

Teleaudiology: The future of audiology?

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<http://www.ncrar.research.va.gov/>



Goals for this presentation

- **State of the art of teleaudiology**
- **Implications**
- **Research needs**

Definition: Teleaudiology

Teleaudiology is 'the delivery of audiology services and information via telecommunications technologies'

IMPORTANT POINT:

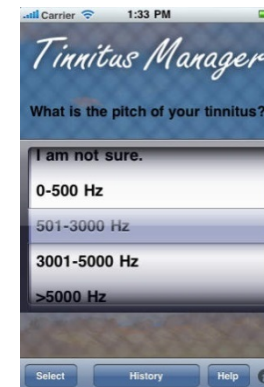
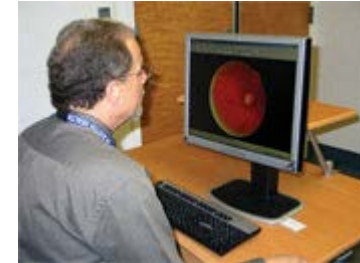
Technology is used as the means to an end.

Telemedicine/teleaudiology is not a separate subspecialty

American Telemedicine Association

Telemedicine methodologies

- **Store and forward:** Video otoscopy and automated testing for later interpretation (audiometry, immittance, OAE, ABR).
- **Synchronous/Real time:** Hearing tests, hearing aid fittings, audiologist-directed real-ear measures, hearing aid counseling, tinnitus management.
- **Remote monitoring:** Hearing aid data logging, OtoID to monitor hearing sensitivity changes.
- **Mobile health:** Online auditory training programs, tinnitus management apps, hearing test apps, counseling apps.



A couple of successful programs

- Alaska Federal Healthcare Access Network (AFHCAN)



- VA teleaudiology program



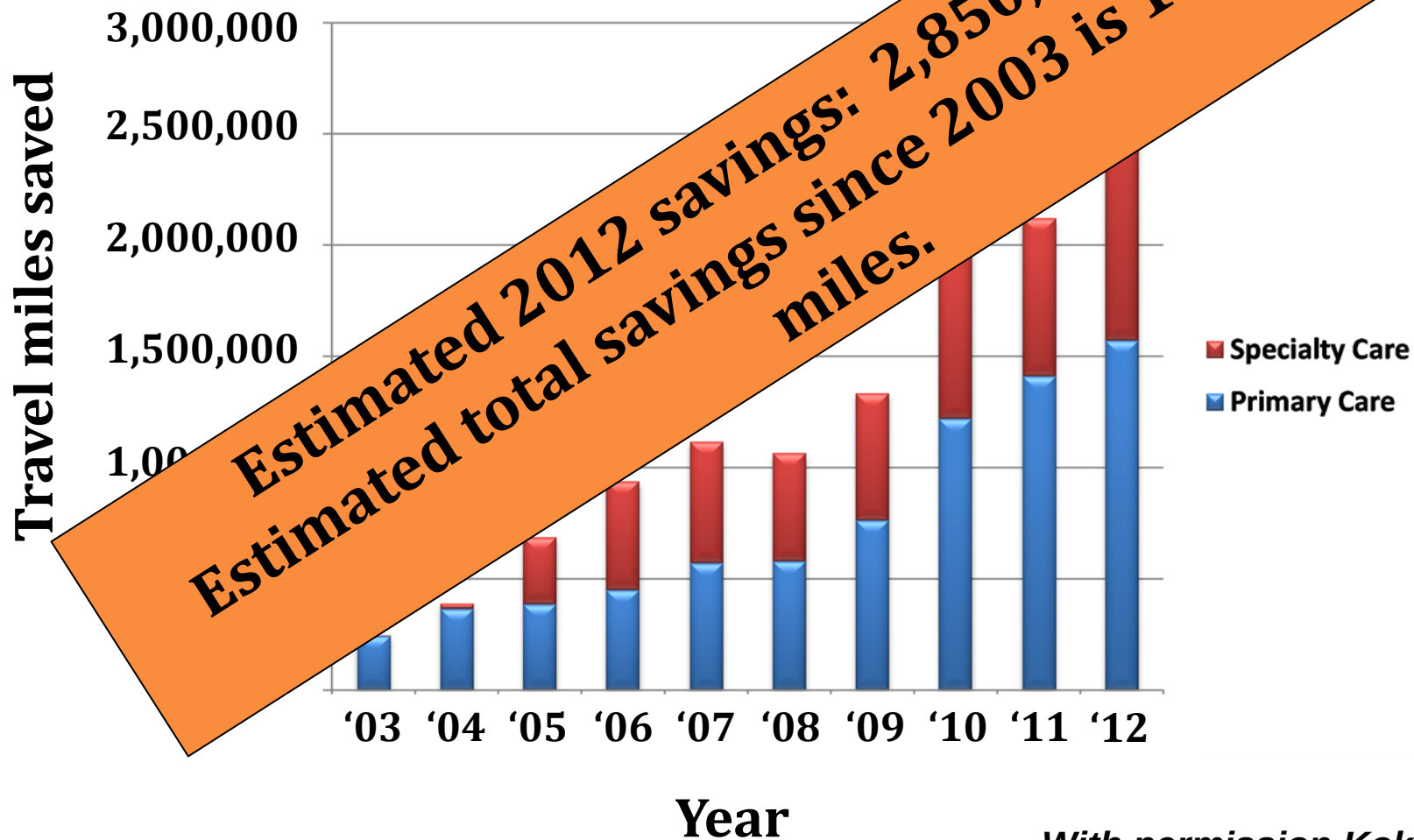
Alaska Federal Healthcare Access Network (AFHCAN)

- **Established in 1998**
- **Provides services to 180 Alaska Native community village clinics, 25 subregional clinics, 4 multiphysician health centers, 6 regional hospitals, and the ANMC in Anchorage.**

Audiology/ENT practice:

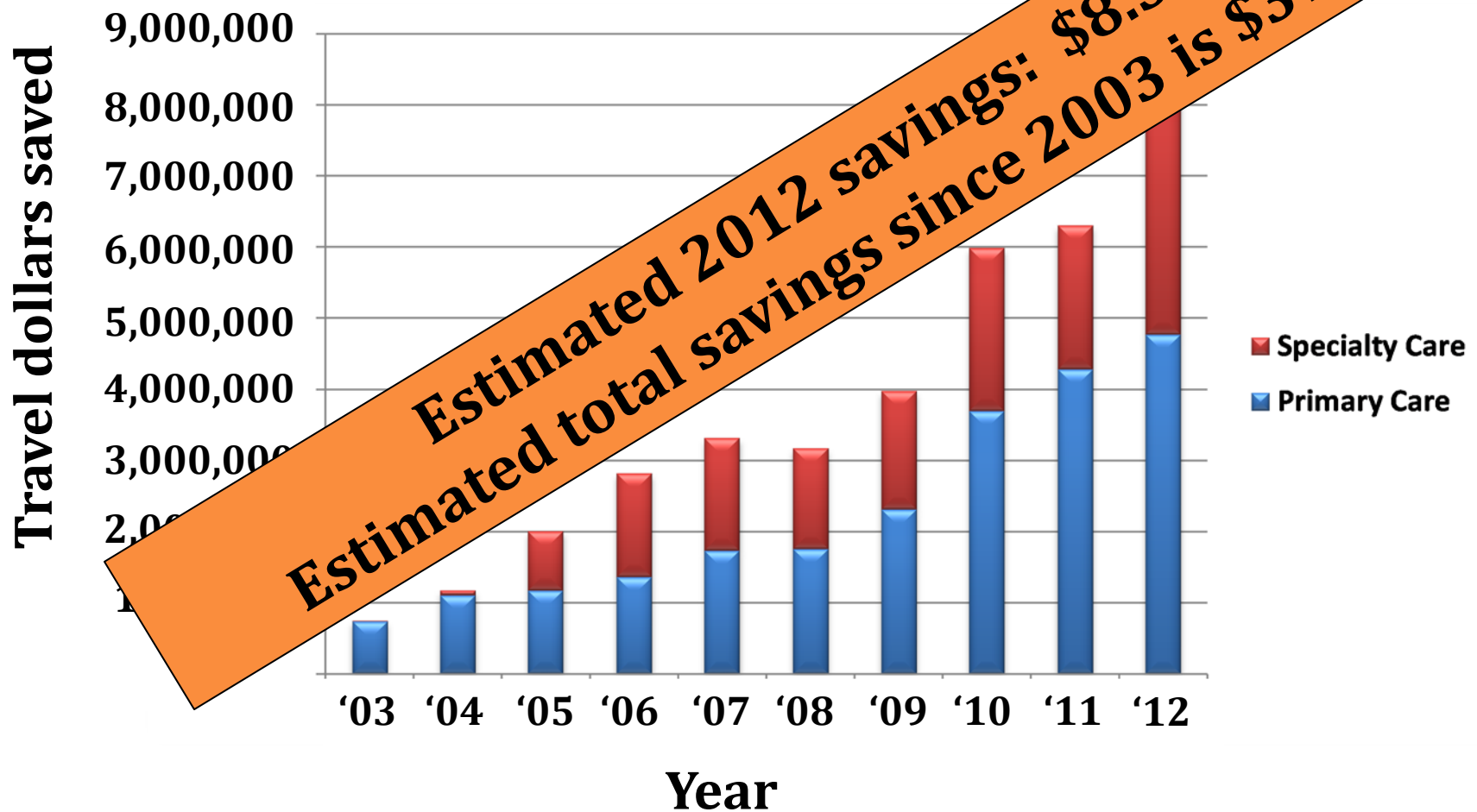
- ✓ **Video otoscopy**
- ✓ **Audiometry**
- ✓ **Tympanometry**
- ✓ **Hearing aid clearance**
- ✓ **Follow-up to surgery (e.g. tubes)**

