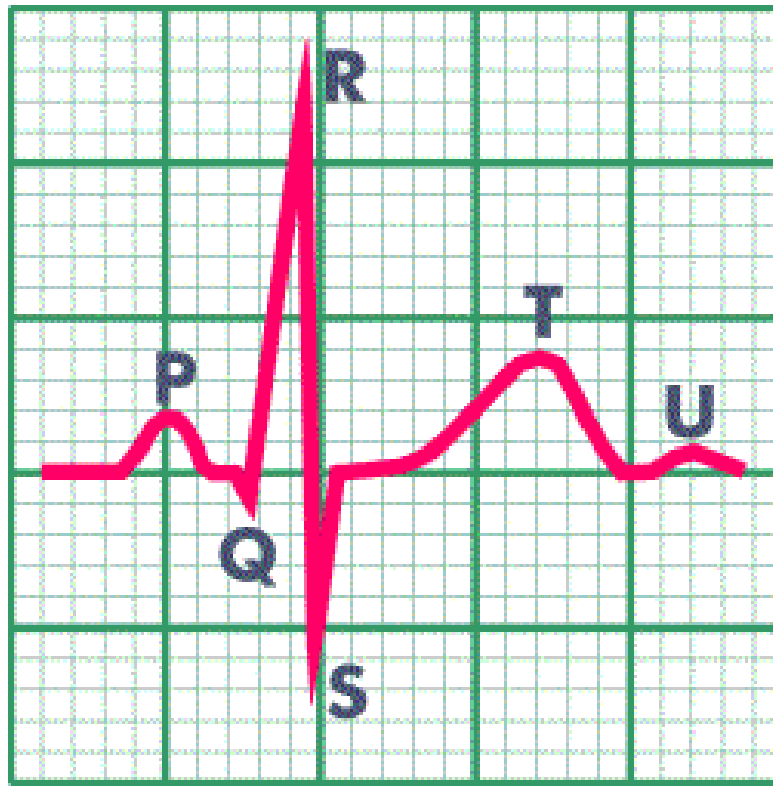


Human Anatomy & Physiology Practical – ECG and Heart Rate Variability

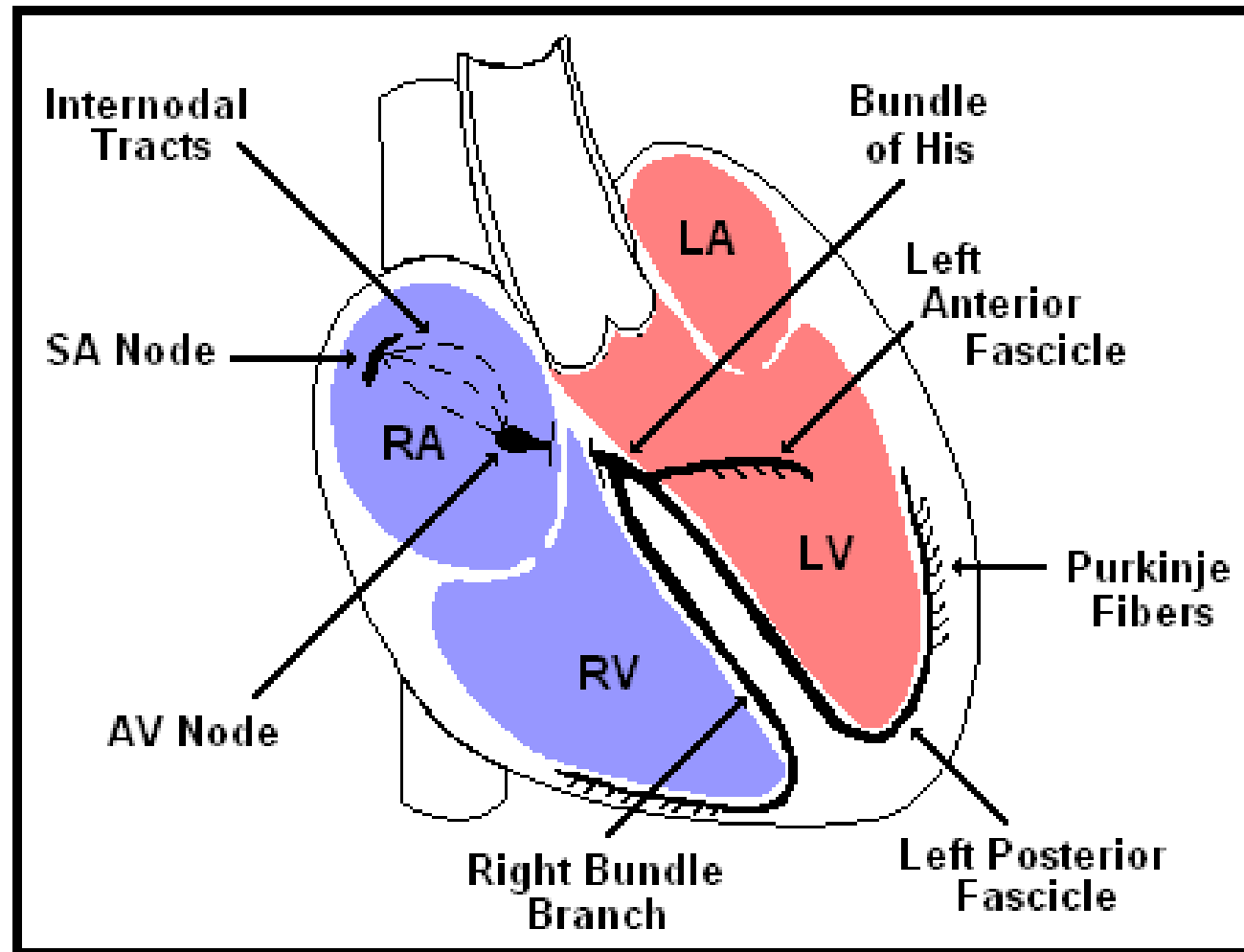
Learning Objectives

- To understand the basics of electrical activity in the heart and how they produce contractions
- To perform and repeat a ECG trace on fellow students, and if time allows take heart rate variability measures.
