

<b>Electrocardiograph (ECG)</b> <b>Ambulatory Clinic Policy &amp; Procedure</b> <b>SELU <input checked="" type="checkbox"/> NW <input checked="" type="checkbox"/> EVH <input type="checkbox"/></b>			
<u>Effective Date:</u> 06/04	<u>Revised:</u> 10/17	<u>Authors:</u> Annette DiJulio, RN	<u>Reviewed By:</u> Clinical Practice Council and Local Practice Council, Sarah Kimbrough MSN, RN, OCN, Naomi Heinecke
<b>PURPOSE:</b> to define the responsibilities of SCCA staff with validated competency to obtain an ECG recording			
<b>POLICY BACKGROUND:</b>	<ul style="list-style-type: none"> <li>The ECG is a transthoracic interpretation of the electrical activity of the heart over a period of time, as detected by electrodes attached to the surface of the skin and recorded by a device external to the body.</li> <li>An ECG is used to measure the rate and regularity of heartbeats, as well as the size and position of the chambers, the presence of any damage to the heart, and the effects of drugs or devices used to regulate the heart.</li> <li>Most ECGs are used for diagnostic or research purposes.</li> <li>Staff performing ECG must undergo training if specified by unit/service manager. Training checklist can be found in <a href="#">Appendix A</a>.</li> </ul>		
<b><u>SUPPORTIVE POLICIES AND PROCEDURES:</u></b>	Utilization of clippers in the clinic <a href="#">ECG Scheduling</a>		
<b><u>PATIENT EDUCATION RESOURCES:</u></b>	N/A		
<b><u>EQUIPMENT AND SUPPLIES:</u></b>	ECG machine Leads ECG paper ECG electrode pads clippers as applicable		

<b>Action:</b>	<b>Rationale:</b>	<b>Special Considerations:</b>
1. Verify the provider order in CPOE and explain the procedure to the patient.		
2. Verify type of ECG in epic and CPOE order.	To confirm what MA/LPN responsibilities are for each ECG type.	Add link here to ECG Guidelines graph that is at end of ECG scheduling policy.
3. Push the F1 button to enter patient data includ-	For accurate identification, this information must be	If research related, there must be a stamp or label

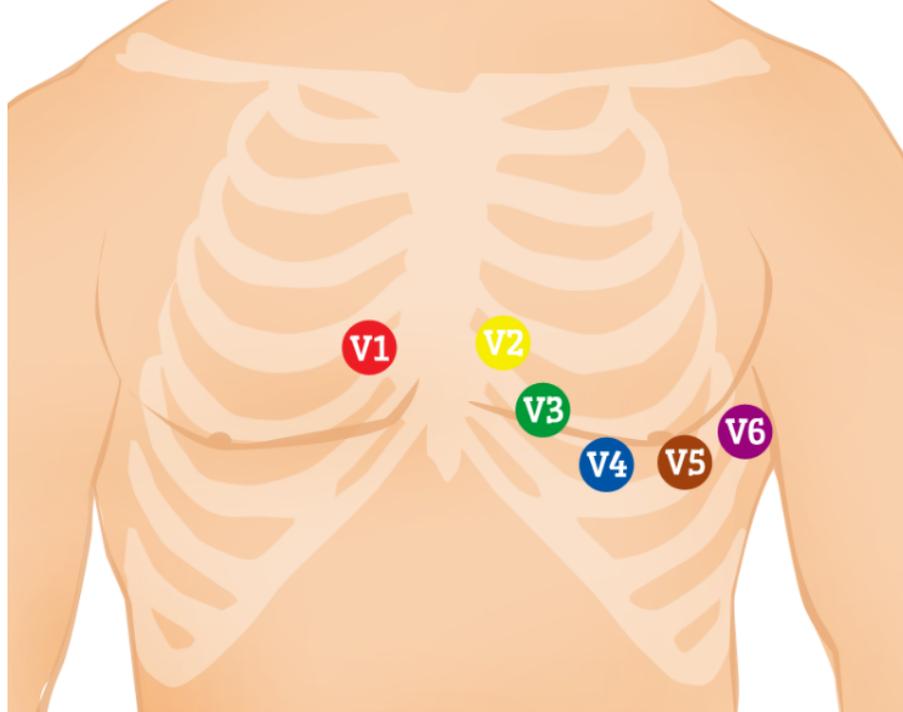
Action:	Rationale:	Special Considerations:
<p>ing the patient's name, U number (including the U), the provider ordering the ECG and their NPI number, reason for the procedure, and first initial/last name of the staff member obtaining the ECG. Push ENTER when done.</p>	<p>entered and printed on the ECG.</p>	<p>with research study code information. The research coordinators provide this. Be sure to place the patient's name and U number to the far right to avoid confusion with the study number.</p> <p>Research ECGs must be labeled appropriately to avoid a patient charge.</p> <p>ECG's not billed to research will be billed to the patient's account.</p>
<p>4. Position the patient in a supine position on the exam table. Remind the patient to lie still and breathe normally.</p>	<p>A comfortable position will enhance the outcome of the EKG to provide an accurate waveform and interpretation. Movement will interfere with a proper waveform. Normal breathing will not interfere.</p>	<p>Make sure that the skin is clean and dry without hair or substance to interfere with the contact to the skin. Utilize the clippers to remove any hair that interferes with contact. Do not use razors in the clinic. Do not use alcohol to prep the skin, it is an irritant to patient's skin and can potentially interfere with obtaining an ECG tracing.</p>
<p>5. Place adhesive electrode pads across the chest and limbs in the following areas:  V1 4<sup>th</sup> intercostal space, right sternal border  V2 4<sup>th</sup> intercostal space, left sternal border  V3 halfway between V2 and V4  V4 5<sup>th</sup> intercostal space, left midclavicular line  V5 Level with V4, left anterior axillary line  V6 Level with V4, left mid axillary line  Right wrist  Left wrist  Right lower ankle  Left lower ankle</p> <p>See ECG <a href="#">picture at end of policy for correct placement of electrode pads.</a></p>	<p>Accurate interpretation assumes technical standards are adhered to during the acquisition and recording of tracings</p> <p>Technical factors can be patient related, operator-dependent, and or equipment related</p> <p>Limb leads: Any part of the upper limbs as long as they are below the shoulder – “wrists.”</p> <p>Any part of the lower limbs as long as they are below the inguinal fold anteriorly – “ankles.”</p>	<p><b>Patient-related factors:</b> Muscle tremors and movement may impair the quality of the recording. Minimize and recognize artifact. Body habitus (i.e. marked obesity), note at the time of the recording. Any placement necessary by deformed or missing extremities must be noted on the ECG recording.</p> <p><b>Operator-dependent factors:</b> Chest leads placed in the proper position, Electrodes make good skin contact to minimize artifact, Incorrect placement of the precordial leads (V1 through V6) may lead to a false diagnosis of myocardial infarction, Reversal of the limb leads and switching of the precordial leads.</p> <p><b>Equipment factors:</b> Ensure Bio-med sticker is current.</p> <p><b>Female patients:</b> Electrodes are NEVER placed on top of the breast unless you cannot gain access to the normal position (note any variation in placement on the ECG recording).</p>
<p>6. Attach the insulated wires/lead to each of the ten electrode pads. Place the appropriately labeled lead to the proper electrode. Each lead</p>		

