

**Jillian McConnell:** Okay everyone, I think we'll get underway just in the interest of time. I don't want to hold anyone else up. Welcome everyone, I am very happy to have you on the call. My name is Jillian McConnell and on behalf of the Canadian Dementia Resource and Knowledge Exchange or CDRAKE for short, I would like to welcome you all here. The webinar that we are going to be participating in today is always a part of a series of webinars hosted by CDRAKE in partnership with the Alzheimer Society of Canada. And so for those who haven't participated in these events before, the audio is provided over the phone, so if you are hearing my voice, you are in the right place and hopefully if you aren't you are seeing the prompts on the screen.

On the left side of the screen, you will see the chat pod that I alluded to, and that's where you can communicate with me during the presentation and where you can send your questions during the question and answer portion of the event. I also want to make you aware that all of your lines have been muted for this call, and that just helps us minimize any background noise or private conversations that you may be having on the side. And then if you do need to ask a question or have a concern during the actual presentation, then please use the chat pod to get in touch with me because I won't be able to hear you.

The presentation itself is being recorded and so within a week or so I will email you just a little notice letting you know the recorded version is available online, and our presenters have made available a copy of the slide deck as well, which I've put the link on the chat pod - it's that Bitly link that you see in front of you and so that might help out for you as well. We encourage you to pass on that link, whether it's either the recorded version or of the slides to any colleagues who weren't able to join us today. Obviously we can't capture everyone during this time frame, although we try our best, so if there is somebody that you know that you think might be interested please feel free to pass along the information.

I also would encourage you if you haven't already to become a member of CDRAKE, it's free, and in addition to having first access to webinars like this today, you'll also receive the CDRAKE Pulse, which is just a bi-monthly newsletter that comes out, and it's an online

communication that helps you keep in touch with resources and research and innovations that are happening across Canada.

So, I think we are ready to go. Our topic today is “The importance of considering hearing needs in individuals with cognitive impairment”, and we are very fortunate to have Kate Dupuis and Debbie Ostroff here with us today to present this featured topic.

So, Kate is a post-doctoral fellow at the University of Toronto. She obtained her PhD in psychology from U of T in 2011 and is a registered clinical neuropsychologist. Her specialists have included clinical assessment and intervention techniques, as well as both quantitative and qualitative research methodologies. Her research interests include: increasing our understanding of the interaction between sensory and cognitive processes, facilitating the use of audiologic rehabilitation techniques by older adults with cognitive impairment, and alleviating communication challenges experienced by individuals with Alzheimer’s disease and their family members.

Debbie is a clinical audiologist with more than 12 years of experience working primarily in hospital settings. She received her Master’s degree in audiology from the University of Ottawa in 2002 and began her career working at the Children’s Hospital of Eastern Ontario in Ottawa before moving to Toronto in 2004, where she worked for the North York General Hospital. She currently works at Baycrest and her areas of interests include: diagnostic audiology, hearing aid fitting and rehabilitation and clinical audiology training of students. So, obviously Debbie and Kate bring a wealth of knowledge to us with regards to this topic, so I’m looking forward to getting it underway.

So, just to let you know that our presenters will speak for about 40 minutes or so, and then we’ll have a 20 minute Q and A at the end and discussion. Just a little reminder, I ask people to refrain from asking questions in the chat pod until the end of the discussion, unless, of course, it’s technology-related, and then I’ll do my best to help you as best I can. So, Kate, Debbie, the floor is now yours.

**Kate Dupuis:** Okay, so today I’m going to be talking about the importance of considering hearing needs in individuals with cognitive impairment.

## Overview

- Introduction to prevalence rates of cognitive impairment and hearing loss in the geriatric population
- Discussion of hearing loss and audiologic rehabilitation solutions
- Communication as a team effort

**Kate Dupuis:** To provide you with a brief overview, I will first be introducing the prevalence rates of cognitive impairment and hearing loss in a geriatric population. Debbie will then take over and provide a discussion of signs and symptoms of hearing loss and different treatment options and audiologic rehabilitation solutions. And finally, I will conclude by discussing how communication can be thought of as a team effort and how we can involve family members, clinicians and care providers in working with older adults with hearing loss.

So, Debbie and I as clinicians who work with the geriatric population are of course very interested in looking at prevalence rates.

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## Census 2011: “Grey Glacier”

- Canada-wide, 4,945,055 persons aged 65+
  - 14.8% of the population
- Growing number of people who are aged 65 and older, what does this mean for the incidence of cognitive impairment and hearing loss?

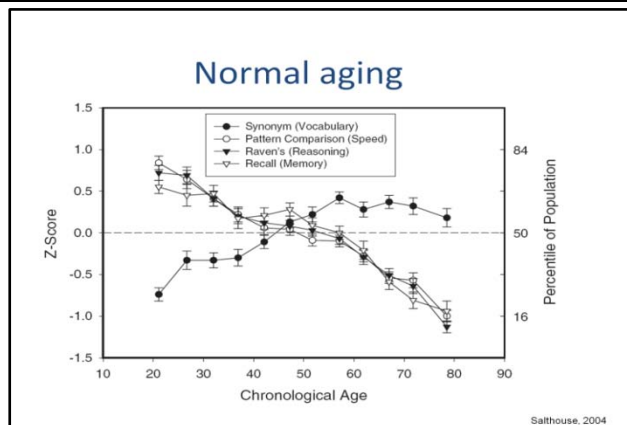


**Kate Dupuis:** So, we know that here in Canada, we have a growing number of older adults. So, in other parts of the world, I've seen it called the “Grey Tsunami”, and here we can call it the “Grey Glacier”. So, population wise, we have approximately 15% of the Canadian population that is over the age of 65, and the two largest growing populations are individuals 60 to 64 and also centenarians. So, with this growing number of people who are aged 60 or 65 and older, what does this mean for us as clinicians or as individuals who are working with or even living with older adults in terms of the incidence rates of cognitive loss and hearing loss?

## Cognitive loss in aging

- Continuum from Normal Aging to Dementia

**Kate Dupuis:** So, when we think of cognitive loss in older adults, we have to think of it as a continuum – from normal aging to dementia. So, of course everyone ages differently and people’s backgrounds and life experiences can serve as either protective factors or even potentially as risk factors. So, when working with older adults, we have to be very aware and make adjustments for different levels of cognition and of potential cognitive loss.



**Kate Dupuis:** When we think about normal aging, we know that there are many different thinking skills that change as we get older. So, on this graph here you see age represented along the bottom, and what you see are different thinking skills, such as here – speech, reasoning and memory skills – that tend to decline across the age range. We know that different cognitive or thinking skills can play a major role in accurate communication. So, for example, when we are speaking if we are unable to keep up with a conversation, or we can’t keep up with what the other individual is saying, we may just choose to drop out. If we can’t remember someone’s name when we see them on the street or where they went for their previous vacation, we may just decide not to even talk to them.

We also know that as we age, there are certain skills that actually improve or remain the same. So, for example here, we know that vocabulary – that general fund of knowledge that we develop throughout our entire lives – actually increases as we get older and older adults can use this contextual information – this general fund – to maintain accurate and effective communication.

