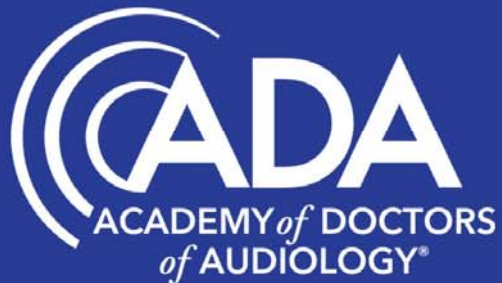


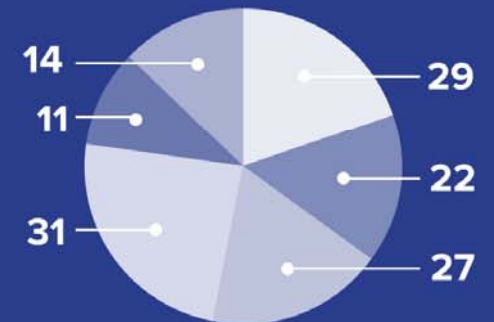
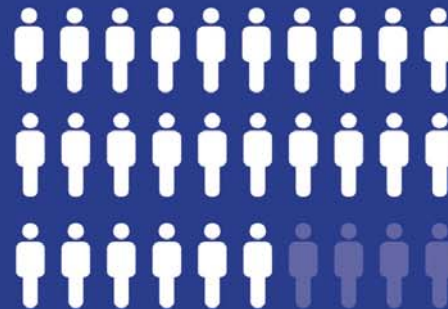
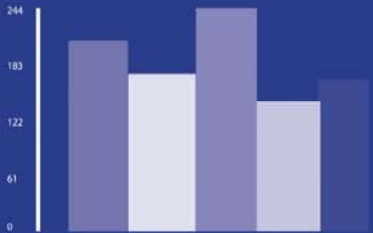
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Outcome Measures Beyond the Audiogram: Putting Non-Audiological Measures into Practice

Brian Taylor & Barbara Weinstein



Brian Taylor, Au.D.

Disclosure Statement:

Financial: Employed by Hypersound and Fuel Medical – Salary received.

Nonfinancial: No relevant nonfinancial relationships to disclose.



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Barbara Weinstein, Ph.D.

Disclosure Statement:

Financial: Unitron – Consulting fee received,
Independent contractor.

Non-financial: No relevant relationships to
disclose.



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Common Sense Approach to Outcome Measures

- What is an patient-reported outcome measure ?
- Why do they matter more than ever?
- The science behind PROMs
- Clinical implementation



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Outcomes Defined

- Your intervention (hearing aids, aural rehab, etc.) made a difference in communicating, daily living and long-term health.
- Require a pre intervention and post intervention measure.



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Current Situation

- 20% of providers routinely conduct any self-reported outcome measure
- Computer-based OMS collect and analyze dozens of business metrics, but no self-reports of outcome

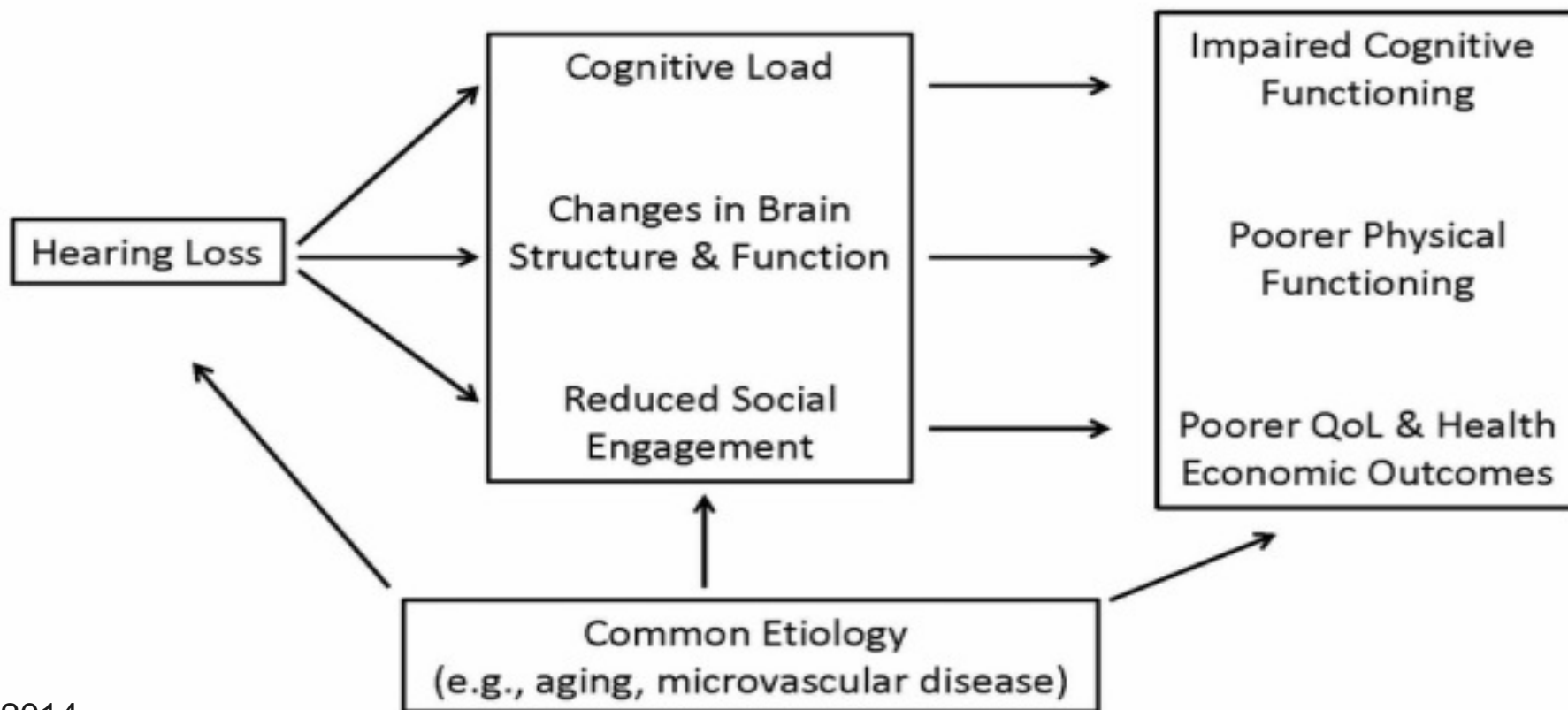


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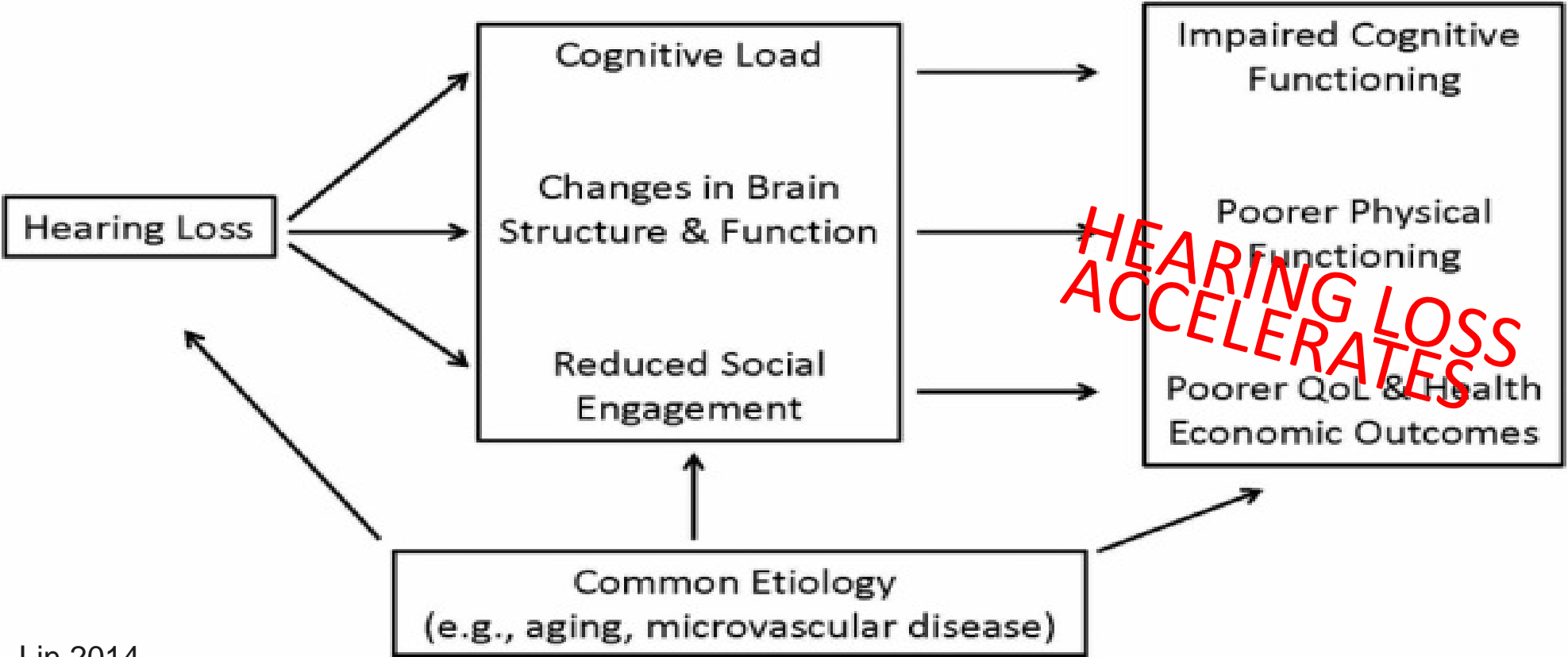


Capture Downstream Outcomes



Lin 2014





Lin 2014



Why Outcomes Matter More than Ever

1. Healthcare Economics
2. Patients want to know
3. Point of differentiation (Data-driven, word-of-mouth advertising)



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Healthcare Economics

FIGURE 1. CUMULATIVE DISTRIBUTION OF PERSONAL HEALTH CARE SPENDING, 2009



NIHCM Foundation analysis of data from the 2009 Medical Expenditure Panel Survey.



