

THE DEVELOPMENT OF AN INTERNET-BASED PROGRAM FOR ADULTS WITH UNADDRESSED HEARING IMPAIRMENT


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PURPOSE OF MY CURRENT RESEARCH

To develop an internet-based program to increase the number of individuals who visit an audiologist after a failed hearing screen.

The Problem

- In the US, fewer than 20% of adults (age 50+) who would benefit from hearing aids actually use them
- Even in countries with public health systems that pay for hearing aids the adoption rate remains below 50%



Chien W, Lin FR. Prevalence of hearing aid use among older adults in the United States. Arch Intern Med. 2012;172(3):291-3
EHIMA. Trends derived from the EuroTrak databases 2009-2012 (Germany, United Kingdom and France). <http://www.ehima.com/qa>

The Solution?

- Hearing Screenings
- In the community
- Over the telephone
- Over the internet




But the follow-up rate following failed hearing screening is poor

Follow-up after failed telephone hearing screening: Australia		Follow-up after failed telephone hearing screening: United States	
	Number/ Percent		Number/ Percent
Number contacted	193	Number contacted	390
Percent who followed up	36%	Percent who followed up	27%
Percent (of number contacted) who obtained a hearing aid	7%	Percent (of number contacted) who obtained a hearing aid	8%

Meyer C, Hickson L, Khan A, Hartley D, Dillon H, Seymour J. Investigation of the actions taken by adults who failed a telephone-based hearing screen. Ear Hear. 2013;34(6):720-3
Watson CS, Kidd GR, Preminger JL, Miller JD, Maki DJ, Crowley A. Characteristics of 40,000 calls to the National Hearing Test. JASA. 2015;138(3):1870

Health Psychology

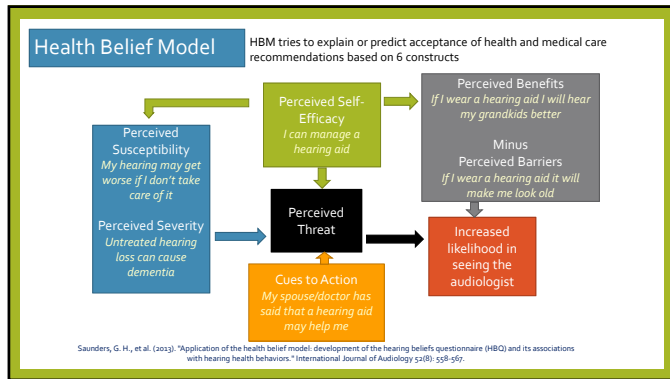
- Health Behavior Change
 - Why do people seek healthcare for a health condition
 - Why do people take up treatment for a health condition
 - What determines the decisions that people make regarding a health condition



Ferguson MA, Coulson NS, Henshaw H, Heffernan E. Application of health behaviour theory to hearing healthcare research: The state of play and beyond. Int J Audiol. 2016 Jul;55 Suppl 3:51-2.

Theoretical Foundations for this Program

- Health Belief Model (HBM)
- Chronic Care Model (Self-Management)



THE CHRONIC CARE MODEL

HEARING LOSS IS A CHRONIC HEALTH CONDITION

Framework for enhancing care delivery by identifying essential components of the health care system that can be modified to promote self-management

"Self-management is defined as the tasks that individuals must undertake to live with one or more chronic conditions. These tasks include having the confidence to deal with medical management, role management and emotional management of their conditions."

Adams K, Greiner AC and Corrigan JM (eds) The 1st annual crossing the quality chasm summit – a focus on communities. Washington, D.C: The National Academic Press, 2004.

