Introduction to Assistive Technology

Wednesday 4 November, 2026

Assistive Technology and Specialised Seating Department, CRC

CRC Central Remedial Clinic

What is **Assistive Technology?**

Assistive technology (AT) is any tool, device, or system that helps people of all ages **increase, maintain,** or **improve their abilities** and do everyday tasks **more independently**.

AT can support many areas of daily life:

COMMUNICATION
e.g., speech-to-text apps, communication boards

ACCESS
e.g., screen readers, magnifiers, alternative input devices

LEARNING
e.g., audiobooks, text-to-speech, study apps

MOBILITY
e.g., wheelchairs, grab bars, navigation apps

DAILY LIVING
e.g., reminders, smart home devices, dressing aids

The goal of assistive technology is greater independence, inclusion, and quality of life.

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UNCRPD



- Assistive Technology is identified by the United Nation Convention on the Rights of Persons with Disabilities as a human right obligation.
- It is seen as the first step towards equal opportunities.
- Only 1 in 10 people, of the 1 billion who need assistive technology get access.

Assistive technology capacity assessment in Ireland
Summary report





People
- Strong advocacy networks and active user groups
- Ongoing challenges in meeting the needs of people with disabilities

Policy
- Commitment to the UNCRPD and a rights-based approach
- Need for a coordinated national Assistive Technology strategy

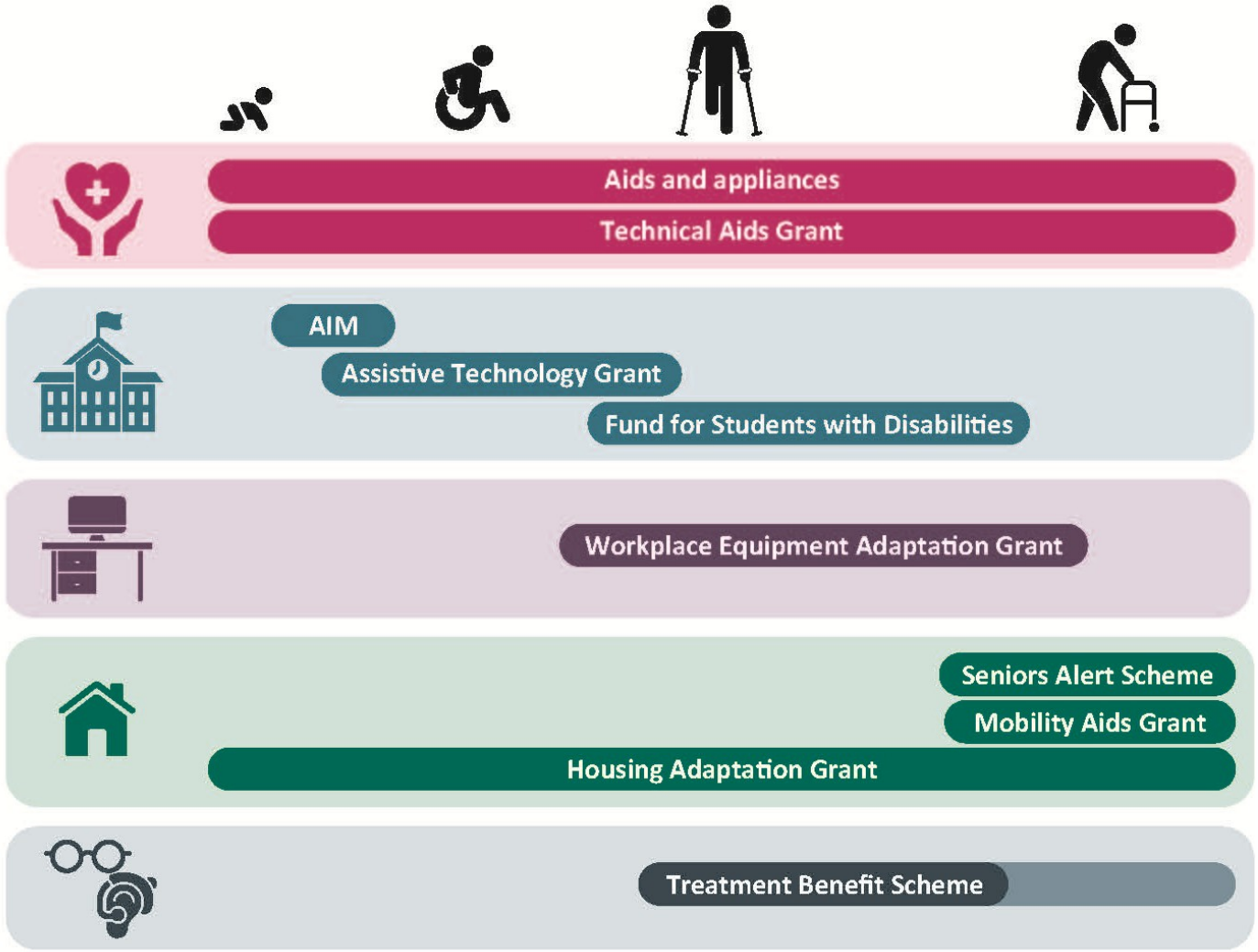
Products
- Lack of a standardised national assistive products list
- Variation in access to assistive technology across services

Provision
- Innovative initiatives such as Freedom Tech demonstrate good practice
- Gaps in service continuity, regional coordination, and data collection

Personnel
- Dedicated and skilled workforce
- Need for enhanced training, workforce development, and multidisciplinary support

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AT services across the life course

