Advancing Technology to Keep Pace with Changing Needs

ALS Association Webinar

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ALS ASSOCIATION

permobil FOUNDATION

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Father, Husband, Notre Dame Alumni, PALS

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Presentation outline

- Equipment provision process
- Seating solutions
- Power mobility base and drive controls
- Power seat functions
- Connected functions
- Interview with Shawn

Client-Centered Equipment Provision

Includes:

- Teamwork
- Empowerment
- Partnership
- Needs, values, wants of each individual
- Individual > System

Provides:

- Reduced equipment-abandonment
- Improve the Person-Technology match
- Improved client outcomes and satisfaction

(Larson-Ranada & Lindstrom, 2019; Nelligan, 2002)

Power Mobility as an Intervention

- Increased ability to participate
- Sense of competence
- Increased self-esteem
- Comfortable
- Improved mobility

“Freedom to go where I want”
“Safer and Faster”
“It’s easier for caregivers”

(Ward, et al., 2015)

Team approach to seating and mobility

- Client
- Family
- Caregiver
- Physician
- Nurse
- Therapy: Physical, Occupational, Speech & Respiratory
- Social worker/case manager
- Equipment providers: Mobility, Communication device, Respiratory and Oxygen/Supplies
- ALS association representative

Mobility Equipment and ALS

Advances in understanding of medical management and quality of life is increasing life expectancy of people living with ALS

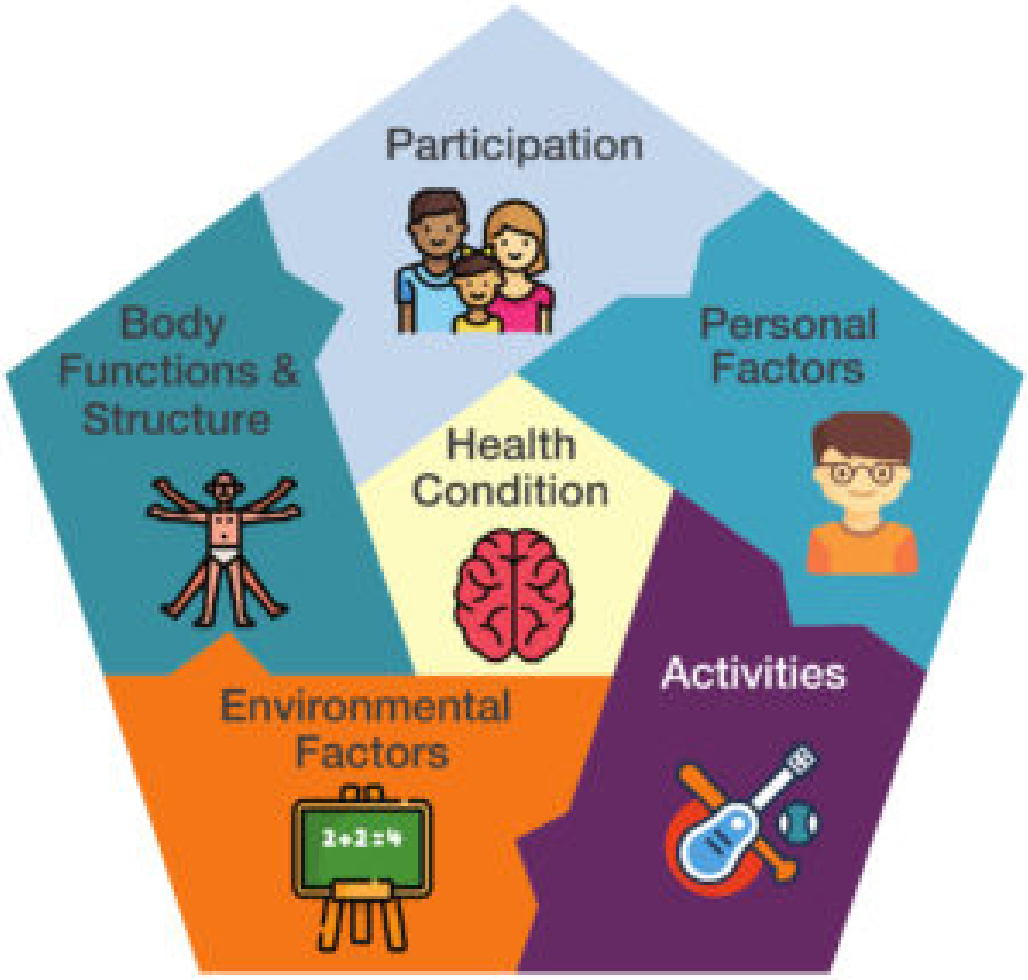
Leading to More:

- life-sustaining measures
- technology
- clinical trials

Resulting in:

- chronic sitting complications
- ongoing mobility assessments
- complex seating needs

