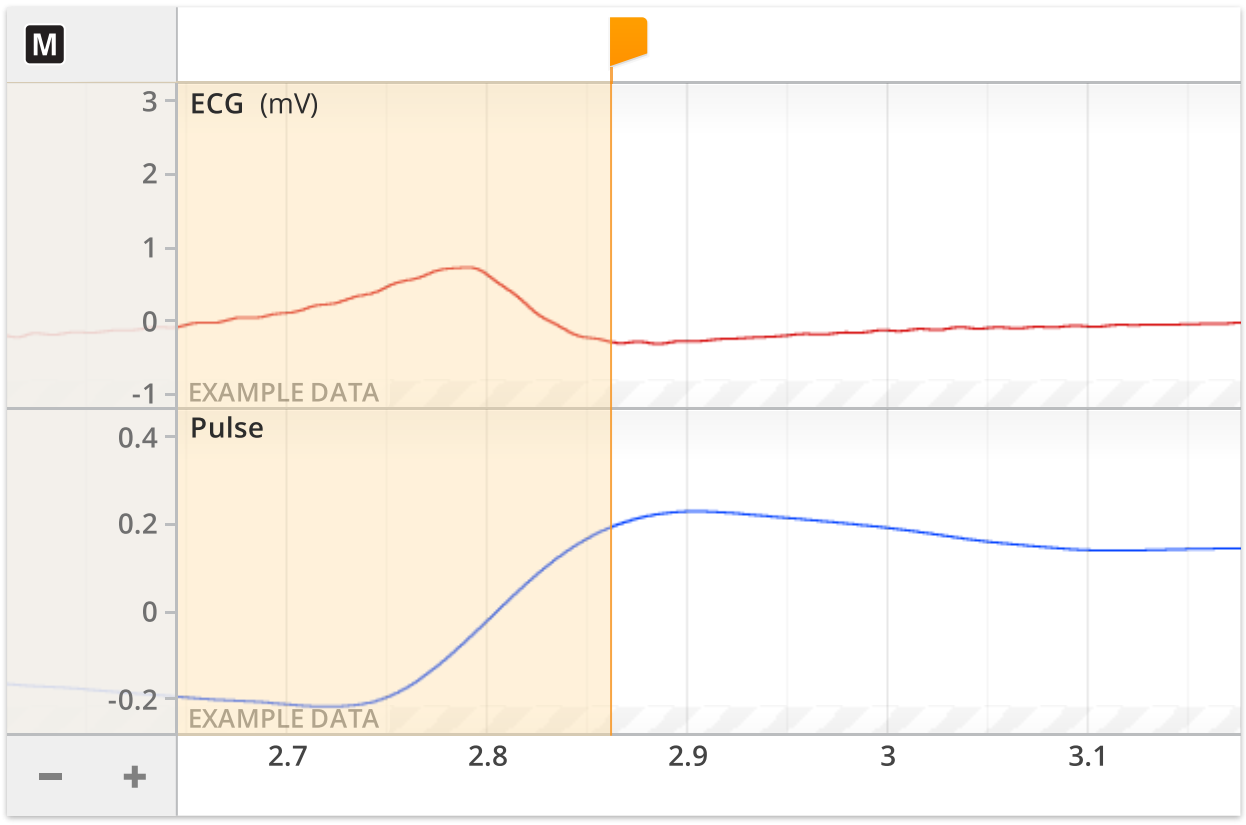
ECG and pulse – Activity



ECG and pulse – Analysis

Enter your data in the tables below.

ECG components

Interval	PR (ms)	QRS (ms)	ST (ms)	TP (ms)
Duration (ms)	159	83	343	713

ECG and pulse

R to start of pulse upswing (ms)	T to dip after peak of pulse (ms)
248	313

Describe the relationship between the ECG and the pulse wave. Explain why the timing of the QRS complex in the ECG and the start of the pulse wave do not coincide.

There is delay until the pulse is recorded due to the distance that it must travel and the muscle conduction

What events generate the P wave, QRS complex, and T wave?

