2023

Barrier-Free Hearing Health:

A Proposal to Improve Access to Hearing Health Services in BC

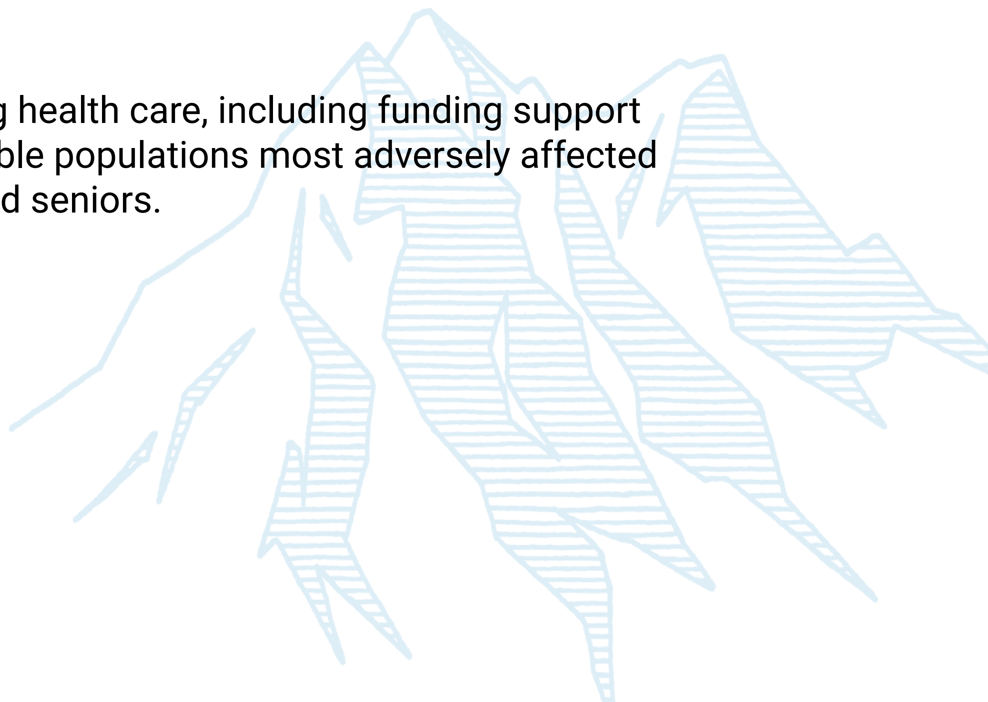
Updated March 1, 2024

OVERVIEW:

- A large and growing proportion of our citizens have hearing loss. Over three-quarters of seniors have hearing loss in both ears.
- Hearing loss can lead to delayed speech and language development in children, and have an impact on social development.
- Left untreated, hearing loss can adversely impact the health and quality of life of our population, especially seniors.
- Research has shown a link between hearing loss and cognitive decline. Treatment with hearing aids and counselling may help to mitigate this risk for those at greater risk for cognitive decline.
- A significant factor contributing to lack of hearing aid usage is the high cost of hearing aids.
- British Columbia lags behind other provinces and territories when it comes to consistent hearing health coverage.
- A passionate committee of concerned hearing health professionals, "Help BC Hear Better" Committee, has resolved to improve hearing health in BC (Home | Help BC Hear Better).

Our Proposed Solution

- Improved access to hearing health care, including funding support for hearing aids for vulnerable populations most adversely affected by hearing loss: children and seniors.



BACKGROUND:

Population Affected

Hearing loss occurs at any age

- Hearing loss is common and increases over the lifespan (APPENDIX I).
- With the aging of our population, hearing loss is becoming even more prevalent. Approximately one third of individuals in the working age 20-69 years and three quarters of adults over 70 years experience hearing loss in both ears.

Financial Barrier

Cost of hearing aids is prohibitive

- Only one in four of those who could benefit from hearing aids choose to wear them.
- The primary barrier for obtaining hearing aids is cost (in BC, approximately $4500 per pair of hearing aids, replaced approximately every 5 years).

Health Consequences

Treating hearing loss improves health

- Hearing loss has health consequences for the individual and treatment can result in decreased medical costs (APPENDIX II). Hearing loss is associated with the following:
  - Early cognitive decline and dementia (Lin et al., 2013; 2023; Lancet Commission, 2020).
  - Social withdrawal, disengagement, loneliness (Shukla et al., 2020).
  - Poorer mental and physical health (Hogan, 2009).
  - A 44% increased risk of 30-day hospital readmission compared to individuals without hearing loss (Reed et al., 2019).

BACKGROUND:

BC Lags Behind

British Columbians deserve equitable hearing aid funding

- Compared to those in other provinces, British Columbians have poorer access to provincial public funding for hearing aids (APPENDIX III).
- The majority of the population receives no financial support; in particular, there is no provincial funding for seniors over the age of 65 years.