Evaluation Considerations



http://www.mackeith.co.uk/ from *ICF: A Hands-On Approach for Clinicians and Families (2019)*

Evaluation considerations: Goals

- Functional positioning
- Mobility
- Comfort
- Managing fatigue
- Decrease risk of pressure injuries
- Preserve quality of life

Evaluation considerations: Needs

- Supportive seating
- Facilitate sit to stand transfers
- Upper extremity (glenohumeral) support
- Integration of multiple drive controls
- Switch access
- Advanced programming capabilities
- Reliable and dependable configuration and service

Seating systems: Seating surface

Risks for skin impairment

- Age
- Nutritional status
- Rapid weight loss
- Medications
- Vascular compromise
- Immunosuppression
- Duration of time in a seated position

Seating systems: Seating Surface

How do you choose:

- Skin protection
- Comfort
- Stability
- Transfers

Seating systems: Back supports

How do you choose

- Balance
- Comfort
- Functional mobility
- Skin
- Stability
- Adjustable

Seating system: Secondary supports

Posterior and lateral elbow blocks
Arm troughs
Pelvic guides
Anterior knee supports
Chest and lap belt
Plus skin protection and comfort

Seating systems: Head Support

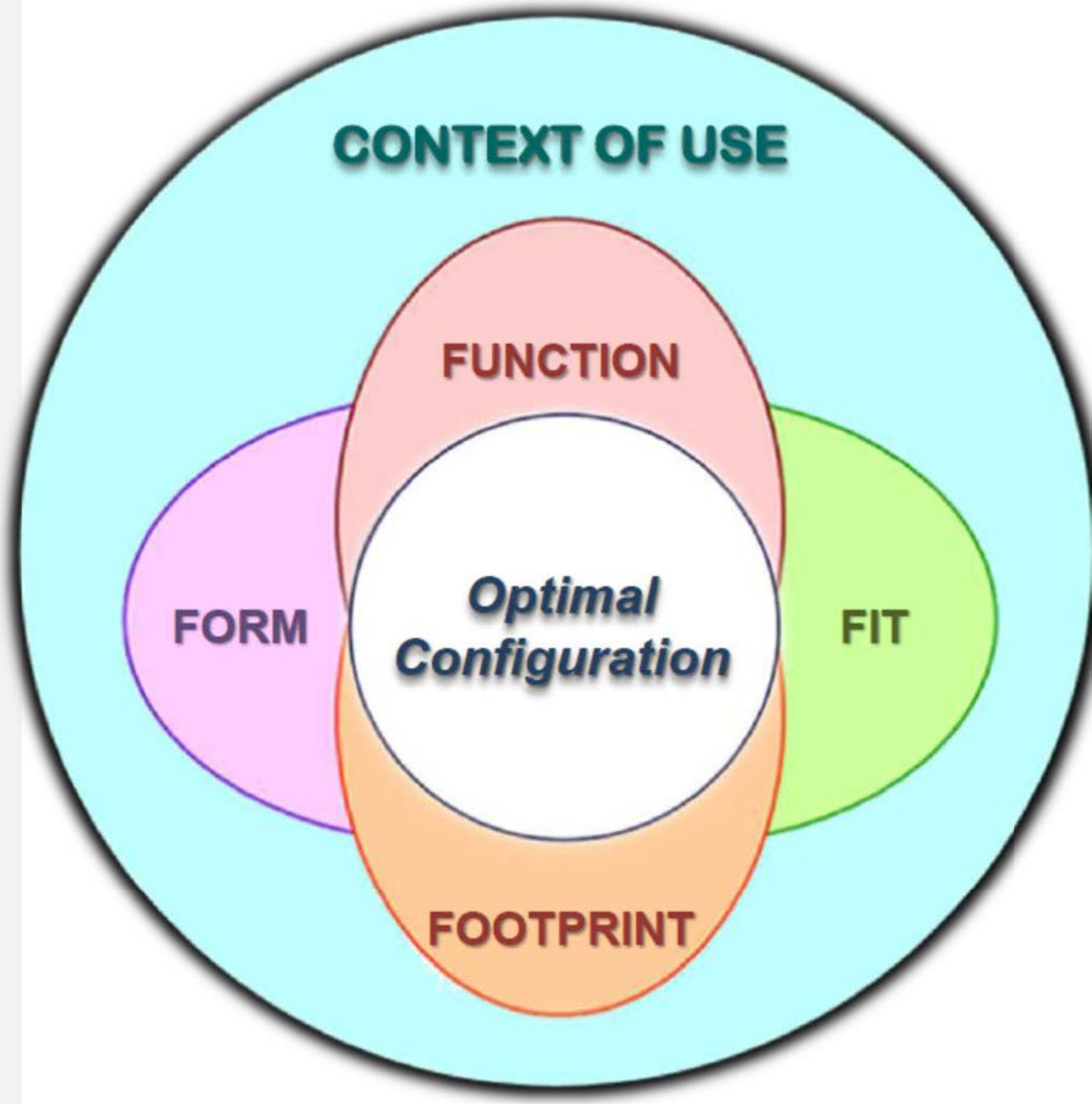
Adjustable

Comfortable

Interaction with drive controls

Interaction with power seat functions

Power Mobility Base



(Mitchell, 2013)