P = atrial depolarization

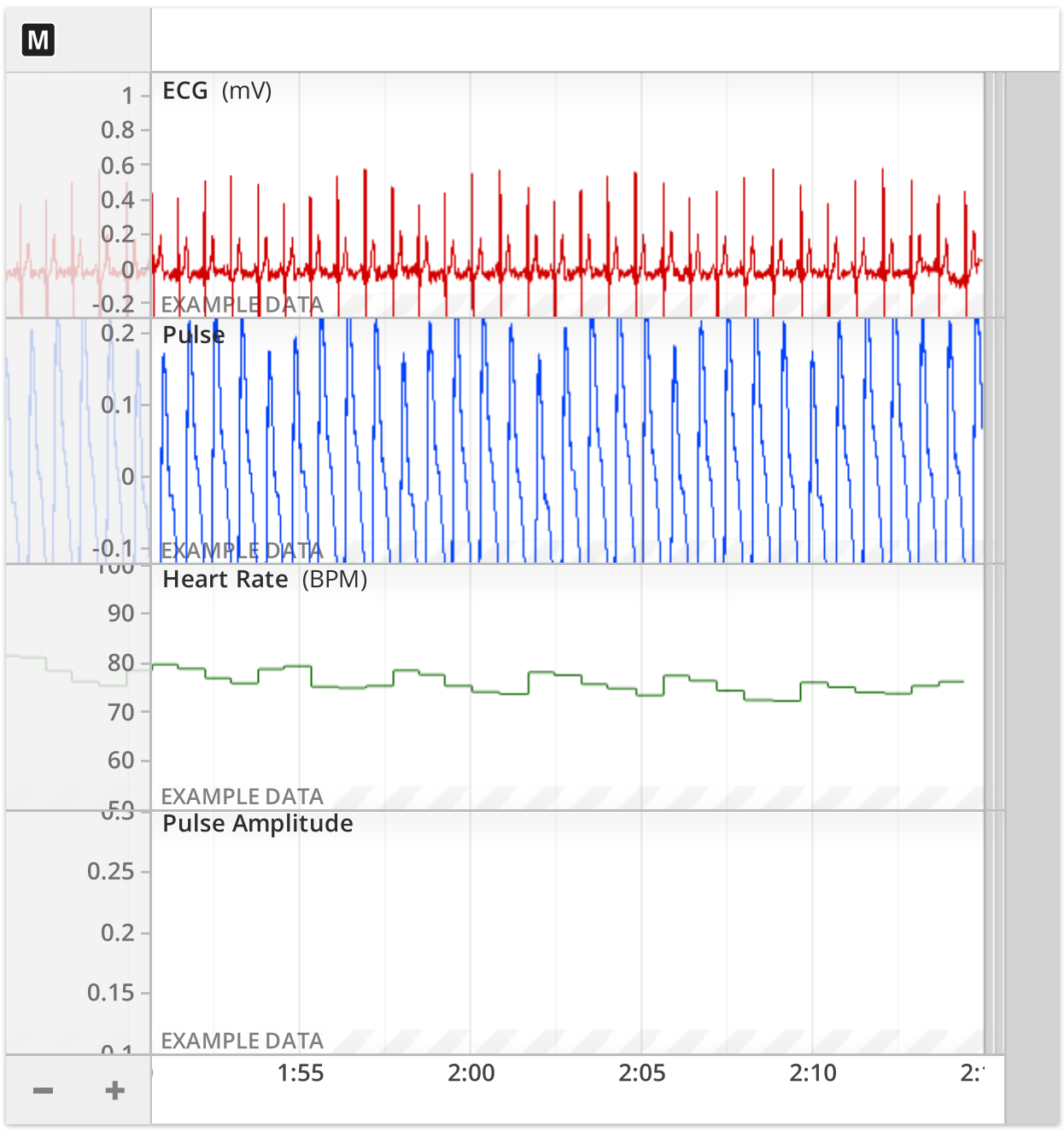
QRS = ventricular depolarisation

T = ventricular repolarization

