

# OUTCOME MEASURES:

Making sure your patient ends up in the right place

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Yogi Berra was a great baseball catcher and manager, and at the age of 89, he is an often-quoted philosopher. His advice concerning knowing where you're going is particularly appropriate for hearing care providers; that is, if you don't create treatment plans based on your patients' needs and measure the success of those treatment plans, your patients may end up in the wrong place — with hearing aids that they don't want and features that are not resolving their problems. This is why we measure the outcomes of treatment — to ensure that patients end up in the *right* place. What is the right place? That's where patients perceive that your treatment has met their goals and they are satisfied with your care including any devices you've prescribed and the follow-up care you've provided. The only way you'll know that your patients are in the right place is by measuring where they are using *outcome measures*.

Audiology-based outcomes can be measured across several different classifications, or *domains*. We'll review a few of these domains here and include a description of what each measures along with tools that you can readily access so you can start measuring the outcomes of your treatment tomorrow. Before we talk about how to measure where we "wind up," let's first discuss where we begin. Establishing the needs of the patient *from the patient's perspective* is perhaps the most critical part of the clinical process, and it should begin at the first visit.

## COSI

The Client Oriented Scale of Improvement (COSI) is an elegantly simple tool that, when used properly, can effectively identify and prioritize patients' needs (another way of saying "goals") by asking the patient to describe what problems they are experiencing and what they expect to achieve from your treatment (Dillon, James & Ginis, 1997). For example, Ms. B. comes to your clinic because she is having increasing trouble hearing. You find out that she's a retired school teacher and volunteers in the gift shop of the

local hospital, where she finds it hard to understand the customers. When you question her further, she also admits to having to turn up the TV louder than her husband prefers and having difficulty understanding what is being bid at her weekly bridge game. So let's fill in Ms. B.'s goals, which are listed on the COSI form in order of priority under "Specific Needs" as illustrated in Figure 1.

Specific Needs	Worse	No Difference	Slightly Better	Better	Much Better	Very Good	Excellent	Final Ability (with hearing aid)
1. I WANT TO BE ABLE TO UNDERSTAND THE CUSTOMERS AT THE HOSPITAL GIFT SHOP.				<input checked="" type="checkbox"/>				10%
2. I WANT TO HEAR THE TV AT A VOLUME THAT IS COMFORTABLE FOR MY HUSBAND.				<input checked="" type="checkbox"/>				25%
3. I WANT TO UNDERSTAND MY PARTNER'S BID WHEN I PLAY BRIDGE.					<input checked="" type="checkbox"/>			50%

Figure 1: A COSI example.

The beauty of the COSI is that it not only identifies your patient's needs, but also creates a road map for your treatment decisions (hearing aid style, technology level, features and accessories, as well as post-fitting considerations) so that you optimize the chances of winding up in the "right place" early on. The other valuable feature of the COSI is that it can be used as an outcome measure. We can measure the extent to which the patient's goals have been satisfactorily achieved. Ms. B. returns to the clinic 30 days after her hearing aid fitting. We ask her to review the goals that we established at her initial visit, and the results we get are illustrated in Figure 1. The first checked column indicates the extent to which Ms. B. perceives improvement in each of the identified situations; the second checked column indicates the amount of remaining difficulties she is experiencing in those situations and could be used to identify additional strategies to further improve her outcomes, such as providing auditory training or remote microphone technology.

Additional information and instructions concerning the COSI can be downloaded at [http://www.nal.gov.au/outcome-measures\\_tab\\_cosi.shtml](http://www.nal.gov.au/outcome-measures_tab_cosi.shtml).

## HHIE, APHAB, AND SSQ

The COSI is an example of an outcome measure that assesses the impact of hearing loss and its interventions on an individual's ability to actively participate in desired activities. The World Health Organization (WHO) refers to this "disability" as activity limitation and participation restriction (WHO, 2001). Other commonly used measures that assess activity limitation and participation restriction are the Hearing Handicap Inventory for the Elderly (HHIE), the Abbreviated Profile of Hearing Aid Benefit (APHAB) and the Speech, Spatial and Qualities of Hearing Scale (SSQ).

The HHIE is a 25-item questionnaire that asks questions across two different domains — emotional and social (Ventry & Weinstein, 1982). An example of an emotional domain item is, "Does a hearing problem make you feel embarrassed when you meet new people?" The answer to each question is scored with four points for a "yes" answer, two points for a "sometimes" answer and zero points for a "no" answer. The points are added together; the higher the total score, the greater the self-perceived impact of hearing loss. The HHIE is administered again several weeks after the hearing aid fitting, and the difference score is an indication of the measure of benefit. The HHIE is a brief, easily understood questionnaire. Many clinics will attach the HHIE to a clipboard that patients complete at the beginning of every visit (Figure 2).