- To be able to record data on excel documents accurately and understand the effects of the measurements you have taken.

Practical - Electrocardiogram



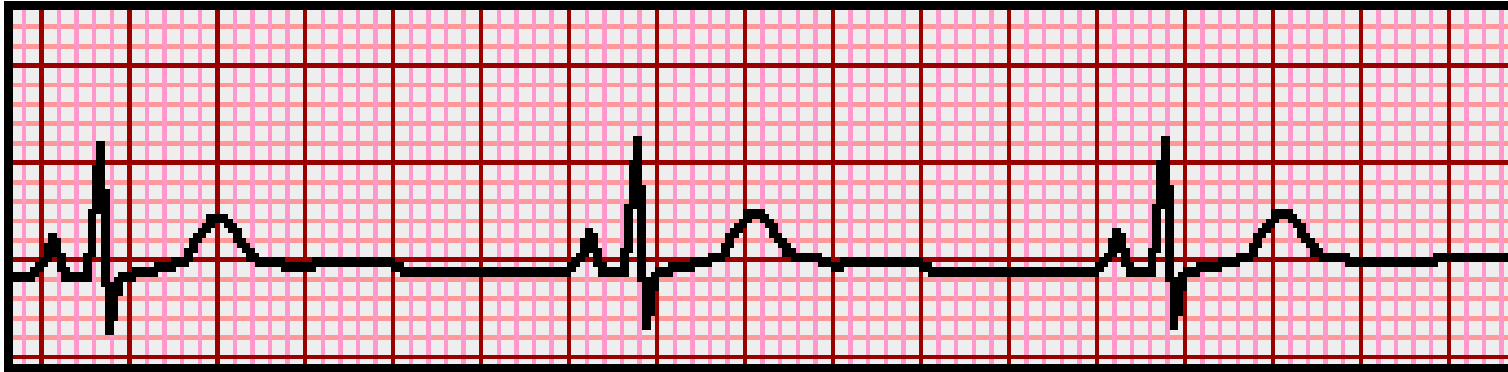
The Normal Conduction System



Rate

- HR of 60-100 per minute is normal
- $\text{HR} > 100 = \text{tachycardia}$
- $\text{HR} < 60 = \text{bradycardia}$

What is the heart rate?

