

# C2Hear Online: towards personalised hearing aid information for the smartphone generation

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# Question

## If you are an audiologist

- How confident are you that the information and advice you offer your first-time hearing aid patients is
  - understood
  - absorbed
  - and then acted upon

once they leave the comfort of your clinic room?



# Show of hands

If you are an audiologist

- **I am confident that the information and advice I offer my first-time hearing aid patients is**
  - understood
  - absorbed
  - and then acted upon

once they leave the comfort of your clinic room

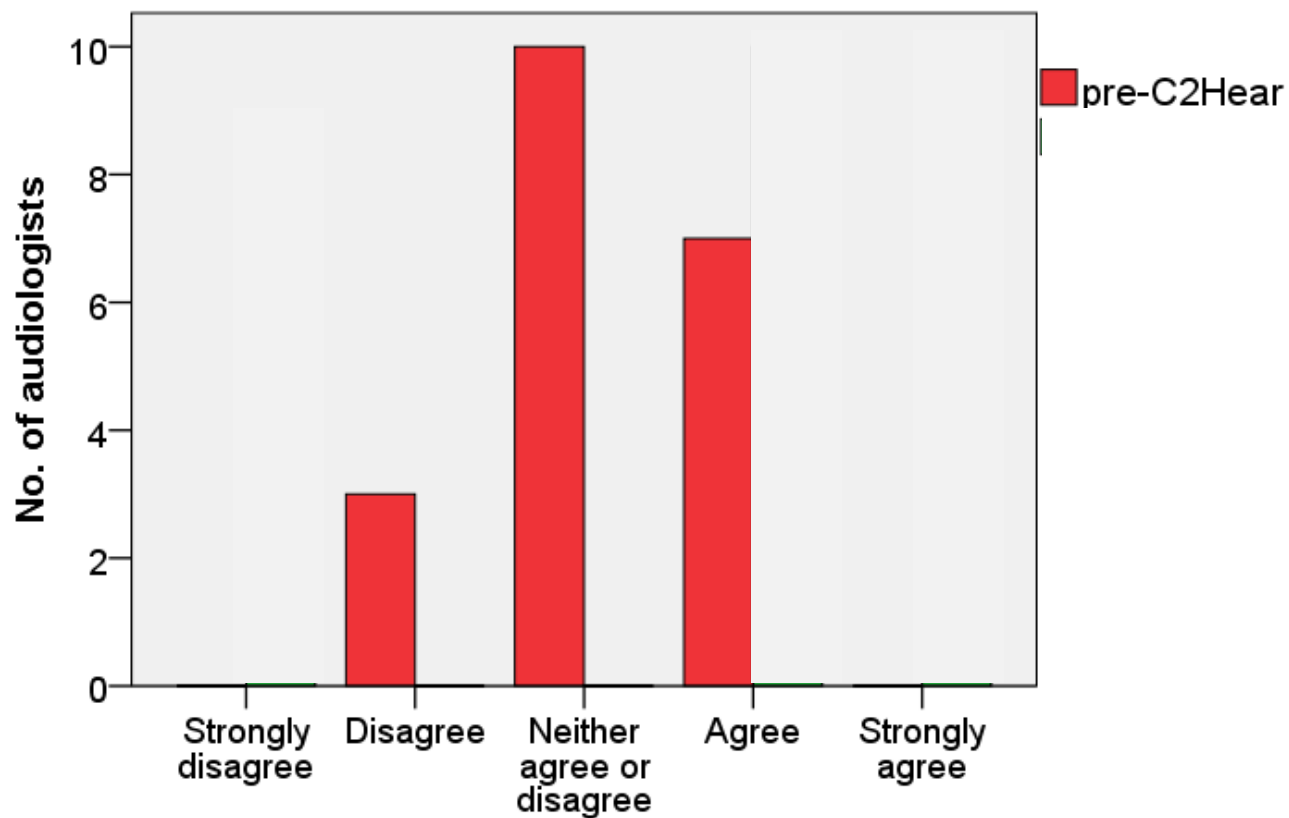
disagree

neither

agree



I am confident that the information given is remembered and acted upon by my hearing aid patients



Tasnim Hajat



# Knowledge of hearing-related issues is poor

- Patients, public, practitioners
  - Experienced hearing aid users
    - hearing aids and how to use them – poor to excellent
    - 60-80% did not know how to use the telephone



Hearing aid non-use  
Costs: NHS

person with hearing loss = communication difficulties  
→ reduced social interaction → poorer QoL

First-time hearing aid users

Overall = 49.6%

Practical = 62.9%    Psychosocial = 34.3%

*(El-Molla, Smith, Henshaw, Ferguson, 2012)*

51% found difficulties using aid at first

*“You get a lot of information ...by the time you get home, you’ve forgotten most of it.”*