Estimated travel savings in miles from telehealth for ALL Patients



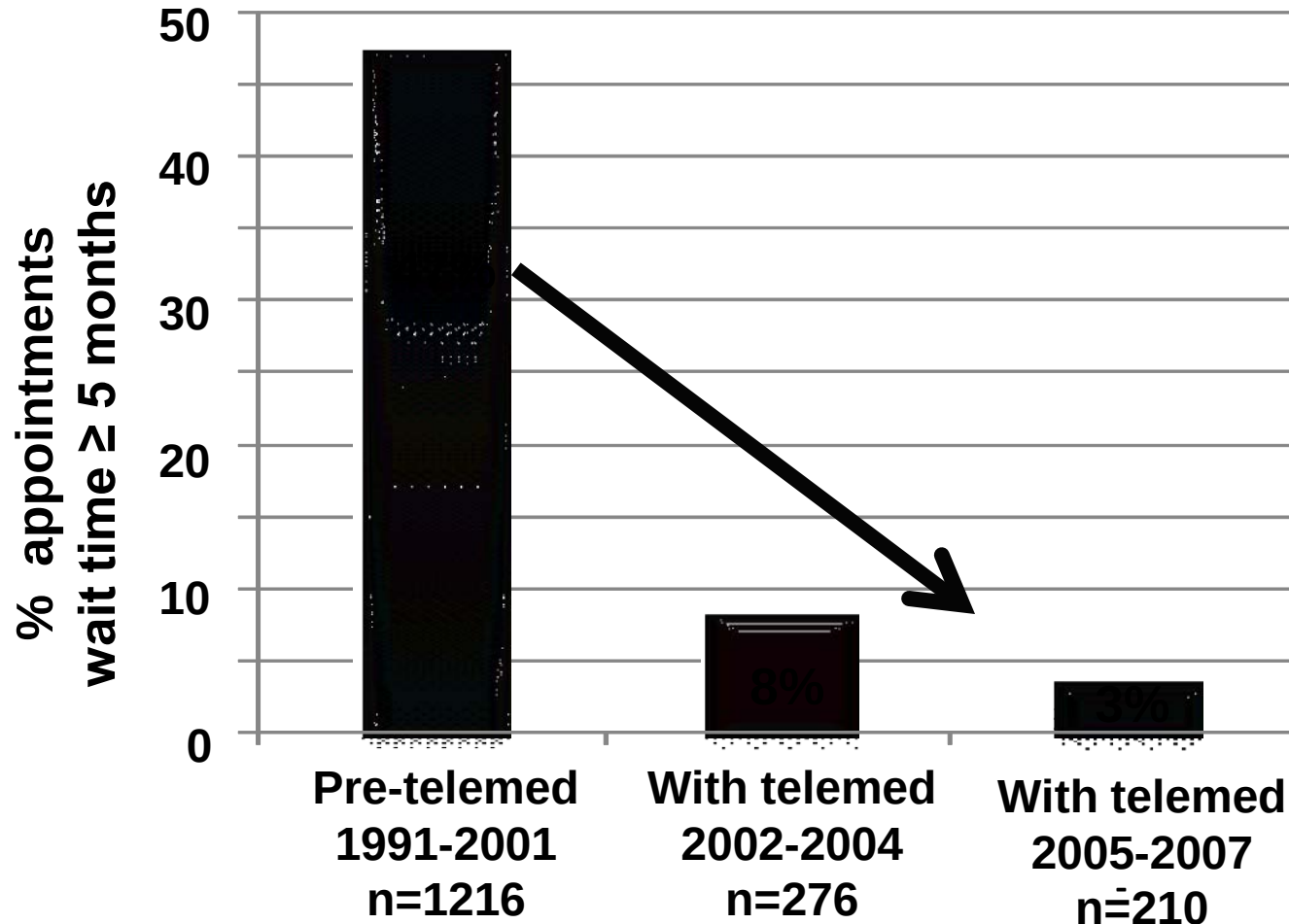
With permission Kokesch (2013)

