GUIDELINE

SUBJECT: ECG investigation in NICU

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Disclaimer:
It should be noted that this document reflects what is currently regarded as a safe and appropriate approach to care. However, as in any clinical situation there may be factors that cannot be covered by a single set of guidelines, this document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in respect of each individual presentation. It does not replace the need for the application of clinical judgment to each individual presentation.
Performing an ECG: One Page summary and Checklist

(Ctrl+Click on Coloured words to jump to that section)

**Staff**
Performed by cardiology technician in work hours
Request form required
Performed by NICU staff out of hours
No request form required

**Machine**
Kept in Coronary Care JHH

**Procedure**
Leads
Attach chest leads V1, V2, V3, V5, V6. Place V4 on the right as V4R
Attach limb leads correctly
Turn on machine
Enter patient details in machine
Wait till baby settles
Press enter and print ECG
Turn off machine
Remove leads
Return machine to CCU

**Problems**
See Trouble shooting
Rationale:
For clinical reasons such as arrhythmias a formal ECG is sometimes required on a neonate. It is preferable that the Cardiology technician carries out the ECG but in the absence of the technician the ECG can be performed by the medical staff or neonatal nurse caring for the baby.

Outcomes:
The aim is for the ECG to be carried out at a timeframe suitable for the neonate.

The request:
A request form is required when the formal ECG is to be performed by the Cardiology technician; however no request form is required when the neonatal nurse is carrying out the ECG tracing.

The paperwork:
See page 5. Instructions for the ECG machine (found with ECG machine). It is important that the correct details are recorded on the ECG machine in order for the trace to be reviewed by available Cardiologist.

Location of ECG machine:
The machine is located in Coronary care on Level 3 John Hunter Hospital. Leads are with the ECG machine.

The procedure:
Positioning of electrodes is demonstrated below for the adult. For neonates positioning is the same except for the V4 lead, which is placed on the right side. Electrode discs may need to be cut in half for the neonate.

This is demonstrated on the following page.
Neonatal positioning of leads on chest

The limb leads are placed as above with the lower limb leads heading up the way as demonstrated.
V1 (Red lead)  
fourth intercostal space at the right sternal border  
| Limb leads- wrist and ankle inner aspect preferred  
These are longer than the other leads.  

V2 (Yellow) fourth intercostal space at the  
left sternal border  
| Right arm- (White) Right deltoid or wrist  

V3 (Green) mid-way between V2-V4  
| Right leg – (Green) Right thigh or ankle  

V4 (Blue) fifth intercostal space at right  
midclavicular line  
| Left arm - (Black) Left deltoid or wrist  

V5 (Orange) Anterior axillary line on same  
horizontal level as V4  
| Left leg - (Red) Left thigh or ankle.  

V6 (Maroon)Mid –axillary line on same  
horizontal level as V4 + V5  

The picture below should be used as a guide.

![ECG leads on baby](image)

To use the ECG machine, once you have placed the leads follow instructions below:

1) Turn on  
2) Enter ID (arrow across top)  
3) Enter details and complete comment section  
4) ECG – wait until settled  
5) Press Enter  
6) Print ECG. This will store data for review and reporting.  
7) Turn machine off  
8) Return machine to Coronary care unit

**Trouble shooting:**

Unsettled baby- can be wrapped up to settle  
If difficult to obtain trace move leg leads to the abdomen/ arm to shoulder.
<table>
<thead>
<tr>
<th>Artefacts</th>
<th>Skin impedance</th>
<th>Muscle movement</th>
<th>Electrical continuity</th>
<th>Electrodes</th>
<th>Cabling</th>
<th>Interference</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>No base line</td>
<td>Check all connections perform continuity check</td>
<td>Check for dry out</td>
<td>Check for probe cable</td>
<td>Check lead switch and ECG machine set up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abrade skin</td>
<td>Stop patient movement</td>
<td>Check ground connection</td>
<td>Use same type of electrodes all sites</td>
<td>Check for static build up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC Noise</td>
<td>Abrade skin</td>
<td>May be untreatable/involuntary muscle tremor</td>
<td>Check ground connection</td>
<td>Check for dry out</td>
<td>May need fully shielded cable and lead wires</td>
<td>Keep cable away from AC cord</td>
<td>Turn off fluoro lights/and/or other equipment</td>
</tr>
<tr>
<td>Intermit Signal</td>
<td>Abrade skin</td>
<td>Check for loose connections</td>
<td>Check for loose electrode Check for dry out</td>
<td>Perform continuity check</td>
<td>Check for static build up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motion Artifact</td>
<td>Abrade skin</td>
<td>Move electrodes off muscle mass</td>
<td>Check for loose connections</td>
<td>Check for loose electrode Check for dry out</td>
<td>Perform continuity check</td>
<td>Turn off fluoro lights/ and/or other equipment</td>
<td>Check set up</td>
</tr>
<tr>
<td>Low Amplitude</td>
<td>Abrade skin</td>
<td>Ensure electrodes are parallel to electrical axis</td>
<td>Check for dry out</td>
<td>Turn off radio/TV</td>
<td>Check gain setting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

REFERENCES:

RELATED LEGISLATION:
DEPARTMENT OF HEALTH CIRCULARS:
AREA POLICIES: GNAH 0059: Chest pain management >18 years 2010
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APPENDIXES:
Developed by; S. Graham & J. Buchan

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