*(AoHL Hear Me Out, 2011)*



**Lots to do!**



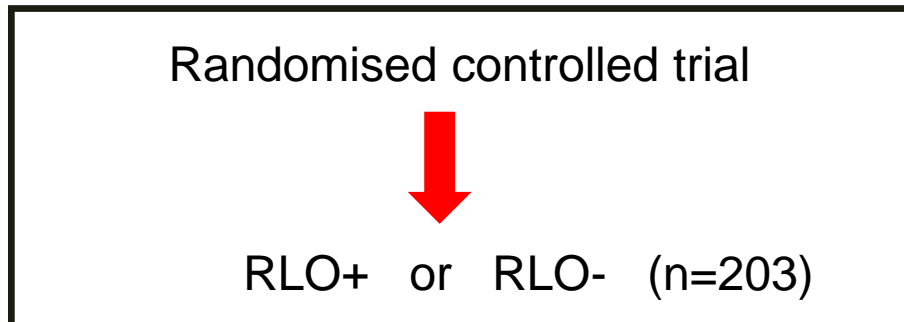
**Lots of information!**

# Past



Q: Do video tutorials *supplement* advice and information provided by audiologists and result in enhanced benefit and use for hearing aid users?

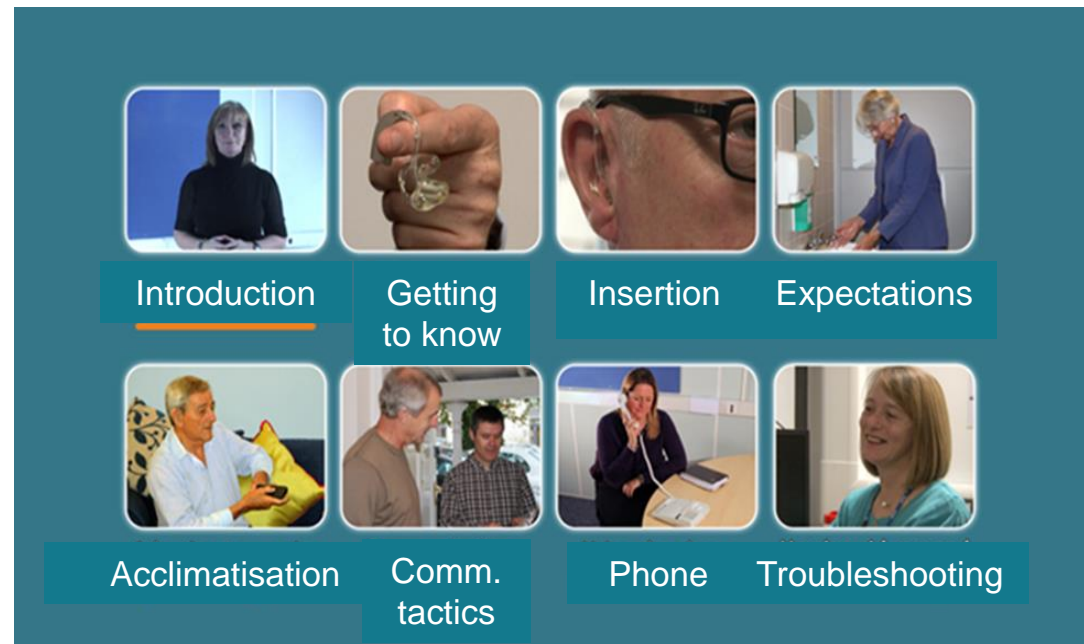
1. To *develop* a series of multimedia videos (reusable learning objects, RLOs)
  - range of auditory rehabilitation subjects
  - accessible to hearing aid users and their families
2. To *evaluate* the benefits and cost-effectiveness of the RLOs



# HEAR-IT study

## 1. Develop a series of interactive multimedia video tutorials: Reusable learning objects (RLOs)

- Based on learning theory
- Range of auditory rehabilitation subjects
- Video clips, animations, photos, testimonials
- Subtitled
- Interactive quiz
- Duration ~1 hour
- Developed with HA users



