BC Adult Cochlear Implant Program

1. Who We Are

In 1982, St. Paul's Hospital established the first clinical Cochlear Implant Program in Canada with the first Canadian patient receiving a single channel cochlear implant that same year.

Today the BC Adult Cochlear Implant Program provides services to more than 360 cochlear implant recipients from across British Columbia and the Yukon. Located at St. Paul's Hospital in Vancouver, we are the only Cochlear Implant centre for adults in BC. Our patients range in age from 18 years to 87 years.

We provide a full range of cochlear implant services including: candidacy assessment, cochlear implant surgery, cochlear implant programming, and ongoing monitoring of a recipient’s performance with the cochlear implant. We also provide follow up programming for individuals who have been implanted with the Cochlear Corporation Auditory Brainstem Implant.

Of the three cochlear implant devices approved by the FDA and Health Canada, we currently implant the Nucleus device by Cochlear Corporation. We provide programming support for BC residents who have been implanted with Advance Bionics or MedEl cochlear implant systems.

Our Cochlear Implant Team consists of three experienced cochlear implant audiologists, an experienced cochlear implant surgeon and a program assistant. All audiologists are registered with the College of Speech and Hearing Health Professionals of B.C. and have Advanced Competency Certification in Cochlear Implant Management.

2. What is a Cochlear Implant

A cochlear implant is a medical device that allows individuals who have significant hearing losses and who do not benefit from traditional hearing aids to hear sound.

A cochlear implant consists of two parts: the implant which is surgically inserted into the inner ear and the speech processor which is worn on the ear picks up and transmits it to the implant.

A cochlear implant does not restore normal hearing. At first the cochlear implant may sound robotic, cartoonish, like someone is speaking a foreign language or just be noise. It takes time, patience and practice to learn to use the sound of a cochlear implant. Understanding what the cochlear implant can and cannot do and having realistic expectations are important before going ahead with cochlear implant surgery.
Further information about Cochlear Implants can be found at:

Advanced Bionics  
www.advancedbionics.com

Cochlear Corporation  
www.cochlear.com

MedEl Corporation  
www.medel.com

3. Anatomy of the Ear/Types of Hearing loss

The ear consists of three parts: outer ear, middle ear and inner ear.

The **outer ear** consists of the pinnae (the ear you see) and the ear canal. The **middle ear** is made of up the ear drum and three tiny bones (ossicles) which form a bridge from the ear drum at one end to the **inner ear** (cochlea) at the other end.

In a normal hearing ear, the outer ear captures sound (vibration) and sends it down the ear canal to the ear drum. The sound causes the ear drum to vibrate and these sound vibrations travel across the bridge of bones to the cochlea. The cochlea is shaped like a snail shell and is filled with tens of thousands of tiny hair cells (like bristles on a hair brush). The sound vibrations cause movement in these hair cells resulting in small electrical charges. These electrical charges are picked up by the auditory (hearing) nerve and sent to the brain where they are recognized as sound.

There are different types of hearing loss depending on what part of the ear is not working. Damage to the **outer** ear or the **middle** ear results in a **conductive** hearing loss while damage to the **inner** ear results in a **sensorineural** hearing loss. If both outer and inner ear structures are damaged you may have a **mixed** hearing loss. Less commonly, hearing loss may be caused by damage to the auditory nerve or to the sound interpretation centres in the brain.

Cochlear implant technology does not work for every type of hearing loss. It is designed to help individuals who have sensorineural hearing loss related to damage to the hair cells in the cochlea but it does require the hearing nerve to be intact and working.
4. How is a cochlear implant different from a hearing aid?

The cochlear implant is very different from the traditional hearing aid for several reasons:

- Traditional hearing aids help people hear by making sounds louder, just like you would increase the volume on the television. The cochlear implant on the other hand helps people hear by electrically stimulating the hearing nerve.
- The cochlear implant has an internal component that requires surgery. A hearing aid does not.
- The cochlear implant does not sound like normal hearing or even hearing with a hearing aid. It takes time and practice for the sound to improve.
- Hearing aids can help people who have different types and degrees of hearing loss. Cochlear implants are only for those with severe-profound sensorineural hearing loss in both ears who do not benefit from hearing aids.