Action:	Rationale:	Special Considerations:
will be connected to a separate electrode.		
7. Visualize a sharp waveform on the ECG machine.		
8. Push the ECG button. The machine will acquire data for 10 seconds and then push ECG button again to print.		
9. Verify accurate copy for chart. If not precise and clear, repeat the procedure to obtain a 2nd EKG.	Make sure that you have a good waveform on the paper copy before you take off the leads so that you can get another ECG if the first one is not appropriate.	<p>Verify lead placement correct. If the lead does not have good contact, the ECG will not pick up the electrical activity. Reposition the lead or remove electrode, cleanse and dry the skin with soap and water and replace.</p> <p>Occasionally, the waveform is clear on the ECG screen, but the printout does not always print out the same. It may have erratic activity within specific leads despite efforts to correct the problem of proper lead placement or contact with electrodes. If this occurs on a consistent basis, with the waveform erratic in any of the leads, consult the supervisor for intervention and assistance in obtaining the ECG. It may need to be reported to Materials Management so that the appropriate technician can come to assess and service the machine as needed.</p>
10. On the ECG report if anything other than “normal sinus Rhythm” or the nurse/MA/LPN have any clinical concerns, the ECG should be reviewed by the provider prior to the patient receiving any treatment or leaving the clinic.	To ensure that the provider determines if it is safe for the patient to receive treatment or leave the clinic.	
11. A copy will be saved to the disc for transmitting later.		
12. Disconnect leads and remove electrode pads from the patient’s skin.		
13. Turn the power off. Plug in the ECG machine when not in use.		
14. Transmission of ECGs will be done Immediately after ECG has been completed.	The printed interpretation at the top of the ECG requires the cardiologist to interpret the ECG.	<p>If unable to transmit within 24 hours, notify the clinical lead in your area (i.e., charge RN, Supervisor, Manager)</p> <p>Some ECG are not transmitted. <a href="#">Refer to ECG Scheduling Policy.</a></p>
15. Turn power on to ECG machine.		