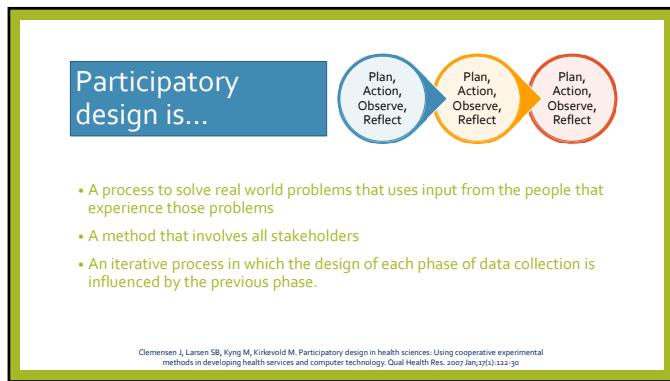
But adherence is a problem

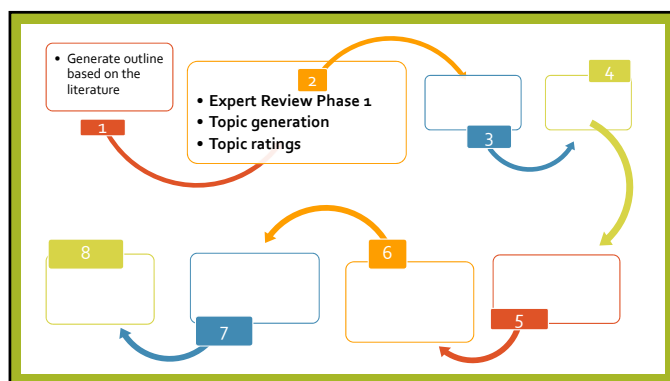
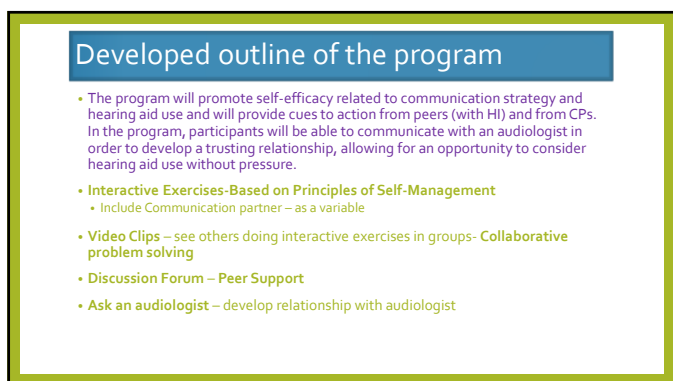
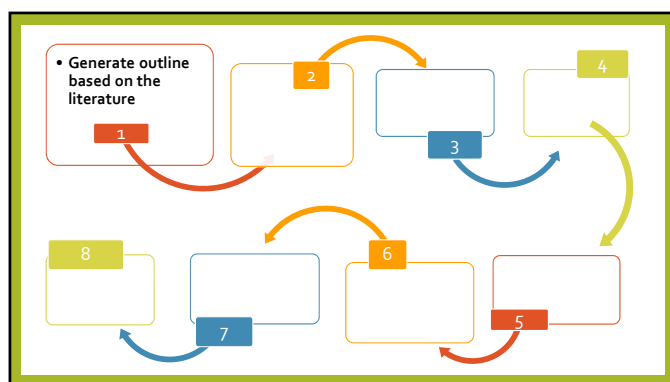
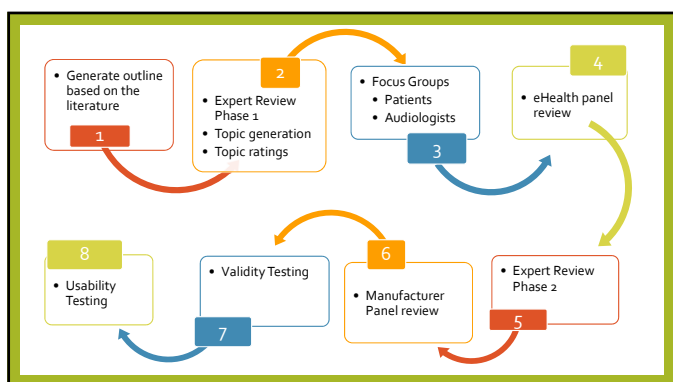
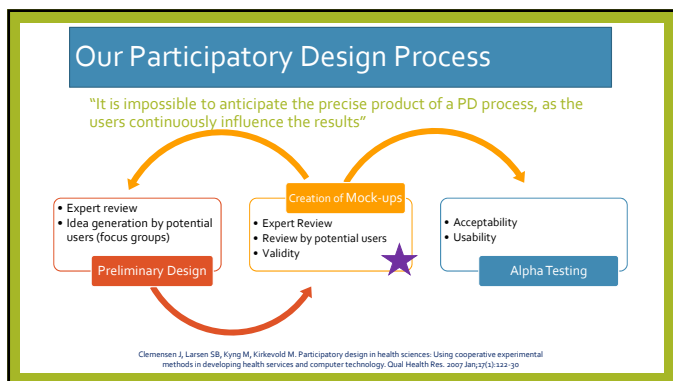
- Researchers measured adherence in three different Internet-based trials: one supporting diabetes self-management, one supporting smoking cessation, and one offering an online personal health record.
- Measured logging into the program
- "In all our three trials we found that many users never used the intervention, substantial proportions of the participants used the interventions only once, and few used the programs until the end of the interventions."