*(Ferguson et al, Ear Hear, 2016)*



# Hearing aid insertion

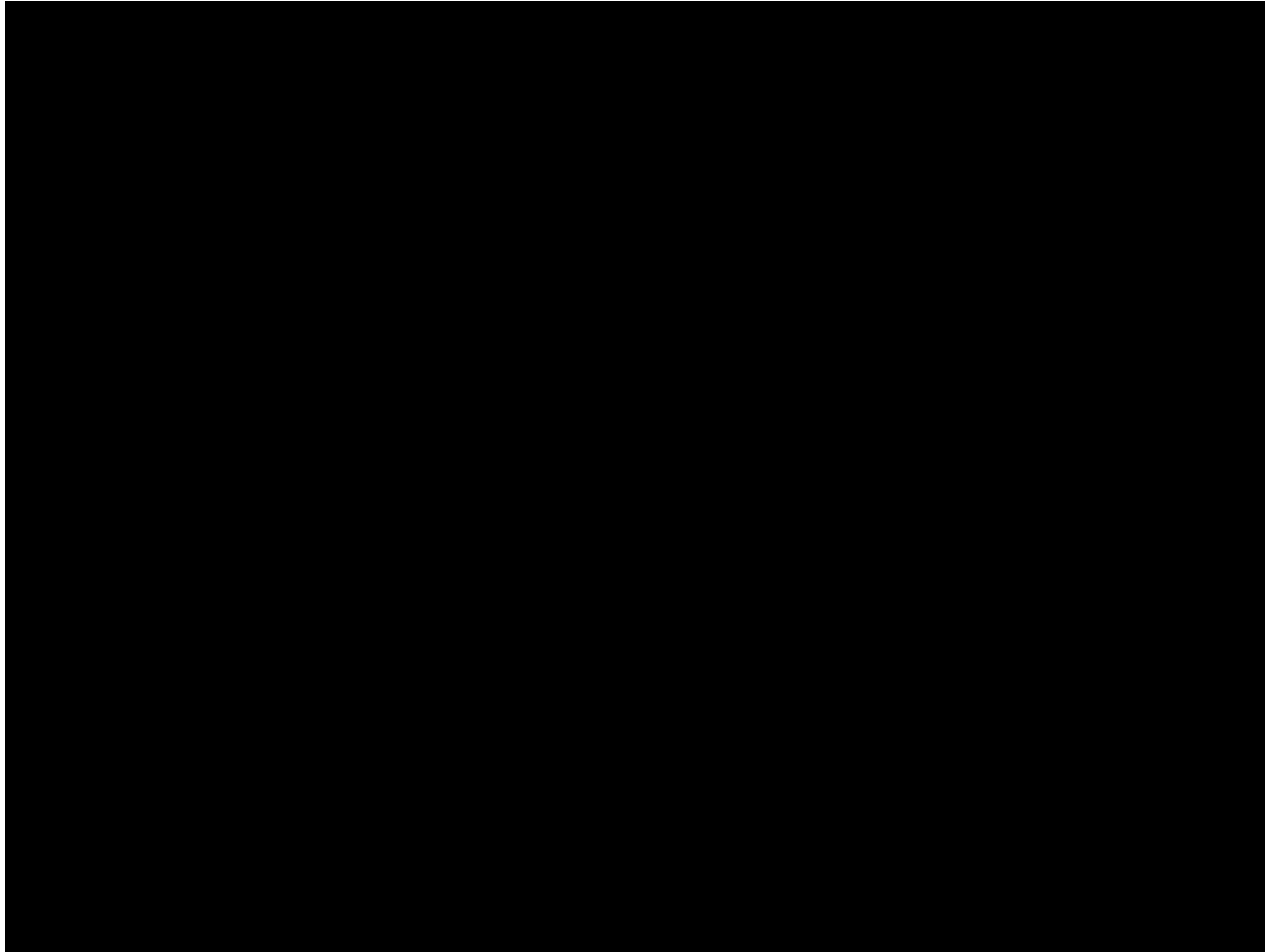

“recognise the shape of your earmould with the shape of your ear” - reinforcements and consequences



*National Institute for  
Health Research*

# Acclimatisation

Learning outcome: be aware of how you adapt to listening with your hearing aids



## 2. Evaluation: Clinically registered RCT (N=203)

### Take-up and adherence

*Take-up = 78%*  
*94.3% watched all RLOs*

### Self-management

*2+ times = 49.9%*  
*Re-use suggested self-management*

### HA knowledge & skills

*Better knowledge on HAs and communication & HA handling skills*

### HA use

*Greater use (GHABP) suboptimal users*

### Valued by users

*Rated RLOs as highly useful (9/10)*  
*Improved confidence*  
*Preferable to written info*

### Health economics

*RLOs were a very effective and cheap healthcare intervention*

*(Ferguson et al, Am J Aud 2015; Ear Hear, 2016)*



# Users voice: post-evaluation focus groups

- Main themes

- Content supported by the vast majority
- Communication partners were involved

*“Well, I went through them, right the way through. I begged my wife to watch them as well which I thought was important”*

- Provided reassurance, helped remember things
  - Improved awareness and confidence

*“it explained how we have to learn to rehear things. That is not an aspect that I [was aware of], to re-educate the brain to interpret what you hear”.*

- Sharing of videos with others (family, friends, neighbours)

*“I have passed my DVD on to on old couple who both have hearing aids ...” I kept telling her. “Play that DVD and you will know why,” because you have got to get used to it, haven't you?”*

