



# Chemical Perfusion of the Inner Ear

*About your treatment*

This handout describes chemical perfusion treatment for patients with Meniere's disease, sensorineural hearing loss, and autoimmune inner ear disease. In some cases, this treatment may be used for tinnitus (ringing of the ears).

This handout explains how the treatment works, how it is done, expected results, and possible side effects or risks.

## What is chemical perfusion?

*Chemical perfusion* is a procedure to inject medicine directly into the inner ear through the eardrum. This treatment can help manage Meniere's disease, sudden sensorineural hearing loss (SSHL), and autoimmune inner ear disease (AIED). Chemical perfusion is less invasive than surgery and has fewer risks.

## Conditions Treated with Chemical Perfusion

### *Meniere's Disease*

*Meniere's disease* causes dizziness and a sense of tilting or spinning. It may be treated with medicine and by limiting salt in your diet. *Diuretics* (medicines that increase urine output) are often prescribed for this disease. For many people, these treatments will control the symptoms.

But, some people still have severe symptoms even with these treatments. In the past, surgery was the only way to treat Meniere's disease when medicines and diet changes did not work. Today, chemical perfusion is another option.

### *Sudden Sensorineural Hearing Loss and Autoimmune Ear Disease*

*Sudden sensorineural hearing loss* (SSHL) is a rapid loss of hearing. In most people, the hearing loss occurs in just 1 ear. It is hard to determine the exact cause of SSHL.

*Autoimmune ear disease* (AIED) results when a person's immune system identifies an inner ear protein as a foreign substance. This causes inflammation and damage to the hearing and balance organs.

Steroid medicines are often used to treat SSHL and AIED. Steroids help reduce inflammation. But, steroids in pill form can have bad side effects and are not advised for people who have other diseases such as diabetes and peptic ulcer. Chemical perfusion offers an option besides taking steroid pills.

## **Chemical Perfusion Treatment**

Chemical perfusion is a *transtympanic* treatment, which means it crosses the *tympanic membrane* (eardrum). This allows us to deliver medicine directly to the affected ear.

The benefits of this treatment are:

- The drug is still strong when it reaches the ear.
- Side effects are less likely, since the drug does not need to travel through the whole body before getting to the ear, as it would if it were taken by mouth or injected into a vein.
- Smaller amounts of the drug can be used.

### ***For Meniere's Disease***

Gentamicin is the medicine used to treat people with Meniere's disease. It is an antibiotic that is commonly given through the veins to treat severe infections. It kills bacteria (germs), and it also keeps the inner ear balance organ from working, or overworking. Treating the inner ear with small amounts of gentamicin stops the sensory cells in the inner ear from causing dizziness.

### ***For SSHL and AIED***

The steroid dexamethasone is a drug that decreases inflammation. It is often used to treat SSHL and AIED. It is used in small doses to treat inflammation in the *cochlea* (the bony structure in the inner ear). This may stabilize or restore hearing, and it may also improve balance problems if they are present.

Injections of dexamethasone may also be used to treat some kinds of *tinnitus* (ringing in the ears).

## **How is the treatment done?**

The gentamicin and steroids used in the Otolaryngology clinic at University of Washington Medical Center (UWMC) are prepared in the hospital's pharmacy. The medicines are used at strengths that we know have worked for patients in research studies. The medicines may be given 2 ways:

- The easiest way is through a tiny needle hole to the eardrum. This can be done in the clinic. A small amount of numbing medicine is applied directly to the eardrum before the needle is inserted.
- If more than 1 injection of either drug is needed, a small ear tube can be put in through a small incision in the eardrum. The injections of the drug are given through this tube.

## Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns. UWMC clinic staff are also available to help.

Otolaryngology – Head and Neck Surgery Center: 206-598-4022

Weekdays from 8 a.m. to 5 p.m., call the Nurse Voice Mail Line at 206-598-7519. Your call will be returned as soon as possible.

After hours and on holidays and weekends, call 206-598-6190 and ask for the Otolaryngologist on-call to be paged.

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The goal of treatment in SSDL and AIED is to stabilize or restore hearing. Because all patients are different, the number of injections of medicine will vary from person to person. Your surgeon will talk with you about what treatment will work best for you.

## Treatment Results

### *Meniere's Disease*

When gentamicin is injected into the inner ears of people with Meniere's disease, 80% to 90% of them (80 to 90 out of 100) are helped. But, relapses may occur.

In 85% to 95% of these people (85 to 95 out of 100), the treatment does not damage hearing. But, in some research studies hearing loss was greater after treatment. The risk to hearing may be higher if more of the drug is needed to control the symptoms of Meniere's disease.

## Possible Risks

- In general, the risks of chemical perfusion with either gentamicin or dexamethasone are low, and most people tolerate the drugs well.
- Any surgery has the risks of pain, bleeding, infection, and drainage.
- If an ear tube is placed to deliver the medicine, it usually falls out within a few weeks and the hole closes on its own. Rarely, the hole does not close, and surgery is done to close it.
- Patients should not drive or use machinery for 6 hours after the injection.
- In gentamicin therapy, hearing is usually not affected, but it may get worse.
- Tinnitus is usually not affected, but it could get worse if hearing loss occurs.
- The risk of hearing loss may affect your decision about whether to have chemical perfusion treatment.

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