Economic Consequences

Funding hearing aids relieves a financial burden

- Untreated hearing loss results in annual loss of household income (Kochkin, 2005) estimated to be $24,000 (CAD)/year (current dollars).
- Costs of improved hearing health need to be considered against the effect of hearing loss on BC household annual income (Appendix IV).
- People with hearing loss experience increased medical costs (25.9%, 36.9%, and 46.5% higher over 2-, 5-, and 10- year periods for individuals with untreated hearing loss) (Reed et al., 2019).
- World Health Organization (WHO) estimates annual cost of unaddressed moderate to higher degrees of hearing loss ranged from $750 to $790 billion, including health care, education, lost productivity, and societal costs (social isolation, communication difficulties, and stigma), with more recent analyses putting annual costs at $981 billion. (WHO, 2017; McDaid et al., 2021).
- Prominent medical organizations recognize the health benefits of third party coverage for effective hearing loss remediation (APPENDIX V).

RECOMMENDED BC GOVERNMENT HEARING LOSS STRATEGY

Healthy Hearing Program

A strategic investment in health

- Creation of a provincial hearing aid program for our vulnerable populations of children (5 to 19 years) and for our seniors (age 60+) is an investment in the future.
- Improving support for individuals with hearing loss is consistent with the BC Government mandate as set out in the Ministry of Health Strategic Direction document (APPENDIX VI).
- Estimated annual costs for a provincial hearing aid program for children and seniors is $560.5M (APPENDIX VII). The program costs will be offset by the savings incurred through decreased health care costs.
- This program will keep the people of BC safer, healthier and more connected with their communities and Help BC Hear Better.

PREPARED BY:

Help BC Hear Better Group

A passionate team of healthcare professionals, researchers and people with hearing loss who want improved access to hearing health care in BC:

- **Co-Chair and Primary Contact: Dr. Brian Westerberg,** Head, Division Otolaryngology-Head and Neck Surgery, Department of Surgery, UBC.

  Email: info@helpbchearbetter.ca

  Phone: 604-806-8540
- **Co-Chair: Grace Shyng,** Audiologist, Clinical Assistant Professor, UBC School of Audiology and Speech Sciences
- **Dr. Lorienne Jenstad,** Audiologist, Associate Professor - UBC School of Audiology and Speech Sciences
- **Danielle Lafleur,** Audiologist, Ph.D Student - UBC School of Audiology and Speech Sciences
- **Dr. Jane Lea,** Otolaryngologist, Director - BC Rotary Hearing and Balance Centre at St. Paul's Hospital
- **Yinda Liu,** Audiologist - Audiology Advisor - Speech-Language & Audiology Canada
- **Heather Ritchie,** Audiologist - Audiology Private Practice Director - Speech and Hearing BC
- **Elissa Robb,** Audiologist, Member - Canadian Hard of Hearing Association BC
- **Janine Sigurdson,** Audiologist - Audiology Public Practice Director - Speech and Hearing BC
- **Craig Stevenson,** Research Assistant, UBC School of Audiology and Speech Sciences

ENDORSED BY:

- Speech and Hearing BC
- BC Otolaryngology Society
- UBC Division of Otolaryngology-Head and Neck Surgery
- UBC School of Audiology and Speech Sciences
- Speech-Language & Audiology Canada
- Hearing Foundation, Vancouver Rotary Club
- Canadian Hard of Hearing Association BC Chapter
- Canadian Hard of Hearing Association North Shore Branch

APPENDIX I:

Prevalence of Hearing Loss

Prevalence of hearing loss by age group in British Columbia

Age Group	Estimated individuals with hearing loss (% of age group)
5 - 19	16,783 (2.3)
20 - 69	606,892 (31.9)
70 +	427,174 (77.4)

Prevalence of unilateral and bilateral hearing loss by decades for the population of British Columbia

Age Group (years)	Population of BC (within the specified age group)	Estimated numbers of BC population with:		
		UNILATERAL hearing loss (%)	BILATERAL hearing loss (%)	UNILATERAL OR BILATERAL hearing loss (%)
0 - 4 *	220,625	-	-	441 - 2206 (0.2-1.0)
5 - 14	470,760	9,368 (2.0)	1,459 (0.3)	10,827 (2.3)
15 - 19	258,980	5,154 (2.0)	802 (0.3)	5,956 (2.3)
20 - 29	590,560	16,418 (2.8)	2,480 (0.4)	18,898 (3.2)
30 - 39	607,340	21,865 (3.6)	9,717 (1.6)	31,582 (5.2)
40 - 49	617,410	39,515 (6.4)	40,131 (6.5)	79,646 (12.9)
50 - 59	709,300	109,233 (15.4)	92,918 (13.1)	202,151 (28.5)
60 - 69	611,615	110,702 (18.1)	163,913 (26.8)	274,615 (44.9)
70 - 79	347,010	45,111 (13.0)	191,203 (55.1)	236,314 (68.1)
80 +	214,450	21,230 (9.9)	169,630 (79.1)	190,860 (89.0)
All ages 5 +	**4,427,425**	**378,596 (8.6)**	**672,253 (15.2)**	**1,050,849 (23.7)**

*Currently funded by Early Hearing Program

APPENDIX II:

Impact of Hearing Loss and the Benefits of Hearing Aids

A Journey of Sobriety:

A gentleman walked into my hearing clinic with a hospital bracelet on his wrist. While he sat alone in the waiting room, his wife took me aside and told me that he was currently being treated at a local hospital for an opioid dependency. He had been there for months. She reported that her husband had been dealing with addiction, depression, and anxiety for a long time, and minimized his hearing loss as "something to be checked off the list". Like going to get your teeth cleaned. Her husband stayed quiet, nodded his head occasionally, but he didn't have too much to say.

