



# HEARING LOSS & HEARING CARE

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INFORMATION FOR  
PROSTHAID CALGARY

SEPT 2018

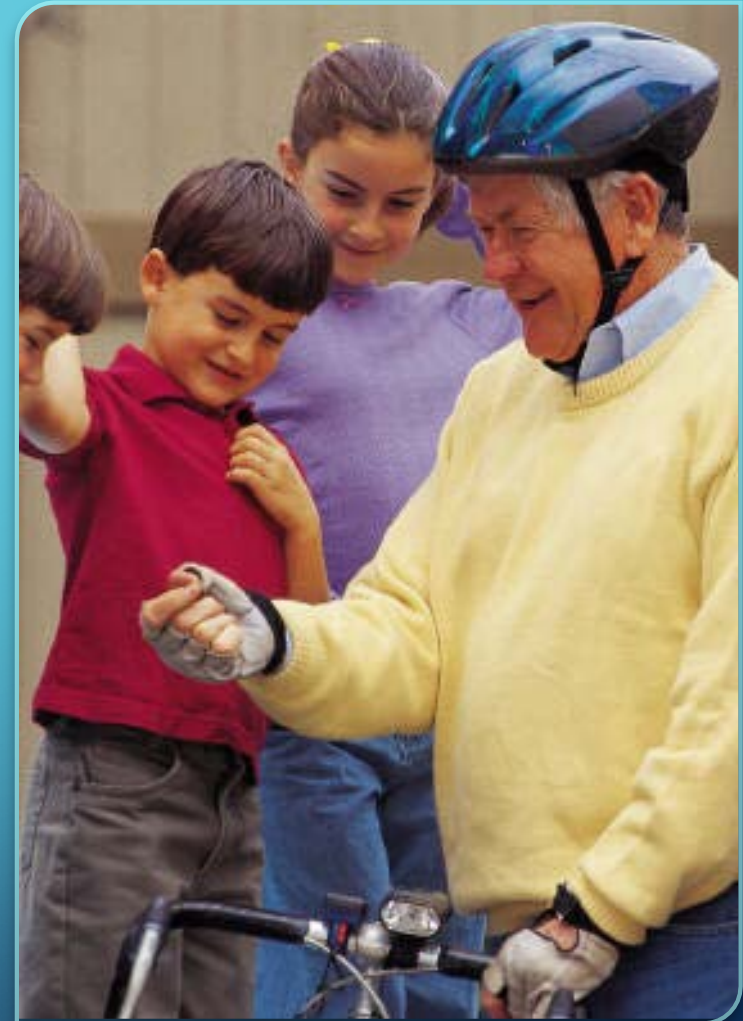
# OUR TEAM

- AUDIOLOGY INNOVATIONS hearing loss clinic  
Suite 226 Glenbrook Plaza & Mission
- Carrie Scarff, Director of Audiology
  - Registered Audiologist
  - Doctorate in Auditory Science
  - Board of Directors Deaf and Hear Alberta
- Elan Feldman, Clinician
  - Registered HAP, Board Certified HIS
  - Experienced clinician
- Eleese Llewellyn, Clinician
  - Registered HAP, Board Certified HIS
  - Experienced clinician



# WHAT WE DO. WHY WE DO IT.

- We treat permanent non-surgically treatable hearing loss in adults
  - Resources and education
  - Devices of all kinds
- We want to reduce the barriers that people with hearing loss experience to improve their **QUALITY OF LIFE**
  - Family and friends/Music/Environment/Work

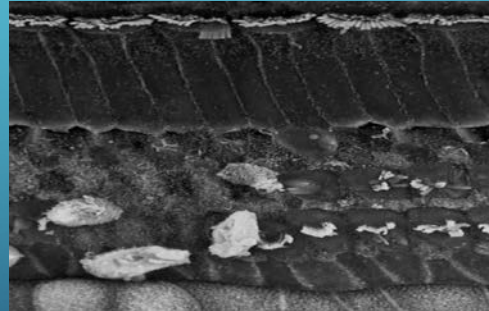
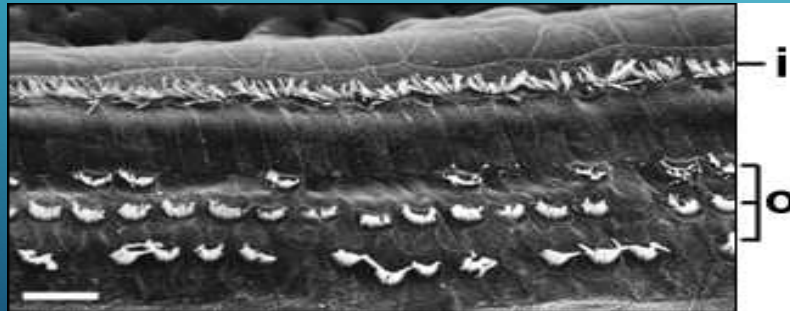
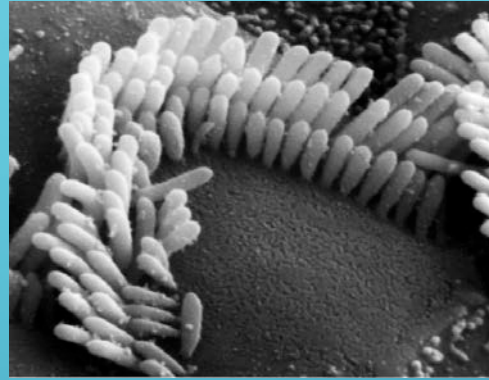
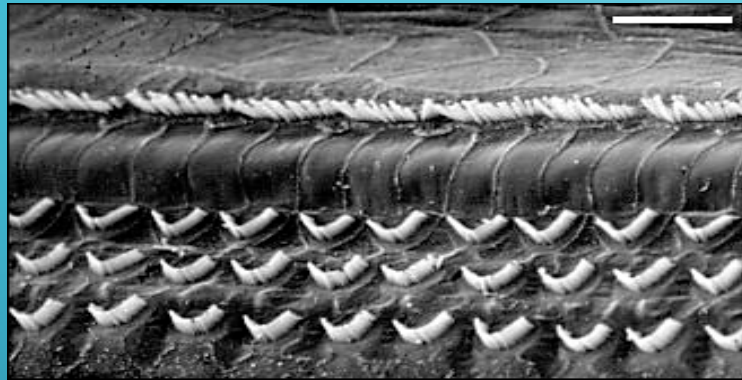