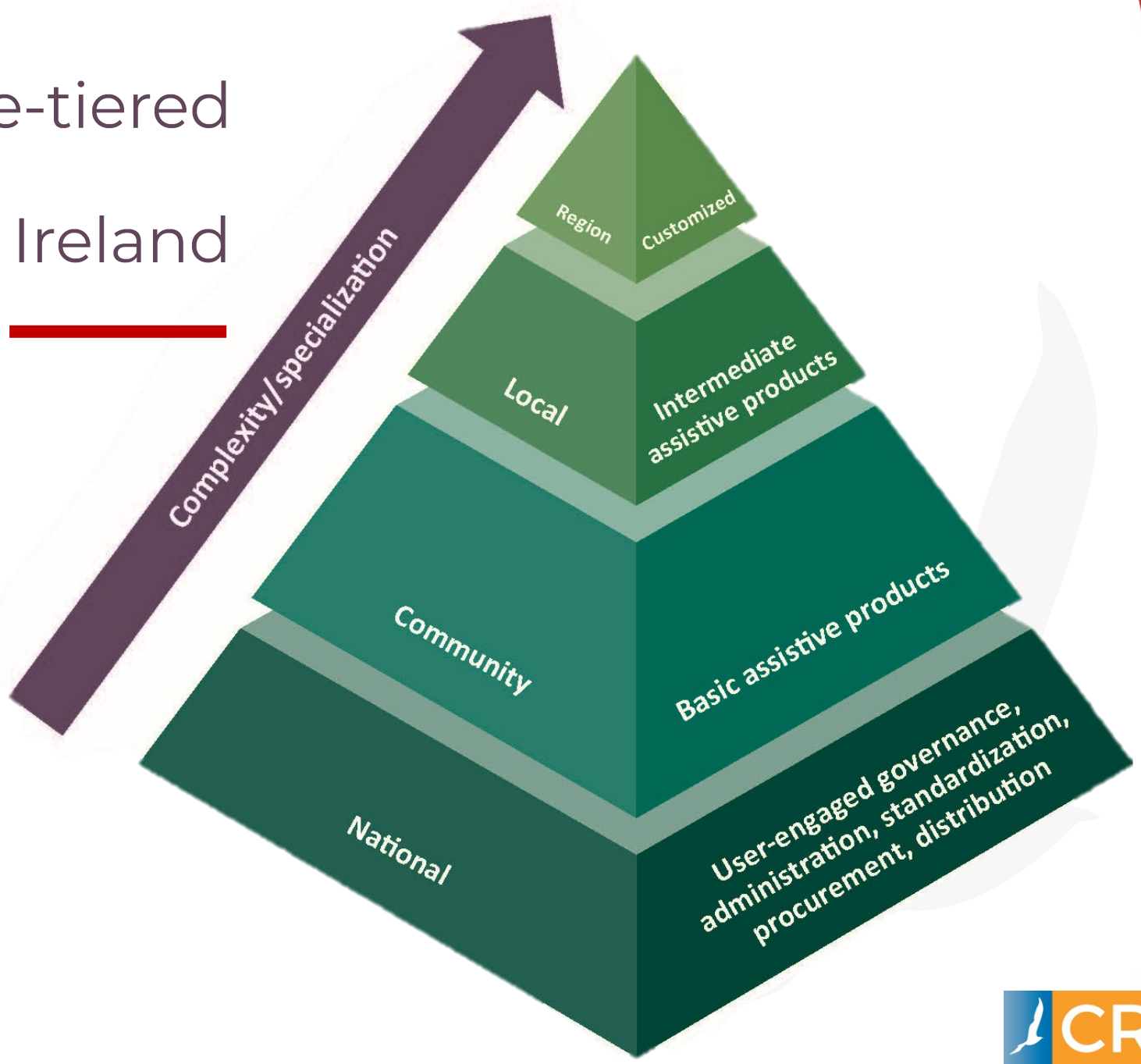




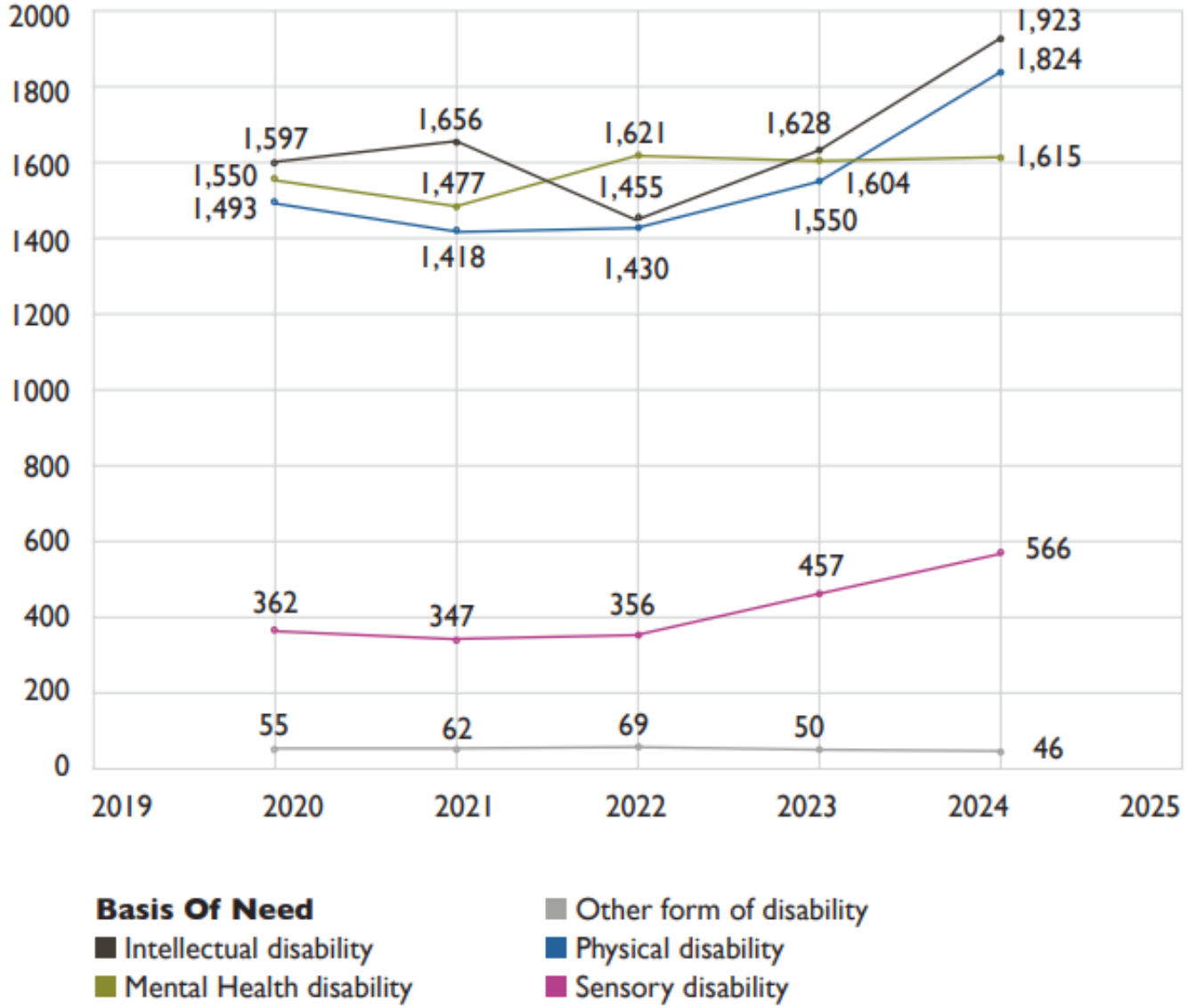
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Proposed three-tiered model for AT provision in Ireland