A hearing test showed a severe hearing loss that would benefit from hearing amplification. He was fortunate enough to have the financial security to afford hearing aids.

He returned two weeks after he received the hearing aids. The first thing I noticed was a bare wrist where a hospital bracelet used to be. I asked him how he had been since he started wearing hearing aids two weeks before. He responded for himself, reported how he has been released from the hospital and has been living at home with his wife again. His wife reported how he is the husband she married years ago. A man she thought she lost. He described how being able to hear his health care team and understand treatment helped him with his sobriety and to be able to live at home again.

I saw him again two months later. He came to this appointment alone. He felt comfortable enough to talk for himself and not have his voice filtered through someone else. He reported the increase in his happiness and satisfaction with life, an increased autonomy and how he doesn't feel chained to another person to help him through life.

Hearing aids allowed him to gain personal autonomy and jump start his journey of sobriety. For him, hearing aids made this gentleman himself again.

A Young Family of Hearing Aid Users:

There are families that have multiple children who are born with hearing loss, or develop hearing loss. Sometimes hearing loss is genetic.

This family had initial funding for their children through the BC Early Hearing Program. As the children grew with their hearing equipment, the parents saw great gains in their children's speech and language development, as well as social development.

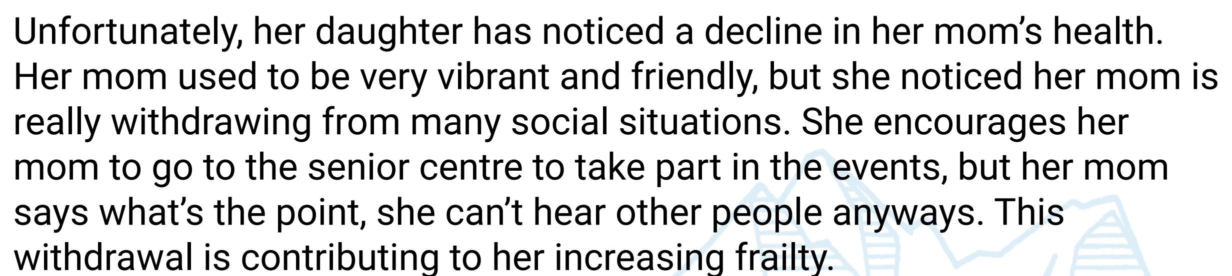
Now that their children have aged out of the BC Early Hearing Program, the parents are worried about having to purchase multiple pairs of hearing aids at nearly the same time. They want to continue to provide access to sounds and language, to allow for success in the classroom and extracurricular activities. However, they no longer have funding available for the children. This impending expense is causing stress for their family.

Loss in Social Connections for an Isolated Senior:

Another example of the impact of hearing loss is provided by a widow with 1 daughter, a single parent of 2 children. Over the years, her hearing loss has significantly worsened, and she has found herself withdrawing from many social events. Her daughter says that mom doesn't want to see her friends much, and around the dinner table with extended family, she often sits quietly and doesn't engage much with others.

This senior is on limited income and has only some CPP and OAS benefits. She does not have any extended health benefits and is not eligible for any other third party support such as Veterans or WorksafeBC. Her daughter being a single parent, cannot afford to help her mom purchase hearing aids. She is slowly saving to pay for hearing aids but at the present time, the average cost of $4500 is really a challenge for her. Her daughter remarks that her mom has been struggling for the past five years, but has delayed purchasing hearing aids because of the cost.

Unfortunately, her daughter has noticed a decline in her mom's health. Her mom used to be very vibrant and friendly, but she noticed her mom is really withdrawing from many social situations. She encourages her mom to go to the senior centre to take part in the events, but her mom says what's the point, she can't hear other people anyways. This withdrawal is contributing to her increasing frailty.



APPENDIX III:

Comparison of Provincial Funding

Current provincial hearing aid funding in British Columbia

Age	Eligibility Description
Children	Children identified through the BC Early Hearing Program until 5 years of age.
	The Ministry of Children and Family Development has funding for children in foster care, and some children who have complex health care needs.
Adults	Work-related noise-induced hearing loss are provided hearing aids with an approved claim through WorkSafe BC.
	Adults unable to work due to permanent disability receive some funding through the Ministry of Social Development and Poverty.