5. Who is a candidate for a Cochlear Implant?

Adults who are referred for a cochlear implant must meet a minimum set of requirements:

- 18 years of age or older*
- Severe to profound sensorineural hearing loss in both ears
- Little or no speech understanding even with well fitted hearing aids
- Communicate primarily through spoken language
- Realistic expectations
- Strong motivation and commitment to be part of the hearing world
- No medical contra-indications

Each referral is considered on an individual basis.

*NB: There is no upper age limit for cochlear implantation.

For individuals under the age of 16 who are interested in a cochlear implant, please contact the BC Children’s Cochlear Implant Services at Children’s and Women’s Hospital in Vancouver. Phone: 604-875-2345.
6. How do I get referred for a Cochlear Implant:

A referral from an Ear, Nose and Throat Specialist is required for a cochlear implant candidacy assessment. We accept referrals for BC residents and will consider referral requests from other Canadian provinces. We do not accept referrals for individuals who reside outside of Canada.

Once a referral is received in our clinic a questionnaire and a Hearing Aid Check form will be sent to you. These must be completed and returned to the clinic before an appointment can be scheduled.

For any adult who received a cochlear implant outside of the province and is now a BC resident, we encourage them to contact our clinic directly to arrange for routine management of their Cochlear Implant.

7. Candidacy Assessment

To determine whether you are a candidate for a cochlear implant, you must have a detailed assessment, including:

Audiological Assessment

- A detailed hearing evaluation with and without your hearing aids
- This assessment may take 3 – 6 hours
- Hearing aids must be in good working order and adjusted appropriately for your hearing loss

Surgical assessment

- A thorough medical history and examination
- CT scan
- Assessment by the Pre-admission clinic for patients who may have additional health issues

Additional tests may be required and will be considered on an individual basis.

All testing is done at St. Paul's Hospital in Vancouver. If you have been tested at another Cochlear Implant Clinic and told you were a candidate, you will still need to have a complete assessment through our clinic.

If you do not speak English, a medical interpreter will be arranged for the assessments. We do not use friends or family members as interpreters during the candidacy assessment.
8. Surgery

Cochlear Implant surgery for Adults is done at St. Paul’s Hospital in Vancouver. Surgery is usually done as a day care procedure.

Surgery is performed under general anesthetic. When you are asleep, an “S”-shaped incision is made behind the ear. A small amount of hair may be shaved behind the ear before the incision is made. The mastoid bone, a honeycomb of air cells behind your ear, is drilled (a mastoidectomy).

The surgery takes approximately 2 hours. After the surgery, you will be monitored in the recovery area until you have fully awakened. Usually, you are able to leave the hospital the same day of the surgery. If you live outside of the Lower Mainland, you should plan to stay in a hotel in Vancouver the night of the surgery. If you are feeling unwell, you may stay one night in the hospital the day of the surgery.

Risks/Side effects of Surgery

- The risk of a serious complication occurring during a general anesthetic is approximately 1 in 200 000 patients.
- When the implant is inserted into the inner ear (the cochlea), you will probably lose any natural hearing in that ear.
- Dizziness is common for 2 or 3 days. Occasionally people can have dizziness for several weeks, but this is rare.
- We need to drill beside a nerve that goes to the muscles of the face. If that nerve is damaged, you will have either a temporary or a permanent weakness (paralysis) of one side of your face. The risk of paralysis of your face is 1 in 1000 (0.1%).
- There is a second nerve that supplies taste to one-half of our tongue. A temporary change in the sense of taste or a metallic taste is seen in 10% of patients. Some people complain about a permanent change in their taste, but this is extremely rare.
- There is a risk of an infection after the surgery. The risk of an infection is less than 1%. However, if an infection occurs, there is a possibility that the implant will need to be removed. If an infection occurs, there is also a risk of meningitis, an infection of the brain.
- The risk of meningitis immediately after surgery is 1 in 5000. The risk of meningitis once all is healed after the surgery is about the same as the general population. We will ask you to speak to your Family Doctor about vaccinations to decrease the risk of meningitis.

If you have any additional health issues, you may be asked to attend the Pre-Admission Clinic at St. Paul’s Hospital prior to your surgery. This may involve a separate trip to Vancouver.

There is currently a waitlist for Cochlear Implant surgery. We are usually able to give two months notice of the surgery date. If you are not able to take the surgery date we offer, we will give you the next available surgery date that works for you.
9. Switch –on/Follow ups

Following the surgery there is a 4 – 6 week waiting period to allow the ear to heal. During this time, you will hear nothing in the ear with the cochlear implant.