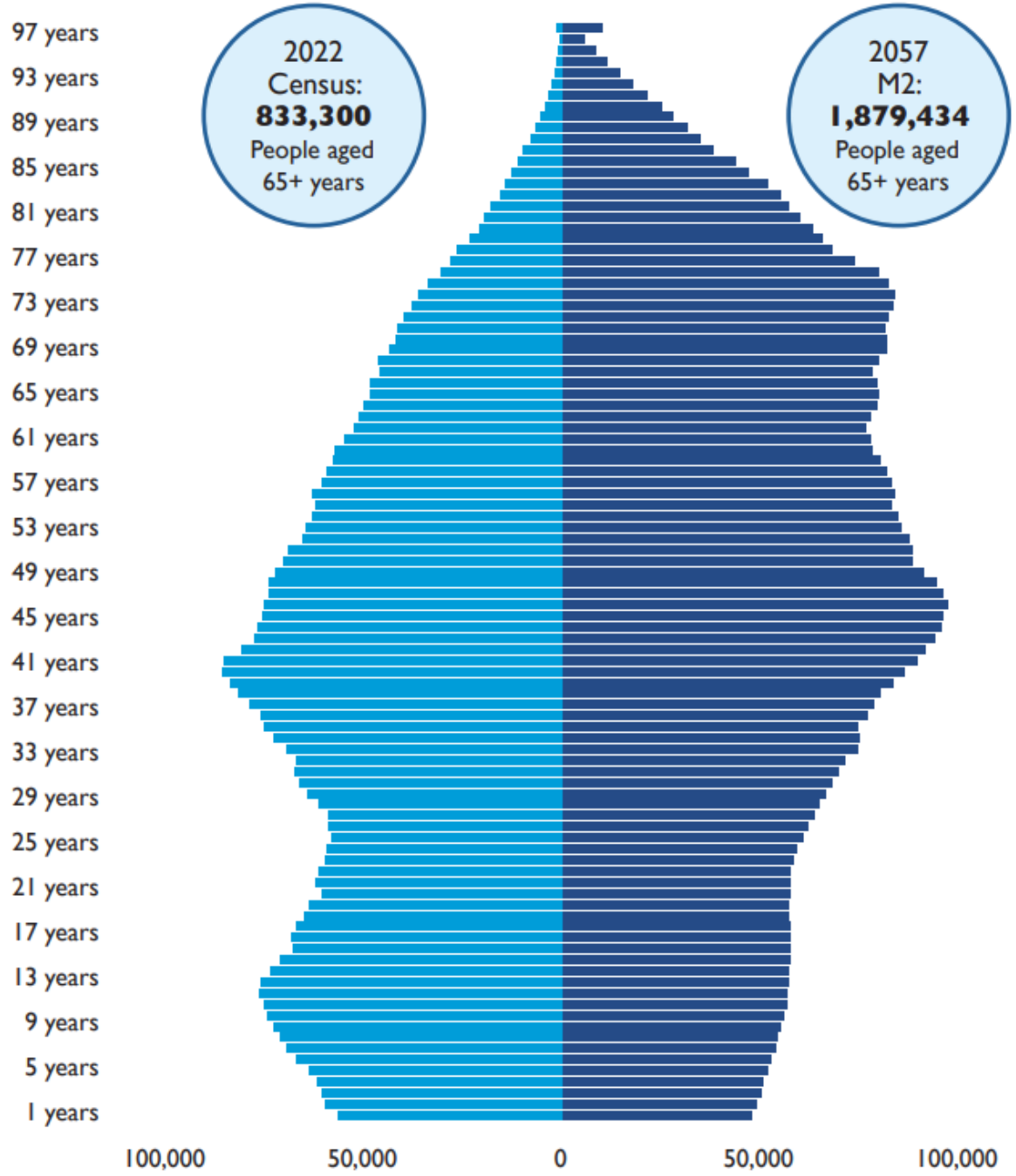
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Growing Disability-Related Need in Ireland

Total households with a disability basis of needs, 2020 -2024

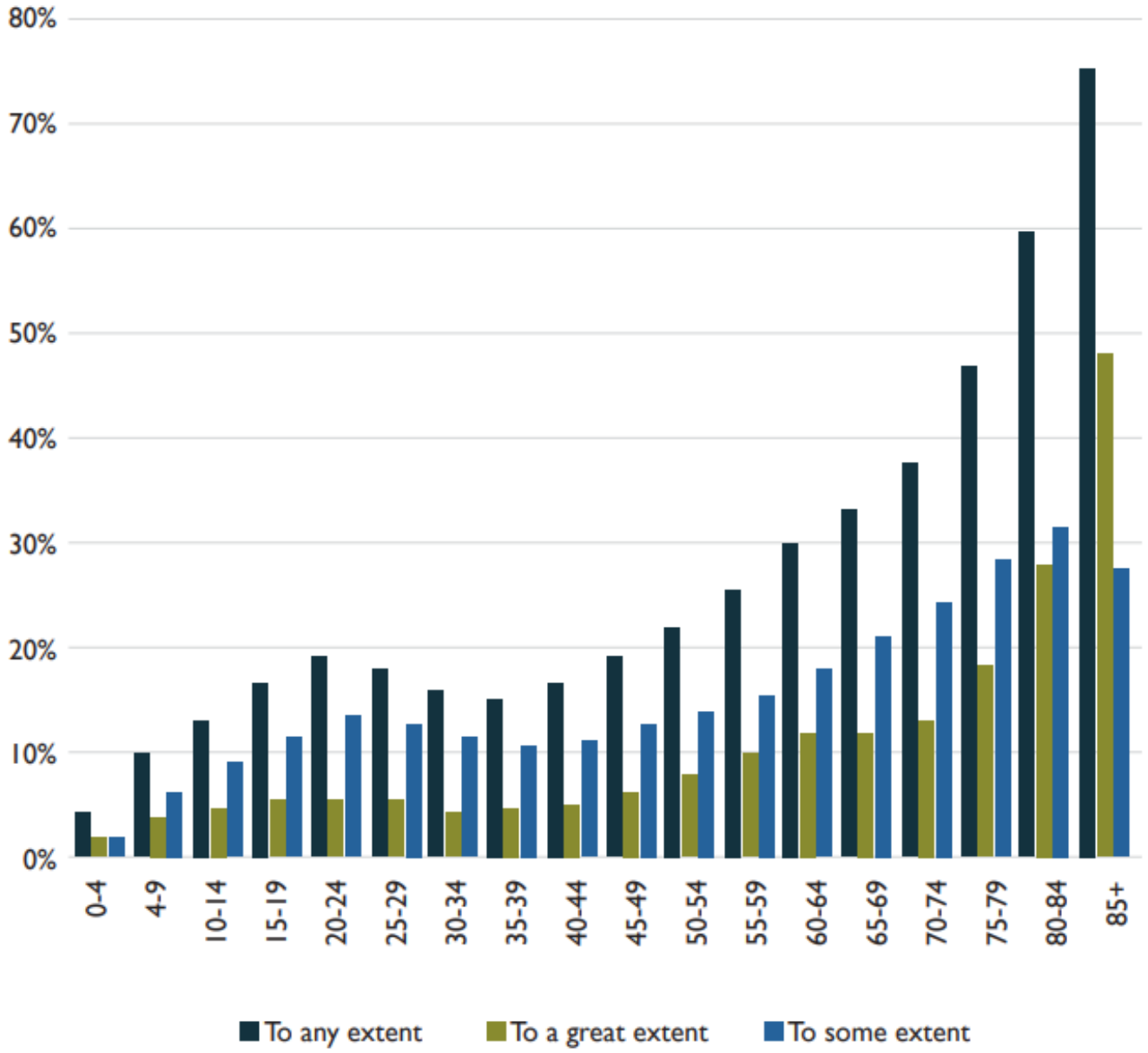
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Population Aging