Hearing aid funding programs across Canada by province/territory

Province/Territory	0 to 5 yrs	0 to 18 yrs	18 - 64 yrs	>65 yrs
Ontario	✓ *	✓ *	✓ *	✓ *
Quebec	✓	✓	✓	✓
New Brunswick	✓ *	✓ *	✓ *	✓ *
PEI	✓ *	✓ *	✓ *	✓ *
Alberta	✓	✓	◐	✓
Yukon	✓	✓ (up to 16 yrs)	✗	✓ *
Newfoundland	✓	✓	◐	◐
Manitoba	✓ *	✓ *	✗	◐
British Columbia	✓	◐	◐	✗
Nova Scotia	✗	✗	✓ *	✗
Saskatchewan	✗	✗	◐	◐
NWT	✗	✗	✗	✓ * (>60 yrs)
Nunavut	✗	✗	✗	✓

✓ Full coverage; ◐ Partial Coverage through dedicated programs with restrictions for eligibility; ✗ No coverage

*Limit to maximum amount: Manitoba 80% to maximum $1800; Ontario 75% to maximum $500 for one aid and $1000 for two aids; NB $1000 per hearing aid; NS $1600 per hearing aid; PEI $1500 per hearing aid; Yukon $600 per hearing aid; NWT $1175 "towards cost of hearing aids"

APPENDIX IV:

Estimated costs for a BC Hearing Aid Program for ages 5 years* and older, compared to loss in annual income**

Age Group (years)	Population of BC (within the specified age group)	Estimated numbers of BC population with:		Annual cost ($CAN millions) based on ideal 100% uptake	Annual cost ($CAN millions) based on optimistic 40% uptake	Overall total income loss**
		UNILATERAL hearing loss (%)	BILATERAL hearing loss (%)			
5 - 19	729,740	14,522 (2.0)	2,261 (0.3)	$8.6M	$3.4M	N/A
20 - 29	590,560	16,418 (2.8)	2,480 (0.42)	$9.6M	$3.8M	$59.4M
30 - 39	607,340	21,865 (3.6)	9,717 (1.6)	$18.6M	$7.4M	$233.2M
40 - 49	617,410	39,515 (6.4)	40,131 (6.5)	$53.9M	$21.6M	$963M
50 - 59	709,300	109,233 (15.4)	92,918 (13.1)	$132.8M	$53.1M	$2.2B
60 - 69	611,615	110,702 (18.1)	163,913 (26.8)	$197.3M	$78.9M	$3.9B
70 - 79	347,010	45,111 (13.0)	191,203 (55.1)	$192.4M	$77.0M	N/A
80 +	214,450	21,230 (9.9)	169,630 (79.1)	$162.2M	$64.9M	N/A
Total for 20 - 69	**3.136M**			**$412.2M**	**$165M**	**$7.4B**
Total for all age groups	**4.427M**			**$775.4M**	**$310M**	

*children 0 to 5 years are covered by Early Hearing Program
** Hearing aid program will provide new pair of hearing aids every 5 years. Expected cost: $4500 for pair; based on the average market rate cost used by WorkBC. This works out to $900/year for bilateral; $450/year for unilateral hearing aid fitting. Some of these costs are partially covered under current program for clients who meet specific eligibility criteria (e.g., WorkSafeBC, WorkBC, Veteran Affairs, First Nations Health, Income Assistance, etc). Costs include:

- Hearing aids that need to be replaced every 5 years.
- A fitting fee to recompense a clinician's time, expertise, and equipment required to appropriately program the hearing aid for the individual's hearing loss
- Counselling and follow up services to help the person manage their hearing loss

APPENDIX V:

American Medical Association Resolution on Prevention of Hearing Loss-Associated-Cognitive-Impairment through Earlier Recognition and Remediation

AMERICAN MEDICAL ASSOCIATION HOUSE OF DELEGATES

Resolution: 113

(A-22)

Introduced by: Senior Physicians Section

Subject: Prevention of Hearing Loss-Associated-Cognitive-Impairment through Earlier Recognition and Remediation

Referred to: Reference Committee A

Whereas, Our AMA holds out as a primary objective "to promote the art and science of medicine and the betterment of public health;" and

Whereas, Our AMA has adopted policy in support of health promotion and preventive care, community preventive services, healthy lifestyles, coverage for preventive care and immunizations, health information and education, training in the principles of population-based medicine, values-based decision-making in the healthcare system, and encouragement of new advances in science and medicine via strong financial and policy support for all aspects of biomedical science and research;1-8 and

Whereas, Our AMA has prior policy supporting insurance coverage for hearing remediation9 as well as for dementia treatment;10 and

Whereas, There is mounting evidence that there is a strong link between hearing impairment in middle and later life and the development of cognitive, as well as social impairments and falls, although its specific causality in relation to later cognitive loss has not yet conclusively been established;11-31 and

