

The "Perfect Storm" of Technology, Demographics and Changing Distribution Models

Dave Fabry, Ph.D. Vice President, Global Medical Affairs, GN Hearing The Regents of

The University of Minnesotta
on recommendation of the faculty
have conferred upon

David Alan Fabry
the degree of

Master of Arts

with all its privileges and obligations

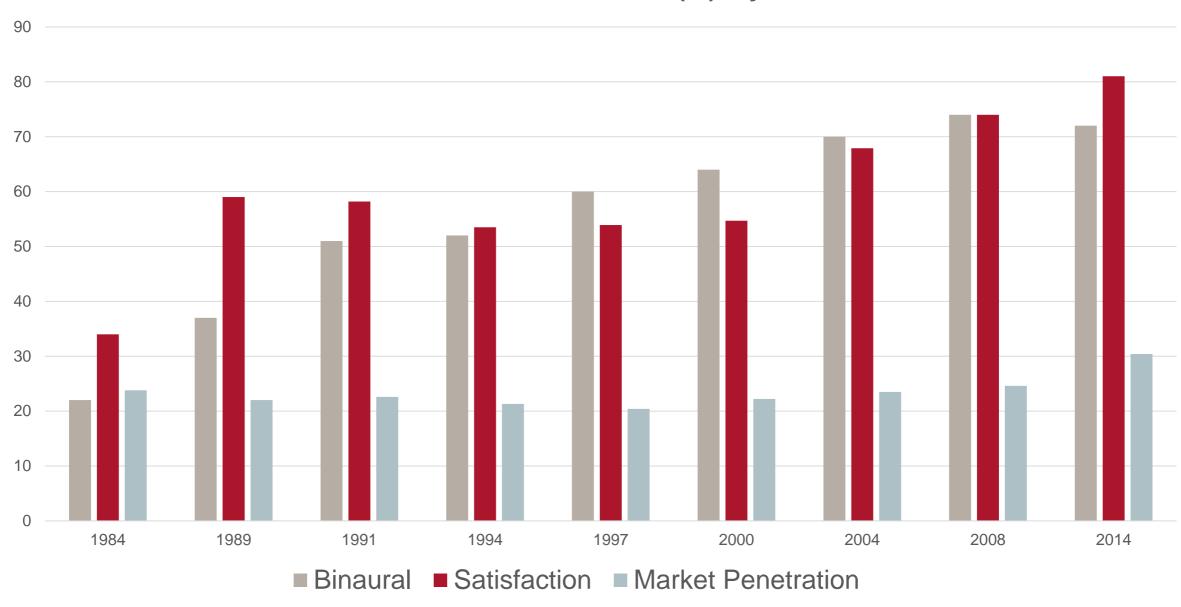
Given in Minneapolis, in the State of Minnesota, the seventeenth day of March, nineteen hundred eighty-four.

Duane a Wilson



C. Letu magrath

US Hearing Aid Binaural Fitting Rate (%), Satisfaction (%) and Market Penetration (%), by Year









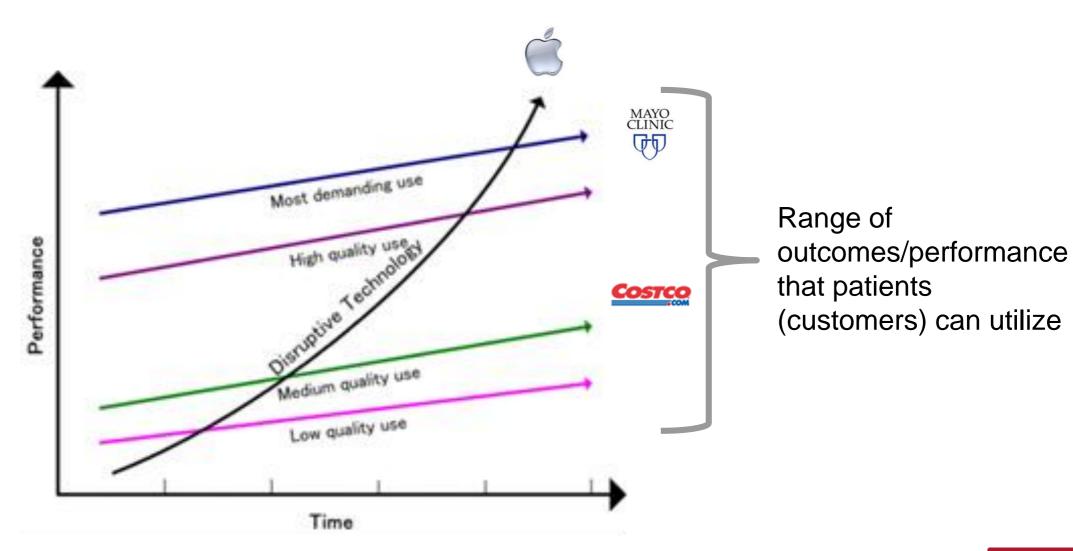
Threats vs. Opportunities







Disruptive Innovation Model

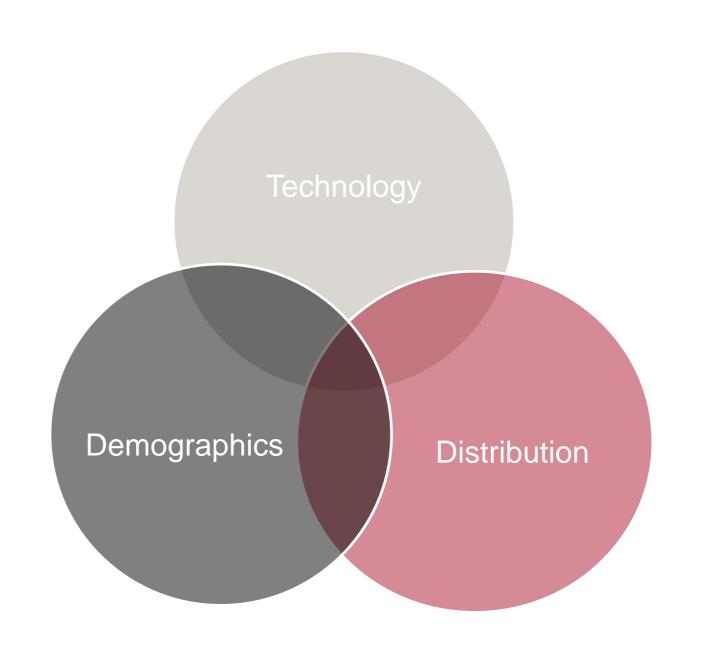




"You can't read the label, when you are sitting inside the jar"

