

## **SOP J-NM-PR-20110401.027.02**

### **NERVE BIOPSY PROTOCOL SUBMISSIONS TO NEUROMUSCULAR LAB**

**PURPOSE:** This protocol is to be sent to prospective contributors who request it.

**SCOPE:** For use by technical personnel in the neuromuscular laboratory.

Unfixed, in vivo peripheral nerve is extremely susceptible to crush injury. The myelin sheaths are especially vulnerable since they are almost liquid in consistency in the unfixed nerve. For this reason, nerve biopsies should be performed by a surgeon familiar with nerve biopsies, in the presence of a pathologist.

#### **RECOMMENDATIONS ON SPECIMEN COLLECTION:**

This section is not intended to reiterate the nerve biopsy technique. However, it is worth mentioning the following:

- a. The nerve should be cut with a very sharp blade, preferably a razor blade.
- b. It should rest on a firm background (tongue blade, dental wax, etc.) while being cut. This will avoid traction of the nerve, and the production of artifacts, many of which may be mistaken for real pathological changes.
- c. Local anesthetics (lidocaine) can be used in the more proximal regions to avoid discomfort.
- d. The proximal end can be tied to indicate the site and to support the nerve (see below).
- e. For all histological purposes, a 1.5 to 2.0 cm portion of nerve is sufficient for both light and electron microscopy.

#### **1. Advance preparation of materials to send nerve biopsy specimens:**

Glutaraldehyde is the best all-purpose fixative for electron microscopy.

- a. Prepare Glutaraldehyde Solution: 2.5% solution of glutaraldehyde in 0.025 M cacodylate buffer (pH 7.35-7.45).
- b. Label a specimen container of sufficient size with all required patient identification information.
- c. Have available a medium for supporting the stretched nerve (i.e. sturdy card stock paper such as index card or wooden tongue depressor).

#### **2. HANDLING OF THE EXCISED PORTION OF NERVE.**

- a. THE NERVE SHOULD NEVER BE PUT ON GAUZE.
- b. The excised nerve should be stretched on a support medium to the point that the transverse ridges in the epineurium disappear (under low power microscopy). Then the very ends of the nerve are pressed to the medium so that they adhere. The nerve is left at room

temperature for NOT MORE THAN ONE MINUTE. Otherwise, the nerve will stick to the medium (Figure 2). Please indicate the proximal end of the specimen. Then the area of the medium bearing the nerve can be excised and put in the fixative. In this way, the nerve is kept straight during fixation and it is easier to prepare for histological examination.

c. FIXATION: Once the nerve is stabilized, immerse it in a 2.5% solution of glutaraldehyde in 0.025 M cacodylate buffer (pH 7.35-7.45).

If the nerve will not to be submitted immediately to the Neuromuscular Laboratory from a local area hospital, leave the biopsy specimen in fixative for four to six hours (depending on the thickness) after fixation, place the specimen in 0.025 M cacodylate buffer to ship.

### **AVOID FREEZING OF NERVE BIOPSY SPECIMENS AS IT DESTROYS THE HISTOLOGY**

### **3. SHIPPING:**

- a. Nerve biopsies do not need to be shipped overnight.
- b. For combined nerve and muscle (for enzyme histochemistry) biopsies; see procedure for shipping muscle biopsies. Do not to freeze the fixed tissues.
- c. Ship specimens to:

**Joint Pathology Center**

**Case Accessions/Neuromuscular Laboratory**

**606 Stephen Sitter Avenue**

**Silver Spring, MD 20910**

The JPC highly recommends that cases be sent using a commercial express courier service (i.e. FedEx, UPS). All mail sent via routine U.S. postal service routes is irradiated prior to delivery at the JPC. This not only causes delays in the receipt of cases, but the enclosed pathologic materials could be damaged to such an extent that a consultation may not be able to be rendered. **Please note that no one is available to accept deliveries after hours, on weekends and federal holidays.**

A completely filled out **JPC Contributor's Consultation Request Form** must be submitted with each case. Be sure to include identification of nerve biopsy site, specimen collection date, time and relevant clinical history. The name, address, telephone and fax numbers of referring pathologist and/or attending physicians are required for all submissions.

**All specimens must have a completely filled out JPC Contributor's Consultation Request Form**  
Forms available at [www.jpc.capmed.mil](http://www.jpc.capmed.mil)

### **CONTRIBUTORS ARE RESPONSIBLE FOR IDENTIFYING INFECTIOUS OR POTENTIALLY INFECTIOUS MATERIAL. FLAG ALL MATERIAL WITH A YELLOW STRIP AND WRITTEN LABELS**

(CREUTZFELDT-JAKOB, AIDS, HEPATITIS, ETC). Please refer to the JPC Contributor's Manual for additional guidance on packing and shipping of materials.