University of Glasgow

VIA VERITAS VITA

MEDICAL SCHOOL

CLINICAL PROCEDURAL SKILLS

RECORDING AN ECG

ECG

An Electrocardiograph (ECG) is used to trace the electrical activity in cardiac tissue and looks at the heart from a variety of angles.

The ECG and be used to identify and locate pathology in:

- The cardiac conduction system
- The cardiac muscle itself#

There are different types of ECG which can be used

Type of ECG	Uses
"3-Lead"	For continuous monitoring. Sometimes printed in a long "rhythm strip"
"12-Lead"	To provide an instantaneous "snap-shot" of cardiac electrical activity- commonly printed out.
Holster monitoring	For 24 or 48 hour monitoring- usually where an arrthymia is suspected

This document is designed to provide guidance in recording and ECG. Understanding the underlying cardiac physiology, interpreting the resultant ECG and identifying pathological abnormalities are covered in other areas of the undergraduate curriculum.

Indications for recording an ECG

Symptom mediated

- Chest pain
- Dizziness/Syncope
- Breathlessness
- Palpitations

Monitoring

- During administration of certain medication
- Poisoning
- Post seizure
- Electrolyte imbalance
- After electrocution or drowning
- In assessment of blunt cardiac trauma

Screening

- Evaluation of pacemaker of internal defibrillator function
- Preoperative prior to administration of anaesthesia
- Health checks (for example in sportspeople or in certain occupations)

Contra-indications

There are no absolute contra-indications for ECG other than patient refusal.

Some patients may have an allergy to the adhesive ECG tabs.

The 3 Lead ECG.

This commonly used when patients require continuous monitoring.

Equipment Required

- Cardiac Monitor/Defibrillator
- Adhesive ECG tabs

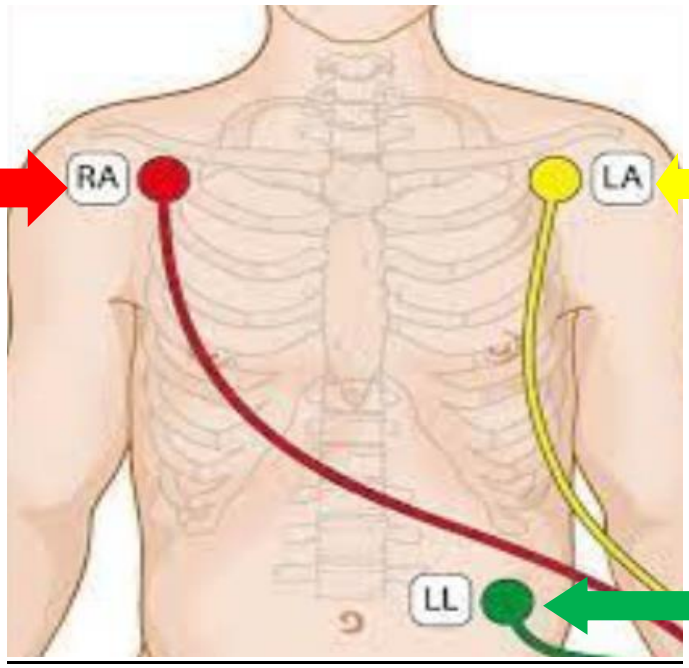
Procedure

- Explain the procedure to the patient and obtain their consent
- Prepare areas on skin- a razor may be required to remove hair.
- Minimise the duration of exposure- patients can wear clothing once the ECG leads are attached.

Select the 3-lead monitoring cable and attach each lead to the patient's anterior chest wall as shown below:

RIGHT ARM (RA)

Just below RIGHT clavicle



LEFT ARM (LA)

Just below RIGHT clavicle

LEFT LEG (LL)

LOWER chest to the LEFT of the umbilicus

- Once the leads are connected- ensure the patient's chest is covered.
- Turn on the monitor and select the appropriate lead according to local instructions.

Equipment Required:

1. ECG Machine
2. ECG adhesive electrodes to attach the ECG leads to the patient (usually stored with the ECG machine)
3. Razor

Preparing for the Procedure

The ECG Machine:

Ensure that the ECG machine is correctly loaded with ECG paper. Most ECG machines have a battery so before disconnecting the machine from the mains supply, check that there is adequate battery charge to perform the procedure.

Note where the ECG machine is kept so it can be readily returned after the procedure.