PatientsLikeMe Survey

171 people living with ALS, MS and Spinal Cord Injury & using power mobility equipment reported that ways to improve their satisfaction with their power wheelchair would be:

51% Drivability on rough surfaces
41% Improved comfort and support
31% Custom settings
30% Drive assist/back-up camera
26% Add-ons for easy and safe transfers

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Power mobility: Drive wheel position

- Drive wheel position
- Drive lock-out
- Tracking technology
- Suspension
- Transportation
- Functional positioning
- Seating system positions

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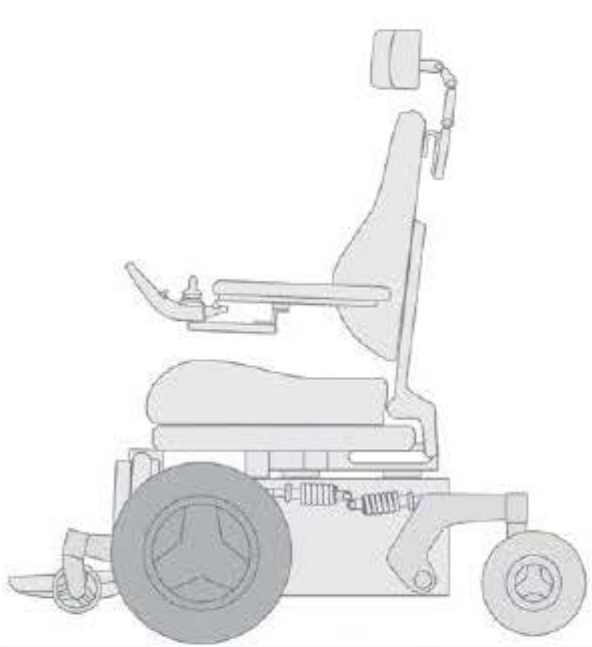
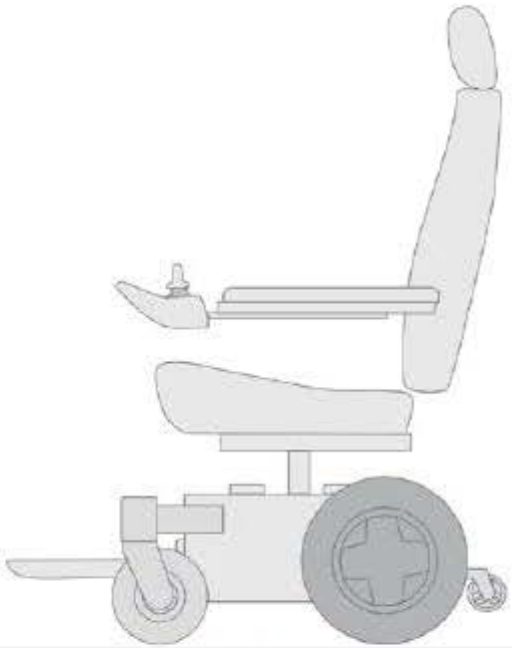
Base selection: Considerations for wheelchair evaluation