# LEARNING OBJECTIVES

- Hearing testing criteria suggestions
  - based on recent statistics of hearing loss prevalence in Canada
- Recent research about hearing loss and related health issues
  - Ototoxic drugs/Dementia/Diabetes/
  - Cardiovascular disease/Risk of falls
- Basic treatment options; hearing aids and other solutions and resources



# HAIR CELL STEREOCILIA IN NORMAL AND NOISE DAMAGED COCHLEA



<http://www.iurc.montp.inserm.fr/cric/audition>

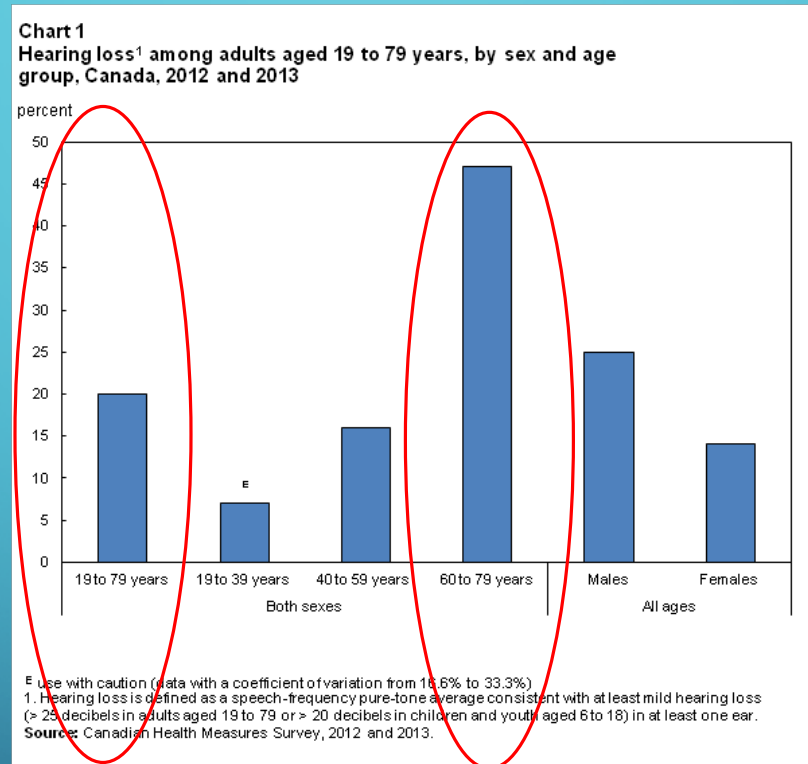
# • Incidence of Hearing Loss in Adults in Canada

