

## Welcome to Johns Hopkins Neurology Laboratories

The Department of Neurology at Johns Hopkins offers comprehensive resources for the evaluation of nerve and muscle disease, including the clinical evaluation, nerve and muscle biopsy, tissue preparation and pathological interpretation.

Diseases of the muscle or nerves can be diagnosed by a biopsy and is a critical step to initiating certain medical regimens. Some of the following conditions may be diagnosed by Johns Hopkins Neuromuscular Pathology or Cutaneous Nerve Laboratories through the evaluation of muscle or nerve biopsies:

- Vasculitis
- Muscular Dystrophy
- Amyloid
- Inflammatory Myopathies
- Peripheral Neuropathies

**The Johns Hopkins Neuromuscular Pathology Laboratory** provides nerve and muscle biopsy staining and interpretation for hospitals and surgical facilities throughout the country. To learn more about our process, refer a patient for clinical evaluation, or for more information about our biopsy and pathological consultation services:

410-614-4278  
neuromuscularpathlab@jhmi.edu  
or visit us online at  
[www.hopkinsmedicine.org/NeuromuscularPathLab](http://www.hopkinsmedicine.org/NeuromuscularPathLab)

**The Johns Hopkins Cutaneous Nerve Laboratory** analyzes skin samples to diagnose and monitor small fiber neuropathies. 3mm skin punches are analyzed for epidermal nerve fiber density and morphological changes. A diagnosis of small fiber neuropathy can be made based upon these results. For more information or to order a cutaneous nerve biopsy kit:

410-614-6399  
skin\_biopsy@jhmi.edu  
or visit us online at  
[www.hopkinsmedicine.org/CutaneousNerveLab](http://www.hopkinsmedicine.org/CutaneousNerveLab)

### For cutaneous nerve biopsies:

Johns Hopkins Medicine  
Cutaneous Nerve Laboratory  
1550 Orleans Street, Room 362  
Baltimore, MD 21231  
Tel: 410-614-6399  
Fax: 410-502-5560  
Email: [skin\\_biopsy@jhmi.edu](mailto:skin_biopsy@jhmi.edu)  
[www.hopkinsmedicine.org/CutaneousNerveLab](http://www.hopkinsmedicine.org/CutaneousNerveLab)

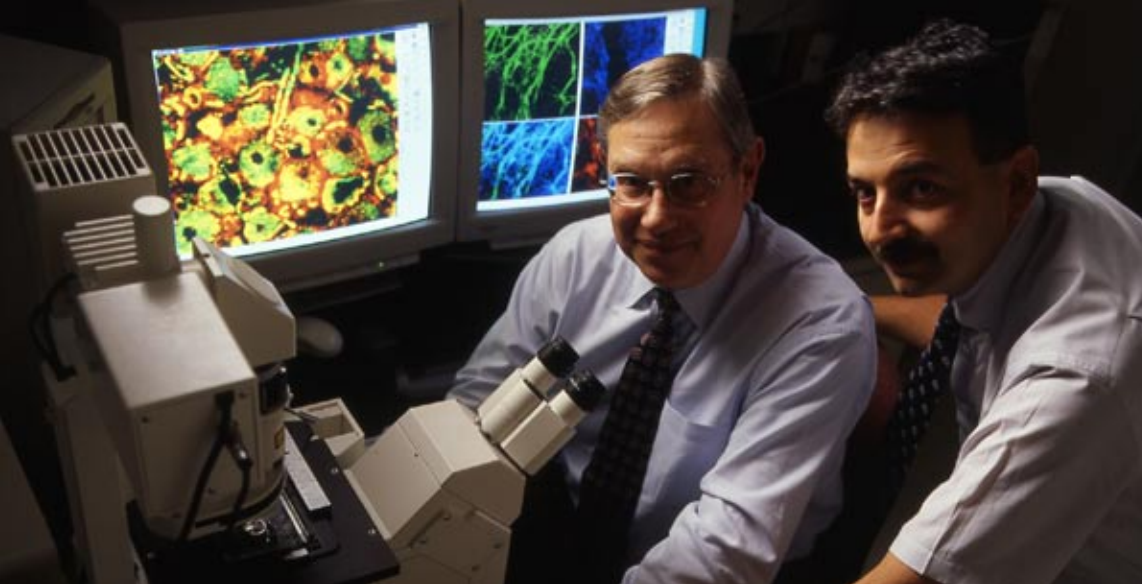
### For nerve or muscle biopsies:

Johns Hopkins Medicine  
Neuromuscular Pathology Laboratory  
600 N. Wolfe Street, Meyer 5-144  
Baltimore, MD 21287  
Tel: 410-614-4278  
Fax: 410-614-7296  
Email: [neuromuscularpathlab@jhmi.edu](mailto:neuromuscularpathlab@jhmi.edu)  
[www.hopkinsmedicine.org/NeuromuscularPathLab](http://www.hopkinsmedicine.org/NeuromuscularPathLab)

THE JOHNS HOPKINS  
DEPARTMENT OF NEUROLOGY

## Neuromuscular Pathology Laboratory and Cutaneous Nerve Laboratory

Accurate biopsy results for neuromuscular and peripheral nerve conditions.



## The Neuromuscular Pathology Laboratory

### How is the muscle or nerve biopsy performed?

A biopsy is an invasive procedure and therefore only appropriate for the diagnosis of serious muscle or nerve disease. Typically completed in one to two hours, a biopsy is performed under local anesthesia and is an outpatient procedure. Patients undergoing nerve or muscle biopsy at Johns Hopkins will receive instructions in advance. It is very important for patients not to take aspirin, aspirin-containing products, or nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen for 10 days prior to the procedure. Patients taking Coumadin (warfarin), Lovenox or ticlopidine will need to follow specific instructions relating to these medications. After the procedure, patients will be given instructions on how to care for the wound.