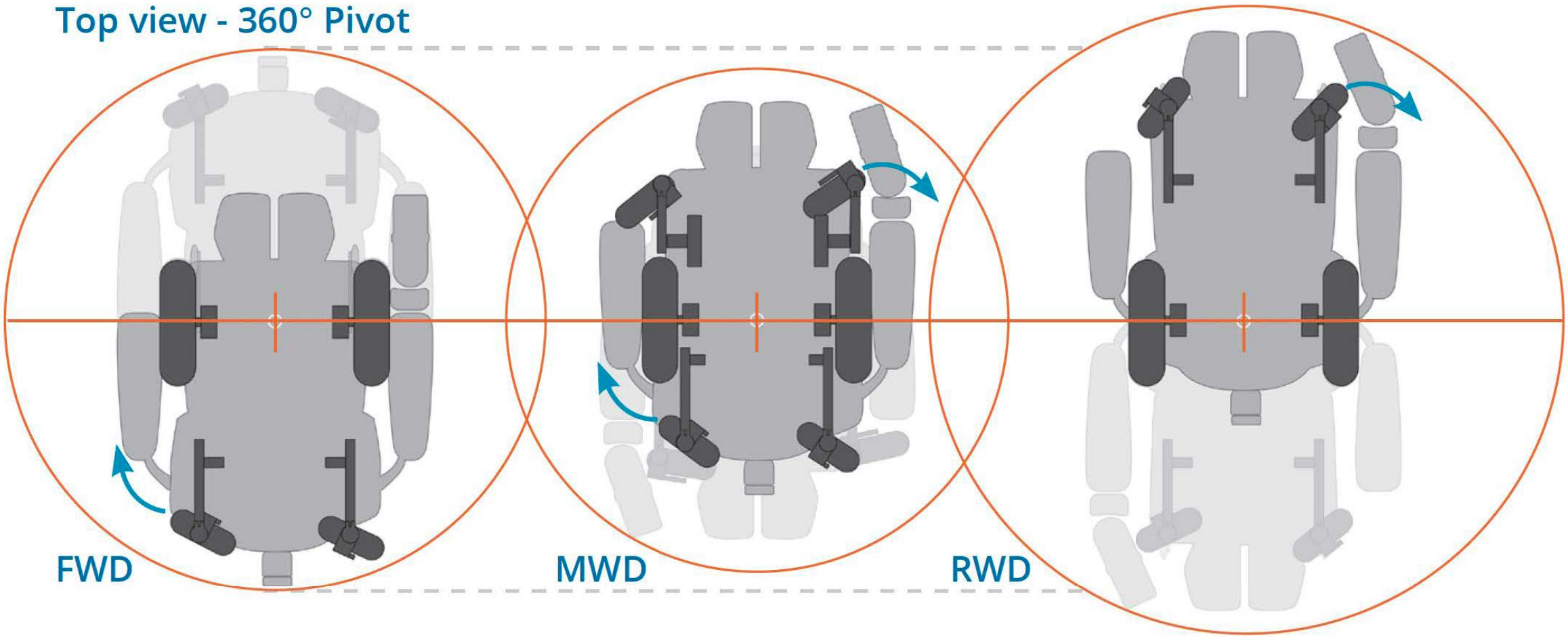
Front-wheel drive

Mid-wheel drive



Rear-wheel drive

Drive wheel position



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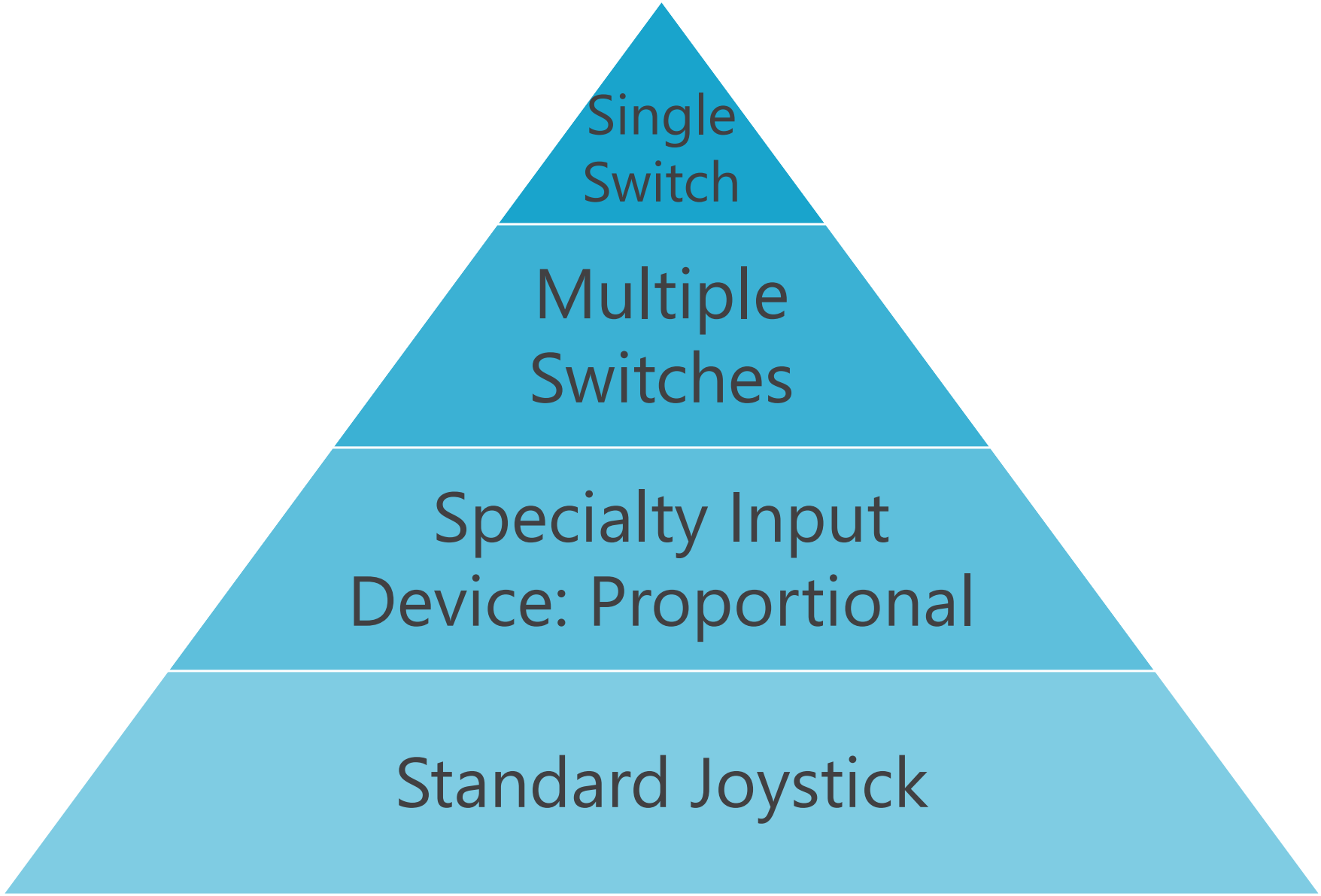
More