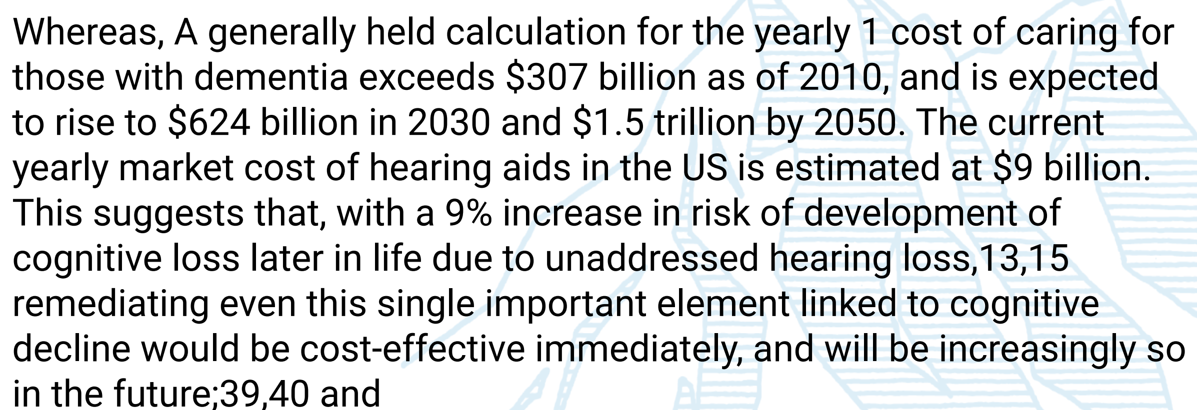
Whereas, The landmark Lancet Commission on Dementia Prevention, Intervention and Care of 2017, amplified by the 2020 follow-up report 13-15 concluded that age-related hearing loss (ARHL) may account for nine percent of all cases of dementia, making this the single largest potentially modifiable risk factor for that condition, beginning in mid-life; and

Whereas, Compared to individuals with normal hearing, those individuals with a mild, moderate, and severe hearing impairment, respectively, have been shown to have a 2-, 3-, and 5-fold increased risk of incident all-cause dementia over 10 years of follow-up in one study;29 and

Whereas, Based on prior and pilot studies,30-31 the causative link between hearing impairment in middle age and later life to cognitive impairment is likely to be confirmed by ongoing ACHIEVE32 and other clinical trials now in progress; and

Whereas, The return on investment for hearing remediation, especially but not exclusively in mid-life, will be substantial and time-sensitive because it may ameliorate (by delay in onset or even prevention of cognitive decline) far more costly care for those with cognitive decline (direct and indirect costs). Delaying the onset of Alzheimer's Disease by even one year has significant fiscal benefits. A 2014 study estimated a one-year delay in the onset of Alzheimer's disease would save the US $113 Billion by 2030. 33-40 This underscores the urgency of current action to reduce subsequent dementia related healthcare costs (perhaps especially, to Medicare) while simultaneously improving the quality of life of affected individuals; and

Whereas, A generally held calculation for the yearly 1 cost of caring for those with dementia exceeds $307 billion as of 2010, and is expected to rise to $624 billion in 2030 and $1.5 trillion by 2050. The current yearly market cost of hearing aids in the US is estimated at $9 billion. This suggests that, with a 9% increase in risk of development of cognitive loss later in life due to unaddressed hearing loss,13,15 remediating even this single important element linked to cognitive decline would be cost-effective immediately, and will be increasingly so in the future;39,40 and



Whereas, The issue of hearing impairment is also a matter of health and social equity, with serious immediate and long-term consequences resulting from neglect of remediation. Unaddressed hearing loss reduces earnings potential and increases disability during gainful years, even before factoring in the likelihood of developing cognitive loss later. Sadly, the cost of hearing amplification and other forms of remediation is significant enough (even with over-the-counter products, which while possibly helpful do not come with professional guidance) to deter purchase and implementation by an indigent population;46 and

Whereas, It is indisputable that promotion of any possibly effective means of delay, prevention, as well as timely treatment of cognitive impairment and dementia is highly desirable for public health, for humane as well as financial reasons; and

Whereas, Congress has shown interest in expanding coverage for hearing remediation in the most recent bill, HR 1118, 'Medicare Hearing Act of 2021,' filed in the current Congressional Session, affording a strategic opportunity for our AMA to more effectively advocate now for expanding coverage to include coverage of preventive strategies in middle age, by promoting this as a way to mitigate future Medicare costs;41-43 and

Whereas, Some developed countries such as Brazil have launched national efforts to bring hearing remediation to the masses45 as a means of reducing later cognitive decline, suggesting that early remediating of hearing is felt by other nations to be a cost-effective pursuit; and

Whereas, The issues involved in analyzing all factors impeding adequate distribution of hearing remediation are complex, and require physicians to be current, informed, and involved in the discussion with patients;44,47-48 and

Whereas, A number of groups have a stake in promoting hearing remediation, including professional and citizen and Federal Agencies, such as the Agency for Health Research and Quality and the National Institute on Deafness and Other Communication Disorders (NIDCD); therefore be it

RESOLVED, That our American Medical Association promote awareness of **hearing impairment as a potential contributor to the development of cognitive impairment in later life,** to physicians as well as to the public (Directive to Take Action); and be it further

RESOLVED, That our AMA promote, and encourage other stakeholders, including public, private, and professional organizations and relevant governmental agencies, to promote the conduct and acceleration of research into specific patterns and degrees of hearing loss to determine those most linked to cognitive impairment and amenable to correction (Directive to Take Action); and be it further