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Interventional Audiology

- 5% of population accounts for 50% of the spending
- This group is mainly the elderly with several co-morbidities
- Most in this population has some degree of hearing loss
- Demonstrate to primary care that audiology plays a role in cost containment
- Document that our treatments are effective



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Goal of Outcome Measures

- Demonstrate to the patient, family, referring physician and others that your treatment plan is effective.
 - Reduce hearing handicap
 - Improve daily communication & quality of life
 - Promote a more active lifestyle
 - Promote better overall general health



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Proximal Measures of Outcome

Domain of Function	Measure
Activity limitation and participation restriction	HHIE-A, SAC
Daily communication	COSI or TELEGRAM
Speech understanding in noise	Quick SIN
Ease of listening, localization and spatial hearing	SSQ-12B or SSQ-C
Use, benefit, participation restrictions, impact on others, quality of life	IOI-HA
Satisfaction	EarTrak Survey, DOSO



Downstream Measures of Outcome

Domain of Function	Outcome Measure
Social & emotional loneliness	DeJung Giervald Loneliness Scale – short form
Perceived health status	Self-reported health
Depression	Patient Health Questionnaire (PHQ-2)
Physical Activity	Self-reported physical activity
Cognition	MMSE, MoCA, 6-CIT



NAME: _____ Date of Birth: _____ Person completing Telegram: _____

T E L E G R A M

	Telephone	Employment	Legislation	Entertainment	Groups	Recreation	Alarms	Members of the family	
RATING									
1 No Difficulty									Live with Normal Hrg Adult
2									Live with Young Children
3 Some Difficulty									Live with Teenagers
4									Live with Adult with Hrg Loss
5 Great Difficulty									Live Alone

Three Main Problems: C: Cell phone, J: Job, P: Public Listening, T: TV, C: Church, -----, S: Smoke, Check all that apply
 Additions: L: Landline, S: School, A: ADA, M: Movies, P: Parties, -----, D: Doorbell
 M: Meetings, -----, C: Clock

Recommendations:
 T _____ E _____ L _____ E _____ G _____ R _____ A _____ M _____

Linda M. Thibodeau, Ph.D.

University of Texas at Dallas

April, 2005



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NAME: _____ Date of Birth: _____ Person completing Telegram: _____

T E L E G R A M

	Telephone	Employment	Legislation	Entertainment	Groups	Recreation	Alarms	Members of the family
RATING								
1 No Difficulty								Live with Normal Hrg Adult
2								Live with Young Children
3 Some Difficulty								Live with Teenagers
4								Live with Adult with Hrg Loss
5 Great Difficulty		J		T		P		Live Alone
	C L			M	M	C	S	D

Three Main Problems to Address: _____

C: Cell phone L: Land line J: Job S: School P: Public Listening A: ADA T: TV M: Movies C: Church P: Parties M: Meetings S: Smoke D: Doorbell C: Clock Check all that apply

Recommendations:
 T _____ E _____ L _____ E _____ G _____ R _____

Linda M. Thibodeau, Ph.D. University of Texas at Dallas

1. TV
2. Meetings at work
3. Phone at work



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NAME: _____ Date of Birth: _____ Person completing Telegram: _____

T E L E G R A M

	Telephone	Employment	Legislation	Entertainment	Groups	Recreation	Alarms	Members of the family
RATING								
1 No Difficulty		L					S	D
2	C		J		T			
3 Some Difficulty				M	M	P	S	
4		J		T				
5 Great Difficulty	C	L		M	M	P		D

- Live with Normal Hrg Adult
- Live with Young Children
- Live with Teenagers
- Live with Adult with Hrg Loss
- Live Alone

C: Cell phone J: Job P: Public Listening T: TV C: Church ----- S: Smoke
 L: Land line S: School A: ADA M: Movies P: Parties ----- D: Doorbell
 ----- ----- C: Clock Check all that apply

Three Main Problems to Address: _____

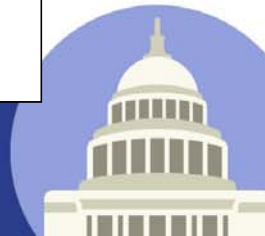
Recommendations:
 T _____ E _____ L _____ E _____ G _____ R _____ A _____ M _____

Linda M. Thibodeau, Ph.D. University of Texas at Dallas April, 2005



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Hearing Handicap Inventory for the Elderly Screening Version (HHIE-S)

Instructions: Please check "yes," "no," or "sometimes" in response to each of the following items. Do not skip a question if you avoid a situation because of a hearing problem. If you use a hearing aid, please answer the way you hear without the aid.

	Item	Yes (4 pts)	Sometimes (2 pts)	No (0 pts)
E	Does a hearing problem cause you to feel embarrassed when meeting new people?	_____	_____	_____
E	Does a hearing problem cause you to feel frustrated when talking to members of your family?	_____	_____	_____
S	Do you have difficulty hearing when someone speaks in a whisper?	_____	_____	_____
E	Do you feel handicapped by a hearing problem?	_____	_____	_____
S	Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?	_____	_____	_____
S	Does a hearing problem cause you to attend religious services less often than you would like?	_____	_____	_____
E	Does a hearing problem cause you to have arguments with family members?	_____	_____	_____
S	Does a hearing problem cause you difficulty when listening to TV or radio?	_____	_____	_____
E	Do you feel that any difficulty with your hearing limits or hampers your personal or social life?	_____	_____	_____
S	Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?	_____	_____	_____
TOTAL SCORE = _____ (sum of the points assigned to each of the items)				

E = Emotional; S = Social

Interpretation of score:

- 0-8 suggests no hearing handicap
- 10-24 suggests mild-moderate hearing handicap
- 26-40 suggests significant hearing handicap

Refer for additional hearing evaluation if score is ≥ 10 points



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HHIE Scoring

- 0-8 denotes no self-perceived handicap.
- 10-22 denotes mild to moderate handicap.
- 24-40 denotes significant handicap.



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HEARING HANDICAP INVENTORY (A&E Versions)

Name/ID: _____ Age: _____ Pre-Fit Post-Fit

INSTRUCTIONS: The purpose of this questionnaire is to identify the problems your hearing loss may be causing you. Circle **Yes**, **Sometimes**, or **No**, for each question. **DO NOT SKIP A QUESTION IF YOU AVOID A SITUATION BECAUSE OF A HEARING PROBLEM** If you currently use hearing aids, please answer as to how you do **WITH** your hearing aids.

- | | | | | |
|------|---|-----|-----------|----|
| E-1 | Does your hearing problem cause you to feel embarrassed when meeting new people? | Yes | Sometimes | No |
| E-2 | Does a hearing problem cause you to feel frustrated when talking to members of your family? | Yes | Sometimes | No |
| S-3 | Does a hearing problem cause you difficulty understanding co-workers, clients, or customers? | Yes | Sometimes | No |
| E-4 | Do you feel handicapped by a hearing problem? | Yes | Sometimes | No |
| S-5 | Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors? | Yes | Sometimes | No |
| S-6 | Does a hearing problem cause you difficulty in the movie or theater? | Yes | Sometimes | No |
| S-7 | Does a hearing problem cause you to have arguments with family members? | Yes | Sometimes | No |
| S-8 | Does a hearing problem cause you difficulty when listening to the TV or radio? | Yes | Sometimes | No |
| E-9 | Do you feel that any difficulty with your hearing limits or hampers your personal or social life? | Yes | Sometimes | No |
| S-10 | Does a hearing problem cause you difficulty when in a restaurant with relatives or friends? | Yes | Sometimes | No |
| S-11 | Does a hearing problem cause you to attend religious services less often than you would like? | Yes | Sometimes | No |
| S-12 | Do you have difficulty hearing when someone speaks in a whisper? | Yes | Sometimes | No |

Score T: _____



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Self-Assessment of Communication (SAC)

- Companion version (SOAC)
- Schow & Nerbonne, 1982, updated in 2001 & 2007
- 9-questions
- Computerized Version:

<http://www.isu.edu/csed/audiology/profile/flashsac/FlashSac.html>



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SELF-ASSESSMENT OF COMMUNICATION

- | | | |
|---|--|---|
| 1 | Do you experience communication difficulties in situations when speaking with one other person? (at home, at work, in a social situation, with a waitress, a store clerk, with a spouse, boss, etc.) | 4 |
| 2 | Do you experience communication difficulties while watching TV and in various types of entertainment? (movies, radio, plays, nightclubs, musical entertainment, etc.) | 4 |
| 3 | Do you experience communication difficulties in situations when conversing with a small group of several persons? (with friends or families, co-workers, in meetings or casual conversations, over dinner or while playing cards, etc.) | 3 |
| 4 | Do you experience communication difficulties when you are in an unfavorable listening environment? (at a noisy party, where there is background music, when riding in an auto or bus, when someone whispers or talks from across the room, etc.) | 4 |
| 5 | How often do you experience communication difficulties in the situation where you most want to hear better? | 4 |
| 6 | Do you feel that any difficulty with your hearing negatively affects or hampers your personal or social life? | 3 |
| 7 | Does any problem or difficulty with your hearing worry, annoy or upset you? | 2 |
| 8 | How often do others seem to be concerned or annoyed or suggest that you have a hearing problem? | 3 |
| 9 | How often does your hearing negatively affect your enjoyment of life? | 2 |

Disability (AL) 70%

Handicap (PR) 42%

Quality of life 25%

Total 56%

[Print](#)
[Exit](#)
[Repeat](#)

- 0-20 No disability or handicap
- 21-40 Slight hearing disability or handicap
- 41-70 Mild to moderate hearing disability or handicap
- 71-100 Severe hearing disability or handicap



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SELF-ASSESSMENT OF COMMUNICATION

- | | | |
|---|--|---|
| 1 | Do you experience communication difficulties in situations when speaking with one other person? (at home, at work, in a social situation, with a waitress, a store clerk, with a spouse, boss, etc.) | 2 |
| 2 | Do you experience communication difficulties while watching TV and in various types of entertainment? (movies, radio, plays, nightclubs, musical entertainment, etc.) | 2 |
| 3 | Do you experience communication difficulties in situations when conversing with a small group of several persons? (with friends or families, co-workers, in meetings or casual conversations, over dinner or while playing cards, etc.) | 2 |
| 4 | Do you experience communication difficulties when you are in an unfavorable listening environment? (at a noisy party, where there is background music, when riding in an auto or bus, when someone whispers or talks from across the room, etc.) | 1 |
| 5 | How often do you experience communication difficulties in the situation where you most want to hear better? | 2 |
| 6 | Do you feel that any difficulty with your hearing negatively affects or hampers your personal or social life? | 2 |
| 7 | Does any problem or difficulty with your hearing worry, annoy or upset you? | 1 |
| 8 | How often do others seem to be concerned or annoyed or suggest that you have a hearing problem? | 2 |
| 9 | How often does your hearing negatively affect your enjoyment of life? | 1 |

