Pediatric Mobility

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Intro:

There are many aspects of our Industry that generate passion. It is difficult to find a topic that generates more passion, as well as different approaches and ideas, than Pediatric Mobility. Those challenged with the responsibility of recommending an appropriate system are often placed into a "Mission Impossible" scenario (cue the music). They are often meeting the child and family for the first time, must complete an assessment, discuss product, trial and script the recommended system, and then hope the changes the child encounters over the next 5 years or so can be accommodated through the prescribed system. All of this needs to be completed in a relatively short period of time - A difficult challenge at best.

Pediatric mobility is more than just a frame with wheels to get from here to there. A mobility system also includes a seating system. The seating system and the mobility base work together to provide not only mobility, but postural support, postural stability, arm and hand function, visual line-of-sight for interaction with the environment and others, even positioning for feeding and swallowing skills, in short – work together to support function. The correct seating system and wheelchair configuration can even influence or help manage muscle tone, and prevent or retard the development of postural asymmetries as the child grows and develops.

Debates within the topic of pediatric mobility include the type of seating to be used, positioning requirements of the child, stroller v/s wheelchair, front (reverse configuration) v/s rear (standard configuration) wheel positioning, crash tested (transport ready) v/s traditional configurations, how much growth to accommodate into the system, and the old standard topic that almost always generates discussion, manual v/s power mobility choices.

Regardless of the debate or approach / system recommended, goals and objectives for both the child and the family or caregivers must be met with an appropriate choice, and correct set-up. One of the most important objectives that take precedence over many others, as well as being co-dependent on others being achieved, is FUNCTION. Any pediatric mobility system that looks good, is measured properly, but does not allow, create, or enhance function, may not have achieved all necessary objectives.

Assessment

If this is the first assessment for mobility a child and family is receiving, taking that extra time to get to know the parents and child, as well as letting the family get to know & begin to feel comfortable with the assessment team can prove invaluable. Just as comfort is a critical component of any final mobility system, so is comfort a critical component of the assessment process. It easy to get excited about all the wonderful technology recently developed that impacts pediatric mobility. What can take a back seat in this process are the emotions, concerns, and thoughts of the child and family in the course of this process - especially when it is the first time. Taking that extra time can make this discovery process more beneficial for all.

Following referral, the assessment for pediatric mobility begins prior to meeting the child and family with a review of records, and interview or discussion with the physician or team initiating the referral. This is a good opportunity to begin to understand current requirements, team goals, as well as past successes & frustrations regarding mobility interventions. Future interventions (surgeries, medication trials, etc…) can be learned at this time.

Following referral, and review of records, all good assessments proceed with a thorough interview to learn current requirements and expectations, as well as develop a list of anticipated needs. This interview needs to include not only the child, family and caregivers, but also any current intervening professionals (i.e., school therapists, teachers, etc…) involved with the care of the child.

A thorough postural and skills assessment is required to determine seating and positioning needs. Simulation of these interventions is extremely helpful and most times required in the course of the assessment. The most perfect mobility base for a child can be rendered almost useless without the correct seating and positioning components.

Following this physical evaluation, individual goals and objectives can be discovered, product parameters simulated, options determined, and the final system can be recommended and prescribed. The work however is only half done. Set-up of the final configuration, and training the family and child in the use of the final system, and follow-up on completion can take more time than the assessment process itself and is often the forgotten aspect of this process.

Early Intervention: Strollers v/s Manual chairs

The first choice for a mobility base, especially for the child under three years of age, can be a difficult choice. A decision between stroller or wheelchair needs to be made by the child's parents or caregivers. The assessment team needs to guide this process with sound recommendations. Infants, and some very young toddlers, often benefit from the use of adaptive strollers as a first mobility base. Strollers used to be the obvious and only choice for these children, and the most easily accepted by parents. The variety of designs and options available has multiplied over the past decade. The ability and need for these systems to accept seating and positioning components has been recognized and addressed over the years by different manufacturers.