Stability, Control, Range of Motion, Endurance

Less



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Drive Controls

Standard Joystick

Specialty Input Device: Proportional

Specialty Input Device: Multiple Switch Control

Specialty Input Device: Single Switch

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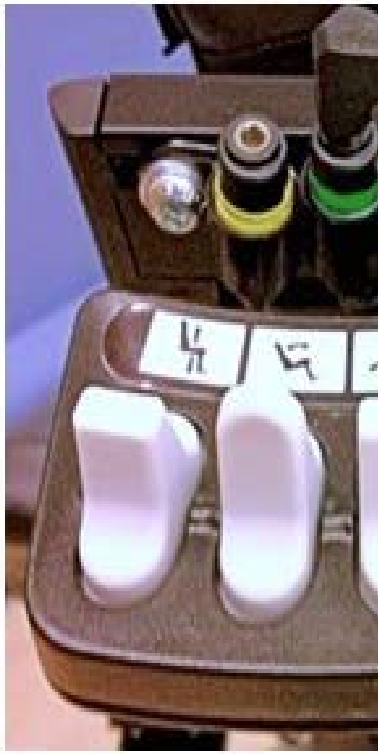
Eye Gaze

Tolt Technologies Ability Drive

www.tolttechnologies.com

Photo: als-connect.org

Switch access



Tracking Technology

Is it standard, can it be added, does it have it?

Drive controls + Tracking:
Switch control easier in FWD
less caster direction change

