Configuring Powered Mobility Systems for the First Time User
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We will share how to configure powered mobility systems for individual first time users who have never had experience with independent mobility. Frequently, these are very young children or much older children who are challenged with complex bodies, are non-speaking, non-ambulatory, and may have many visual, auditory and/or sensory processing issues. These configurations are critical to the individual being able to learn and to become competent in the use of powered mobility. The configurations will change as the individual becomes more experienced. The day of delivery is NOT the day of a final configuration, but rather it is the day of an INITIAL configuration, which will change, and must change as the individual’s experience expands.

These configurations include:
1. The actual physical configurations of the chair including all its physical components;
2. The programming the electronics
3. The configuration of a seating system which will support access to the environment
4. Learning/training strategies which really work.

As equipment for seating, access, and mobility is prescribed and subsequently implemented, frequently problems ensue when: 1) the chair is configured in its “standard” shipping mode or for an individual already competent in driving; 2) seating has been designed only to manage the body, rather than assist an individual in control of the body, 3) the individual’s ability to process sensory-motor information is disregarded, 4). methods of access are presented or expected to function in a particular way, 5). the chair’s electronics are inadequately or incorrectly programmed, and 6). driving skills are inadequately or incorrectly “taught” or supported.

To assist individuals in developing competency with powered mobility, these issues must be understood, acknowledged and configurations changed. Individuals who are in their powered systems for the first time are not going to demonstrate the skills they will develop over time. The configurations of their systems need to reflect this.

With the current programmable electronics, it is critical that their programming support “first time” use and then change when “skills and competence develop.” Programming should also be reflective of the environments being learned, as well as the access type being utilized. Joystick driving's programming is very different than head array driving. We must recognize not just indoor and outdoor driving, but also levels of experience in managing and learning environments, and their accessibilities.

We will share specific configurations, and programming which works. We have both been supporting independence in powered mobility for over 20 years, and this knowledge of real experience has been honed by the individuals we have served. It is
their input, their environments, and their use of systems and their experiences of success and failure that have created these configurations. This course will focus on seating, access, and mobility as they directly relate to functional independence and the continued development of competence.

**The Physical Configuration of the Chair needed.**

In order to support learning mobility, not driving, the physical configuration of the chair must support independent control and mobility. The configuration must suit and be planned to work for both the child and the trainer.

**For the Trainer:**

The **visual display** needs to be mounted in the rear of the chair and within an easy viewing of the trainer. The trainer must know the programmability of the chair, and its current "modes." The child will not and should not be expected to manage a chair before she has even experienced making it go where she wants. The visual display should not be sticking out, nor sticking up and high. It should be mounted stably and as a part of the chair in the rear.

The **switch controller interface** must also be mounted initially in the rear for the trainer's access; NOT hidden. When training a first time user, the switch interface can be turned off, to pause and reflect, rather than turning the whole system off. The trainer must be able to easily turn on the chair, and the switches, so that the child's initial and immediate experience is control of moving the chair, not “turning the chair on or waiting.”

The **chair's On/off switch** is initially controlled by the trainer. Even the reverse switch of the chair may need to be initially controlled by the trainer. Why? The child must experience movement, and control of the chair within a familiar environment. From that experience, the child will develop increased desire, attention, and competence to extend her learning to include management of the chair and the activity.

Unless a **tray** is being used to hold switches/sensors, the tray should be off. No parts of the chair should be “hanging,” “loose” or “sticking out.” When a child is learning they should be able to see their entire body and its relationship to the environment.

If a **communication device** is used, it should NOT be mounted, initially, when child is learning to become mobile.

The trainer needs to know how to STOP the chair by turning it off, and/or by turning the switch interface off, and by dis-engaging the chair and using “free wheeling.”

An **attendant control or “emergency stop” switch**, should NOT be used initially. These are only important when exploring new environments after a child has experience, and the adult needs to be able to manage the chair itself for a long distance (or on a ramp) or cannot be nearby.