Wangberg, S. C., Bergmo, T. S., & Johnson, J.-A. K. (2008). Adherence in Internet-based interventions. Patient Preference and Adherence, 1, 57-65.

Theoretical Foundations for this Program

- Health Belief Model (HBM)
- Chronic Care Model (Self-Management)
- Participatory Design





Expert Panel

- 4 audiology researchers/AR experts
- 1 social worker, expertise in hearing impairment

Round 1

- Generate topics
- Review procedures

Round 2

- Rate topics (5 areas, 29 topics)

Expert Panel Feedback-Phase 2

Key:
 ✓ -important Key point
 X -unnecessary or redundant

Key point	1	2	3	4	5
Some short-term effects of hearing loss may include difficulty communicating with others, fatigue, frustration, stress, and reduced social activity	X	✓	✓	✓	✓
Long term effects of hearing loss can include social isolation, depression, anxiety, and cognitive decline.	X	✓	✓	✓	X
Management of hearing loss may include hearing aids, cochlear implants (for more severe hearing loss), hearing assistance technologies, communication strategies, and counseling.	✓	✓	✓	✓	✓
Hearing aids do improve hearing and communication but they don't "cure" hearing loss. When you still get hearing aids you still need to learn how to use them and you still need to use effective communication strategies.	✓	✓	✓	✓	✓
Tell your communication partners that you really want to hear what you have to say. When you ask for him or her to repeat it is not because you are not interested or because you weren't listening, it is because you have a hearing loss.	✓	✓	✓	✓	✓

- Communication strategies
- You can take steps to improve communication

- You are not alone
- Support from peers with HL, support from communication partners

- Seeking Help
- What is an AUD, management options

- Hearing loss basics
- Impact of HL, communication, social impact

Interactive Exercises

Goal Setting (behavior)	Set a goal defined in terms of the behavior to be achieved. Participants will consider their communication problems and select one that they would like to solve. Example: I will improve communication with my spouse when we are in the house at dinner time.
Review behavior goal(s)	Consider current ability. Participant will rate his/her ability to deal with the problem. Example: How would you rate your ability to understand your spouse at the dinner table? (Participant will put cursor on the line below and current ability will be assigned a value based on distance in mm.)

Discussion Forum

- Weekly topics
- Where do you have difficulty communicating?
- What happens when you tell someone that you have a hearing loss
- Expected that not all would post, but all would read

Topics	Replies	Views	Last Post
<u>Cost</u>	28	67	Monday, February 19, 2018, 3:09 p.m.
<u>Time and Effort</u>	11	39	Sunday, February 18, 2018, 5:47 p.m.
<u>Stigma</u>	25	45	Friday, February 16, 2018, 10:21 p.m.
<u>Dementia, Depression, Social Isolation</u>	9	23	Saturday, February 17, 11:03 a.m.
<u>Learning about Hearing and Tinnitus</u>	16	40	Monday, February 19, 2018, 2:26 p.m.
<u>Quality of Life</u>	22	42	Sunday, February 18, 2018, 12:45 p.m.



Focus Group Participants	
Focus Group	Participants
1	6 HA users (3 female, 3 male), 2 CPs Ages 56 - 79
2	5 AUD (all female), 2 - 15 years experience 2 Private Practice, 2 ENT/AUD practice, 1 non-profit
3	6 adults with HL (3 female, 3 male), 1 CP 3 have seen AUD wondering if HA will help Ages 51 - 78
4	4 adults with HL (3 female, 1 male), 2 CPs 1 HA user, 3 seen AUD wondering if HA will help Ages 57 - 82


Focus group subjects were given this scenario

Meet Jim

Jim is your friend of many years. He recently told you that he is having difficulty hearing his granddaughter. He told you:

"I have noticed more difficulty hearing lately. I don't know if it is a hearing loss or the fact that I am getting older. I am hesitant to get hearing aids because I know a few people who either don't like their hearing aids or don't wear them. I just don't know what to do."

