Powered Mobility for Infants and Toddlers

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Powered Mobility for Infants and Toddlers

Numerous research studies have been conducted about using power mobility with infants and young children. The information in this newsletter is based on the work of many researchers whose work is included in a Useful Reference list at the end of the newsletter. We hope you will explore the articles on this list to learn even more!!!

Powered mobility is no longer seen as a last resort for children who will never be able to walk. Although some parents may view it as a barrier to their child’s development of walking, professionals have come to view powered mobility as a viable option for those with mobility limitations. The sooner a child is able to get around without assistance, the more experiences they will gather while exploring their environment. It is important to consider powered mobility early on so that children with limited mobility are not hindered by their inability to navigate through the world, thereby creating secondary deficits. Despite the positive benefits, powered mobility has been reported as underused in children under 7 years old.

Why is mobility important for infants and toddlers?

When children begin creeping, crawling, and eventually walking, they gain ways to independently explore the environment. Exploration allows children to develop new skills and learn more about the world around them. However, not all children are able to move by themselves. Children with mobility limitations have been shown to also demonstrate limitations in cognition and attention, spatial awareness, visual perception and postural responses, and social and emotional development. In the realm of spatial awareness, children are reported to lack object permanence and are not appropriately wary of heights.
Why is Mobility Important for Infants and Toddlers? (Continued)

Children with limited mobility have also been shown to have low self-initiative and achievement motivation, effects that have also been reported in studies with typically developing infants whose locomotion was intermittently restricted. Limited mobility is also associated with limited use and understanding of nonverbal communication, a communication barrier with long lasting effects. Peers may see children with limited mobility as not able to fully participate in typical routines or activities. Typical children may learn to avoid children they perceive as non-participating, leading to exclusion in peer interactions. Assistive technology devices meant to aid in mobility should be introduced around the same time that typically developing children begin walking so as to help prevent these sometimes long-lasting effects of impaired mobility that begin in infancy.

Who Can Use Powered Mobility?

Because manual wheelchairs require children to use arm strength and coordination, hand grip, head and trunk control, and endurance compared to typically ambulatory children, powered mobility is an option that allows the opportunity for independence while saving the child’s energy for learning. In order for powered mobility to be a viable option for a child with limited mobility, the child must possess motivation and understanding (or the ability to learn to understand) of basic cause and effect, spatial relationships and problem solving concepts, attention. Physical ability to activate the device consistently and purposefully is also necessary. A child’s IQ and chronological age are not strong indicators of ability to use powered mobility. Children as young as 7 months and with IQs below 55 have successfully learned to use powered mobility devices, although it may take them more time and practice to gain competence. Modifications may be needed when children are young and are learning components of powered mobility. Modifications should be child-and goal-specific and can be permanent or temporary. Some examples are seating modifications, such as back cushions or head supports, and steering modifications, such as switches or a tennis ball over a device’s joystick to help a child grip. The chair should be programmed to allow for simple control, moving to more complex situations as the child demonstrates increased competency and interests.
Safety and Training Considerations

For children who have never been independently mobile before, a powered mobility device becomes their legs, so to speak. For this reason, the use of these devices should be encouraged and taught in a way similar to the way in which children are taught to walk; it is not like learning to drive a car. Children should use their own motivation and curiosity to learn through different routines and activities throughout the day. Adults should be responsive and encouraging and give children ample time to practice with the device. The process by which children learn to use powered mobility should contain some defining features: (a) active one-on-one instruction in which an interventionist coaches, models, and prompts age appropriate behaviors; (b) supplemental peer guidance in which the child interacts with other children and joins their activities; and (c) environmental modification in which the interventionist modifies the physical environment, provides time and opportunities for the child to work independently, and organizes specific activities to foster participation. One study showed that even without training, two infants drove more than half of the time they were in their powered mobility devices. Children want to explore!