*(Ferguson et al, Ear Hear, 2016)*

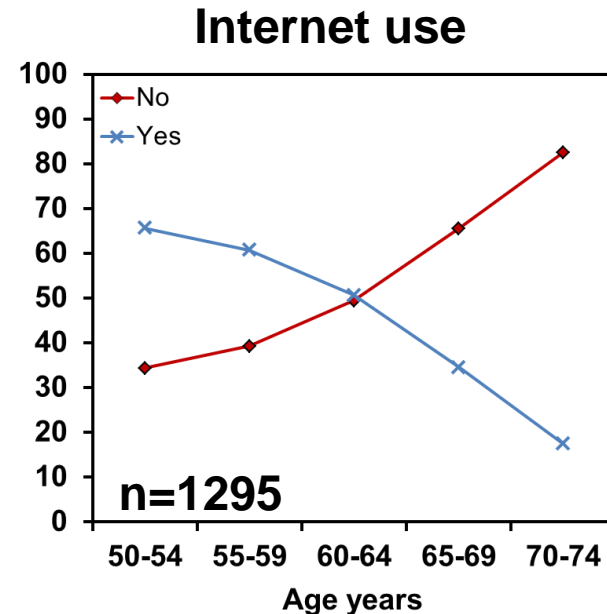
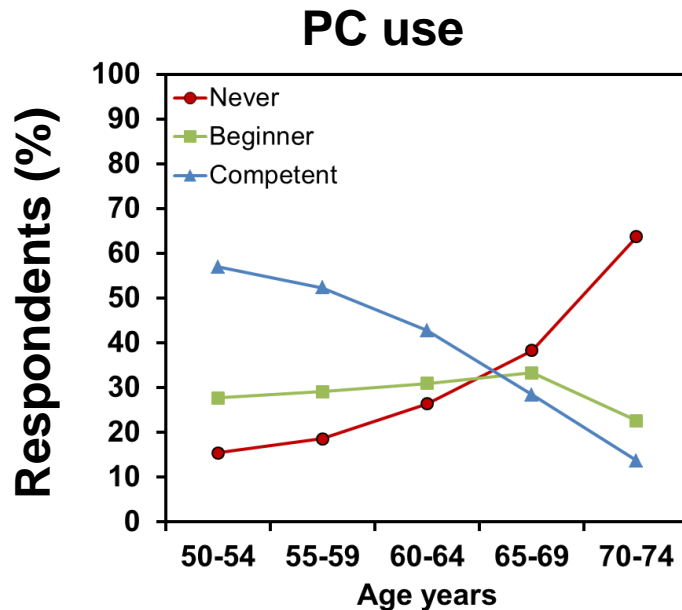


# Present



# Choice of media delivery:

## In 2010/11, PC & internet use was low



PC and internet use declined with age ( $p < .001$ )

	50-54 yo	70-74 yo
PC use	= 85%	= 36%
Internet use	= 66%	= 17%



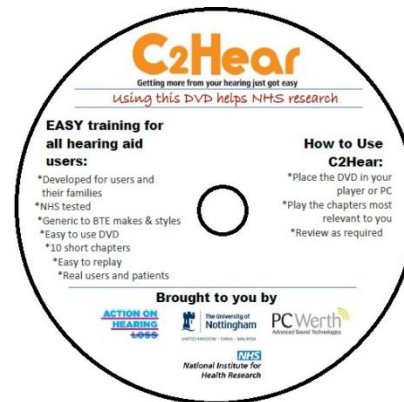
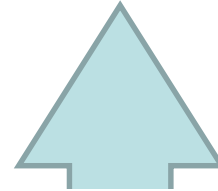
Home-delivered

52%				15%
			33%	

# Let's get the RLOs out there!

BAA 2014  
C2Hear launched

## Patients



NHS Supply Chain  
Framework:GHB9636

# The times they are a-changing

- Year-on-year increase in internet and smartphone use

	<b>Internet</b>	<b>Internet via smartphone</b>	
2010	61%	9%	36%
2012	70%	-	-
2014	78%	42%	74%
	(55-74y)	(65+y)	(55-84y)





# Let's get the RLOs out there!

BAA 2015  
C2Hear Online  
launched



>9500 views

Waiting room Demos, flyers link to website

**C2Hear Online** View as: Yourself

Home Videos Playlists Channels Discussion About

For returning subscribers For new visitors

**An Introduction to C2Hear Online**  
921 views 3 months ago  
C2Hear Online is a series of short, interactive, multimedia videos about hearing aids, hearing loss and communication.  
These videos have been shown to provide a range of benefits by a high-quality research study. For more information visit our website: <http://www.hearing.nihr.ac...>  
Please tell us what you think about C2Hear Online by completing our feedback form, <https://www.surveymonkey.co...>