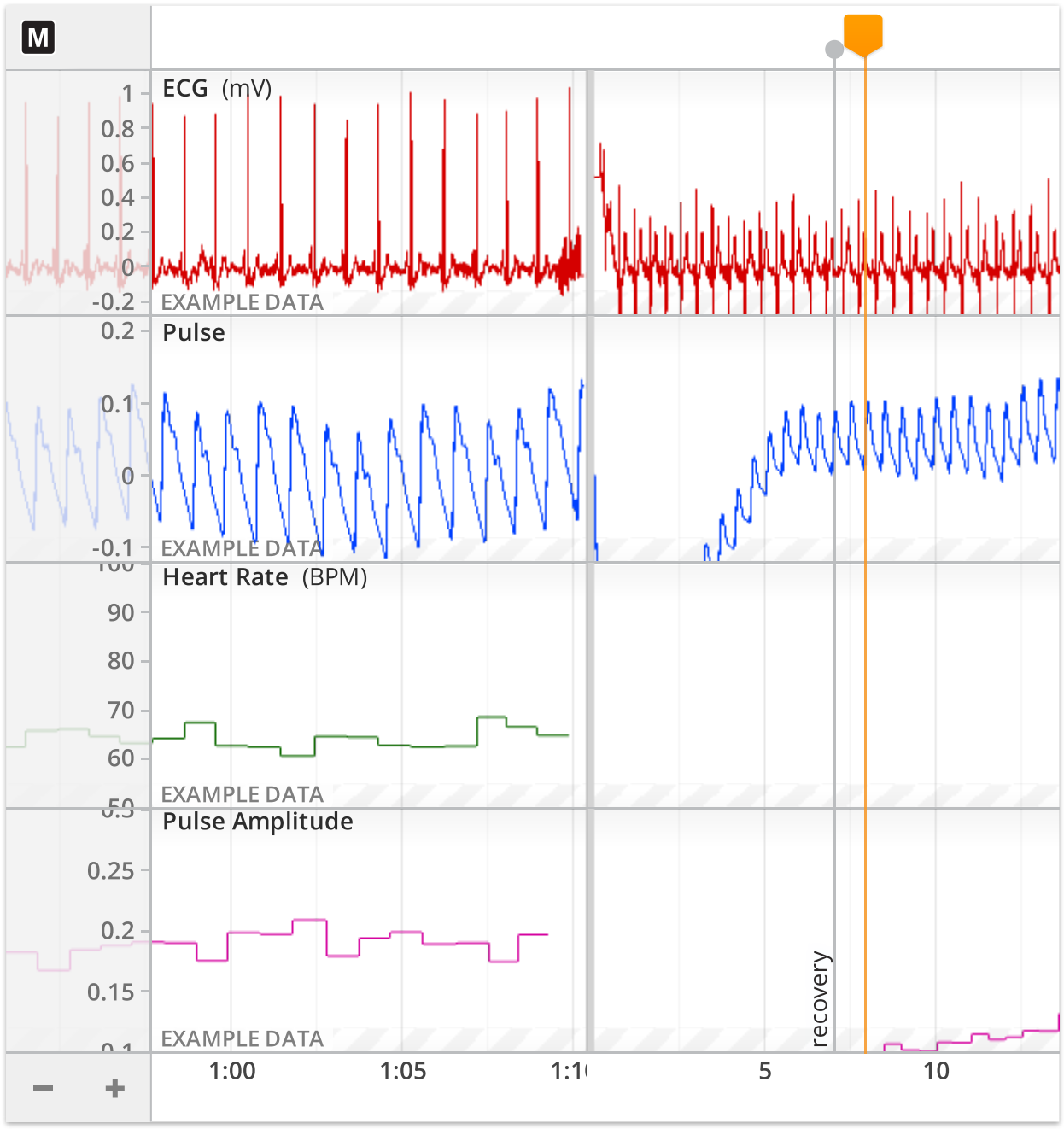
What is the dicrotic notch, and why does it follow the T wave?