Estimated travel savings in \$\$\$ from telehealth for ALL Patients



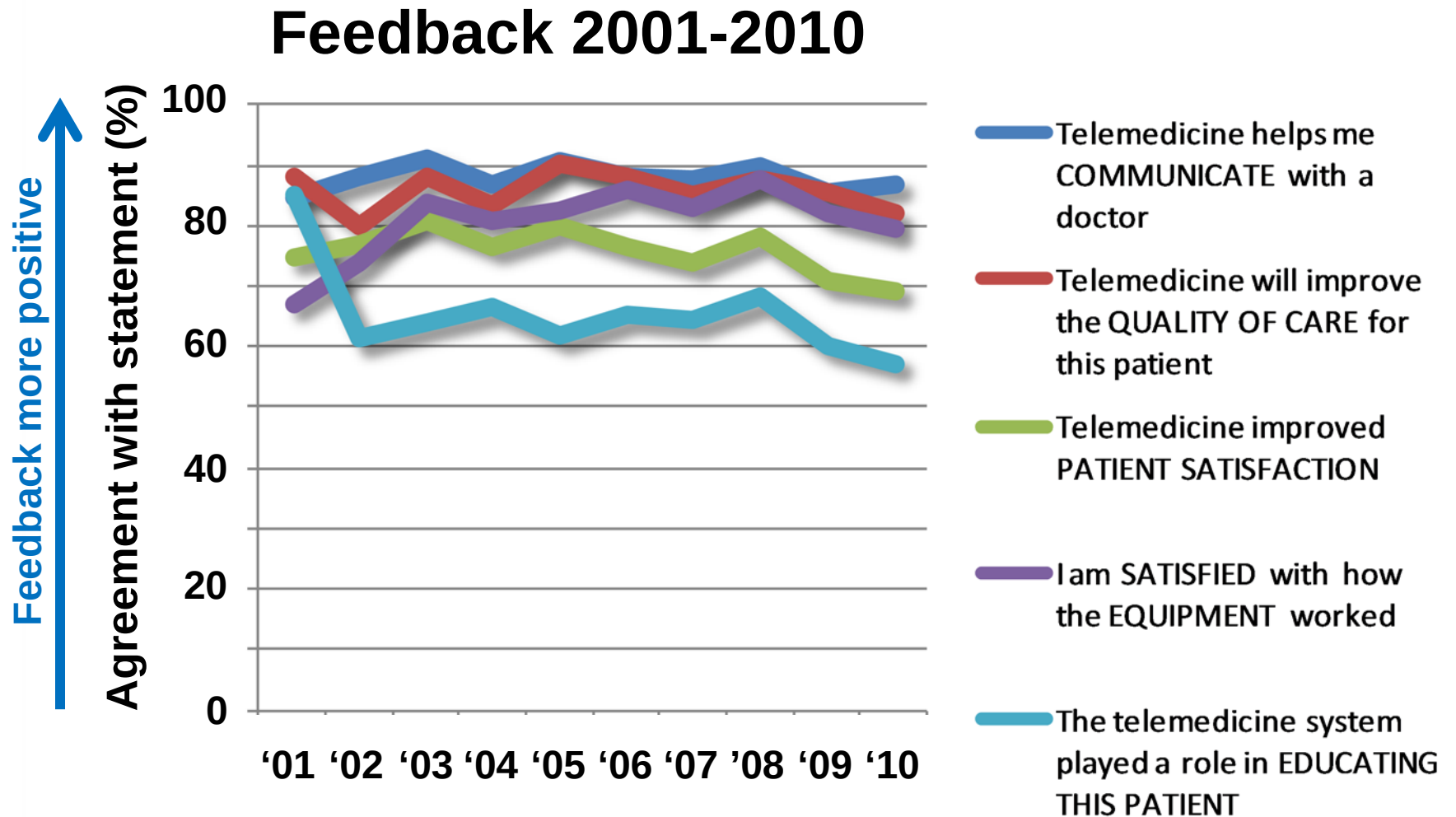
With permission Kokesh (2013)

Telehealth has decreased wait times dramatically



With permission Kokesch (2013), Data courtesy of Phil Hofstetter

Provider satisfaction (36,383 responses)

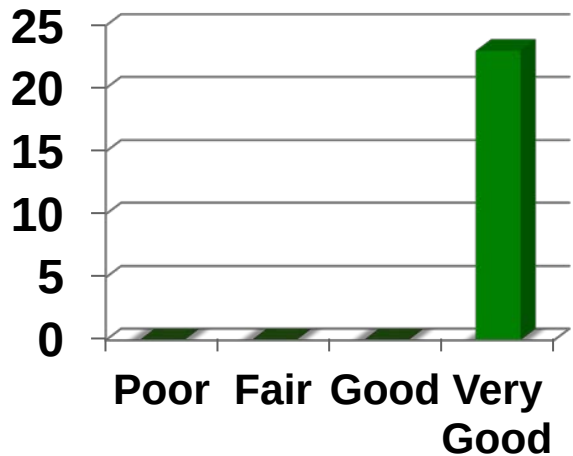


With permission Kokesh (2013)

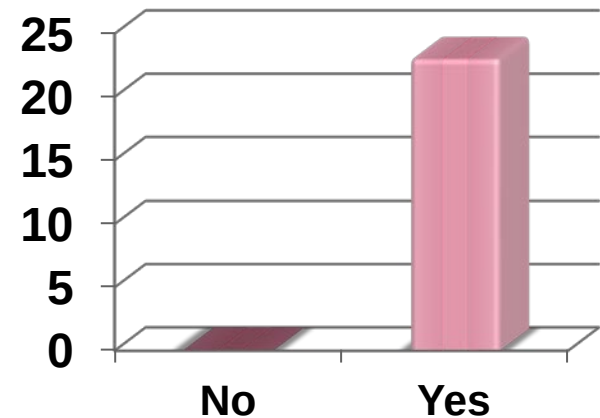
Patient satisfaction (n=25)

With permission Kokesh (2013)

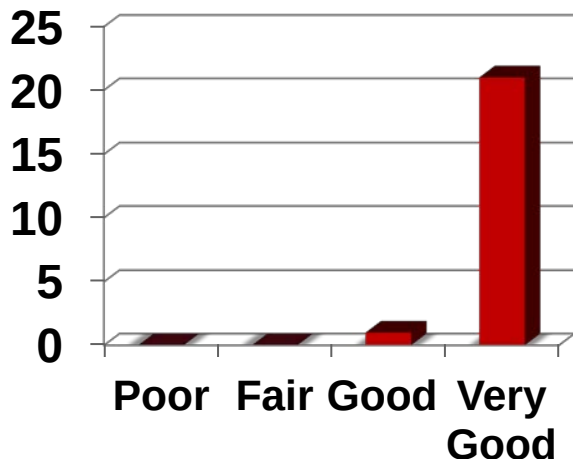
How satisfied were you with the use of the telemedicine technology?



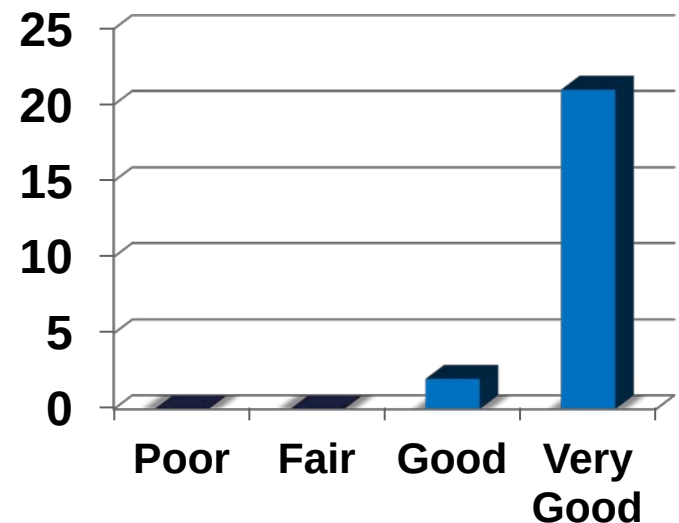
Would you be willing to have a telemedicine exam for follow-up?



How well did the telemedicine technology help you understand your problem?



Overall satisfaction with visit



VA Telehealth Program

- 37% enrolled Veterans live in rural areas and 2% live in highly rural areas (22.6M total = 8.6M).
- 47% rural and 95% highly rural Veterans have travel times >2 hr. to a VA clinic.
- Over 1.6M Veterans with auditory disabilities



With permission Gladden (2013)

Ongoing projects

Automated Audiometry (Audiology, Inc.): Automated audiometry via clinical video, store and forward, and home telehealth (VA Tennessee Valley HCS).

Remote Audiometry (RemotEAR, by Otovation): Remote audiology using a novel clinical video telehealth hub (Greater Los Angeles VA HCS).

Remote Programming of Cochlear Implants (Cochlear Americas): Patient-centered cochlear implant programming using semi-automated remote programming software (VA Puget Sound HCS).

Smartphone Application for Home Programming of Hearing Aids (Phonak): Feasibility of hearing aid programming via personal smart phones (Cleveland VAMC).