**Channel tips**  
Get discovered  
6 tips to build community

**The University of Nottingham**  
NIHRtv  
University of Notting..

**Popular channels**  
Enable

**Hearing aid videos: custom mould (9 videos)**  
This series of 9 videos is about custom mould hearing aids.

**Getting to know your hearing aids**  
by C2Hear Online  
518 views · 3 months ago

**How to insert your hearing aids**  
by C2Hear Online  
244 views · 3 months ago

**What to expect when wearing hearing aids**  
by C2Hear Online  
368 views · 3 months ago

**Troubleshooting**  
by C2Hear Online  
176 views · 3 months ago

**Adapting to wearing hearing aids**  
by C2Hear Online  
198 views · 3 months ago

One size fits all  
Limited interactivity



# Future



# Internet-smartphone mode of delivery



Previously used a DVD platform

Benefits of greater flexibility of internet-smartphone platform are:

- tailored for the needs of the individual
- greater interactivity to promote greater learning
- means to self-monitor and self-evaluate
  - enhance self-management as well as knowledge
  - greater accessibility

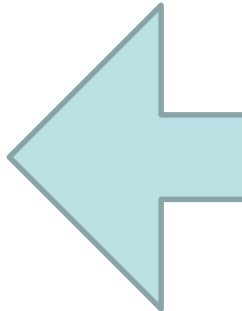
# Currently undergoing development



National Institute for Health Research



Communication Partners



**C2Hear**  
Online Getting more from your hearing just got easy

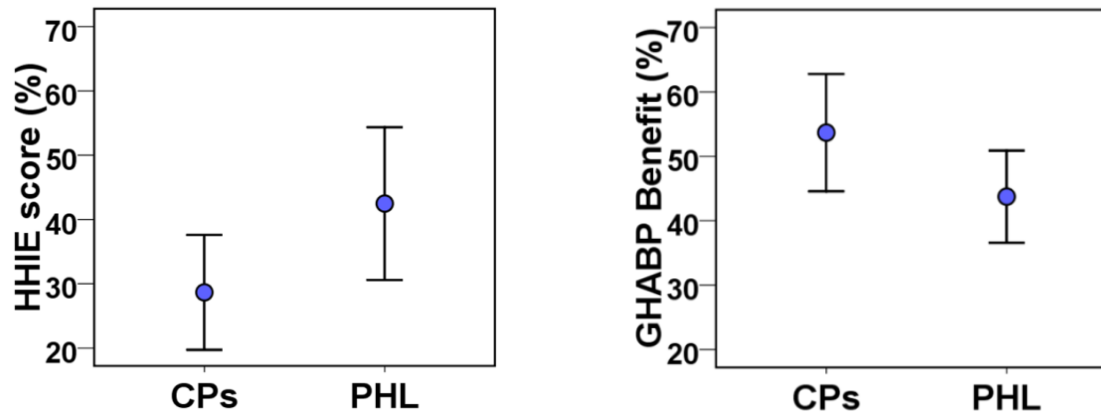
What is hearing loss, and the consequences of HL?  
Communication tactics  
Psychosocial aspects of hearing loss



# Communication Partners

## Why CPs?

- Increasing research to show CPs are an important factor in AR
- Knowledge and understanding about hearing-related issues in the general population is poor.



- Participation restrictions (HHIE) assessed by CPs *less* than PHL
- Benefits of hearing aids assessed by CP *greater* than PHL
- Focus groups suggested that CPs would value information *relevant to them*



# CP m-RLO content: evidence-based



Systematic review

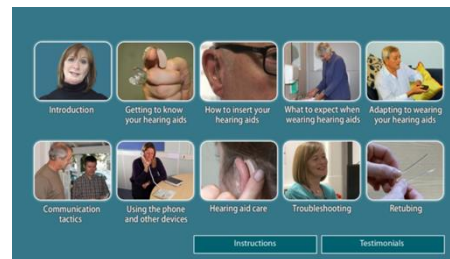
## What's new and relevant to CPs?



Literature - metasynthesis



Users' voice - focus groups



## Communication tactics Expectations Acclimatisation



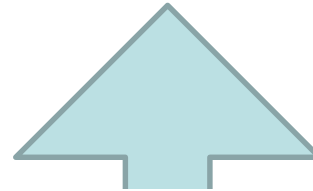
Users' voice - video footage

# Future development: grant funding pending

Aim: to develop individualised  
theoretically-driven m-RLOs

- tailored to the needs of  
the individual
- incorporate greater  
interactivity
- means to monitor  
progress (IMP-OS)

