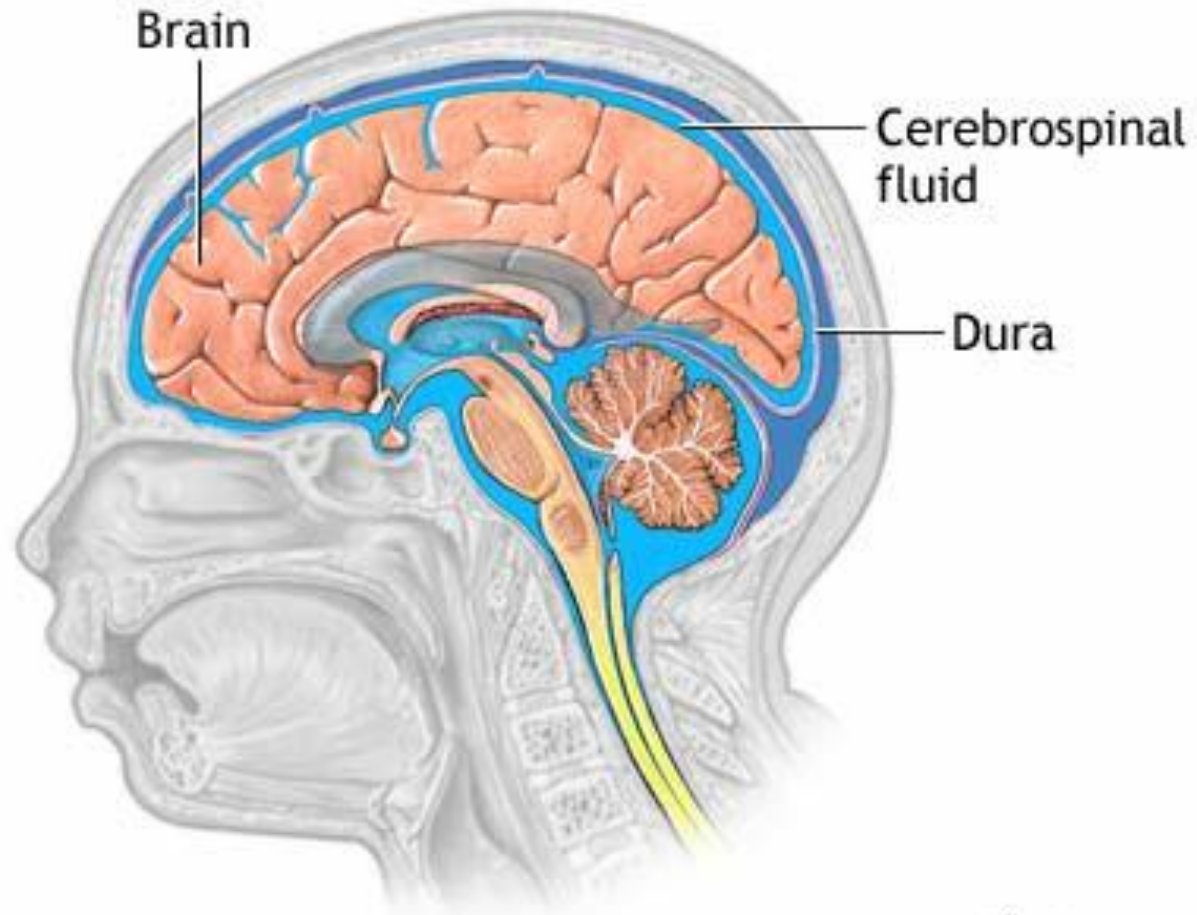


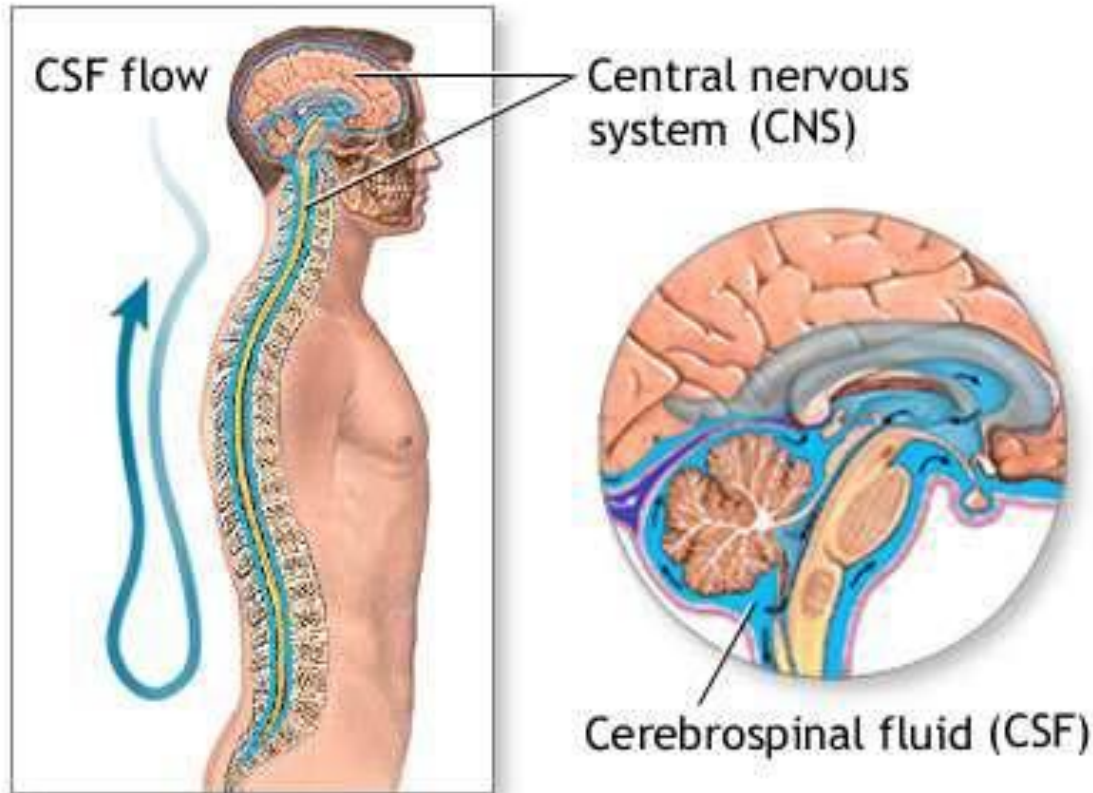
CSF leak

Intracranial hypotension