	YES (4)	SOME- TIMES (2)	NO (0)
S-1. Does a hearing problem cause you to use the phone less often than you would like?	—	—	—
E-2. Does a hearing problem cause you to feel embarrassed when meeting new people?	—	—	—
S-3. Does a hearing problem cause you to avoid groups of people?	—	—	—
E-4. Does a hearing problem make you irritable?	—	—	—
E-5. Does a hearing problem cause you to feel frustrated when talking to members of your family?	—	—	—

Figure 2: HHIE example.

The APHAB is a 25-item questionnaire where each question represents a specific listening situation across four different subscales: ease of listening, reverberant environments, background noise and aversiveness of sounds (Cox & Alexander, 1995). The patient responds on a five-level scale ranging from "never" to "always" for each of the described situations — for example, "When I am in a crowded grocery store talking with the cashier, I can follow

the conversation ..." The responses are scored manually or via a software program. The lower the score is, the greater the self-perceived disability. As with the HHIE, the APHAB is readministered following treatment to obtain a measure of benefit. The APHAB is one of the few outcome measures that has a normative reference scale. The benefit of a normed scale is the added convenience of referencing a single patient's score against the scores of a larger group of people in order to understand how closely they rate themselves as compared to the average patient. The APHAB is available as part of the NOAH 4.0 software.

The APHAB can be downloaded at: <http://www.harlmemphis.org/index.php?CID=130>.

The SSQ measures self-perceived disability across three domains: speech intelligibility, spatial hearing and speech quality (Gatehouse & Noble, 2004). An example of a question on the spatial hearing subscale is, "You are sitting in between two people. One of them starts to speak. Can you tell right away whether it is the person on your left or your right without having to look?" The patient responds on a 10-level scale from "not at all" to "perfectly" and the points are added to measure self-perceived difficulties in each of the three subscales (Figure 3). An increase in the post-treatment scores provide a measure of benefit.

The SSQ can be downloaded here: <http://www.ihr.mrc.ac.uk/products/display/ssq>.

NAME	CONDITION	DATE
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?	Not at all 0 1 2 3 4 5 6 7 8 9 10 Min Max	Perfectly tick if not applicable did not use <input type="checkbox"/> <input type="checkbox"/>
2. You are talking with one other person in a quiet, carpeted lounge room. Can you follow what the other person says?	Not at all 0 1 2 3 4 5 6 7 8 9 10 Min Max	Perfectly tick if not applicable did not use <input type="checkbox"/> <input type="checkbox"/>
3. You are in a group of about five people, sitting round a table. It is an otherwise quiet place. You can see the person you are talking to.	Not at all 0 1 2 3 4 5 6 7 8 9 10 Min Max	Perfectly tick if not applicable did not use <input type="checkbox"/> <input type="checkbox"/>

Figure 3: SSQ example.

## SADL, GHABP AND DOSO

In addition to measuring outcomes in the activity limitation and participation restriction domains, we might also be interested in evaluating our patient's satisfaction with our service and devices. The SADL and DOSO are two such measures. The Satisfaction with Amplification in Daily Life (SADL) is a 15-item, post-fitting measure that assesses satisfaction across four subscales: positive effect, service and cost, negative features and personal image (Cox & Alexander, 1999). An example of a service and cost question is, "How competent was the person who provided you with your hearing aid(s)?" The patient responds on a seven-level

scale ranging from “not at all” to “tremendously” (Figure 4). One of the benefits of using the SADL is that you can compare your patient’s responses against norms that were established as part of the development of the test.

The SADL can be downloaded here:  
<http://www.harlmemphis.org//index.php?CID=131>.

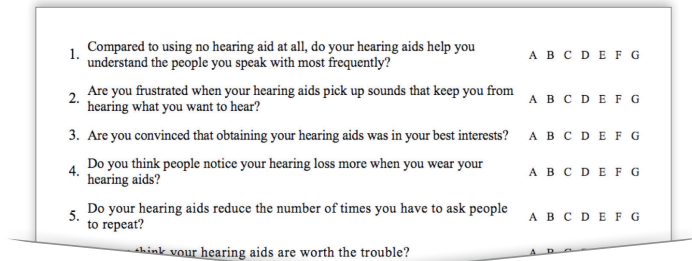


Figure 4: Excerpt from the SADL.

The Glasgow Hearing Aid Benefit Profile (GHABP) combines the questionnaire format of the APHAB and HHIE with the open-ended features of the COSI (Gatehouse, 1999). Patients respond to questions representing four different listening environments: TV, conversing with one other person, conversing on a busy street or in a busy shop, and conversing with several people in a group. For each situation, patients respond on a five-level scale indicating how much difficulty they are experiencing; how worried, annoyed or upset they are; the proportion of time they wear their hearing aids; how much the hearing aids helped; and how satisfied they are with their hearing aids (these last three are administered post-treatment). Furthermore, the patients can identify up to four additional situations (similar to the COSI) that are not represented by the initial four.