Disability (AL) 20%

Handicap (PR) 17%

Quality of life 0%

Total 17%

- 0-20 No disability or handicap
- 21-40 Slight hearing disability or handicap
- 41-70 Mild to moderate hearing disability or handicap
- 71-100 Severe hearing disability or handicap

[Print](#)
[Exit](#)
[Repeat](#)



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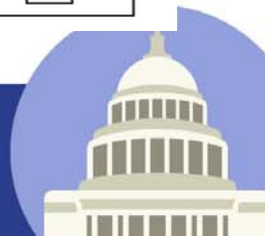


Speech, Spatial Qualities – short version

- http://www.ihr.mrc.ac.uk/downloads/products/questionnaires/ssq/eng/SSQ_v5_6.pdf
- Developed by MRC Institute of Hearing Research (IHR)
- 12 questions
- SSQ-B (benefit)
- SSQ- C (compare various devices)



<p>1. You are talking with one other person and there is a TV on in the same room. Without turning the TV down, can you follow what the person you're talking to says?</p>	<p>Comparing your ability now with your ability before getting your hearing aid/s</p> <p>Much worse Unchanged Much better</p> <p>_____</p> <p>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</p> <p style="text-align: right;">Not applicable <input type="checkbox"/></p>
<p>2. You are talking with one other person in a quiet, carpeted lounge-room. Can you follow what the other person says?</p>	<p>Comparing your ability now with your ability before getting your hearing aid/s</p> <p>Much worse Unchanged Much better</p> <p>_____</p> <p>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</p> <p style="text-align: right;">Not applicable <input type="checkbox"/></p>
<p>3. You are in a group of about five people, sitting round a table. It is an otherwise quiet place. You can see everyone else in the group. Can you follow the conversation?</p>	<p>Comparing your ability now with your ability before getting your hearing aid/s</p> <p>Much worse Unchanged Much better</p> <p>_____</p> <p>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</p> <p style="text-align: right;">Not applicable <input type="checkbox"/></p>
<p>4. You are in a group of about five people in a busy restaurant. You can see everyone else in the group. Can you follow the conversation?</p>	<p>Comparing your ability now with your ability before getting your hearing aid/s</p> <p>Much worse Unchanged Much better</p> <p>_____</p> <p>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</p> <p style="text-align: right;">Not applicable <input type="checkbox"/></p>
<p>5. You are talking with one other person. There is continuous background noise, such as a fan or running water. Can you follow what the person says?</p>	<p>Comparing your ability now with your ability before getting your hearing aid/s</p> <p>Much worse Unchanged Much better</p> <p>_____</p> <p>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</p> <p style="text-align: right;">Not applicable <input type="checkbox"/></p>



INTERNATIONAL OUTCOME INVENTORY – HEARING AIDS
(IOI-HA)

1. Think about how much you used your present hearing aid(s) over the past two weeks. On an average day, how many hours did you use the hearing aid(s)?

- | | | | | |
|--------------------------|----------------------------|--------------------------|--------------------------|----------------------------|
| none | less than 1
hours a day | 1 to 4
hours a day | 4 to 8
hours a day | more than 8
hours a day |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Think about the situation where you most wanted to hear better, before you got your present hearing aid(s). Over the past two weeks, how much has the hearing aid helped in that situation?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| helped
not at all | helped
slightly | helped
moderately | helped
quite a lot | helped
very much |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. Think again about the situation where you most wanted to hear better. When you use your present hearing aid(s), how much difficulty do you STILL have in that situation?

- | | | | | |
|--------------------------|------------------------------|--------------------------|--------------------------|--------------------------|
| very much
difficulty | quite a lot of
difficulty | moderate
difficulty | slight
difficulty | no
difficulty |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Considering everything, do you think your present hearing aid(s) is worth the trouble?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| not at all
worth it | slightly
worth it | moderately
worth it | quite a lot
worth it | very much
worth it |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5. Over the past two weeks, with your present hearing aid(s), how much have your hearing difficulties affected the things you can do?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| affected
very much | affected
quite a lot | affected
moderately | affected
slightly | affected
not at all |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. Over the past two weeks, with your present hearing aid(s), how much do you think other people were bothered by your hearing difficulties?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| bothered
very much | bothered
quite a lot | bothered
moderately | bothered
slightly | bothered
not at all |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Considering everything, how much has your present hearing aid(s) changed your enjoyment of life?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| worse | no change | slightly
better | quite a lot
better | very much
better |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

<http://www.harlmemphis.org/index.php?CID=133>



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Downstream Measures of Outcome

Domain of Function	Outcome Measure
Social & emotional loneliness	DeJung Giervald Loneliness Scale – short form
Perceived health status	Self-reported health
Depression	Patient Health Questionnaire (PHQ-2)
Physical Activity	Self-reported physical activity
Cognition	6-CIT
Overall state of health	15-D Questionnaire



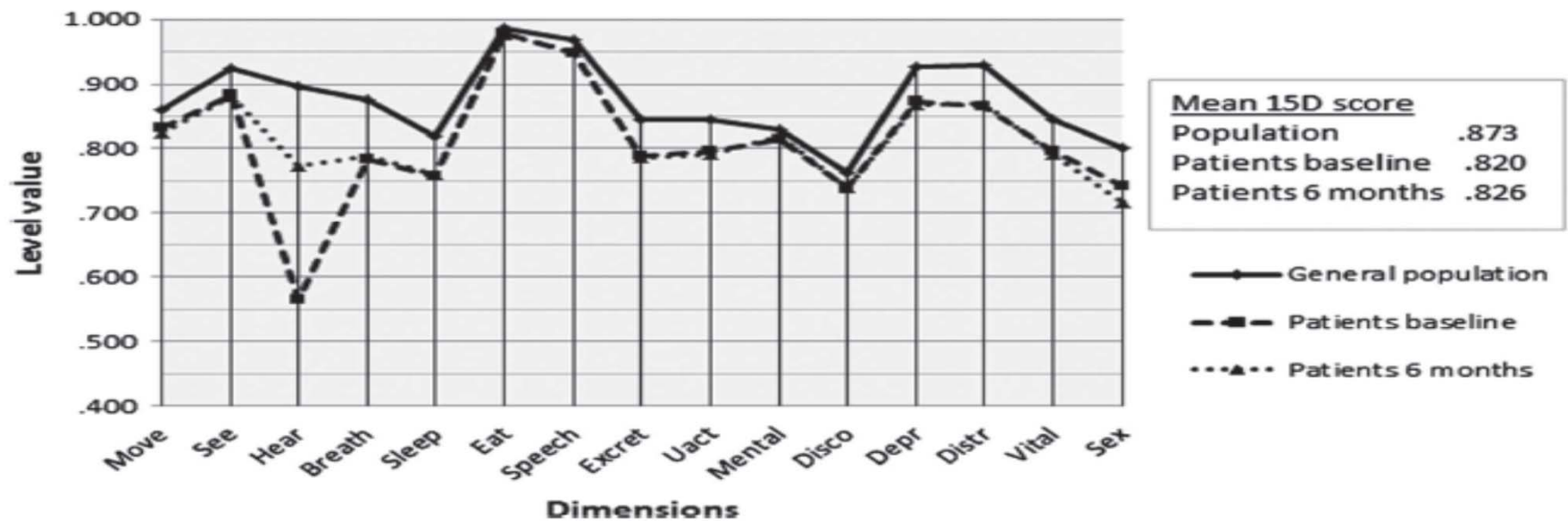
15-D Questionnaire

- Self-report of quality of life, along 15 dimensions
- Provides “population baseline” score for adults
- <http://www.15d-instrument.net/15d>
- Sintonen H. An approach to measuring and valuing health states. Soc Sci Med 15 C: 55-65, 1981, updated several times



- Niemensivu, et al IJA 2015
- 949 adults fitted with unilateral hearing aid compared to control group with normal hearing
- group with hearing loss had lower scores (pre-fitting)
- 6 month post AR: mean improvement was marginal

Health related quality of life



QUESTION 1. MOBILITY

- 1 () I am able to walk normally (without difficulty) indoors, outdoors and on stairs.
- 2 () I am able to walk without difficulty indoors, but outdoors and/or on stairs I have slight difficulties.
- 3 () I am able to walk without help indoors (with or without an appliance), but outdoors and/or on stairs only with considerable difficulty or with help from others.
- 4 () I am able to walk indoors only with help from others.
- 5 () I am completely bed-ridden and unable to move about.

QUESTION 2. VISION

- 1 () I see normally, i.e. I can read newspapers and TV text without difficulty (with or without glasses).
- 2 () I can read papers and/or TV text with slight difficulty (with or without glasses).
- 3 () I can read papers and/or TV text with considerable difficulty (with or without glasses).
- 4 () I cannot read papers or TV text either with glasses or without, but I can see enough to walk about without guidance.
- 5 () I cannot see enough to walk about without a guide, i.e. I am almost or completely blind.

QUESTION 3. HEARING

- 1 () I can hear normally, i.e. normal speech (with or without a hearing aid).
- 2 () I hear normal speech with a little difficulty.
- 3 () I hear normal speech with considerable difficulty; in conversation I need voices to be louder than normal.
- 4 () I hear even loud voices poorly; I am almost deaf.
- 5 () I am completely deaf.



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QUESTION 9. USUAL ACTIVITIES

- 1 () I am able to perform my usual activities (e.g. employment, studying, housework, free-time activities) without difficulty.
- 2 () I am able to perform my usual activities slightly less effectively or with minor difficulty.
- 3 () I am able to perform my usual activities much less effectively, with considerable difficulty, or not completely.
- 4 () I can only manage a small proportion of my previously usual activities.
- 5 () I am unable to manage any of my previously usual activities.

QUESTION 10. MENTAL FUNCTION

- 1 () I am able to think clearly and logically, and my memory functions well
- 2 () I have slight difficulties in thinking clearly and logically, or my memory sometimes fails me.
- 3 () I have marked difficulties in thinking clearly and logically, or my memory is somewhat impaired.
- 4 () I have great difficulties in thinking clearly and logically, or my memory is seriously impaired.
- 5 () I am permanently confused and disoriented in place and time.