- Mike Maddock



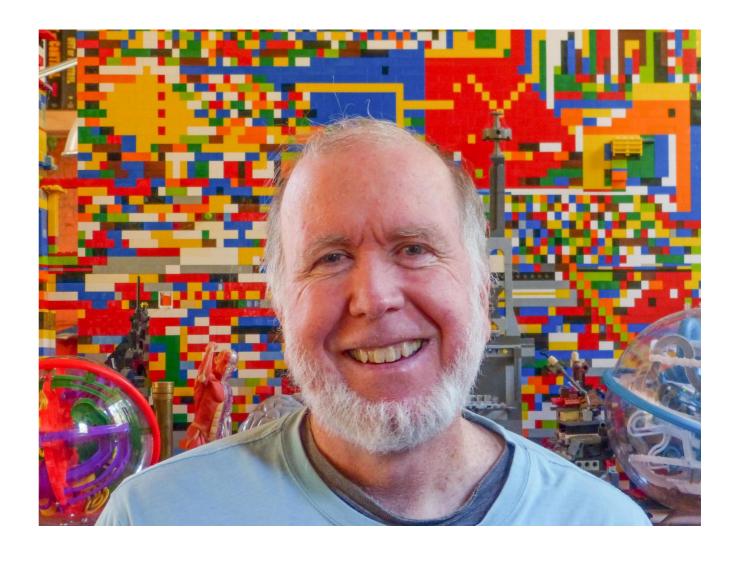


THE

THE 12 TECHNOLOGICAL
FORCES THAT
WILL SHAPE OUR
FUTURE

KEVIN KELLY

AUTHOR OF WHAT TECHNOLOGY WANTS



Becoming

Cognifying

Flowing

Screening

Accessing

Sharing

Filtering

Remixing

Interacting

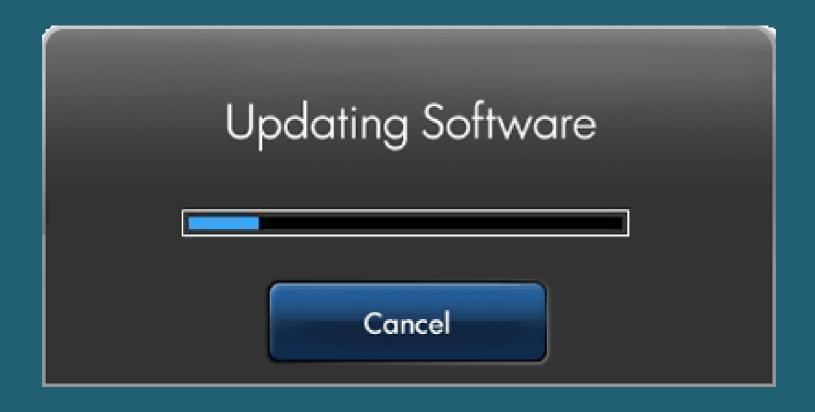
Tracking

Questioning

Beginning









Becoming

Cognifying

Flowing

Screening

Accessing

Sharing

Filtering

Remixing

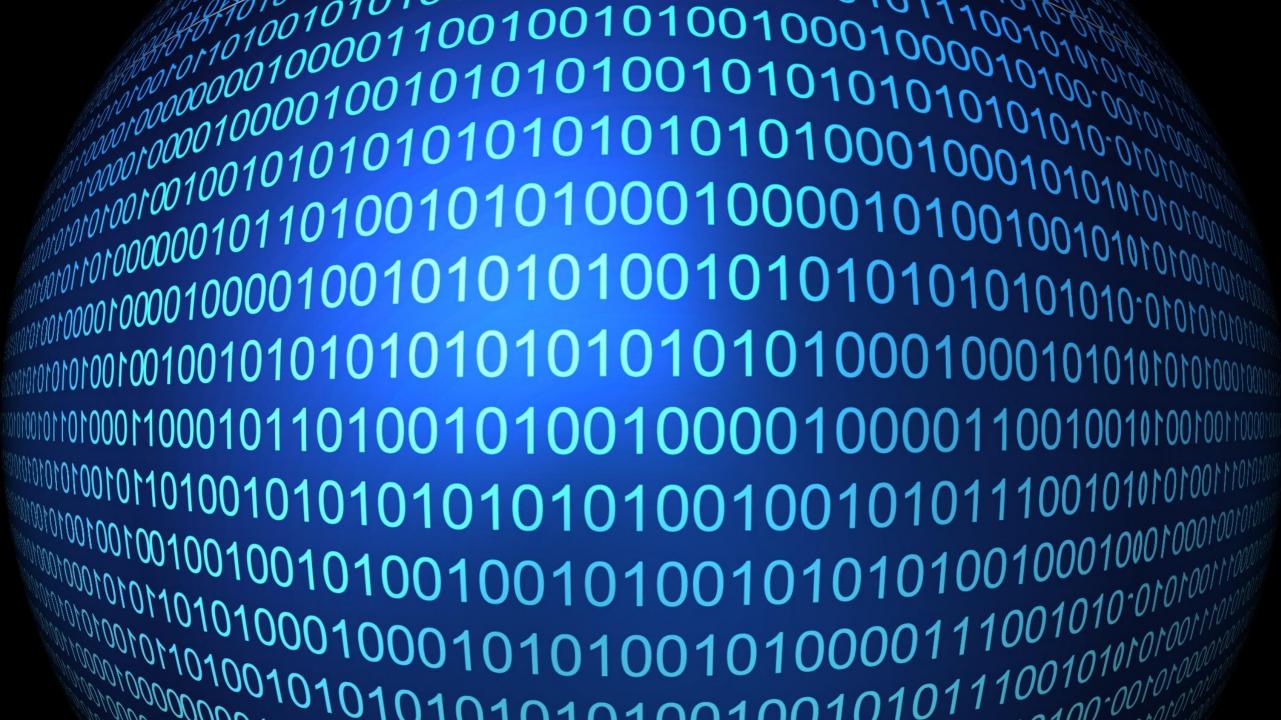
Interacting

Tracking

Questioning

Beginning

































Becoming

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Flowing

Screening

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Tracking

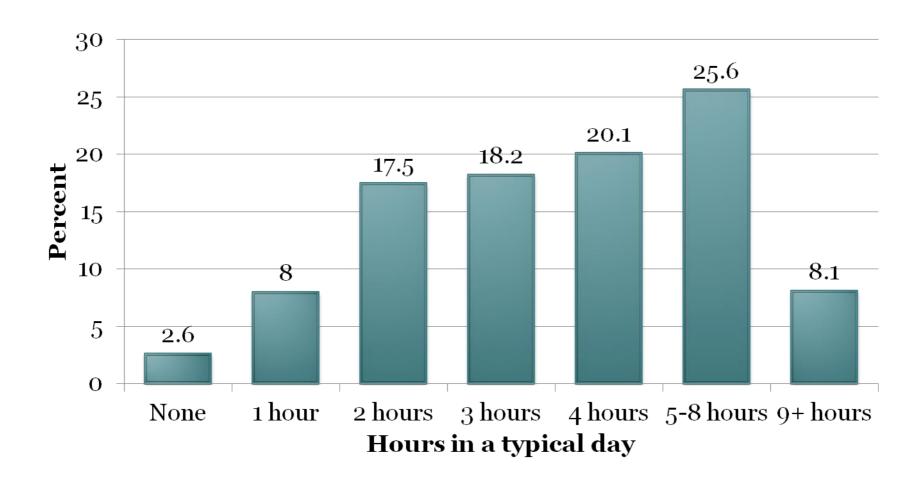
Questioning

Beginning





Media habits – total HL population *Media = watching television*





PREMIER MEMBERS









































































































SPONSORED MEMBERS















AirPods

Wireless. Effortless. Magical.



Becoming

Cognifying

Flowing

Screening

Accessing

Sharing

Filtering

Remixing

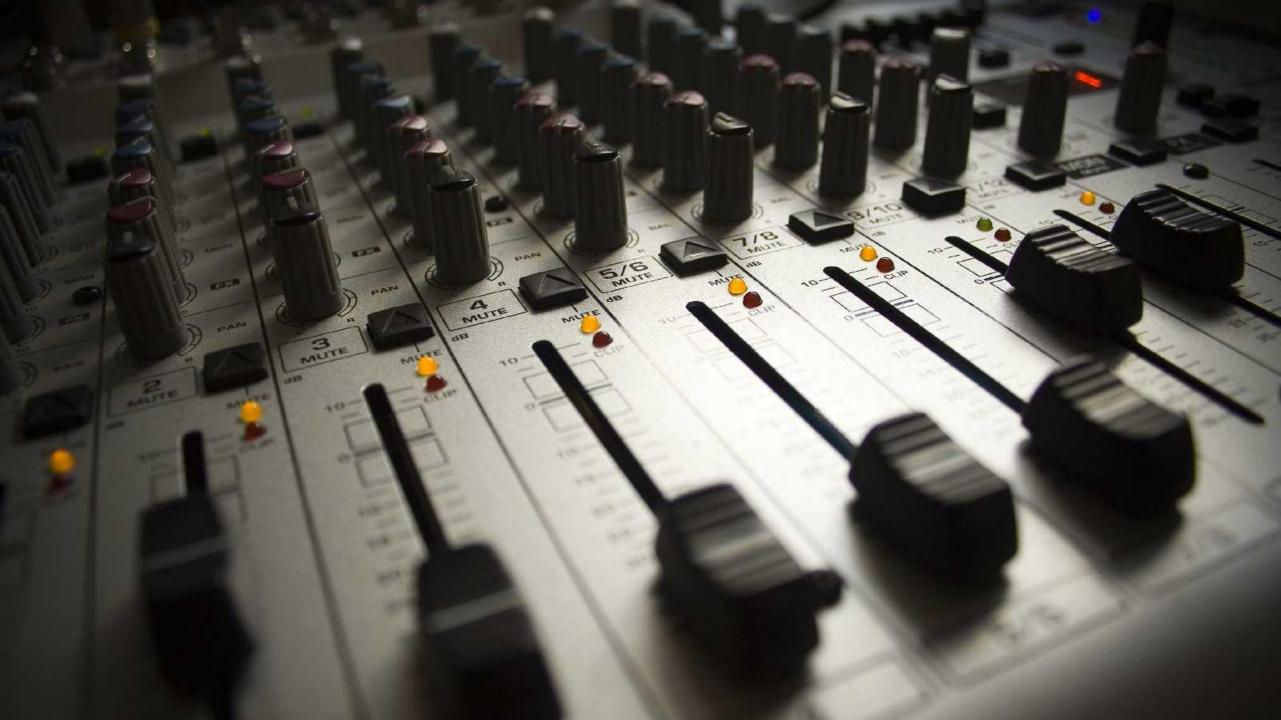
Interacting

Tracking

Questioning

Beginning





AirPods

Wireless. Effortless. Magical.





Fennex – Augmented Hearing App By FENNEX AG

Open iTunes to buy and download apps.



View in iTunes

+ This app is designed for both iPhone and iPad

Free

Category: Health & Fitness Updated: Jul 31, 2017

Version: 1.0.2 Size: 52.9 MB Language: English Seller: FENNEX AG © 2017 FENNEX AG

Rated 4+

Compatibility: Requires iOS 10.0 or later. Compatible

Description

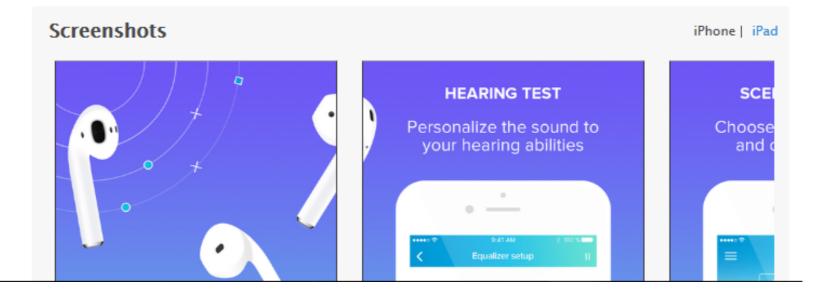
Fennex[™] is a hearing aid app that provides augmented hearing by turning your Apple headphones (EarPods or AirPods) into a personal hearing amplifier. Firstly, take a quick hearing test that indicates your hearing abilities. Secondly, use the hearing test results to personalize your hearing experience. Thirdly, select a listening scene

FENNEX AG Web Site) Fennex - Augmented Hearing App Support)

...More

What's New in Version 1.0.2

* Improved sound quality with 48% better performance versus previous version



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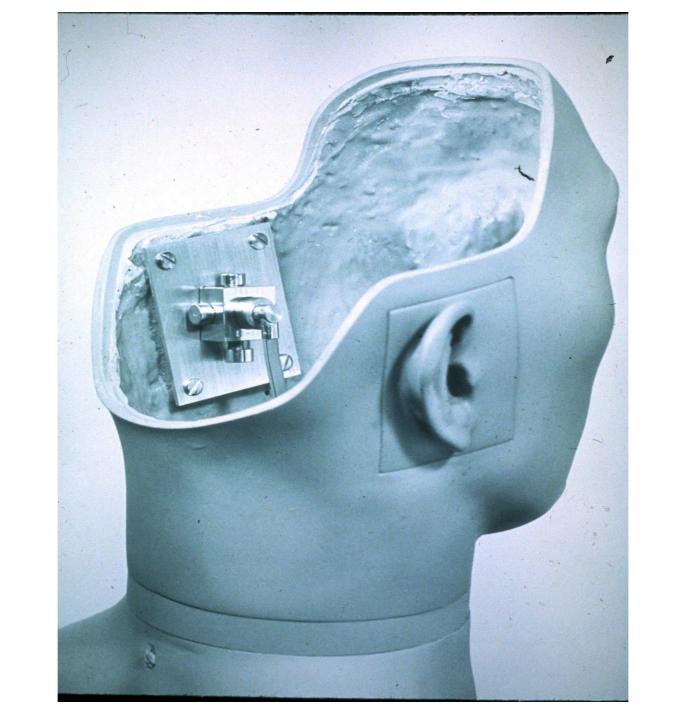
Tracking