When discussing the advantages of strollers, it is generally agreed they are more acceptable for many parents. Strollers can be more portable, and less expensive than a wheelchair. Flexibility in the design of today's strollers has improved nearly at the same pace as the flexibility designed into pediatric wheelchairs. The benefits of sitting in an upright position, allowing postural stability to provide the opportunity to develop motor skills and achieve functional goals can be provided with some systems for some children. There are stroller designs that provide for, or can be adapted to provide for some adaptive seating needs.

When discussing the disadvantages of strollers, growth needs to be addressed. The ability to accommodate growth needs with an adaptive stroller is limited and usually restricted to modifying the seating. Use of some adaptive strollers in a school setting do not allow the child to be at the same level of his friends and peers. Often compromised in the selection of a stroller is the opportunity for and benefits of independent mobility. The potential for, and anticipated potential for independent propulsion needs to be considered.

Although an appropriate choice for some, recommendation of an adaptive stroller is not for all. This needs to be based on the needs and anticipated needs of the child and family or caregivers, the age of the child, and functional level.

Manual Chairs

The Pediatric Manual wheelchairs of today offer many advantages over their predecessors. In addition to the way they accommodate growth, they have improved in many other ways.

Many manual wheelchairs offer axle placement choices or center of gravity adjustment to be able to set up the chair with the wheel in the best position for propulsion. Propulsion is easiest with long pushes on the handrims rather than many short pushes to cover the same distance. An ideal starting point for a rear wheel (standard configuration) chair is to position the axle under the pelvis. (HoSoPoA: Head over Shoulders over Pelvis over Axle). Wheels positioned rearward from this point do offer more stability, but can make the wheels more difficult to propel, even encouraging poor postures at times to achieve a good stroke on the handrims. Placing a small amount of camber in the rear wheels benefits many pediatric users by not only making the chair more stable and responsive, but also easier to push by bringing the top of the wheels closer to the user.

Some manual pediatric wheelchairs offer “reverse configuration”, or placement of the large wheels in the front of the chair with the casters in the rear. This configuration often benefits very small children by placing the top of the handrim very close to their hands for easy reach. When the child grows and can better benefit from a standard configuration, these systems can be changed, sometimes without additional parts.

A feature in many pediatric manual chairs is the ability to change rear wheel size without changing the important seat to floor height. As a general rule, the larger the wheel for propulsion, the easier it is to propel.

Growth

Pediatric Mobility systems that effectively meet today’s needs may not necessarily meet the needs of that same child tomorrow. The fact is that children grow. Depending on the disability and age level, some sooner and faster than others. A child with Spina Biffida or Osteogenisis Imperfecta for example may require less frequent growth adjustments in a mobility base than a child with Cerebral Palsy.

There needs to be a balance between achieving the objectives of today with the anticipated objectives of tomorrow. Children with a disability also demonstrate changes in orthopedic status, neuro-muscular status, respiratory status, developmental skill level, and even feeding / swallowing abilities. Effective planning during the prescription phase of a mobility system requires knowledge of these areas in order to best anticipate the needs of tomorrow.

Many manufacturers accommodate this need for change by building flexibility into pediatric mobility systems. The fact that a wheelchair is available in a small size does not necessarily make it a pediatric system. In order to qualify for a pediatric system, it needs to meet the changing needs of the pediatric user.

Accommodating change in height is usually considered the most important aspect of growth in a wheelchair, power or manual. Most children grow taller much faster than they grow wider. Increased seat depth can accommodate for growth in height. The most efficient mobility bases accommodate this growth by either moving the back canes rearward along the base, or by adding length to the front of the system. The best way to add length to the front of a system is to change the seat rails and front one half of the chair to make it longer. Most pediatric systems that achieve growth through either of these methods also allow repositioning of the rear wheel for most efficient propulsion. Either method for growth gives the best opportunity to keep the front casters and footrests, as well as center of gravity in an ideal location for the child.