Action:	Rationale:	Special Considerations:
16. Push the F6 button for “more”.		
17. Push the F2 button for main menu.		
18. Push the F5 button for file manager.	Each ECG should be checked for proper information	
19. Select the F1 button to transmit one ECG or select F2 button to transmit all of the ECG’s at one time.		
20. If sending only one ECG, highlight the selected patient by moving cursor over name and push enter. The entire line will turn gray.	The ECG’s will be transmitted over the phone line and automatically deleted after being sent. Plugging the ECG machine in when not in use will restore the battery.	Urgent ECG’s requiring a stat read must be sent immediately.
21. Push the F4 button to transmit.		
22. When completed, push the F6 button to go back to the main menu or turn the machine off and make sure that it is plugged in while not being used.		

References: White, K (2011). *Fast Facts for Adult Critical Care*, ECG. K. White (Ed.). Mobile, AL. Kathy White Learning Systems.

## Chest (Precordial) Electrodes and Placement



- » V1 - Fourth intercostal space on the right sternum
- » V2 - Fourth intercostal space at the left sternum
- » V3 - Midway between placement of V2 and V4
- » V4 - Fifth intercostal space at the midclavicular line
- » V5 - Anterior axillary line on the same horizontal level as V4
- » V6 - Mid-axillary line on the same horizontal level as V4 and V5

## Appendix A ECG Skill validation

Revised 6/14

<b>Employee Name:</b>			
<b>Position:</b>			
<b>Department:</b>			
<b>Assessment Area</b>	Preceptor initials	Orientee initials	Date
<b>RESTING ECG</b>			
1. Review <i>Electrocardiograph (ECG) Nursing Policy and Procedure</i> .			
2. Prepare patient/Place Leads			
3. Turn Power “On”			
4. Push <b>F1</b> (Patient Data) <ul style="list-style-type: none"> <li>a. Demographics screen will appear. Enter patient information. <b>REMEMBER</b> when entering patient number to use the letter “U” in front of the number (example:U1234567)</li> <li>b. Use the arrows to move down and click on Return</li> </ul>			
5. Push the “ <b>ECG</b> ” Button. The machine will say “ <b>Acquiring data</b> ” for 10 seconds.			
6. Push “Continue” and the machine will print the EKG and save a copy of the chart to disk.			
7. Review concepts of what constitutes an adequate EKG tracing, troubleshooting when artifact appears, and discuss measures to improve the quality of the tracing.			
8. To make a second copy, push the “ <b>Copy</b> ” button. A second strip will then print. The ECG is automatically stored to a 3.5” 1.44 MB disk for later transmission.			
<b>TRANSMIT ECG</b>			
1. Turn Power “On”			
2. Push <b>F6</b> (More)			
3. Push <b>F2</b> (Main Menu)			
4. Push <b>F5</b> (File Manager) <ul style="list-style-type: none"> <li>a. While at this screen please print the directory by pushing <b>F4</b> (Directory). It will print off the list of all EKGs saved to the disk.</li> </ul>			
5. Push <b>F5</b> (Location) <ul style="list-style-type: none"> <li>a. A menu will pop up with a table of options available to transmit EKG. MUSE Network is the first one and is highlighted.</li> </ul>			
6. With MUSE Network highlighted, Push “ <b>Enter</b> ” on the keyboard.			
7. Push either <b>F1</b> (Select) to send one EKG or <b>F2</b> (Select All) to transmit all of the EKGs at one time. <ul style="list-style-type: none"> <li>a. If selecting <u>one</u> EKG, highlight by moving the cursor over name and push “Enter”. The entire line will now turn Grey.</li> </ul>			
8. Push <b>F4</b> (Transmit)			
9. The EKGs will be transmitted over the phone line and deleted automatically after being sent. When finished push <b>F6</b> (Main Menu) or turn the machine “Off”.			

<b>MANUALLY DELETING ECG'S</b>			
1. Turn Power “ <b>On</b> ”			
2. <b>Push F6</b> (More)			
3. <b>Push F2</b> (Main Menu)			
4. <b>Push F5</b> (Mile Manager)			
5. <b>Push F1</b> (Select)			
<ul style="list-style-type: none"> <li>• Move the cursor over the file you wish to delete and push “<b>Enter</b>” to highlight the file. When highlighted, the entire line will turn Grey.</li> </ul>			
6. <b>Push F5</b> (Delete)			
<ul style="list-style-type: none"> <li>• A warning screen will pop up asking you to make sure you wish to delete this file.</li> </ul>			
7. <b>Push F2</b> (Yes)			
When finished <b>push F6</b> (Main Menu) or turn the machine off.			
<b>LOADING PAPER</b>			
<ul style="list-style-type: none"> <li>• Open the unit by pushing the button on the top left corner of the ECG. (This will cause the ECG top to pop up from the left side.)</li> <li>• Open the lid.</li> <li>• Place the pad of paper in so the holes are on the left side.</li> <li>• Advance the paper by pulling the first sheet out and over the side of the ECG.</li> <li>• Close the lid on the paper you just pulled out.</li> </ul>			

Signature \_\_\_\_\_ Orientee \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_ Preceptor \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_ Supervisor \_\_\_\_\_ Date \_\_\_\_\_