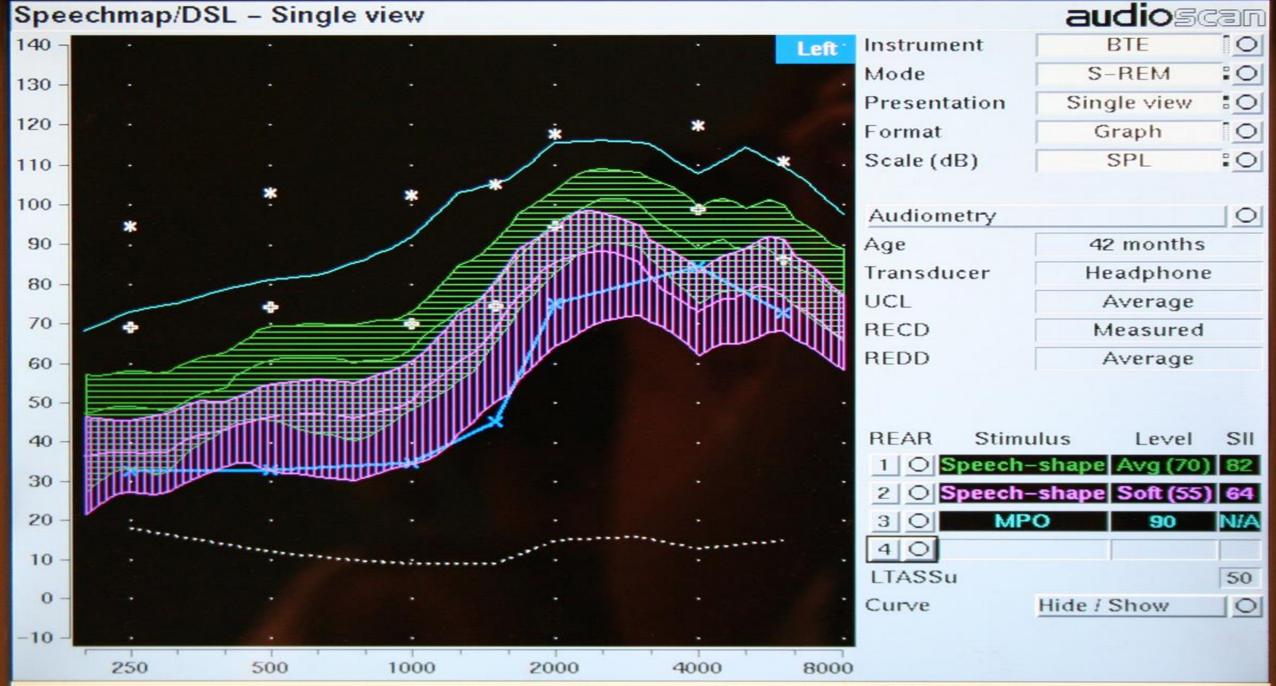
Questioning

Beginning









Connect coupler and instrument to coupler microphone. Select one of REAR 1 through REAR 4.

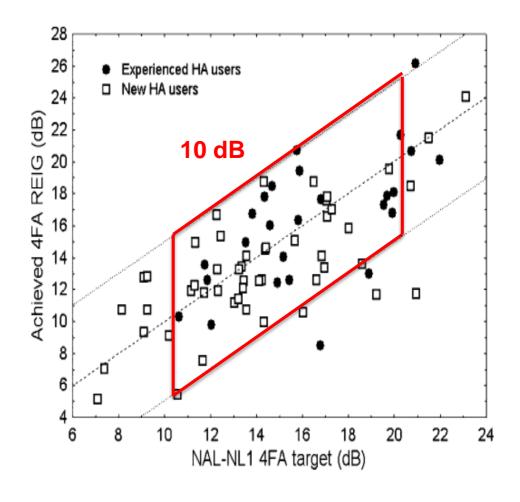
Is first fit the final fit?

Kiedser et al, 2008

New and experienced wearers show a range of gain preference

Patients' judgment of loudness will change with time

Starting gain may affect preferred final gain (Mueller et al, 2008)



Auditory Ecology

The range of acoustical environments that a person experiences, the auditory demands of those environments, and the importance of those demands to an individual's daily life.

(Gatehouse et al., 1999)

Potential Predictors of Benefit

Hearing Thresholds

Loudness Discomfort Level

Susceptibility to Upward Spread of Masking

Broadened psychophysical tuning

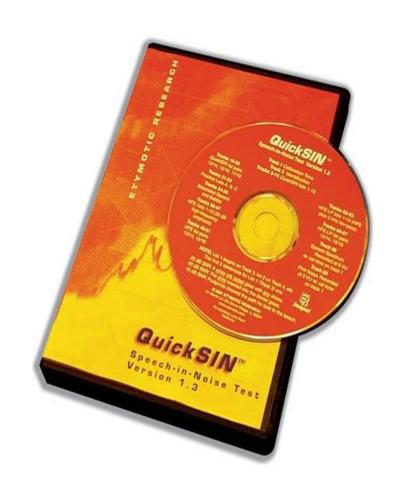
Spectral and Temporal smearing

Noise dosimetry measurement

Lifestyle and Demand questionnaire

Cognitive function

Speech in noise testing



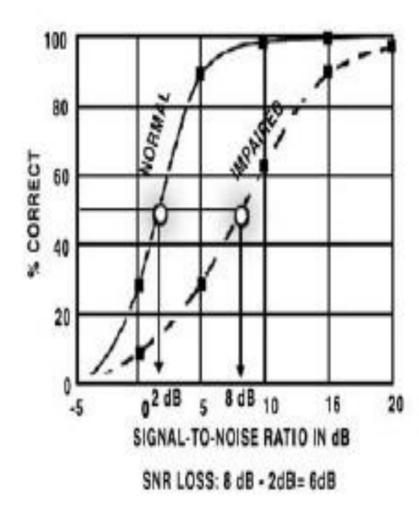
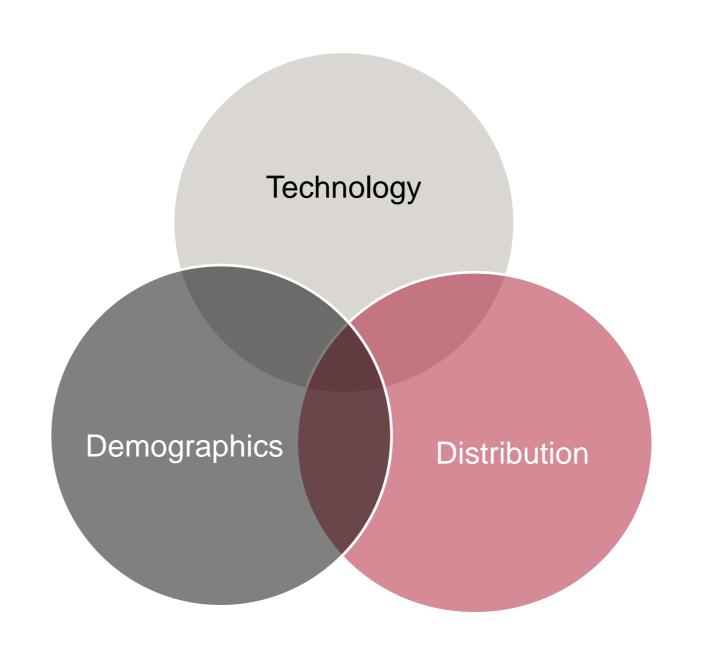


Figure 1 (From Killion, 2002)

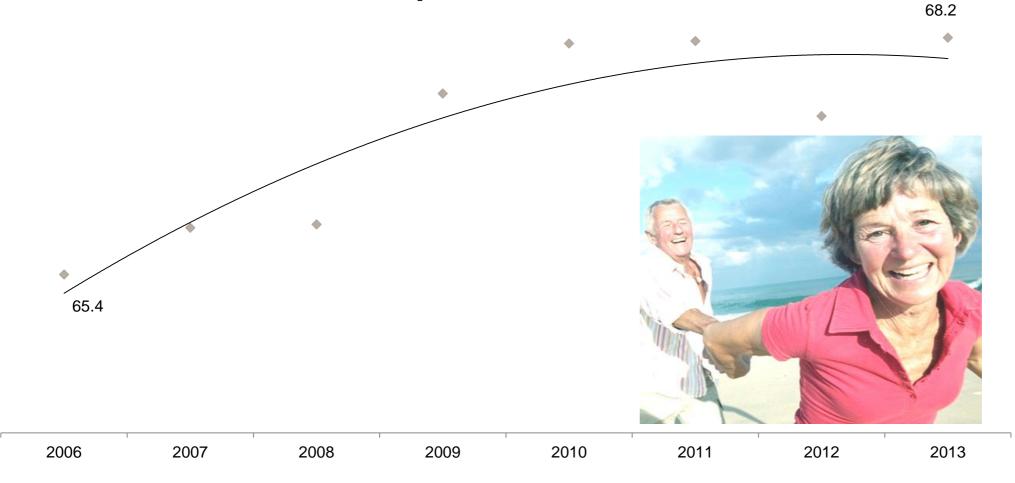
Using SNR Loss Measures to assist with Selection of HA Technology

SNR LOSS	CATEGORY	TECHNOLOGY NEEDS	
0 - 2 dB	Normal	Omni-directional microphones (CIC/ITC)	
2 – 7 dB	Mild	Fixed/Dynamic Directional mics	
7 – 15 dB	Moderate	Dynamic/Adaptive directional mics	
> 15 dB	Severe	FM/Remote Microphone system	





A Positive, Optimistic View of Life



% Boomers indicating at what age the feel 'old age' begins

Open-Minded & In Pursuit of Knowledge



They are more likely than the population to describe themselves as "knowledge-seeking"

Have adapted to and adopted new technologies, with 7 in 10:

- Comfortable using new technologies and devices
- Using technology to stay connected with family on a regular basis

More Boomers than younger generations agree they...