- MORE PREVALENT than previously estimated

- Approximately 18% ages 19-79 years

- 4 frequencies 25 dB+ affecting ability to hear speech

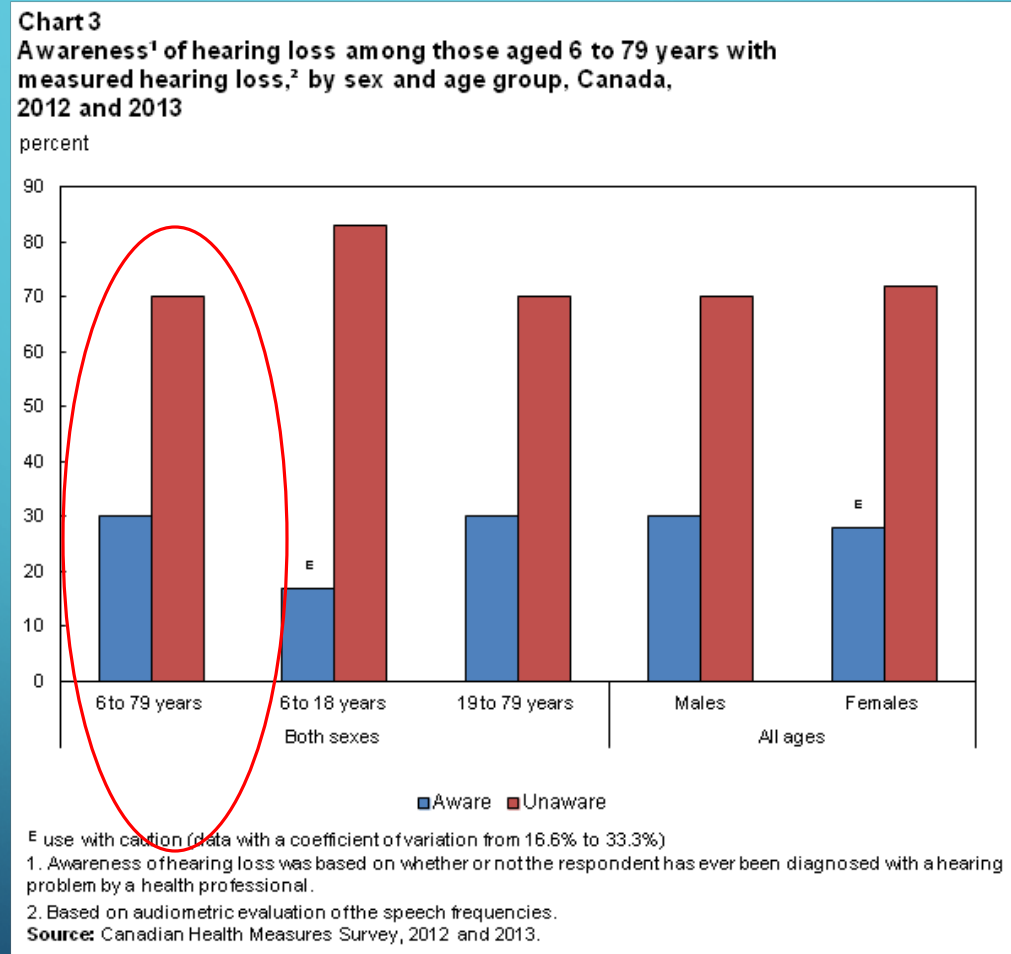
- Those over 80 NOT included



- 47% between 60 and 79 ALMOST HALF
- Approximately 65% from age 70-79

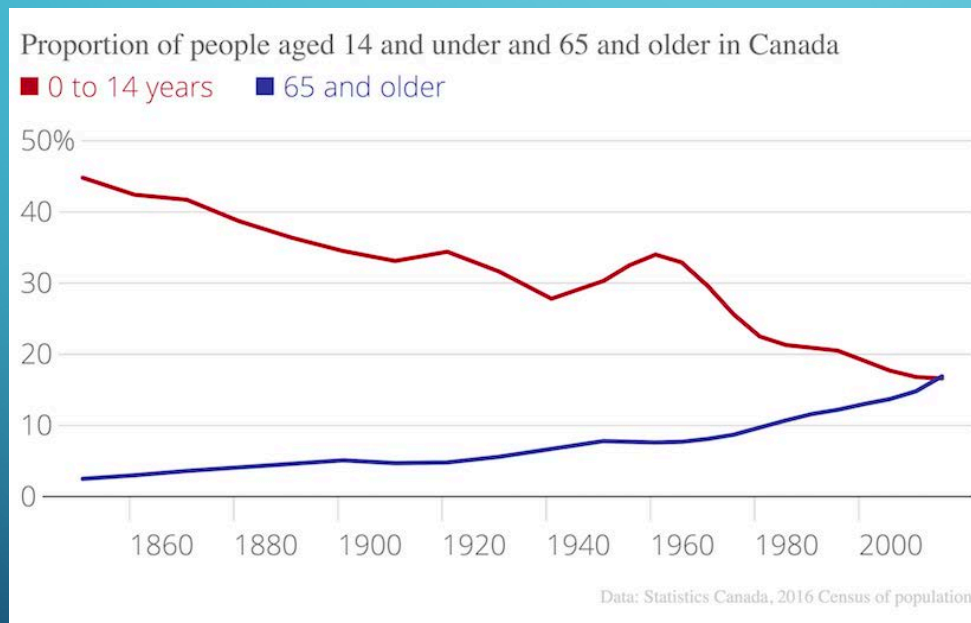
# WE NEED TO EDUCATE PEOPLE ABOUT THESE RESEARCH FINDINGS SCREEN & REFER BECAUSE:

- Approximately 70% of those with a hearing loss were unaware of it



# POPULATION AGING

- Canadian population is aging. 2016 census:
  - 65+ more population than children ages 14 and under for 1<sup>st</sup> time





# WHY IS IT IMPORTANT TO SCREEN & TO REFER FOR TESTING

- People are *not* aware of their hearing loss
- People tend to wait
- Related health issues

Hearing loss correlated with

\***OTOTOXIC MEDICATIONS/**

- Dementia/
- Cardiovascular disease/
- Risk of falls/
- Diabetes/
- Depression/



# OTOTOXIC

## Ototoxicity

oto = ear | toxicity = poisoning

- Any medication that damages the ear is considered 'Ototoxic'
  - Can result in:
    - hearing loss that can be temporary or permanent,
    - Tinnitus
    - Vestibular issues



More than  
**200**  
medications  
are known to be  
**OTOTOXIC  
OR POISONOUS  
TO THE EARS**

*\*Patients with family  
history of ototoxicity are  
at greater risk for hearing  
loss from ototoxic drugs*