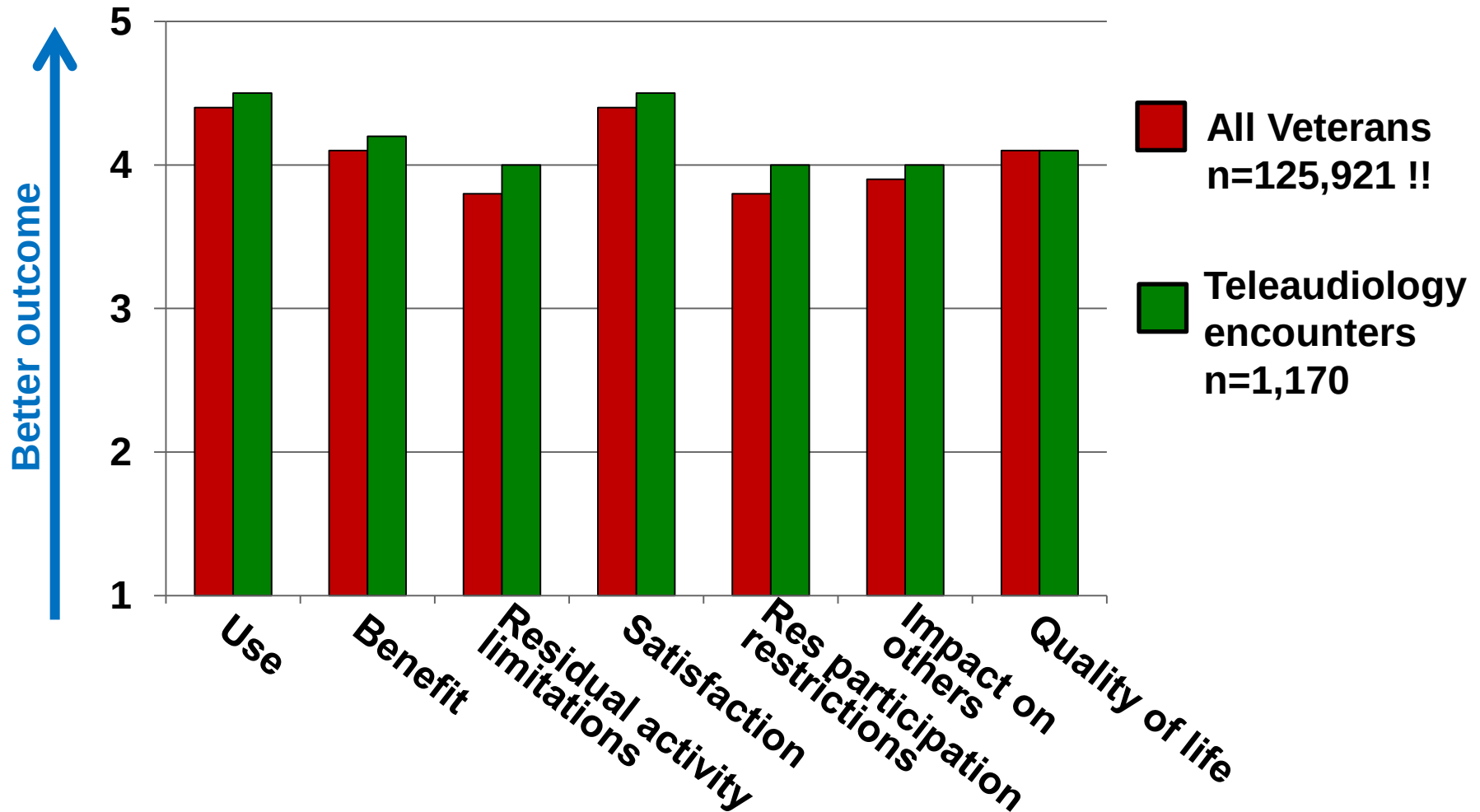
With permission Gladden (2013)

VA pilot program: Remote hearing aid programming

- Technician works with patient at the Community Based Outpatient Clinics (CBOC), audiologist is at a remote site.
- Ten rural locations

**Are outcomes equivalent for face-to-face
and remote programming?**

IOI-HA outcomes from teleaudiology encounters



With permission Gladden (2013)

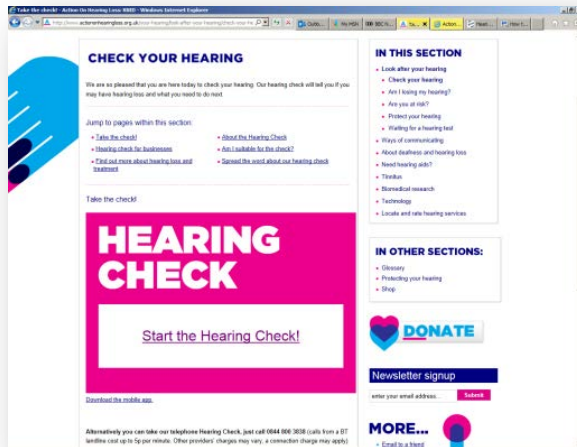
What about teleaudiology for individuals not yet in a system?

- For the rest of this presentation I will focus on mobile health - Patient driven (independent of practitioner) use

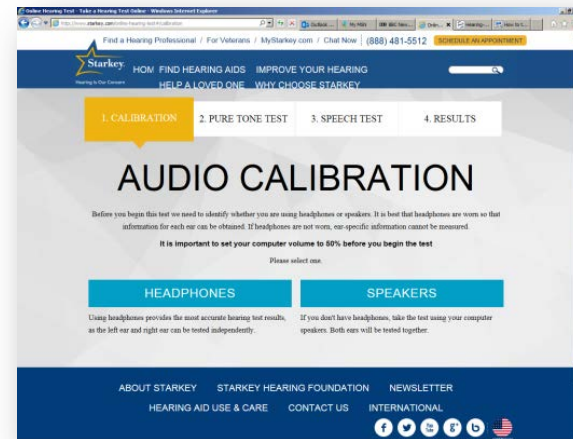


Technology has made it easier to access a hearing test:

■ Online hearing tests

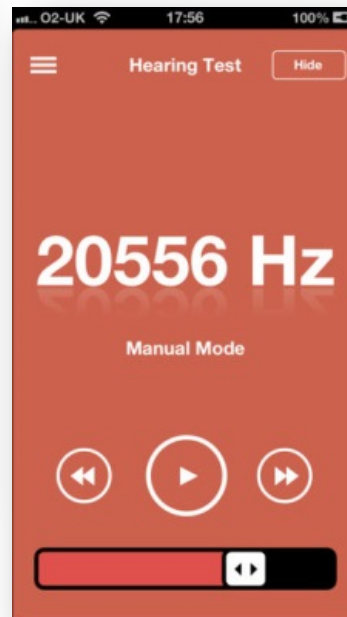


Not for profit
organizations



Most major
manufacturers

■ Apps for hearing tests



- Telephone hearing screenings using digits presented in noise

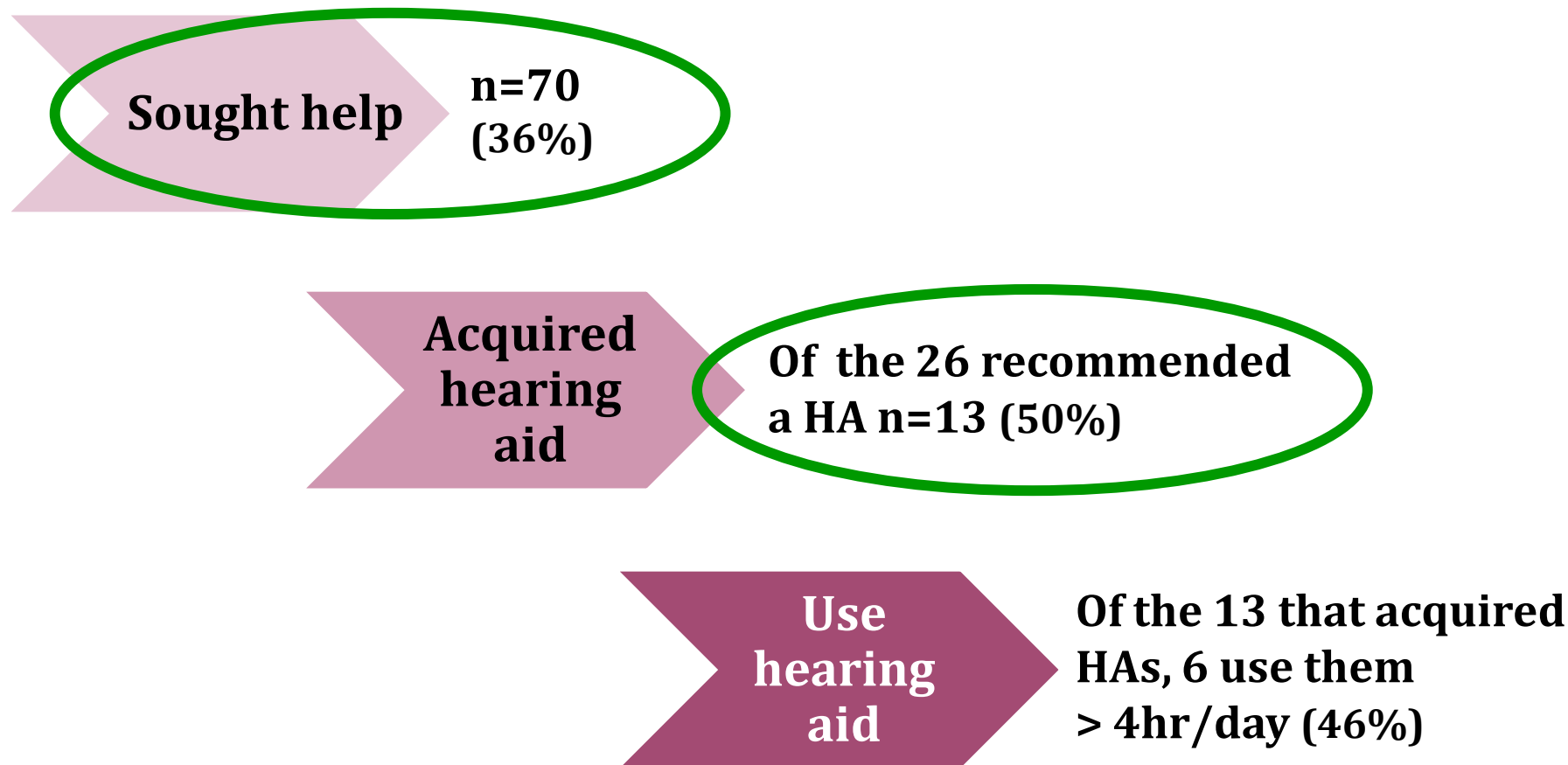


Issues to consider

- **Are data accurate?**
 - False negatives would be a problem.
- **Do users understand the results provided?**
 - Health literacy
 - This is no different than many patient-clinician interactions except user cannot ask questions.
- **Do self-conducted tests motivate behavior change?**

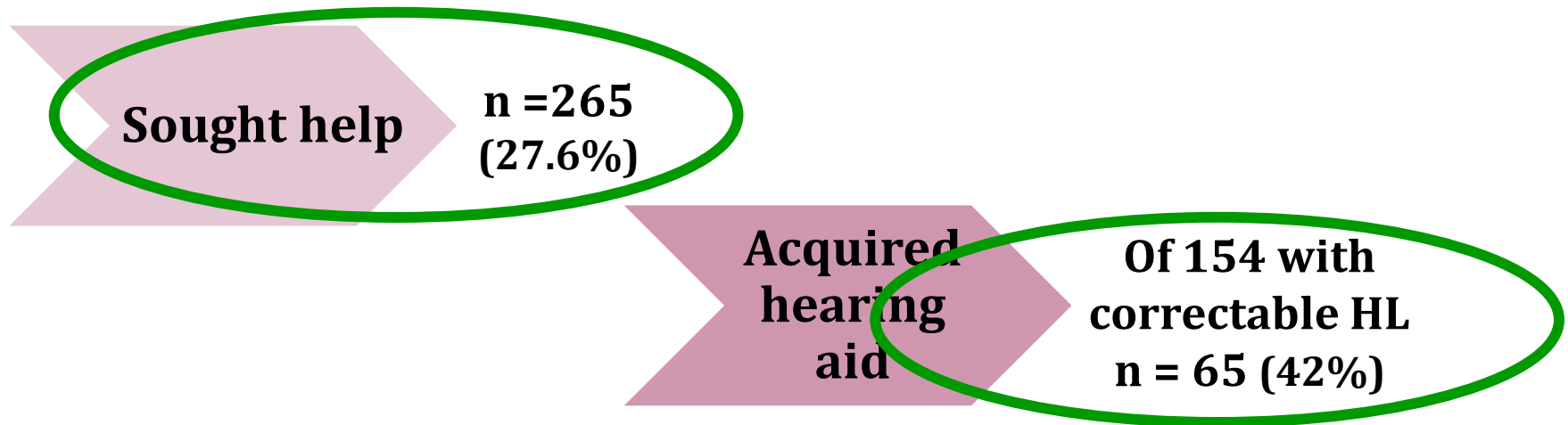
Actions taken by individuals who failed a telephone hearing screen

Of 193 individuals failing a telephone-based screening:



However, similar findings are seen with face-to-face screening also:

Of 651 individuals in SAI-WHAT randomized trial who screened positive for HL:



...so the issue isn't teleaudiology

Solutions?

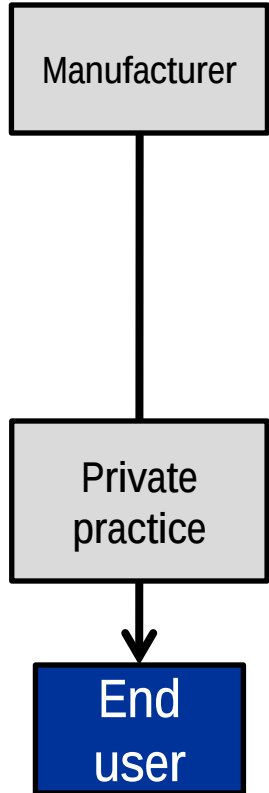
- Studies to better understand attitudes and beliefs around hearing health behaviors
- Public health messages targeted for different age groups to bring awareness of hearing and hearing loss to the whole population not just those with increased likelihood of HL

Technology has made it easier to acquire hearing assistive technology:

- **Alternative distribution systems**

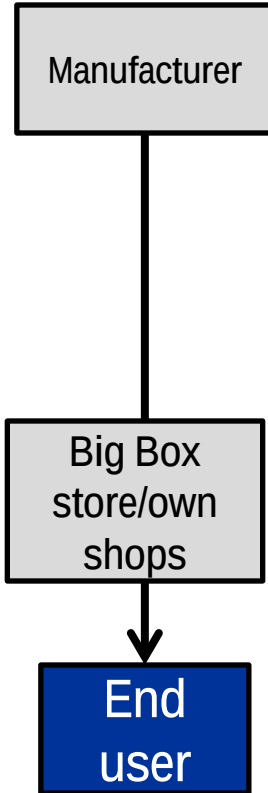


Traditional



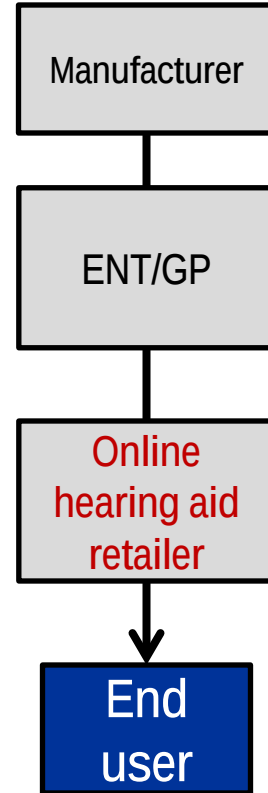
Hearing professional involved

Direct distribution



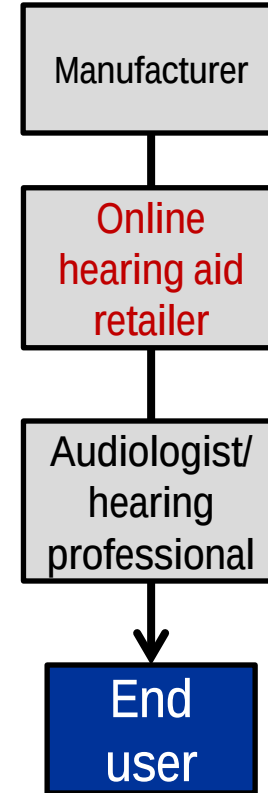
Hearing professional involved

Semi-direct via MD



Hearing professional involved

Online Retail + local support



Hearing professional involved

Online Retailer only



No hearing professional involved

From Northern, 2013

- **Controversial but inevitable**

Especially with increased availability of personal sound amplification systems (PSAPs).

