Experiment HH-2: The Electrocardiogram and Heart Sounds

Note – this lab uses a manual or electronic stethoscope so that students can gain an understanding for using an external stethoscope for listening to the heart. If you would like to use the Heart Sounds microphone instead – please refer to Lab HH-8 "Auscultation".

Equipment Required

PC or Mac Computer

IXTA, USB cable, IXTA power supply

iWire-B3G ECG cable and electrode lead wires

EM-220 Event marker

Stethoscope

Alcohol swabs

Disposable ECG electrodes

Note – You must connect the iWire-B3G prior to turning on the IXTA.

ECG Cable and Event Marker Setup

1. Locate the iWire-B3G ECG cable and electrode lead wires and EM-220 event marker.
2. Plug the DIN8 connector to the EM-220 event marker into Channel EM1 on the back of the IXTA.
3. Insert the connector on the end of the iWire-B3G ECG cable into the iWire 1 input on the front of the IXTA.
4. Insert the connectors on the red, black, and green electrode lead wires into the matching sockets of the ECG cable.
5. Instruct the subject to remove all jewelry from their wrists and ankles. Another option is to use the area just under each clavicle which will give a better recording.
6. Use an alcohol swab to clean a region of skin on the inside of the subject's right wrist/clavicle. Let the area dry. Then, rough up the skin in that area with an emery board. this improves the conductivity of the electrodes.
7. Remove a disposable ECG electrode from its plastic shield, and apply the electrode to the scrubbed area on the wrist.
8. Repeat Steps 6 and 7 for the inside of the left wrist/clavicle and the inside of the right ankle.
9. Snap the lead wires onto the electrodes, so that:
    - the red (+1) lead is attached to the left wrist or under the left clavicle,
    - the black (-1) lead is connected to the right wrist or under the right clavicle,
    - the green (C or ground) lead is connected to the right leg or on the abdomen.

10. Instruct the subject to sit quietly with their hands in their lap. If the subject moves, the ECG trace will move off the top or bottom of the screen. If the subject moves any muscles in the arms or upper body, electromyograms (EMGs) from the muscles will appear on the ECG recording as noise.

Figure HH-2-S1: The ECG cable and event marker connected to an IXTA.