RESOLVED, That our AMA advocate for increased hearing screening, and **expanding all avenues for third party coverage for effective hearing loss remediation** beginning in mid-life or whenever detected, especially when such loss is shown conclusively to contribute significantly to the development of, or to magnify the functional deficits of cognitive impairment, and/or to limit the capacity of individuals for independent living. (Directive to Take Action)

Fiscal Note: **Modest - between $1,000 - $5,000**

Received: 04/07/22

References

1. E-8.11 Code of Medical Ethics, Health Promotion and Preventive Care
2. H-35.967 Treatment of Persons with Hearing Disorders
3. H-425.982 Training in the Principles of Population-Based Medicine
4. H-170.986 Health Information and Education
5. H-425.972 Healthy Lifestyles
6. D-425.996 Implementing the Guidelines to Community Preventive Services
7. H-460.943 Potential Impact of Health System Reform Legislative Reform Proposals on Biomedical Research andClinical Investigation
8. H-450.938 Value-Based Decision-Making in the Health Care System
9. H-185.929 Hearing Aid Coverage
10. D-345.985 Payment for Dementia Treatment in Hospitals and Other Psychiatric Facilities Loughrey, D.G., Kelley,M.E., et al. (2018). Association of Age-Related Hearing Loss With Cognitive Function, Cognitive Impairment, and Dementia A Systematic Review and Meta-analysis; AMA Otolaryngol Head Neck Surg. 144(2):115-126. doi:10.1001/jamaoto.2017.2513. Published online December 7, 2017. Corrected on January 18, 2018.
11. Tingley, K. (Feb. 20, 2020). Can Hearing Aids Help Prevent Dementia? NY Times Magazine Section. Retrieved from News: Can Hearing Aids Help Prevent... (The New York Times) - Behind the headlines - NLM (nih.gov)
12. Livingston, D.A., Sommerlad A., et al. (Dec. 16, 2017). Dementia prevention, intervention, and care. The Lancet, 390, No. 10113; 2673-2734, doi: 10.1016/S0140-6736(17)31363-6

14. Frankish, H., Horton, R. (July 19, 2017). Prevention and management of dementia: a priority for public health. The Lancet, 390, No. 10113. doi:10.1016/S01406736(17)31756-7
15. Livingston, G., Huntley, J., et al. (July 30, 2020) Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. The Lancet, 396, No. 10248. doi: 10.1016/S0140-6736(20)30367-6

16. Lin, F. & Albert, M. (August 2014). Hearing Loss and Dementia – Who is Listening? Aging Ment Health. 18(6): 671–673. doi: 10.1080/13607863.2014.915924

17. Lin, F., Yaffe, K., et al. (Feb 25, 2013). Hearing loss and cognitive decline in older adults. JAMA Intern Med. 173(4):293-9. doi:10.1001/jamainternmed.2013.1868

18. Lin, F., Yeh, C, et al.(August 6, 2021) Making Hearing Aids Affordable Isn't Enough, Older Adults also need Hearing Services. Accessed through the Center for Medicare Advocacy.

19. Lin, F., et al.(July 18, 2023). Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial. Lancet (published online July 18 2023). https://doi.org/10.1016/S0140-6736(23)01406-X

20. Roberts, K.L., Allen, H.A. (March 1, 2016). Perception and Cognition in the Ageing Brain: A Brief Review of theShort- and Long- Term Links between Perceptual and Cognitive Decline, Aging Neurosci. doi:10.3389/fnagi.2016.00039

21. Hearing Loss and Dementia: How Are They Related? Johns Hopkins Cochlear Center For Hearing and PublicHealth.

22. Dong, S.H., Park. J.M., et al. (2019). The Relationship between Age-Related Hearing Loss and Cognitive Disorder. ORL 81:265- 273. doi: 10.1159/000500989

23. Slade, K., Pack, C., et al. (October 1, 2020). Review|: The Effects of Age-Related Hearing Loss on the Brain and Cognitive Function. Trends in Neuroscience. 43, Issue 10, 810821. doi:10.1016/j.tins.2020.07.005

24. Uchida, Y., Sugiura, S, et al. (February 2019). Age-related hearing loss and cognitive decline—The potential mechanisms linking the two. Auris Nasus Larynx, Volume 46, Issue 1, pages 1-9. doi.org/10.1016/j.anl.2018.08.010 24. Wayne, R. & Johnsrude, I. (September 2015). A review of causal mechanisms underlying the link between age-related hearing loss and cognitive decline. Ageing Research Reviews, 23, Part B, 154-166. doi.org/10.1016/j.arr.2015.06.002