- **What role do audiologists play?**

The field will need to figure this out.

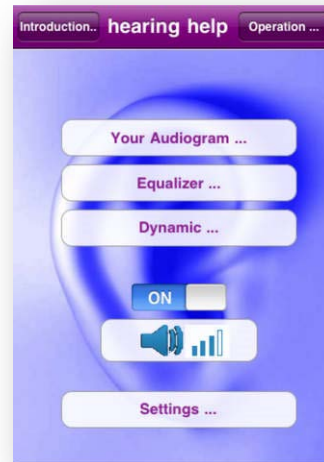
- **Conduct systematic studies research to examine outcomes.**

Other ways technology has made it easier to acquire hearing assistive technology:

A smart phone can be turned into a 'hearing aid'



Experimental from
University of Essex (free)



Costs \$4.99!



Can record and
replay conversation



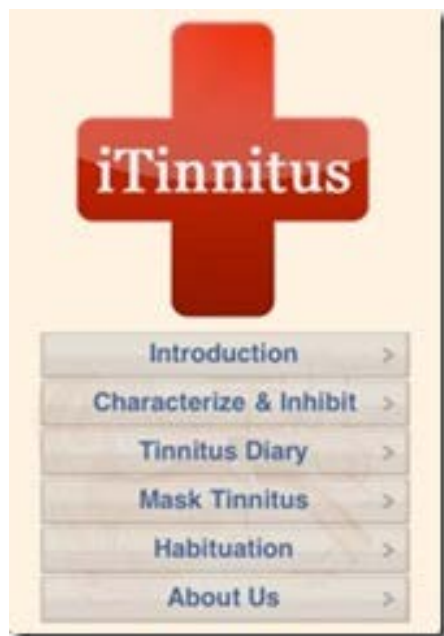
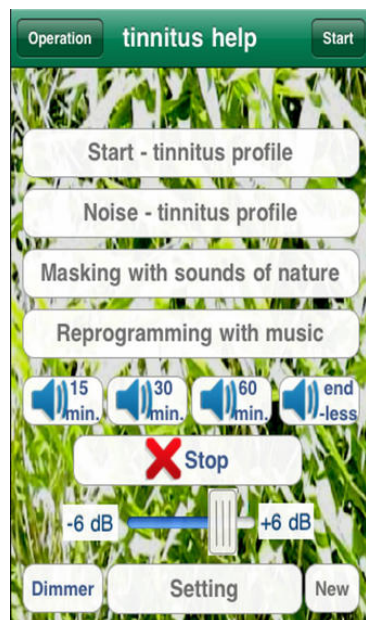
Developed at Northwestern U
and U Minnesota

Issues raised

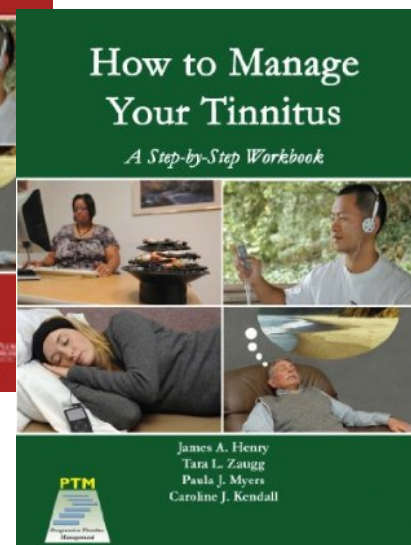
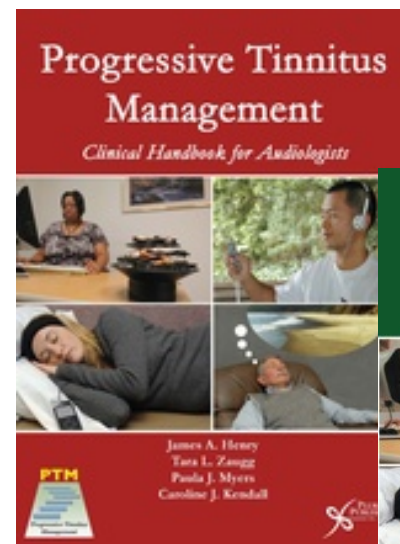
- **Many unanswered questions**
- **Conduct systematic research to examine pros and cons**

Technology and tinnitus management

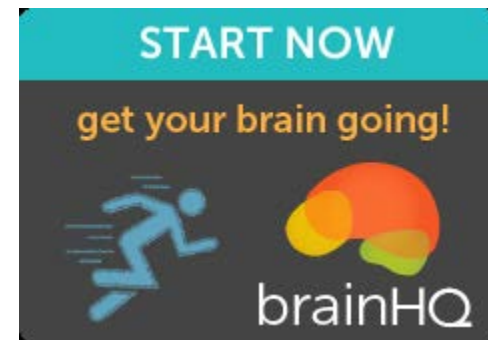
- Apps for tinnitus management



- Telephone tinnitus management



Technology permits home-based auditory training



Is auditory training effective?

Findings are mixed

- Need ways to better identify who will and will not benefit
- There are few downsides to training so if the individual is willing then why not try it?

Technology has spawned online hearing-related counseling programs, support groups, etc.

HearingLikeMe
JOIN or SIGN IN Search...

Living Raising Supporting Learning The F

Join Us.

Hearing Impaired Support Group.

Join our hearing impairment support forum and connect. Share your story, make new friends and be a part of one of the fastest-growing HoH forums on the web.

Screen Name
max. 8 characters

Email Address
We will not share your email address

Password
min. 8 characters

☐ I agree with the [Terms of Use](#)

Reasons to Join:

- Get Inspired**
Join a growing community of people. You'll gain inspiration, learn new ways to live with hearing loss.
- Share Stories**
Participate in discussions with others who've gained during their own journey. The ability to submit story ideas.
- Stay Informed**
Stay up to date by receiving notifications published on HearingLikeMe. You'll receive updates on new content.

A Speechmark Practical Photocopy Resource

Active Communication Education (ACE)

A Program for Older People with Hearing Impairment

Louise Hickson,
Linda Worall
& Nerina Scarinci

Open Chat Night
Wednesday night at 8 p.m. to 10 p.m. EST

- Safe and Fun for all Ages
- Scheduled Topics
- Make New Friends
- 'Ask the Audiologist' Nights
- People Just Like You

Hearing Loss Association of America

Paula Rosenthal's

HearingExchange

Blog and Resources for People with Hearing Loss

Are these programs effective?

Little work available - one study showed positive outcomes.

RCT comparing:

Online education by a professional

vs.

Online discussion forum with peers

Results:

Decreased reported hearing handicap and psychosocial benefits among participants in both groups.