- **TEMPORARY:**

- Salicylate pain relievers, quinine and loop diuretics such as furosemide to treat **fluid retention** (edema) in people with congestive heart failure, liver disease, or a kidney disorder such as nephrotic syndrome
- Non-steroidal Anti-inflammatory Drugs (**NSAIDs**) a class of analgesic medication that reduces pain, fever and inflammation. Aspirin (brand names include Bayer, Buferin, and Ecotrin, St. Joseph)
  - Ibuprofen (Advil, Motrin)
  - Naproxen (Aleve, Anaprox DS, Naprosyn)
  - Celecoxib (Celebrex)

### *REDUCTION IN EFFECT AFTER DISCONTINUED USE*

- Generally temporary: aminoglycoside antibiotics used for bacterial infections (10%), 3% chance of being permanent
  - Gentamicin, tobramycin, less often used streptomycin and amikacin

# PERMANENT OTOTOXICITY



**PERMANENT:** Cisplatin (50% of adults), (40-80%) children on platinum based chemo such as Cisplatin (2017 NIH)

Cisplatin: one of the most common chemotherapy agents delivered intravenously that is used to treat testicular cancer, non-small cell lung cancer, bladder cancer, cervical cancer, ovarian cancer and head and neck cancer.

**Why does it cause hearing loss?** the body eliminates the drug in most other parts, cisplatin sticks around in the inner ear and accumulates over time

**Concerns:** Hearing loss can occur later (need for monitoring)

**Considerations:** Researchers working on a way to reduce it's uptake in the inner ear stria vascularis

# WHAT ARE THE SYMPTOMS TO LOOK FOR?



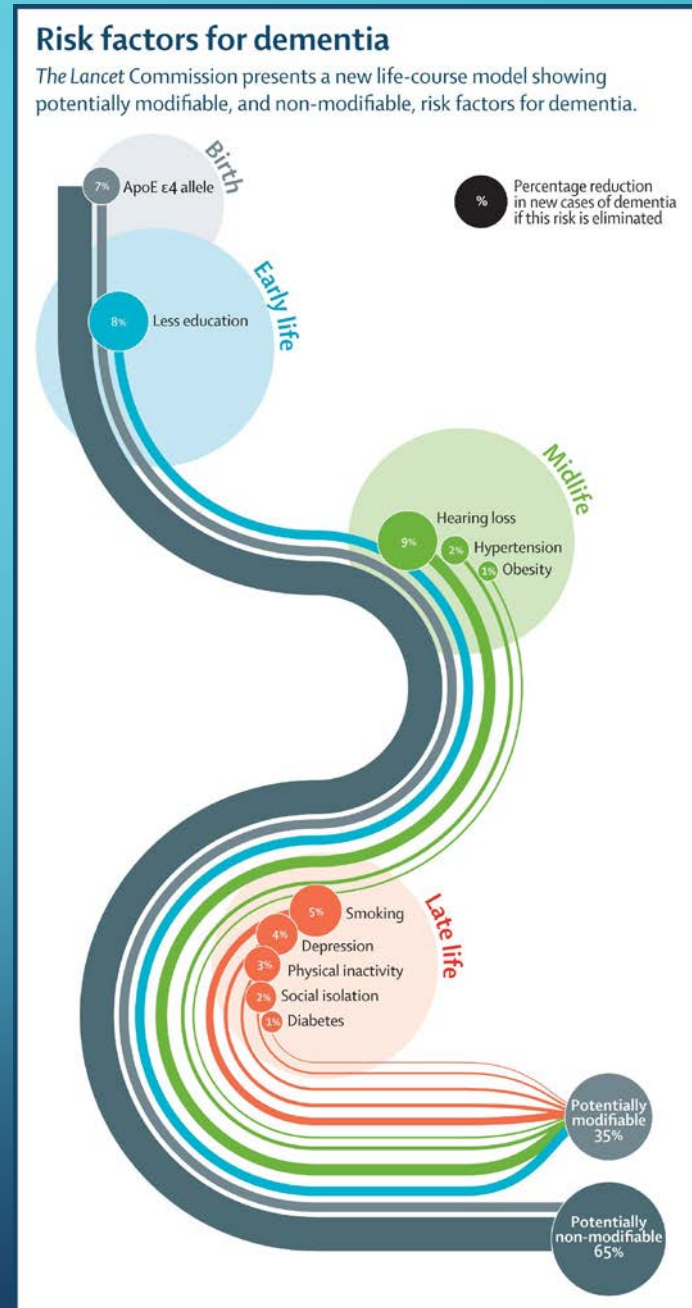
- Tinnitus is 1 of the 1<sup>st</sup> symptoms of ototoxic damage
  - Can be described as ringing , roaring, clicking, hissing or buzzing
- Hearing loss can be mild to profound and can be permanent and occur after long periods of time
  - Depends on the damage to the hair cells in the cochlea
  - Monitoring important as it can occur over time

# HEARING LOSS & DEMENTIA

- Lancet July 2017
- International Commission looked at Dementia prevention, intervention and care
  - -consolidated knowledge base to prevent and manage dementia
- One of highest

Potentially modifiable risk factors is hearing loss

Note: technology interventions can improve care BUT should not replace social contact



# THERE IS A LINK BETWEEN HEARING LOSS AND COGNITIVE DECLINE

## WHY?

- Auditory deprivation. Dr. Frank Lin, John Hopkins University medical school August 2014
  - Showed that the **gray matter of the brain atrophies if hearing loss is untreated after 4.5 years (NeuroImage, 2014).**