The initial activation or “switch-on” of the cochlear implant and all follow up appointments are done at the clinic in Vancouver. For the switch-on, you will come to the clinic for 3 – 4 days in a row and should plan to be there for the full day (mornings and afternoons). If you live out of town, you will need to arrange to stay in the Vancouver area for this time. Family members or a friend are welcome to come with you for support during all or part of your activation.

During this time your audiologist will program (map) your cochlear implant, work with you to learn to use the sound of the cochlear implant (listening practice), review the speech processor and the accessories provided with the cochlear implant, perform baseline assessments of implant functioning and measure speech understanding.

After the switch-on, you will need to come back to the clinic for follow up appointments at 1, 3, 6 and 12 month intervals. These appointments will take approximately 2 to 3 hours and can be scheduled in the morning or the afternoon. After the first year, you will need to come just once a year. At your follow up appointments we will answer any of your questions, check your speech processor, adjust your programs if necessary and monitor how you are understanding speech.

10. Costs

The BC Ministry of Health provides funding for a limited number of cochlear implants each year. For BC residents who receive medical benefits through the BC Medical Services Plan, there is no charge for candidacy assessment, cochlear implant surgery, the cochlear implant, original external equipment (speech processor and accessories), activation or follow-up appointments. The manufacturers offer a three year warranty on the speech processor. After this, repairs and replacement costs are your responsibility. Service agreements (extended warranties) are available.

For out of province referrals, approval for funding must be obtained from the potential candidate’s home province before any assessment can be arranged.

Costs to you may include:

- Travel to and from the BC Adult Cochlear Implant Program in Vancouver
- Parking
- Accommodation (if necessary)
- Batteries
- Replacement parts (if not covered under warranty)
• Repairs (if not covered under warranty)
• Service agreements (optional, available through manufacturer)
• Upgrades to speech processors
  • Over time, speech processor technology (external part) becomes obsolete and needs to be replaced with more current technology. Cochlear implant recipients can expect that they will need to upgrade their speech processors one or more times over their lifetime. This does not require another surgery.

In some cases, costs may be fully or partially covered by a third-party payer such as the Department of Veteran’s Affairs, Worksafe BC, the Ministry of Income Assistance or through extended health benefits.

You must plan for how you will manage the long term costs of the cochlear implant.

11. FAQ

Will the cochlear implant give me back my hearing?

The Cochlear Implant does not restore normal hearing. If you are not using your speech processor you will not hear in the ear with the cochlear implant.

Do I get one implant or two?

Due to limited funding for cochlear implants, we are only able to implant one ear (unilateral) at this time. In some cases, where a patient has both a loss of vision as well as a loss of hearing or where there is an urgent medical reason, we may implant both ears (bilateral). Under these circumstances, the decision would be made on an individual basis.

Which ear gets the implant?

This decision is made on a case by case basis. Consideration is given to the amount of natural hearing remaining in each ear, how long the ear has been deaf/hard of hearing and use of hearing aids. Occasionally, there may be a medical reason why one ear cannot be implanted. If both ears qualify for implantation, the decision of which ear to implant is up to you.

What will happen to the hearing in the ear with the implant?

You must expect to lose any natural hearing in the ear with the cochlear implant. This is why accurate results from the cochlear implant candidacy assessments are required to ensure that appropriate recommendations can be made. It is important to make sure we do not implant an ear with good residual hearing.
What happens if the tests say I am not a CI candidate after my assessment?

If you are not a CI candidate, it is usually because you are hearing as well or better with your hearing aids than you would with a cochlear implant. If this is the result of your assessment, we will spend time discussing other technology (hearing aids, assistive listening devices), communication strategies and community resources that may help you better manage your hearing loss. You will still be able to return for further testing if your hearing gets worse. We know that hearing can change and will be happy to reassess your hearing should this occur.

How soon can I get the implant?

The Ministry of Health funds a limited number of cochlear implants for adults each year. Depending on the number of cochlear implant candidates each year, you may be placed on a waitlist. Our waitlist has ranged from a few months to two years.

What if I was tested at another cochlear implant program and told I was a candidate?

We do not accept cochlear implant assessments from other clinics. You must be tested and found to be a candidate at our program in order to be implanted in BC.

What will the CI sound like?