Less desirable is to add length to a wheelchair seat by making the seat longer while not changing the base. This often does not place the wheels in the most ideal location for propulsion, does not allow the foot rests to be moved to accommodate growth, and can make the chair more difficult to propel by placing too much weight over the front casters (front loading). There are times however when this is the only method available.

Back height also needs adjustment to accommodate growth in height. The ideal back height for a child is one that provides adequate postural support while not interfering with upper extremity motion and function. Adjustable back heights, achieved either through the seating system or the mobility base are especially essential for those using anterior chest supports as part of their seating system. The top strap of the chest support best helps posture when it is positioned perpendicular to the top of the shoulder.

Changes in width are usually needed less frequent than changers in depth, but need to be considered in the prescription process. Most Pediatric Power chairs are growth friendly and allow width to be changed by either telescoping the sides out, or replacing cross members between the side frames. Folding Pediatric manual chairs are usually grown in width by replacing the crossbraces under the chair. Often overlooked when growing chairs in width is foot placement. Footplates often need to be changed with a wider set in this process.

A good rule of thumb is to check a system for growth needs every 6 months. Very young children requiring early intervention may require more frequent checks, and some children less frequent. This is only a rule of thumb.

Manual v/s Power

It was not all that long ago that power mobility was not considered appropriate for any children under the age of seven. Fortunately for children, this thought process has changed dramatically over the years.

It is well documented that vestibular stimulation and interaction with the environment are necessary for development. Children with disabilities are often deprived of these opportunities. Children as young as 18 months old can be appropriate for, and have able to demonstrate, independent operation of a power wheelchair. Just as an 18 month child is not able to walk wherever they want unsupervised, neither do they drive wherever they want unsupervised, but they can get there without assistance.

Children, when first given the opportunity to control or drive a power chair, often begin by spinning in circles. For many, this is the first opportunity some have ever had to be independently mobile. Spinning for many children is just plain fun. Soon they learn how to stop spinning, then spin in the other direction, then spin back and forth, then go forwards, etc… For a youngster, learning to drive a power wheelchair is not all that dissimilar to a toddler learning how to walk – one step at a time.

Children who quickly learn to release the driver control (joystick or switch) when the chair is going somewhere they don't want to go (into an obstacle) generally learn rather quickly to independently operate the power wheelchair. Children who take a while to learn this skill usually take longer to learn to operate the chair, but many do learn.

Seating systems for pediatric power chairs are available as small as 10" wide by 10" deep. These can be made even smaller through adaptive seating. Advances in power wheelchair electronics make it possible for individuals with very little or only very localized physical control to independently operate a power chair. There are a variety of controls and switches available for use with nearly any part of the body a child can control. Through additional components, these same controls on the power wheelchair can also be used to operate communication devices, environmental controls, and even computers if required.

Advances in the software of power wheelchair electronics can allow independence and promote increased safety and control through enhanced programming capabilities. Programming can adjust not only speed and other performance parameters, but also modify how quickly the chair will respond to driver commands, and even at which point the chair will stall when encountering an obstacle such as a wall or a desk.

The most recent advances in power mobility allow True Tracking capabilities, or the ability for the chair to stay true to the driver's command and not veer off course, regardless of the terrain or obstacles encountered. This capability most impacts those individuals driving a wheelchair with switches (non-proportional controls), and those joystick drivers who are considered "marginal", or able to operate a joystick to drive a wheelchair, but with some difficulty.

In summary, those who are successful in recommending and setting up or configuring pediatric mobility systems are able to look at a very large picture, address many issues, and stay current with technologies and systems available. Pediatric mobility systems do much more than get somebody from here to there. Pediatric mobility systems must also include an appropriate seating system as well. The most successful systems are flexible enough to address today's needs today, and still accommodate those needs anticipated tomorrow.

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