Their 2014 study:

A substudy of Baltimore longitudinal study of Aging (NIH). Thousands of participants

-126 adults tracked over time given MRI's

-compared those with hearing loss and **not SURPRISINGLY**

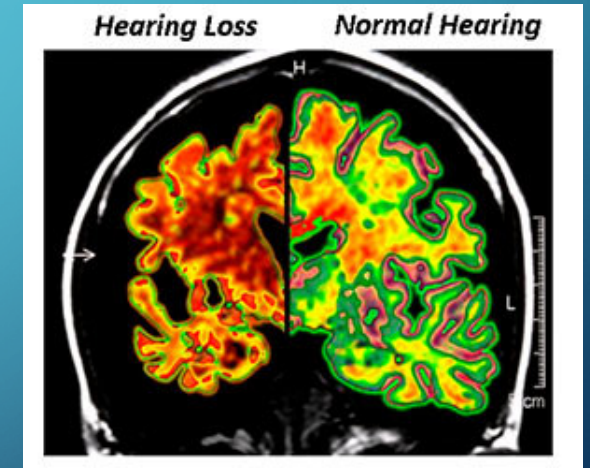
those with hearing loss had accelerated atrophy in superior temporal gyri

areas of speech processing

### **SURPRISINGLY CHANGES ALSO SEEN**

in (mid/inferior temporal gyri-areas responsible for memory and cognitive skills)

- It is important to determine if providing the proper sound stimulation can reinvigorate these structures
  - Why? Peele (2011) lack of neural activation from reduced auditory signal could restructure brain



# WHY IS THERE A LINK BETWEEN HEARING LOSS AND COGNITIVE CHANGES?

- Social isolation
  - Research
    - Research long supports that social isolation is a known risk factor for dementia and Alzheimer's
    - We know that people start withdrawing from favourite activities when they have hearing loss
      - miscommunications/ lack of confidence





# RELATIONSHIP BETWEEN CARDIOVASCULAR DISEASE & HEARING LOSS

- Patients with cardiovascular disease are **54%** more likely to suffer from hearing loss.
  - In those with least one heart attack, **80%** were found to have damage to the inner ear. Individuals who **exercised at least once per week** saw a **32%** reduction in risk of hearing loss (Harvard Medical School)
- An individual's risk of hearing loss increases by **15.1%** if he or she is a **persistent smoker** (Dawes et al., 2014)



Healthy cardiovascular system has a positive impact on hearing.

Conversely, inadequate blood flow and trauma to the blood vessels of the inner ear can contribute to hearing loss.

# HEARING LOSS AND RISK OF FALLS

- Johns Hopkins School of Medicine study suggests untreated hearing loss as a risk factor for falls (Lin et al., 2012)
  - Mild hearing loss nearly **tripled the risk of falling** in over 2000 people
  - **More significant hearing loss increased the risk** substantially
  - Other research shows individuals with hearing aids perform better on balance tests with hearing aids on vs. off (Rumalla et al., 2015)
    - Patients were ambulatory without assistance, more than mild loss
    - Experienced bilateral hearing aid users

## WHY?

Reduced access to auditory cues for  
Environmental awareness



# RELATIONSHIP BETWEEN DIABETES & HEARING LOSS

- Hearing loss is **TWICE** as common in patients with diabetes
  - The strongest association between diabetes and hearing loss was found in the younger diabetes groups in this study, hence the group least likely to have hearing loss from natural aging.
- Hearing depends on small blood vessels and nerves in the inner ear
  - high blood glucose levels may damage these vessels and nerves
- Hearing tests are frequently overlooked in routine diabetes care.



# HEARING LOSS AND DEPRESSION



- Significant link between hearing loss and moderate to severe depression
  - depression rate 5% up to 11% from no hearing loss to those with hearing loss in adults (Li et al 2014)
- Inability to hear and understand speech in background noise has been found to increase loneliness (Stam et al., 2016)
- Untreated hearing loss=anxiety, less organized social activities

Hearing loss treatment=improved relationships, confidence, mental health, independence and security (National council on aging, 1999)

After fit with aids, reduced degree of depression

STABLE over time (Mulrow et al. 1992)



# PATIENTS DO NOT SEEK TREATMENT ON THEIR OWN

- 75% of people with hearing loss do not seek treatment
  - Most wait an average of 7-10 years+ to get treatment
  - Brain changes
  - Visual changes, manual dexterity etc



# IMPACT OF UNTREATED HEARING LOSS

- Exhaustion
- Less social activity (isolation)
- Sadness and depression
- Miscommunications with loved ones
- Emotional turmoil and insecurity



National Council on Aging (NCOA), May 26, 1999 Untreated Hearing Loss Linked to Depression, Isolation in Seniors