## Mild Cognitive Impairment

- “Predementia phase of cognitive dysfunction”  
(Petersen et al., 2009)
- Memory complaint, preferably corroborated by an informant (e.g., caregiver, family member)
- Impaired memory function for age and education
- **Intact activities of daily living**
  
- Prevalence rates 10-20% over age 65  
(Anderson et al., 2012; Petersen, 2006; Roberts et al., 2008)

**Kate Dupuis:** Moving on from normal cognition, a more milder level of impairment – there’s a new, sort of recently developed diagnostic category called mild cognitive impairment – and this can be thought of as essentially a pre-dementia phase of cognitive dysfunction. So, the individual can present with changes to many thinking skills but typically there will be a change to memory. This is often corroborated by a family member or a caregiver, and what you’ll notice in this individual is that they present with an impaired memory function for someone of their age and education, but they are still able to maintain their activities of daily living. So, for example, they will still remember their appointments, that they have to go pay a bill at the bank, but they will have memory impairments on testing. We know that prevalence rates for mild cognitive impairment are approximately 10 to 20% of individuals over the age of 65.

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## Mild Cognitive Impairment

- Rates of conversion to dementia: 10-15% per year
  - 80% conversion rate after 6 years (Petersen et al., 2001)
  - Time to intervene?

**Kate Dupuis:** And for our purposes, what’s very interesting about this is that the rates of conversion to dementia are very high. So, the majority of individuals who have been diagnosed with mild cognitive impairment will convert to dementia after about a six-year period of time, and as clinicians or as individuals deciding upon policy or diagnostic criteria, we can think of this as a potential time to intervene. So, is this a time where we can actually identify individuals who are at risk of developing dementia and provide them with interventions that can either reduce the risk or slow down the rate of conversion?

## Dementia

- Prevalence of dementia
  - 1.5% of Canadians have dementia (2008)
  - Prevalence increases with age
    - Over 65: 7% in 2008, projected 9% in 2038
    - Over 90: 49% in 2008, projected 50% in 2038
- Rising Tide (Alzheimer Society of Canada Report, 2010)
  - Underlines medical, social, and productivity costs associated with growing number of people with dementia

**Kate Dupuis:** And of course, what we're trying to do is delay this conversion to dementia. We know that approximately 1.5% of Canadians have dementia and prevalence rates increase with age. They also are projected to increase over time, such that in approximately 2038, they'll be about 9% of Canadians over the age of 65 who are affected or have been diagnosed with dementia. And in 2010, the Alzheimer Society of Canada published an excellent report called "Rising Tide", which really served to underline the medical, social and productivity costs which are associated with a growing number individuals with dementia. And these costs, it's important to point out, are not necessarily just for taking care of those individuals who have dementia, but also take into account the cost associated with caregiving.

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## Alzheimer's disease

- Alzheimer's disease (AD) is the most common form of dementia
- Gradual deficits in the ability to perform everyday tasks
- AD typically leads to impairments in higher order cognitive functions such as memory, language, and **communication**

**Kate Dupuis:** Often times, when we think of dementia we think of Alzheimer's disease because it is the most common form of dementia – affecting approximately 60% of those individuals who have been diagnosed with a dementia. And typically in Alzheimer's disease, you'll see impairments in higher order cognitive functions or thinking skills (such as memory, language, attention) and what really differentiates Alzheimer's disease or a dementia from a milder form of cognitive impairment, is the gradual deficits in the ability to perform everyday tasks. So, someone with Alzheimer's disease may longer remember that they have to book their appointment with Debbie to come in for a hearing aid test. They may longer remember that they have to go and pay a certain bill at the bank, and these different types of impairments in thinking skills can also lead to impairments in communication and function.

Cognitive Loss	Untreated Hearing Loss
Social Isolation (Holman et al, 2000)	Social Isolation (Weinstein & Ventry, 1982)
Decreased comprehension (Pogacar & Williams, 1984)	Decreased understanding/discrimination (Dubno et al, 1984)
Repeating questions (Nyatsanza et al, 2003)	Repeating questions (Katz, 2002)
Short-term memory problem (Miller, 1973)	Working memory problem (Salthouse, 1998)
Stereotyped/inappropriate word use (Nyatsanza et al, 2003)	Stereotyped/inappropriate word use (Tesch-Romer, 1997)
Difficulty following conversation (Bozeat et al, 2000)	Difficulty following conversation (Dalton et al, 2003)
Depression, anxiety (Bierman et al, 2007)	Depression, anxiety (Cacciatore et al, 1999)

**Many of the behavioural consequences of cognitive impairment in older adults are very similar to those of untreated hearing loss**

**Kate Dupuis:** So in this slide here, what I've presented on the left are some consequences of cognitive loss and on the right are some consequences of untreated hearing loss. And I've identified three very important ones that seem to be consistent across the two different types of loss. So, you see here that decreased comprehension occurs with both individuals who have cognitive loss or who have untreated hearing loss. You see memory problems, such as no longer being able to remember what someone told you or no longer being able to keep in mind what you want to say next in the conversation, and these can result in difficulties following conversations.

So that many of the behavioural consequences of cognitive impairment in older adults are actually very similar to those of untreated hearing loss – there may be a different underlying mechanism that's causing these behavioural consequences – but they are very similar. So, being in this field, sort of at the conjunction of audiology and psychology, it's interesting for us to know why are these behavioural changes and these behavioural consequences occurring. Also, it's important for us to understand what is underlying an individual's difficulty following conversation. Is it hearing loss or cognitive loss?

So, from a scientific perspective, if we're creating diagnostic criteria for cognitive loss, we need to make sure that we're not also capturing people who are suffering from hearing loss. This is also very important for a clinician, who is seeing an older individual in the clinic. You know, a family member might say that "my mom just doesn't keep up with conversations when we're out with all the grandkids" – that could be something to do with a cognitive change or it could simply be that they have an untreated hearing loss.

## Prevalence of Hearing Loss

- Hearing loss is third most common chronic condition in older adults
  - 1/3 of persons over the age of 65  
(Minister of Public Works and Government Services Canada, 2006)
  - 1/2 of persons over the age of 85  
(Cruikshanks et al., 2010)



**Kate Dupuis:** And of course, when we're thinking about whether it could be cognitive loss, untreated hearing loss or a combination of the two, we should probably suspect some level of hearing loss because we know that prevalence rates of hearing loss in older adults are quite high. It's actually the third most chronic condition in older adults, and we know from large scale population research that approximately one-third of individuals over the age of 65 and half of individuals over the age of 85 will have some level of clinically significant hearing loss.

Now, the important thing for us to think about when interacting with older adults – either in a clinical setting or even at home when talking to a family member or loved one – is that these data and these prevalence rates look very different if we actually ask people to self-report hearing loss.

So, Statistics Canada at the end of 2013 published results from a survey looking at disability levels in Canadians across the age span. And, when asking individuals to identify whether or not they had a hearing loss, what they found was that for those 75 years of age and older, only approximately 11% of these individuals stated that they had a hearing loss.

So, from the larger scale population-based research, we know this is unlikely to be true – it's probably closer to 40%. So, this is one of those cases where it may not be enough for us just to say, "Do you have hearing loss?", the individual may just say, "Oh no, I just can't keep up with those conversations the way that I used to because I'm tired or I just can't remember as much as I used to". So, here's a situation where we may really need to probe, we may really need to find better ways of questioning individuals whether they are experiencing some hearing loss.



### Link between hearing loss and cognitive loss

- Strong connection between sensory and cognitive function in old age  
(e.g., Baltes & Lindenberger, 1997; Lindenberger & Baltes, 1994)
- Age-related hearing loss is independently associated with cognitive impairment  
(e.g., Gurgel et al., 2014; Lin et al., 2011)
  - The likelihood of developing dementia is directly proportional to degree of hearing loss
  - The more severe the hearing loss, the greater the risk

**Kate Dupuis:** And one of the reasons as a scientist that I'm so interested at looking at this link between hearing loss and cognitive loss is that it's not necessarily a new idea – we've known for years that there's this strong connection between sensory and cognitive function in old age. That graph I showed you before where we looked at different thinking skills and how they change over the lifespan, if we were to look at a similar graph for vision or for hearing, what you'll see is that there are declines in visual and auditory acuity across the lifespan.