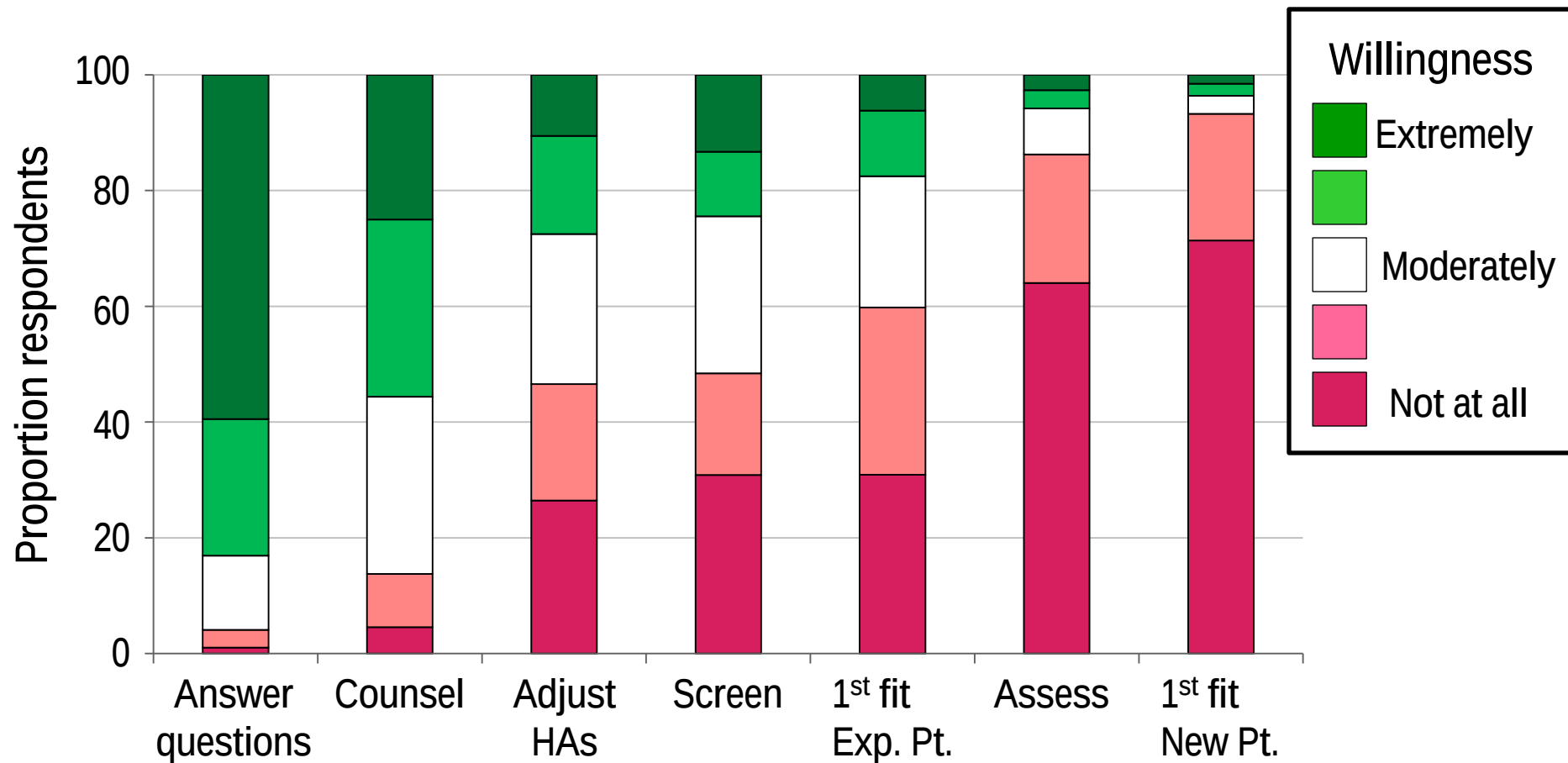
More research is needed.

Thoren et al. (2011). JAAA 22:274-285

What do patient and clinicians think about teleaudiology?

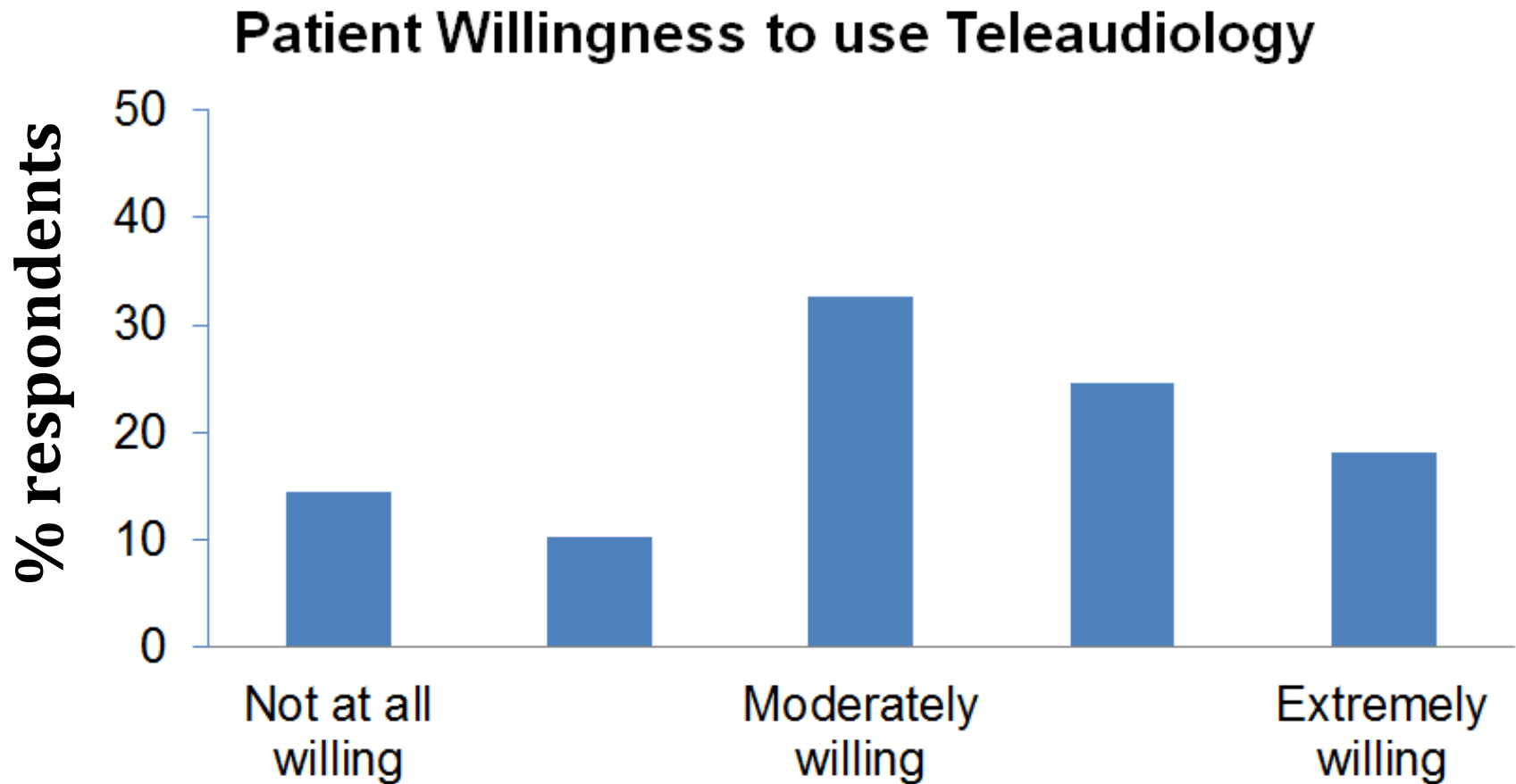
Data from Singh, Pichora-Fuller, Launer and Boretzki

Clinician willingness to use teleaudiology: ($n = 202$, age mean = 67.1 yr., $SD = 15.3$)



Singh et al. (submitted)