Small dip representing the closure of the aortic valve

ECG and pulse – Activity



ECG and pulse: HR and pulse – Analysis

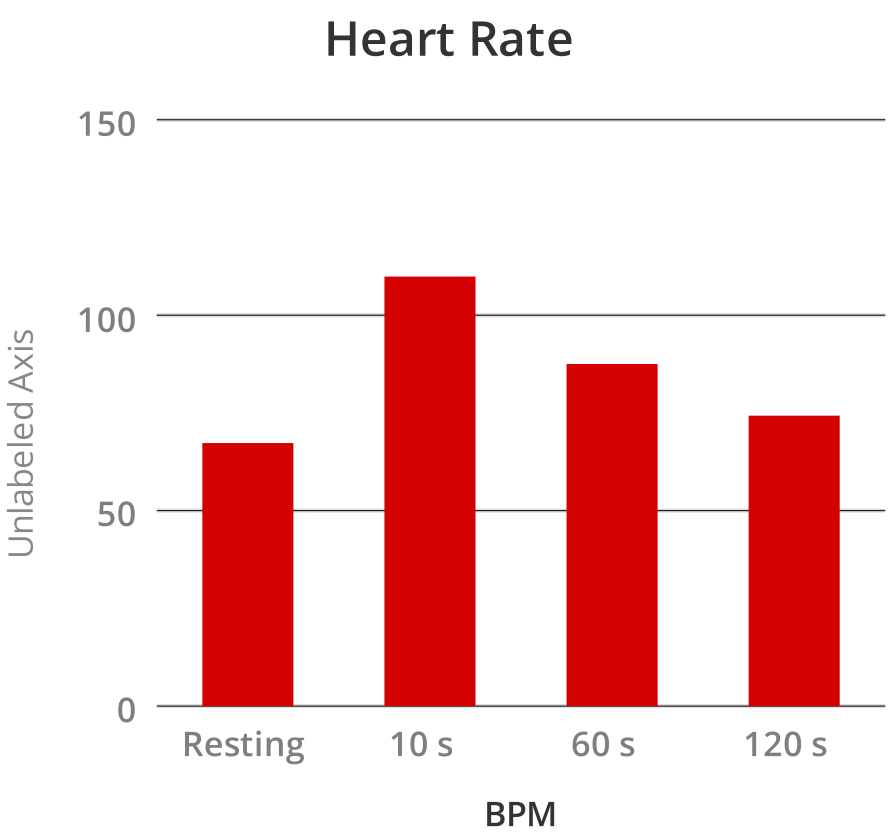


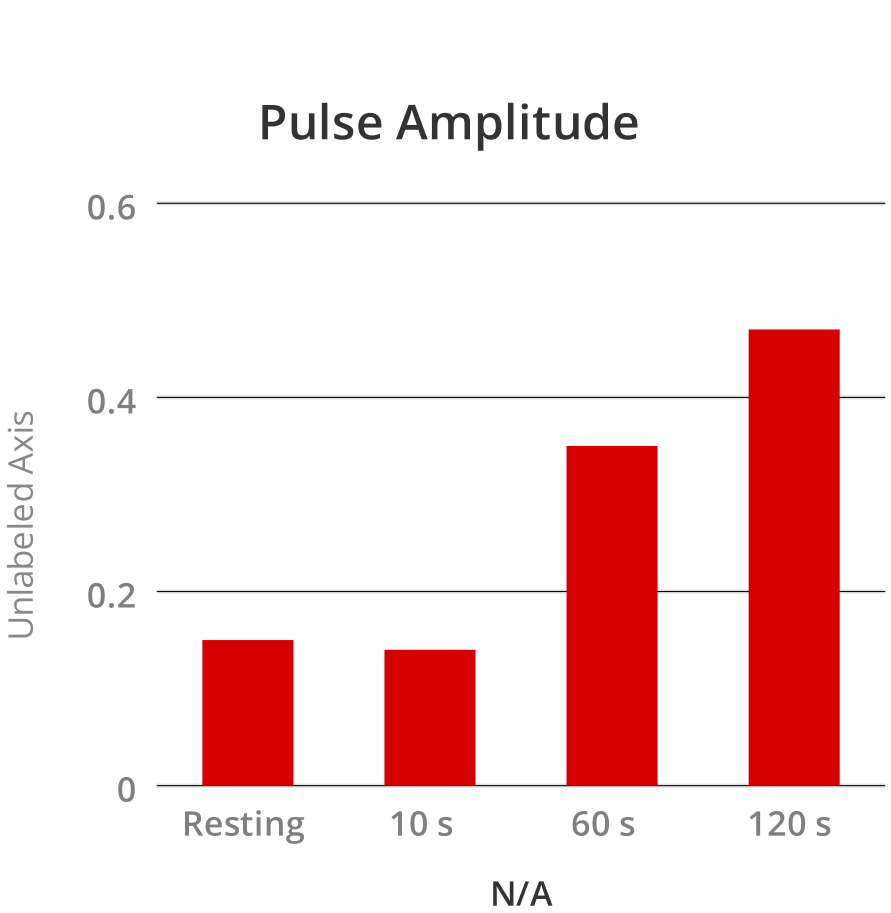
Heart rate

Measurement	Heart Rate
Resting	67.29
10 s	109.89
60 s	87.51
120 s	74.30

Pulse amplitude