Less input device movement:
increased safety and activity tolerance

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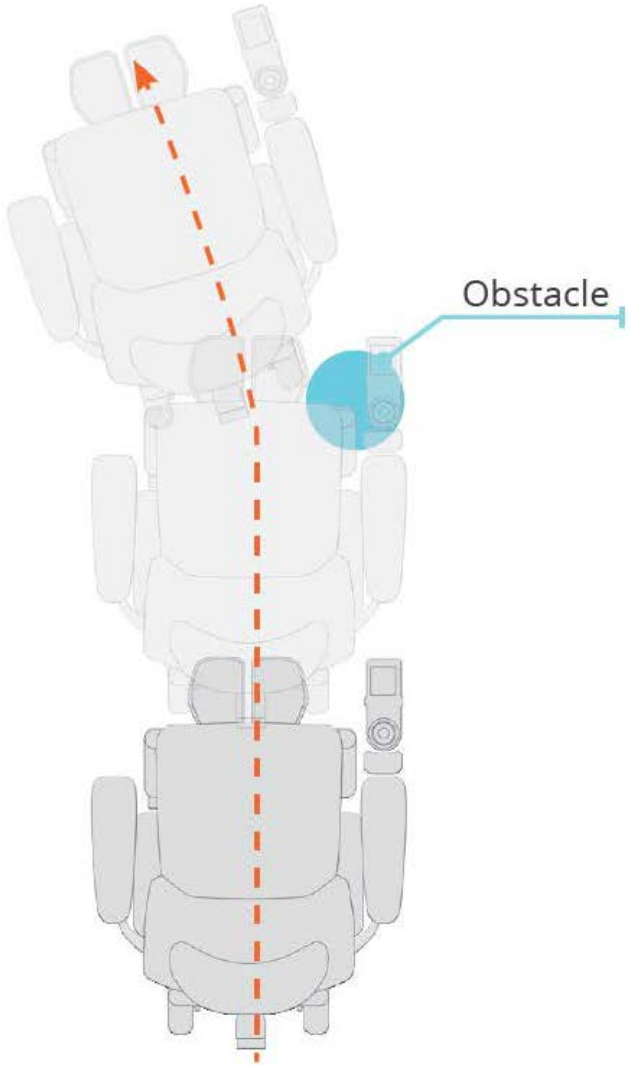
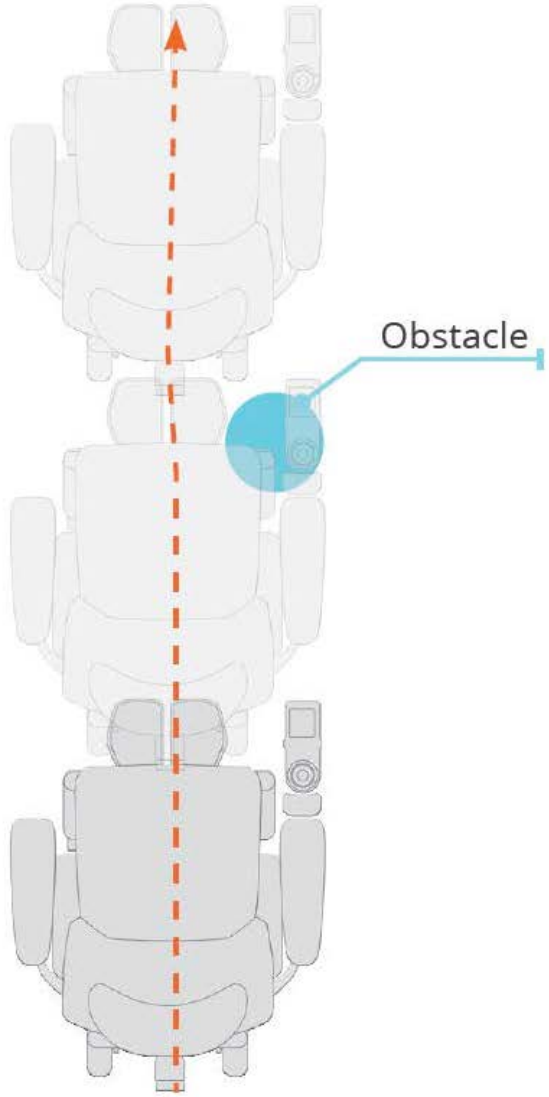
Without Tracking

Additional input needed with the drive control *(joystick or other)* to maintain intended direction



