



Beyond Exploration:
What's the Next Step for
Pediatric Seating &
Mobility?

Permobil Academy Webinar Series



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What We Learned from the
Explorer Mini Webinar:

- Self Initiated ON TIME mobility stimulates neuronal activity and is the foundation for more learning!
- Postural development occurs in stages and requires movement/weight shift

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What We Learned from the
Explorer Mini Webinar:

- Developmental skills are all intertwined
 - Vision (visual foraging vs visual idle)
 - Reaching/Midline UE activity and visual convergence
 - Balance/Posture
 - Mobility

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What We Learned from the
Explorer Mini Webinar:

The Explorer Mini is the ideal starting point for young children with mobility impairments

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Questions to Discuss Today: What if a Child.....

<p>01 Has outgrown the Explorer Mini? Or is ready for full time mobility?</p> <p>02 Cannot use the joystick?</p> <p>03 Requires power seat functions?</p>	<p>04 Requires medical equipment? (such as a ventilator)</p> <p>05 Has no head control and/or poor airway management?</p> <p>06 Is "unsafe" with powered mobility?</p>
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What if a child has outgrown the Explorer Mini
Or is ready for full time mobility?

We have options!






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Manual vs. Power

- Not all kids who start in the Explorer Mini will be lifetime power wheelchair users!
- Need to distinguish functional mobility and therapeutic mobility
- Consider environmental access and transportation
 - But also think outside the box!



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Demands of Ambulation

- Partially ambulatory children with disabilities may exhibit an atypical gait pattern or may need assistive devices or orthotics.
- Increased energy requirements for medically or neurologically involved children
 - Energy spent on breathing, circulation, and digestion
 - *Function* takes a back seat
- Gait either *worsens* or *takes more energy* to complete as the child ages and gets heavier


(Bennett et al., 2005; Jones et al., 2004; Waters, Hislop, & Campbell, 1983)

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Demands of Manual Wheelchair Propulsion





- UE strength and coordination
- Handgrip
- Head and trunk control
- Endurance
 - Higher oxygen consumption during MWC propulsion than the typical child uses when ambulating



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Push Stroke Technique

Semicircular	Arc	Single Loop Over	Double Loop Over
			

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Pediatric Propulsion Styles

FIGURE 12 | Representative stroke patterns observed by individuals during the propulsion task. (A–D) Correspond to the four patterns previously identified and identified in adult users (A) semicircular (SC), (B) single looping over propulsion (SLOP), (C) double looping over propulsion (DLOP), and (D) arcing (ARC). (E) Does not appear to readily fall into one of these categories.


Slevens et al., 2015

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Different Propulsion Patterns

- Children <4 years of age usually have shorter arms...which leads to shorter push strokes (tend to push on the front 1/3 of the wheels)
- Limited extension
 - Teach peers to safely assist
 - Push handles for parental access
- Dependent on access to wheels
- Utilize "play" to teach propulsion




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Manual Wheelchairs
 How Can We Do Better?




- Sit the child IN the chair not ON the chair
- Appropriate seat width
- Seat height
- Camber
- Armrests?
- Wheel access?
- Keep in mind the Child:Chair weight ratio



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Permobil Pediatric Manual Wheelchair Options

Pilot	Twist	Aero Z
		

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Permobil Pediatric Manual Wheelchair Options

Pilot	Twist	Aero Z
		

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Consider Power Assist

Push Rim Activated	SmartDrive
	

Chair Set up Compromise?
 Transportation Challenges?

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Permobil Pediatric Power Wheelchair Comparison

<p>M300 PS Jr 24"W x 36"L ~310lbs</p> 	<p>Koala 23"W x 32"L ~225lbs</p> 	<p>Explorer Mini 19.5" W x 25" L 52lbs</p> 
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Koala

- Nearly 25 years!
- Group 5 Pediatric Base (US)
- Low Seat to Floor Height
- Small Footprint
- Integrated power tilt & Elevating seat





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K450 MX

- Seat to Floor
- Elevating Seat
- Optional Power Tilt





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K300 PSJR and M300 PSJR



- Built for Growth
- Options:
 - Power Tilt
 - Manual Tilt
 - Seat Elevation
 - FWD or MWD Base
 - Group 3 Funding (US)

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PSJr Armrest Adjustment


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F3 Corpus with Comfort Seating

** Custom option*


PSJr Armrests allow for more appropriate upper extremity support



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What about Power Seat Functions?

- Tilt
- Recline
- Power Seat to Floor
- Elevating Legrests
- Standing
- Active Height (Seat Elevation)
- Active Reach (Anterior Tilt)



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What if the Child cannot use the joystick?

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Lots of other Specialty Input Device Options

Light Touch Joysticks Multiple Switch Systems Head Arrays

Sip n Puff Foot Controls Video Game Controllers

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What about safety with powered mobility?

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Barriers to Powered Mobility: Safety Concerns

- The very skills that are required to be "safe" develop through independent mobility
- Use (age) Appropriate Supervision

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Kids don't Crash ... they INTERACT!

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Still Concerned?

There are Options!

<p>Stopping</p> <ul style="list-style-type: none"> **Remote Stop Attendant stop Switch 	<p>Not Moving</p> <ul style="list-style-type: none"> Set Up No-Drive Profiles Sleep Timer Lock the Joystick Circuit Breaker 	<p>Avoid Injury</p> <ul style="list-style-type: none"> **Foot Bumper Individual Programming - Power, Speed, etc.
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permobil **Available for extra charge

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What if a child requires Medical Equipment?

- Vent Tray
- Bag Hooks
- Push Handles

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What if a child has no head control and/or poor airway management?

- Head Support
 - Swing away supports/switches?
- Power seat functions
 - Memory Positions
- Seating and positioning options
 - Backrest/Cushion/Straps

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What differentiates seating for children versus seating for adult populations?

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Not just little adults

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Seating Considerations

- Children sit with more external rotation and abduction
- Pelvis is susceptible to high forces which may result in permanent boney changes as the child grows/develops (don't over position)
- Forcing into adduction (legs together) may result in dislocation


TiLite Twist Abduction frame

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Planar vs. Contoured Seating

Contoured:
Gentle supportive surface that allows children to move more freely while still providing cues to postural alignment.


Planar:
Requires more belts, straps and accessories for support.



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Remember the Goal

Allow Movement and Postural Development



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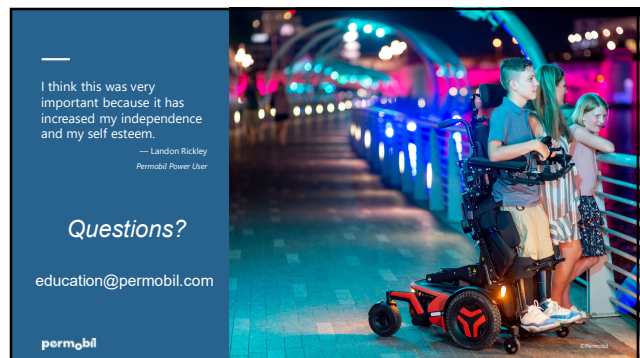
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