The quality of the sound and ability to understand speech is different for each person. At first the sound may be anything from robotic or cartoonish speech to sounding like you are listening to a foreign language to just hearing noise. With patience, persistence and practice, the sound quality improves for everyone.

How long will it take for me to understand with the Cochlear Implant?

The cochlear implant is not a quick fix and it takes effort and practice on your part to use the sound. Some people begin to understand speech fairly quickly; for others it can take weeks or longer. The more you listen with a cochlear implant the sooner the sound will improve.

I have one normal hearing ear and one deaf ear…can I get an implant in my deaf ear?

No, criteria established by the FDA in the US and Health Canada state that you must have a severe-profound sensorineural hearing loss in both ears to be considered for a cochlear implant.
Am I too old for a cochlear implant?

You are never too old for a cochlear implant. We have successful cochlear implant recipients who had surgery in their 80’s. You must be approved for surgery, be able to participate in programming of the implant and have the opportunity to communicate with others.

Am I taking an implant away from a child?

Funding for the Adult and Children’s programs are separate. You will not be taking an implant away from a child.

Do I wear it all the time?

The cochlear implant is surgically placed under your skin and once your ear has healed you will not see or notice it.

You wear the speech processor all waking hours unless you are showering/bathing or swimming. You take off the speech processor when you go to bed. When you are not wearing the speech processor you will not hear anything in the implanted ear.

Can I wear it swimming?

No, the speech processor is water resistant but not waterproof. You must take it off if you go swimming.

Can I still use my hearing aid?

You will not be able to use a hearing aid in the ear that has been implanted. You can continue to use a hearing aid in the opposite ear. For most people, using a hearing aid in one ear and the cochlear implant in the other provides better hearing than just the cochlear implant or just the hearing aid alone.

Will I be able to use the phone?

Most cochlear implant users are able to use the phone at least in a limited way. It will depend on how well you are able to understand speech without lip-reading. For most people, it takes time and practice to learn to use the phone.

Will I enjoy listening to music?

The sound of music with the Cochlear Implant varies greatly from person to person and cannot be predicted in advance. For many people with Cochlear Implants music is just noise. Other people say they enjoy listening to music with the Cochlear Implant. If you are someone who had normal hearing in the past, music will sound completely different than you remember.
Can I hear when it’s noisy?

Most people will continue to find it more difficult to hear in groups and/or when there is background noise. (This is true for people with normal hearing.) The ability to understand in noise is different for each person and will depend greatly on the environment (i.e. how noisy it is).

Will I still need to lip read?

Most people with cochlear implants continue to need to lip read to some extent, particularly in noisy or difficult listening situations. It is easier to lip read when you are able to hear sound so this may improve with the Cochlear implant.

Can I hear the TV or radio?

Most people with Cochlear implants continue to use closed captioning with the TV. How well you can understand on the TV and radio will depend on how much you can understand without lip reading as well as the quality of the sound and how fast the speaker is talking.

I have bad tinnitus/ringing in my ears. Will a Cochlear Implant help?

Tinnitus may get worse immediately after surgery but usually goes away. For most people, listening with their speech processor helps reduce or even eliminate the tinnitus.

Should I wait for better technology?

Although cochlear implant technology is constantly improving, success with a cochlear implant may be affected by the length of time an ear has been without sound. If you are a candidate, waiting for “better” technology may not result in “better” hearing. We recommend that once you are determined to be a candidate that you have your surgery as soon as possible.

Is there anything I can do to hear better while I’m waiting for the Cochlear Implant?

Anything you can do to better manage your hearing loss now will be helpful when you have the cochlear implant. There are many ways to become better at communication and to get better access to sound.

These may include technology, such as:

- Well fitted hearing aids (in both ears if appropriate)
- Assistive Listening Devices (ALD’s) for communication (FM systems, Voice Carry Over phones, Personal Neck loops), alerting (flashing lights for phone/doorbells/baby monitors, vibrating alarm clock) and personal safety (flashing lights/vibration for smoke alarms)
• Closed captioning for TV
• Real time captioning for meetings or classes
• Videophone technology: i.e. Blackberry/iPhone4

…..or education and communication strategies, such as

• Speech (lip) reading classes
• Courses on Managing Hearing Loss
• Educating family and friends in how to talk to you

12. Clinic Contact Information:

We welcome inquiries from anyone who is interested in learning more about Cochlear Implants or about our program.

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