# RESEARCH ALERT

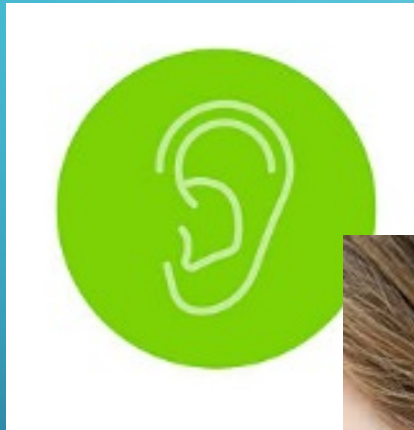
## TREATING HEARING LOSS CAN REDUCE COGNITIVE DECLINE

- Recent study Oct 2015 University of Bordeaux France (Journal of the American Geriatrics Society)
  - 3670 individuals 65 and older
  - hearing loss no aids, normal hearing, hearing loss and aids
  - Longitudinal over 25 years Mini mental state exam
- **RESULTS:** Cognitive decline SIGNIFICANTLY WORSE in those with hearing loss and NO hearing aids than both other groups
- **HEARING AIDS** acted as a protective measure

**NEW PROSPECTIVE STUDIES UNDER INVESTIGATION**



# PROTECTION IS KEY TO AVOID HEARING LOSS AND POTENTIAL DETRIMENTAL EFFECTS ON THE BRAIN





# RULES OF THUMB FOR SAFE SOUND

Use this table to see whether you may be in situations that could cause gradual, noise-induced hearing loss:

Due to the noise around you:	Means the sound levels are probably:	Means you're at significant risk of permanent hearing loss if exposed daily for:
someone standing a metre away has to shout to be understood	higher than 85 dBA	8 hours or more
someone standing 30 cm away has to shout to be understood	higher than 95 dBA	45 minutes or more
someone has to shout into your ear to be understood	higher than 105 dBA	5 minutes or more

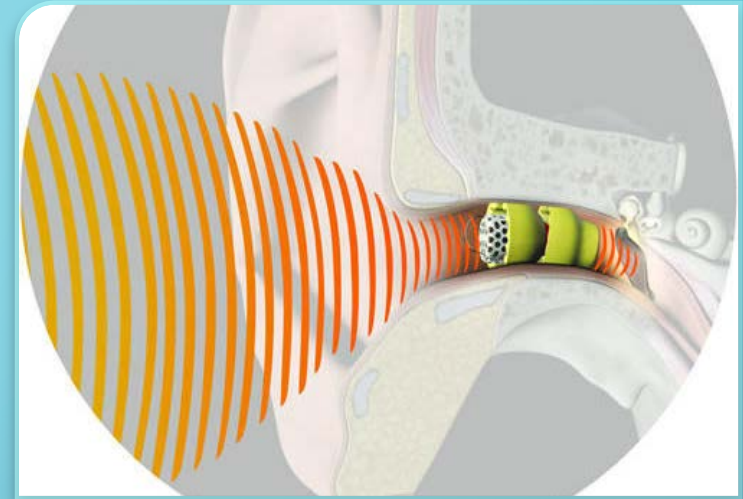
Technology is helpful-you can download an app on your phone to measure the sound levels

1 metre rule for setting ipod level. Others **SHOULD NOT** be able to hear what you are listening to  
Remember, you can always cover your ears for a moment



# HEARING AID UPDATE

- Hearing aids are computers
  - modifiable
- Open ear styles
- Lyric
- Rechargeable devices-for those with reduced manual dexterity
- CROS systems for unilateral deafness
- Bluetooth
- Water resistancy



# HEARING AID UPDATE

## OPEN EAR STYLES

- More natural sound
- Available for more significant losses
- Offer frequency shifting



## RECHARGEABLE AIDS

- Good for those with manual dexterity issues
- Ease of use
- Environmentally friendly





Green blinking LED = charging



## FAR FIELD DEVICES: FM AND EXTERNAL MICS

- REMEMBER: hearing aids **ONLY** turn up sound that arrives at the ear
- **FM Systems:** in conjunction with hearing aids
  - Very helpful to cut **down background noise**  
**SEND SOUNDS TO THE EAR** from a distance  
Function as if you have an **EXTRA EAR**
  - \*Offers excellent real world improvement for people who ***already have*** hearing aids.

# WHY DON'T HEARING AIDS ALWAYS FIX THE HEARING PROBLEM?

- HEARING AIDS make the sounds louder at the ear, but the sound needs to GET to you through the distance and noise AND brain still needs to **process** it properly
- Adults after age 35 & particularly elderly show slowing down of brain activity:
  - discriminating sounds
  - following rapid speech
  - listening in noise
  - remembering what we hear (Tremblay et al, 2006)



