Intrathecal Chemotherapy (IT Chemo)

The cerebrospinal space is the area surrounding the spine and brain, which contains cerebrospinal fluid. Cerebrospinal fluid (CSF) is a colorless fluid, produced in the ventricles of the brain, which acts as a buffer around the brain and spinal cord, to keep them safe from injury.

Intrathecal (IT) chemotherapy is used to treat cancers that have entered into the CSF. When a cancer has gotten into the CSF, it may be called CNS (central nervous system) involvement. Chemotherapy given intravenously and/or by mouth are typically not able to cross into the CSF, and therefore, are unable to treat these cancer cells. Giving chemotherapy directly into the CSF allows the medication to reach the cancer cells and minimizes the potential systemic (overall) side effects that intravenous chemotherapy can cause.

IT chemotherapy can be used to treat or to prevent cancer in the CSF. IT chemotherapy may be administered as part of a chemotherapy regimen or on an as needed basis. IT chemotherapy may not have been part of your original chemotherapy plan, but added because cancer cells are found in your CSF. Symptoms of cancer in the CSF include a change in the person's ability to think and speak, difficulty swallowing, headaches, seizures and changes in vision. To determine if cancer cells are present in the CSF, a procedure called a lumbar puncture is done.

Intrathecal chemotherapy is administered during a procedure called a lumbar puncture or through an ommaya reservoir (shunt). Prior to having IT chemotherapy, you will have you labwork done. You need to have a sufficient platelet count to ensure that your blood will clot at the site after the procedure. Your provider will also talk to you about medications that you take or allergies you have that could affect the procedure.

Administration of IT chemotherapy through a lumbar puncture

A lumbar puncture is a sterile procedure in which a needle is placed into the cerebrospinal space in between two bones (vertebrae) in your spine. The needle may be used to withdraw (remove) CSF and/or to administer the chemotherapy through a syringe, attached to the needle, directly into your CSF. It can be an uncomfortable procedure, but you should not feel pain. A numbing medication will be used where the needle is inserted. The numbing medication may burn and you may feel a pinch at the site where it is being injected. A lumbar puncture can be anxiety provoking and some patients require an anti-anxiety medication prior to the procedure. You also will want to go to the bathroom prior to the procedure since you will have to remain still during the procedure.

- Your provider will position you in a way that your spine is stretched out to create space between the bones in the back. Opening this space makes the cerebrospinal space more accessible. You will be instructed to either lie on your side in a fetal position in bed or you will sit on the edge of your bed and rest your chest, arms and head on a tray or chair that has been placed in front of you, with your feet dangling off the bed.
- Once you are in a comfortable position your provider will feel your back to determine the best place to insert the lumbar puncture needle. It is important to remain still during this time unless you are instructed to move. Once your provider has determined where to insert the needle, he or she will mark the spot with either a marker, a pen or with a piece of plastic making an indentation into the skin.
- Your doctor will put on sterile gloves. The area is cleaned with a topical soap to prevent any germs from being introduced into the CSF. You will have a sterile drape placed on your back to cover the area not being affected by the lumbar puncture.
- Next, your provider will use a needle to give some anesthetic (numbing) medication in the area that the LP is being done. You may feel some burning or pressure for a few seconds before the numbing occurs. Your provider will touch the area and ask if you can feel it to ensure adequate numbness.
A long, thin needle is then used to enter the cerebrospinal space through the location that was previously marked and numbed. You may feel pressure but you should not feel pain. It is important for you to stay as still as possible. If you need to move you must notify your provider first. If you are feeling pain it is important to notify your provider. Once in the needle is in the appropriate space, CSF is collected into test tubes. Your chemotherapy is then infused through this needle directly into the CSF. The whole procedure typically takes about 30 minutes.

Once the procedure is complete, the needle is removed and either gauze secured with tape or another type of dressing is placed over the area. You will then be instructed to lie flat for 30-60 minutes.

**Administration of IT chemotherapy through an ommaya reservoir**

A provider may suggest an ommaya reservoir be placed in patients who will require frequent administration of IT chemotherapy. However, a patient must be able to tolerate the surgical procedure and general anesthesia required to place an ommaya reservoir. An ommaya reservoir consists of a small port (about the size of a quarter) that is placed underneath the skin on the head, which is attached to a catheter (tube) that is threaded into a ventricle (open space) in the brain. CSF is produced in the ventricles and an ommaya reservoir gains direct access to the CSF. An ommaya reservoir may be used to both remove CSF (for testing) and to administer IT chemotherapy.

The procedure to remove CSF and to administer IT chemotherapy through an ommaya reservoir is fairly simple and is similar to accessing a port used for IV infusions.

- The provider puts on gloves and the area surrounding the ommaya reservoir is cleaned.
- A needle is used to “access” the ommaya port by inserting it through the skin and into the port.
- Chemotherapy can be injected directly into the reservoir, which flows into the CSF. If CSF is needed for testing, the needle can be used to remove CSF.
- A dressing or band-aid is applied where the needle was removed.

If CSF was removed, either through a lumbar puncture, or from your ommaya shunt, your body will have to produce more CSF to refill the space. When you have less CSF circulating than what is normal, you can develop a headache. Lying flat for 30 minutes to an hour after the procedure can prevent a headache. If you do have headache after the procedure, notify your care provider or nurse. If you experience side effects including; dizziness, uncontrolled bleeding from the needle insertion site, blurry vision, uncontrolled nausea and vomiting, or confusion, it is important to notify your physician immediately.

If you have any questions or concerns please contact your care provider.