The GHABP can be downloaded here:  
<http://www.ihr.mrc.ac.uk/products/display/questionnaires>.

The Device Oriented Subjective Outcome Scale (DOSO) is a 25-item, post-fitting questionnaire that is a device-specific outcome measure; that is, the questions are directed toward measuring the benefits of the device rather than toward measuring the effects of the device on modifying the effects of the hearing loss (Cox, Alexander & Xu, 2009). An example of a DOSO item is, “How good are the hearing aids at cutting out background noise in a restaurant?” The scoring is similar to that of the SADL — a seven-level scale ranging from “not at all” to “tremendously” and can be subdivided into six subscales: speech cues, listening effort, pleasantness, quietness, convenience and use (Figure 5).

The DOSO can be downloaded here:  
<http://www.harlmemphis.org//index.php?CID=148>.

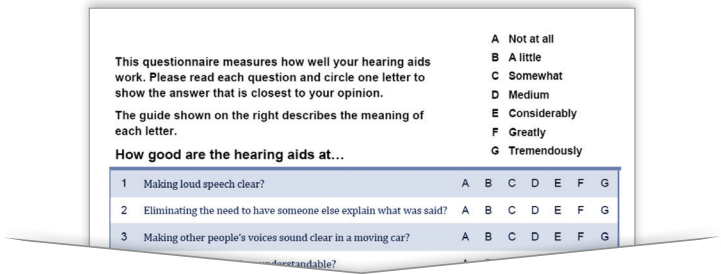


Figure 5: Excerpt from the DOSO.

We’ve talked about outcome measures that assess activity limitation, participation restriction, disability and satisfaction. Wouldn’t it be great if a single measure could capture each of these domains? There are several that do — the GHABP described earlier and the International Outcomes Inventory for Hearing Aids (IOI-HA) (Cox, Alexander & Beyer, 2003). The IOI-HA consists of seven questions, each addressing different outcome domains: activity limitation, participation restriction, satisfaction, quality of life and device usage — for example, “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)?” The patient responds on a scale from “none” to “more than eight hours a day” (Figure 6). Speaking of usage, hours of hearing aid use is an important outcome measure. While it’s difficult to associate a given amount of benefit with a given number of hours of use, we do know that there will be no benefit achieved if the hearing aid is not being used at all; however, we don’t necessarily need a questionnaire to determine hours of use — onboard data-logging can provide that information readily. Often, it’s instructive to compare a self-report of hearing aid use with the data-logging information. Like the HHIE, the IOI-HA is easily understood and quickly completed. It is probably the most widely used outcome measure (it’s been translated into 24 different languages) and can be easily placed on a clipboard for patients to complete.

The IOI-HA can be downloaded here:  
[http://www.icra.nu/?page\\_id=61](http://www.icra.nu/?page_id=61).

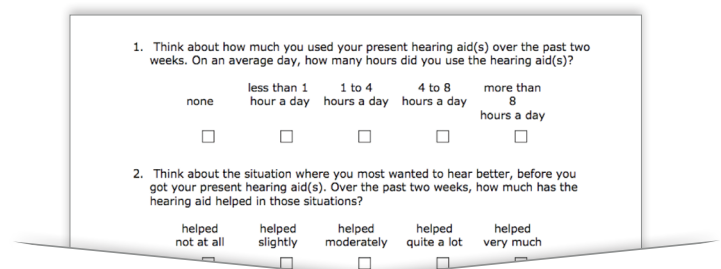


Figure 6: Excerpt from the IOI-HA.

## CONCLUSION

The options and proliferation of outcome measures can be a confusing alphabet soup for busy clinicians. So here is a recommended outcome measurement protocol for you to start using tomorrow that is easy to administer and will effectively measure the benefits of your treatment:

**Pre-treatment:** Sit down with your patients and establish their three most important treatment goals using the COSI. This will assist you in understanding their needs in order to prioritize treatment strategies. Remember to be as specific as possible. "Hearing better in noise" is not as effective a goal as "I want to understand my wife when we eat lunch at our favorite restaurant after church each Sunday."

**30 days post-treatment:** Re-administer the COSI. If your patient's primary goals have not been met, revise treatment (add auditory training, remote microphone technology, etc.) and check again in another 30 days.

**90 days post-treatment:** Administer the IOI-HA and compare your patients' responses to published norms.

And if you're still undecided about what to do, just follow Berra's advice: "If you come to a fork in the road, take it."

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