Preparing People with Intellectual Disability for Healthcare Settings Using AI-Based Virtual Reality

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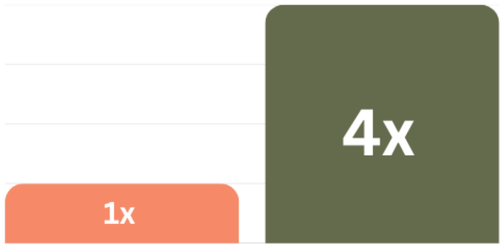
Health outcomes for people with intellectual disability

People with intellectual disability **die 27 years earlier** than the general population (Trollor et al., 2017).



People with intellectual disability experience 4 times the rate of **preventable hospitalisations** compared to the general population (Weise et al., 2021).

3 to 4 people with intellectual disability experience **potentially avoidable deaths** (Trollor et al., 2017).

Lower use of **preventative healthcare services** and **significant barriers to care** in general practice (Salvador-Carulla & Symonds, 2016; Lennox et al., 1997).

H e a l t h c a r e A c c e s s

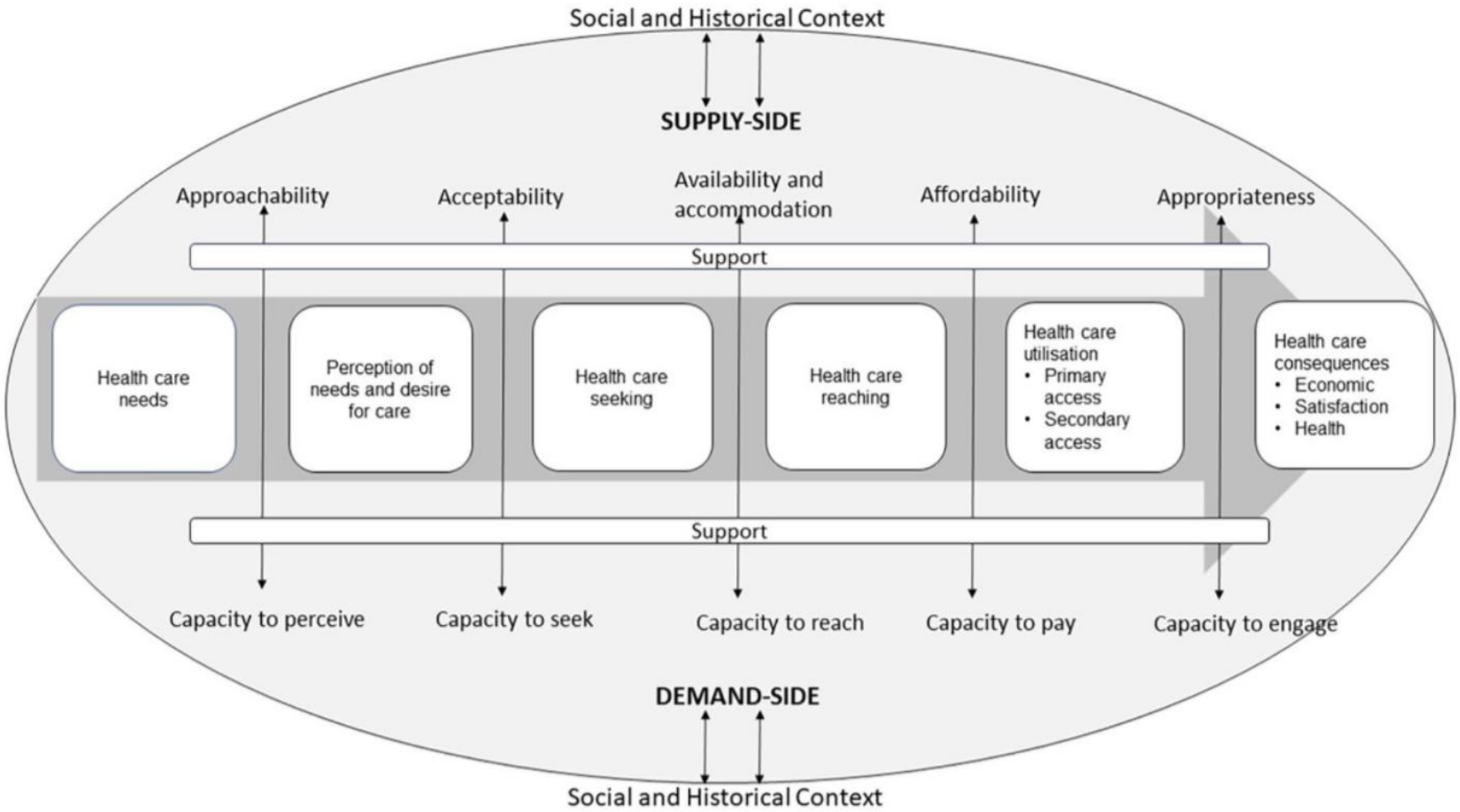


Figure of Modified framework of healthcare access for people with intellectual disability (Barrington et al., 2025, *Scand J Public Health*)

Barriers to Healthcare

Systemic barriers

Limited training about intellectual disability

Inaccessible information

Few reasonable adjustments

Stigma and discrimination

Individual barriers

Fear, anxiety, lack of trust

Communication challenges

Over reliance on supporters

Lack of confidence

Reimagining Access to Healthcare

What if someone could...

- Walk into a clinic for the first time and already feel confident?
- Ask the questions that matter — without fear or confusion?
- Practise conversations, learn what to expect, and ask questions in a safe, familiar space?

Better access starts with creating safer spaces to learn and practise.

A Call to Innovate

- *"The Roadmap calls for exploring the use of emerging technologies to reduce barriers to healthcare."*
  — Australian Department of Health, 2021

- Virtual reality (VR) and artificial intelligence (AI) offer a new opportunity to **build preparation, confidence and comfort.**

Virtual Reality (VR)

VR enables users to:

- See, hear, and interact with virtual characters and objects
- Move around in a simulated environment
- Practice real-life scenarios in a safe and repeatable way

Training application developed for people with intellectual disability during my PhD (2021)

VR for Addressing Healthcare Barriers – What has been done?

- Distraction tool in dental settings (Mehrotra et al. 2023; 2024)
- Preview a hospital environment and see short videos from staff (Acton et al. 2024)
- Preparing users for waiting rooms and clinical examinations (Hall et al. 2011):

Figure 3. Screenshot of clinical examination room.

Summary

- Most emerging tech health studies focus on distracting users with VR or assisting physical activity with motion control technology (e.g., Wii Sports & Xbox Kinect)
- VR studies have yet to enable users interact, ask questions, or talk to healthcare staff

Integrating AI into VR

VR – immersive environment to help users see a clinic setting

AI – adaptive conversations to practice speaking to doctors and nurses

Together, they can help people:

- Rehearse appointments
- Build communication skills
- Feel more confident

Research Aim

To co-design, develop, and evaluate the feasibility and usability of immersive AI-based VR applications to improve healthcare preparedness for people with intellectual disability

Project Goals

1. Co-design and develop the application
2. Gather user feedback in a pilot study

AI-VR Development

L i v e d E x p e r i e n c e I

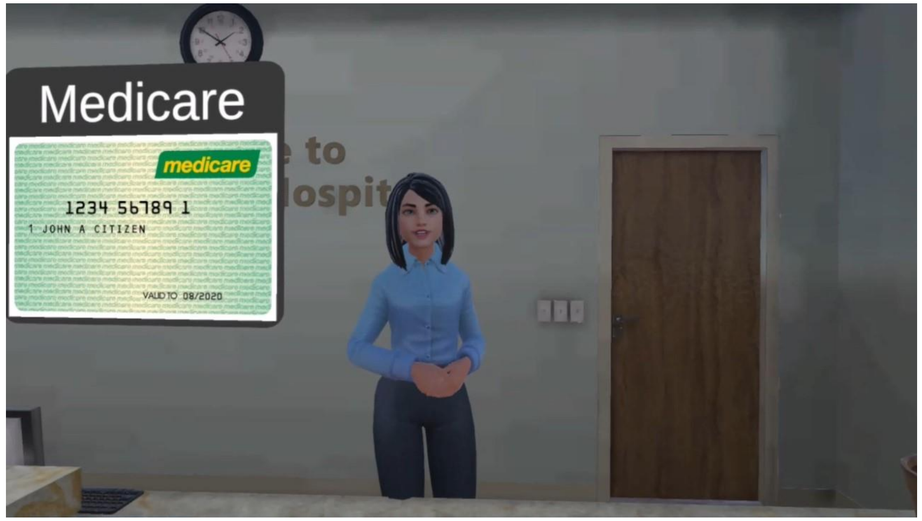
1. Ongoing input provided by a researcher with lived experience

2. Two co-design meetings were held with the **Council for Intellectual Disability**

Top Priorities Discussed:

- Practice talking with doctors
- See what the clinic looks like beforehand
- Reminders of what to bring to an appointment
- Use VR in a safe space with support

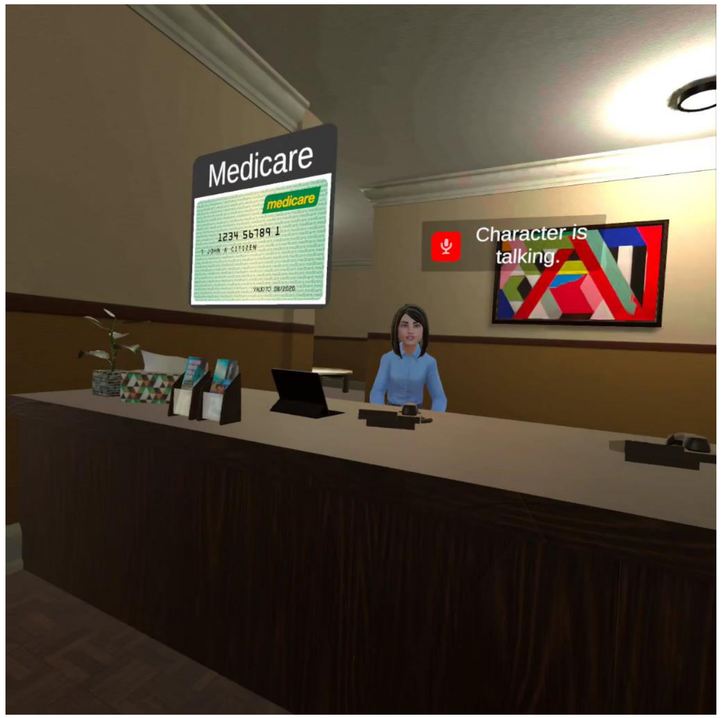
Initial Prototype



Insights from the second co-design session

- Make conversations feel more natural and realistic
- Environments should look like real GP setting
- Reception scene should include things you need for your appointment
- Add clear examples of what to expect during visits

AI-based VR Application



Scene 1 – Checking in with the Receptionist

Scene 2 – Sitting in the waiting area

Scene 3 – Speaking with the doctor

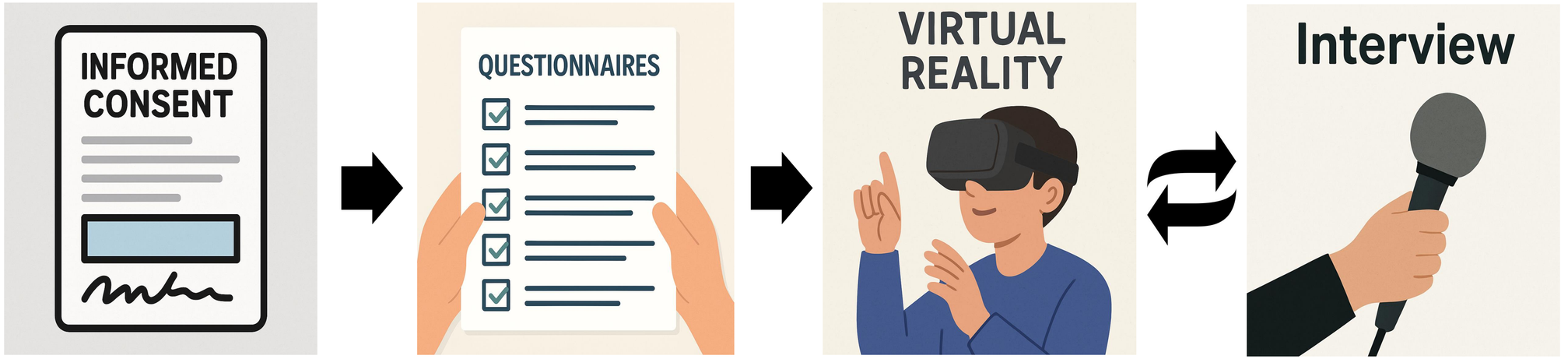
Talking to the Avatar in VR

“Why do you put it in my ear or on my forehead, and what does it do?”

— Participant question (recreated in the video)

Feasibility Study

S t u d y D e s i g n



Participants

Inclusion Criteria

- Adults (18+) with intellectual disability
- English-speaking
- Able to wear VR headset and hold controller
- Did not participate in co-design of the application

Our sample

- 10 participants (5 females, 5 males)
- Average age: 42.9 years (*SD*=11.65)
- All advocates from disability organisation in NSW

Participants' Usual Healthcare Experiences

- Everyone had a regular GP
- Many do not always understand their doctor
- Some felt OK asking questions — others didn't
- Feelings about visits were mixed — some felt good, some felt anxious
- Only a few always feel fully comfortable

Overall, our participants have always engaged with healthcare when needed, but did not always feel confident or comfortable during visits.

Semi-structured Interviews

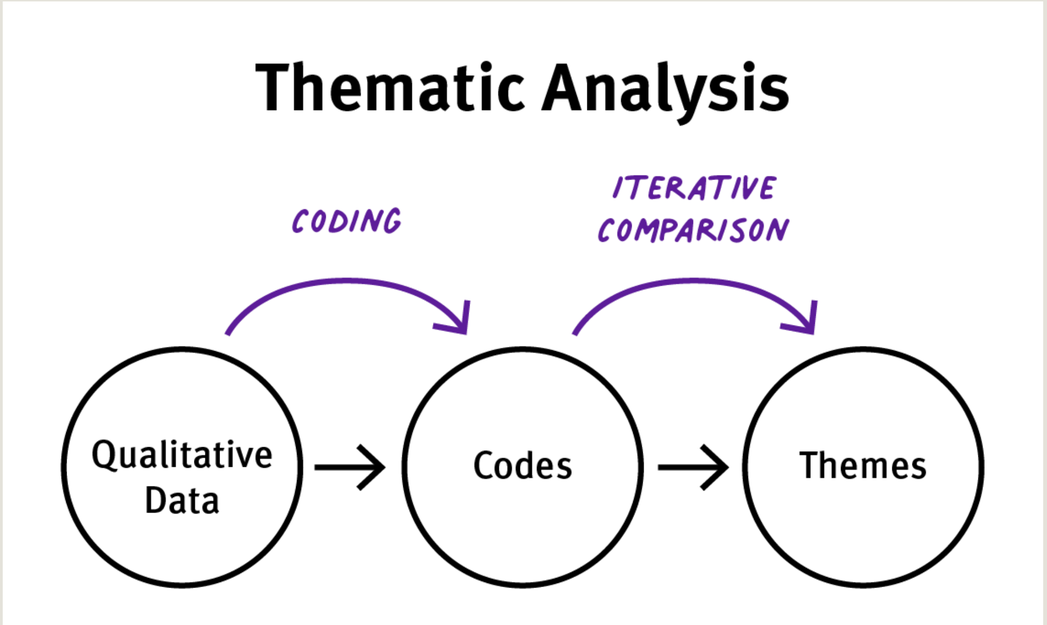
Purpose:

- To explore participants’ experiences and reflections after each VR scene.

- Researcher used accessible communication
- Researcher asked follow-up questions
- Session audio recorded

Qualitative Analysis

- A reflexive thematic analysis approach was used (Braun & Clarke, 2006)
- We analysed interview transcripts to identify common patterns in participants' feedback.
- First, we generated initial codes from the data.
- Then, we organised these codes into broader themes that captured shared meanings.



Study Findings

VR Task Data (*n* =10)

Metric	Average (Range)	Percentage of valid responses by AI
All communicative acts	13.3 (6–37)	88.3%
Questions asked by the user	3.7 (0–28)	91.9%
Comments made by the user	1.6 (0–10)	53.1%
Attempts to speak when the microphone was inactive	2.1 (0–8)	-
Technical issues	3.1 (0–9)	-

Theme 1 – A Human Touch in a VirtualConversation

- The AI helped people learn about healthcare in a calm, easy-to-understand way.
- Participants valued how the avatar gave patient, helpful responses.
- Some said the conversation felt less natural at times or limited in what it could say.

Participant Quotes:

“She never said ‘I don’t know’... Not like Siri.”

“That information... was for people who have never been to the doctor.”

Theme 2 – Stepping Into the Virtual Clinic

- Realistic aspects helped people feel more ready for real appointments.
- Being in a space that looked and felt real increased confidence and trust.
- Seeing what the clinic looks like reduced uncertainty and anxiety.
- Some participants found the noise and sensory detail uncomfortable or distracting.

Participant Quotes:

“Everything is like about the same as how it’s set up in an actual doctor’s room.”

“It was the loud noises I didn’t really like. I’d rather have a quiet waiting room.”

Theme 3 – The promise and problem of VR

- Participants enjoyed using VR and saw its potential for learning about healthcare.
- Some found it difficult to know when to speak, or they had to repeat themselves.
- Technical challenges affected how natural and easy the experience felt.

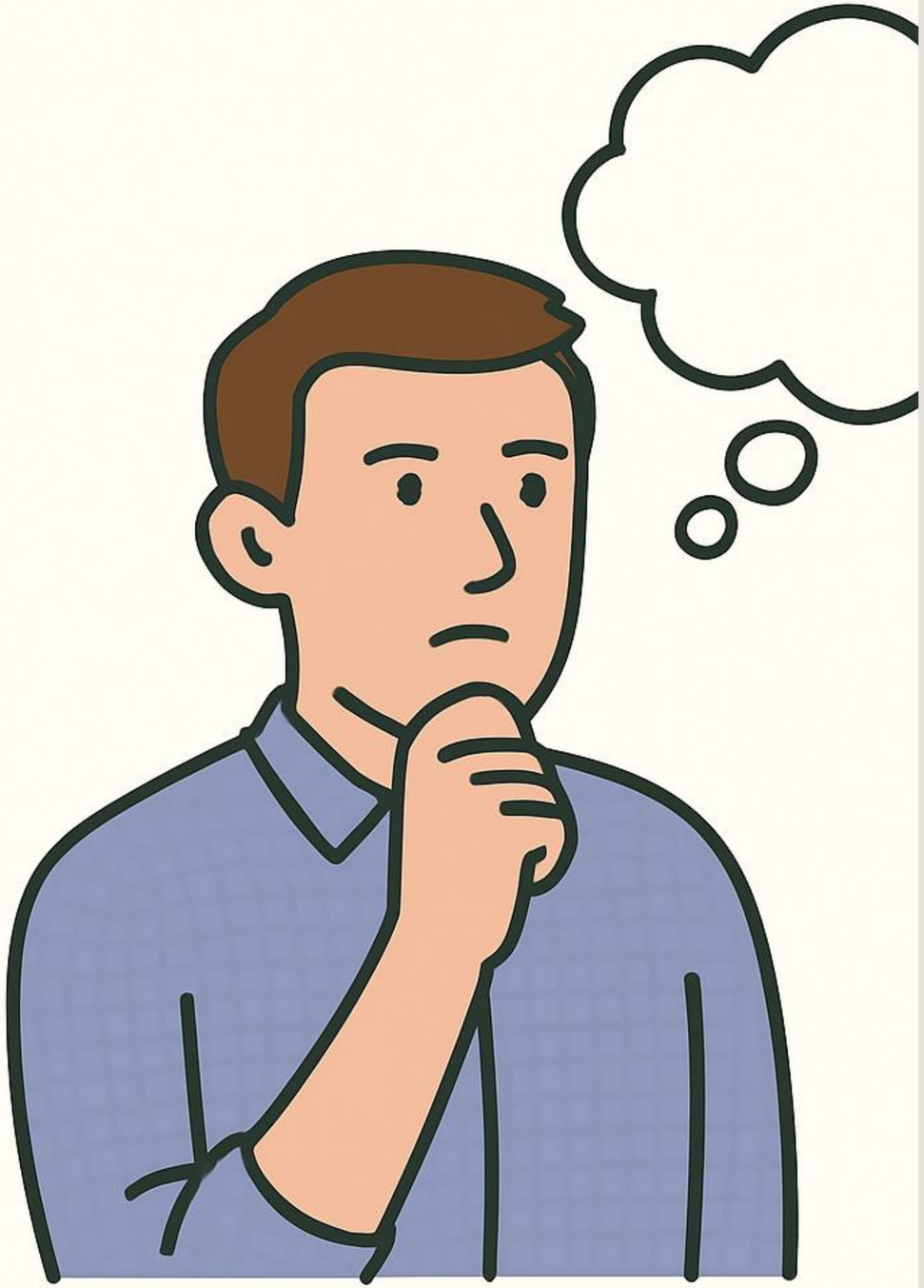
Participant Quotes:

“Looking for when it was the right time to speak [was difficult].”

“How many times do I have to repeat myself?”

General Reflections

- Lived experience input is essential
- AI-VR can support healthcare access through self-paced learning
- Calm, low-pressure environments reduce anxiety and support engagement
- Technical usability and communication support still need improvement



W h a t ’ s N e x t?

- Comprehensive annual health assessment (CHAP) experience
- Show what health checks look like in real time

My Team, Partners and Mentors

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Prof Sylvia Gustin

Katrina Sneath

Council for Intellectual Disability

UNSW Disability Innovation Institute

Health Systems Research

NEURO RECOVERY Research Hub

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Questions?

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