Patients



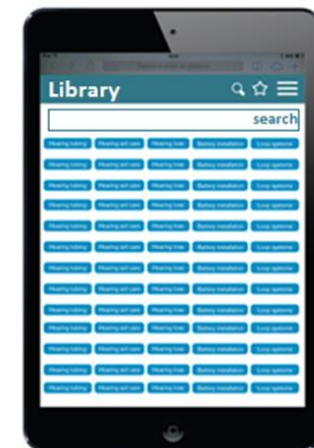
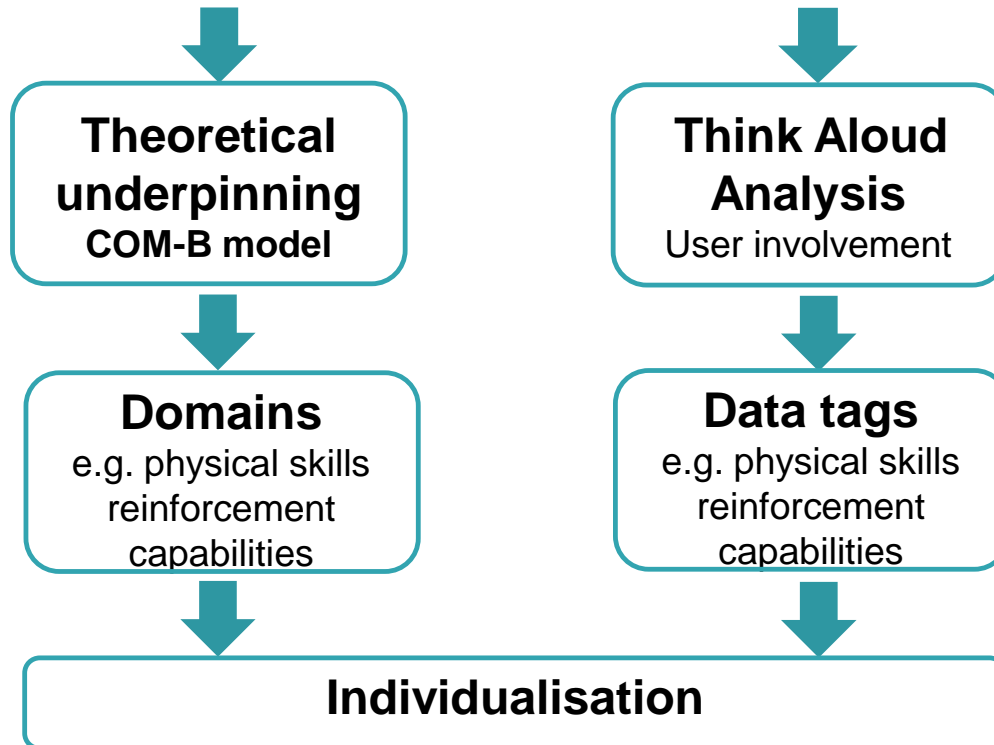
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(\*Coulson, Ferguson, et al, 2016)

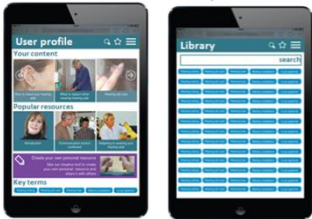


# Hearing aid users: Phase 1: individualise



# Suite of resources – mhealth programme

- Individualise
- Interactivity
- Self-evaluation

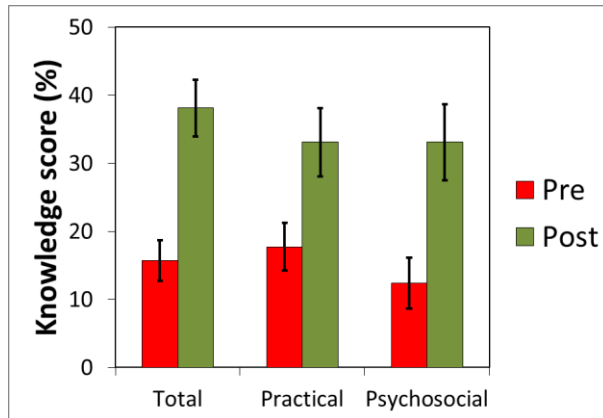


- Other languages
- UK: English not first language



# Training residential carehome staff

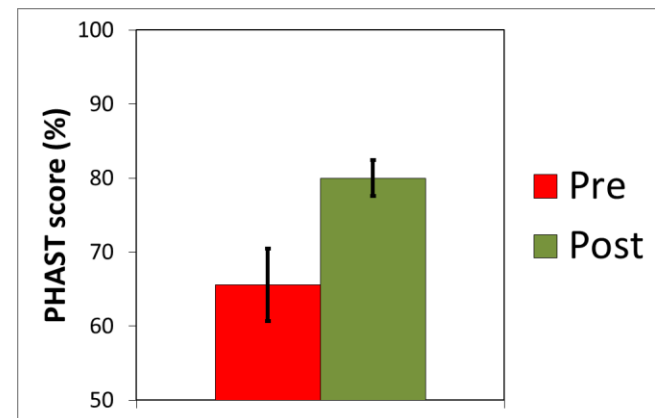
n = 25 care home staff  
n = 3 homes



**Knowledge of hearing aids and communication**

Significant pre-post improvement  $p < .001$   $d = 3.6$

“This should be made mandatory at induction with annual refresher sessions”