Ensure that the patient's demographic information is correctly entered into the machine:

- Patient Name
- Patient Date of Birth
- Patient Identifier (CHI number or Hospital number)

Explain the procedure to the patient:

"I would like to record an ECG which looks at the electrical activity of your heart. This involves attaching some stickers to your chest, arms and legs and connecting these to a machine. It may be necessary to shave some hair where the stickers attach to make them stick better. The procedure takes a couple of minutes and is not painful."

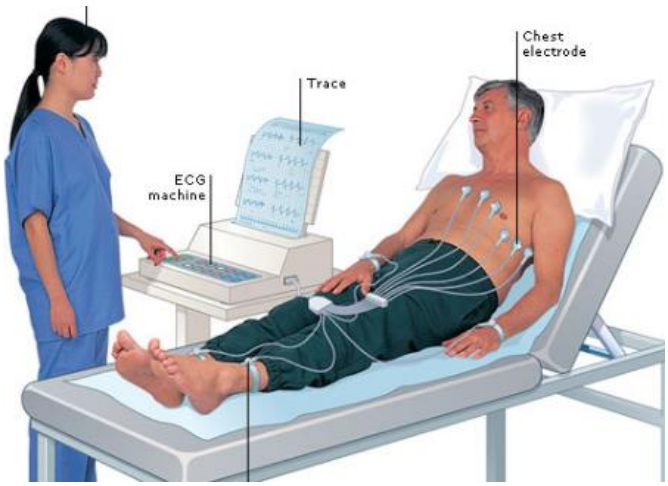
Gain consent from the patient for the procedure.

TOP TIPS

- Be sensitive to patient modesty when performing the procedure.
- Ensure the duration of exposure of the chest is minimised.
- Offer a chaperone.

Patient Preparation:

- The patient should be positioned comfortably at a 45◦ angle
- Provide a gown or a blanket which can cover the patient to minimise the duration of exposure.
- Check on patient comfort before starting the procedure.
- Don appropriate PPE in accordance with local protocol.



Performing the Procedure

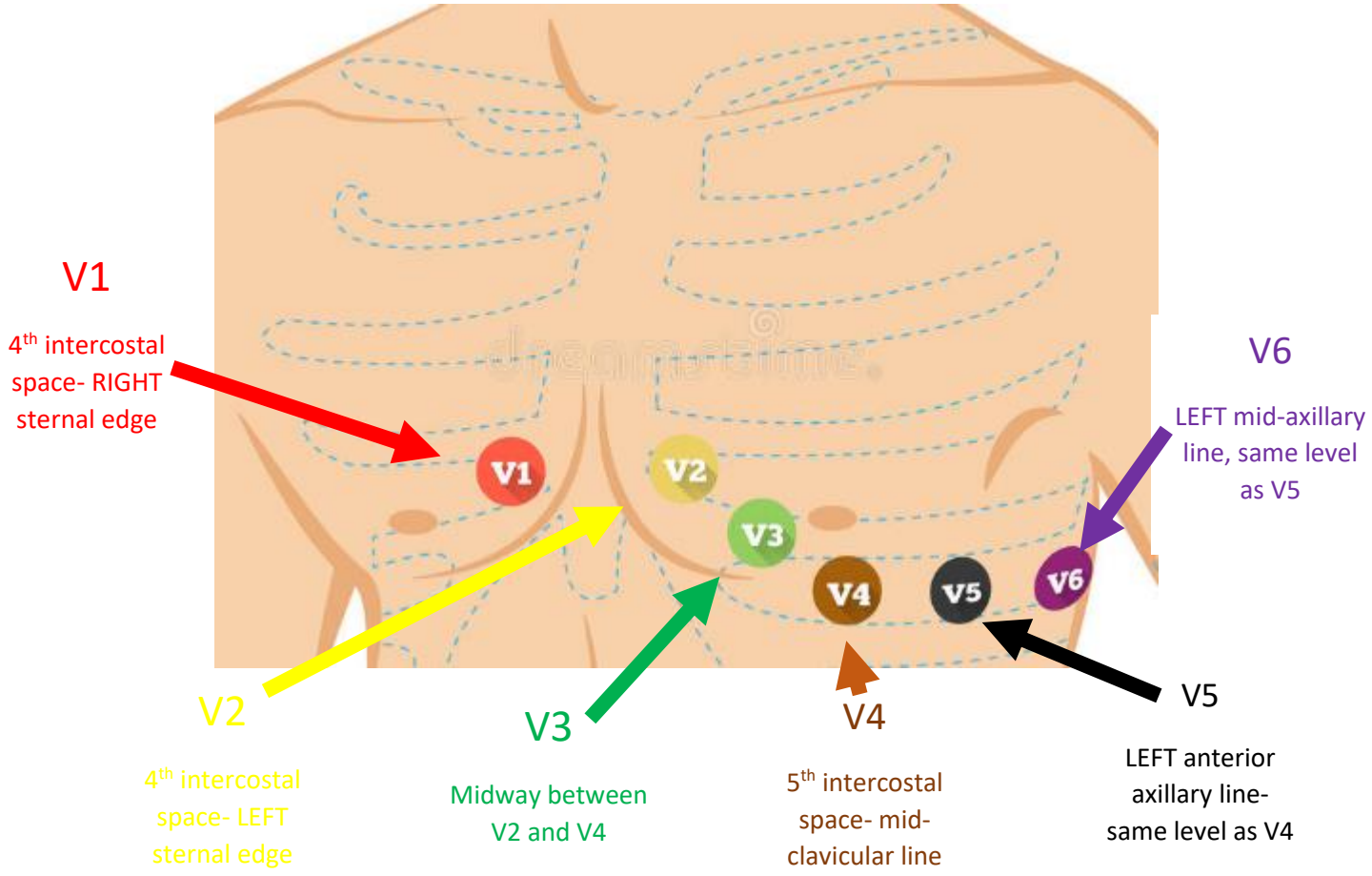
An ECG requires the placement of:

- 6 leads on the patient's anterior chest wall.
- 4 limb leads- one on each limb.

The Chest Leads

In patients with significant breast tissue, this may have to be displaced to ensure optimal contact with the anterior chest wall.

The chest leads are numbered V1-V6 and should be positioned as below:



ORDER OF PLACEMENT
V1 V2 V4 V3 V5 V6

Having attached the chest leads, the patient's exposed chest can be covered by a blanket or a gown to maintain dignity.

TOP TIP
Attach the cable to the ECG tab inferiorly to reduce tension and lessen the likelihood of the tab becoming detached

The Limb Leads

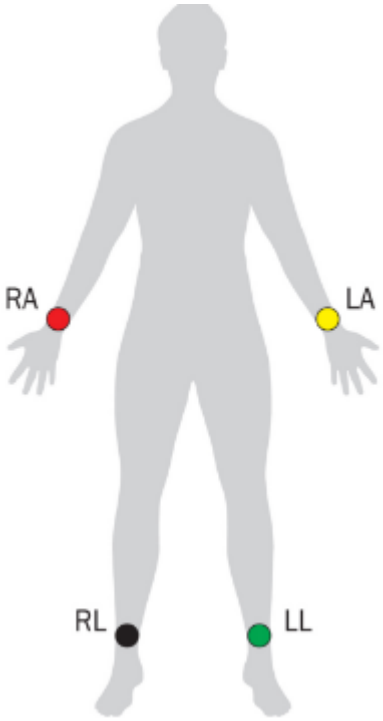
There are 4 limb leads, which should be attached to bony prominences. If possible:

- Upper limbs: attach to the ulnar styloid
- Lower limbs: attach to lateral maeollus

For patients who have an amputated limb, the lead should be placed on the most distal position possible with the contralateral tab placed at the same level.

RED LEAD

Right Upper Limb



YELLOW LEAD

Left Upper Limb

BLACK LEAD

Right Lower Limb

GREEN LEAD

Left Lower Limb

TOP TIP

Attach the cable to the ECG tab inferiorly to reduce tension and lessen the likelihood of the tab becoming detached

- Having attached the 10 leads to the patient, ask the patient to remain as still as possible.
- When the ECG trace represented on the ECG machine appears stable, press the appropriate button on the machine to record the trace.
- If a stable trace cannot be achieved, check the contact of the ECG tabs and that the patient is able to remain still.

TOP TIPS TO IMPROVE ADHESIVENESS OF ECG TABS

If hair is preventing the tab from sticking, gain consent from the patient to shave a small area using a razor.

If skin is visibly soiled, wash and dry the area before attaching tabs.

If skin is oily, wash with an alcohol wipe and allow to dry before attaching tabs.

Refrain from pressing down hard on tabs to make them stick, this expels the gel and causes the tabs to become detached.

Post Procedure

Remove the patient's ECG from the ECG machine (this normally requires tearing along perforations on the ECG paper).

Switch the ECG machine off.

Carefully remove the ECG tabs from the patient (this might be a little uncomfortable and care should be taken).

Explain to the patient that the procedure is finished and thank them.

Dispose of PPE in accordance with local protocol.

Ensure that the patient's ECG is placed in the patient's notes, that is has been interpreted and that interpretation has been documented.

Return the ECG machine to its station and ensure that is connected to the mains supply.