25. Fortunato, S. &. Forli, F. (June 2016). A review of new insights on the association between hearing loss and cognitive decline in ageing. Acta Otorhinolaryngol Ital, 36(3): 155–166. doi: 10.14639/0392-100X-993 26. Glick, H.A., Sharma, A. (February 2020). Cortical Neuroplasticity and Cognitive Function in Early-Stage, Mild-Moderate Hearing Loss: Evidence of Neurocognitive Benefit From Hearing Aid Use. Neurosci. doi:10.3389/fnins.2020.00093
27. Golub, J., Brickman, A., et al. (November 14, 2019). Association of Subclinical Hearing Loss With Cognitive Performance. JAMA Otolaryngol Head Neck Surg, 2020;146(1):57-67. doi:10.1001/jamaoto.2019.3375
28. Dawes, P., Emsley, R., et al. Hearing Loss and Cognition: The Role of Hearing Aids, Social Isolation and Depression. PLoS ONE 10(3): e0119616. doi:10.1371/journal. pone.0119616
29. Mahmoudi, E., Basu, T, et al. (September 2019). Clinical Investigation, Can Hearing Aids Delay Time to Diagnosis of Dementia, Depression, or Falls in Older Adults? J Am Geriatr Soc, 67:2362–2369. doi.org/10.1111/jgs.16109
30. Lin, F.R., Metter, E.J., et al. (2011). Hearing loss and incident dementia. Arch Neurol, 68(2):214– 220. doi:10.1001/archneurol.2010.362.
31. Deal, et al. (2017). Hearing Impairment and Incident Dementia and Cognitive Decline in Older Adults: The Health ABC Study, J Gerontol A Biol Sci Med Sci, Vol. 72, No. 5, 703–709. doi:10.1093/gerona/glw069
32. Deal, J.A., Albert, M.S., et al. (June 2017). A randomized feasibility pilot trial of hearing treatment for reducing cognitive decline: Results from the Aging and Cognitive Health Evaluation in Elders Pilot Study, Alzheimer's & Dementia: Translational Research & Clinical Interventions.3, 410-415, accessed 4/2/21 at http://dx.doi.org/10.1016/j.trci.2017.06.003
33. Aging and Cognitive Health Evaluation in Elders (ACHIEVE). Sponsor: Johns Hopkins Bloomberg School of PublicHealth, Collaborators: University of North Carolina, University of South Florida, University of Pittsburgh, University of Mississippi Medical Center. Wake Forest University, University of Minnesota. https://clinicaltrials.gov/ct2/show/NCT03243422

34. Quick Statistics About Hearing U.S. Department of Health & Human Services National Institutes of Health
35. Hearing Aids Market by Product (Receiver In The Ear, Behind The Ear, In The Ear, In The Canal Hearing Aids,Cochlear Implant, BAHA implant), Types of Hearing Loss (Sensorineural, Conductive Hearing loss) & Patient (Adult, Pediatric) - Forecast to 2022 [186 Page Report].
36. Emmanuel A., Varun N., et al. (May 2, 2019). US Hearing Aid Market Wonder Report - US Hearing Aid Market Market Growth By Channel, ask wonder.com.
37. Ruberg, K. Untreated Disabling Hearing Loss Costs Billions – in the US and the Rest of the World, Advocacy & Research May 2019 Hearing Review.
38. Shield, B. Using hearing aids contributes to better health, higher income, and better family and social life—and has a huge positive effect on Gross National Product. Hearing Loss. A report for Hear-It AISBL.
39. Reed, N. S., Altan, A., et al. (January 1, 2019). Trends in Health Care Costs and Utilization Associated WithUntreated Hearing Loss Over 10 Years. JAMA Otolaryngol Head Neck Surg,145(1):27-34. doi:10.1001/jamaoto.2018.2875
40. Zissimopoulos, J., Crimmins, E., et al. (November 2014). The Value of Delaying Alzheimer's Disease Onset. Forum Health Econ Policy. 18(1): 25–39. doi: 10.1515/fhep2014-0013
41. Hedt, S. (June 11, 2019). Research Spotlight: Alzheimer's Disease. USC School of Pharmacy
42. Press Release (October 18, 2019). McBath-Dingell Legislation to Improve Seniors' Access to Hearing Aids UnderMedicare Passes House Committee. https://mcbath.house.gov/2019/10/mcbath-dingell-legislation-to-improve-seniorsaccessto-hearingaids-under-medicare-passes-house-committee
43. H.R.116-326, Medicare Hearing Act of 2019, Committee Report (2019-2020).
44. Richtman, M. (September 25, 2019) Letter Supporting Medicare Dental, Vision, and Hearing Benefit Act of 2019. (President and CEO, National Committee to Preserve Social Security and Medicare)

45. H-35.967 Treatment of persons with Hearing Loss. The AMA believes that physicians should remain the primary entry point for care of patients with hearing impairment and continue to supervise and treat hearing, speech, and equilibratory disorders.
46. Lopes, P.T., Bento, R.F. (December 8, 2020). Ear Parade: A Call for Preventive Actions to Strengthen theHealthcare System against Hearing Loss, International Archives of Otorhinolaryngology. doi:10.1055/s-0040-1712480
47. Stickel, A. & Tarraf, W., et al. (December 17, 2020). Hearing Sensitivity, Cardiovascular Risk, and NeurocognitiveFunction: The Hispanic Community Health Study/Study of Latinos (HCHS/SOL). JAMA Otolaryngol Head Neck Surg. doi:10.1001/jamaoto.2020.4835
48. Deal, J & Lin, F. (2021). USPSTF Recommendations for Hearing Loss Screening in Asymptomatic Older Adults – ACase of Missing Evidence and Missing Treatment Options. JAMA Network Open, 2021:4(3). doi:10.1001/jamanetworkopen.2021.0274
49. Sternasty., Sumitrajit, D. (March 25, 2021). Barriers to Hearing Aid Adoption Run Deep Than the Price Tag. JAMA Otolaryngology-Head & Neck Surgery. doi:10.1001/jamaoto.2021.0172