QUESTION 12. DEPRESSION

- 1 () I do not feel at all sad, melancholic or depressed.
- 2 () I feel slightly sad, melancholic or depressed.
- 3 () I feel moderately sad, melancholic or depressed.
- 4 () I feel very sad, melancholic or depressed.
- 5 () I feel extremely sad, melancholic or depressed.

QUESTION 13. DISTRESS

- 1 () I do not feel at all anxious, stressed or nervous.
- 2 () I feel slightly anxious, stressed or nervous.
- 3 () I feel moderately anxious, stressed or nervous.
- 4 () I feel very anxious, stressed or nervous.
- 5 () I feel extremely anxious, stressed or nervous.

QUESTION 14. VITALITY

- 1 () I feel healthy and energetic.
- 2 () I feel slightly weary, tired or feeble.
- 3 () I feel moderately weary, tired or feeble.
- 4 () I feel very weary, tired or feeble, almost exhausted.
- 5 () I feel extremely weary, tired or feeble, totally exhausted.



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DeJung Gierveld Loneliness Scale - Short Version

1. I experience a general sense of emptiness
2. There are plenty of people I can rely on when I have problems
3. There are many people I can trust completely
4. I miss having people around
5. There are enough people I feel close to
6. I often feel rejected



DeJung Gierveld Loneliness Scale - Short Version

“I miss having people around”

5-point Scale:

No!

No

More or Less

Yes

Yes!

No Response



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DeJung Gierveld Loneliness Scale - Short Version

“I miss having people around”

5-point Scale:

No!



No

More or Less

Yes

Yes!

No Response



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Self-reported health

How would you rate your health, compared to others your age?"

Much worse

Worse

Same

Better

Much Better



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Patient Health Questionnaire 2 (PHQ-2)

- http://www.cqaimh.org/pdf/tool_phq2.pdf
- 2-question screener for depression
- 0 to 6 scale
- Score of 3 or higher – additional screening/evaluation encouraged



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The Patient Health Questionnaire-2 (PHQ-2)

Patient Name _____ Date of Visit _____

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not At all	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3



Screening for Cognitive Disorders

- 6-CIT
- See Sweetow, *Audiology Today*, 27, 4, 2015



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6-CIT

1. What year is it?
2. What month is it?

Ask the patient to repeat the following name and address: Arthur Jones, 42 High Street, Detroit

3. About what time is it?
4. Count backwards from 20
5. Say the months of the year in reverse order
6. Repeat the name and address discusses earlier



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6-CIT scoring

- 0-7 normal
- 8-9 mild cognitive impairment
- 10-28 significant cognitive impairment
- Computerized version available
- Integrate in current speech audiometry assessment



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Next Steps

- Choose 1-2 proximal measures of outcome
- Screen for downstream consequences (simple scaling questions)
- Have a solid referral network in place (depression, cognitive disorders)
- Ask your computer-based OMS to include your metrics
- Use aggregate scores to manage your staff and to market practice



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Dr. Weinstein and PROMs



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POSITIVE DEVIANCE – APPROACH TO IMPROVING QUALITY OF HEARING HEALTH CARE

- Break free from the constraints and norms of our profession
- Identifying practices or professions achieving desirable outcomes (positive deviance) promote and adopt the behaviors that explain the improved outcome
- Strength-based approach to change - best experts to solve our challenges
- Identify and optimize existing, sustainable solutions from within our profession to assist with innovation
- Easier to change behavior by practicing it



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STEPS (Bradley, et al., 2009)

Identify positive deviants – high performance

Use qualitative methods to study practices and propose hypotheses – define acceptable performance measures

Test hypothesis-mixed methods approach to influence performance

Work with key stakeholders to disseminate evidence

Patient level data and organization level data



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Realities of Age Related Hearing Loss (ARHL)

- Undetected but Prevalent
- Underestimated
- Neglected and untreated: 10 - 30%
- Risk factor for morbidity and mortality
- Increases caregiver burden
- Hearing care solutions improve quality of life
- Fatiguing to communicate among those who seek help for their and for those reporting psychosocial hearing difficulties



- The most pronounced effects of hearing loss are psychological, not the more readily evident communicative gaps or “mishearings” experienced in everyday interactions



REGULATORY REALITIES OF AGING-VALUE BASED PAYMENT MODELS

- Secretary of HHS Moving Toward Incentive Value Based Payment Model
 - Policy makers intent on measuring the value of health care services and rewarding clinicians and health care entities that that improve that value
- Must demonstrate value of care to patients
- Innovative value-based payment methods within Medicare (Beauchamp, Jette, Ward, Kurlinski, et al., 2015; Beauchamp, Bean, Ward, Kurlinski, et al, 2015)



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3Ds – Gawande (2011)

- **D**ata Interest
- **D**ecide on Solutions/Audiologist using data
- **D**isseminate Information



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VALUE BASED CARE – PATIENTS NEED DATA TO MAKE DECISIONS (Accountable)

- QUALITY
- COST
- TIME



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Data (Jette, 2015)

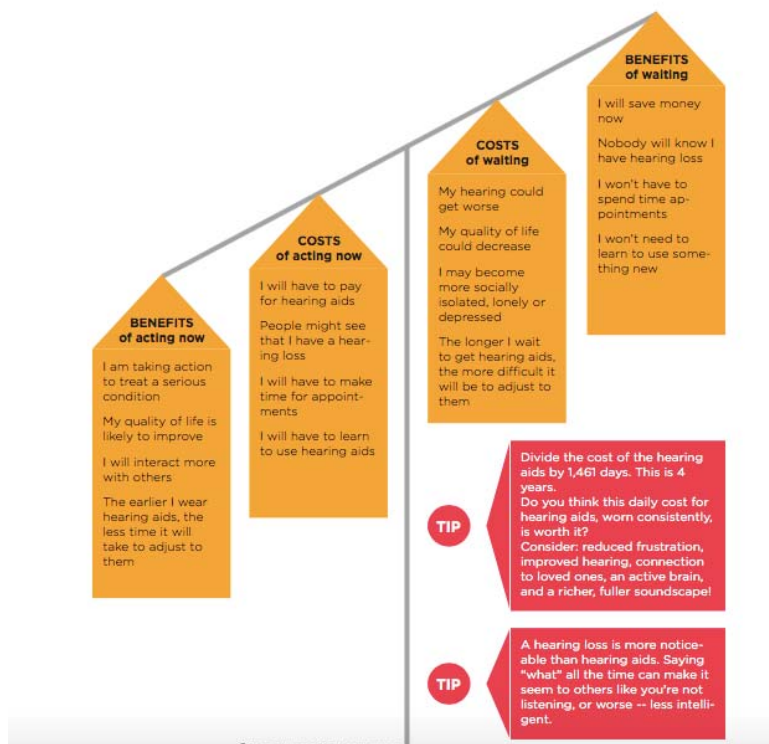
- Measure in Real Time the Value of the Care we Provide
 - WHAT SOLUTIONS WORK FOR TREATING HEARING LOSS AND ATTENDANT PSYCHOSOCIAL DIFFICULTIES UNDER WHAT CIRCUMSTANCES WHAT ARE THE OUTCOMES ACHIEVED AND AT WHAT COST?
 - INCORPORATE THE VIEW OF THE PATIENT IN TERMS OF IMPACT OF CONDITION ON PERSON'S LIFE



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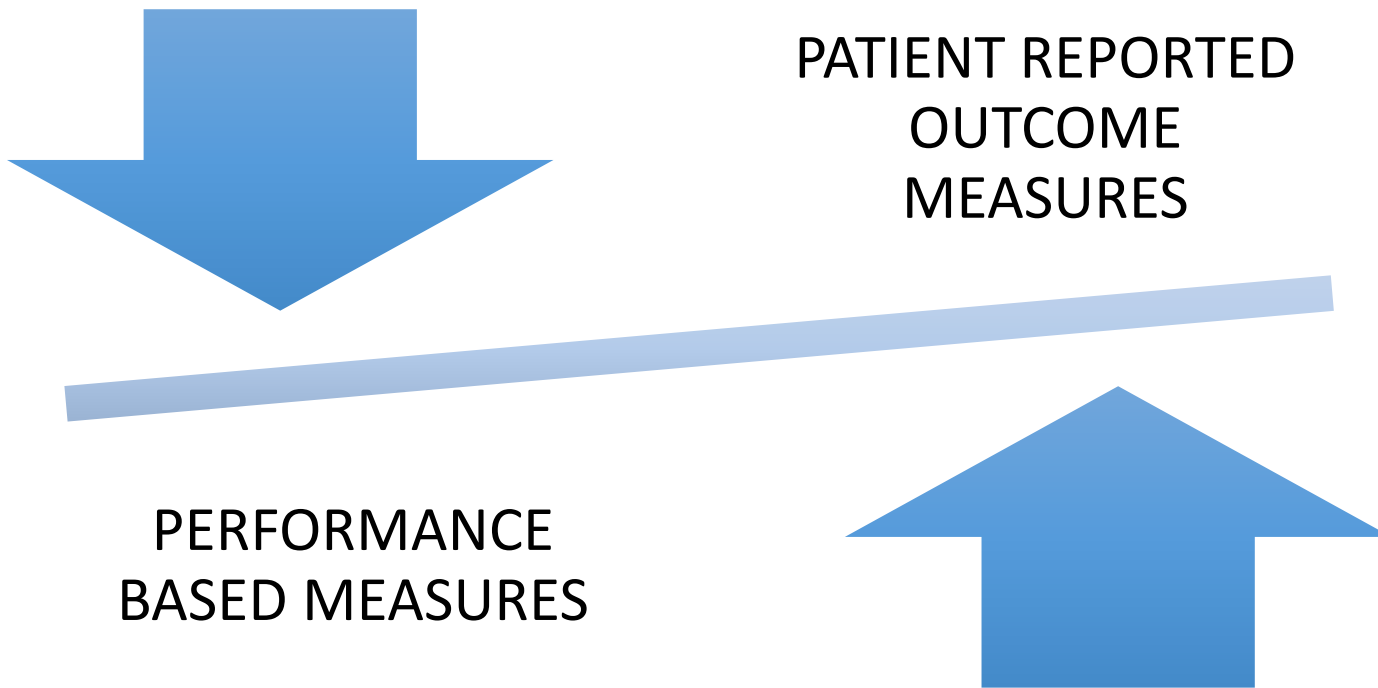