Jim told you that he has seen other people reject their hearing aids. He is concerned that hearing aids may not work for him or maybe he will have difficulty using them correctly.



As a friend- you want to give Jim some information that will help him decide to seek hearing healthcare (e.g., to get a hearing test, to get information about hearing devices.)

- What types of information does Jim need to learn before he would be willing to seek hearing healthcare?
- How can we be sure he will have confidence that this is useful and trustworthy information?
- How could you improve Jim's belief that he can manage his hearing loss so he will take steps to get a hearing test and consider treatment?
- What can you tell Jim that would motivate him to see an audiologist?

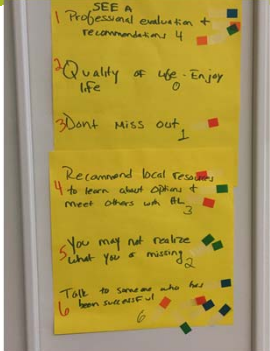
Here are some of our ideas!



1. Explain to Jim that there are some negative outcomes associated with untreated hearing loss (for example, social isolation) BUT many of them can be minimized with treatment.
2. Introduce Jim to some people who are successfully managing their hearing loss.
3. Explain the steps that Jim can take to seek treatment for his hearing loss (e.g. see an audiologist, get his hearing tested, learn about treatment options)

Topic Generation

- Reviewed all ideas generated by participants
- Reviewed topic areas generated by expert panel
- Individuals ranked the top 3 most important ideas



Topic Sorting


- Group Sorting
- Group Discussion
- Individual Sorting

Topics for Card Sorting Exercise-Results

Topic	Group1	Group2
1. Even though hearing loss is common with age, it is still important to do something about it.	1	2
2. People often say that they feel "left out" because of their hearing loss.	1	3
3. Some people with hearing loss feel isolated from others.	1	3
4. Some people experience frustration, fatigue, and stress because of their hearing loss.	2	2
5. Although the cause-and-effect relationship is not fully understood, research has shown that untreated hearing loss is associated with cognitive decline.	2	1
6. Research has shown that untreated hearing loss is associated with depression.	1	2

Audiologist Focus Group

- What information would you like for patients to have before they come see you?
- Do you have any suggestions of how we can best motivate potential patients to seek help from an audiologist?
- Would you be interested in participating in a program like this as a professional?
- How much time would you be willing to spend on the program each week?



Nodes

- Hearing loss
- Communication difficulties
- Social support
- Quality of life
- Cost
- Stigma

Table:

Node	Value
Hearing loss	100%
Communication difficulties	100%
Social support	100%
Quality of life	100%
Cost	100%
Stigma	100%

Peer Support: When it comes across the table from someone else who has the same problem you can see the lightbulb go on (69 yo male, considering HA, FG3)

Communication Partner Support: (Husband's name) went in to have his hearing tested by an audiologist, he (Aud) said most of his male patients came because their wife insisted. I know it sounds sexist but the opposite is probably true too. I mean probably if women came in it was their husband. (79 yo female, considering HA, FG2)

Distrust/Cost

Social Support

Improved Quality of Life

Stigma

Being very transparent (is important), because one of the biggest things patients ask about is prices, and why can't I go online and get this for this price? Versus why are you telling me it's several thousand more if I come here or if I go there?... You can really explain, this is a bundled pricing approach and this is what to expect and this is what will be included versus if you're getting them online, what's included with that? Who's going to be seeing you? Many times they don't understand that \$2000 difference that you're actually pay for somebody's service and their time. (Aud)

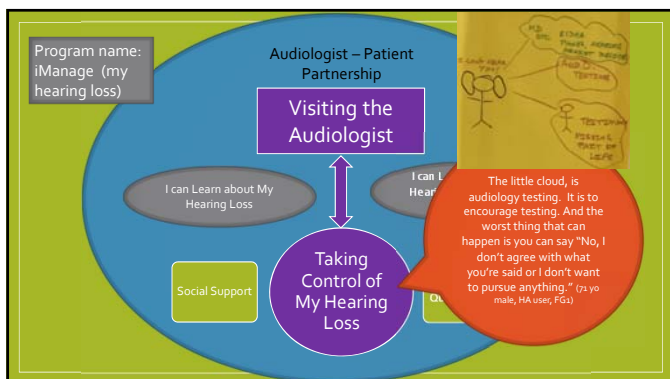
I can learn about my hearing loss

Understanding HL	Personalization of hearing test/ hearing management
Find out if HL due to a medical problem	Importance of baseline hearing test
Find out what you've been missing (because of your HL)	