APPENDIX VI:

BC Government Strategic Direction

Improving care for individuals with hearing loss is consistent with BC Government Strategic plans:

Improving support for individuals with hearing loss is consistent with the BC Government mandate as set out in the Ministry of Health Strategic Direction document:

- **Objective 1.2: Improved health outcomes and reduced hospitalizations for seniors through effective and timely community services:**
  - Expand timely access to publicly funded community-based care services…and specialized services for seniors so that they can remain at home for longer.
- **Objective 2.1: Effective and equitable population health, health promotion, and illness and injury prevention services:**
  - Work with health care sector partners and professionals to develop and strengthen the delivery of public health initiatives, long-term health promotion, illness and injury prevention services, and clinical preventative screening and diagnostic services…
  - These actions and policies promote healthy, active lifestyles, healthy built environments, and social connectedness…

Improving support for individuals with hearing loss is also consistent with the BC Government Mandate Letter to the Honorable Adrian Dix:

- Putting people first: Since 2017, our government has focused on making decisions to meet people's needs….to keep seniors safer, healthier and more comfortable.
- … so that people can stay in their own homes for as long as is safely possible…

APPENDIX VII:

Estimated costs for a BC Hearing Aid Program for children* (5 -19 years) and seniors (60 yrs +) **

Age Group (years)	Population of BC (within the specified age group)	Estimated numbers of BC population with:		Annual cost for hearing health services for bilateral hearing loss ($CAN millions) based on ideal 100% uptake	Annual cost ($CAN millions) based on optimistic 40% uptake	Annual cost based on partial 50% funding only
		UNILATERAL hearing loss by age group (%)	BILATERAL hearing loss by age group (%)			
5 - 19	729,740	14,522 (2.0)	2,261 (0.3)	$8.6M	$3.44M	$4.3M
60 - 69	611,615	110,702 (18.1)	163,913 (26.8)	$197.3M	$78.92M	$98.65M
70 - 79	347,010	45,111 (13.0)	191,203 (55.1)	$192.4M	$76.96M	$96.2M
80 +	214,450	21,230 (9.9)	169,630 (79.1)	$162.2M	$64.88M	$81.1M
Total for all age groups	**1,902,815**	**191,565**	**527,007**	**$560.5M**	**$224.2M**	**$280.2M**

*children 0 to 5 years are covered by Early Hearing Program
** Hearing aid program will provide new pair of hearing aids every 5 years. Expected cost: $4500 for pair; based on the average market rate cost used by WorkBC. This works out to $900/year for bilateral; $450/year for unilateral hearing aid fitting. Some of these costs are partially covered under current program for clients who meet specific eligibility criteria (e.g., WorkSafeBC, WorkBC, Veteran Affairs, First Nations Health, Income Assistance, etc). Costs include:

- Hearing aids that need to be replaced every 5 years.
- A fitting fee to recompense a clinician's time, expertise, and equipment required to appropriately program the hearing aid for the individual's hearing loss
- Counselling and follow up services to help the person manage their hearing loss

APPENDIX VIII:

Supporting References

Hogan, A., O'Loughlin, K., Miller, P., & Kendig, H. (2009). The health impact of a hearing disability on older people in Australia. Journal of Aging and Health, 21(8), 1098-1111.

Kochkin, S. (2005). The impact of untreated hearing loss on household income. Better Hearing Institute, 1-10.

Lin, F. R., Yaffe, K., Xia, J., Xue, Q. L., Harris, T. B., Purchase-Helzner, E., ... & Health ABC Study Group, F. T. (2013). Hearing loss and cognitive decline in older adults. JAMA internal medicine, 173(4), 293-299.

Lin, F., et al. (July 18, 2023). Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial. Lancet (published online July 18 2023).
https://doi.org/10.1016/S0140-6736(23)01406-X

Livingston, G., Huntley, J., et al. (July 30, 2020) Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. The Lancet, 396, No. 10248. doi: 10.1016/S0140-6736(20)30367-6

McDaid, D., Park A-L, Chadha, S. Estimating the global costs of hearing loss. Int J Audiol. 2021; 60:162-170.

Reed, N. S., Altan, A., Deal, J. A., Yeh, C., Kravetz, A. D., Wallhagen, M., & Lin, F. R. (2019). Trends in healthcare costs and utilization associated with untreated hearing loss over 10 years. JAMA Otolaryngology–Head & Neck Surgery, 145(1), 27-34.

Shukla, A., Harper, M., Pedersen, E., Goman, A., Suen, J. J., Price, C., ... & Reed, N. S. (2020). Hearing loss, loneliness, and social isolation: a systematic review. Otolaryngology–Head and Neck Surgery, 162(5), 622-633.

World Health Organization. Global Costs of Unaddressed Hearing Loss and Cost-Effectiveness of Interventions. 2017