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Patient-Reported Outcome

- Any report of the status of a patient's health condition that comes directly from the patient or a caregiver or a surrogate, without interpretation of response by the clinician
- Specific, measurable, actionable, reliable, and time bound (SMART)
 - If a process or outcome cannot be measured it cannot be improved



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- “... any report of the status of a patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else.” (NQF)
- “ ... reports coming directly from patients about how they feel or function in relation to a health condition and its therapy...” (Cochrane)
- Universal health outcomes: “... reflect the important clinical effects of chronic conditions and their treatments...” (Tinetti et al. JAGS 2011)
- How hearing loss impacts trajectory of one’s life



PATIENT REPORTED OUTCOME MEASURES

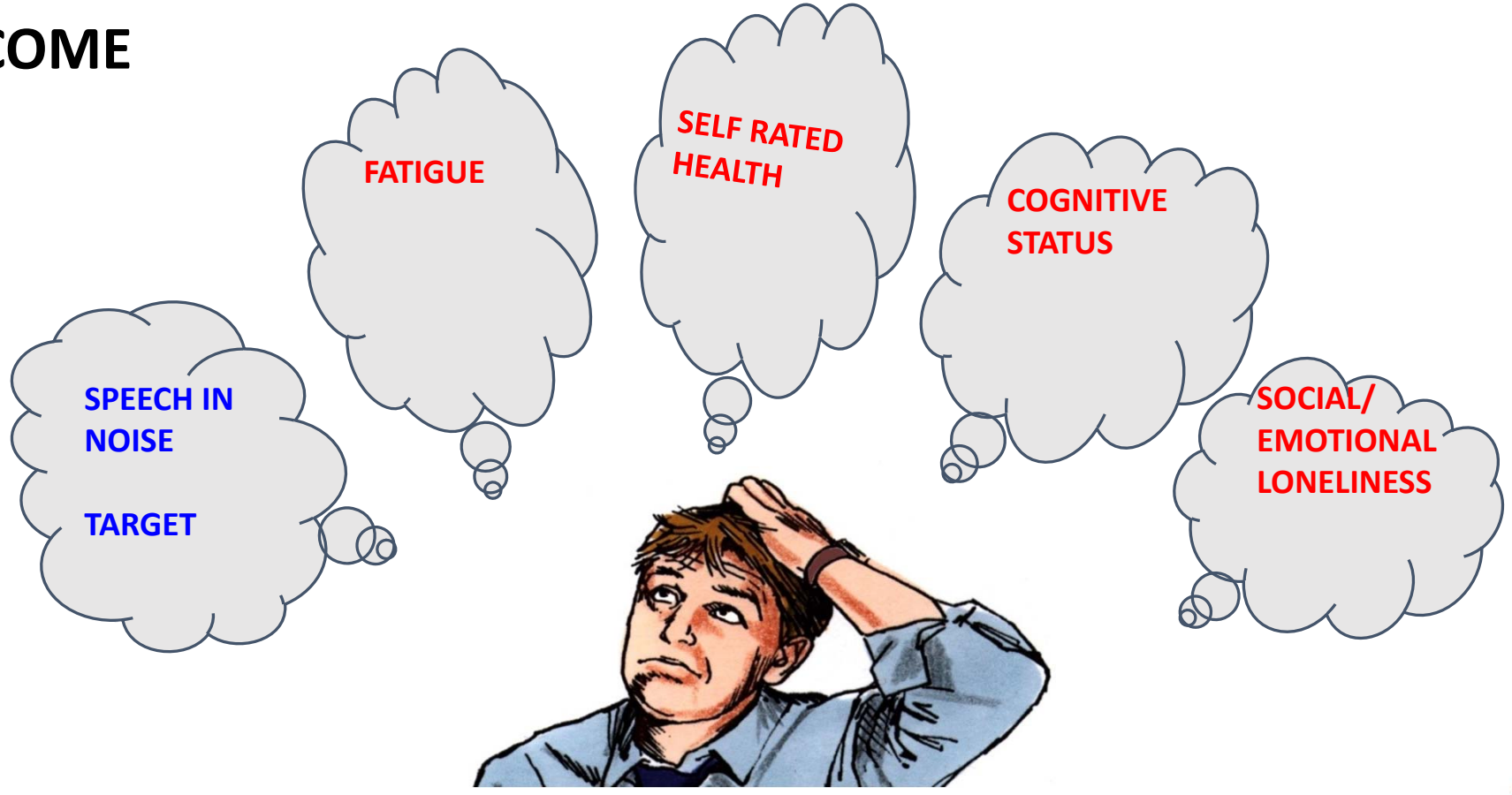


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WHICH PATIENT REPORTED OUTCOME



Slide 59

- 1 I do think we should perhaps discuss this here if time allows. Also, this is within the Ida Presentation- does that matter if I created it??
samantha morgan,

DOMAINS TO BE MEASURED (IOM, 2015)

Health Status

The Patient Experience

Care Costs, Efficiencies

Engagement in Health Care – Physician
Patient Communication



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Immediate Outcomes

- Improved speech understanding in noise
- Improved patient centered communication during hearing health care encounter
- Ease of listening enhanced
- Reduced self reported hearing handicap
- Social engagement increased
- Reduced loneliness/subjective social isolation
- Communicating in a Patient Centered Fashion

Intermediate Outcomes

- Increased patient self efficacy
- Improved physician patient communication
- Fewer depressive symptoms
- Improved cognitive status
- Improved self rated health
- Reduction in falls
- Reduced caregiver burden
- Fatigue level reduced

Health Outcomes

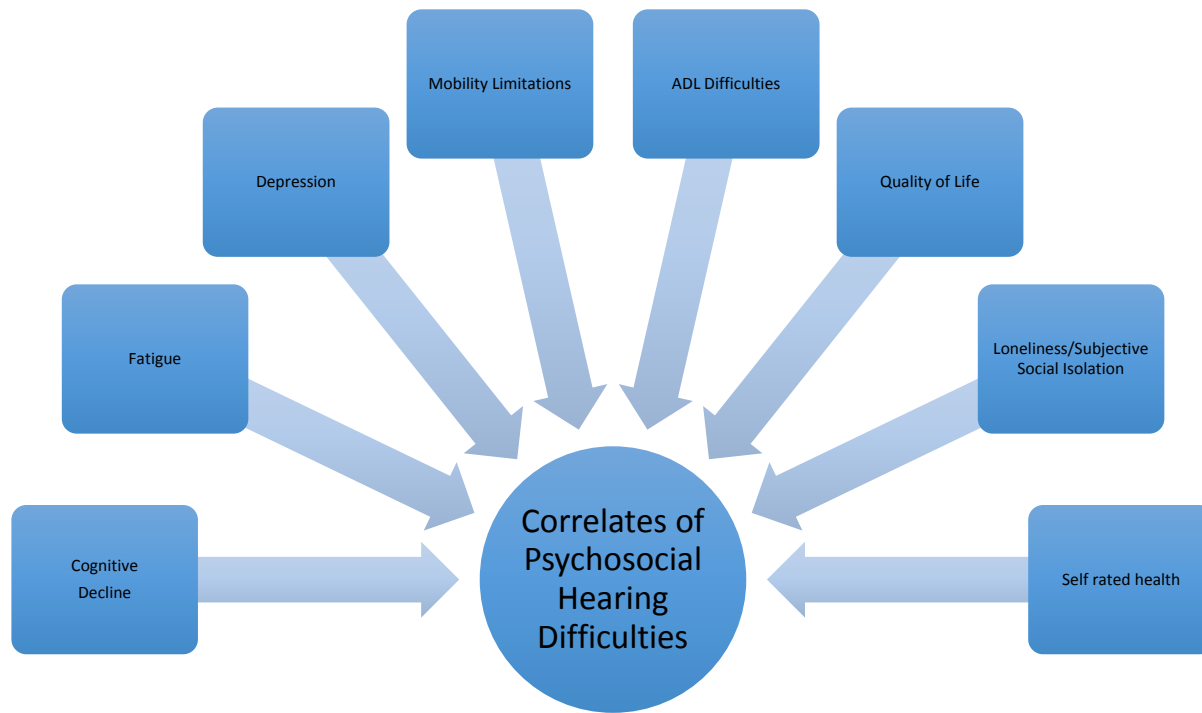
- Improved transitions in care
- Reduced health care expenditures
- Improved quality of life and well being
- Improved biologic outcomes
- Co-morbidity reductions
- Improved ratings of health care
- Reduced repeat hospitalizations

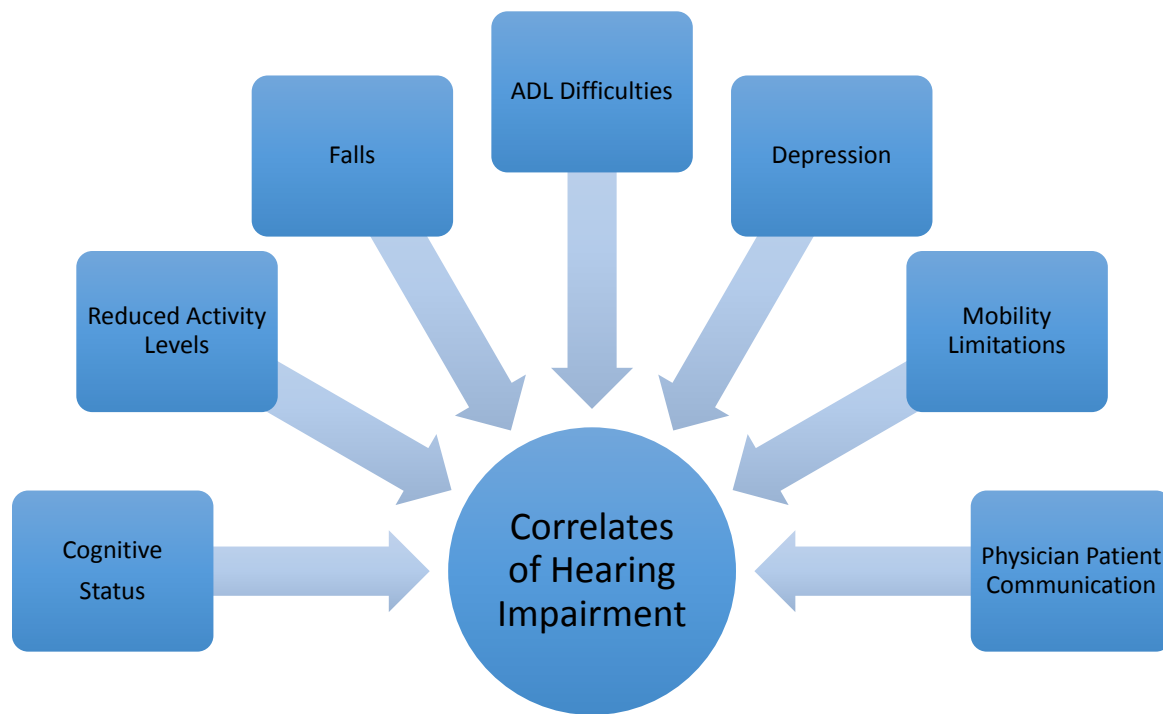


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PRO Measure (PROM)