However, what we are starting to have definitive data about coming from large scale epidemiological studies – looking at thousands and thousands of individuals over a decade span of time – is that age-related hearing loss appears to be independently associated with cognitive impairment; such that, the likelihood of an individual developing dementia is directly proportional to their degree of hearing loss. So, even if we control for things like education level, for medical conditions that we know are risk factors for both dementia and hearing loss (such as hypertension, diabetes), we still find that the more severe a hearing loss, the greater the risk.

## Link between hearing loss and cognitive loss

- Potential explanations?
  - Specific cause
    - Cognitive
    - Fewer processing resources available to use in difficult listening environments
    - Underlying neuropathological process
  - Social isolation (“use it or lose it”)
  - Mood factors

**Kate Dupuis:** So, when we’re thinking about this connection we have to start asking ourselves, “What are the possible explanations for this?”, because once we can identify possible explanations, maybe we can start to intervene in specific areas. So, first of all, we know that one possible explanation is related to a sort of cognitive processing idea. So, we have a pool of cognitive resources that we use every day, and we know that if you’re in a difficult listening environment, you have to pay really close attention – you’re straining to understand, you may miss something that someone said so you have to try and figure out what it was that they said. So, essentially you have fewer processing resources available to you, and this strain over repeated exposures to this type of environment may actually cause or lead to cognitive decline.

We also know there may be an underlying physiological process, perhaps there’s something in the brain that’s changing that’s impacting not only our cognitive thinking skills but also our hearing abilities. We can also look at a possible explanation related to the “Use or Lose It” hypothesis. So, we know that a lot of older individuals with hearing loss become socially isolated – Debbie will talk about this more in her section – but the idea is if you’re not going to Bridge, if you’re not going to the synagogue like you used to, you’re going to be at home, you won’t be as cognitively engaged as you used to be.

Finally, there’s some very recent research showing that depression seems to have predictive factor for the risk of dementia. So, a low mood can influence you’re likelihood of developing a cognitive loss, and we know that many individuals with hearing loss also suffer from mood difficulties. So, this is another possible explanation where we could be intervening.

### Prevalence of concurrent hearing and cognitive loss

- Little research examining how many older individuals experience both hearing loss and changes to their thinking skills (e.g., memory, attention, language)

**Kate Dupuis:** As someone working with older adults, from a practical perspective, we have to think to ourselves, “Well, what is the likelihood that the client we’re seeing will be experiencing both hearing loss and changes to their thinking skills?”. The truth is there is not a lot of research out there looking at this. The data that I was speaking of related to this increased incidence of dementia in individuals with hearing loss, these data are quite new. So, this is really a new field for us to be exploring.

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### Prevalence in a community-based sample

- Research conducted at University of Toronto
- 301 older adults
  - Healthy, community-dwelling, recruited from newspaper ad
  - Average age 71 years
- Results
  - 36% neither hearing impairment nor cognitive impairment
  - 45% fail the hearing screen
  - 47% fail the cognitive screen
  - **28% fail both screens**

Dupuis et al. (under revision)

**Kate Dupuis:** We have done some research in a community-based sample looking at this exact question. The research that I conducted at the University of Toronto with a team of scientists there, I looked at over 300 older adults recruited from the community – they’re quite young, so an average age of 71 years – and what we found is that if we gave these individuals a screen for their hearing, a screen for their thinking skills, we find that approximately one-quarter of these individuals will fail both screens. Now, these are people who are self-identifying as healthy older adults, who are ready and willing to come in to do a research study, and this is quite a high level for us to be finding that these individuals are having difficulty on both of these types of screens.

## Prevalence in a clinical sample

- Research conducted at Baycrest Audiology
- 47 older adults
  - Audiology patients purchasing a new hearing aid
  - Average age 84 years
- Results
  - 83% fail the cognitive screen

Keymanesh et al.

**Kate Dupuis:** More recently here at Baycrest, one of Debbie's colleagues, Akram Keymanesh, has been instrumental in spearheading some research in a more clinical sample. So, we've been looking at older adults who are coming to the Baycrest audiology clinic to purchase a new hearing aid. So, these adults are quite a bit older than the ones we saw in our experimental setting and what we're finding in these individuals is that if we're giving them that exact same cognitive screen, over 80% of them do not meet the minimum criteria for passing this cognitive screen. Now, these individuals are older, a lot of them are very frail, they may have mobility issues, they also have a lot more medical issues than an older adult perhaps that we're seeing in the lab. And, you might be thinking, "Well, this is a cognitive screening test, it's not a full neuropsychological test battery", but it's important to note that research has shown that many physicians rely heavily on cognitive screening tools just like the one we use – it's called the Montreal Cognitive Assessment – when making their diagnosis of a cognitive loss. So, these data may actually be representative of concurrent loss of both hearing loss and cognitive loss in an older population.

So, now you may be thinking, "Well, I'm thinking of one of my loved ones or one of the clients or one of the individuals who comes into my clinic, and I'm starting to wonder, well how can I know? How can I know if what I'm seeing is a cognitive loss or if it's a hearing loss? And if it is a hearing loss, what can I do?". So, I'm now going to turn you over to Debbie who will be providing you with some answers to these questions.

## Age-related hearing loss

- What is age-related hearing loss?
- How can you know who has hearing loss?
- Why is it important to know whether or not someone has hearing loss?
- What strategies can we use to better communicate with those that have hearing loss?
- What resources are available for patients with hearing and cognitive declines?

**Debbie Ostroff:** Okay, good afternoon everyone. Thank you for joining us today. So, what I'd like to do now is give you some information about hearing loss due to aging, what the warning signs are and why we believe it is more important than ever to have an early diagnosis of hearing loss. I'll give you some communication strategies when speaking with hearing impaired people, as well as information on resources available for patients with hearing and cognitive decline.

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## Age-related hearing loss

- Presbycusis: a slow progression of hearing loss that occurs with aging.
- Causes include:
  - Genetics
  - Exposure to loud noise
  - Ototoxic drugs
  - Diabetes, hypertension
  - Smoking, poor dietary habits

**Debbie Ostroff:** Hearing loss due to aging is also known as presbycusis. It gradually occurs in most people as they grow older and often affects both ears equally. There are many causes of presbycusis, but when an elderly person has difficulty recognizing speech it is usually the result of a complex interaction of the inner ear, central auditory and cognitive changes that occur with age.

How do you know who has hearing loss?



**Debbie Ostroff:** So, unfortunately hearing loss is an invisible condition. There's no obvious sign – like a walker or a cane – to let you know that it's there. We cannot see hearing loss, but we can see the impact or consequences the hearing loss will have on a person's everyday life. These effects can be attributed to unfriendliness, confusion or personality changes.

