

Nottingham
Biomedical Research Centre



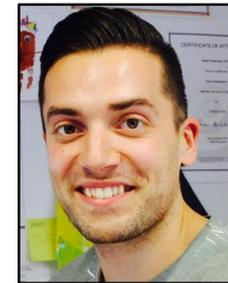
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National Institute for
Health Research

Personalising hearing healthcare education delivered by mHealth technologies

Melanie Ferguson



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Delivery and retention of information in new hearing aids users is poor



“You get a lot of information ...by the time you get home, you’ve forgotten most of it.”
51% found difficulties using aid at first

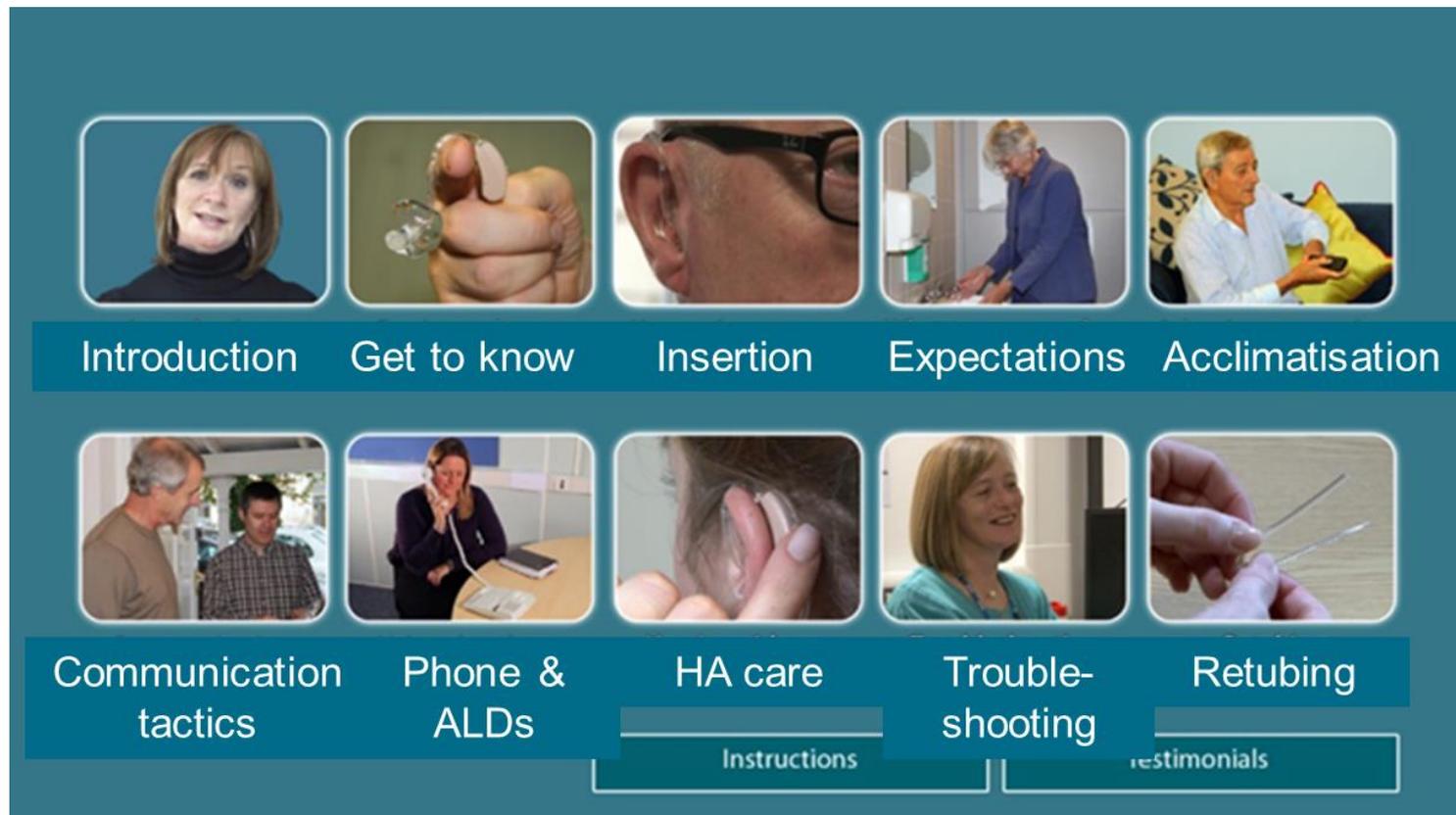
(AoHL Hear Me Out, 2011)

- Retention of information in first-time hearing aid users after 6 weeks, free recall

Overall = 49.6%: practical = 62.9%, psychosocial = 34.3%

(El-Molla et al, BAA, 2012)

C2Hear: reusable learning objects (RLOs) → multimedia programme for hearing aid users



Home-delivered 51%



33%

(Ferguson et al, Int J Audiol, 2018)

Involvement of patients and public is at the heart of our research



(Ferguson et al, Int J Audiol, 2018)

C2Hear RLOs are clinically effective

- Evidence-based, randomised controlled trial (n=203)



knowledge



handling
skills



self-
management



hearing
aid use



self-efficacy

C2Hear



valued by users

(Ferguson et al, Ear Hear, 2016)

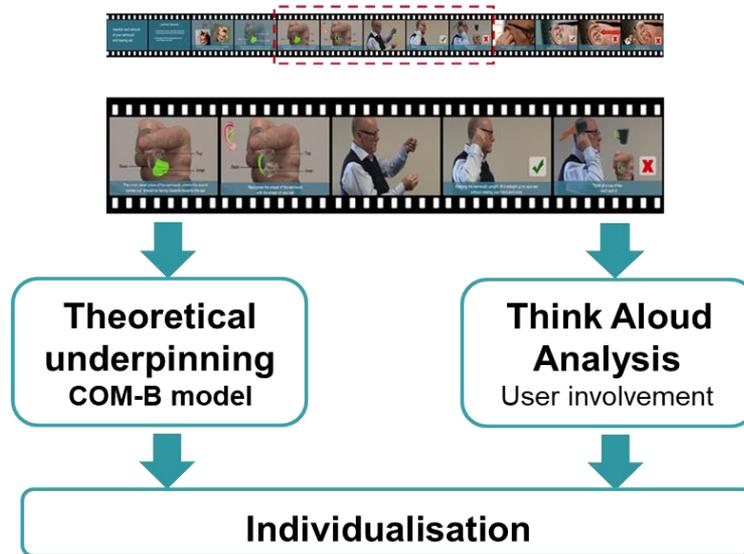
➤ C2Hear Online: freely available multimedia RLOs on YouTube

- Lots of positives but....
 - RLOs 5-8 minutes, too long
 - One size fits all
 - Limited interactivity
- To future-proof
 - Shorter
 - Individualise
 - Interactive
 - (Inclusive)

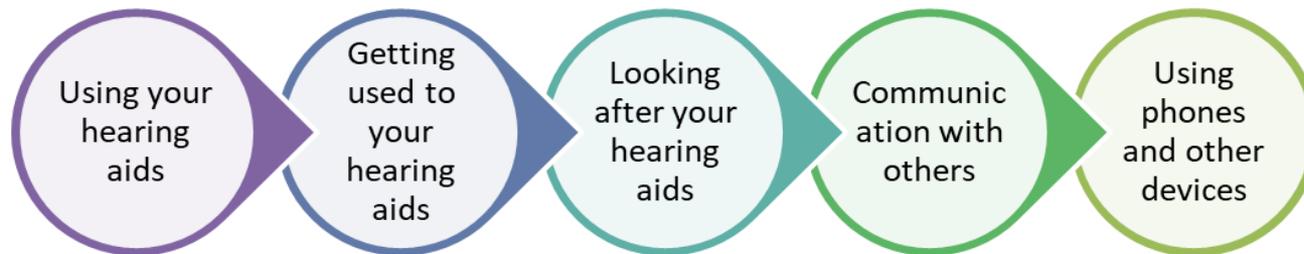


To view C2Hear Online: just google C2Hear YouTube

Individualised: tailored to meet user's specific needs (m2Hear)



- 42 mRLOs, designed for smartphone technologies
- Greater interactivity
- Additional activities



(Ferguson, ENT and Audiology News, 2017)

Individualised information to meet user's needs

How do I know which hearing aid is for my left/right ears?

The image illustrates a user interface for 'm2Hear' on a tablet and several overlapping windows of an interactive quiz. The quiz content includes:

- Left and right ear markers**: A section titled 'How do I know which hearing aid is for my left/right ear?' with a 'Try the activity!' button.
- Interactive Quiz - How to use your hearing aids**: A section titled 'Please complete the following short quiz to see what you have learned.' with a question: 'Which side - How do I know which hearing aid is for my left/right ear?' and a 'Replay' button.
- Labelling activity**: A section titled 'Label the hearing aid' with the instruction 'Drag the matching label into the box for each arrow?'. It features a diagram of a hearing aid with arrows pointing to 'Left/right ear markers', 'Battery compartment &', and 'Programme switch & volume'. A text box explains: 'Left/right ear markers: A blue marker is for the left aid. A red marker is for the right aid - it may be helpful to think of 'L' for red and 'R' for right. It is important you don't swap the hearing aids as they have been programmed specifically for each individual ear.'

At the bottom, the device usage statistics are shown:

Device	Percentage
Smartphone	5.1%
Tablet	40.7%
Laptop	35.6%
Desktop Monitor	18.6%

Additional interactivity

How do I work with other to help me take part in conversations?

How do I work with others to help me take part in conversations?

Hearing problems and solutions activity

Here are some situations you might recognise with suggested solutions.

Activity: Drag which solution you think would be best to each problem.

✓ Helps communication



✗ Doesn't help communication



m2Hear rated higher than C2Hear

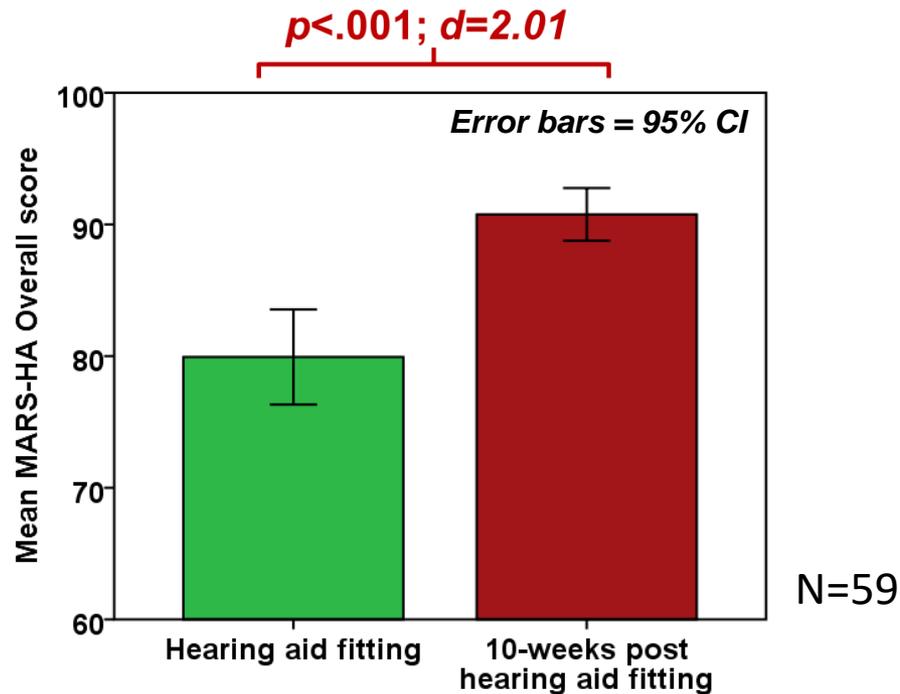
uMARS = user version Mobile Application Rating Scale

Average uMARS score (0=poor, 5=excellent)	C2Hear	m2Hear
Overall App Quality	3.6	4.2
Engagement	3.1	3.6
Functionality	3.8	4.4
Aesthetics	3.0	4.2
Information	4.5	4.6
Subjective App Quality	3.3	4.1
Star Rating	3.7	4.0
Perceived Impact (Behaviour Change)	3.6	4.3



Self-efficacy for hearing aids was significantly improved

Measure of Audiological Rehabilitation for Self-efficacy for Hearing Aids (MARS-HA)



What the patients said

- Provides reminders

“[m2Hear] started to change my life. I had... a prop basically... something to fall back onto if there was a problem.”

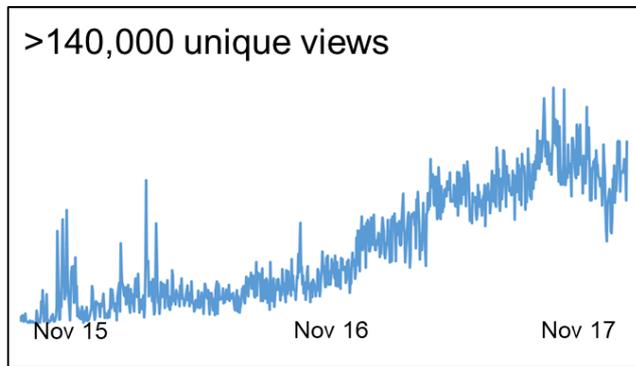
- Convenient to re-visit

It's more convenient to use, wherever you are. You just get your phone out.

- Comprehensive content

“I knew which section to go to and there were details in there that would give me what I needed.”

Summary of ehealth and mhealth developments



UK	45%
N America	46%
India	6.6%
Australia	1.1%

November 2015



Freely available
online

2016/17



mRLOs for
communication
partners

2017/18



mRLOs tailored
for hearing aid
users

➤ **Multiple patient benefits**

Thanks to



Patient panels



David Maidment and Rachel Gomez

Nottingham University Hospitals
NHS Trust

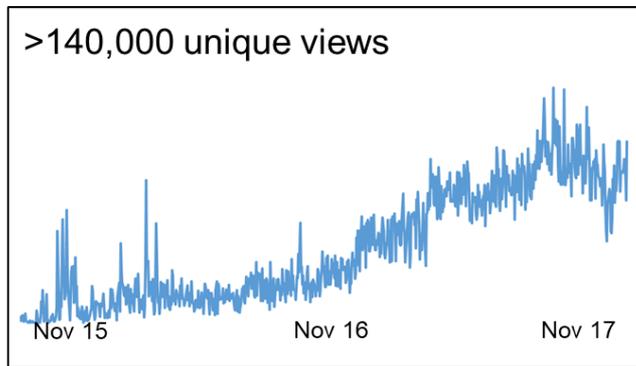


Clinical and academic colleagues



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