

## Fine-wire Electrode Usage Guide

1. Check the expiration date on the fine-wire needle packaging and verify that the fine-wire sterilized packaging is intact. Follow local site procedures and discard any packages that have expired, or are not sealed and intact.
2. Prepare the subject for the insertion by cleaning and sterilizing the insertion area as appropriate for the intended test, taking all necessary precautions to prevent infection and or contamination.
3. Remove the fine-wire electrode from the package and visually inspect both ends of the electrode wire without touching or contaminating the wires or needle. This may require holding the electrode against a light surface under a bright light and using a magnifying glass. Both of the hooked ends should be insulated to within 2mm of the tip with the remaining wire being exposed - the bare ends should be staggered, not in contact with each other, and snug against the point of the needle. There should be no kinks throughout the length of the wire that might cause the wire to break when removed from the subject after the test. The opposite ends of the wires should have approximately 6mm of uninsulated, exposed wire for connection to the recording interface.
4. Refer to your anatomical guides as appropriate, locate the desired insertion point and insert the needle into the muscle smoothly to the desired depth to place the hooked wires into the target muscle.
5. Carefully withdraw the needle, leaving the fine-wire pair in place within the muscle and connect the uninsulated, free ends of the wires to the inputs of your recording system. Use small pieces of tape to secure the wires at the insertion site and against the skin to minimize any movement of the wires, or strain at the insertion point during testing. This helps to minimize signal artifact and noise.
6. You may optionally check the wire placement within the muscle by applying a stimulation pulse using a suitable approved nerve stimulation device. Always start with a low stimulation level and gradually increase the level while observing the target muscle - if the wire is placed correctly then a small twitch will be observed in the correct muscle when it is stimulated. Motion Lab Systems pre-amplifiers can withstand stimulation pulses without problems but if you are using another system then you should check with the manufacturer to ensure that a stimulation pulse will not damage their equipment.
7. Connect an external ground reference electrode to the subject and perform the EMG test, visually monitoring the EMG signal quality during the test if at all possible.
8. After the EMG test has been completed, the recording equipment should be disconnected from the subject. The fine-wire electrode wires can then be removed with a gentle, smooth and steady pull. This will usually bring the electrodes out painlessly as the wires are so fine and delicate that they offer little resistance to their removal.
9. Immediately inspect the wires after removal to ensure that the wires have been removed intact from the subject - the wires are nominally 200mm in length  $\pm 3.125$ mm. Occasionally small parts of the wire will remain in the muscle after a test but provided that the wire fragments are small (less than a couple of millimeters) this is not normally a cause for concern.
10. Swab the wire removal site with a sterilizing solution, apply a suitable sterile covering if necessary and dispose of the used needle and wires in accordance with local safety policies.

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