Performing High Quality ECGs on Patients in Respiratory Distress

Respiratory distress can impact the quality of the ECG being recorded. Referring to the Hopkins article on respiratory distress, some behaviors can impact the quality of the ECG recording[1].

- **Breathing rate**. An increase in breaths per minute **may lead to increased chance of respiratory artifact on the waveform**, especially in the chest/precordial leads.
- **Retractions.** The chest appears to sink in just below the neck or under the breastbone with each breath or both.– **may lead to muscle artifact**, which looks like random or jagged high frequency signals in the ECG baseline.
- **Sweating.** – may lead to **electrodes falling off or moving.**
- **Body position.** The optimal position for a 12-lead ECG is **laying in the supine position,** this will be required until the ECG is completed.

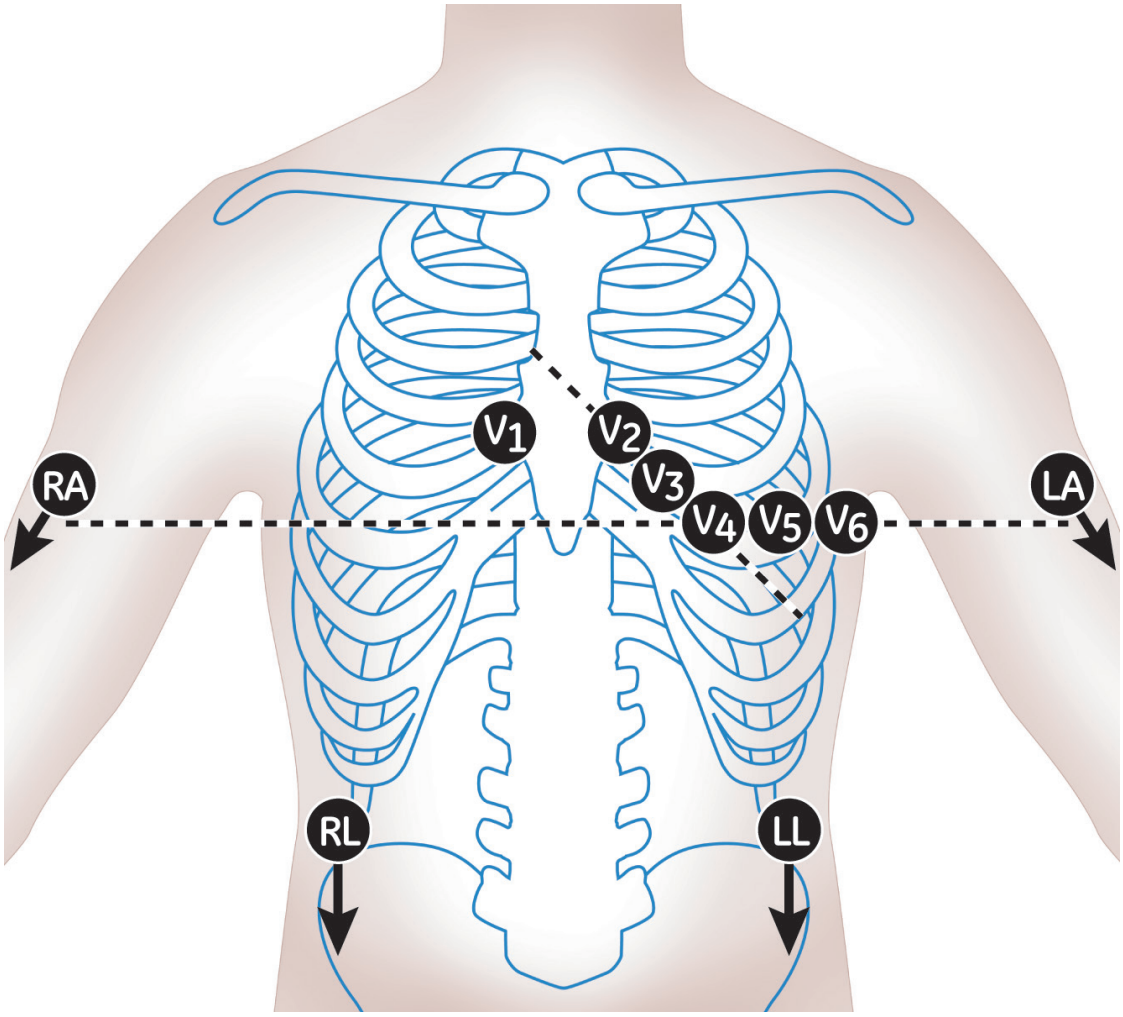
Here are a few reminders on how to get the most of the ECG you are trying to take:

- Perform **good skin preparation** by cleansing skin areas where electrodes will be placed to remove oils, lotions, dead skin cells or perspiration[2, 3].
- Apply **fresh electrodes to correct locations[3].**
- If regular electrodes aren't staying on, try to use **electrodes with conductive gel[2].**
- **Don't place** electrodes over bony prominences, thick muscles, or skin folds, which could interfere with wave transmission[4].
- Applying electrodes over muscular areas, like the pectorals or oblique abdominals, may produce **motion artifact[1].**
- **Minimize patient movements.** Make sure the patient is lying relaxed and still, and does not speak during the recording[1].
- Check **reversal of limb electrodes** and the switching of precordial (chest) electrodes. Even when the electrode signal quality appears to be sufficiently good, the interpretation of an acquired ECG can be adversely affected by unintended reversed or switched electrodes in the wrong locations, misleading the ECG analysis interpretations[3].
- **Check filter settings on your device.** These may need to be adjusted according to the patient condition and waveform quality[2].
- If your ECG device has a **signal quality indicator,** wait for green when possible[3].

DISCLAIMER: This document is intended as a set of reminders to help address challenges with acquiring an ECG on patients with respiratory distress. This is not a substitute for thorough product training. If you have not received training on the use of the product you should request training assistance from GE Healthcare or the manufacturer of the ECG device.

1 - https://www.hopkinsmedicine.org/health/conditions-and-diseases/signs-of-respiratory-distress
2 - https://general-devices.com/files/documents/Prep-Check/User-Documents/Rx_For_ECG_Monitoring_Artifact.pdf
3 - MAC™ VU360 Resting ECG Analysis System Operator's Manual 2088531-001B
4 - https://journals.lww.com/nursing/fulltext/2002/04000/how_to_perform_3__or_5_lead_monitoring.38.aspx

Resting ECG Lead Placement



Traditional 12 Electrode Placement

AHA Label	IEC Label	Electrode Location
V1 (red)	C1 (red)	Fourth intercostal space at the right sternal border.
V2 (yellow)	C2 (yellow)	Fourth intercostal space at the left sternal border.
V3 (green)	C3 (green)	Midway between locations V2and V4 (C2 & C4).
V4 (blue)	C4 (brown)	Mid-clavicular line in the fifth intercostal space.
V5 (orange)	C5 (black)	Anterior axillary line on the same horizontal level as V4 (C4).
V6 (purple)	C6 (purple)	Mid-axillary line on the same horizontal level as V4 and V5 (C4 & C5).
LA (black)	L (yellow)	Left deltoid.
RA (white)	R (red)	Right deltoid.
LL (red)	F (green)	Above left ankle. (Alternate placement: Upper leg as close to torso as possible).
RL (green)	N (black)	Above right ankle. (Alternate placement: Upper leg as close to torso as possible).