When considering safety, children should learn to use their powered mobility devices in relatively small, familiar environments, with parents who understand the operation, usage, and risks of the device. The home should be conducive to the use of a powered mobility device, and the family should consent to any rules or guidelines set up by the child’s therapist for maximum safety. Stop switches or parental remote controls can be used to keep children safe. Force fields around joysticks have been shown to be useful safety equipment while helping children learn more quickly to use the joystick. Some devices can be equipped with infrared and sonar sensors to detect obstacles and help children navigate through tight spaces.

Types of Powered Devices

A powered mobility devices may be wheelchairs, ride on toys, or powered standing and sitting devices.

**Powered wheelchairs** allow the child to move independently through use of a joystick or other necessary modifications, such as switches, so that they may participate in daily activities and routines with peers and family members. Powered wheelchairs with larger wheels are available for rugged terrain such as sand on a beach, so that full participation is never out of reach.

Photo credit: http://www.independentliving.co.uk/otto/bock.html
Types of Powered Devices (Continued)

Ride on toys are much less expensive than traditional powered wheelchairs, relatively lightweight, and easily transportable. Because they are not mechanically complex, many modifications can be done at home. Postural modifications, like the green foam in the picture to the left, can be made and changed to fit the needs of children as goals and abilities change.

Photo credit: http://www.udel.edu/gobabygo/

Powered standers allow children to explore their environments in an upright position. Depending on a child’s musculature, the stander can have either prone, leaning slightly forward, or supine, leaning slightly backward, positioning. Activity trays can be attached to the front of the stander and modifications can be made to provide any necessary head and trunk support. Sit-to-stand powered standers, which can be sat in as a chair before raising into a standing position, are also manufactured.

Photo credit: http://quest.mda.org/article/stand
Activities and Routines

The use of powered mobility allows all children with limited mobility to participate in daily activities and routines with their family members and peers. Below are some examples of how powered mobility devices can be integrated into different activities and routines to foster independence and socialization.

<table>
<thead>
<tr>
<th>Morning Routine</th>
<th>Mealtimes</th>
<th>Indoor Play</th>
<th>Bedtime</th>
</tr>
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<tbody>
<tr>
<td>Allow your child to get ready as independently as possible, moving from room to room and only receiving help when needed.</td>
<td>Ask your child to take food from shelves or cabinets to help prepare a meal. Or have your child carry things from the kitchen to eating area.</td>
<td>Place your child’s favorite toy across the room and encourage him or her to move toward it.</td>
<td>Much like morning routine, have your child prepare for bed independently.</td>
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<tr>
<th>Outdoor Play</th>
<th>Storytime</th>
<th>Leaving the House</th>
<th>Family Outings</th>
<th>Chores</th>
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<tr>
<td>Find an accessible playground and have your child interact with other children.</td>
<td>Have your child go to the bookshelf and select which book to read.</td>
<td>Have your child get used to entering and exiting the home in their device.</td>
<td>Have your child explore new locations (museums, friends’ homes, etc) or get practice in operating the device at the mall.</td>
<td>After play, have the child pick up after themselves and learn where things belong.</td>
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Family and Child Outcomes

The use of powered mobility has been shown to benefit children’s perceptual, cognitive, motor, language, and social skills. Children formulate an identity as well as learn cause and effect relationships and how to use their arms and hands to direct themselves toward a goal. Increasing these skills inevitably leads to an increase in initiation, curiosity, exploration, and independence. By being mobile, a child can interact with peers in an inclusive environment.

Parents identify powered mobility as decreasing frustration and allowing more participation with extended family, two negative effects of mobility impairments on parents. Parents of immobile children report a serious concern with their child’s acceptance and interactions and the impact that their child’s immobility might have on others. Mothers surveyed reported varied reactions to the initial suggestion of powered mobility but overwhelmingly saw their child’s increased independence as a source of excitement, joy, and pride. One downside to powered mobility is that transportation of the heavy and large devices may be challenging. Additionally, special situations such as needing to redesign a home to make it easy to use powered mobility devices may be expensive.
Useful References


Please feel free to forward this newsletter to any individuals or agencies that may benefit from information on assistive technology.

Questions? Comments? Want to have the newsletter sent directly to your inbox? Email Livia at livia.fortunato@jefferson.edu