...Are taking more responsibility for their health compared to 10 years ago

81%



...Will take whatever means necessary to control their own health

64%

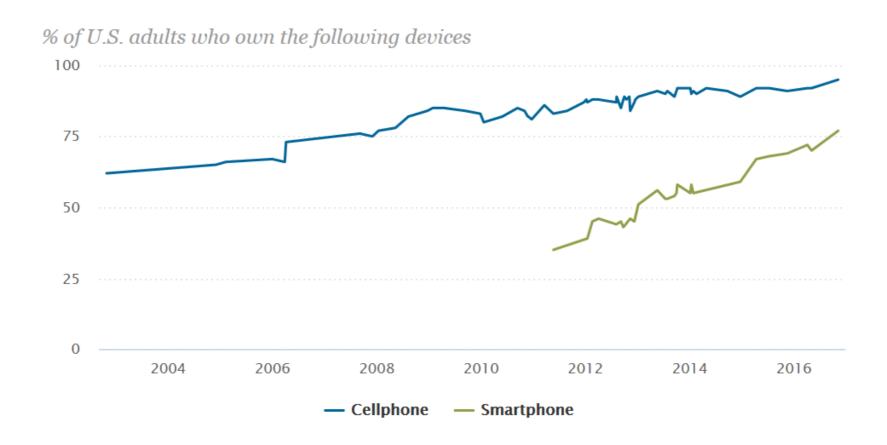


READ LESS MINDS. ASK MORE QUESTIONS.

Technology and tele-health is emerging as a driver of consumers' healthcare decision making

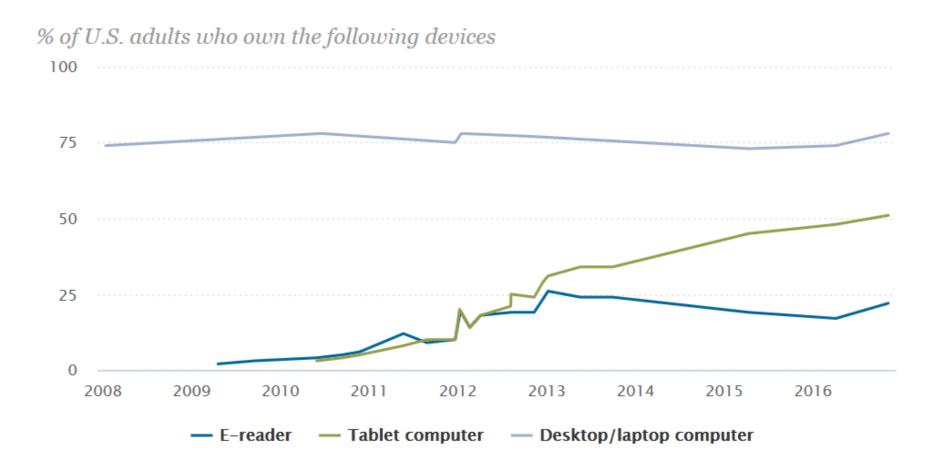
 Approx. 86% of respondents see value in incorporating tele-health care into a healthcare regimen

They have the technology!



Source: Pew Research Center, January 12, 2017

Survey Findings: They have the technology



Source: Pew Research Center, January 12, 2017

Key Survey Findings

The future hearing aid wearer can be expected to choose a brand that offers tele-health

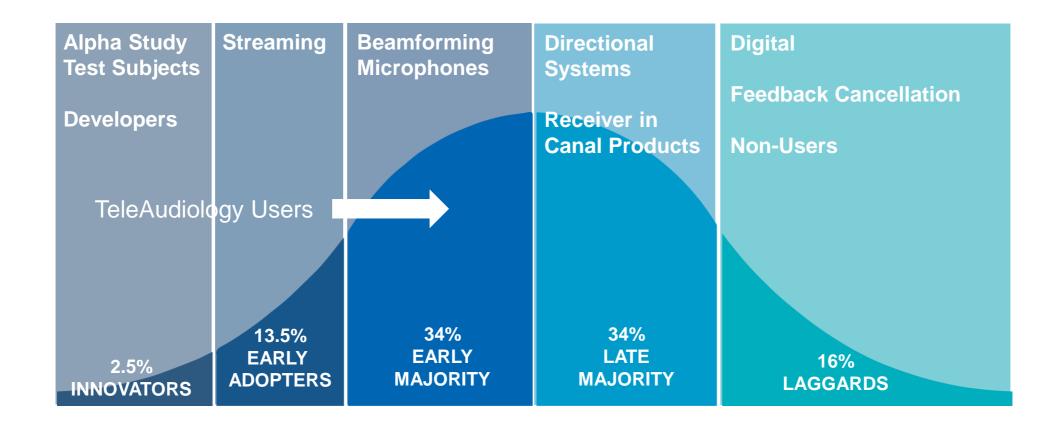
- Of the 35-54 year-old age group 20% answered that they were very likely to change their hearing aids or other hearing assistance device to a brand that provides a telepresence function that links them directly to a healthcare professional
- 30% of the 35-54 year olds answered that telepresence is the future of the healthcare industry

Key Survey Findings

The users see benefits of TeleAudiology - and are online

 22% of all respondents would be very or somewhat likely to communicate with their audiologist or other healthcare professional through telepresence. This is 39% for the age group 35-54 year old

TECHNOLOGY TRENDS



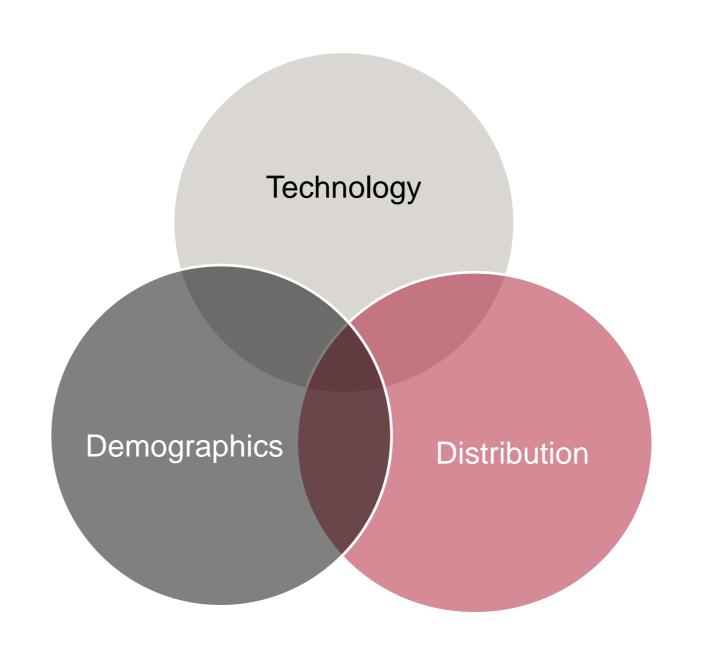
Key Survey Findings

The users expect their health professionals to be flexible and on the forefront of technology. Of those not satisfied with their hearing care professional (HCP):

- 30% said it was due to the HCP not offering the most recent technology available
- 23% stated that it was too hard to schedule an appointment
- 31% felt that the doctor's office was too far away and they were all in the +55 year age group

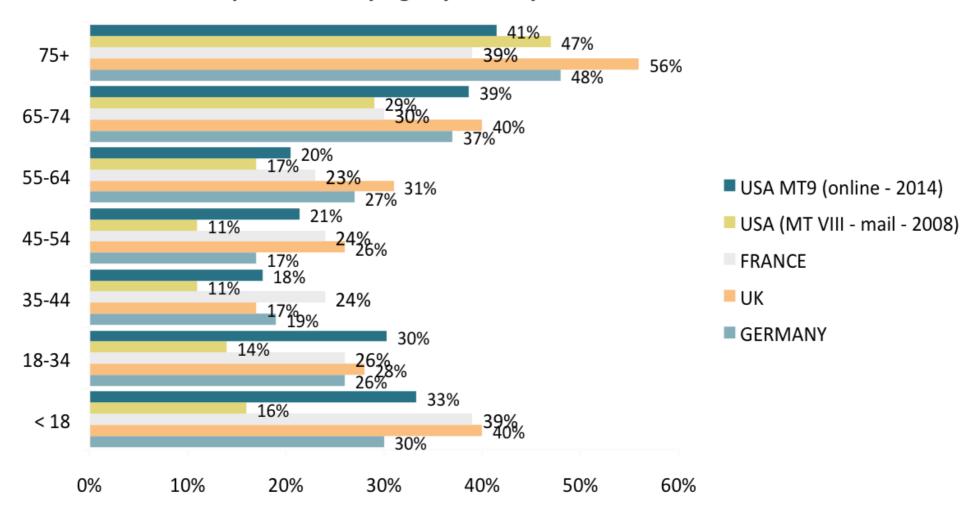
EMPATHY Understanding what so

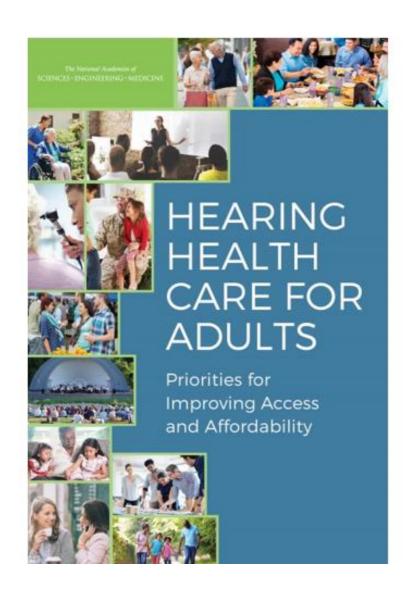
Understanding what someone needs and acting on it.



