

Great Ape TAG - endorsed

# A Guide to Performing a Standard Electrocardiogram (ECG) in Great Apes

## Positioning

A 6 channel (basic; limb leads only) ECG can be performed with the animal in any position. Performing a 12 channel ECG, however, is aided by positioning the animal in dorsal recumbency.

Where possible, an electrocardiogram (ECG) should be performed routinely in all great ape anaesthetic procedures.

A **6 channel ECG** uses 4 electrodes placed on the limbs to gather basic information about heart rate and rhythm.

A **12 channel ECG** involves the placement of 6 additional electrodes on the chest. A 12 channel ECG provides a great deal more information about the electrical activity of the heart and can therefore aid in the diagnosis of more subtle changes such as myocardial ischemia or infarction.

## Skin preparation:

- Clipping:
  - Adhesive electrodes can be placed on the dorsal or palmar/plantar aspect of the hands or feet, so no clipping is required
  - For the chest leads, it may be necessary to clip a small window if hair prevents good attachment of the electrodes
- The skin should be clean and clear of visible contamination. The application of surgical spirit to the skin can help to ensure good skin contact of electrodes

## Electrode placement:

- Proper electrode placement is crucial in achieving an accurate and diagnostic ECG

## Limb Leads:

LIMB	STANDARD	AMERICAN
Right fore	Red	White
Left fore	Yellow	Black
Left hind	Green	Red
Right hind (earth)	Black	Green

Table 1: Showing positioning and colour coding of ECG cables

Chest Leads:

LEAD	LOCATION	EXPLANATORY NOTE
V1	Fourth intercostal space (ICS) at right sternal border	Locate sternal angle (angle of Louis) – this is the 2 <sup>nd</sup> rib Move to the right – this is the 2 <sup>nd</sup> ICS. Move down 2 ribs to the 4 <sup>th</sup> ICS Where this space meets the sternum is the position for lead V1
V2	Fourth intercostal space (ICS) at left sternal border	Go back to the sternal angle and move into the 2 <sup>nd</sup> ICS on LHS Move down two ribs to the left 4 <sup>th</sup> ICS Where this space meets the sternum is the position for lead V2
V3	Between fourth and fifth intercostal space (ICS)	Midway between V2 & V4 (Place V4 first)
V4	Fifth intercostal space (ICS), left mid-clavicular line	From the V2 position move down one rib to the 5 <sup>th</sup> ICS (left) V4 is in this ICS in line with the middle of the clavicle
V5	Fifth intercostal space (ICS), left anterior-axillary line	Follow the 5 <sup>th</sup> ICS to the left until your fingers are below the beginning of the axilla. This is the position for V5
V6	Fifth intercostal space (ICS), left mid-axillary line	Follow the 5 <sup>th</sup> ICS further until you are immediately below the centre of the axilla. This is the position for V6

Figures 2a and 2b:

2a (left) shows the anatomical location of V1-6 chest leads<sup>1</sup>. 2b (right) shows ECG electrodes in situ on chimpanzee undergoing a routine health check.