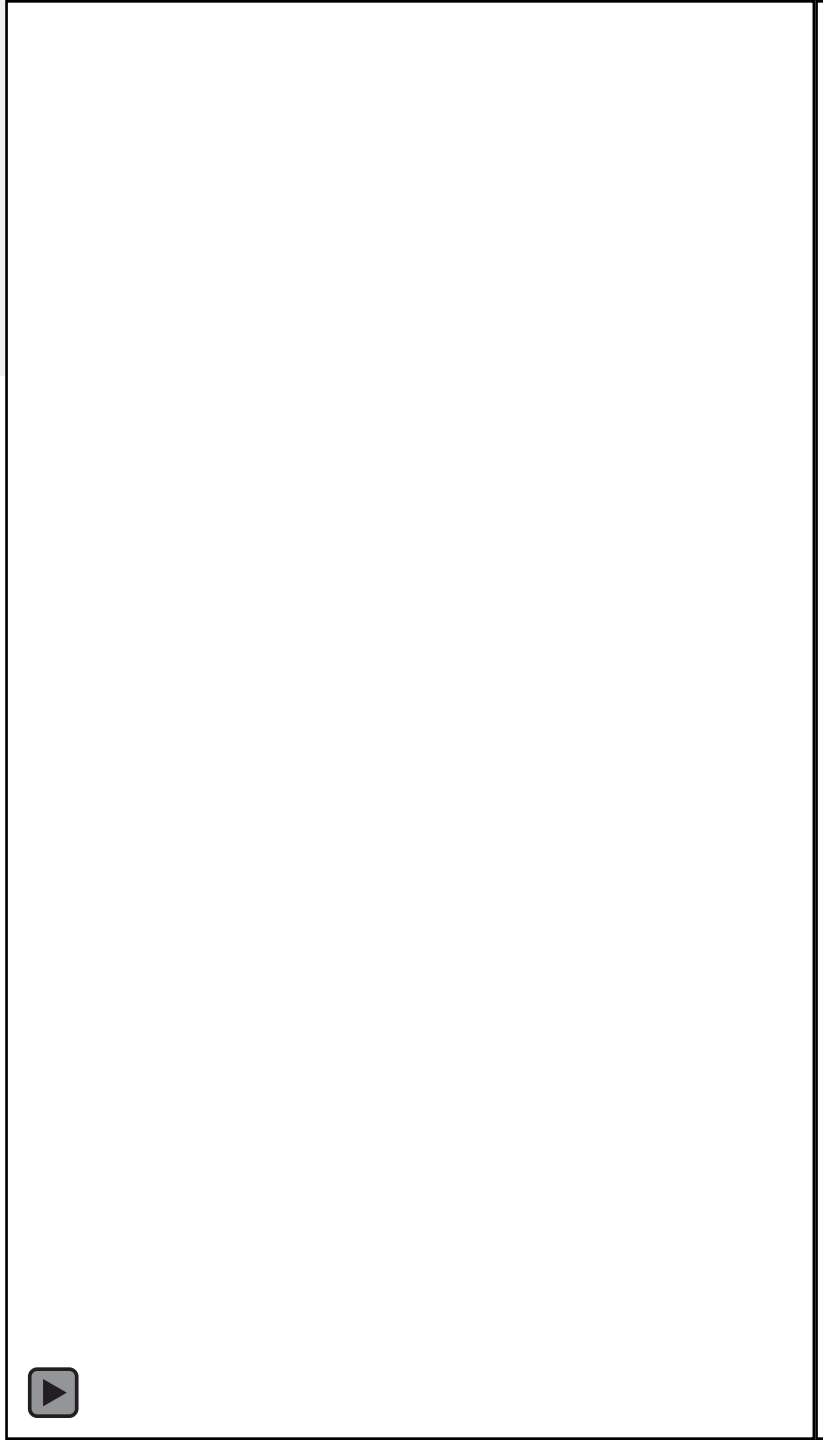
With Tracking

Technology senses changes and adjusts without needing additional input from the client drive controls



Programming

- Speed
- Acceleration/Deceleration
- Torque and Power
- Tracking technology for switch control



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Power seat functions are essential

FWD

Drive in almost any position

- Tilt, recline or total back angle

MWD

Out of the box programming to limit driving in tilted or reclined positions

Power seat functions

Frequency of use:

- TILT: 32%: 3-5 times per day and 23% 11-20 times per day
- RECLINE: 28% 3-5 times per day and 31% 11-20 times per day
- ELR: 19% 3-5 times per day and 19% 11-20 times per day

(Ward, et al., 2010)

Benefits of PSF:

- Improved postural support, sitting tolerance and comfort
- Elevating legrests were used more frequently than expected

(Wu, et al., 2017)

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Functional positioning

FWD allows more options for LE positioning as the footplates can be tucked back farther since there are no front casters (Lange & Minkel, 2018)

FWD you can also have more anterior tilt, footplates all the way to the ground and even standing if appropriate

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Seat elevators donated on new chair order since the Permobil Foundation launch in 2017

Power Mobility: Integrated technology

Bluetooth
- iOS, Android, PC

Infrared
- Single blast only

Permobil Connect
- battery life availability
- seat function usage,
- optional GPS location

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Power Mobility: What else do you need to bring with you?

- Ventilator tray or soft bag
- Oxygen tank
- Output module
- Feeding tube/IV holder
- Respiratory kit
- Essentials carrier
- USB charger
- Powertech converter/inverter
- Phone/Tablet holder
- Upper Extremity Tray

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Power Mobility: Additional technology

Obstacle detection

EEG/BCI drive controls

Autonomous drive

Wireless switch control

Environment or person-tracking software

What will you discover?

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Personal Journey: Meet Shawn

- Shawn is a 54-year-old male, who was diagnosed with bulbar onset ALS at age 48
- First power wheelchair obtained in 2015 was a Permobil M300 with left hand joystick controls
  - Tilt, recline, elevating leg rests, seat elevate
- Father, husband, network engineer, Notre Dame Alumni

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Personal Journey: Meet Shawn

Drive controls:

- 2017 re-evaluated for new drive controls
- Prescribed Head array switch control

Shawn quickly realized that head array was not a long-term solution

- Cervical spine was requiring more support

Shawn and his son John went to work creating his own Specialty Input Device and applications interfacing Permobil OMNI controls with Eye Gaze PC

Questions for Shawn

1. What programming modifications have helped you use your chair with increased independence?
2. Before you had your Eye Gaze PC, did you use any Bluetooth or IR functions from your power wheelchair?
3. What have you found to be helpful in protecting your skin, keeping you comfortable, and supporting your posture?
4. You recently were prescribed a new chair and decided to select a front wheel drive, what was that decision process and what differences do you notice?
5. What power seat functions do you have on your new chair?
6. What advice do you have for a person with ALS who is starting the process of obtaining a power wheelchair?