Hearing Aid Adoption: US and Europe (MT9 and EuroTrak)

Adoption Rates by Age by Country





Hearing Health Care for Adults: Priorities for Improving Access and Affordability

Suggested citation: National Academies of Sciences, Engineering, and Medicine. 2016. *Hearing Health Care for Adults: Priorities for Improving Access and Affordability.* Washington, DC: The National Academies Press.

The National Academies of SCIENCES • ENGINEERING • MEDICINE

Over-the-Counter Hearing Aid Legislation



Over-the-Counter Hearing Aid Legislation



Over-the-Counter Hearing Aid Legislation

S. 670/ H. 1652 includes changes from original legislation S. 9

Strengthens language specifying OTC hearing aids are intended to be used for adults "over the age of 18"

Direct Secretary of HHS to take steps to ensure safety and efficacy

- Requirements to establish output limits appropriate for OTC devices
- Requirements for appropriate labeling; reporting adverse affects, listing contradictions, and advising to consult with physician if present

Preempts state law

•Finalize rather than withdraw PSAP guidance

Senate Follows House Action; Passes FDA User Fee Bill with OTC Hearing Aid Provision

Today at 1:42 PM



Senate Follows House Action; Passes FDA User Fee Bill with OTC Hearing Aid Provision

On August 3, the US Senate passed the FDA Reauthorization Act, legislation reauthorizing the FDA's user fee programs for prescription drug, medical device, generic drug, and biosimilar biological products. The legislation also contains a provision that would direct the FDA to develop a category of over-the-counter (OTC) hearing aids for adults with perceived mild to moderate hearing loss. The US House of Representatives <u>passed</u> this legislation on July 12. This legislation will now go on to the President to be signed into law.

As this legislation progressed through Congress, the Academy met with lawmakers to share the Academy's statements on OTC Devices and Accessibility and Affordability for Hearing Care and to reinforce the important role of audiologists in optimizing hearing-care outcomes for patients. On the passage of this OTC hearing aid legislation, Academy President Ian Windmill, PhD said, "Throughout the legislative process, the Academy advocated for changes to the OTC hearing aid legislation to allow for consumers to self-direct their care in a safe and appropriate manner. While the legislation is not perfect, it is a substantial improvement over previous iterations of the bill. We will continue to engage with

The final passage of the OTC hearing aid legislation comes after nearly two years of national dialogue prompted by the release of the President's Council of Advisors on Science and Technology (PCAST) report on age-related mild to moderate hearing loss. The National Academy of Sciences, Engineering, and Medicine (NASEM), formerly the Institute of Medicine (IOM), also convened public and private stakeholder meetings as they prepared and released their own recommendations in their report entitled Hearing Health Care for Adults: Priorities for Improving Access and Affordability. The US Food and Drug Administration (FDA) and the Federal Trade Commission (FTC) hosted workshops and other events to solicit stakeholder feedback on this topic.

Academy President Windmill went on to say, "During many of the national discussions on age-related hearing loss, audiologists were frequently identified as leaders in advancing policies to improve access to services and devices for consumers. Audiologists can provide guidance to the consumer on determining if an OTC hearing aid device or other amplification product can offer the best results for hearing loss treatment. With the passage of the OTC legislation, we, as audiologists, must continue to lead through consumer education, outreach to other providers, and partnerships with federal agencies. Our efforts will now shift towards directly engaging with the FDA and FTC to shape new OTC hearing aid device regulations that will be developed and implemented in the coming months and years."

The Academy will keep members up-to-date on next steps regarding the development of a category of OTC devices as more information becomes available. Visit the Academy's website for the latest in <u>Government Relations News</u>.

What's the 411 on



Telemedicine is a healthcare service provided to a patient by a healthcare professional from a different location through the use of telecommunications technology.

TELEMEDICINE COULD BE...

Connecting with your doctor over video

Conducting a follow-up appointment online

Participating in a virtual consultation

patients will benefit from a remote service by the end of 2017

LEADING MEDICAL **SERVICES USING TELEMEDICINE**

- Radiology
- Mental Health
- Pathology
- Primary and Urgent Care
- Intensive Care Unit Monitoring
- Chronic Care Monitoring
- Wellness Applications

TYPES OF **TELEMEDICINE DELIVERY**

- Live Video
- Voice
- Mobile Devices
- Store and Forward
- Provider-to-provider Consultation
- Direct to Consumer
- Artificial intelligence

Connect with ATA

www.americantelemed.org









115TH CONGRESS 1ST SESSION H. R. 2550

To amend title XVIII of the Social Security Act to provide for an incremental expansion of telehealth coverage under the Medicare program.

IN THE HOUSE OF REPRESENTATIVES

May 19, 2017

Mr. Thompson of California (for himself, Mrs. Black, Mr. Welch, and Mr. Harper) introduced the following bill; which was referred to the Committee on Energy and Commerce, and in addition to the Committee on Ways and Means, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

Medicare Telehealth Parity Act of 2017 would phase in expansion of telehealth services by:

- Expanding the list of eligible providers and related covered services to include audiologists, speech-language pathologists, respiratory therapists, physical therapists, and occupational therapists;
- Removing the geographic barriers under current law and allowing for the provision of telehealth services in rural, underserved, and metropolitan areas;
- Expanding access to telestroke services, regardless of where the patient is located;
- Allowing remote patient monitoring (RPM) for patients with chronic conditions such as heart failure, chronic obstructive pulmonary disease (COPD), and diabetes; and
- Allowing the beneficiary's home to serve as a site of care for home dialysis, hospice care, eligible outpatient mental health services, and home health services.

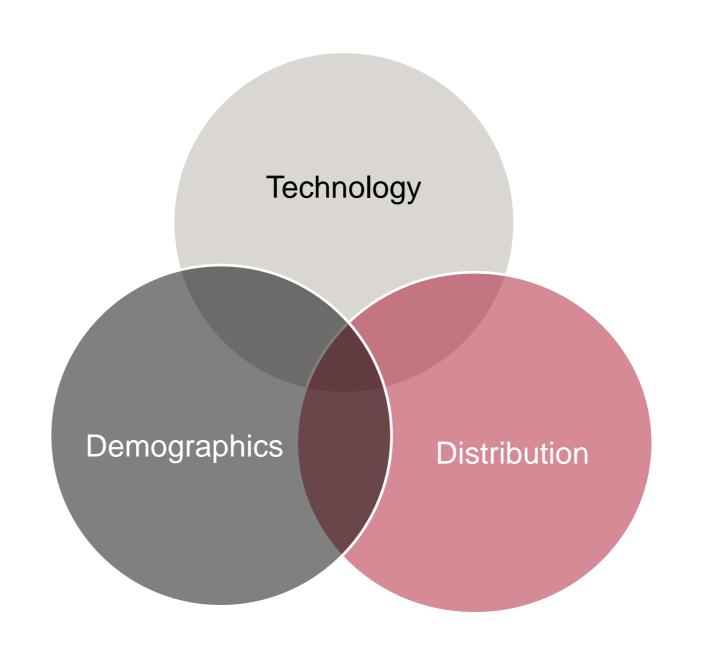
Telemedicine State Licensure Compact Legislation Tracking

TELEMEDICINE

ASSOCIATION

2017 State Licensure Compact Legislation Tracking (as of July 2017)

	Interstate Medical					
<u>State</u>	<u>Licensure Compact</u>	Enhanced NLC	APRN Compact	<u>PSYPACT</u>	<u>PTLC</u>	N ₁
Alabama	>					
Alaska						
Arizona	✓	~		✓	✓	
Arkansas		✓				
California						
Colorado	✓	Proposed*			✓	
Connecticut						
Delaware		✓				
DC	Proposed					
Florida		✓			Proposed	



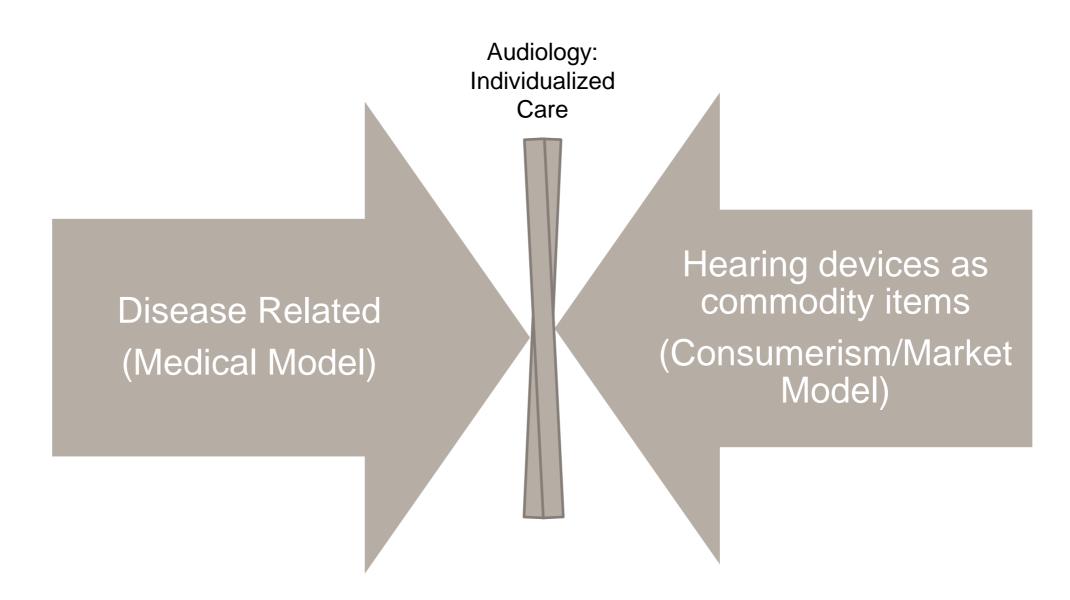


Healthcare Future Shifts

From Treatment to Prevention



Note Pressures on Hearing Healthcare Definition



What Should Insurance Pay For...?