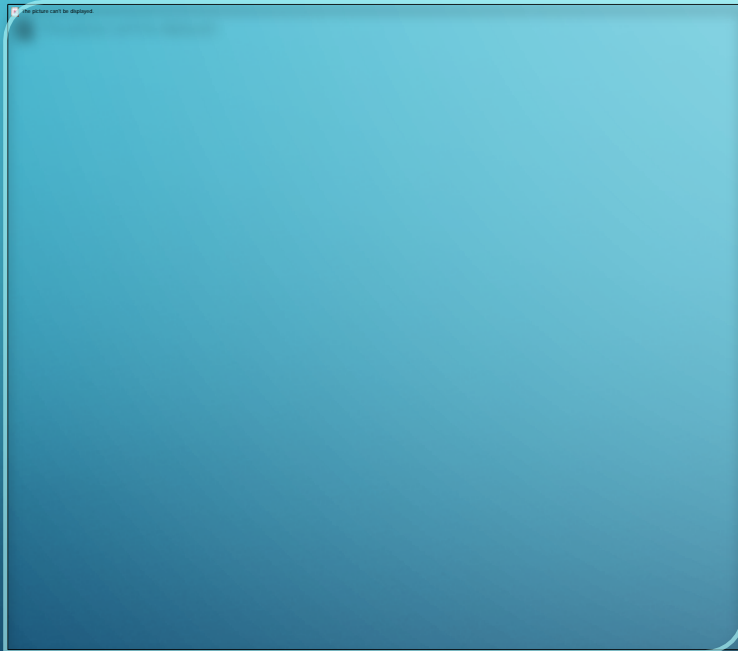
# CONSISTENCY IS KEY



- Hearing aid use takes time to adapt:
  - Up to 18 months of continuous use
- Best practice:
  - to wear all day and all evening during waking hours
- If they **won't** wear them because “they aren't working”; consider:
  - have they been tested in past 2 years?
    - Hearing changes
  - Could an assistive device help?
  - Are they wearing them all the time?

# RELATED EAR ISSUES

- Tinnitus: Ringing in the ears
- -Common, particularly in patients with hearing loss
- (92% Chasin ,2008)
- (current thought is it's related to cortical reorganization following hearing loss)
- -Very good success by improving communication if hearing loss present
- -The new environmental sounds that a patient can now hear 'mask' the tinnitus
  
- Behavioural management also offers good real world improvement



## WHY CHOOSE TO COME TO US?

- We CARE ABOUT IMPROVING YOUR QUALITY OF LIFE and will find solutions to improve your hearing that are right for you

- We have access to low income programs for seniors

- We test for listening in noise abilities

- We offer MOBILE services for those with limited mobility

- We are knowledgeable about assistive devices that work with hearing aids and the tv, Bluetooth, headsets, implantable hearing aids

+++Our patient's are successful-take a look at our reviews







## Audiology Innovations ✔ Claimed

 95.6 Rating Score™ 

Other

Of 81 ratings/reviews posted on 3 verified review sites, Audiology Innovations has an average rating of 5.0 stars. This earns a Rating Score™ of 95.6.

 Visit Website

 Get Directions

 Call Now

Oj S.  1 review

 04/05/2018

Always on time for appointments for adjustments and consultation.....Elan is very pleasant and helpful!

Mike D.  1 review


 03/23/2018

I had a great experience with Elan Feldman at Audiology Innovations. I was able to make an appointment and get in to see him on a very timely basis. My original plan was to get some sleep ear plugs made, but during the course of our meeting Elan and I were also able to discuss my hearing issues and we set up a date to have my hearing tested. Once it was determined that I was experiencing some high end hearing loss, Elan provided me with some hearing aids to take home on a free trial basis. We actually tried two different types of hearing aids and I had plenty of time to see if they were for me. In the end they were not, but it was great to have the chance to test drive the hearing aids first. My ear plugs for sleeping were made from an injection mold and custom fitted to my ears. The first set I had made caused a bit of pain when I slept so Elan made some changes to the plugs. When that didn't work out, Elan made a new mold for me and asked the manufacturers to make some adjustments to the final product. In the end, the second set of plugs were a perfect fit. I was very happy with my experience with Elan and Audiology Innovations. Elan took the time to figure out my needs and address them in a manner that left me a satisfied customer. I strongly recommend that you give Audiology Innovations a try for all your hearing needs.

Sheridan A.  1 review

 03/21/2018

It has been my pleasure to know Dr. Scarff for more than 10 years and from the moment I discovered that I was experiencing hearing loss until now I have enjoyed the most consistent helpful and effective care possible. As a Sales and Business Development Specialist, clear hearing is vital for effective communication and a requirement to conduct business successfully. Under Dr. Scarff's care and instruction I've selected the perfect hearing aid option which has improved my hearing and quality of life at work and at home. I consider my hearing aids an advantage that I never had previously and wear them at all times. I can use them to control and amplify me hearing, use them to listen to music or watch TV or answer my phone. May I suggest that if you are wondering about your hearing, do yourself a favour and contact Dr. Scarff for a hearing evaluation and watch your life improve.

Mark T.  1 review

 03/13/2018

I have been wearing hearing devices for the past two years. While the original level of service was excellent, I honestly expected that to be the case. It has been the post sale level of service that has impressed me the most. The clinic is always looking to enhance my experience and I am most appreciative of that. I would be happy to recommend the clinic to my good friends. In fact, one of my very good friends is also a customer!

**Reply from business** 03/20/2018

Dear Mark, I really appreciate that you took the time to review your experience with our clinic. I am especially glad that you are happy with our follow up care. Our goal is to keep improving on your hearing throughout your journey with us. You've been great at being open to new information and recommendations based on the research. Thank you kindly for referring your friends too. That is a high compliment!

Glenn H.  1 review

 03/05/2018

My hearing assessment conducted by Dr. Carrie Scarff was thorough, time-efficient, affordable and informative. Accordingly, I would not hesitate to recommend Audiology Innovations and Dr. Scarff to anyone seeking to better understand the state of their hearing and any challenges they may be experiencing.

Brad W.  1 review

 03/02/2018

Professional, friendly and helpful. I have been very pleased with Audiology Innovations and the great people that work there. I have learned a lot about my hearing and what is best for me. I am very happy with my high tech hearing aids.