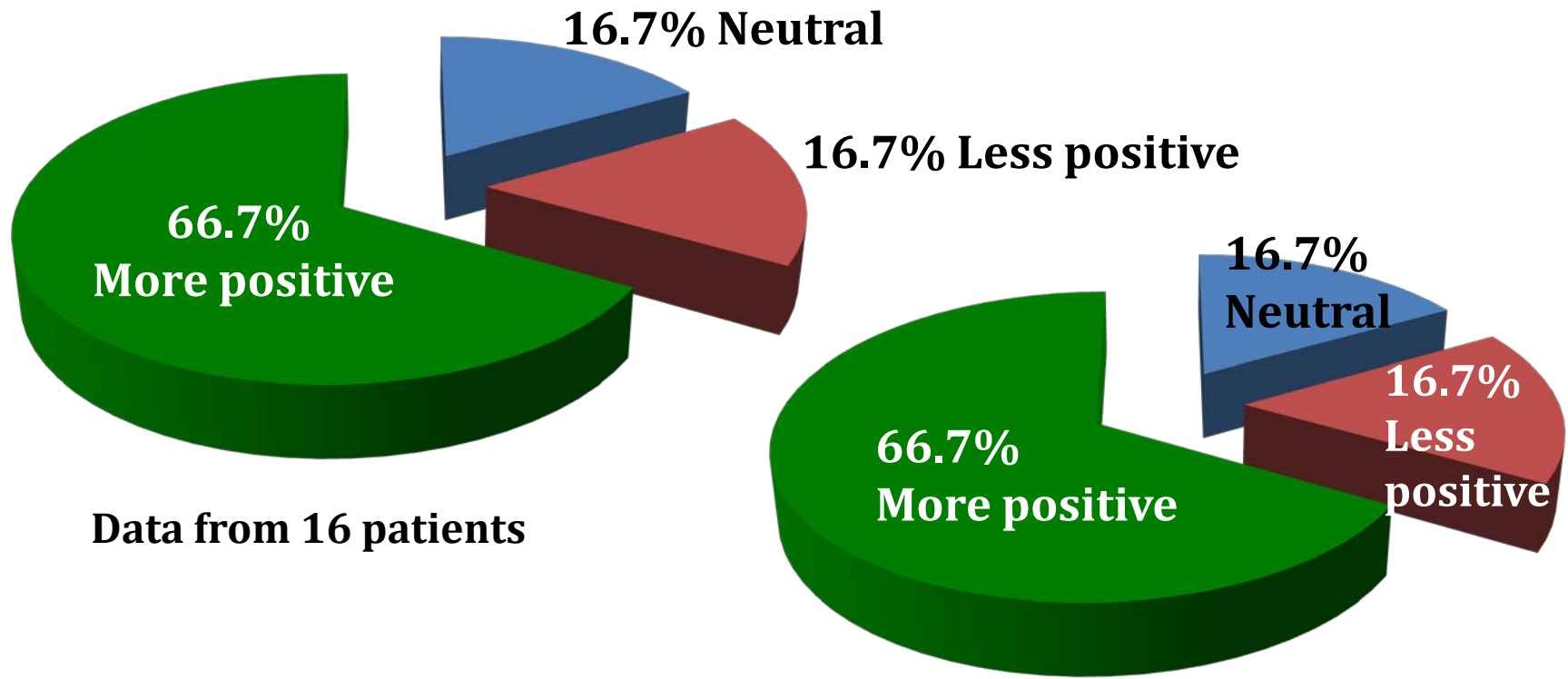
Patient willingness to use teleaudiology (n=224 , age: mean = 67.1 yr., *SD* = 15.3yr)



Singh et al. (in preparation)

Do attitudes change after engaging in teleaudiology?

Attitudes pre-to-post remote hearing aid fine-tuning



Data from 16 patients

Data from 8 audiologists

Data from study collected by Phonak - with permission

Implications

- **Attitudes can change**
 - **Good news for teleaudiology!**
- **Approach to education of clinicians about teleaudiology is likely critical for good outcome.**



Teleaudiology raises a host of other considerations too:

- IT support and contingency plans
- Patient privacy
- Patient expectations
- Patient health literacy
- Billing
- Licensing (across states)
- Integration of teleaudiology into daily practice

Summary

Teleaudiology provides:

- **Easier access to hearing healthcare at many levels**
- **Greater diversity of options for audiological rehabilitation**

and it is generally acceptable to patients and clinicians

It could/should therefore open up hearing healthcare to a broader demographic of individuals

Major research needs

- **Validate data**
- **Optimize usability & effectiveness**
- **Understand outcomes**
 - **Patient**
 - **Clinician**



There remains a needs to change hearing health behaviors so that people access the many available options

To conclude....

The question is not will teleaudiology happen (it will), but how will it happen, and what can we do to ensure it yields positive outcomes for both the patient and the professional?



Thank you for listening
Gabrielle.saunders@va.gov



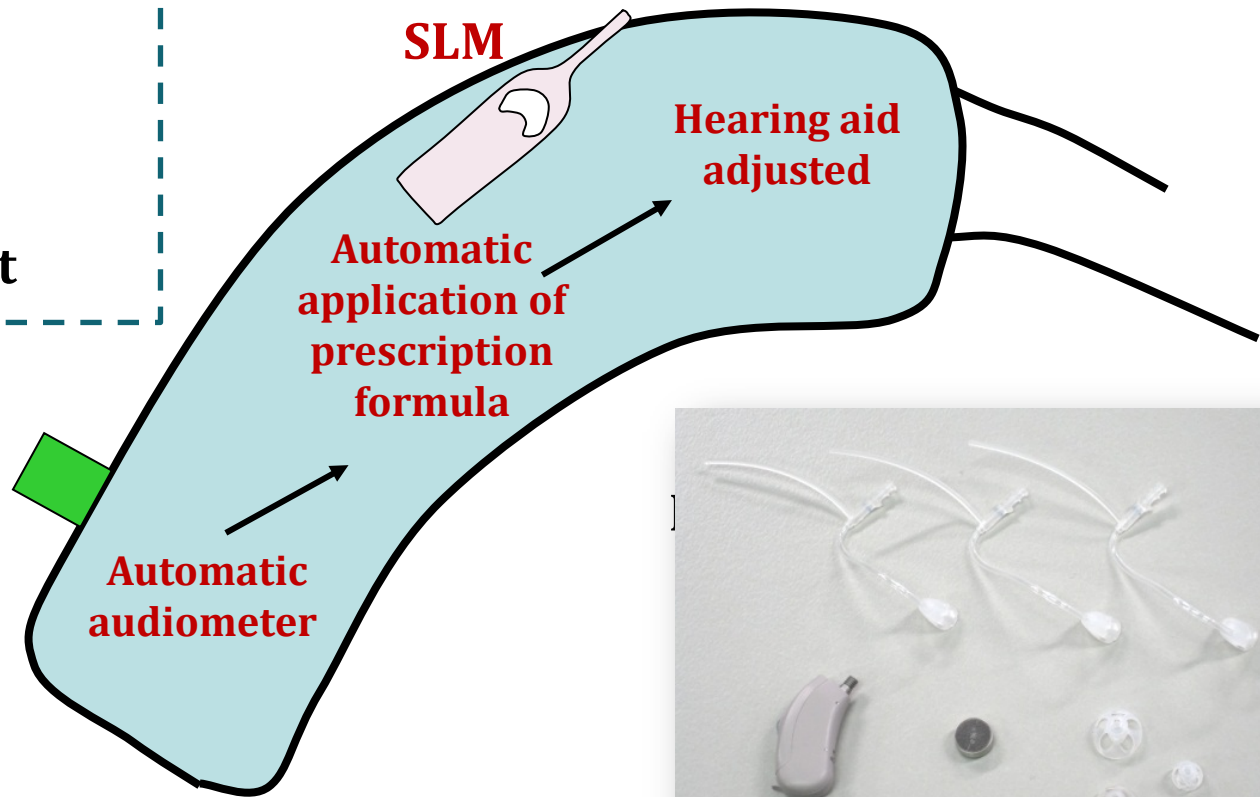
Portland, Oregon



Australian 'Do-it-yourself' self-fitting hearing aid

User responsible for:

- ✓ Assembly
- ✓ Fitting
- ✓ Fine-tuning
- ✓ Management



From Hickson, 2013

Can individuals assemble and activate the hearing aid without professional support?

Outcomes from Australia (AUS), S. Africa (SA), Hong Kong (HK)