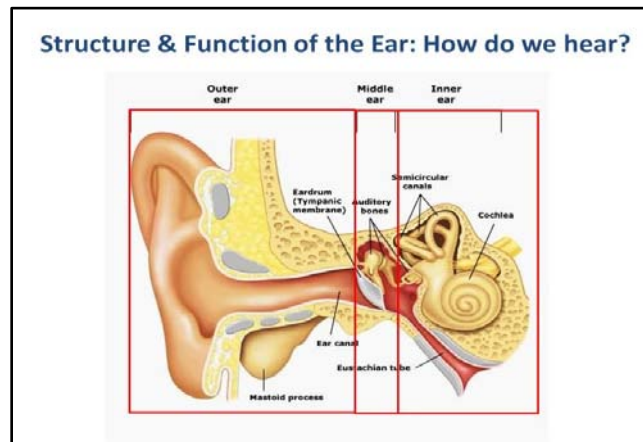
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**WARNING:**  
**SIGNS!**

Signs of age-related hearing loss

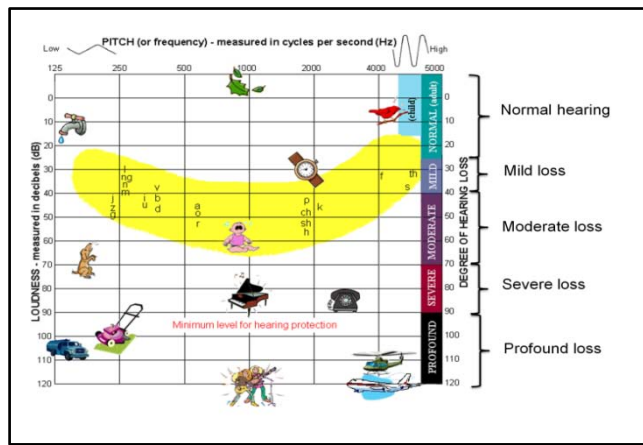
- Able to hear people speaking - difficulty 'understanding' the words
- Strain to understand conversation
- Frequent requests for repetition
- Complaints that others speak too fast
- TV/radio volume too loud for others
- Unable to hear over the telephone
- Able to hear better when wearing glasses
- Trouble following conversation when two or more people are talking

**Debbie Ostroff:** Some of the most frequently heard complaints of older listeners include: "I can hear people talking but I can't make out the words", they report that people mumble, they need to see the speakers face to speech read, so they say, "I can hear better with my glasses on", they ask people to repeat frequently, they need more volume for the television and the radio, they say that people talk too fast and they have trouble following conversation in a group setting.



**Debbie Ostroff:** If you're dealing with somebody who has hearing loss, it's always helpful to understand how we hear and how sound travels to the brain. Ears have three sections leading up to the brain: the outer ear, the middle ear and the inner ear. The outer ear consists of the pinna, which is the part you can see on the side of your head. The pinna helps sound travel into our ear canals. The sound waves will then hit your eardrum and cause it to vibrate.

The middle ear is a very small space behind the eardrum that is filled with air. This cavity is connected to your nose and throat by the Eustachian tube. The middle ear contains three small bones. They pick up vibrations from the eardrum and transfer them to an opening of the inner ear where the cochlea – our organ of hearing – is situated. The vibrations that come from the middle ear create movement of fluid contained in our cochlea. Tiny hairs in this fluid begin to bend as the sound waves pass by and this will create nerve impulses that are carried to the brain for interpretation.



**Debbie Ostroff:** So this is an audiogram – it is a chart of results which provides information about the severity of a person’s hearing loss. The two main components that are graphed are frequency and intensity. And, when you have your hearing tested, the audiologist determines the softest sound that you could hear at each specific frequency. A person with age-related hearing loss will typically have more difficulty hearing high frequency speech sounds, such as s, f, th. High frequency information is most critical for understanding words, so if consonants that form the beginning and ends of words are missed, speech sounds muffled and unclear. Often people complain that they can hear the talker but they cannot understand what is being said – and this is a very common complaint of seniors.

### Age-related hearing loss

- Have to consider the **functional** effects of age-related hearing loss
- WHO – There are more people in the world with a disabling level of hearing than the entire population of the United States.

**Debbie Ostroff:** Since people are living longer than ever before, and the proportion of older people in our society is growing, it is imperative that we begin to think about the functional effects hearing loss will have on our senior population. Just recently I found out that, according to the World Health Organization, there are more people in the world with a disabling level of hearing than the entire population of the United States. And personally, I find that pretty alarming.



## Effects of hearing loss on communication

- Asking for repetition makes those with hearing loss feel like a nuisance, and afraid of appearing stupid
- Bluffing/guessing what was said results in embarrassing mistakes
- Others' impatience and intolerance erodes confidence, and discourages communication

**Debbie Ostroff:** The effects of hearing loss on communication and interpersonal relationships can be devastating. Since age-related hearing loss usually progresses gradually, those affected tend to adjust their lifestyle to accommodate it rather than doing something about the problem. Or, when they finally do decide to seek help, they're in a much more desperate state. As hearing loss progresses, coping with social activities becomes more and more challenging. Seniors often avoid socializing as a way to minimize stress and anxiety that becomes associated with it, and then this leads them to become more isolated, introverted and unsociable. And then they begin to say things like, "There's nothing for me to hear, so why would I need a hearing aid".

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## Effects of hearing loss on communication

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**Debbie Ostroff:** Hearing loss interferes with performance of activities of daily living because it affects our ability to communicate and compromises our ability to live safely and independently.

### Effects of hearing loss on daily living

- Communication difficulties affect:
  - Personal relationships and socialization
  - Participation in health care
  - Emotional wellbeing
  - Cognitive function
  - Quality of life
- Compromises safety
- Reduces independence

**Debbie Ostroff:** If you can't hear, you can't communicate in the hearing world, and this affects virtually all aspects of daily life. Hearing well keeps us connected to each other which is healthy for our emotional well-being.

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### Why must we be attuned to age-related hearing loss?

- Assessment
  - May confound performance on assessment measures
- Intervention and Management
  - Participation in consultation and decision making
    - Treatment planning and implementation
  - Consider ability to participate in intervention
  - May need additional follow-up

**Debbie Ostroff:** We know that sensory and cognitive changes are closely linked, and that both contribute to communication difficulties. When they co-exist, as they frequently do in the elderly, the effect on communication ability is even more devastating. Untreated hearing loss can make it more difficult to diagnose dementia and often aggravates the behavioural manifestations of dementia.



### Seeking treatment for age-related hearing loss

- Refer to physician for possible medical issues (e.g., wax, infection, pathology)
- Refer to Audiologist for assessment and management:
  - Hearing test
  - Hearing aid/assistive device evaluation and prescription
  - Dispensing of device(s)
  - Hearing rehabilitation, individual or group

**Debbie Ostroff:** So how does someone get help for hearing loss? Well the first step is usually to see your doctor who will do a physical exam and provide any medical treatment that may be necessary, so maybe they'll remove wax or treat any infection present. The doctor should then refer to an audiologist for an assessment and management of hearing loss if required. Audiologists perform a battery of tests to give information about the degree and type of hearing loss. The audiologist will then explain the results of the tests and discuss treatment options. They may also dispense and fit the prescribed device.

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### Reluctance to seek treatment

- Average wait time between being diagnosed with hearing loss and seeking help is 10 years
- Only 20% of older adults who might benefit from hearing aids use them successfully

**Debbie Ostroff:** Unfortunately, most people with hearing loss wait an average of ten years before they decide to get help. Frequently, it's only when others complain that the hearing loss is becoming a nuisance that help is sought. Their family becomes tired of repeating and raising their voice or even has difficulty reaching them by telephone or the volume on the television is turned up so loud that it bothers others.

Our philosophy at Baycrest is that regardless of age, you don't know how much hearing aids can help you until you actually try them. Everyone is a candidate for a hearing aid until proven otherwise.



## Barriers to managing hearing loss

- Invisible, insidious disability
- No need; just a 'normal' part of aging?
- Denial
- Stigma
- Misconceptions about treatment options
  - Patients and physicians
- Hearing loss as a low medical priority
  
- People with cognitive loss may be less likely to get help for hearing loss

**Debbie Ostroff:** Several barriers prevent seniors from receiving the care that they need for their hearing loss. Seniors often deny the fact that they have hearing loss. I'm always amazed at how often I hear such similar complaints from my patients with hearing loss. They insist that they are not to blame for their trouble hearing. They truly believe that others mumble or don't speak clearly enough or don't know how to project their voice well.

There also seems to be some misconceptions about treatment options. If a patient is completely opposed to the idea of a hearing aid and their physician believes that audiologists only help by providing them with a hearing aid, the physician might not refer to us. Physicians may be overlooking hearing loss as a possible factor contributing to a range of health issues, including depression and cognitive impairment. Patients with dementia are being overlooked because we don't think that they can be helped.

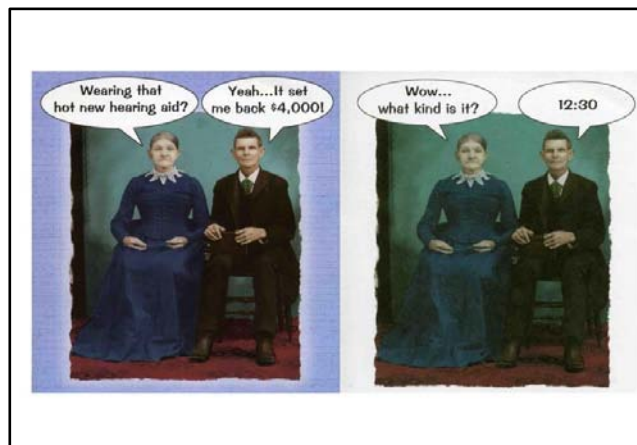
In addition, in spite of costs resulting from the effects of hearing loss, it does not appear on the priority list of health policy and health system programs. The bottom line is that hearing loss affects our society and can cost our economy a lot of money.

## Seeking treatment: Hearing aids

- Improve audibility
- Minimize listening fatigue (by reducing cognitive demands)
- Facilitate social participation
- Improve mood, well-being, and quality of life
- Possible benefit to cognitive function



**Debbie Ostroff:** So how can hearing aids help? By delivering an audible speech signal, hearing aids may reduce our demand on cognitive resources. So for an elderly listener, this means it can alleviate the effort it takes for them to listen, which will ultimately minimize their amount of fatigue, and this is a direct improvement to their quality of life. Hearing aids are now better at detecting and enhancing speech while reducing non-speech noise. We imagine that using hearing aids and other forms of rehabilitation techniques may help cognitive function. The good news is that there is currently plenty of ongoing research in this area to determine what the potential benefits are.



**Debbie Ostroff:** Hearing aids do not restore hearing to normal like glasses can give us 20/20 vision. Hearing aids do not cure hearing loss, but they do provide relief for the effects of hearing loss. People with reduced manual dexterity from arthritis or a stroke, those with low vision and those with cognitive impairment will have much more difficulty managing their hearing aids.

Caregivers can help with hearing aid management, but if they are not well-informed about this, they may feel intimidated. Hearing aids won't slow down the speech of a fast talking person – there will always be people who actually do mumble or turn their back to you while their talking or speak with an accent – but hearing aids can make it easier for a person with hearing loss to communicate with those types of people.

**Auditory Rehabilitation:  
There is more to rehab than hearing aids!**

- Though hearing aids still main treatment focus
  - Many patients/caregivers not interested
  - Limited success/benefit
  
- Goal of management: Effective communication



**Debbie Ostroff:** There's an urgent need to develop more effective approaches to rehab. The current approach is typically based on a medical model, where hearing aids are the main focus of treatment. There's an overwhelming impression among physicians and the public that hearing aids are the only option for treating hearing loss.

We need to change our approach for getting people help. People often come in to our clinic saying, "If I get a hearing aid, I want the smallest one". Perhaps we need to emphasize the fact that it doesn't actually matter what size the hearing aid is, but more importantly we should be saying, "A hearing aid will allow you to have easier conversation with your grandchildren", or "You'll have less difficulty speaking with friends when playing cards together", or "You can hear conversation over the telephone without thinking everyone is whispering".

In addition, clinicians can do their part – not by advertising free hearing tests with offers of buy one get the other half off – essentially what we should be doing is educating the public on how a hearing aid can improve their quality of life, improve their relationships with other people. Maybe hearing aid manufacturers can assist us too by advertising the social benefits of having a hearing aid, so that we can finally begin to eliminate the stigma that is still associated with hearing loss.

People should not feel ashamed to wear a hearing aid; they should know that hearing loss is a serious health issue that must be addressed. And if it is, they'll live healthier lives.

What can we do to minimize the impact of hearing loss?

- Assistive technology
- Environmental modifications
- Communication strategies

**Debbie Ostroff:** Nurses, caregivers and PSWs can also assist us in long-term care facilities by ensuring that patients are not only wearing their hearing aids properly, but that they are working too.

So what else can we do to minimize the impact of hearing loss?

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#### Assistive technology

- Assists auditory processing
  - By providing amplification
    - In noisy, reverberant environments
    - When speaker at a distance
  - By placing microphone close to sound source
- Personal amplifiers e.g. Pocket Talker and FM
  - Large and easy to manipulate
  - Robust and durable
  - Harder to lose!




**Debbie Ostroff:** Other than hearing aids, the use of an assistive listening device, such as a Pocket Talker or a FM system, can be very helpful in noisy environments. With an assistive listening device, we can place the microphone closer to the sound source – which decreases the distance between the speaker and the listener. One of the biggest complaints we get from patients is that they cannot hear the television well enough. There are many types of wireless headsets available for streaming sound from the television directly to their ears.



**Debbie Ostroff:** There are other alternatives to hearing aids and they are: amplified telephones, alerting devices and infrared systems. Telephone communication is extremely important to seniors – being the main link with their families and the outside world. Not being able to hear the phone, doorbell or fire alarm compromises safety and worries family and friends who may feel that it is no longer safe to live alone. But if we can keep elderly people in their own homes for as long as possible, it may help to maintain their independence and well-being. Keeping them at home may also help to alleviate the economic implications.

**Environmental modifications**

- Quiet environments with minimal distractions
  - Reduce competing noise (music, other speakers, traffic)
  - Reduce reverberation
- Modify seating with respect to distance from speaker and background noise
  - Always sit facing talker



- Ensure good lighting for use of visual cues

**Debbie Ostroff:** Because the speech signal is often degraded by environmental factors, interviews, assessments and counselling face-to-face should be conducted in quiet environments with minimal distractions. We can reduce competing noise by turning off music or closing windows. We can avoid large rooms that have only hard surfaces that create a lot of reverberation. Smaller rooms with carpeting, acoustic tile on the ceilings, acoustic panels, padded furniture and drapes are better at absorbing echoes. And, try and position yourself in front of the listener within 3 to 6 feet from them and ensure good lighting. Avoid talking from another room.





## Communication strategies

- Use 'clear speech'
- Provide context for your conversation
- Paraphrase sentences you repeat
- Ensure that information has been heard correctly
- Attract the listener's attention before speaking
- Use written materials, pictures and objects to facilitate understanding (supported conversation)
- Maximize use of visual cues

**Debbie Ostroff:** Here are some communication strategies that you can use when speaking with a hard of hearing person. Speak slowly, clearly and naturally without exaggerating your lip movements. Try giving the listener the topic of conversation; this enables them to better predict what you're going to say and draw on knowledge to fill in gaps where words are not heard. Keep sentences short and simple – the longer the sentence, the more cognitive function is required.