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https://www.youtube.com/watch?v=06pjhd3zfZU&feature=youtu.be

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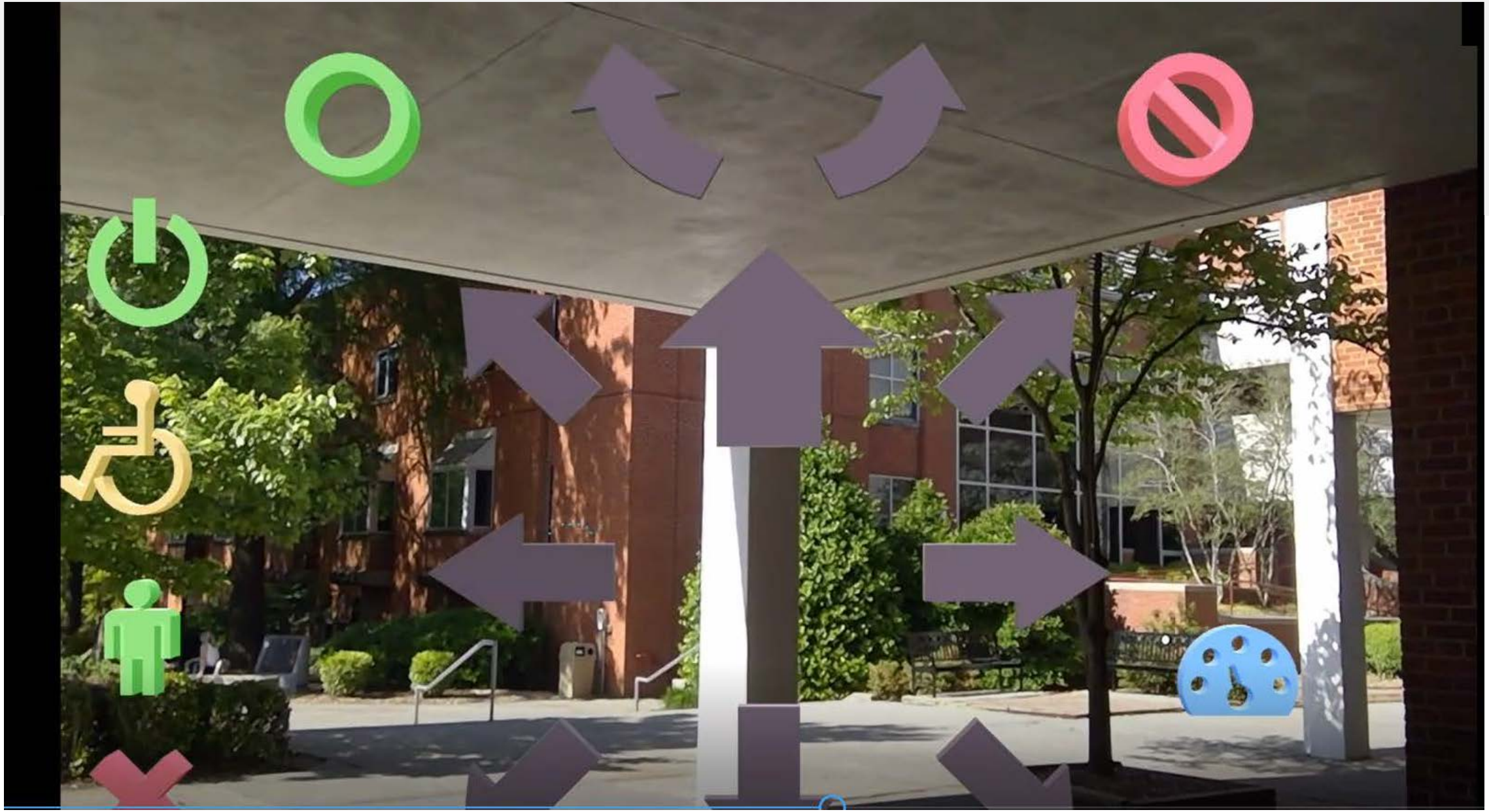

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Resources

ALS Association: www.als.org
Permobil Foundation: www.permobilfoundation.org
Permobil US: www.permobilus.com

YouTube link for Shawn & John's EyeDrive video:
https://www.youtube.com/watch?v=06pjhd3zfZU&feature=youtu.be

Steven Mitchell LinkedIn Article:
https://www.linkedin.com/pulse/how-effectively-provide-complex-rehab-technology-home-steve/?trackingId=

Permobil webinar "Power of Preparation: What to Consider for a Wheelchair Evaluation".
https://hub.permobil.com/permobil-product-webinar-form-page

Summary

- Power mobility can have a positive influence on quality of life
- Use of multiple power seat functions helps with comfort, tolerance, edema management
- Drive controls and switch access need to be constantly and consistently reassessed
- Select seating solutions for skin protection, comfort, stability, posture, & function
- Discuss computer access an environmental controls
- Utilize resources: ALS Association, Permobil Foundation, PALS, PT/OT
- If we know that a Permobil is going to a person with ALS it is expedited to be built within 1 day.

Questions?

Thank you!

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