MAYO CLINIC LABORATORIES

Submitting Non-Protocol Autopsy Brain/Spinal Cord for Examination

Brain Harvesting

The brain should be removed by the usual techniques, as described in standard textbooks of autopsy procedure (eg, Handbook of Autopsy Practice. Fourth edition. Edited by BL Waters, 2009). The scalp incision should be made in a coronal plane that begins in the mastoid area behind the earlobe, and extends over the palpable posterolateral ridges of the parietal bones to the opposite mastoid. The anterior and posterior halves of the scalp are then reflected forward and backward, respectively, the anterior flap to 1 cm to 2 cm above the supraorbital ridge and the posterior flap to just above the occipital protuberance. The cranium is opened with an oscillating saw. The depth of the cut should extend just short of the inner cranial table and care should be taken to prevent entrance of the saw blade into brain parenchyma. The dura is then incised along the line of sawing and the anterior attachment of the falx cut between the frontal lobes. The frontal lobes are then gently elevated, the olfactory bulbs and tracts peeled from the cribriform plates, and the cranial nerves, pituitary stalk and internal carotid arteries cut as close as possible to their exit or entry point in the base of the skull. When removed, the brain should be weighed, and if possible, photographed.

Since frozen tissue is highly desirable for current and future research studies, please obtain the following:

1. **Take a 1 cm^3 sample of frontal lobe, either from inferior frontal surface or from frontal tip, and freeze at -70°C.**
2. **Place remaining (uncut) brain in 10% to 15% buffered formalin, suspended by a thread under the basilar artery, and fix for 7 to 10 days prior to shipping.**

Spinal Cord Harvesting

In some cases (eg, motor neuron disease, ALS, frontotemporal dementia, multiple system atrophy), examination of the spinal cord, skeletal muscle and peripheral nerve are important to establish a diagnosis. The spinal cord can be removed by either an anterior or posterior approach, although, in general, posterior removal provides a more intact specimen. Following exposure, the cord should be removed with its dural sheath intact, and with care to avoid sharp angulation that may result in distortion and artifact. The entire extent of the spinal cord, from high cervical to low lumbar-sacral levels (eg, to bony level L5) should be obtained. If possible, dorsal root ganglia from multiple levels should be included. It is desirable to pin the specimen to a Styrofoam board to approximate anatomic position and fix in 10% buffered formalin x 10 days. Dorsal root ganglia from appropriate levels (eg, L5) are desirable. Several samples of skeletal muscle should be obtained, including diaphragm, deltoid, biceps, gastrocnemius and quadriceps. It is desirable to have both *snap frozen* and routinely fixed (10% buffered formaldehyde) muscle samples for study. Peripheral nerve samples (eg, sural nerve) should be marked by a tie at the distal end, and suspended in 2.5% paraformaldehyde with a 23-g or 25-g needle serving as a weight at the distal end.

Shipment of Tissues and Frozen Specimens

Following formalin fixation for 7 to 10 days, the fixed specimen should be wrapped in formalin-soaked towels and double-bagged for shipment. The frozen specimens (frozen frontal lobe sample) should be packed in dry ice in a Styrofoam container.

Ship all specimens by **Federal Express** to:

Department of Anatomic Pathology
Attention: Neuropathology Working Group
Mayo Clinic Laboratories
3050 Superior Drive NW
Rochester, MN 55901-1995

Please call the neuropathologist-on-call directly at 507-284-3887 if you have any questions.