Population Pyramid of Ireland

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Census 2022

Prevalence of disability by age group

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Types of AT



Low-Tech

Communication board
pencil grips
visual aids

Eye-gaze systems
special-purpose computers
electronic communication devices

High-Tech





Computer Hardware

Alternative keyboards
switches
pointing devices

Screen readers
communication programs
educational software

Software





Edu-cational Supports

Inclusive learning materials
curriculum aids
specialised instructional software

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Who can benefit from AT?



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Aims of Assistive Technology



- Participate to the best of their ability in home, work & community
- Increase opportunities for social interactions
- To empower students to become independent learners
- Improve equality of access across the curriculum
- Integration with their peers in terms of course or project work
- Increase their potential for employment

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Assistive Technology & Specialised Seating

(ATSS)



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ATSS referral criteria

Any person with:

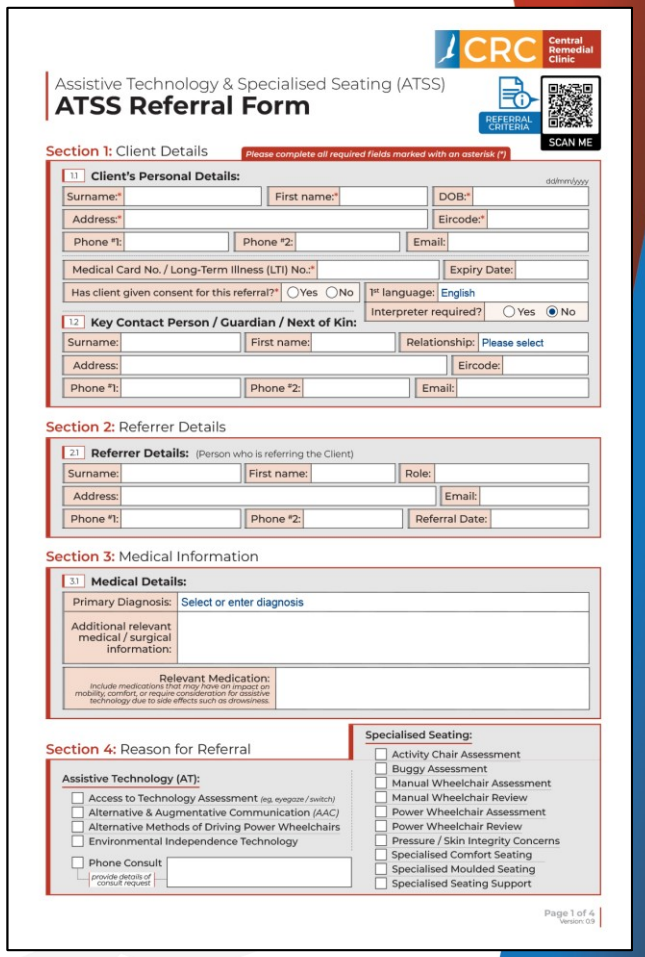
- a primary complex physical disability,
- dual diagnosis (physical and intellectual disability),
- a complex neurological and/or neuromuscular disorder

who requires:

- specialised postural support and mobility to optimise function within their daily lives,

and/or

- technology for communication, alternative access to electronic assistive technology solutions for education, employment, mobility, leisure or community-based activities.


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Assistive Technology & Specialised Seating (ATSS)

ATSS Referral Form

REFERRAL CRITERIA

SCAN ME

Section 1: Client Details

Please complete all required fields marked with an asterisk (*)

1.1 Client's Personal Details: dd/mm/yyyy

Surname:* First name:* DOB:*

Address:* Eircode:*

Phone *1: Phone *2: Email:

Medical Card No. / Long-Term Illness (LTI) No.:* Expiry Date:

Has client given consent for this referral?* Yes No 1st language: English

Interpreter required? Yes No

1.2 Key Contact Person / Guardian / Next of Kin:

Surname: First name: Relationship: Please select

Address: Eircode:

Phone *1: Phone *2: Email:

Section 2: Referrer Details

2.1 Referrer Details: (Person who is referring the Client)

Surname: First name: Role:

Address: Email:

Phone *1: Phone *2: Referral Date:

Section 3: Medical Information

3.1 Medical Details:

Primary Diagnosis: Select or enter diagnosis

Additional relevant medical / surgical information:

Relevant Medication: Include medications that may have an impact on mobility, comfort, or require consideration for assistive technology due to side effects such as drowsiness.