Measurement	Pulse Amplitude
Resting	0.15
10 s	0.14
60 s	0.35
120 s	0.47





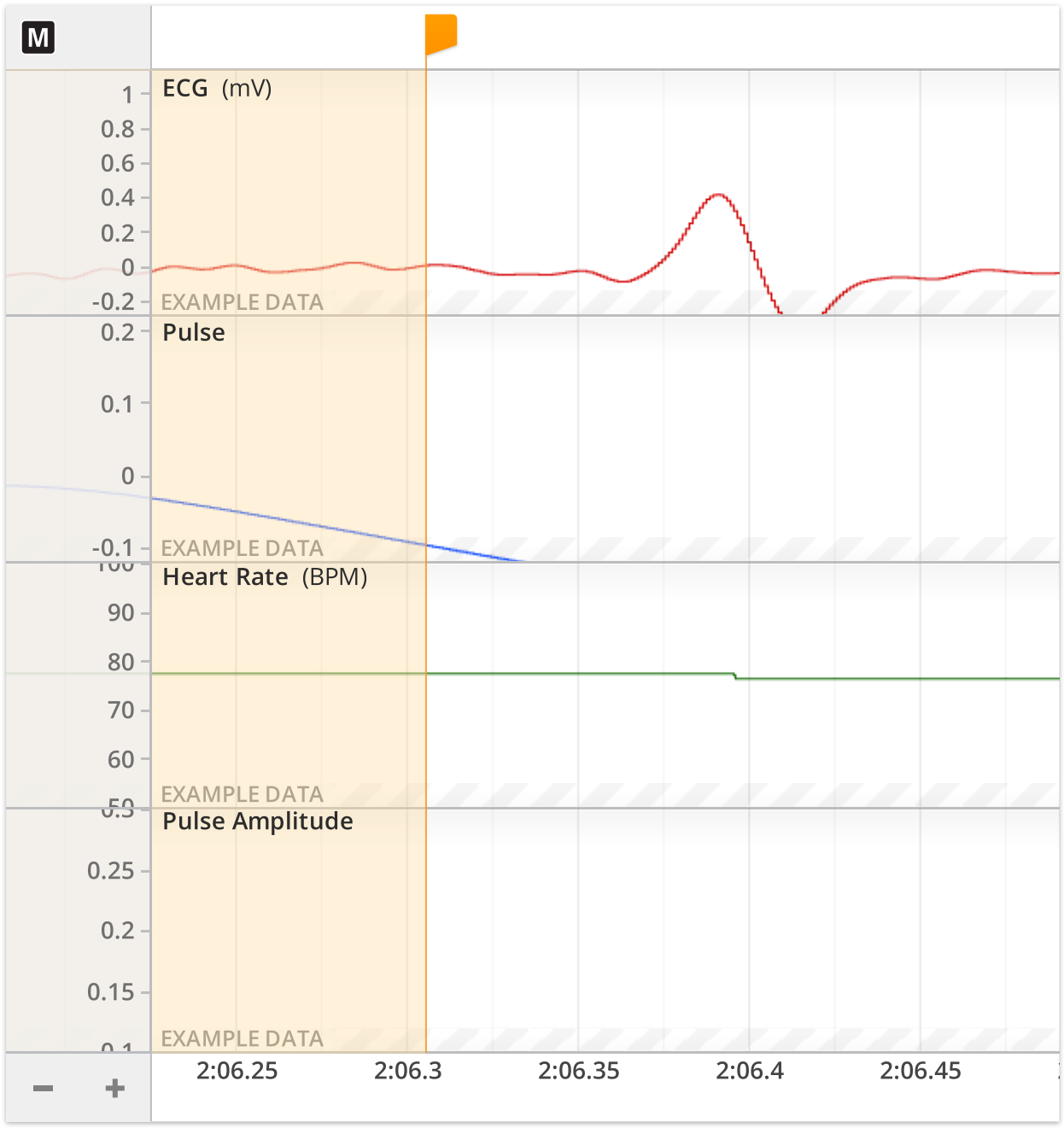
Based on the general trend of your data, what happened to the heart rate and pulse amplitude immediately after exercise and then during recovery from exercise? What is the physiological advantage of these changes?

