

TeleAudiology

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Telemedicine... "It allows us to connect a patient to a doctor and it allows us to erase time and distance which is really the miracle of telemedicine."

Jay Robbins
Director of Telemedicine
Tift Regional

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Hearing Loss most common chronic disabling condition

642 million affected to some degree

Disabling hearing loss (> 40 dB HL): 328 million

- 798,000 newborns annually born with or acquire permanent bilateral hearing loss
- 1 in every 4 adults over 45 years of age (WHO, 2008)

Intervention can reduce social, educational and economic consequences of hearing loss

- Cycle of poverty - higher unemployment rates; greater risk of hearing loss due to poor hygiene or disease outbreak; poor knowledge about prevention of hearing loss

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Audiology Services?

Ratio of audiologist to general population

- in developing countries: 1 for every 500,000 to 6.25 million
- In developed countries: 1 for every 20,000

In some countries there are NO audiology or otolaryngology services!

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Despite increasing awareness:

Only 22% of those individuals who could benefit from hearing aids actually receive one in the U.S. (Kochkin, 2005)

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Audiological Services Not Available

Shortage of trained staff

Expense of equipment

- Audiometers
- Sound Booths

Call for creative means with critical review that compliment existing structure.

Is Tele-Audiology the Answer?

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Tele-Health/Tele-Medicine

EEG
Cardio-monitoring
Surgical Procedures
Physical Evaluations
Counseling
Therapy
Speech Pathology
Audiology

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Definition of Telehealth

Use of medical information exchanged from one site to another via electronic communications to improve patient health status. (American Telemedicine Association)

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TeleAudiology

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Employing TeleHealth

- Synchronous, real time manner
- Asynchronous, store and forward
- Hybrid

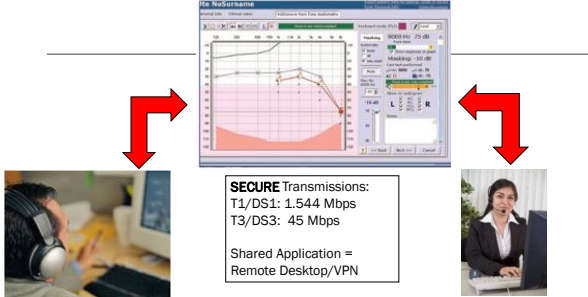
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Employing TeleHealth

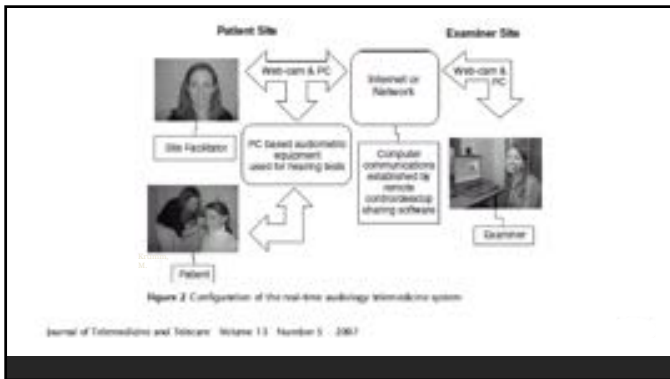
- Synchronous, real time manner
 - Assessment via interactive videoconferencing
 - Infers simultaneous bi-directional transmission

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Synchronous



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Employing TeleHealth

- Synchronous, real time manner
- Asynchronous, store and forward
 - Digital picture emailed to health care practitioner
 - Fax results
 - Infers one direction transmission

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Asynchronous

Secure & Encrypted

Transmit:
Case history
Hearing Screening Results
Patient Self-Assessment

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Employing TeleHealth

- Synchronous, real time manner
- Asynchronous, store and forward
- Hybrid
 - Mix of store and forward with synchronous manner

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Equipment Needs

Videoconferencing

Two computers

- At patient site
- At professional's site

Computerized audiometry

- Wide range of test capabilities
- Application sharing in real-time (remote access)

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Personnel

Clinician

Hearing Assistants

- | | |
|---|--|
| <ul style="list-style-type: none">◦ Conducting screenings of other areas◦ Fitting headsets (noise excluding)◦ Placement of real-ear measurement probes◦ Instructing Patients◦ Connect electronically with the pt side◦ Immittance & OAE probe placement◦ Trouble shooting hearing aids◦ Trouble shooting cochlear implants◦ Trimming/replacing earmold tubing◦ Earmold impressions | <ul style="list-style-type: none">◦ Conducting screenings of other areas◦ Fitting headsets (noise excluding)◦ Placement of real-ear measurement probes◦ Instructing Patients◦ Connect electronically with clinician side◦ Immittance & OAE probe placement◦ Trouble shooting hearing aids◦ Trouble shooting cochlear implants◦ Trimming/replacing earmold tubing◦ Earmold impressions |
|---|--|

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SUPPORT PERSONNEL

**Hearing Health
Assistant
(Audio Assist)**

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Supervision (as determined by license)

Direct

- (line of sight) audiologist in same room while AA is engaged in tasks

Indirect

- Audiologist in proximity and/or accessible

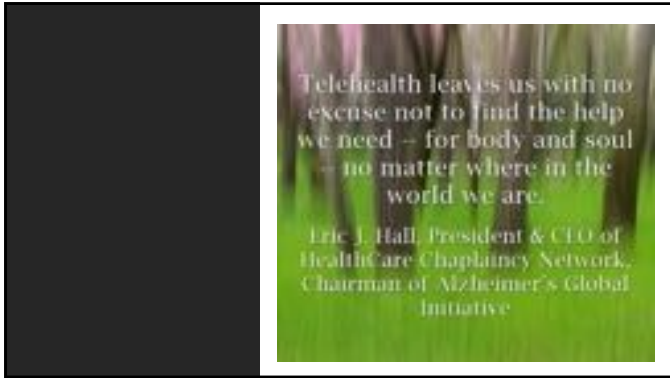
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Licensing? Scope of Practice?