Section 4: Reason for Referral

Assistive Technology (AT):

- Access to Technology Assessment (eg, eyegaze / switch)
- Alternative & Augmentative Communication (AAC)
- Alternative Methods of Driving Power Wheelchairs
- Environmental Independence Technology
- Phone Consult (provide details of consult request)

Specialised Seating:

- Activity Chair Assessment
- Buggy Assessment
- Manual Wheelchair Assessment
- Manual Wheelchair Review
- Power Wheelchair Assessment
- Power Wheelchair Review
- Pressure / Skin Integrity Concerns
- Specialised Comfort Seating
- Specialised Moulded Seating
- Specialised Seating Support

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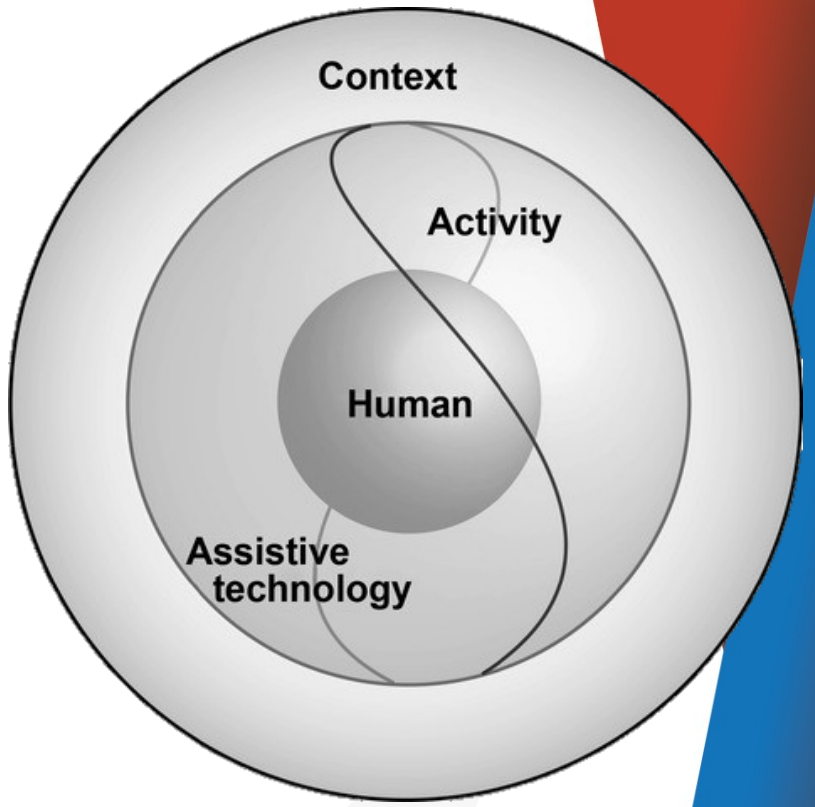
Assistive Technology Assessment

The more we understand about the interaction between the person, task and environment, the better equipped we are to identify the tools needed to achieve the desired outcome.

- What tasks does the person have difficulty with?
- What are the person's abilities and challenges?
- In what context does the person complete the tasks?

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Human Activity Assistive Technology Model



The HAAT model (Cook & Hussey, 1995) is a framework that looks at the place of assistive technology in the life of a person with a disability.

- **Human:** The individual using the assistive technology.
- **Activity:** The task or goal the individual wants to achieve.
- **Assistive Technology:** The device, tool, or system that supports participation in the activity.
- **Context:** The environment in which the activity occurs, including physical, social, cultural, and institutional factors.

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AT Assessments



- Assessments should be a collaborative process between the person, their family and multidisciplinary team members.
- Training for the person and staff and integrating it across multiple environments is an important component within the assessment process.
- Depending on the primary team's experience, outside support may be sought from Assistive Technology specialist services

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AT Categories

💬 Communication
- Speech aids
- Writing aids

💻 Computer
- Input devices
- Output devices
- Accessible software

🎓 Education & Learning
- Cognitive aids

👁️ Vison & Reading
- Screen magnification
- Screen Readers
- Reading aids

👂 Hearing & Listening
- Hearing aids
- Listening tech

♿ Mobility
- Power wheelchair access

👁️ Environmental
- Lighting controls
- Smart home systems
- Automated doors
- Voice activated EC

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Low Tech Assistive Technology

- Communication boards and picture cards
- Pencil grips, slant boards, and reading guides
- Magnifiers and large-print materials
- Built-up utensils and non-slip mats
- Grab rails, canes, and positioning cushions
- Visual schedules, checklists, and reminder systems

Benefits:

- Affordable
- Easy to use
- Little training required
- Highly effective in supporting independence

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Mid Tech Assistive Technology

- Basic communication devices with recorded messages (e.g., single-message buttons)
- Electronic magnifiers (software-based magnifiers)
- Switch-operated toys or appliances for motor accessibility

Benefits:

- Affordable
- Easy to use
- Little training required
- Effective in expanding independence

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High Tech Assistive Technology

- Eye-gaze and speech-generating communication devices
- Screen readers and speech-to-text software
- Electronic magnifiers and Braille displays
- Hearing aids and cochlear implants
- Powered wheelchairs and smart prosthetics
- Voice-controlled smart home systems

Benefits:

- Enhances independence
- Improved communication and learning
- Increases access to technology and environments
- Supports participation in daily life

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AT through the lifespan

Early Years (0-5)

- Adapted Toys
- Seating
- Communication Aids

School Age (5-18)

- AAC Devices
- Learning Software/apps
- Reading Supports

Adulthood (18-65)

- Workplace AT
- Smart Home Tech
- Powered Mobility

Older Adults (65+)

- Mobility Aids
- Hearing Aids
- Fall Detection
- Medication Aids
- Smart Home Tech

AT needs evolve to support participation, independence and quality of life at every stage.

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Cause & Effect Learning

Cause and effect is one of the first skills thought in early switch access.





The learner discovers:

- "When I press the switch, something happens."
- "If I stop pressing, it stops."
- "I can make things happen intentionally."



This understanding forms the foundation for later skills such as communication, environmental control, computer access and powered wheelchair use.

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Switches

There is no single "best" switch. The right switch depends on a person's movement, strength, accuracy, and preferences.



- **Button Switches**
  The most common type. The user presses a button surface.
- **Proximity Switches**
  Activated when a body part comes close to the sensor without requiring physical pressure.
- **Sip-and-Puff Switches**
  Activated by blowing or sucking through a tube. Often used by people with very limited movement.
- **Chin Switches**
  Positioned near the chin and activated by small chin or head movements. (Typically Button or Proximity style switches)





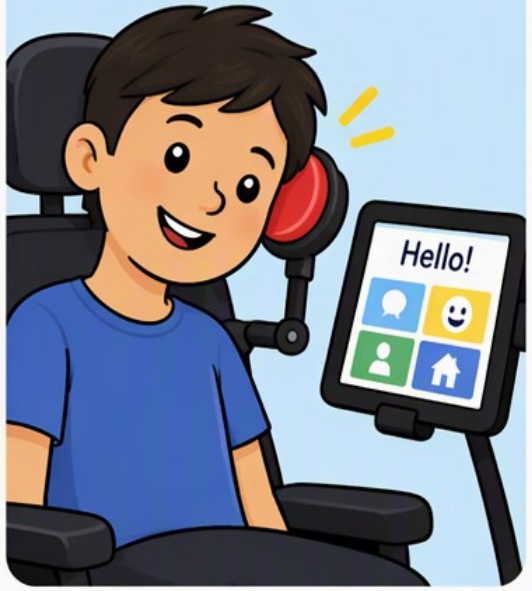
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One, Switch, Many Possibilities

A switch can be used in different ways to help individuals with physical disabilities access an AAC device

Head Access

The buddy button can be mounted beside the head, on a headrest or swing-away mount. The individual activates the switch by leaning their head into it.



Hand Access

The buddy button can be held in the hand, attached to a glove, or mounted within reach. The individual presses the switch with their hand or fingers.



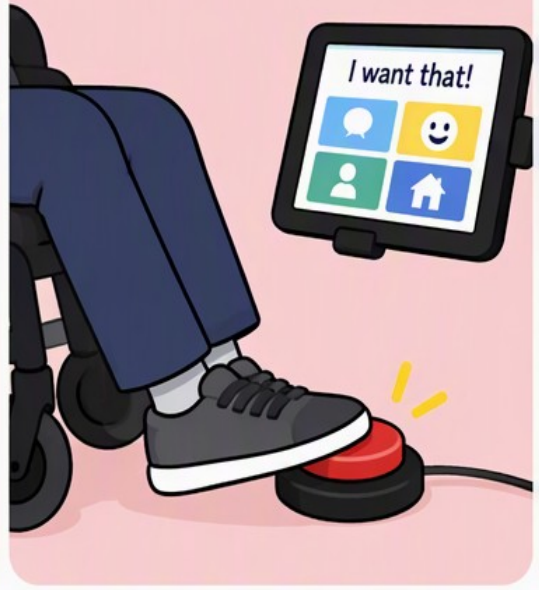
Knee Access

The buddy button can be strapped to the knee or placed on a knee mount. The individual activates the switch by moving their knee.



Foot Access

The buddy button can be placed on the floor, in a foot pedal, or mounted for easy access. The individual activates the switch by pressing it with their foot.



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Case Study: Access

- **Human:** 7 year old with a diagnosis of CP, high muscle tone, involuntary movement
- **Activity:** Access to high tech device
- **Technology?**
- **Context:** Home and school

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Eye Gaze





- Eyegaze allows a person to control a computer using only their eyes.
- An eye tracker monitors where the user is looking on the screen and converts that gaze into cursor movement and selections.
- Eye gaze is an alternative means of access, in most cases replacing the keyboard & Mouse.
- The eye tracker sits below the screen and uses infrared light and cameras to track eye movement.
- The technology can be used for almost anything a mouse can do.
- Eyegaze can provide a way to access communication, education, employment, and leisure activities independently.

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Menu

10:26

No eyes detected

Rest

Chat

Messages

Message banking

TV

WhatsApp

YouTube

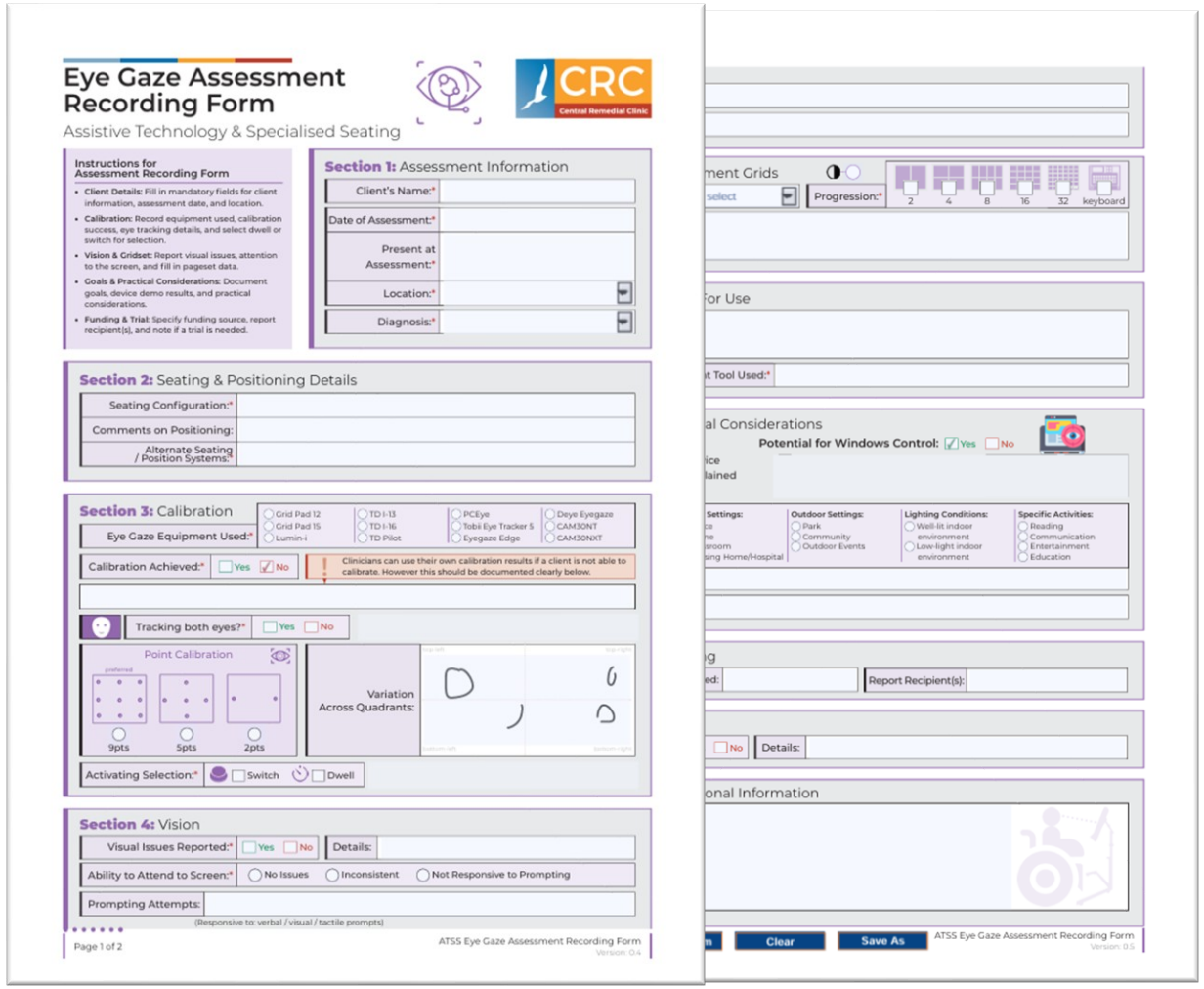
Computer

Alarm

Settings

Battery

Guidelines for Eye Gaze



Eye Gaze Assessment Recording Form

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Instructions for Assessment Recording Form

- **Client Details:** Fill in mandatory fields for client information, assessment date, and location.
- **Calibration:** Record equipment used, calibration success, eye tracking details, and select dwell or switch for selection.
- **Vision & Gridset:** Report visual issues, attention to the screen, and fill in pageset data.
- **Goals & Practical Considerations:** Document goals, device demo results, and practical considerations.
- **Funding & Trial:** Specify funding source, report recipient(s), and note if a trial is needed.

Section 1: Assessment Information

Client's Name:* | Date of Assessment:* | Present at Assessment:* | Location:* | Diagnosis:*

Section 2: Seating & Positioning Details

Seating Configuration:* | Comments on Positioning: | Alternate Seating / Position Systems:*

Section 3: Calibration

Eye Gaze Equipment Used:* — Grid Pad 12 / Grid Pad 15 / Lumin-i / TD I-13 / TD I-16 / TD Pilot / PCEye / Tobii Eye Tracker 5 / Eyegaze Edge / Deye Eyegaze / CAM3ONT / CAM3ONXT

Calibration Achieved:* Yes No — Clinicians can use their own calibration results if a client is not able to calibrate. However this should be documented clearly below.

Tracking both eyes?* Yes No

Point Calibration (preferred) — 9pts / 5pts / 2pts

Variation Across Quadrants:

Activating Selection:* Switch Dwell

Section 4: Vision

Visual Issues Reported:* Yes No — Details:

Ability to Attend to Screen:* No Issues / Inconsistent / Not Responsive to Prompting

Prompting Attempts: (Responsive to: verbal / visual / tactile prompts)

Page 1 of 2 — ATSS Eye Gaze Assessment Recording Form Version: 0.4

ment Grids — select — Progression:* 2 4 8 16 32 keyboard

For Use

t Tool Used:*

al Considerations

Potential for Windows Control: Yes No

Settings: / Outdoor Settings: Park, Community, Outdoor Events / Lighting Conditions: Well-lit indoor environment, Low-light indoor environment / Specific Activities: Reading, Communication, Entertainment, Education

Report Recipient(s):

No Details:

onal Information

Clear Save As ATSS Eye Gaze Assessment Recording Form Version: 0.5

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HeadMouse Nano / Quha Zono







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Head Mounted & Target Mice



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R-Net System

Curtiss-Wright (formerly PG Drives Technology)

- R-Net and Q-Logic 3 advanced wheelchair control systems.
- Primary purpose is to drive and control a powered wheelchair.
- Also be used as a HID, allowing users to control computers, smartphones, tablets, and televisions from their wheelchair joystick or alternative drive controls.



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Case Study: Progressive Condition

Human: Client with a diagnosis of MND
Declining function in hands
Changes in mobility and voice

Activity: Access to phone, WhatsApp, social media apps, web-based work platform, TV

Technology?

Context: Home environment

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Environmental Control

- Environmental control systems are a type of assistive device designed to help people with physical disabilities independently control their environment.
- Technologies range from remote control like devices typically using IR (infra-red), Radio (Wi-Fi, Easywave, Z-wave etc..) to more complex computer based systems.
- Devices can be stand-alone or integrated and can be accessed with switches, joysticks, eye-gaze and other access methods

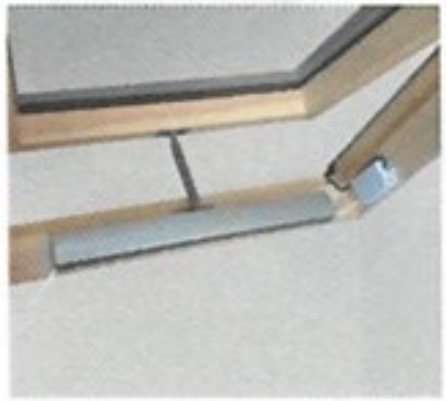
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What can be controlled?

- Lights
- Heating
- Air conditioning
- Television
- Phone
- Doors
- Windows
- Curtains
- House hold appliances



Smart Bulb



Window Opener



Phone Access



Door Opener

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HouseMate





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Hi tech Integrated Devices



Integrated AAC and ECU systems

Supports independence and participation in daily life

- Heating and smart home devices
- Phone and video calls

  Emergency call systems

- Lights and appliances

  TV and entertainment systems
- Doors and intercoms



Access via touch screen, switch, eye gaze and head tracking, alternative mouse access

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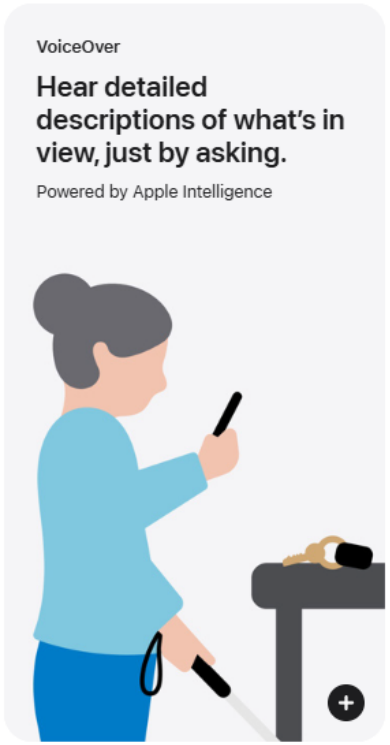
Windows Accessibility Features

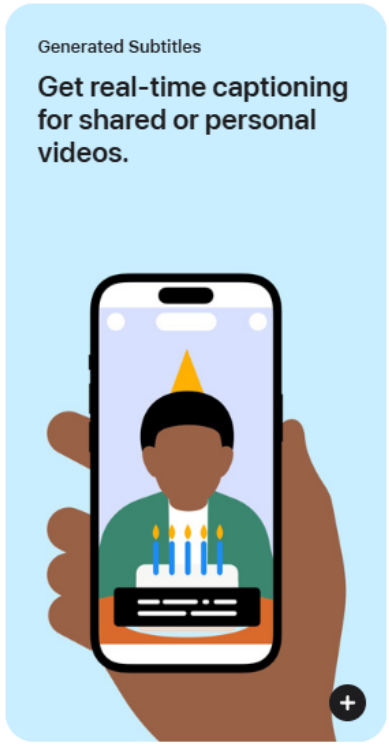
- **Sticky Keys:**
  Helps users who find it difficult to press multiple keys at the same time.
- **Filter Keys:**
  Filters out repeat key presses.
- **Narrator:**
  Reads text aloud and describes items on the screen.
- **Magnifier:**
  Enlarges parts of the screen to make content easier to see.
- **High Contrast Themes:**
  Improves visibility by increasing the contrast between text and backgrounds.
- **Closed Captions**:
  Displays spoken audio as text for users who are deaf or hard of hearing.
- **Voice Access**:
  Allows users to control their PC and dictate text using their voice.
- **Live Captions**:
  Automatically creates captions for audio played on the computer.
- **OSK (On Screen Keyboard)**:
  Customizable and re-sizeable on-screen keyboard.

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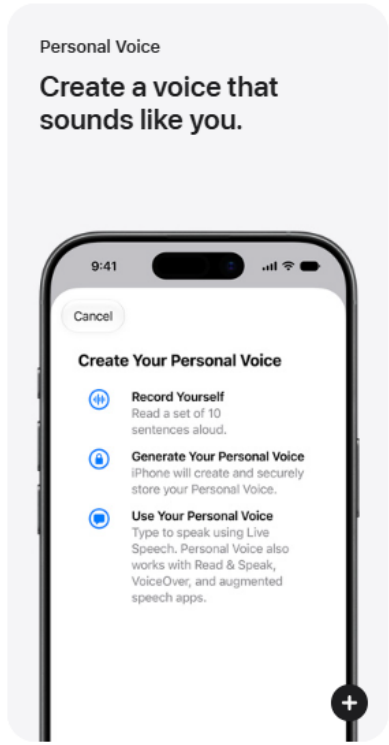
https://www.apple.com/accessibility/

Apple Accessibility

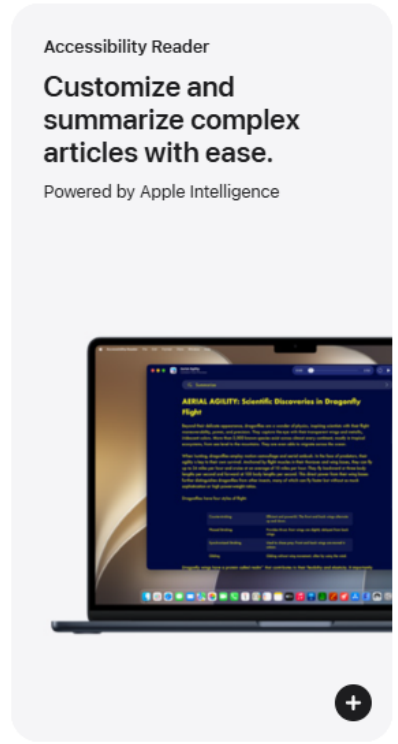






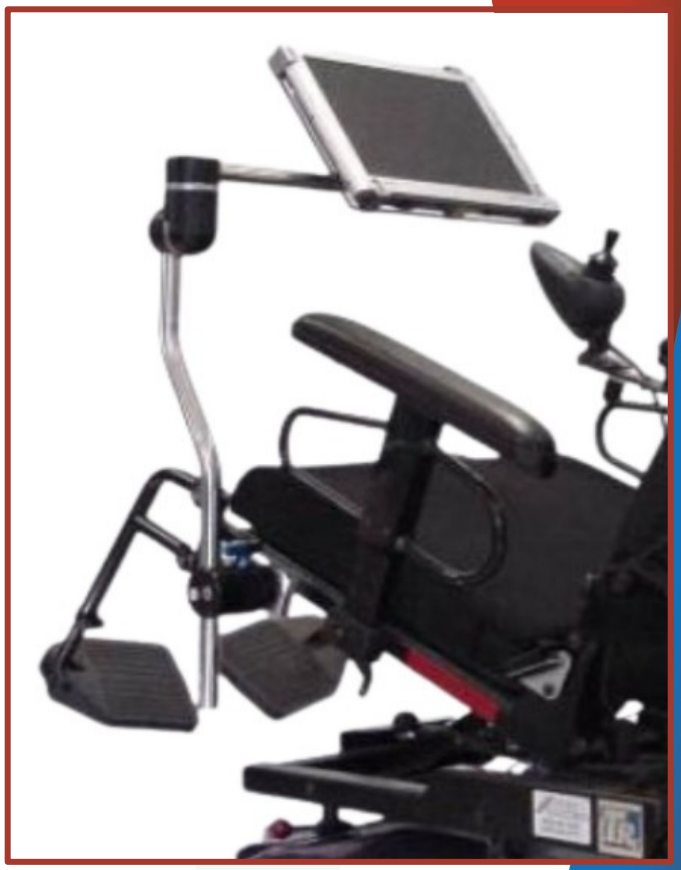






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Mounting & Positioning



Mounting is the method used to securely position an assistive technology device so that it is safe, comfortable, and easy to access.



A good mount should:

- Hold the device securely
- Place the device in the correct position
- Be easy to adjust
- Allow access for transfers and daily activities
- Support long-term use

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Situations to Consider

At home



Standard wheelchair



Second wheelchair



Sofa or recliner



Desk or table



Bed

At school/work



Standard wheelchair



Desk or table

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Why Mounting Matters

Good mounting helps with:

- Consistent access
- Better posture
- Increased independence
- Greater participation in education, work, and home activities

Poor mounting can result in:

- Fatigue
- Poor posture
- Reduced communication access
- Reduced accuracy with touch or eye gaze
- Frustration for users and caregivers

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Clinical & Safety Considerations



- Follow manufacturer guidance and intended use.
- Use a person-centred assessment process.
- Ensure device compatibility and safety.
- Review warnings, contraindications, and limitations.
- Report incidents and device issues promptly.
- Provide user and staff training.
- Maintain clear clinical records.

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Learning Needs questionnaire on website



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Any questions...



...just ask Simon!!

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ATSS TRAINING LECTURE SERIES

Specialised Seating and Assistive Technology

Building knowledge. Enhancing care. Empowering better outcomes.



A 5-PART TRAINING SERIES DESIGNED TO SUPPORT YOUR KNOWLEDGE AND PRACTICE IN ASSISTIVE TECHNOLOGY

OCTOBER 15TH	TRAINING SERIES 2	Introduction to custom moulded seating 12:30–1:30pm
OCTOBER 21ST	TRAINING SERIES 3	Introduction to manual wheelchairs 12:30–1:30pm
OCTOBER 28TH	TRAINING SERIES 4	Introduction to power mobility and alternative access 12:30–1:30pm
NOVEMBER 4TH	TRAINING SERIES 5	Introduction to assistive Technology 12:30–1:30pm

ALL SESSIONS ARE HELD 12:30–1:30PM
Mark your calendar and join us for each session!

VENUE: ONLINE
Join from the comfort of your home or workplace.

ORGANISED BY:
ATSS DEPARTMENT, CENTRAL REMEDIAL CLINIC

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