Heart rate increases during exercise and declines afterwards. Pulse amplitude increases during recovery. Smaller pulses ensures consistent blood supply to core tissues and becomes larger to recover tissues after

Changes in the cardiovascular system are only some of the changes that occur in the body during and after exercise. What other physical changes did you observe in the volunteer?

Sweating, increased resp rate, increased temperature

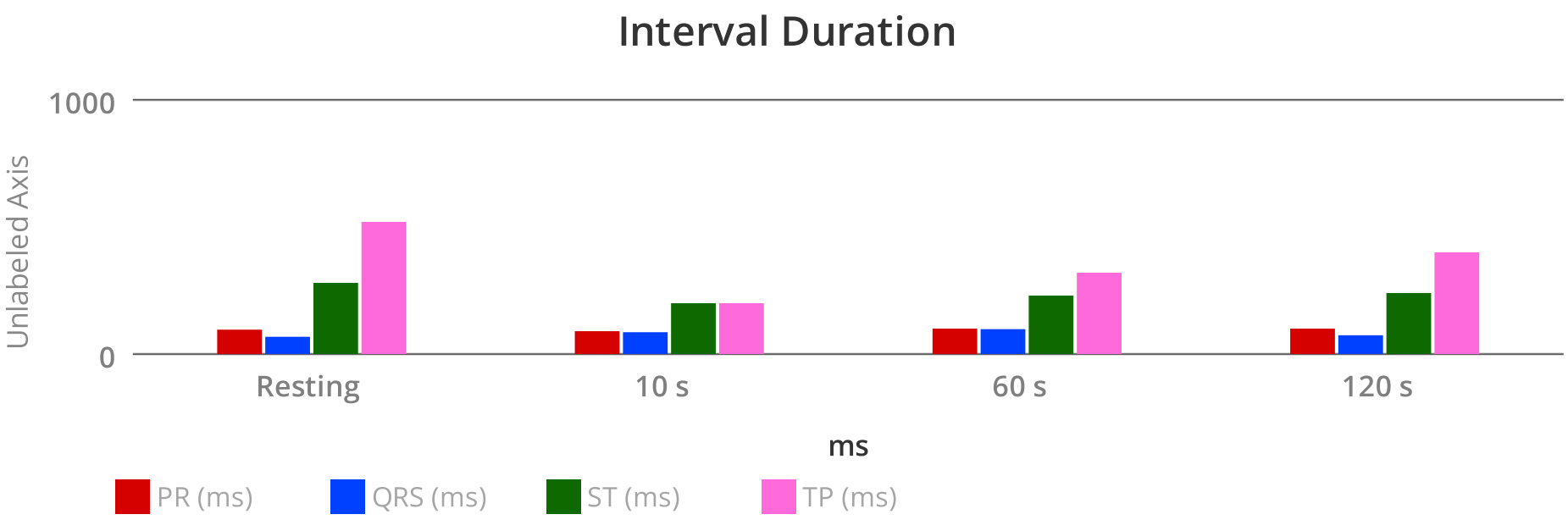
ECG and pulse: ECG – Analysis



Enter your data in milliseconds (ms). Note: The readouts may be in seconds!

Measurement	PR (ms)	QRS (ms)	ST (ms)	TP (ms)
Resting	96	68	280	520
10 s	90	86	200	200
60 s	100	98	230	320
120 s	100	74	240	400

Complete the graph below by labeling the title and axes, include appropriate units.



Label the diagram below.