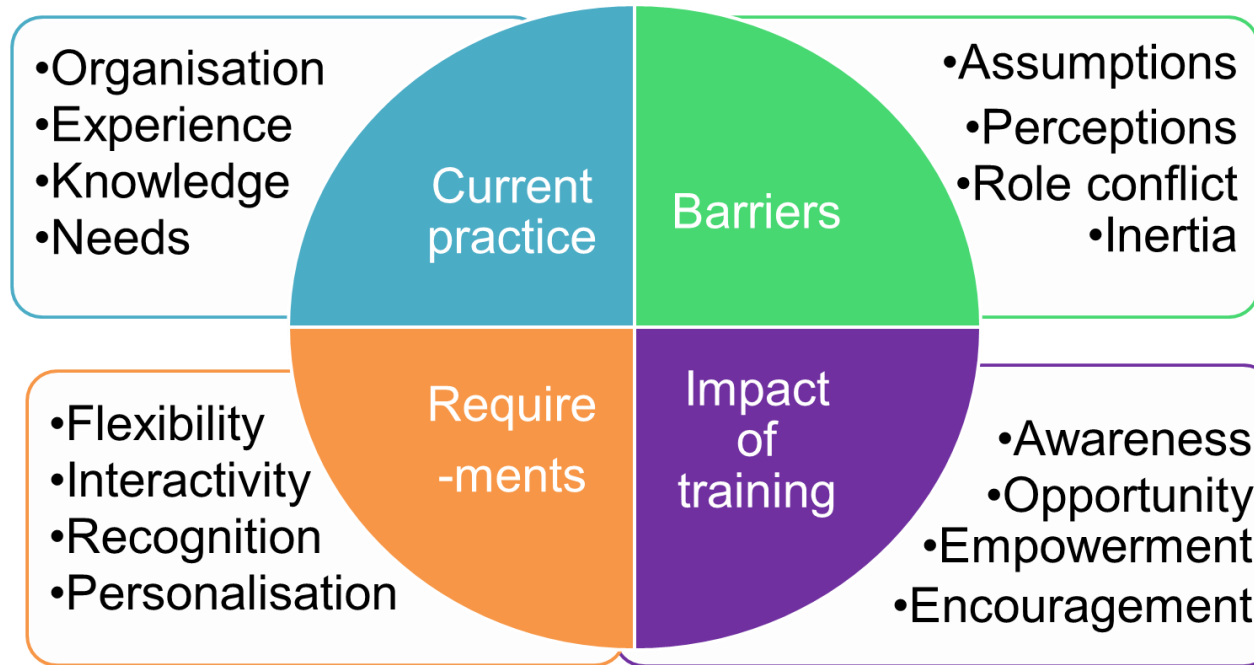


**Practical hearing aid skills**

Significant pre-post improvement  $p < .001$   $d = 3.3$

“Awareness of hearing aids has definitely gone up with all of us” *(Rocks et al, in prep)*