A CSF leak is an escape of the fluid that surrounds the brain and spinal cord.

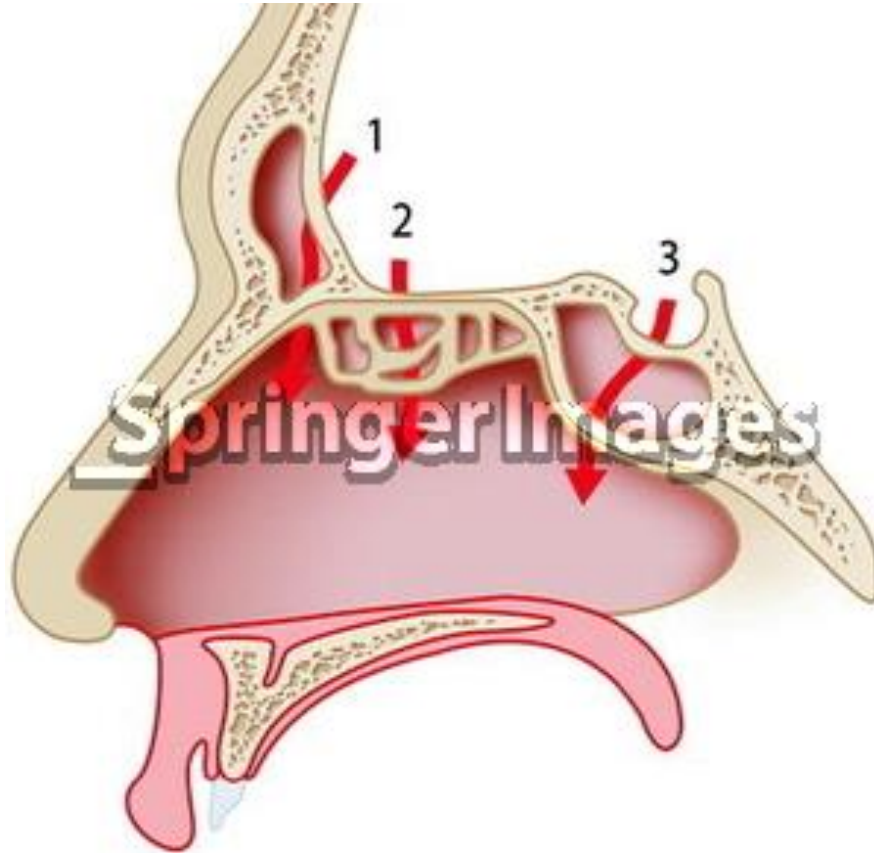


ADAM.