PR interval

PR segment

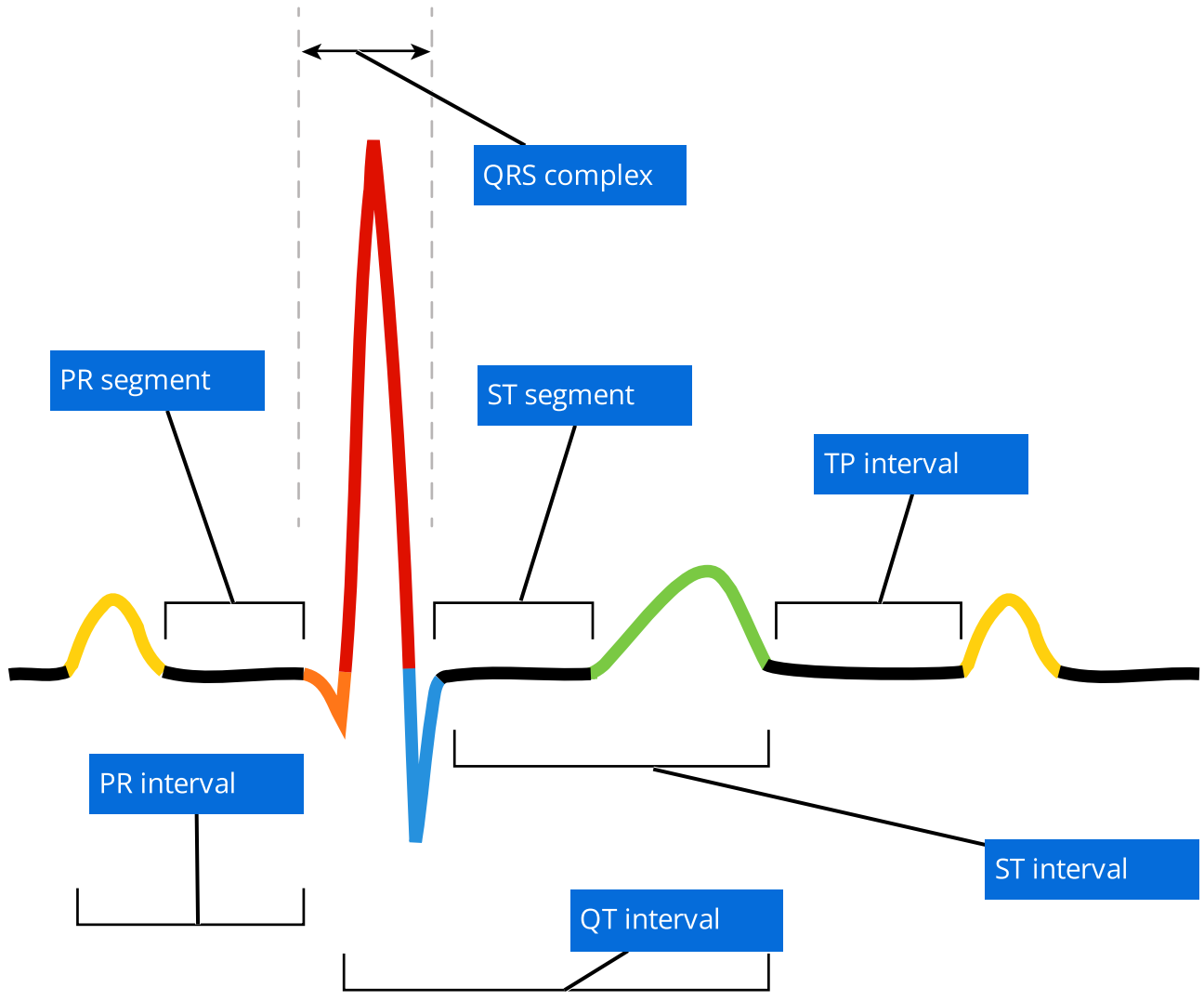
QRS complex

QT interval

ST interval

ST segment

TP interval



How did the RR interval and the heart rate change during exercise?

- RR interval decreases, heart rate decreases
- RR interval decreases, heart rate increases
- RR interval increases, heart rate decreases
- RR interval increases, heart rate increases

Which of the following is altered the most in conditions where heart rate is increased?

- PR interval
- QRS interval
- T wave duration
- TP interval

12-lead ECG – Activity

What cardiovascular and respiratory parameters are being recorded?

Heart activity + resp rate + pulse rate + blood oxgen

Which Lead (I, II or III) has the greatest amplitude of R wave?

Can you explain why this is so? (You may need to refer to slide 24 .. Lecture 4 to help you.)

Lead 2

Are all elements of the ECG trace (P, QRS and T waves) discernible on each trace?

What explanation can you provide where elements appear to be "missing" ?

Vectors travelling perpendicular will hide wave segments.

12-lead ECG – Analysis

When compared with the previous (neutral limb position) traces - (copied here below for reference), which lead or leads appears to have changed most with changing forelimb position ?

Lead 1 apprears different and lacks P complex.

Using a ruler measure the approximate peak amplitude value for the P and R waves on each lead in the two limb positions, and record in the table below.

Peak Value (mV)	Lead I Neutral	Lead 1 Left leg forward	Lead 2 Neutral	Lead 2 Left leg forward	Lead 3 Neutral	Lead 3 Left leg forward
P wave amplitude						
R wave amplitude						
T wave amplitude						

Based on your assessment of these traces, which lead appears to display the greatest variability in trace form, associated with changes to limb position?