Paraphrase if you have to repeat – as different words or sentence structure may be easier to process. Repeating the same message which the listener failed to understand causes anxiety and stress and is less likely to result in the listener bluffing by pretending that they have heard. Ensure the person with hearing loss has understood. It helps to ask them to repeat the information back to you to verify that they've heard it correctly.

Get the listener's attention – you can do this by lightly touching their shoulder or arm, discretely waving your hand in front of their line of vision, or say their name before beginning a conversation. The person with hearing loss will not have the opportunity to speech read if they don't know you're talking. It takes a few seconds to locate the source of speech and focus on the speaker. Provide important information in writing, such as directions and appointments. Background noise is especially bothersome to the hard of hearing elderly listener, so save important discussions for quieter places if you can.



## Communication strategies

- Talk **to** a hard of hearing person (not about them to another person)
  - Ask them how you can facilitate communication
- Allow them to express themselves
  - Avoid speaking on their behalf
- Help them build confidence and have a constructive conversation
- Be patient, maintain a sense of humor, stay positive and relaxed

**Debbie Ostroff:** Here are some additional strategies that are particularly important for elderly listeners – especially those with cognitive deficits. Listening for the hard of hearing person can be very stressful and tiring. Understanding and patience on the speaker’s part can reduce these factors significantly. Do not pretend to understand what the hard of hearing person is saying. Talk to them directly – not about them to another person. Help them build confidence and have a constructive conversation. Be patient, maintain a sense of humour, stay positive and relaxed.

So I’m now going to let you listen to Kate who will finish off our presentation today with some more information to consider when dealing with individuals who have both hearing loss and cognitive impairment.

### Implications for interacting with older adults

- Awareness
  - Integrate assessment and understanding of hearing loss into everyday interactions with older adults
  
- Measurement
  - Observation
  - Questioning
  - Self-report questionnaires

**Kate Dupuis:** Thank you Debbie. So, all of this information that Debbie's provided us with different solutions for treatment of hearing loss, we can try and integrate these into our everyday interactions with older adults no matter what we're doing – if we're clinicians, if we're caregivers, if we're family members with loved ones. One of the most important things to do is to just have a heightened level of awareness – knowing that the hearing loss prevalence rates are quite high in older adults. Just understand that may be something that's going on and try to use either environmental modifications or communication strategies, such as the ones that Debbie described when interacting with the older adults.

As a clinician, you can also use different measurement techniques. You can observe the individual – does it seem that they can understand you more when you're talking to them? If you stand behind them and say some words will they even be able to understand?

You can question them by asking specific questions, such as the ones that Debbie raised as signs of hearing loss – “Do you have difficulty understanding speech when you're in a busy or loud environment?”, “Is it hard for you to understand when more than one person is talking at the same time?”. These may be more helpful strategies and questions to use than just asking the older adult, “Do you have hearing loss?”. They may not know. There are also a number of self-report questionnaires that you can administer to older adults with hearing loss to figure out what types of difficulties they're actually having.

### Implications for interacting with older adults

- Communication takes two (or more!)
  - Family Members
  - Friends
  - Health-care providers
  - Caregivers



**Kate Dupuis:** We know that communication takes two or more, and communication can be with family members, with friends, with healthcare providers, with caregivers or even – especially nowadays – it can be in person or even over the telephone, over new technology, such as Skype or FaceTime. So these types of communication situations and interactions are something that we have to think about. We have to think about the influence of hearing loss, not only on the individual who is experiencing the changes, but also on their family members and on the other people with whom they communicate.

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### Social withdrawal and isolation

- Especially problematic in older adults
  - Individuals without strong support systems
  - Potential links to cognitive decline?
- Crucial to maintain community ties and access to communication partners



**Kate Dupuis:** So Debbie and I have both talked about this issue of social withdrawal and isolation. We know that this is especially problematic in older adults with hearing loss. It can be especially difficult for individuals who do not have strong support systems. So, given the fact that centenarians are the second fastest growing group of individuals in Canada, it's quite likely that a lot of these individuals will no longer have the same social support groups they used to. Many of their friends may have passed away, even their family members may have passed away.

We know that social withdrawal is particular problem in hearing loss, and as we discussed earlier could be potentially linked to cognitive decline. So, it's crucial for us to work to help individuals with hearing loss maintain community ties and access to their communication partners.

### Third-party burden

- Disability experienced by an individual related to their communication partner's hearing loss (WHO, 2001)
- For individuals with normal cognition... hearing loss can strain relationships (Hallam et al., 2008)
  - Hearing loss in one member of a couple contributes to lower levels of well-being in the other member (Wallhagen et al., 2004)
- Cognitive loss can add to the degree of burden experienced by communication partners

**Kate Dupuis:** The term “third-party burden” has been coined by the World Health Organization to describe burden that’s experienced by the individual who is not directly experiencing the disability. So in the case of someone with hearing loss, third-party burden would refer to the disability experienced by an individual that is related to their communication partner’s hearing loss. So, a daughter with normal hearing may experience third-party burden due to her father’s hearing loss for example.

And in a research that’s been conducted with individuals who have normal cognition, we know that hearing loss can strain relationships. Hearing loss in one member of a couple can lead to lower levels of general well-being in the other member, and although this is yet to be studied we can imagine that cognitive loss would serve to add to the degree of burden that is being experienced by communication partners.

## Communicating in caregiving

- Communication difficulties are one of the most distressing problems reported by caregivers of people with dementia

(Kinney & Stephens, 1989 ; Ripich & Honer, 2004)

- Breakdowns in communication can lead to frustration and difficulties in accomplishing everyday tasks

(Orange, 1991; Savundranayagam et al., 2005)

**Kate Dupuis:** Indeed, communication difficulties are one of the most distressing problems that are reported by caregivers of individuals with dementia. And we know that breakdowns in communication can lead to frustration and difficulties in accomplishing even the most simple everyday tasks, such as administering medication. We also know that breakdowns in communication are one of the biggest predictors of when an individual is moved out of their home and into a long-term care facility. So as Debbie mentioned before, these communication breakdowns cannot only have an impact on psychological well-being but can also impact where an individual's actually living.

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## Caregiver burden in dementia

- The majority of individuals with dementia live at home and are cared for by “informal caregivers”
  - Extensive literature on experiences of burden in caregivers of individuals with dementia
  - Impact on carers' physical, psychological, and social function
- Communication breakdown → caregiver burden

**Kate Dupuis:** There is a large literature on caregiver burden of dementia, and we know from research done in Canada and across the world that the majority of individuals with dementia are living at home and they're being cared for by what's called “the informal caregivers” – so by family members or friends. And we know that these individuals bearing can actually relate to burden in terms of physical, psychological and social function in the care providers. We can imagine as well that communication breakdown can even cause greater levels of caregiver burden.