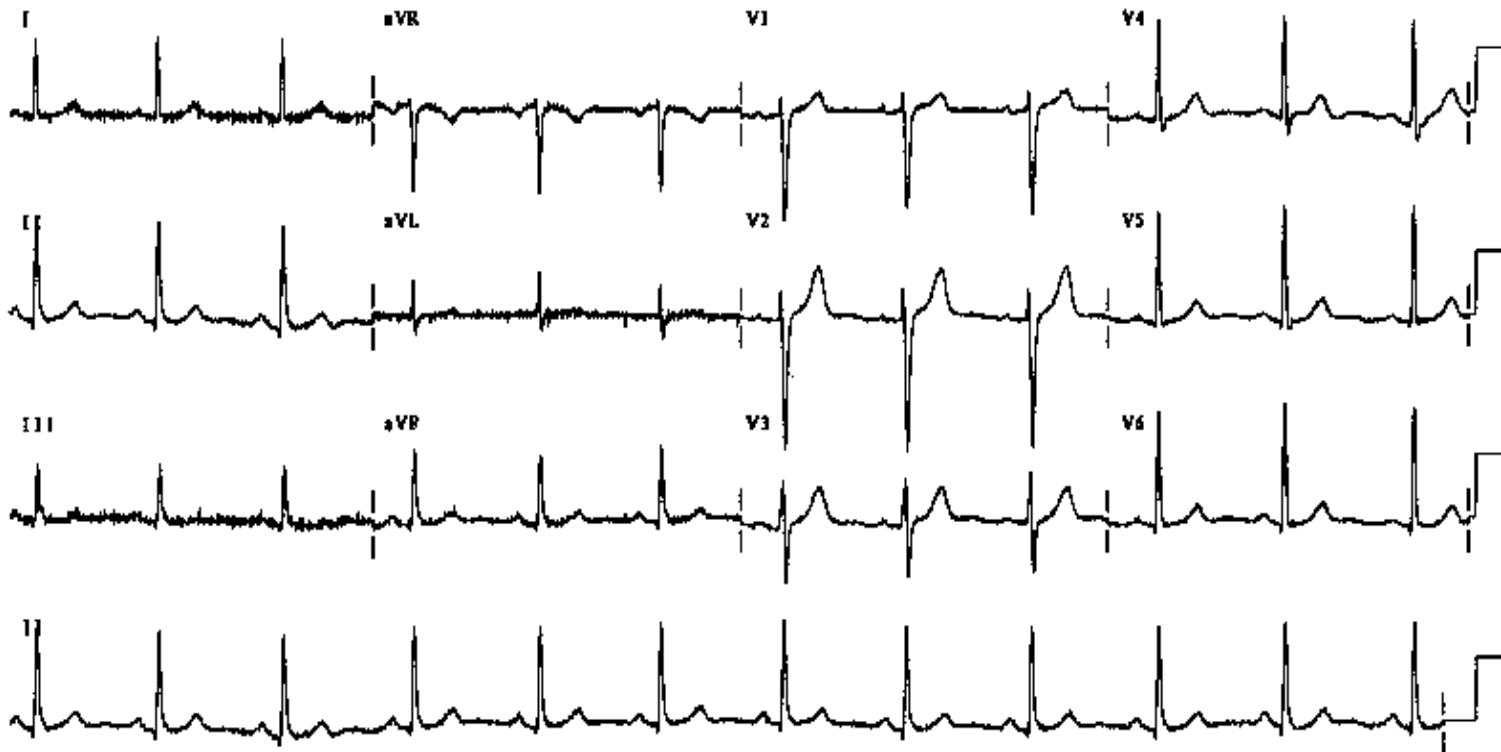


www.uptodate.com

$$(300 / 6) = 50 \text{ bpm}$$

What is this rhythm?