# RLOs for residential carestaff

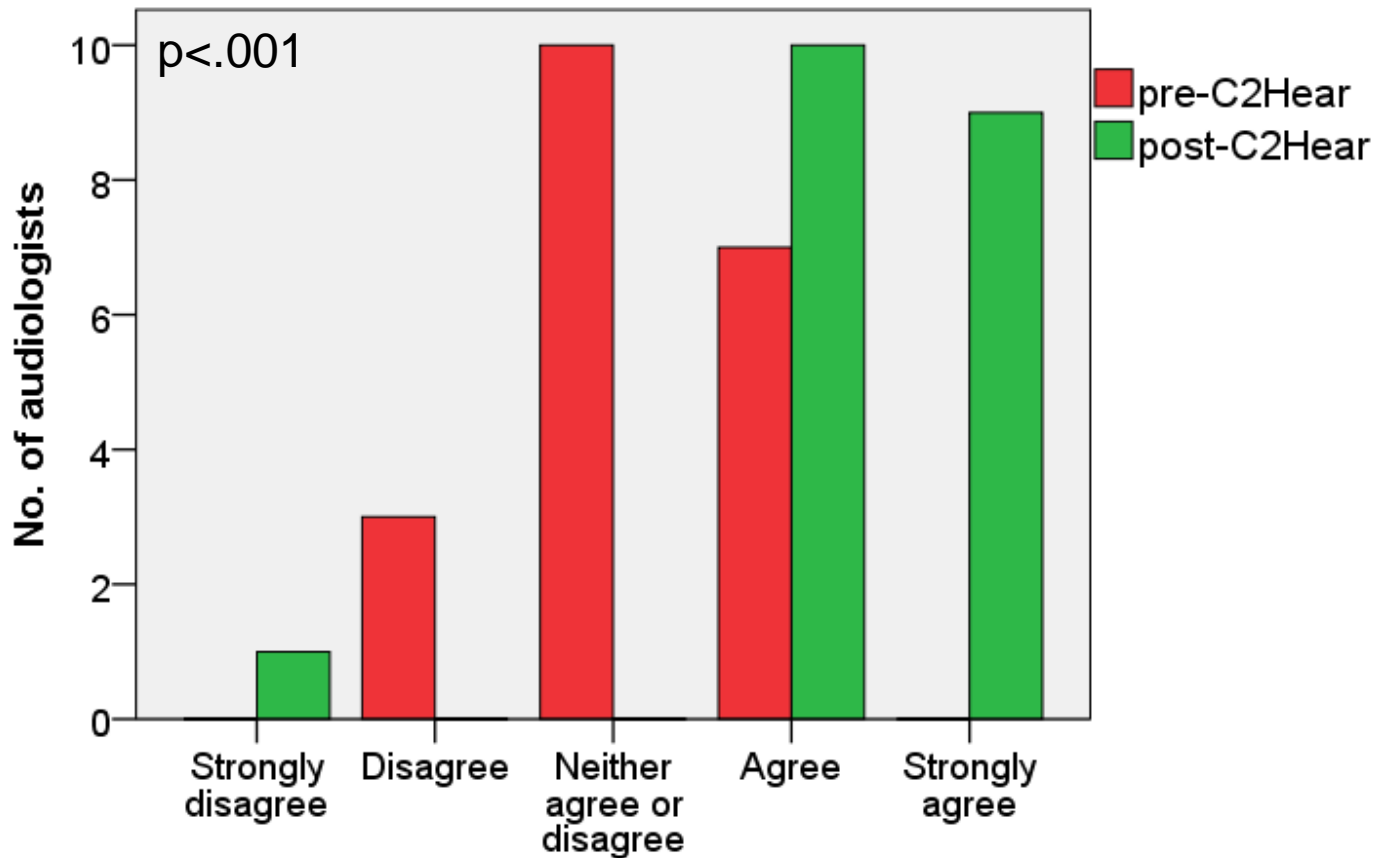


*“Hearing aids often drop off the radar. We shouldn’t be waiting for a crisis”*

*“This project has changed the things I’m doing and saying on a daily basis”*

*(McShea et al, in prep)*

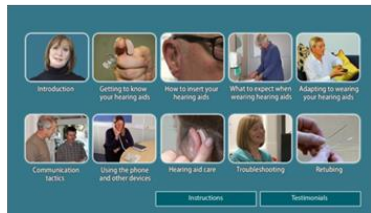
I am confident that the information given is remembered and acted upon by my hearing aid patients



# Summary online developments

November 2015

**C2Hear**  
Online Getting more from your hearing just got easy



Open access - all

2016

**C2Hear**  
Online Getting more from your hearing just got easy



m-RLOs communication partners

Future

**C2Hear**  
Online Getting more from your hearing just got easy



m-RLOs hearing aid users and other populations



# Thanks to...



Patient panels

**NHS**  
National Institute for  
Health Research



Clinical and academic colleagues

## Nottingham Audiology Service

Will Brassington  
Karen Goodrum-Clarke  
Julie Brady  
Leena Kapilla  
Alissa Baguley  
Joanne Rowe  
Annie Jones  
Jeff Davies  
Karenbir Bath  
Helen Bastow

## University of Nottingham

Heather Wharrad  
Paul Leighton  
James Henderson  
Mike Taylor



Nottingham University Hospitals **NHS**  
NHS Trust



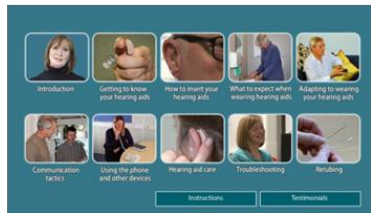
Marian Brandreth, Holly Thomas, Ashana Tittle, David Maidment, Lynzee McShea, Alex Barker

Queries: [Melanie.ferguson@nottingham.ac.uk](mailto:Melanie.ferguson@nottingham.ac.uk)

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November 2015

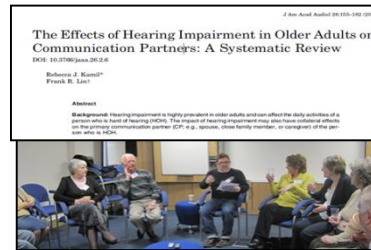
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Open access - all

2016

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m-RLOs communication partners

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m-RLOs hearing aid users and other populations