I can learn about my management options

How do you get the word out that there are these things [different management options for hearing loss besides hearing aids]? We don't talk about this. We get commercials that say for \$450 you can get hearing aids. And so we all think that they're so expensive, they're cost prohibitive. We're not trained in ear health, or what can you do. Especially in this day and age of what you're going to be facing with kids constantly with ear buds. That discussion isn't part of our life. (57 yo female, wonders about HAs, FG3)

Discussion with communication partners



- ### What we learned- from People with Hearing Loss
- People don't trust audiologists, and trust and cost are keeping some away
 - People don't understand that there are management options in addition to hearing aids, they don't understand that hearing aid costs vary with the level of technology
 - The idea of a baseline hearing evaluation is appealing when presented as a medical option (in order to learn about your hearing and management options) as opposed to a hearing aid sales option
 - Since people don't trust audiologists- they want information from successful hearing aid users

What we learned- from Audiologists

- Importance of baseline hearing test
- Importance of speech in noise testing for personalizing recommendations
- Forget about the "Ask the audiologist" feature

What we learned

- Self-Management is important
- But that will not get people in to the audiologist
- First we get them to the audiologist where they can..
 - Participate in shared decision making
 - Learn self-management skills

Decision Coaching Aid

- Patient Decision Aids Research Group, Ottawa Hospital Research Institute, University of Ottawa
- "A decision coach is a trained health care professional who is non-directive and provides support that aims to develop patients' skills in:
 - Thinking about the options
 - Preparing for discussing the decision in a consultation with their practitioner
 - Implementing the chosen option"

<https://decisionaid.ohri.ca/coaching.html>

Clarify your decision.

What decision do you face?

What are your reasons for making this decision?

Explore your decision.

Knowledge
List the options and benefits and risks you know.

Values
Rate each benefit and risk using stars (★) to show how much each one matters to you.

Option #1	Reasons to Choose This Option Benefits / Advantages / Pros	How much it matters to you: (★ or as many as you want)

Support

Who else is involved?

Which option do they prefer?

Is this person pressuring you? Yes No

How can they support you?

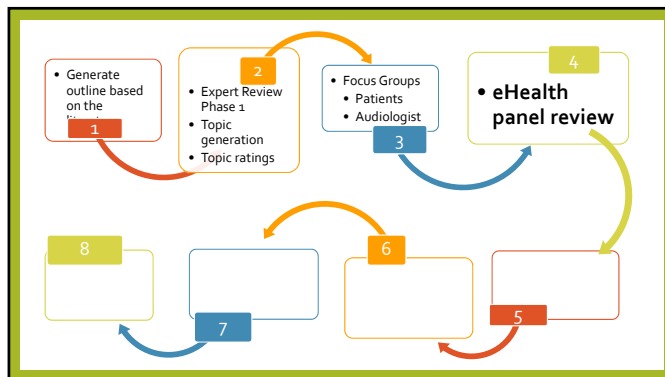
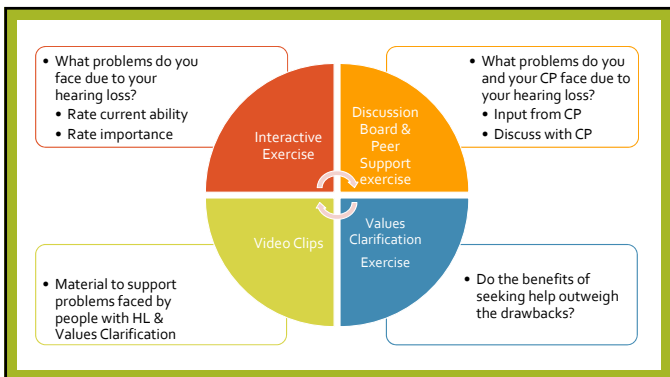
Identify your decision making needs.