Audiology

Healthcare

Practitioner / Medical Model

Wellness Care

Consumer / Market Model

Disease Detection, Diagnosis & Progression Auditory Rehabilitation following Auditory
Rehabilitation
for Age &
lifestyle
hearing
problems

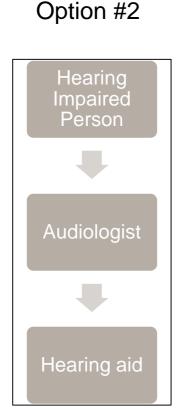
Hearing Conservation Consumer Electronics & "Internet of things"

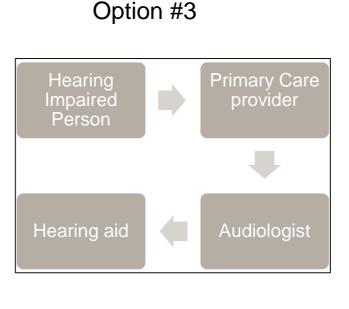
Product Design

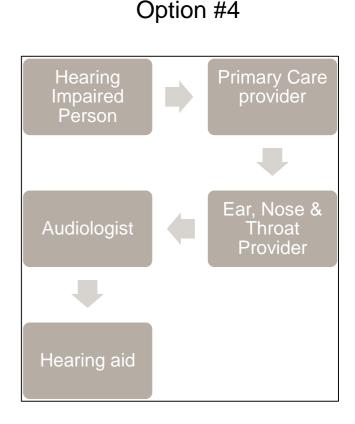
Which Model Has the Best Outcomes?

Cost / diagnosis? Cost / hearing Aid? Cost / hearing benefit?

Hearing Impaired Person
Hearing aid







Fennex – Augmented Hearing App By FENNEX AG

Open iTunes to buy and download apps.



View in iTunes

+ This app is designed for both iPhone and iPad

Free

Category: Health & Fitness Updated: Jul 31, 2017

Version: 1.0.2 Size: 52.9 MB Language: English Seller: FENNEX AG © 2017 FENNEX AG

Rated 4+

Compatibility: Requires iOS 10.0 or later. Compatible

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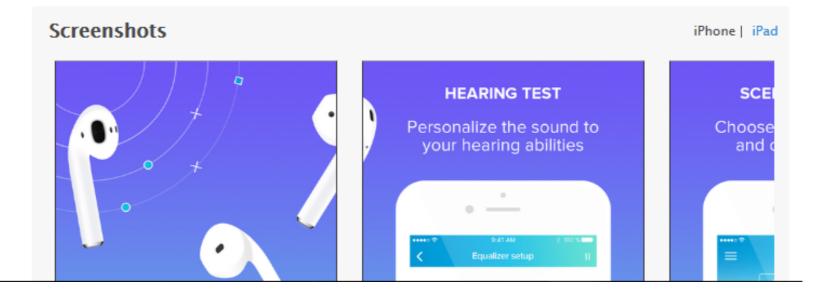
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FENNEX AG Web Site) Fennex - Augmented Hearing App Support)

...More

What's New in Version 1.0.2

* Improved sound quality with 48% better performance versus previous version



Did you know?

74% of adults have their vision examined every two years? (Glaucoma Research Foundation)

62% of adults see their dentist annually? (CDC & Prevention)

23% of adults receive hearing screenings during physical examination? Better Hearing Institute)



Healthcare Future Shifts

From Treatment to Prevention

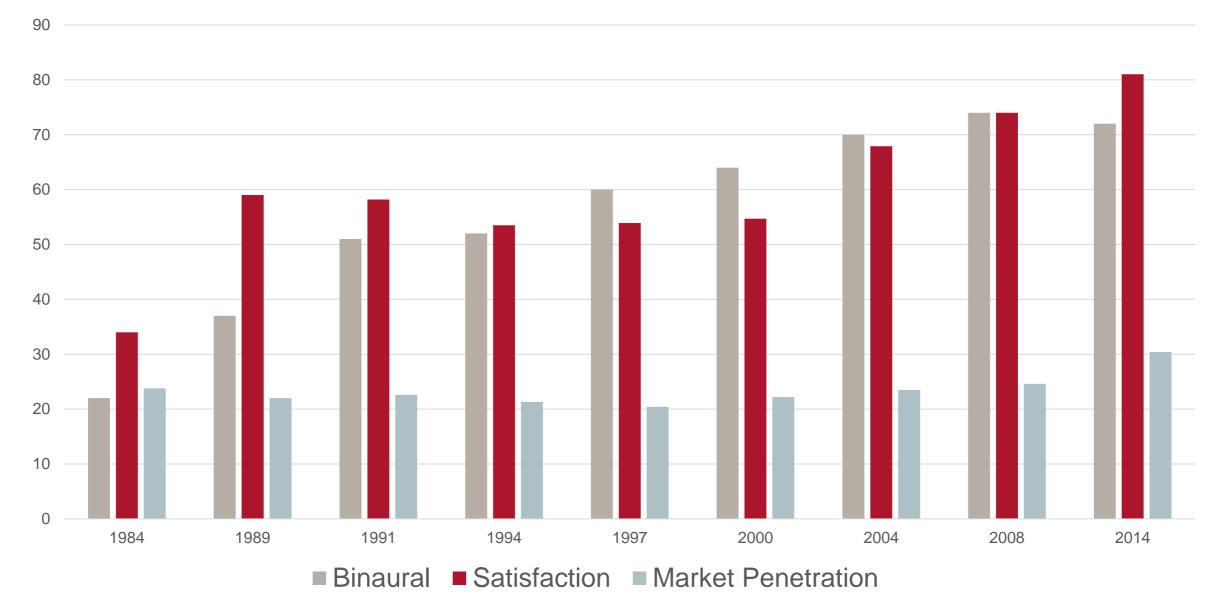
From Provider Centric to Patient Centered







US Hearing Aid Binaural Fitting Rate (%), Satisfaction (%) and Market Penetration (%), by Year



Approaches



Asynthonous tools



Goal

Increase access

Convenient services

Continuity of care

Reduce cost





Provided by qualified practitioner

Primarily for persons with limited access

Validate before implementation



ASHA

Assure service quality

- Validate efficacy and cost-effectiveness
- Meet needs of patients who need greater access to services



Issues

- License defines legal requirements to practice
- State laws may vary
- Few Boards have addressed
- "Mutual recognition" model



Healthcare Future Shifts

From Treatment to Prevention
From Provider Centric to Patient Centered
From Bureaucracy to Innovation

























Data Privacy

Information about an individual's health, e.g. hearing loss is considered sensitive personal information.

The processing of all personal information is regulated by data privacy laws and regulations, including the EU General Data Protection Regulation (GDPR), the US Health Insurance Portability and Accountability Act of 1996 (HIPAA), and local data protection laws in each country.

These laws and regulations contain provisions on processing of personal information, and stricter provisions on processing of sensitive personal information

FDA vs. FTC: Who does what?

The FDA:

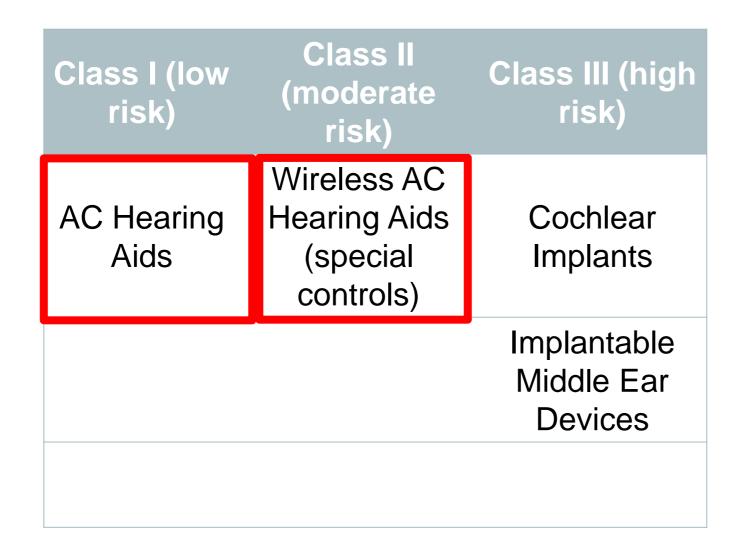
Has a broad charge that includes regulation of food, drugs, biologics, vaccines, medical devices, electronic products, cosmetics, veterinary products, tobacco products, etc.

The FTC:

A federal agency that regulates many types of advertising. The FTC protects consumers by stopping unfair, deceptive or fraudulent practices in the marketplace.