- An instrument or scale or single item measure used to assess the PRO concept as perceived by the patient, obtained by directly asking the patient to self report



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- Patient reported outcome measures (PROMs) - quantify socially defined life activities
 - Inexpensive, convenient, and patient-centered
 - FDA – Outcomes conceptually grounded
- PROMs - help to demonstrate the impact of our interventions on daily life function (Beauchamp, Jette, Ward, Kurlinski, et al., (2015)
 - Bring perspective of patient, caregiver to center of care delivery and performance measurement
 - Help make the case for greater investment in hearing interventions



PROMs AT POINT OF CARE

- Facilitate shared decision making
- Monitor treatment across conditions
- Engage patients in prioritizing competing demands
- Symptom-based screening
- Potential metric for treatment decisions
- Simplify treatment approaches for both patients and clinicians



VALUE OF PROMs

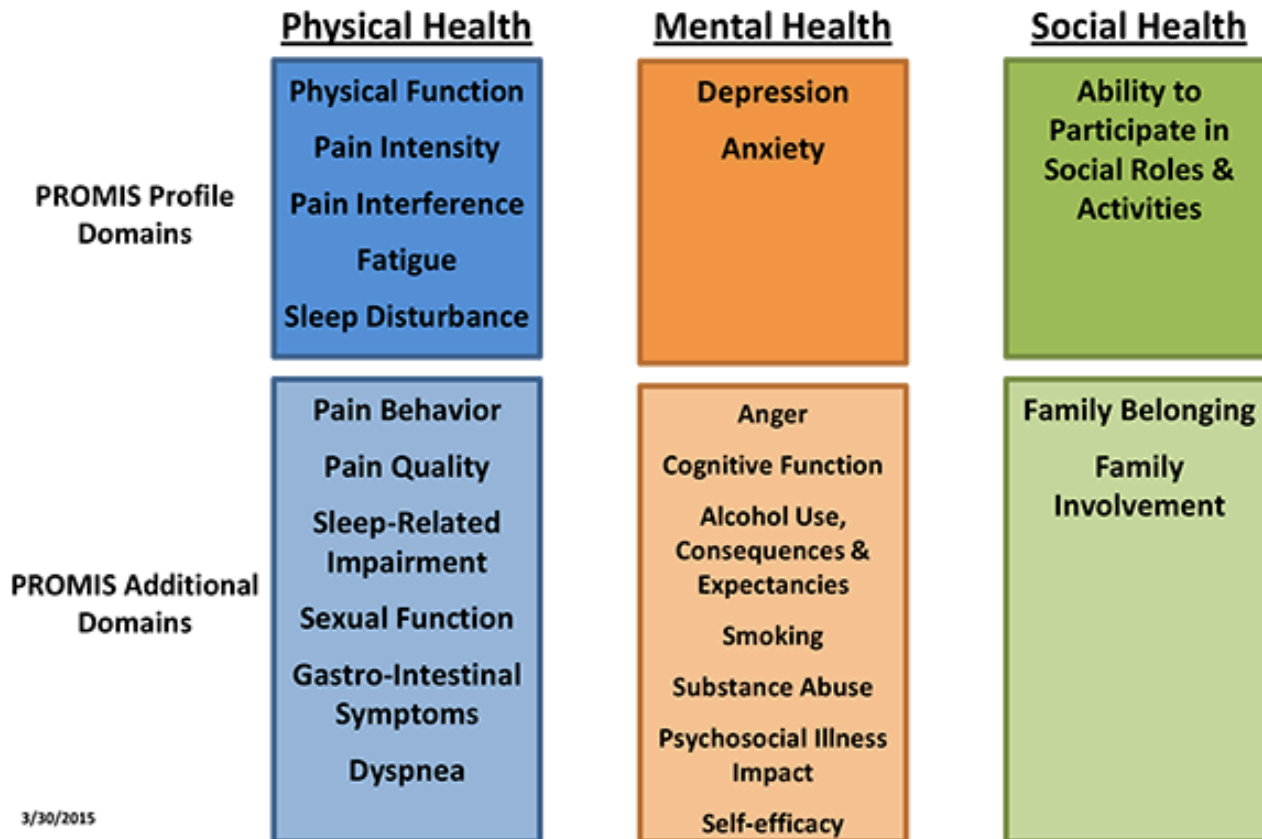
- Critical to assessing whether clinicians are improving the health of patients
- Attempt to capture whether the services provided actually improve patients' health and sense of well-being

]



PROMIS

(<http://www.nihpromis.org/measures/instrument-overview>)



3/30/2015



PRO-ADA

DOMAIN OF FUNCTION	MEASURE
FATIGUE	Multidimensional Fatigue Symptoms Inventory (MFSI-SF)
DEPRESSION	PHQ-9, PHQ-2
SELF RATED HEALTH	SF -12
SOCIAL/EMOTIONAL LONELINESS	DeJong Gierveld Loneliness Scale (11 item, 6 item)
FALLS	Falls History
COGNITIVE STATUS	MMSE, MoCA
DISABILITY LEVEL	ADL, IADL
PHYSICAL ACTIVITY LEVEL	Self Reported Physical Activity Levels
CAREGIVER BURDEN	Caregiver Burden Inventory (CBI), HHI-SP



ITEM BANK – PROMIS, NIH TOOLKIT

- **Fatigue**
- **Physical Function** (ability to carry out activities that require physical actions)
- **Depression**
- **Cognition**
- **Social relationships - ability to participate in social roles**
- **Psychological well-being**



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PATIENT CENTERED?

I provide my patients with the opportunity to tell me their journey/story and I pay careful attention to what they are saying

I ask thoughtful questions about their “journey” to help determine readiness to seek treatment for their hearing loss

I ask my patients what steps they feel they want to take to help hear and function better with their hearing loss

I offer my patients a variety of options for treating their hearing loss (other than hearing aids) and let them decide how they want to proceed

I ask my patients what steps they feel they want to take to help hear and function better with their hearing loss



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How Well Providers (or Doctors) Communicate with Patients

The survey asked patients how often their providers explained things clearly, listened carefully, showed respect, provided easy to understand instructions, knew their medical history, and spent enough time with the patient.

Q14	Provider explained things in a way that was easy to understand	Response Options <ul style="list-style-type: none">● Never● Sometimes● Usually● Always
Q15	Provider listened carefully to patient	
Q17	Provider gave easy to understand information about health questions or concerns	
Q18	Provider knew important information about patient's medical history	
Q19	Provider showed respect for what patient had to say	
Q20	Provider spent enough time with patient	



SF 12 (Ware et al, 1996)

- PCS - self-perceived quality of physical health
- MCS – self perceived quality of mental health
- Scores range between 0 and 100 with lower scores indicating higher levels of perceived disability, respectively



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Indexes of Disability In Relation to Self Care

- Activities of daily living (ADL; Katz et al, 1970)
 - Self care (DEATH)
- Instrumental activities of daily living (IADL; Lawton & Brody, 1969)
 - Independent living (shop, telephone, meds, etc.)



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FROM PROM to PRO-PM

- **PRO-based Performance Measure**

- How patient reported data are aggregated and interpreted to reflect performance



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PRO-Based Performance Measure (PRO-PM)

- A performance measure that is based on PROM data aggregated for an accountable health care entity
 - Proportion of hearing aid users with depression (e.g. initial PHQ-9 score > 9 who after three or six months of hearing aid use had a PHQ-9 score of <5 at follow-up)
 - Proportion of hearing aid users with psychosocial hearing difficulties (baseline score HHI > 18 who after three or six months of hearing aid use had an HHI score <10 at follow-up)
 - Proportion of hearing aid users with improved self rated health following three to six months of hearing aid use
 - Proportion of patients rating their patient experience/encounter as favorable



DISSEMINATION – USE DATA TO IMPROVE AND PROMOTE PRACTICE

- AGGREGATE DATA – BUILD A PORTFOLIO OF EVIDENCE FOR SCALABLE IMPROVEMENTS
- POSITIVE DEVIANCE – AGGREGATE DATA POSTED ON WEBSITE FOR MARKETING PURPOSES – DISSEMINATION OF INFORMATION
 - BEST PRACTICES, PRACTICE INNOVATION



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VALUE OF HEARING AIDS

PATIENT



Audiologist



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REDUCE CAREGIVER BURDEN

COGNITIVE STATUS??

REDUCE DEPRESSIVE
SYMPTOMS

REDUCE SOCIAL/EMOTIONAL
LONELINESS

IMPROVE SELF PERCEIVED
PSYCHOSOCIAL DIFFICULTIES



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Depression

- Hearing aid use - significantly associated with lower odds of major depressive disorder (MDD) and any depressive symptoms (Mener, Betz, Genter, & Lin, 2014)
- Frequent or regular use of hearing aids - associated with lower prevalence of depressive symptoms (Wang, Schneider, Burlutsky, et al., 2009)



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DEPRESSION (Boi, et al., 2012)

N=15	Baseline	One Month	Three Months	Six Months
Depression Scores (CES – D)	23.27	13.27	14.2	11.3
Caregiver Burden SF-36 (social functioning, social emotional, mental health scales)	10	7	7	3.8
	387	93%-moder to severe; 7% severe		523

Binaural, digital
 Wore units six to 12 hours/day
 Normal on MMSE and on ADLs



Protective effects of HA use against cognitive decline?



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COGNITIVE STATUS

- Rate of incident cognitive impairment - 11.1% for hearing-aid users versus 15.5% for non-users (11 year) (Dawes, et al., 2015)
- Hearing aid users and non users comparable on MMSE
- Not supportive of a robust effect of hearing-aid use as being protective against cognitive decline.