Knowledge Do you know the benefits and risks of each option? Yes No

Values Are you clear about which benefits and risks matter most to you? Yes No

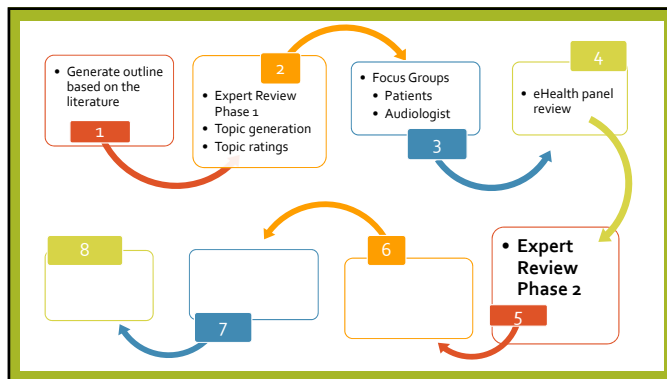
Support Do you have enough support and advice to make a choice? Yes No

Certainty Do you feel sure about the best choice for you? Yes No



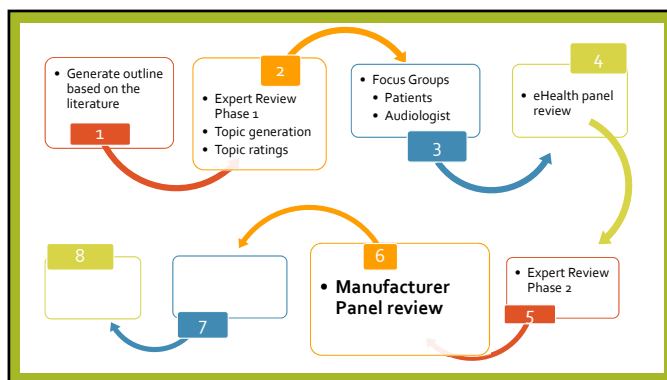
E- Health Panel

- 6 e-health experts: research audiologists, and individuals with interests in public health and engineering; all worked for a research institute associated with a hearing aid manufacturer. They reviewed the latest mock-up and offered suggestions to improve program adherence and success.
- Tell a cohesive story throughout the program.
 - Participants need to understand how hearing loss is experienced (as they may not understand their own experience)
- Participants need to understand the consequences of untreated hearing loss and what they can expect from successful management
- Show that communication problems are due to the HL not the people involved
- People in clips and in animation should be 10 years younger than target audience
- More content, More information



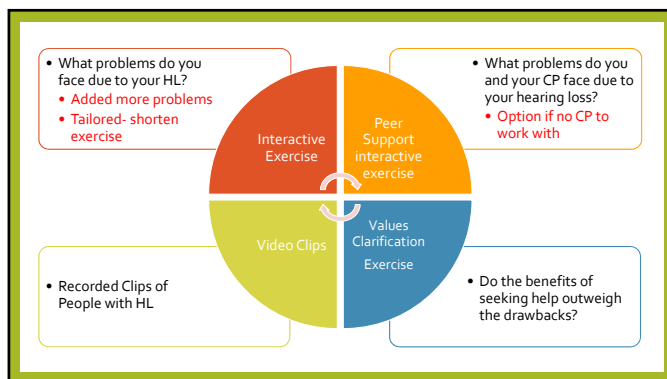
Expert Review Phase 2

- Meeting with HLAA state Leader
- Discussion at HLAA meeting
- Figure out the motivating factor to seek help for each individual
- Need to grab participant in first 5 minutes
- Sometimes it is necessary to be confrontational in order to get someone to seek help. (Does your spouse matter to you? Does your job matter to you?)
- Discussion Board with peer support will not work!!!



Manufacturer Panel

- 6 hearing aid marketing, human factors, and business experts (who worked for a hearing aid manufacturer). They considered design factors that might influence uptake and adherence to the program.
- Make the program shorter
- How big is the motivation for someone to take-up the program



Part 1: We attempt to demonstrate that hearing loss is important

Perceived Severity
Untreated hearing loss associated with dementia

- Tailored process to find 2 very important or 3 somewhat important reasons to see an audiologist to "manage my hearing problems"
- Will be presented with up to 8 problems to consider

Include patient testimonials and animations to explain problems, provide information, promote trust, and provide support

Improved Quality of Life Social Support

When your hearing has caused problems in your communication and relationship with people you love with? Select the number that best applies. A rating of 1 means you have no problem at all. A rating of 5 means it is a big issue.