FDA-Regulated Medical Hearing Devices



Not Regulated

PSAPs "Hearables"

Over-The-Counter Hearing Aid Act of 2017

$$Senate = S.670$$

$$House = HR 1652$$

OTC hearing aid:

- Same technology as AC or wireless AC hearing aid
- For use by adults over 18 to compensate for perceived mild to moderate hearing impairment
- May use wireless technology or include tests for self-assessment of hearing loss
- Is available OTC, without involvement of a licensed person, to consumers through in-person transactions, by mail, or online

Over-The-Counter Hearing Aid Act of 2017

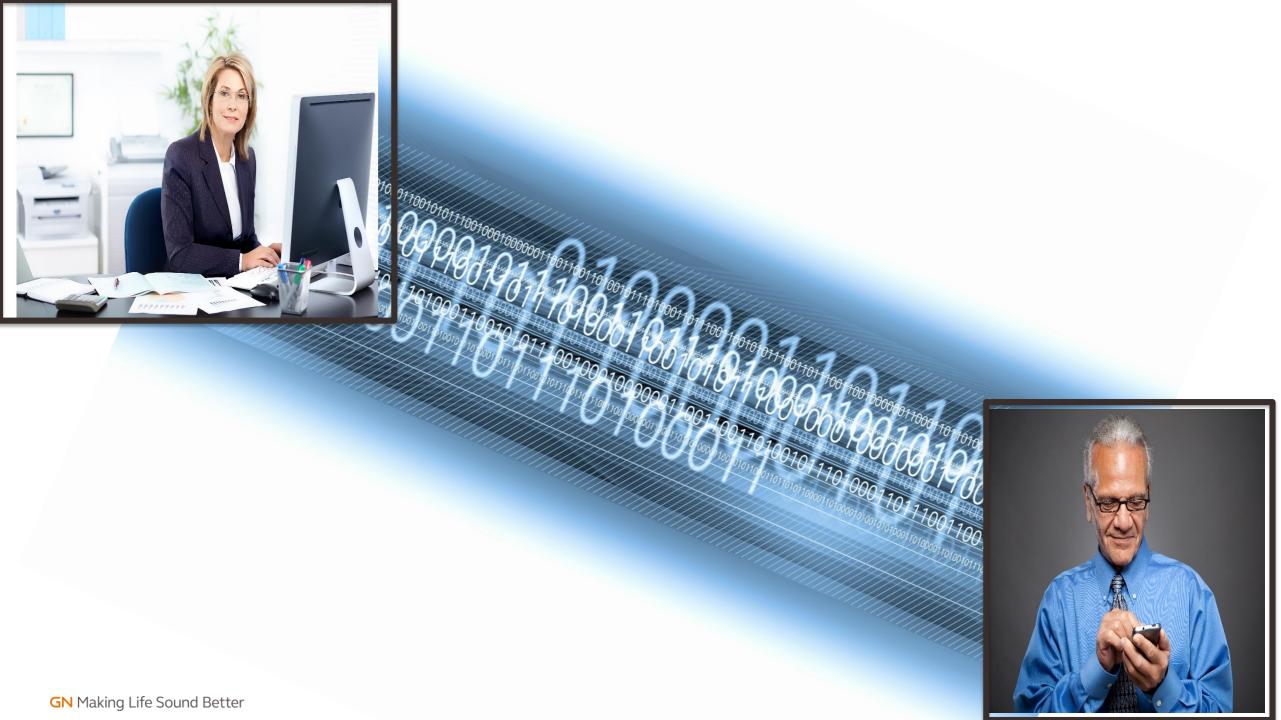
FDA is required to generate regulations that:

- Establish or adopt appropriate output limits
- Include reasonable assurance of safety, efficacy, AND privacy/security!

Healthcare Future Shifts

From Treatment to Prevention
From Provider Centric to Patient Centered
From Bureaucracy to Innovation
From disconnected to Hyper-connectivity





Perceptions Toward Internet-Based Delivery of Hearing Aids among Older Hearing-Impaired Adults

DOI: 10.3766/jaaa.15058

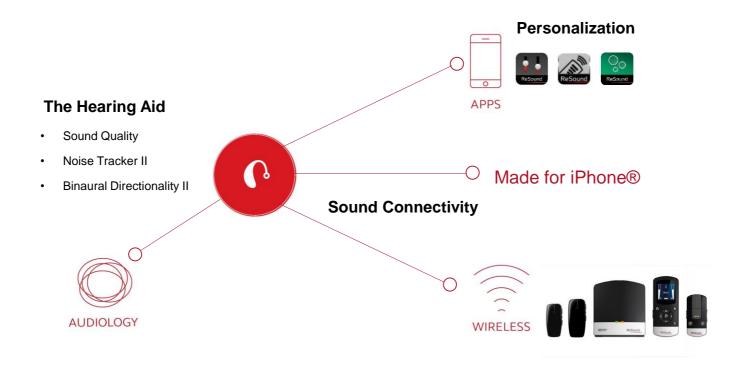
Navshika Chandra*
Grant D. Searchfield*†

Abstract

Background: Despite evidence that hearing aids can improve the social and psychological functioning of older hearing-impaired adults, hearing aid uptake is low. High cost of hearing aids and poor access to audiology services in rural areas are potential barriers to hearing aid acquisition. Methods of hearing aid delivery deviating from the traditional clinician-based model have been available to consumers for many years. One such method is Internet hearing aid sales. However, research exploring Internet-based hearing aid delivery, as a method to improve hearing aid uptake in this population, is limited.

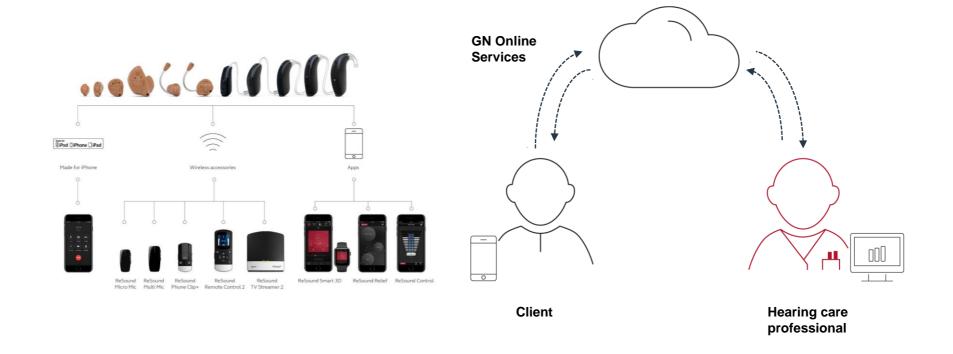
Purpose: The purpose of this study was to explore the perceptions of older hearing aid users (aged ≥65 yr) toward Internet-based hearing aid delivery.

The Hearing Ecosystem





TeleAudiology as an Engagement Tool



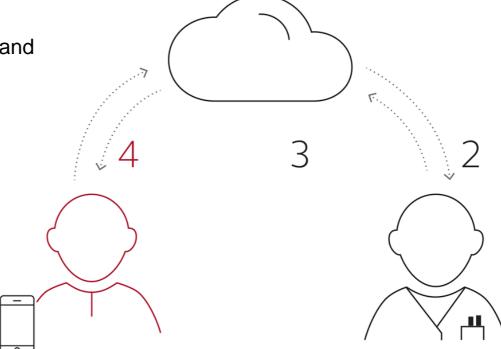


ReSound Assist

Easy access for your patients

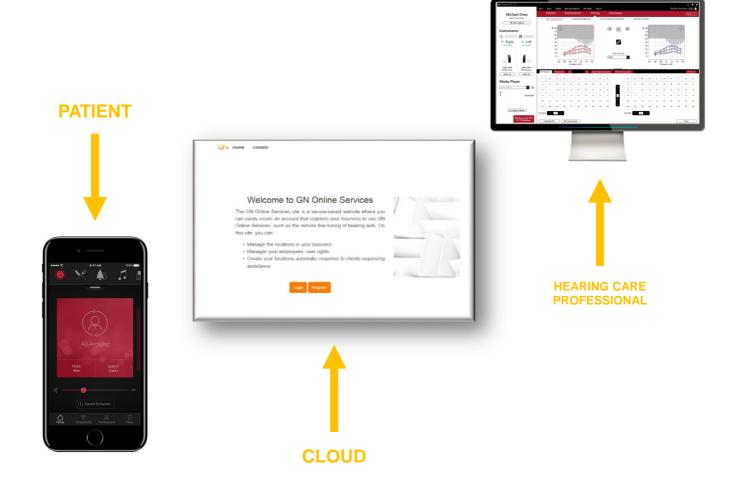
 Remotely make fine-tuning adjustments after the first fit in your office

 Less time scheduling appointments and more time supporting patients





What is ReSound Assist?





How does ReSound Assist work?

R Remote Fine-Tuning st



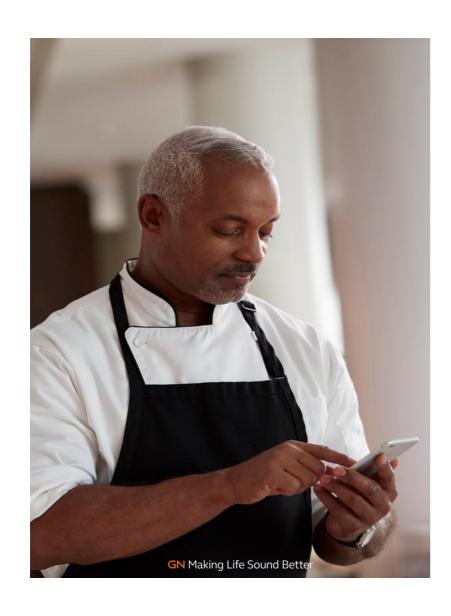
Updated settings.



Updated ne settings.