## Caring for the caregiver

- We need stronger support and education programs for these informal caregivers  
(Institute for Research on Public Policy, 2011)
  - Alleviate burden
  - Increase efficiency of homecare → reduce costs

**Kate Dupuis:** Now one of the issues here is around caring for the caregiver. So, we need to make sure that not only are we putting our efforts towards caring for the individual with the dementia or with the hearing loss, but also for the caregiver. So, the Canadian Institute for Research on Public Policy has stated that we need stronger support and education programs for these informal caregivers. So, we know that formal caregivers are often times educated about these different possibilities of burdens. So, for example, the Alzheimer Society of Toronto is holding a personal support worker forum tomorrow in which experts will be talking about a number of different issues that can arise during care provision. But, we need strong programs such as these for informal caregivers as well. This could serve to alleviate burden, could also increase the efficiency of homecare which in the long run may help to reduce costs.

So, from a health economics perspective, the worldwide cost of dementia care in 2010 was over \$600 billion, and a lot of these costs are related to the movement towards long-term care or even for informal caregivers who can no longer work and have to stay home to take care of, for example, an aged parent who's suffering from dementia. So, one type of education that we can provide is around the use of audiologic rehabilitation solutions.

So as Debbie discussed very clearly, there are a number of environmental modifications and particular communication strategies that can be used in an attempt to alleviate these communication breakdowns. We also know that the provision of hearing aids – although not a perfect device – may also be able to help. However, you may run into this idea on the perspective of clinicians or on the perspective of caregivers, “What’s the point? Why would I make my mom with dementia go through this process to come in, get a hearing aid, what if she loses it? It’s expensive”.

### Potential benefits of hearing aid use in individuals with dementia

- Hearing aid provision can lead to...
  - Qualitative improvement in quality of life
    - e.g., Enjoying church more, speaking to wife and friends more
  - Reduction in problem behaviours
  - Stable caregiver burden over a period of 6 months
  - Improvement in caregivers' subjective ratings of their care recipients' hearing

Most benefits for caregivers are secondary to gain in their care recipients' functioning

**Kate Dupuis:** Well, there's actually quite a growing literature on the benefits of hearing aid use in individuals with dementia. So, not only can we implement the communication strategies but we can also implement the use of hearing instrumentations, such as a hearing aid. We know that the use of hearing aid provision in individuals with dementia can lead to qualitative improvement in quality of life. So, for example, individuals will state they are enjoying church more, they're getting out, they're speaking more to their wife and friends.

We also know that hearing aid use in individuals with dementia can lead to reductions in problem behaviours; so, for example, aggression and wandering behaviours. And the perspective of a caregiver, the provision of hearing aids can lead to stable caregiver burden over a period of six months. So, not necessarily a decline but at least not an improvement over a period of half a year, and also caregivers report that they find that their care recipients hearing is improving and their communication skills are improving from the use of the hearing aid. So, we see here that most of the benefits are for the caregivers. So, they're secondary to the gain in the care recipient's functioning. So, this is the idea of that third-party burden that I spoke of earlier, that if we can alleviate the hearing loss in the individual with dementia, if we can serve to reduce the number of communication breakdowns, perhaps we can have a strong effect on improving the third-party burden.

So, what we need to do is encourage interaction between caregivers and clinical staff to support developing these types of skills. So, not only the environmental modifications and communication strategies, but also the use of hearing aids. Often times, if an individual with dementia is using a hearing aid they may forget to replace a battery or to clean it, they may put it down and not know where it went; so, it maybe it's actually the caregiver who's now assuming a lot of these responsibilities related to the hearing care.



## Self-efficacy in caregivers

- If hearing care does fall on the caregiver... how can we involve them in all aspects of their care recipient's audiologic rehabilitation?
  - Individuals who are accompanied by a significant other may experience more improvement in their functioning than their solo counterparts (Preminger, 2003)
  - Spouses of individuals with normal cognition who attend audiologic rehabilitation programs may also experience reductions in their stress and negative affect (Preminger & Meeks, 2010)

**Kate Dupuis:** And if hearing care does fall on the caregiver, how can we serve to involve them in all aspects of that care recipient's rehabilitation? So here at Baycrest, our audiologists strongly encourage all clients to come in to all their sessions with a family member – be it a spouse, a child or a caregiver – to come in and be part of the treatment. And, we know that this works because individuals who are accompanied by a significant other have been shown to experience improvement in their functioning above and beyond the improvement shown by individuals who are coming in on their own.

And, we also know that for spouses of individuals with normal cognition – who are coming to audiologic rehabilitation programs – they experience reductions in their stress and their negative affect. So, you can simply imagine these types of benefits for individuals who are caring for those who do not have normal cognition, who are experiencing cognitive loss.

## Educating clinicians and caregivers

- Benefits of improved hearing
  - Reduce frequency of communication breakdowns
  - Improve feelings of self-efficacy
  - Benefits to mood and social involvement
  
- Research at Baycrest
  - Benefits of hearing aid use regardless of cognitive status  
(Keymanesh et al)

**Kate Dupuis:** So, we can educate clinicians and caregivers about the benefit of improved hearing or the benefit of improved communication skills. We can be invited to do webinars such as these, presentations at conferences; we're working with the Alzheimer Society of Canada to provide information in their web content for physicians and family members about the importance of audiologic rehabilitation.

So, we want to get out the message that if we're improving hearing, we may be reducing frequency of communication breakdowns. We may serve to improve feelings of self-efficacy in a caregiver. So, someone says, "Wow, I know how to change a hearing aid battery. I can manage my mom's hearing loss better now". And we also know that this can lead to benefit to mood and social interaction, which as I described earlier, may be potential risk factors for developing cognitive loss. And research here that we've been doing at Baycrest is actually shown that hearing aid users seem to benefit from their aids regardless of their cognitive status – regardless of how well they're doing on that cognitive screen.

## Implications for policy and practice

- Screening programs
  - MTO aged 80+ driving evaluation
- Aging at Home strategy
  - Safety
  - Reduced care costs

**Kate Dupuis:** So to conclude, we'd just like to give a little bit of a message in terms of the implications of what you've heard today for policy and practice. So, one of the things that, you know, we talk about a lot are the idea of screening programs. So, we know that the Ministry of Transportation Ontario has recently implemented a new cognitive portion to the driving evaluation for individuals aged over 80 years. Well, what if we were to say, "Why don't we add a hearing evaluation? Why don't we do hearing screening at that age or at a younger age to try and get these individuals who may be saying when asked, 'Oh no, I don't have a hearing loss', but actually are experiencing changes to their hearing?"

This can also have implications for the Aging at Home strategy. So, Ontario did adopt a 4-year aging at home policy where they've spent over \$1 billion looking into ways to maintain people living at home. And, as Debbie discussed earlier, audiologic rehabilitation can provide solutions to this by providing assistive devices that improve safety. And by aging at home, we can see reduced care costs.

Questions?

**Kate Dupuis:** So, thank you all very much for your attention today, and Debbie and I are both happy to take any questions you may have.

**Jillian McConnell:** Thank you very much, Debbie and Kate, for that wealth of information. I know that we are a little bit short on time but I still want to invite anyone who has a question to certainly feel free that they have an option to ask. We have a couple of different, I guess, options. If you prefer, you can type your question into the chat pod or if you want you can ask a question over the phone by pressing \*7 to unmute your line, and I would ask only those that wish to ask the question over the phone to hit \*7. I also want to mention I'm going to start posting some pole questions and I encourage you to all answer before you leave, so keep that in mind as we continue on our discussion.

We've already had one question come up, and that was with respect to what the fail score was of a MoCA – the Montreal Cognitive Assessment – so Kate, can you maybe talk about that a little bit?

**Kate Dupuis:** Sure. So, the MoCA is scored on 30 points (the maximum is a score of 30 points) and typically the fail score is a 25 or below. So, usually the pass rate is 26 and above; so, anything below that is a general flag for the individual that there may be something going on in terms of their thinking skills. Now, of course this isn't a diagnosis. So, of course a physician or a psychologist would have to conduct other tests to confirm.

