

Instructions For Attaching Leads

To ensure a stable signal and proper data acquisition during a PhysioFlow® monitoring session, it is absolutely critical that the electrodes are set up and configured correctly. Follow these steps when setting up a subject/patient.

- a. If need be shave the areas required for probe placement (as seen below) with a disposable surgical razor.
- b. Remove metallic parts that may interfere with the electrodes (e.g. necklace).
- c. Clean off the sites with an alcohol prep pad and dry with a paper towel. Then rub the skin with the supplied Nuprep® abrasive gel using gauze or paper towel. Remove the excess gel when done. Skin color must turn bright pink. Please note that the electrode sites should stay clear from anything covering them (film, tape) or substance (such as Betadine), that could generate an electrical insulation.
- d. **IMPORTANT:** Please use PhysioFlow® PF-50™ electrodes only. Any other electrode will decrease the signal/noise ratio and impair the performance of the device. **WE CAN NOT ENSURE CUSTOMER SUPPORT IF ANY OTHER ELECTRODE IS USED.**
IMPORTANT: Please make sure the electrodes are in good condition (expiration date, electrode bag not opened). There is one spare electrode in the bag in case you need it.
- e. Connect the PhysioFlow® electrodes to the patient cable before positioning the leads on the subject. A clicking noise indicates that the two have been connected correctly.

Peel and apply the electrodes (6 in total) to the proper locations on the left side of the subject's neck, the middle of the sternum, the rib closest to V6, and next to the spine. (Please see pictures below). The spinal electrodes (green and black) must be placed next to the midpoint of the spine (not on the spine). To ensure proper placement have the subject stand or sit up straight and visualize the point on the spine corresponding to the same vertical position as the xiphoid process on the front (middle to end of the sternum) and place the green electrode.

These two last electrodes can be placed on the xiphoid process (green lead), and laterally on the rib (black lead) as well, but stability under exercise conditions is less optimal. If signal quality is questionable, please move these two leads two inches laterally after re-prepping the skin (left side of the body first, then right if no effect). Please use new electrodes and do not reposition already attached electrodes.

- f. The neck electrodes (white and blue) must be positioned so that they touch each other or slightly overlap and so that they both fit on the neck rather than one on the collar bone. Best placement is achieved on the lateral triangle of the neck (vertical line under the ear lobe). Please do not ask the patient to « help » by extending the neck. The posture should be natural and close to the posture of the actual monitoring session. Wrinkles should be avoided. These neck electrodes have the greatest tendency to fall off due to their location near a high density of sweat glands and the higher probability of subject movement in that area. Subjects should look ahead when exercising to minimize this risk.
- g. When applying the electrodes, ensure that the gel pad in the center of the electrodes contacts the skin before the rest of the electrode. Do this by lifting up the sides of the electrode while placing the gel pad in the center flush against the skin. Then firmly push down on the sides of the electrode making sure no air pockets (or wrinkles) exist between the skin and the electrode. Finally, rub the foam of the electrode with circular finger motion. **DO NOT PRESS ON THE ELECTRODE HEAD.**
- h. Depending on the size and structure of the patient, electrode positioning may need to be adjusted as follows: in case of a wide QRS (LBBB or pacemaker), please place the mid sternum electrode (V1) on the rib opposite side of the V6 electrode (to create a horizontal line between the two). The V6 electrode (orange) must be placed on the rib bone closest to the left ventricle for a proper ECG signal (see pictures below).

In case of a big ECG T-wave a risk of double counting of the heart rate exists (especially when animals such as swine or dogs are measured). The best solution is to bring the red ECG1 electrode next to the xiphoid process (see pictures below).

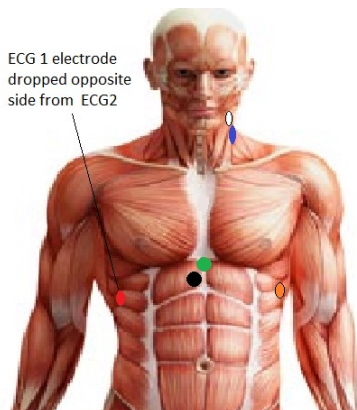
- i. In case of an exercise test, have the subject put on a Spandage (or Surgifix) shirt over their torso to ensure that the Physioflow probes and cable do not interfere with the subject's movement and ability to exercise. For PF05 Lab1 patient cables (reference PF92), the greatest amount of stability is achieved by placing the large rectangular center piece of the cable on the subject's right shoulder. Have the subject also place a smaller cutout piece of Spandage or 3M Coban wrap around their neck to secure the stability of the neck electrodes and probes. Alternatively, 3M Transpore tape can be used to solidify the probe cables on the skin (like when an ECG holter is used), but this does not ensure maximal stability during exercise, especially on a treadmill.
- j. Make sure that none of the probe cables run over any of the electrodes. Overlap can interfere with the Physioflow signal. Ensure that the subject's mobility is maintained by having them rotate their torso left and right. Adjust the probe cables as necessary if extra slack is needed or if the cables need to be repositioned.
- k. If need be, gauze pads can be inserted in between the Physioflow probes and the Spandage shirt to further increase probe stability.
- l. If measurements are to be made underwater or with a significant amount of fluid buildup around the electrodes, the electrodes and contacts can be covered using a waterproof patch.



Conventional electrode position (rest)

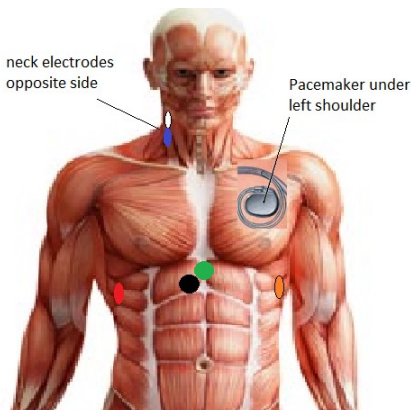


Conventional electrode position (Exercise)



ECG 1 electrode
dropped opposite
side from ECG2

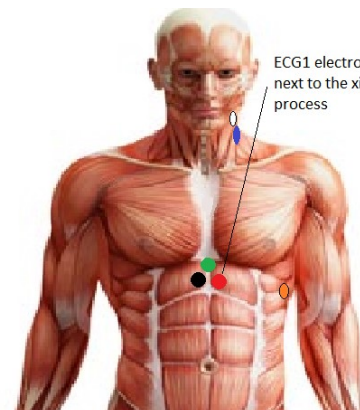
ECG placement (red orange) in case of a wide QRS



neck electrodes
opposite side

Pacemaker under
left shoulder

Electrode placement when a pacemaker is present



ECG1 electrode placed
next to the xiphoid
process

ECG electrode position in case of big T-Wave (double counting)