Some states have no license for Audiology

Texas license – scope of practice updated to recognize TeleMedicine.

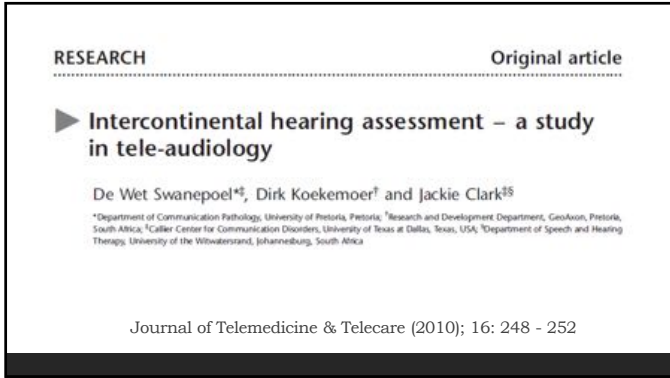
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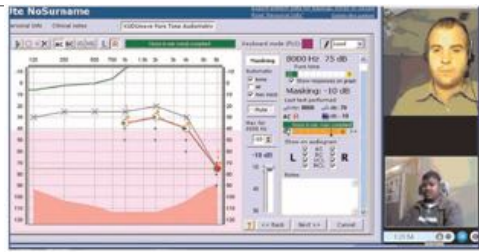
Purpose

Ascertain if there is a difference in:

- Test time
- Patient Response time
- Quality of signal presentation

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Audiometry



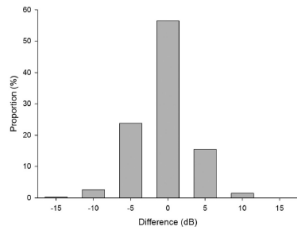
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KUDUwave



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Threshold Difference



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Face-to-Face vs. Remote Audiometry

Table 1 Average thresholds (dB) for face-to-face and remote audiometry

	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall
Mean face-to-face threshold (SD)	9.2 (8.8)	7.6 (7.7)	8.6 (8.7)	8.7 (10.5)	8.5 (8.7)	5.3 (10.5)	10.1 (17.1)	8.3 (10.7)
Mean remote threshold (SD)	10.2 (8.9)	8.1 (8.5)	9.3 (8.5)	8.9 (10.5)	8.4 (8.1)	6.1 (10.4)	10.9 (17.0)	8.8 (10.7)

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Reaction Times

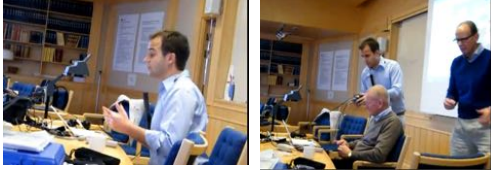
Table 2 Average reaction times (ms) and number of presentations for face-to-face and remote audiometry (nine subjects)

	Mean	SD	No. of presentations
Face-to-face audiometry	596	191	93
Remote audiometry	594	189	75
Mean difference	2	69	18

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TeleAudiology is HERE

Sweden - South Africa



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FaceTime



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hearZA

ENG



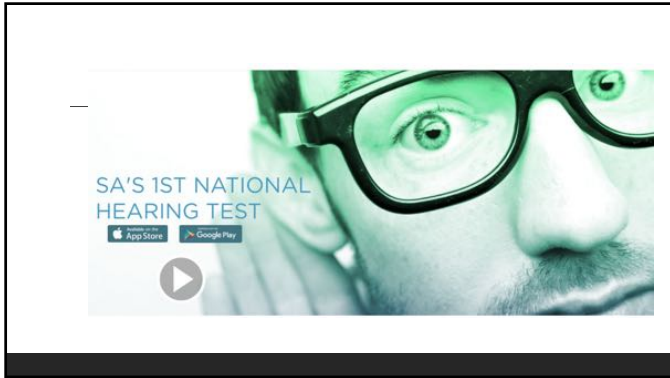
SIMPLE & EASY-TO-USE
Works on all Android & iOS smartphones and any headphone

QUICK TEST
Know your hearing score in 2 minutes

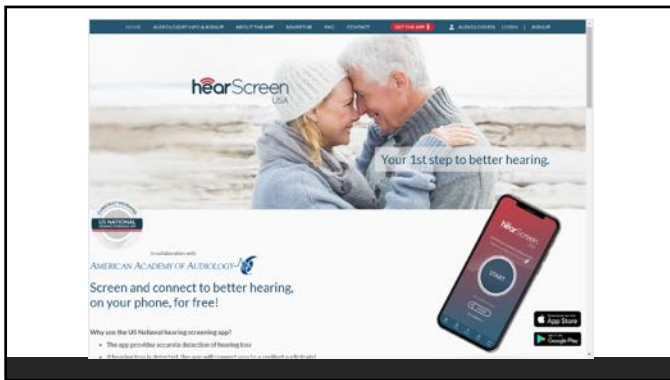
ACCURATE RESULT
Clinically validated by the University of Pretoria

CONNECTIONS
Track your hearing score

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