Normal sinus rhythm

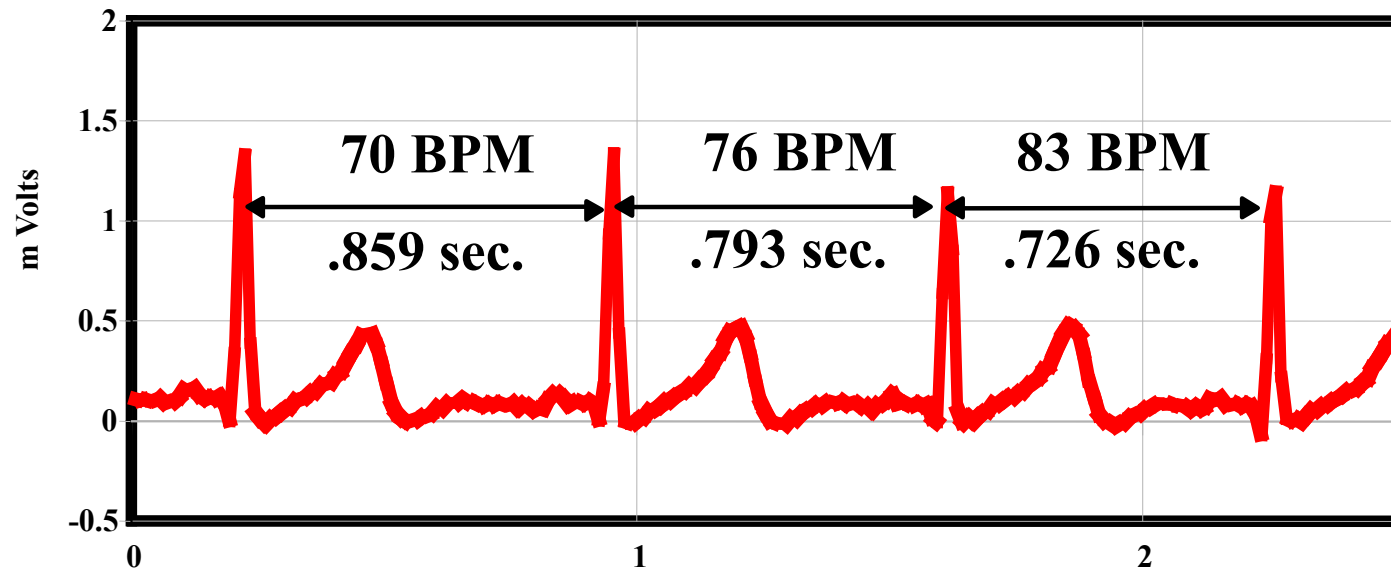


Heart Rate Variability is:

A measure of neurocardiac function that reflects heart-brain interactions and autonomic nervous system dynamics.

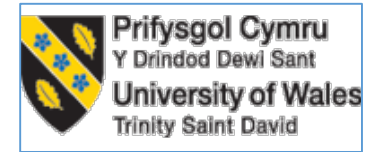
McCraty & Singer, 2002

Heart Rate Variability

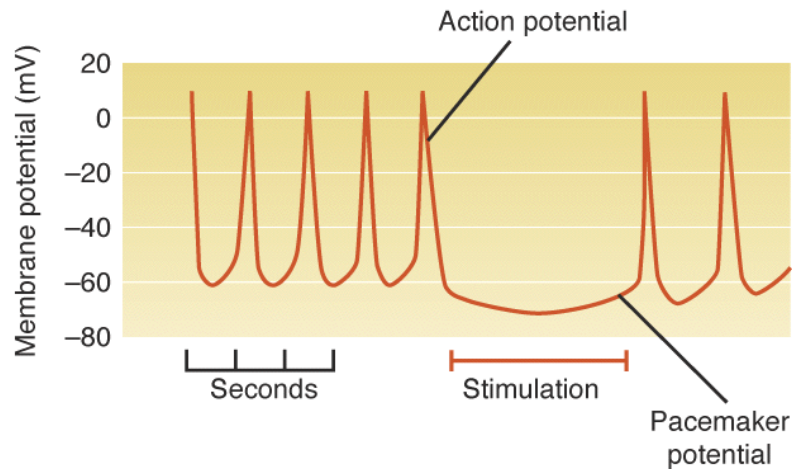


← 2.5 seconds of heartbeat data →

* Autonomic Nervous System Effects on the Heart

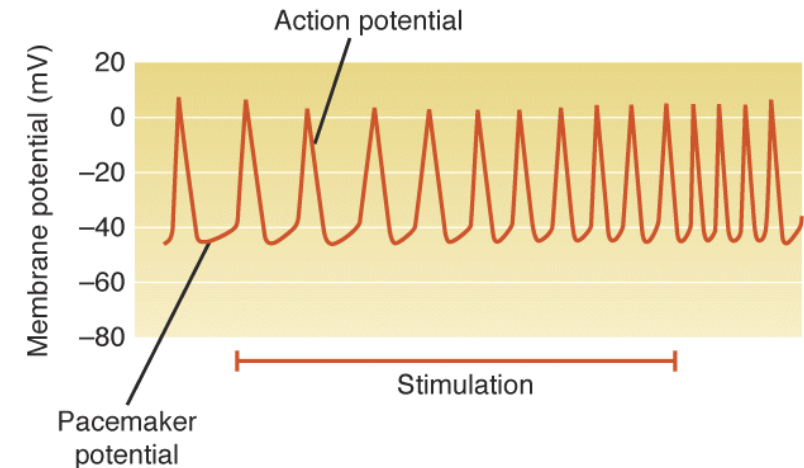


(a) Parasympathetic stimulation via vagus nerve



Parasympathetic Nervous System (PNS), inhibits cardiac action potentials

(b) Sympathetic stimulation



Sympathetic Nervous System (SNS), stimulates cardiac action potentials

Types of ECG

- 12 lead – for detailed cardiology analysis
- 5 lead – for ITU and hospital based checks
- 3 lead – for training purposes

Use of ECG

- Get machine out and power on
- Make sure you have the leads and sticky pads available for application to the client
- Two pads are placed below the clavicle (one left, one right)
- The remaining pad is stuck to the left mid chest region (just below the pectoral crease)
- Hold the cable to stop interference
- Run print out for 20 cycles
- Red – Right Clavicle, Yellow – Left Clavicle, Green – Pectoral crease

Task

After getting your baselines, repeat after performing the light wall task. What result are you expecting to see in relation to heart rate?

Use the calculation to $[R1-R2]^2 + [R2-R3]^2 + \dots \sqrt{\quad}$

Record all your results on the excel document under a separate TAB if feasible