Richard F.  1 review

 02/26/2018

I visited Dr. Scarff to consult with her about my tinnitus. After a thorough hearing test she was able to conclude that the ringing in my ear was a result of hearing loss. She gave me information on how to deal with tinnitus and strategies on how to handle the problem in the future. Thank you Dr. Scarff!

**Reply from business** 03/20/2018

Dear Richard, Thank you for taking the time to comment on our work with you on Tinnitus (ringing in the ears). Many people experience Tinnitus and don't know where to receive the education and support that can help them. I'm glad we were able to provide you with useful strategies to manage your Tinnitus. Best regards, Dr. Scarff.

# AUDIOLOGY INNOVATIONS

## Top Rated Local<sup>®</sup>

### 33 Verified Ratings

Quality	4.9
Value	4.8
Timeliness	4.9
Experience	5.0
Satisfaction	4.9
Average Overall	4.9

Kristy T. ☆ 1 review

★★★★★ 03/20/2018

Every interaction I have had with Audiology Innovations has been extremely positive. The staff are helpful and very knowledgeable about hearing loss. If they are unsure they will find out and call you back. They go above and beyond and I will definitely be referring my clients here to Audiology Innovations.

Reply from business 03/20/2018

Dear Kristy, Thank you for taking the time to comment on our care of your clients in seniors' residences. And thank you for looking out for your clients by bringing in their hearing aids when they were in need of repair. You go above and beyond in your care for our seniors as well. For that, we are truly grateful. Dr. Scarff

Keith B. ☆ 1 review

★★★★★ 03/14/2018

I am thrilled with my hearing aids, and the care that was taken to program them exactly right for my ears. At age 77, I was reluctant to admit I needed them but now I can hear so many things I have missing... such as the "clicking" of the turn signal on my vehicle and more vehicle sounds.... hearing the top end of voices instead of just the lower tones... and I could go on. The folks at Audiology Innovations are very professional and also so nice to deal with.

Reply from business 03/20/2018

Dear Keith, Thank you for taking the time to comment on your experiences with your hearing and with our team. It is rewarding to receive your comments that you are enjoying your new and improved hearing! I'm proud that you enjoy your interactions with our staff. Remember that we are here to help you hear as well as possible, so don't hesitate to contact us should you need anything.

## HOW TO CONTACT US

- Glenbrook plaza 403-802-6022

- Suite 226. Please feel free to stop by and see Elan or Cindy.

One of our clinics is right next door. Grab some referral pads

- Mission 202-320 23<sup>rd</sup> Ave SW 403-252-4722

- [www.audiologyinnovations.ca](http://www.audiologyinnovations.ca)

HOME VISITS  
NOW  
AVAILABLE

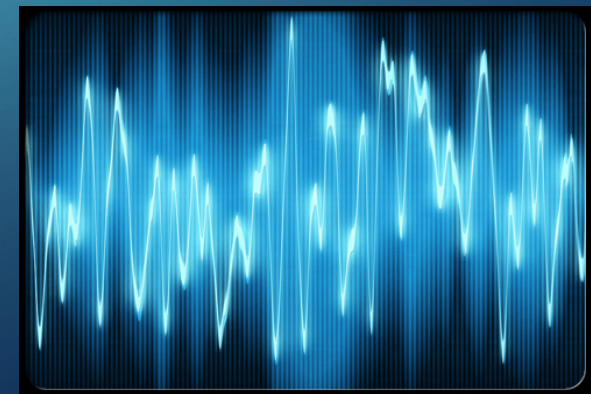


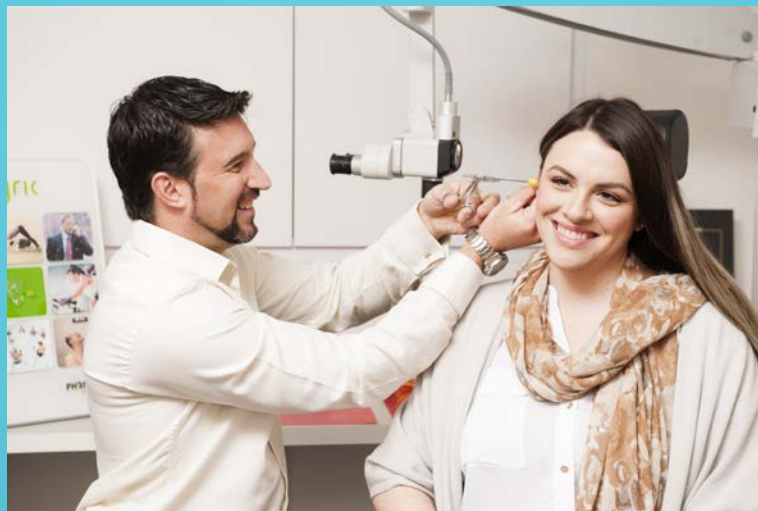




# HOW TO USE THE HEARING SCREENER

- Hearing Screener
  - Elan will demonstrate how to operate





- We are your partner in your patient's hearing care
  - We provide thorough report after testing
  - It will include our recommendations
    - Noise protection education
    - Tinnitus care
    - Audiometric re-evaluation at a specified time
    - Hearing devices & aural rehabilitation strategies
    - Hearing protection-custom made for concerts/hunting etc

# HEARING LOSS ACTS LIKE A FILTER

