

The electrocardiogram

is an external measure of electrical potential difference caused by electrical activity of the heart
it is based on basic physical principles and vector analysis
it is used for the monitoring and diagnosis of heart disorders

Components

Sensor	Central Processing	Display
<p>Electrodes silver and silver chloride foam pad separates from skin gel improves conduction 4 limb electrodes, 6 chest</p>	<p>Differential amplifiers difference between two leads common mode rejection matching frequencies</p>	<p>Consists of a screen (or print out) shows the twelve 'leads' corresponding electrical potential changes</p>
<p>Chemical changes caused by potential changes vary impedance which is measured</p>	<p>Frequency settings high freq filters reduce muscle, mains current low freq filters reduce respiratory movements wider range for diagnostic 0.05 - 100Hz less for monitoring 0.5-40 Hz</p>	

Methods to reduce artefact

Patient factors

Patient must remain as still as possible (reduces non cardiac muscle uses and motion)
Skin should be clean shaven at electrode attachment points
Electrodes should be placed in to the correct locations

Electrode factors

Improved contact with the skin is desirable to reduce polarisation
The use of gels as conductors

Central processing

Multiple electrodes may be used to improve common mode rejection algorithms
Temperature should be kept constant (reducing current drift)
Ensure the frequency range is appropriate (reducing bandwidth reduces artefact (and detail))

Display

Ensure that the display is accurate, the printer feed is at the correct speed (25mm/sec)