**Jillian McConnell:** Great, thank you very much. Now also somebody has just asked about getting a copy of the PowerPoint presentation so I'm just posting that link for everyone to see. It's a link that will take you to the CDRAKE website where you'll be able to find the PowerPoint slides. Okay, another question. What would you recommend for an individual who has been given a borderline diagnosis of hearing loss and it is not recommended that the individual needs a hearing aid right now? And, as a follow-up, also how much are the Pocket Talkers?

**Debbie Ostroff:** Okay, so for a patient who has been given a diagnosis of borderline normal hearing, we typically don't recommend the use of a hearing aid because we don't want to amplify frequencies that don't need to be amplified. But, what we usually talk about with people like that is all of the other assistive listening devices. So, it depends on what situation their having difficulty with. Let's say it is television, which is one of the most difficult situations that people have, we'll recommend an assistive listening device just for the television. So, they'll wear a headset and there's a box that you plug into the television and it brings the sound of the television directly to their headset on their ears, and that's really helpful. And, they range anywhere from, well a good one, from \$80 to \$300 or \$400. A Pocket Talker usually costs around a \$150.

**Mary Schulz (Alzheimer Society of Canada):** Jillian, it's Mary here from ASC, can you hear me?

**Jillian McConnell:** Yes, I can Mary, go ahead.

**Mary Schulz:** Hi there, I'm wondering for the presenters, since hearing loss so prevalent in an older population (whether or not they have dementia) and that the Alzheimer Society runs so many support groups for caregivers but also for people with dementia, would it be best practice to have Pocket Talkers and other kind of amplifying devices as kind of a normative procedure with any support groups that we have in-person? I wonder if the presenters could speak to that.

**Kate Dupuis:** So from my perspective, I think Mary that would be a fantastic endeavour to do. I know that Marilyn Reed, the practice adviser in audiology did actually give a presentation for the Alzheimer Society and had brought a Pocket Talker with her, and had a fantastic story that she told us about an individual. She put the Pocket Talker in his ears and all of a sudden he could hear, and the reaction not only from him but also from his wife who was there and said, "I've been trying for years to talk to him about his hearing loss". It was an instantaneous reaction. So from my perspective, you know, it would be a wonderful thing for the Alzheimer Society to do.

**Mary Schulz:** Thank you.

**Jillian McConnell:** Perfect – thank you. Another question and I think this is really a great question actually because I hear this a lot. In hospital we encourage families to leave hearing aids at home due to loss. This can impact the MoCA, as cognitive testing is increasingly used in hospital and can be a barrier for discharge. Do you have any suggestions?

**Debbie Ostroff:** I actually never suggest that the hearing aids be left at home. If you can create some sort of system where the hearing aids are kept in a drawer in a box that you know will always be placed there, with signs around it so that the nurses know where the hearing aids can be found, and you know, all the family members know that it's in a safe place. Because yes, the hearing aids will be very helpful for that patient for many reasons to communicate better with the doctors, with nurses, so I don't actually ever recommend that they leave them at home.

**Kate Dupuis:** Sunnybrook Hospital does have a smart box program where every individual who comes in is given a box and that's where their valuables – including glasses and hearing aids – will be placed. And as Debbie said, a large sign that can be easily placed above the bed that says, "This person needs to use aids", and that way if someone is coming in to do any sort of assessment, they hopefully will ensure that the individual is, you know, able to see and hear appropriately. But, that definitely is a problem and we've conducted some research showing that if your testing in a loud environment, for example, the individual is not going to be able to respond as well on these types of screening tools, and that hearing impaired people will do worse on these types of screening tools simply because of their hearing loss. So, I can imagine these scores would be even lower if the individual isn't given the opportunity to be using their devices.

**Jillian McConnell:** Those are both excellent points and I think it's something we can be doing across the province, if not across the country, so thanks for touching on that and what a great question. And, I think this is also a great question – is there any research that patients with end stage dementia benefit from hearing aids? And if so, how would you assess if they don't respond?

**Kate Dupuis:** So at this point, the majority of research that's being done is with individuals in the mild to moderate stages of dementia. We do know that even those individuals with moderate to severe levels of dementia are able to respond to some types of audiologic tests. Although as Debbie said, there's different ways that audiologists can modify their protocol for individuals with cognitive loss but at this stage, I do not know of any research that's being conducted on hearing aid use in older individuals with very late stages of dementia.

**Jillian McConnell:** Great, thank you. I think that's a really interesting point actually. And then, just a couple more questions. I know we're a little bit over but there's some more questions coming in, so bear with me if you have the time. There's another question here – I work as part of the Behavioural Supports Ontario project, the BSO, I'm wondering if it is valuable to get some Pocket Talkers for clients to use in a group setting – in a day program?

**Debbie Ostroff:** I think it's definitely a valuable thing to have. It's a good thing to have because patients who are in denial – so it will help in that environment – but it will also help them maybe realize, "Oh, this is helping me. Maybe I need to go and seek help and look into getting a hearing aid or an assistive listening device". So, there are many benefits to that.

**Jillian McConnell:** Great and someone has raised their hand. Carol, have you unmuted yourself? Carol, did you have your hand raised to ask a question? Okay, perhaps there is a question here – do you have suggestions for standardized screening for cognitive impairment other than the MMSE or the MoCA? Hopefully that takes care of Carol's question.

**Kate Dupuis:** Well, in terms of just those two items, I would definitely recommend the MoCA because it is a more sensitive measure than the MMSE. There are different screens that one can use. A lot of physicians will use the Mini-Cog, which is a simple clock drawing test and a recall of just three words. So, that I know is being commonly used and often times the cognitive screen that some individuals will use when they're very short on time is simply just a

clock drawing test. And that does, you know, have quite good predictive value, not as well as a larger screener, but for someone who is pressed for time or wants to get a very cursory view of that individual's cognition – a simple clock drawing test – I have seen that used in the literature.

**Jillian McConnell:** Great, thank you, and maybe we'll do just one last question here. There's a request or I guess a suggestion about other assistive devices being used as well as like a FM sound, if that could be touched on or spoken to.

**Debbie Ostroff:** I didn't go into details about FM system, but definitely FM system is a great alternative and would answer the question previously about a group setting. So, we do have FM systems here at Baycrest that we provide for group situations, where the microphone would be placed closer to the speaker and that works similarly to a Pocket Talker and those are very helpful.

**Jillian McConnell:** Perfect, thank you. Okay, so in the interest of time, I know that there's more discussion that could be done and could be had, but I am cognizant of the time and I know people have to get back to their other appointments throughout the day, so I think we need to end our discussion at this point. Thank you for participating in the evaluation questions on the screen, so I appreciate that and as I said earlier we'll provide the slides online and post a recording of this presentation within a week or so and you will all receive notification of that. Just really quickly, I just want to thank our presenters again, Kate Dupuis and Debbie Ostroff, and thank you all as well for your questions and comments.

I do want to let you know that the Alzheimer Society and CDRAKE will be hosting a couple of webinars over the next few months. There will be a webinar on vascular dementia that is actually being offered in French in the month of June; as well as a webinar on the LGBTQ individuals who have received a dementia diagnosis and their care partners. So that's going to be really interesting as well, and that's going to be in June as well. So keep an eye out for those notices in your inbox in the very near future. Once again, thank you again to our presenters and to all of our participants. Thank you as well, so have a great day everyone. Bye.