Lead 1

Can you draw a diagram to explain why this may be so?

May not cross heart

Can you explain why the different waves of the ECG (that is, P wave, QRS complex, and T wave) are seen as an upward deflection in some leads but a downward deflection in others?

Different directions

Conclusions: How good is Einthoven's hypothesis when related to a quadruped ECG?

Below are some of the assumptions on which Einthoven's hypothesis is based. For each one, describe why this may or may not apply as well in quadrupeds

HUMAN- principles on which Einthoven's hypothesis is based	Quadruped differences
Heart is at the centre of an equilateral triangle	Offset
The trunk is a uniform volume conductor	True
The limbs are attached at fixed points	True
Limbs serve as linear conductors	True

The ECG is recorded in a healthy individual at rest and immediately after strenuous exercise. Which of the following parameters is likely to change the most on their ECG trace?

- R wave amplitude
- P-R interval
- QRS duration
- R-R interval
- Q-T interval

Which of the following is NOT a determinant of R wave amplitude in an ECG

- contractility
- direction of depolarisation
- mass of tissue depolarising
- lead chosen for recording

Which of the following statements about atrial repolarisation is correct?

- Atrial repolarisation occurs during the T wave
- Atrial repolarisation is not visible because it happens too quickly to be recorded
- Atrial repolarisation is obscured by ventricular depolarisation
- The Q wave represents atrial repolarisation
- Atrial repolarisation is not visible because the atria are so small

Popup - Notebook

Reflection notebook

Popup - Reflection notebook

Reflection notebook: