



Calvary

**A Clinical Reasoning Framework for  
Implementation of Eye Gaze Technology for  
Individuals with Motor Neurone Disease**

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Continuing the Mission of the Sisters of the Little Company of Mary

# What is Eye Gaze?



# Current options for accessing a computer or AAC device

## Direct access ('hands on')

- Keyboard (via screen or separate)
- Stylus
- Modified mouse or keyboard
- Typing splints



## Indirect access ('hands free')

- Head mouse – Tracker Pro
- Quha Zono gyroscopic mouse
- Switch scanning
- Eye Gaze



## Who might consider Eye Gaze?

An individual who:

- Has **limited active** movement in their arms, hands or neck
- Is **unable to use regular computer** keyboard and/or mouse/tablet
- Is experiencing difficulty using their device with their current alternative access method
- Has been unsuccessful in trials of other access methods
- Will soon lose the movement required to access their computer

# Assessment

- Client
- Goals
- Environment
- Occupational Performance
- Support person
- ***Trial!***
- Funding availability



# What do you need for successful Eye Gaze implementation?

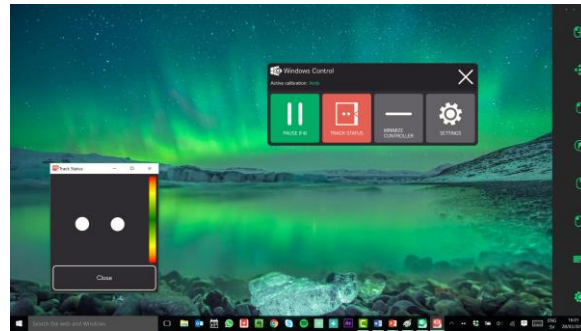
- ☑ The **person** and **positioning/mounting**
- ☑ **Computer** (Tablet/Device)
- ☑ The **software**
- ☑ The eye gaze **camera**
- ☑ Successful **calibration**
- ☑ A **support person** or team



## Software/Choice of device

What does the person want to do with their eyegaze system?

- Communication
- Social media
- Gaming
- TV control
- Other environmental control
- Blogging



Consider dwell/switch/zoom to click – different options available with different software.

# Mounting and Positioning

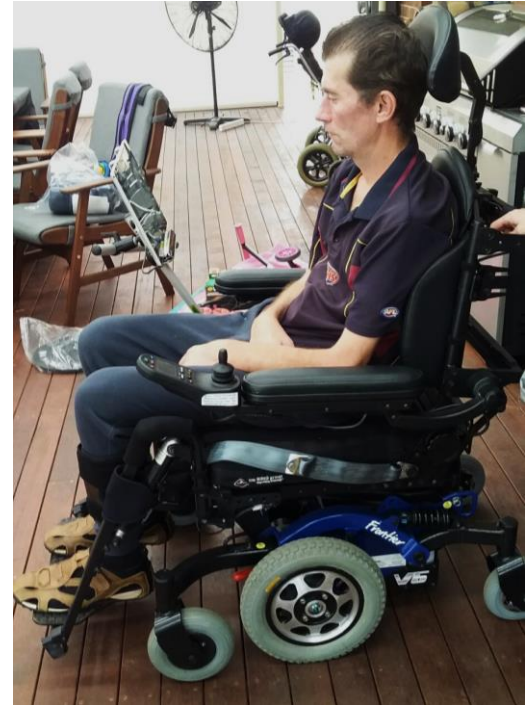
- Where will the person use their eyegaze system?
- Does it need to be a mobile system?
- What are they using it for?
- Where will it be used in the house?
- Careful consideration of options is imperative.



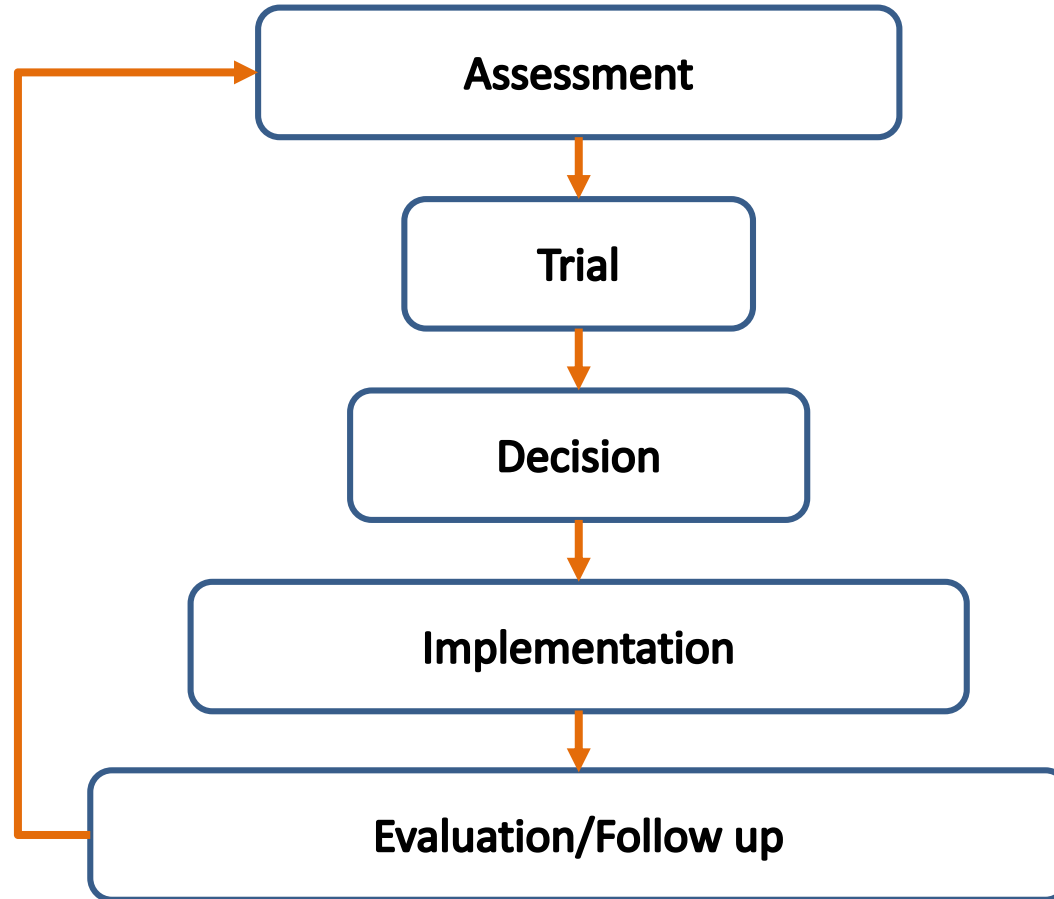


# Implementation and Evaluation

- Set up hardware/Install software
- Mounting
- Configuring individual user settings
- Calibration training
- Support team education and training
- ***Practice!***
- Ongoing review, problem solving and trouble shooting as the individual's function and needs change
- Low tech back up option if using for communication



# Implementation of Eye Gaze



# Case study- Narelle

## **Assessment:** SP and OT work together

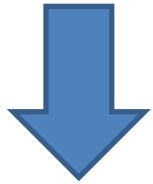
- 47 Year old lady with bulbar onset MND
- Narelle's hand function is changing and she cannot touch the screen of her Ipad effectively and efficiently anymore to access her communication app
- Goals: AAC, social media, email, internet access, e-books
- OT review of head position/posture in wheelchair and hand function
- Supportive partner and daughters around to set up/support the use
- Wants to use at home and in the community

## **Trial:**

- Discussed and trialled hands free access options – head/gyroscopic mouse vs eye gaze access.
- Discussion on software and device options and mounts related to wider goals

## Needs:

- Light weight mobile system
- Ability to have mounted
- Communication software
- Hands free access
- Internet/web access



## Decision:

- Small Eyegaze camera
- Windows surface pro **tablet**
- **Tablet holder/bracket**
- Communication **Software**
- Rolling **mount** for in bed/recliner
- Wheelchair **mount**

## Doesn't need:

- Heavy duty/robust system
- Extra large battery
- Infrared/environmental control
- Extra loud speakers



## Implementation:

- Funding applications completed by OT and SP
- Allocate appropriate time for set up
- Training with SP with communication software
- Training with OT on use of computer control options and set up of mounts
- Training of carers, family
- Provide pictorial written instructions
- Practice, Practice, Practice!

## Case study- Narelle

### **Evaluation/follow up:**

- Regular monitoring on use of system as Narelle's function changes
- Ensuring that there is a “low-tech” back up communication option available is essential – work with Speech Pathologists
- Ongoing trouble shooting and problem solving as issues arise
- Support person to maintain regular software updates and ensure wifi connectivity

# Case Study – Barry

## Assessment:

- Barry is 75 and has flail arm variant MND
- Lives at home with wife in the country
- Walks with no aids, speech is intact
- Limited use of arms, some finger movement intact
- Main goal is access his computer to use emails and surf the net
- Barry can't use his keyboard and mouse



## Trial: Occurring over clinic appointment and inpatient admission

- Main goal to find best hands free access option
- Head mouse/eyegaze
- Communication software/windows control

**Decision:**





## Case Study – Barry

### Implementation:

- Loaning tablet until Home Care Package can fund
- Training completed with client and wife, Barry can direct carers/other family on set up

### Evaluation/Follow up:

- Follow up in clinic
- Email contact
- Ongoing review of useability – location of switch
- Communication
- Mobility

## Benefits of successful implementation

- Improves Quality of Life !!!!!
- Stay connected
- Regain control
- Purposeful activity
- Communication with people and environment
- Improve independence
- Reduce carer burden



# Literature

*“Our data suggests that Eye Tracking Communication Systems enable patients to stay mentally autonomous and to realize their needs in terms of social activities and participation, improving successful adaption to the disease, psychological well-being and possibly even modifying disease course.” Linse et al. 2017*

*“Eye-tracking assistive device seems to enhance the ability of a patient to interact socially, to participate in the community, and to make personal choices about her or his care.” Hwang et al 2014*

*“Timely referral and economic burden remain critical issues in decision making for communication support in ALS.” Londral et al. 2015*

## Take home points

- Eye gaze is one of many access methods
- Eye gaze is not just used for text to speech
- Successful implementation requires:
  - **Thorough assessment**, trial and set up
  - Accurate **positioning**
  - Motivated client- practice!
  - Support from family and carers
  - Ongoing monitoring as MND progresses
- Timing and funding
- Positive impacts on quality of life when used successfully



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## Useful Resources

- **Zytecq:** <http://www.zytecq.com.au/>
- **LinkAT:** <http://linkassistive.com/>
- **Tobii:** [www.tobii.com](http://www.tobii.com)

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