Things I’ve learned.

W. Campbell
* Involved in teleaudiology since 2008.
* 1st clinical use of remote infant ABR.
* Development of Teleaudiology Resource Guide with NCHAM working group.
* Development of Ontario Infant Hearing Program teleaudiology protocol.

* So, what do I know?
I know Distance!
Digital Transformation for Audiology.....Threat?
* 2000 debut at AAA.
  * $40 million invested
  * Retail for $39-replaced every 40 days
  * Profit margin of $19.50
  * 2005: folded

* 2008 Songbird Flexfit:
  * $79 direct to consumer. 400 day battery life

* March 2012: Songbird Clear BTE, 1000 stores in US
NORTH BRUNSWICK, NJ—Songbird Hearing, Inc., called it quits—again. For at least the second time in the 12-year history of the original disposable hearing aid, the Songbird has apparently failed to build the market its manufacturer had hoped for.

Attempts to reach company executive for comment were unsuccessful.
* www.ovationhearing.com
* www.eargo.com


Our latest hearing aid with an all new chip, for maximum audio fidelity and our best noise reduction yet.

$2,450
As low as $114/month**

BUY NOW GET YOUR FREE SAMPLE

* Online hearing aids
Distinguish yourself from others.
* Save clients time and money.
* Efficiency in clinician time.
* The right tool for the job!

* Digital Transformation for Audiology…or Opportunity
*Telehealth in audiology is not new:
  * Fabry, 1990’s, hearing aid programming.
  * Schmiedge (thesis) 1997, OAE’s.
  * Franck et al, 2006, CI programming.
  * Pearce, Ching, Dillon, 2009, assessment delivery.
Ontario Infant Hearing Program (IHP)

- Provides universal screening, assessment, communication development services.
- Audiologists sited in 12 regions across Ontario.
* 2006: Barriers to access to IHP ABR services in northern Ontario
* Loss to Follow Up
* Travel cost for families
* Training and Support of EHDI professionals
* Wait List for Service
* Quality Assurance

*Issues in EHDI*
* 2006: Barriers to access to IHP ABR services in northern Ontario
* Infants missed at hospital before discharge
* Infant who refer at Stage I and do not return for Stage II
* Infants who refer from Stage II and do not return for assessment
*Probability of HL*

Graph showing the prevalence of HL in different populations:
- Prevalence in General Population
- Prevalence in WBN refer population
- Prevalence in NICU refer population
2006: Barriers to access to IHP ABR services in northern Ontario

2008:
- Technology became available
- Online services accessed
- Development of pilot for province wide program

2008-2011: Integrated into clinical schedule
*Hub site:
  * This is where the assessing audiologist is located.
  * Equipment necessary for establishing the telemedicine and data connection.

*Spoke site:
  * This is where the infant is located.
  * ABR, otoscope, OAE equipment location
  * Trained technician and intake staff
Remote Assessment

Laptop → Headbox → Electrodes
USB → Ear probe
Remote Assessment

- Spoke Laptop
- USB
- Headbox
  - Electrodes
  - Ear probe
- Remote Connection
- Hub Laptop

![Remote Assessment Diagram](image-url)
Software barriers:

* 2006: ABR software was DOS based and could not be controlled using Windows based desktop sharing software.

Access barriers

* 2008: Use of Ontario Telemedicine Network (OTN) secure network, data link connected to video link.
* OTN used fixed sites, limiting access to service.
* Overcoming risk to OTN network and various agency concerns.

Making it work
* 2008-2011: 120 Ax, 1 ID

* 2011 to present:
  * Development of Ontario protocol
  * Established 2 other sites in ON
  * Dev’t of funded remote Ax programs in Ontario and British Columbia

* All that work for....
* Videoconference and data connections
  * Established telemedicine network
  * Skype for Business
* Trained staff
  * Hub site audiologist
  * Spoke site technician
  * Scheduling and support staff

*Key Components*
* Telemedicine network access.
* Desktop sharing solution.
* Testing environment.

*Challenges and Solutions*
* Agency IT policy restrictions.
* Patient Privacy.
* Clinician comfort with technology.
* Patient comfort with technology.

*Challenges and Solutions*
There we go.
An interesting and
thought-provoking post.
I can't wait to see
the responses.

I can
typing.

* Law of Unintended
Consequences
* Technology changes.....
* Staff change......
* Agency policies change.....
* Funding changes.....
* Equipment setup and team involvement is critical.
* 2015: 710,000 HA dispensed (21% of market)

* VA eAudiology:
  * 176 sites (+419 brick and mortar)
  * 23,561 remote appointments
  * Satisfaction and outcomes rated as good or better compared to face to face.
* Royal Institute for Deaf and Blind Children, Australia
* RemoteEar.com
* NCHAM: A Resource Guide Supporting Teleaudiology
* KUDUwave
* OtoID
* VA Teleaudiology
* Alaska Federal Healthcare Access Network
* BCEHP

* eAudiology Now
Signia TeleCare
Starkey Telehear

1. Patient completes case history with local office.

2. Hearing healthcare professional performs hearing test.

3. Hearing healthcare professional connects to a TeleHear\textsuperscript{SM} consultant with their patient.

4. Over a video conference, the overseeing practitioner, the patient and the TeleHear\textsuperscript{SM} consultant walk through the patient’s audiogram results and recommend a solution that fit their hearing needs.

With permission from www.telehear.com
* Hearing aid adjustment.
* Counseling.
* Post fit follow up.
*Virtual home visits:
  * Hearing aid adjustments
  * Counseling
  * Direct DIY instruction
  * Post fit follow up

*Practical eAudiology*
With permission from Municipality of Greenstone
* Web based manufacturer software
* Connection to devices
* Assistance at remote site
* Video conference or live chat link
* Manufacturer supplied links
* OTN PCVC
* Vidyo
* Skype for Business
* Teamviewer
* AnyDesk
*Keep it simple!!*
* Know your community
* Understand the cultural aspects and impact
* Link to resources to help with things you don’t understand
* What are the barriers? How can they be overcome?
* Don’t just apply temporary solutions
* What are the strengths? How can you use them?
The internet is so fascinating!

That's the microwave!
* Isolated attempts at online or direct sales.
* Rise in public sector programs, i.e., VA, EHDI, CI.
* Innovation and integration into private sector practice.
* Manufacturer’s role?

**Where are we going, really?**
Bill Campbell
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References:


*References:


* Schmiedge, 1997 *Unpublished Master’s Thesis*, 1997,
