Information Sheet
Lumbar Puncture

What is a lumbar puncture procedure?

A lumbar puncture, also called a spinal tap, is a medical procedure performed by experienced clinicians to collect cerebrospinal fluid, or CSF, from the lower back with a needle. CSF is a clear fluid that cushions the brain and spinal cord, protecting the brain from injury. CSF also supplies nutrients and chemicals that support health of brain cells and removes waste products from the brain.

Why complete a lumbar puncture in the Alzheimer's Disease Research Center Study

Analysis of CSF helps researchers better understand the clinical course, progression, and potential treatments for Alzheimer's disease and related dementias. For example, CSF measures amyloid and tau in the brain (hallmarks of Alzheimer's disease), helps with detecting changes in the brain over time, gives insight into differentiation of diseases, and increases understanding of the impact of Alzheimer's disease on the central nervous system.

This is an optional procedure, meaning that your decision to participate or not to participate in it will not impact your ability to be in the Alzheimer's Disease Research Center (ADRC) study.

Before the procedure

To ensure the lumbar puncture is safe for you, we will ensure you have a current MRI. On the day of the procedure, we will draw 8 teaspoons of blood. Fasting time for the blood draw is 4 hours.

Note that blood thinning medicines or anticoagulant medicines that are taken regularly would exclude you from a lumbar puncture because there is an increased risk of bleeding. Aspirin must be stopped 5 days before.

The procedure

You will receive a numbing medication on your back to reduce pain or discomfort. A fine needle, designed for reducing pain during the lumbar puncture, will then be introduced through the lower back, between two lumbar vertebrae. Approximately 3 teaspoons of CSF will be removed. Fluoroscopy (a type of x-ray) will be used to guide the needle placement accurately.

After the procedure

You will lie down flat for 1 hour after the procedure, and a coordinator will get you the food at this time. Next we will provide transportation home. You are encouraged to avoid physical exertion for 24 hours. We will call the following day to check in. The results of your lumbar puncture are used for research and will not be made available to you.

Risks

Though lumbar puncture is generally recognized as safe and involves minimal discomfort, it does carry some risks:

- **Headaches:** up to 25 percent of people who have undergone a lumbar puncture develop a headache afterward due to a leak of fluid into nearby tissues. The headache typically starts from several hours to up to two days after the procedure and may be accompanied by nausea, vomiting and dizziness. Headaches can often be resolved by drinking fluid or caffeinated beverages. On very rare occasions, the headache needs to be resolved with a blood patch, where a small amount of the patient's own blood is used to seal the fluid leak.
- **Discomfort,** such as a slight burning sensation, may occur from the use of the local anesthetic applied at the puncture site prior to the procedure.
- Some people feel **pain or tenderness** in their lower back after the procedure. Pain is minimized by using numbing medication at the site of the needle puncture.
- **Bleeding** may occur. Risk of bleeding is reduced by excluding participants who are regularly taking blood thinners, stopping aspirin 5 days before the procedure, and review of bloodwork prior to the procedure.

- **Infection** at the puncture site and infection and swelling of the brain covering (meningitis) are extremely uncommon in healthy study participants. This is minimized by the use of sterile conditions to perform the procedure.
- **Increased pressure within the skull** (intracranial pressure), due to a brain tumor or other space-occupying lesion, can lead to compression of the brainstem after a sample of CSF is removed. A participant's recent brain MRI will be used to determine if there is evidence of such a lesion that results in increased intracranial pressure.
- **The radiation** dose you will receive from the fluoroscopic-guided lumbar puncture is approximately 0.2 to 0.3 mSv which is less than a yearly dose from natural environmental radiation in the US (3.1 mSv) and well within the limit set by the FDA for individuals participating in basic research studies, which is 50 mSV. According to the International Commission on Radiological Protection, the increased risk of health effects, such as cancer, from radiation doses of this amount is either too small to be observed or nonexistent. The NYULH Radiation Safety Committee has reviewed and approved the use of diagnostic radiation in this research study.
- **Fainting** is relatively uncommon but a possible risk.

In our experience of over 1,000 lumbar puncture procedures, less than 3% of subjects have had side effects. Headaches and back pain were most common and typically subsided within 24-48 hours, with the advice to limit strenuous activity, hydrate, or take caffeinated beverages. Almost all participants who experienced these mild adverse events participated in the subsequent longitudinal follow-up without further complications. On very rare occasions, headaches may be severe and require a blood patch from a licensed neuroradiologist.

Samples

The NYU Alzheimer's Disease Research Center (ADRC) is responsible for handling and analyzing data from samples.

Data is collected and stored at the National Alzheimer's Coordinating Center (NACC), which is the main hub for collaboration and communication between ADRCs across the United States (funded by the National Institute on Aging). Sharing data is a powerful tool to advance knowledge of the disease.

Analysis includes looking at DNA to conduct "whole genome studies," which means looking at the entire DNA sequence rather than just looking at one gene.

Samples are stored for current and future research purposes. Some samples are stored at the National Centralized Repository for Alzheimer's Disease and Related Dementias (NCRAD), which is supported by the National Institute on Aging.

Some samples will initially be stored at NYU ADRC (145 East 32nd Street) and then sent to SciSafe Inc. in New Jersey for storage and use in ADRC's ongoing research projects. These samples are stored until they are used up. Only the principal investigator (person in charge of research) and authorized staff will have access to your samples.

If you decide to allow us to store your samples and later change your mind, you can request the destruction of remaining samples by contacting the principal investigator in writing.

Results

The results of the lumbar puncture will not be provided to you. The hope is that your participation will contribute to the development of new knowledge regarding the risk factors, causes, and treatment of Alzheimer's disease and related disorders.