### Where are the biopsies performed?

Surgeons at any hospital or surgical facility who are familiar with diagnostic nerve and muscle biopsy procedures can obtain a specimen, which then should be sent directly to the Neuromuscular Pathology Laboratory for staining and interpretation.

Biopsies can also be performed at the Johns Hopkins Outpatient Center and for inpatients at The Johns Hopkins Hospital. Patients can expect to spend one half day or more at the outpatient center in preparation and follow-up for the procedure. The tissues obtained at the time of biopsy are prepared in the nerve and muscle pathology laboratories at Johns Hopkins.

### How can I send a specimen to the lab?

The Neuromuscular Pathology Laboratory receives fresh specimens by courier or frozen specimens by overnight mail. *Please call 410-614-4278 two days in advance to inform the lab that a nerve or muscle specimen will be arriving.* The protocols for sending nerve and muscle biopsy specimens can be found at [www.hopkinsmedicine.org/NeuromuscularPathLab](http://www.hopkinsmedicine.org/NeuromuscularPathLab)

### Who interprets the results?

The results of pathological studies are interpreted by designated neuromuscular specialists, attending physicians in the Johns Hopkins Department of Neurology.

### When will my patient and I receive the results?

After the biopsy, a report on frozen or paraffin specimens will be sent to the referring physician, generally within two weeks. A report on plastic nerve specimens will be provided in three to four weeks.

### Are biopsies covered by insurance?

Our staff will secure a patient's insurance authorization once the appropriate referral forms have been completed. These forms can be obtained by calling **410-614-4278**.

### Is there a doctor or laboratory technician with whom I can directly communicate?

If you have any questions or concerns, please contact **410-614-4278**.



## Cutaneous Nerve Laboratory

For patients who present with small sensory nerve dysfunction, a cutaneous nerve/skin biopsy is useful to diagnose the presence and stage the severity of a neuropathy. Usually, however, a specific cause is not directly identified by the skin biopsy, but further testing may be indicated if a neuropathy is confirmed. The American Academy of Neurology has recommended skin biopsy as useful for the diagnosis of small fiber sensory neuropathy in symptomatic patients. (AAN practice parameters, *Neurology* 2009; 72:1-1)

### What is the cutaneous nerve/skin biopsy procedure?

A cutaneous nerve/skin biopsy is a very simple procedure performed in the outpatient setting and takes 10 to 15 minutes. First, the skin is thoroughly cleaned and a small injection of a local anesthetic to numb the skin is made. Then, a sample of skin is taken by a biopsy from the numb area of the skin. Finally, a bandage dressing is used to cover the biopsy site. Generally, the skin heals easily within one to two weeks without the need for a suture. The risk of bleeding or infection is extremely low.

### Can I perform the biopsy in my office or does my patient need to come to Johns Hopkins?

Biopsies can be performed at physicians' offices and then sent to the cutaneous nerve lab, or at the Johns Hopkins Outpatient Center. In both situations, our staff will secure the patient's insurance authorization once the appropriate referral forms have been completed. These forms

can be obtained by calling **410-614-6399** or at [www.hopkinsmedicine.org/CutaneousNerveLab](http://www.hopkinsmedicine.org/CutaneousNerveLab). If a physician wants to perform the biopsy at his or her office, a biopsy kit can be mailed once the patient's insurance authorization is obtained.

### Once my patient is approved, what will I receive?

Once contacted, we will initiate insurance authorization and a biopsy kit will be shipped to the physician's office. Step-by-step instructions with photographs will be included and video demonstrations are available at our web site. The biopsy kit includes:

- **Biopsy fixative**
- **Skin punch tool**
- **Scalpel and forceps**
- **Biopsy ID form**
- **Buffer and cryoprotectant solutions**
- **Printed instructions for obtaining biopsies and for cryoprotecting samples**
- **Wound care instructions to give to patient**
- **Shipping container and ice pack for return shipment (NOTE: Keep ice pack in refrigerator until use)**
- **Shipping instructions, including a pre-printed air bill for return shipment**

### Where can my patient go to have the cutaneous nerve/skin biopsy?

Biopsies are performed at both the Johns Hopkins Outpatient Center and at the Johns Hopkins Bayview Medical Center.

### How can I direct my patient to prepare?

The cutaneous nerve/skin biopsy is a relatively minor procedure. Patients should be informed that they will receive a local anesthetic prior to the biopsy. No other specialized preparation is necessary. Patients who are anticoagulated with an INR above 3.0 should not be biopsied.

### Who interprets the results?

The results are interpreted by expert physicians in the Johns Hopkins Department of Neurology who are specially certified in neuromuscular pathology.

### When do my patient and I receive the results?

After the biopsy, a report will be sent to the referring physician within one to two weeks.

### Are biopsies covered by insurance?

Our staff will obtain insurance authorization once the appropriate referral forms have been completed. These forms can be found online at our Web site or by calling **(410) 614-6399**.



### Is there a doctor or technician with whom I can directly communicate?

If you have any questions or concerns about the cutaneous nerve/skin biopsy, please contact us at **410-614-6399**.

### My patient has more questions. Is there more information to explain the procedure?

Our Web site is an excellent resource for both patients and physicians, and features a Q&A section. Please direct your patient to visit this site for more information: [www.hopkinsmedicine.org/CutaneousNerveLab](http://www.hopkinsmedicine.org/CutaneousNerveLab).