How important is it for you to improve this problem? Select the number that best applies. A rating of 1 means it is not important at all. A rating of 5 means it is very important.

Part 2- Discuss hearing problems with a communication partner

Support
Who else is involved?
Social Support

Cues to Action
My spouse/doctor has said that a hearing aid may help me

You are going to watch a video to see a couple discuss what it is like to live with a hearing loss. Tom and Joan have been married for 30 years. Over the past 5 years, Tom has noticed difficulty hearing. Tom has a friend who has a hearing aid that whistles all the time. Tom does not want to see an audiologist because he thinks that hearing aids don't work.

Video will show a couple completing the GPS with an audiologist. After considering each other's experience with hearing loss- the couple will

1. Consider where they communicate well
2. Select a problem to work on
3. Select a solution for the problem

We hope you have learned that a hearing loss impacts more than the person with hearing loss. Hearing loss affects spouses, family, friends and colleagues. When a person with hearing loss does something to improve their hearing, like wearing a hearing aid, it helps the person with hearing loss and it helps family and friends.

Part 3- Values Clarification in which the user decides if the advantages of taking action outweighs the drawbacks

Perceived Benefits
If I wear a hearing aid I will hear my grandchildren better

Values
Rate each benefit and risk using stars (★) to show how much each one matters to you.

Minus Perceived Barriers
If I wear a hearing aid it will make me look old.

Should I Visit an Audiologist?

How important is reducing your risk of dementia, depression, and social isolation?

How important is hearing more about my hearing loss (status)?

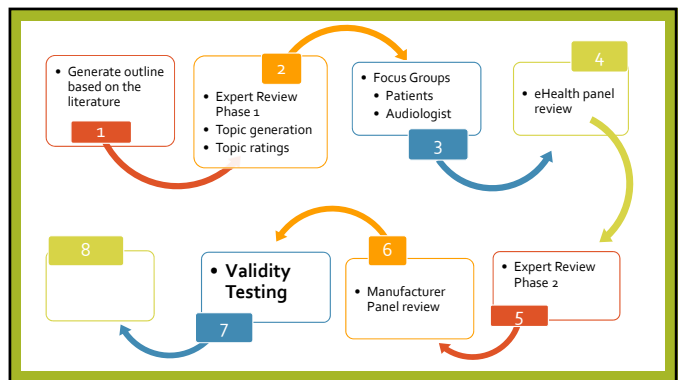
How important is learning my quality of life, communication, and relationships?

How much does the cost of working with an audiologist concern you?

How much does the time and effort required to work with an audiologist concern you?

How much does the stigma of wearing a hearing aid or hearing assistance technology concern you?

Include patient testimonials and animations to explain problems, provide information, promote trust, and provide support



Validity Testing- Video Clips & Animation

- 5 individuals who report difficulty hearing.

CLIP #1	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The information in the clip was INFORMATIVE					
The information in the clip was UNDERSTANDABLE					
The clip was INTERESTING					
I could RELATE to the person or content in the clip					
The content or speaker was TRUSTWORTHY					
The information in the clip was IMPORTANT					
What was the TOPIC of this clip (what did it make you think about?)					
Any comments or concerns?					

Highest rated clip: Importance - Do you want to improve your relationships and communication?

Work in Progress!
Not professionally edited yet.

16:17:33:05

Another highly rated clip: Decisional Balance - Stigma



"It is impossible to anticipate the precise product of a PD process, as the users continuously influence the results"

Thank you! Oticon Foundation

• iManage Team Members

- Ann Rothpletz, research audiologist
- Laura Galloway, research audiologist
- Rebecca Smith, AuD student
- Keira Glasheen, AuD student

• Collaborators

- Elisabet Thorén (formerly of Eriksholm, Denmark)
- Ariane Laplante-Lévesque (formerly of Eriksholm, Denmark, Now Oticon)

• Expert Panel

- Elisabet Thorén
- Ariane Laplante-Lévesque
- Gabrielle Saunders (Formerly of NCRAR, Portland, Now Eriksholm)
- Michelle Arnold (University South Florida)
- Michelle Niehaus (Social Worker, State of KY)