ADAM.

The cerebrospinal fluid (CSF) serves to supply nutrients to the central nervous system (CNS) and collect waste products, as well as provide lubrication.



The most frequent locations of dural defects after frontal skull base injuries.

- 1- Fronto-nasal CSF leak (direct cranio-nasal)
- 2- fronto-ethmoido-nasal CSF leak (indirect cranio-sino-nasal)
- 3- spheno-nasal CSF leak (indirect cranio-sino-nasal)

When it leaks out, the pressure around the brain and spinal cord drops.

Symptoms:

- A headache
- Otorrhea
- Rhinorrhea



Symptoms

- Headache that is worse when upright and better when horizontal (but other patterns do occur).
- Nausea and vomiting
- Neck pain or stiffness
Change in hearing (muffled, underwater, tinnitus).
- Sense of imbalance
- Photophobia (sensitivity to light).
- Phonophobia (sensitivity to sound).
- Interscapular (between shoulder blades) pain.
- Pain or numbness of arms.
- Changes in cognition (“brain fog”)
- Dizziness or vertigo

Forms

- Depending on the manifestations, there are 2 forms of leak:
- a clear cerebrospinal fluid is secreted from the nose and ears;
- hidden (nasal) – the phenomenon of liquorrhea is hidden since the CSF is constantly swallowed and cannot be diagnosed.

Forms

- Depending on **the place of fluid leakage**, the following forms of fluid are distinguished:
- nasal – CSF expired from the nose associated with damage to the bones of the skull in the anterior cranial fossa, most often in the ethmoid sinus;
- hidden – a cerebrospinal fluid is excreted out of the ears which fact is associated with a fracture of the temporal bone pyramid;
- wound – cerebrospinal fluid flows out of a postoperative wound;
- spinal – CSF excretes from a spinal defect (for example, in case of back injuries).

Forms

- Depending **on the cause of fluid leakage**, there are 2 forms:
- primary occurs immediately after the injury, surgery;
- secondary occurs after a period of time as a result of the formation of a fistula.

#leakweek day 2 symptoms

#leakweek day 4 diagnosis

Dizziness
vomiting
COMA

NAUSEA
BRAIN FOG
ARM PAIN
pain between
shoulder blades
DEATH



POSITIONAL HEADACHE
hearing changes
Neck Stiffness
LIGHT SENSITIVITY
off balance
stroke
TREMOR



Diagnostic Procedures:

1. CSF vs. nasal secretions:

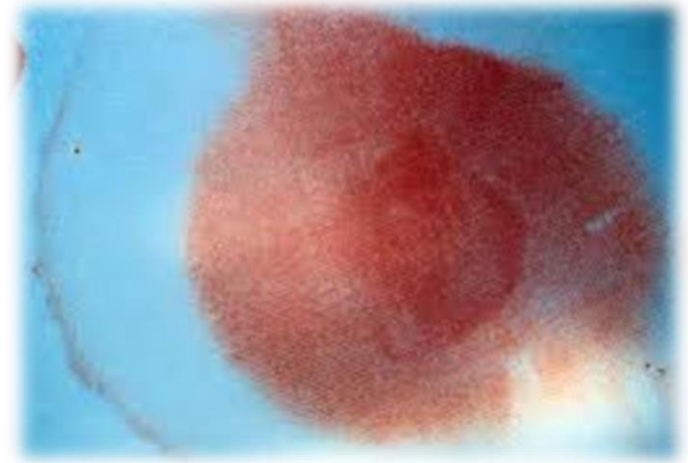
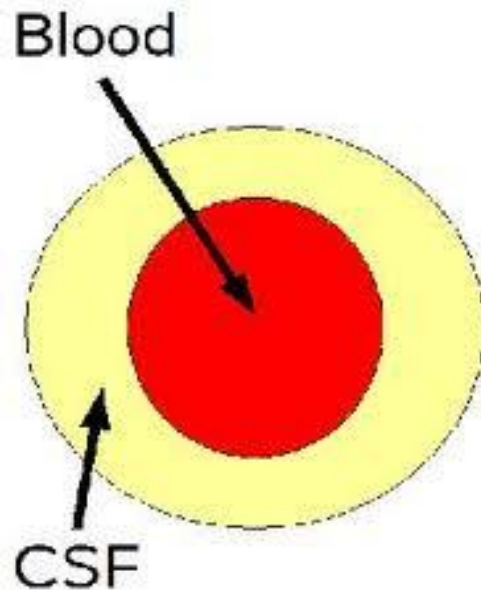
- History??
- When the discharge occurs??
- Whether discharge can be sniffed back??
- Character of discharge??
- Taste??
- Glucose levels??
- Specific test – Beta 2 transferrin??

Diagnosis

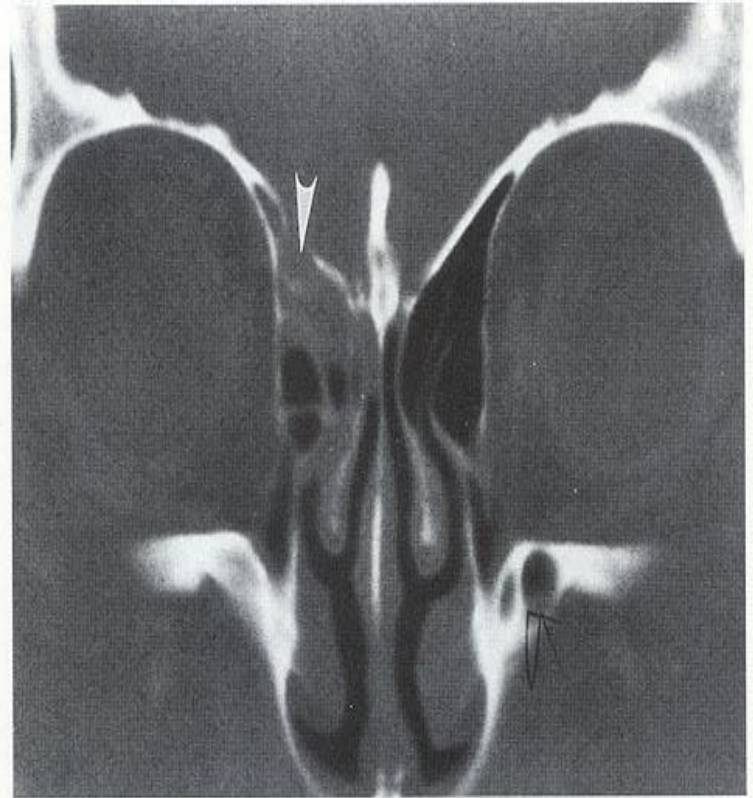
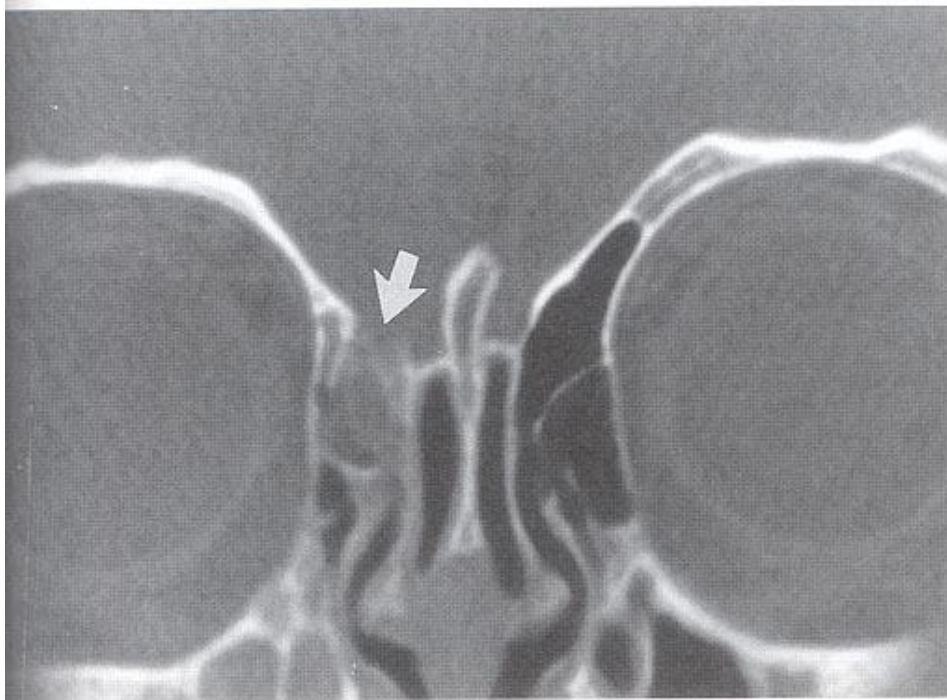
- **Analysis of complaints and history of the disease:**
- **how long the first signs** of a cerebrospinal fluid leakage appeared – cerebrospinal fluid providing nutrition and metabolism in the brain (constant leakage of clear fluid from the nose, ears);
- **what event immediately preceded** the appearance of this disorder (head injury, head surgery).
- **neurological examination** is also required to assess the presence of defects of the skull, spine, leakage of cerebrospinal fluid from the ears or nose, signs of a fracture of the skull.
- **value the glucose rate in the leaking fluid:** liquor contains a lot of glucose, but it is not enough in the nasal mucus (it makes it possible to distinguish leaking fluid from the common cold).
- **sample handkerchief (oil stain):** wipe out the fluid with a handkerchief. Liquor, unlike nasal mucus, leaves oil stains on the fabric, and when dried, the leaking fluid remains soft.
- **CT (computed tomography)** and **MRI (magnetic resonance imaging)** of the head and paranasal sinuses allow you to study the structure of the brain in layers and determine the presence of damage to the skull bones.