COGNITIVE STATUS (Amieva, 2015)

- Hearing loss (do you have hearing trouble?) (major, moderate, none)
 - Hearing impaired more co-morbidities, higher depression scores, higher level of dependencies
 - Poorer MMSE scores
- Persons with self rated hearing loss - greater cognitive decline over 25 year period
- Subjects reporting hearing loss not using hearing aids declined more rapidly on the MMSE than the hearing aid users
- Elderly adults with hearing loss using hearing aids - similar rates of cognitive decline as those with no hearing impairment



- Self rated hearing loss significantly associated with a lower score on MMSE and greater cognitive decline during 25-year follow-up period (independent of age, gender and educational level) (Amieva, 2015).



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- Cognitive decline in individuals with hearing impairment was no longer significant after controlling for depression, social network size, comorbidities, dependency, IADL
- There is no direct effect of hearing loss on cognitive decline but depressive symptoms and social isolation may mediate the association.

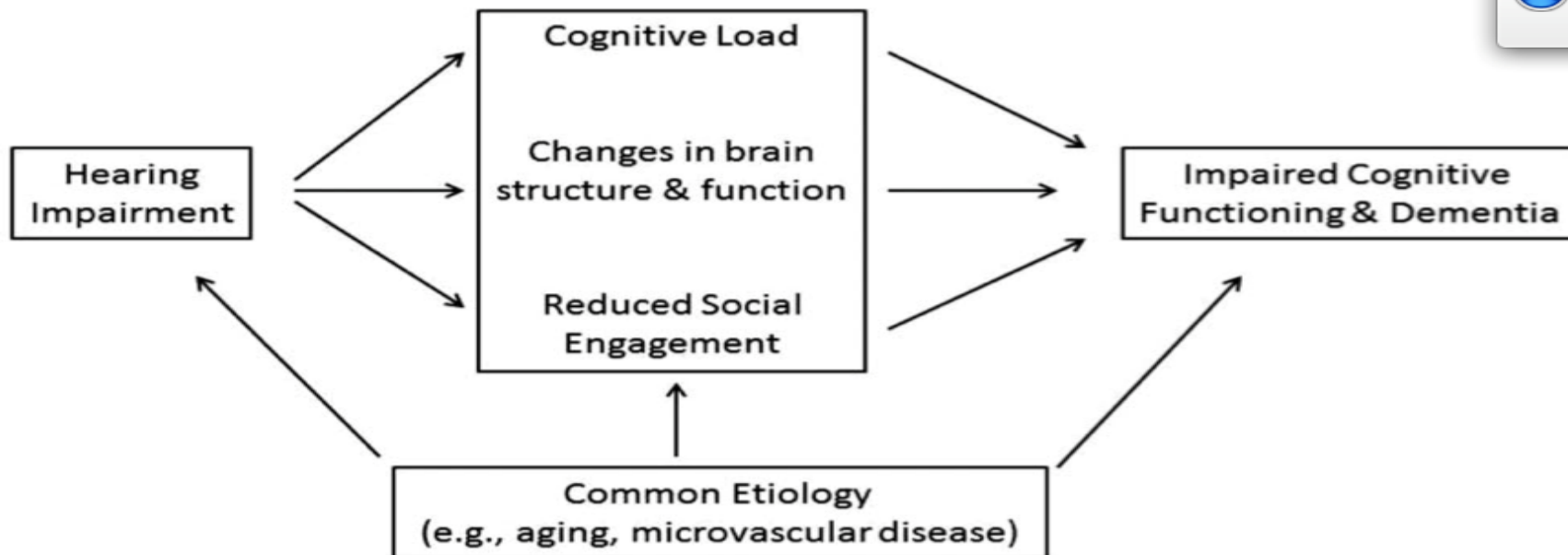


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Lin & Albert (2014)



- By partially restoring communication abilities, hearing aids may help improve mood, increase social interactions, and enable participation in cognitively stimulating abilities and consequently could slow cognitive decline



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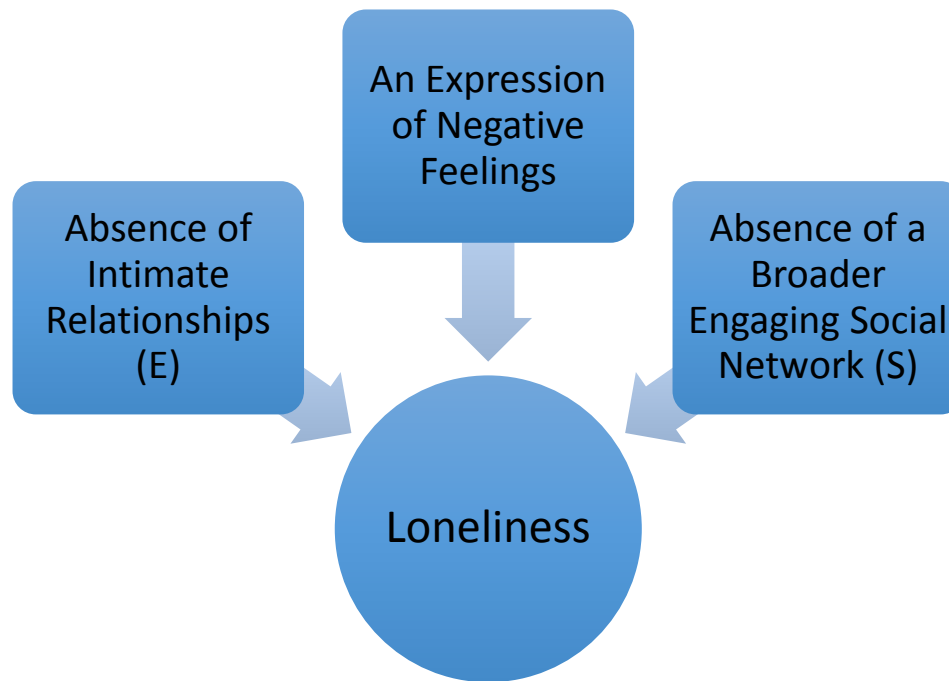
SOCIAL/EMOTIONAL LONELINESS



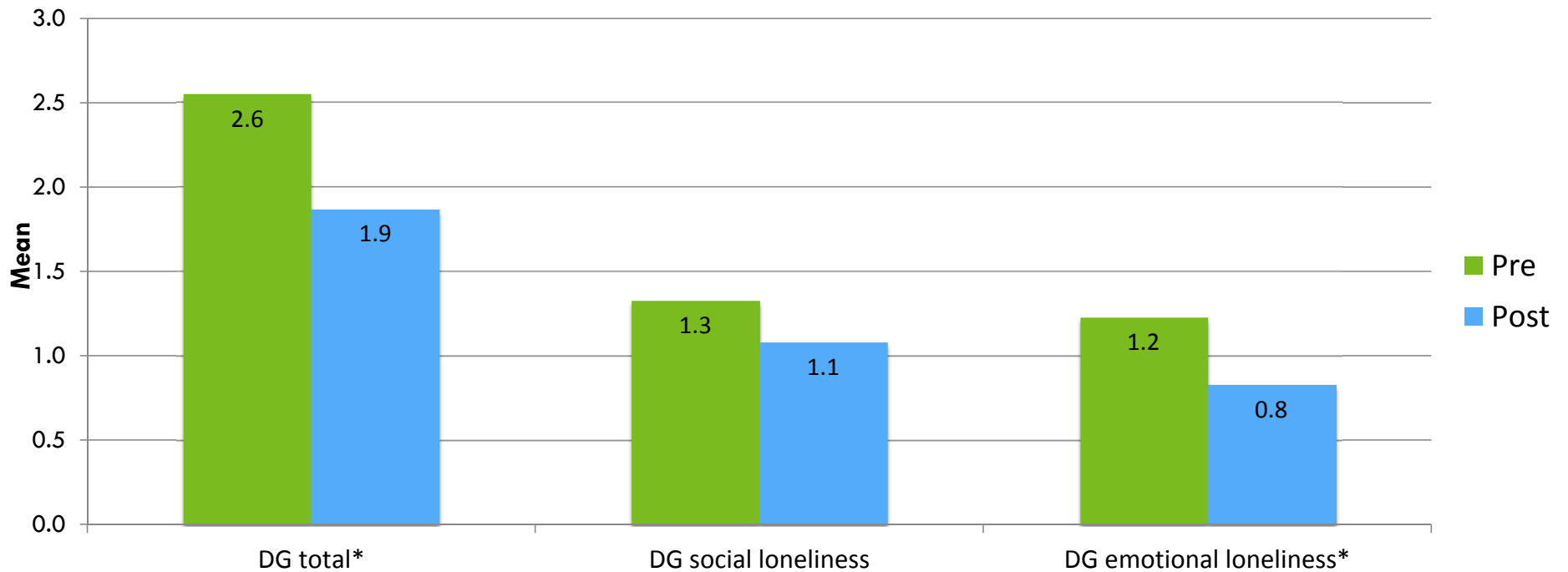
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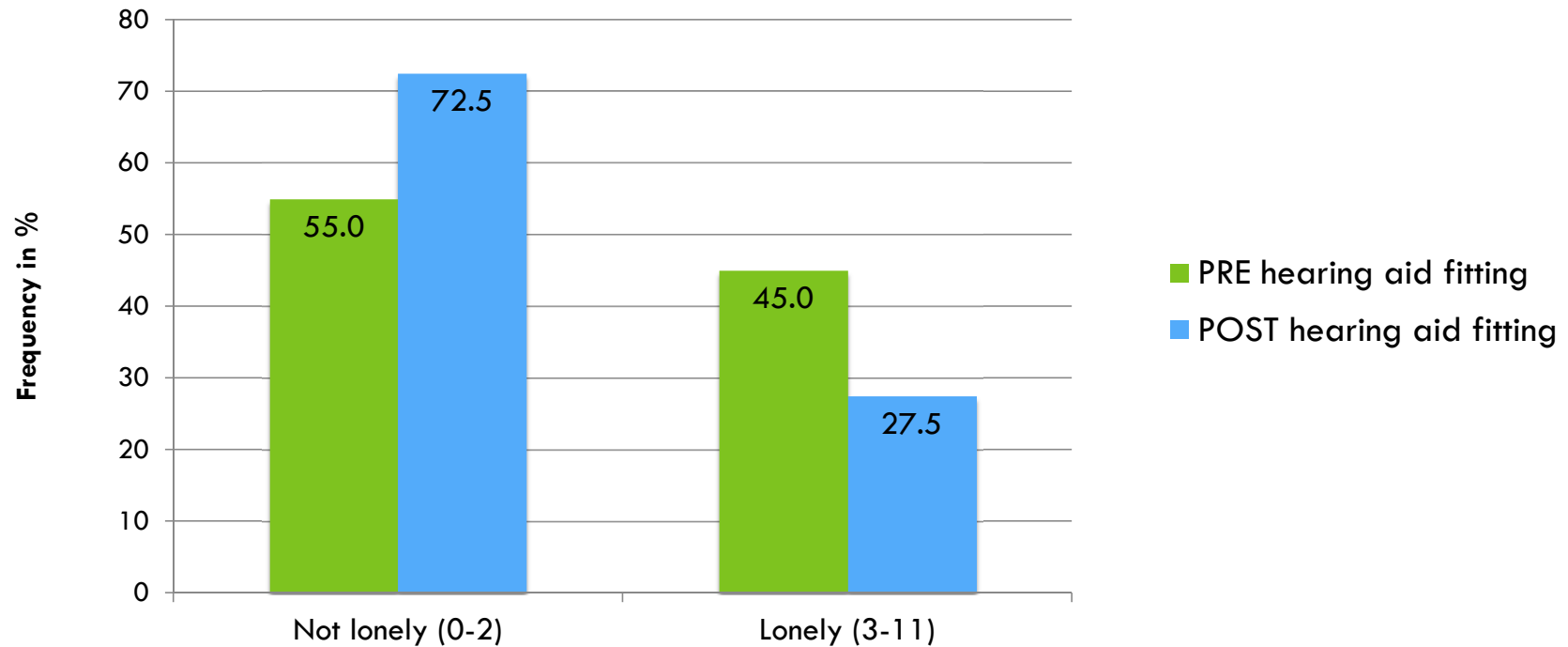