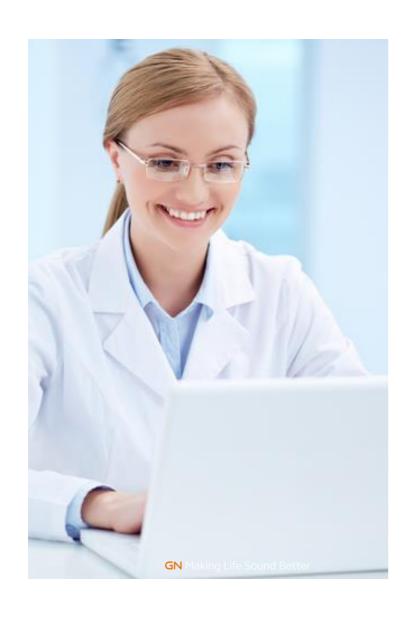


Benefits of ReSound Assist

For Patients

- Convenience
- Real-time feedback to hearing care professional in challenging hearing situations
- Hearing instruments can be adjusted based on real world patient experience





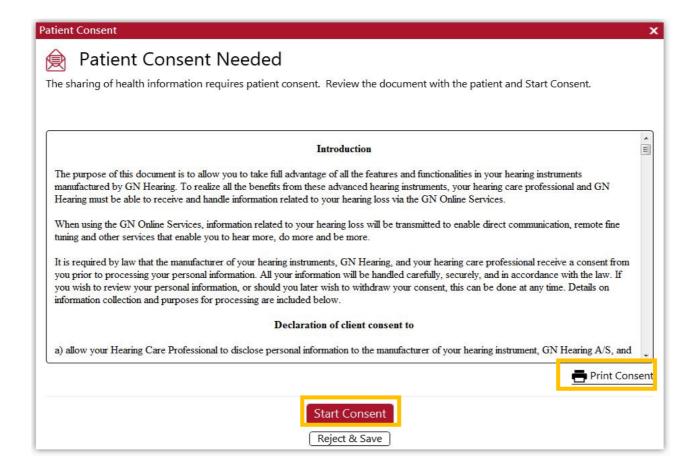
Benefits of ReSound Assist

For Hearing Care Professionals

- Improved patient engagement
- Enhanced level of care
- Reduced number of appointments for fine-tuning adjustments



Providing Patient Consent





Healthcare Future Shifts

From Treatment to Prevention
From Provider Centric to Patient Centered
From Bureaucracy to Innovation
From disconnected to Hyper-connectivity
From Hearing "Aids" to "Hearables"





The Ear is Prime Real Estate for Sensing

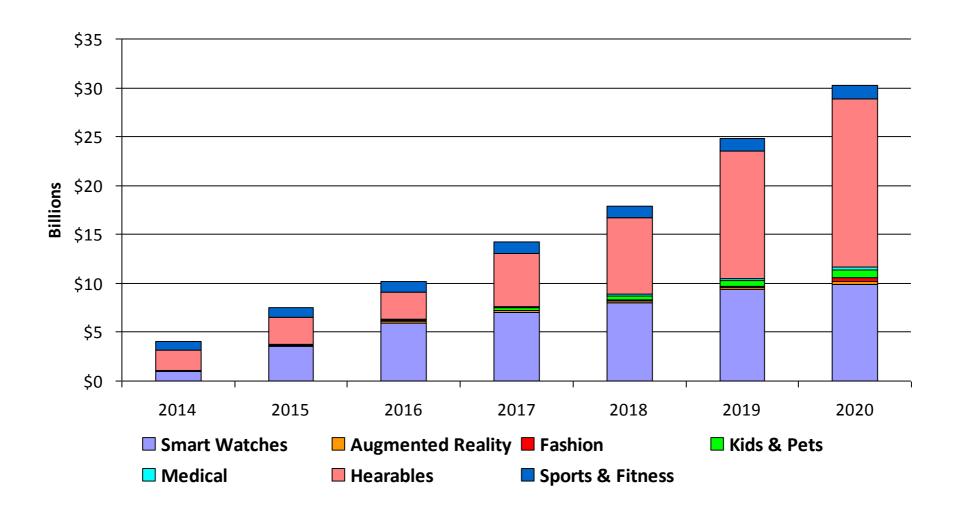


Biometrics and health

Location, position and vibration

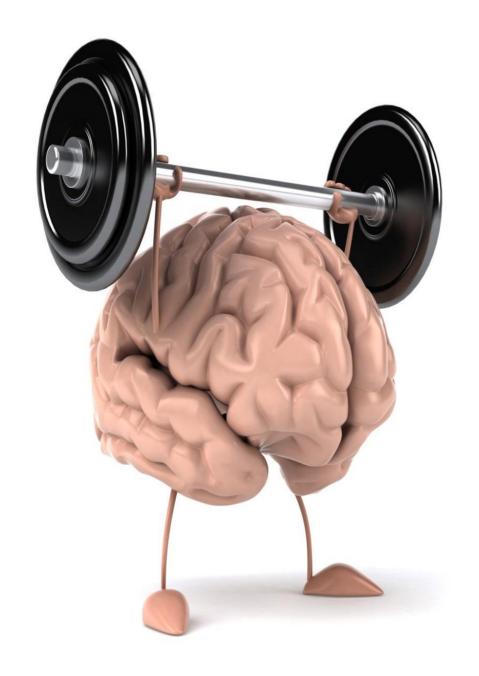
Two way communications

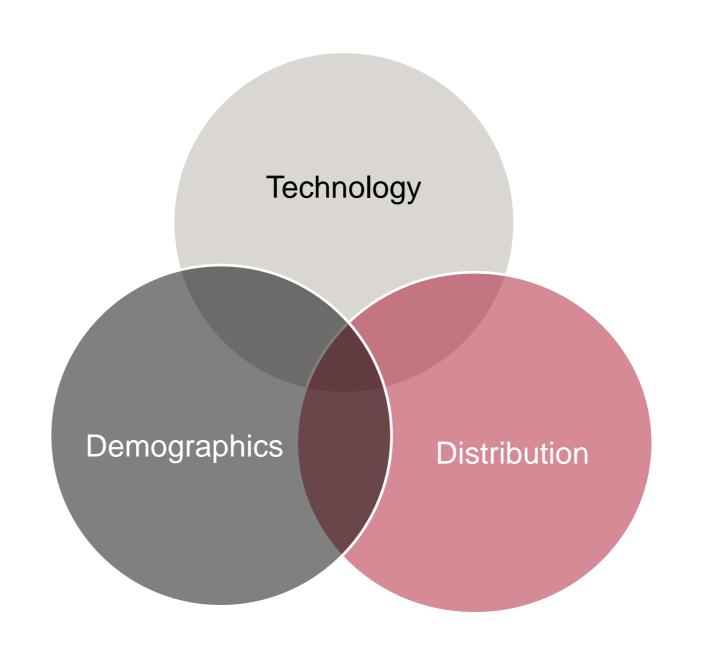
The global market for smart wearables



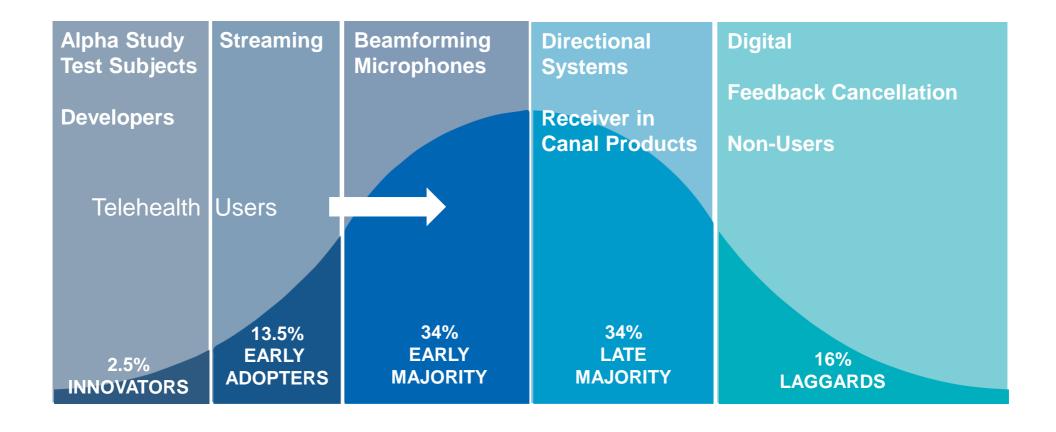
For more details, download the report from www.bit.ly/smartwear





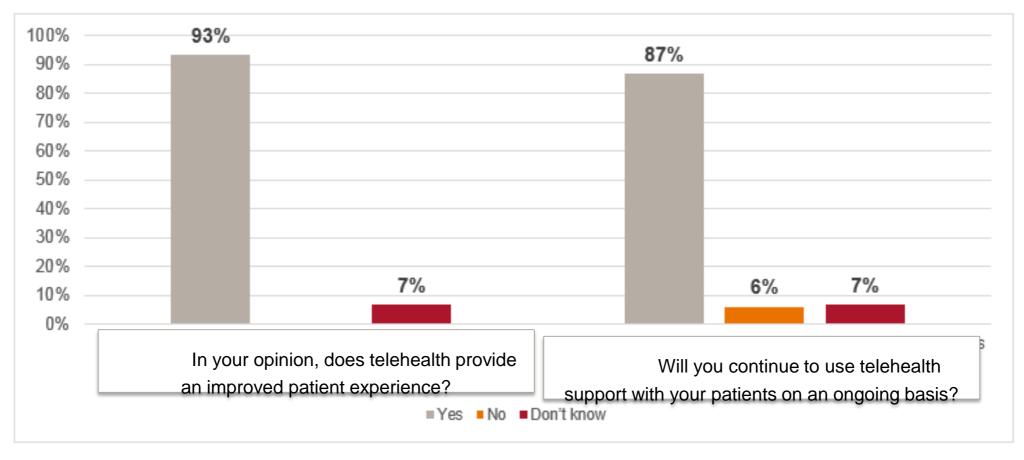


TECHNOLOGY TRENDS





Initial survey results from a telehealth support model



Market test April-June 2017 in US, Italy, Netherlands and Denmark with participation of 15 Audiologists (Wilke)



Create a patient experience that over-delivers value at *every* patient contact

Appointment 1 – First Fit and verification of initial fitting targets

Appointment 2 – Real-time adjustments – Deliver practical improvements to the patients hearing aids based on their feedback in real-world envrionments.

Appointment 3 – Using apps – now is the chance to showcase the control the patient can have over their technology and how to make it suit their lifestyle further using manufacturer and third-party apps. Demonstrate use of telehealth support (in office)

Appointment 4 – TeleHealth – Now use telehealth to address real-world challenges *in-situ*. Holding this back ensures the patient sees this as a huge convenience as opposed to an overwhelming resource. In addition – this moment provides an opportunity to make the optional subscription available to more patients.

Appointment 5 – Showcase the ecosystem – Have a wireless accessory pre paired to allow you to introduce an enhanced experience to the patient through connecting further devices to their devices.



Thank you Dafabry@gnresound.com