2. Halo sign test :

Cerebrospinal fluid mixed with blood forms a "*halo sign*" when dripped on filter paper.



3. CT scan of the head :



4. MRI of the head or spine:



5. Radionuclide cisternography

Radionuclide cisternography is a very sensitive for the detection of CSF leak



Treatment:

Depending on the cause of the leak, many cases go away on their own after a few days.

Treatment:

- **Non-surgical methods include:**
- not straining the abdomen, blowing out;
- elevated head position preventing leakage of cerebrospinal fluid;
- diuretic drugs to reduce intracranial pressure, which will reduce leakage of cerebrospinal fluid;
- lumbar drainage: releasing CSF from brain cavities to reduce CSF pressure in the skull;
- antibiotics (prevention and treatment of infection);
- anti-inflammatory drugs (nonsteroidal anti-inflammatory).
- **Surgical methods offered by My Canadian Pharmacy are:**
- surgical treatment of the dura mater defect and skull, hermetic wound closure;
- removal of a cyst of the spinal cord or brain, sewing up the dura mater.

Expectations (prognosis):

The outlook is usually good depending on the cause. Most cases heal by themselves with no lasting symptoms.

Complications:

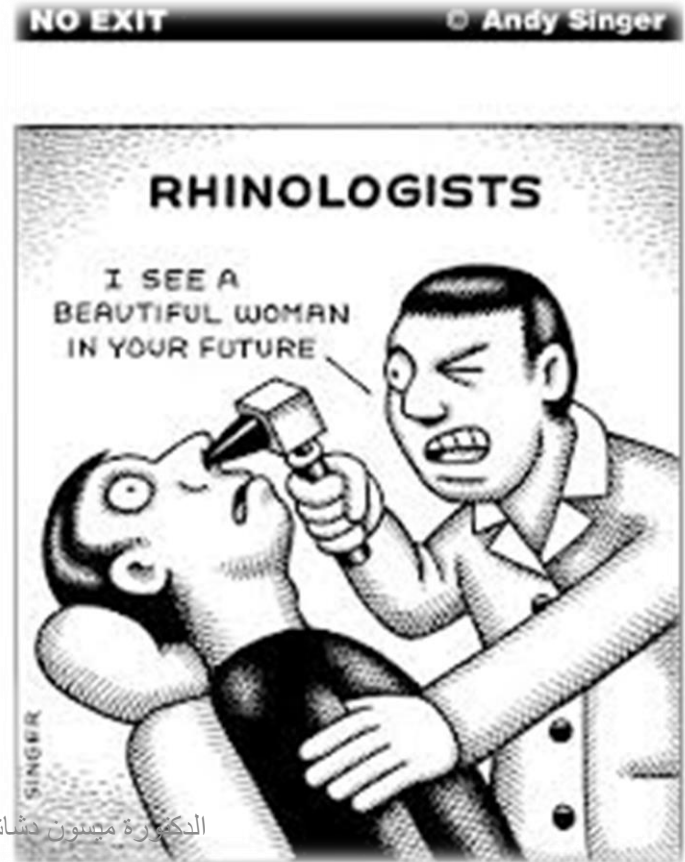
Complications may occur if the cause is surgery or trauma. Infections after surgery or trauma can lead to [meningitis](#) and serious complications, such as swelling of the brain.

Prognosis

- **Spontaneous spinal CSF leaks.**
- **Rebound Intracranial Hypertension**

Conclusion...

Cerebrospinal fluid leaks, regardless of cause, are conditions that should be addressed by a rhinologist as soon as identified..



References:

- <http://pgblazer.com/2010/08/cerebrospinal-fluid-csf-vs-nasal-discharge-differences.html>
- www.ncbi.nlm.nih.gov