Outcomes on DG Loneliness Scale (N=40)



CHANGE IN SOCIAL/EMOTIONAL LONELINESS



Physical Functional Status

- Hearing-aid users - statistically significantly higher (better) mean SF-12 physical component score than non-users (Dawes, et al., 2015)
 - No association with mental health measures



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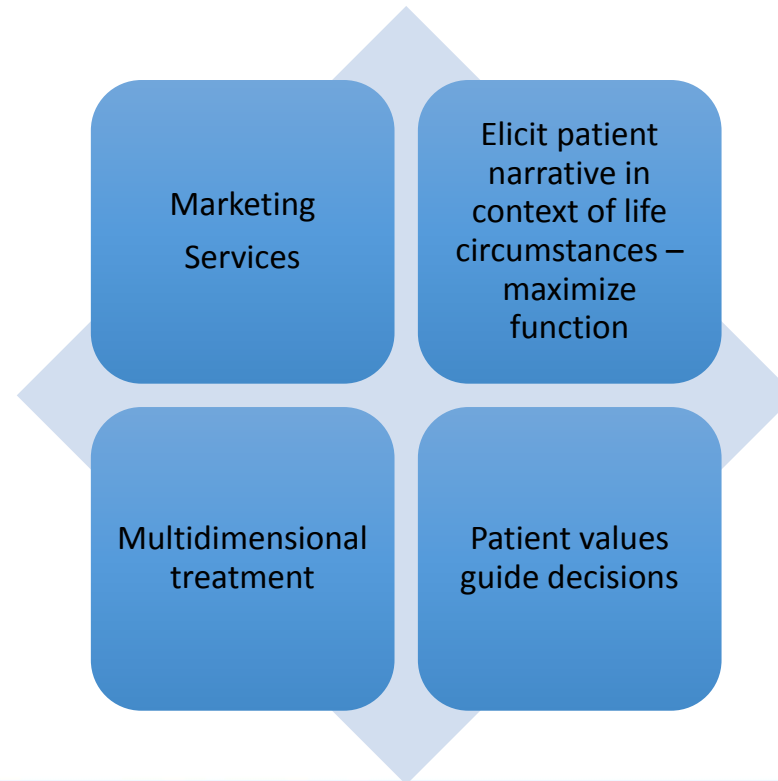


SELF RATED PSYCHOSOCIAL HEARING DIFFICULTIES - HHI

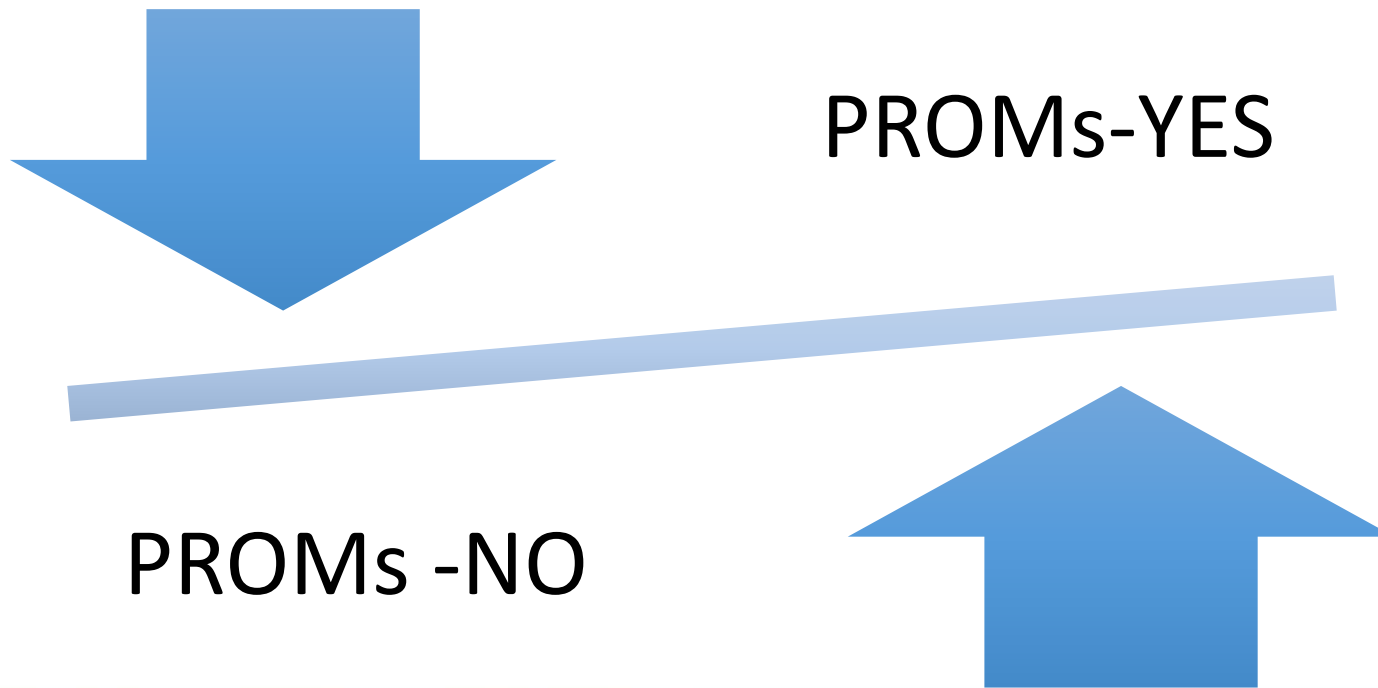
- Hearing aids associated with reduced handicap (Dawes, et al., 2015; Thoren, et al, 2015; Chisolm, et al., 2007))
- Hearing-aid users may still experience significant levels of handicap after hearing aid use (Thoren, et al., 2015; Dawes, et al., 2015
- E Rehab effective in reducing residual disability



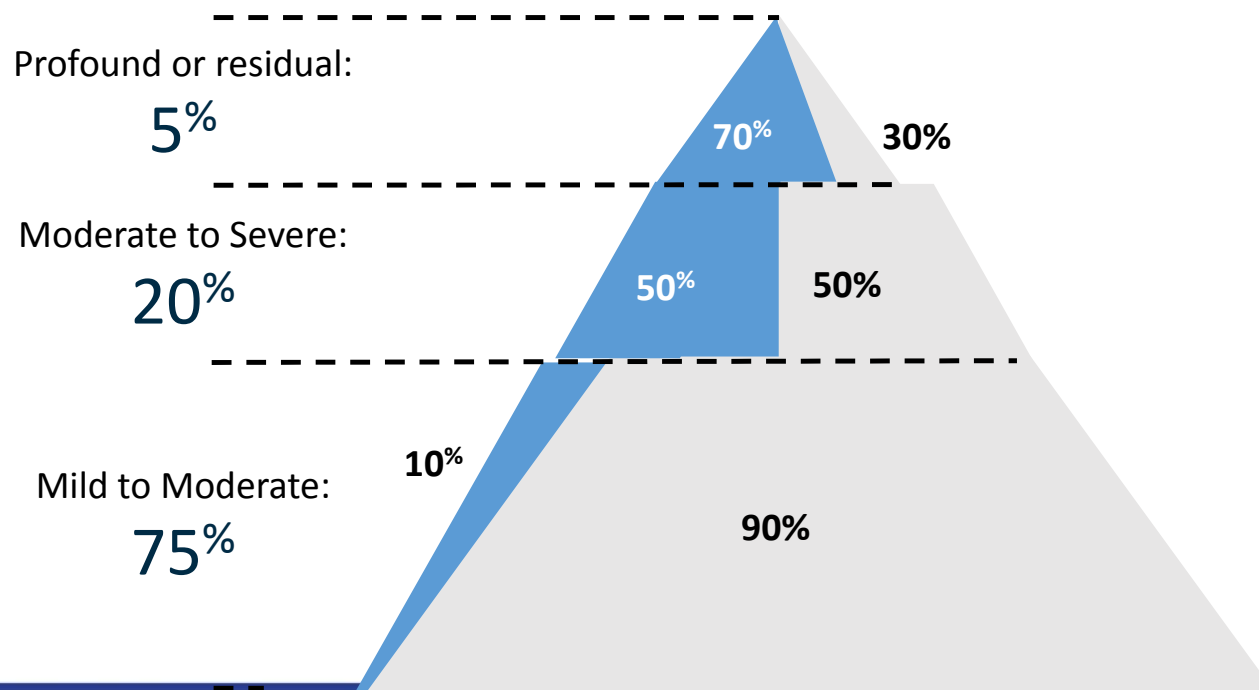
INGREDIENTS FOR CLINICAL PRACTICE



AUDIOLOGIST DECISION AID (ADA)



The Unmet Need



Questions



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