**The Programming of the Chair required.**

Every powered chair should have its remote programmer with it. Programming is NOT the venue of the RTS, but rather for the trainers and adults working with the child. With children and first time users, programming will change, and change considerably, back and forth as experience is gained and new environments explored.

**Standby and standby modes** should not be programmed or used when a child is first learning mobility. These modes are not needed, and constantly interfere with the child's understanding of the consistency of actions of the chair.
**No seat functions** should be programmed on, nor should **re-set** be programmed. The chair should simply drive, drive slowly, and stop. There should be no menu to follow, no waiting to occur, except for the turning on/off and set up by the trainer.

The **speed** needs to be set very slowly, imitating the speed of an initial stepping toddler. This speed should also be slow enough that the child can hold themselves steady within the chair. However, the chair still needs to perform, so **torque or the power level** needs to be adjusted to allow the chair to move efficiently over carpeting, or door sills.

**Speed and turning deceleration and acceleration** must be adequately programmed. There are always “delays” built into systems for joysticks, but this causes an unanticipated delay or a drifting of the chair when using switches. When programming for switch access, the reactions should be immediate with no delays. Acceleration and deceleration are only needed when the child can manage increased speeds and multiple environments.

Initial work is indoors. When going outdoors, re-program the chair at that time, and alter it if needed. However, keep the indoor changes consistent.

**The Configuration of a Seating System to support access to the environment.**

Seating for task performance is the foundation for independent control of the chair. This is seating which does not control tone, nor is it the seating needed for safe, passive transport. This is seating which allows the child to manage her own body, use tone, and allows for pelvic mobility (true stability). This seating is often radically different than the seating needed by the child for the child to be managed. Now, the child is to manage herself.

This may often require the armrests to be removed, the legrests to be removed, the chest supports to be removed, and the seat and back angles may need to be radically altered to support a more upright, yet forward posture. Positions of task performance are critical in independent control. These are positions of pelvic weight bearing, and support. Using seating which has controlled the child, is not going to support the child in controlling herself.

A child should get close to objects, be near to walls, not in the middle of the hall, as mobility is approach, not driving on a road, but rather exploring an environment.

The training session must be short, and as the child’s own patterns of independent control are observed, the seating can be increasingly supportive of independent control.

Digital (single switches) control of the chair, particularly with head switches can be considered a starting point, instead of proportional control (joystick) with a hand. Most children who are considered to have complex needs, have difficulty with tone management or motor coordination. A joystick can make a chair move, but controlling it is another completely different scenario. Managing both speed and direction can confuse a young child, or a child who has never experienced mobility. Using digital control, a switch always and only performs one task, and it is always consistent and reliable. This allows a child to quickly and automatically expect the switch to perform a particular way, allowing the child to develop a natural expectation of the activity.

Switch placement must allow immediate success and control. Zero pressure switches are critical here, as the child must only control his range of motion, and not
have to coordinate that range with strength. Managing range and strength (or coordination) is already difficult, and can be eliminated with initial training strategies. Success and control, especially control of stop, happens naturally with children when real independence is available. This allows the foundation of safe management of the chair as competence increases with experience.

Attendant control should never be used to manage a chair while a child is learning. Attendant control is for management of the chair when the child is not in the chair. When the child is either headed for trouble, or the adult is anxious about the chair and child's location, the adult trainer needs to turn the chair off, and disengage the chair, move the chair, explain to the child why this activity was stopped. Then, the trainer can start the chair up again, giving the child an experience of time and understanding as to how the difficulty arose. Crashes should not be experienced, the trainer is there to prevent them. Safety is the responsibility of the adult trainer, as the child is learning to "walk." We certainly do not allow toddlers to run out in the street, and we do not expect them to not run out after we tell them once. We remain with toddlers all the time, expecting them to not know rules, to learn to manage their bodies as they learn and experience activity. This same method of support and supervision must occur for powered mobility training.

**How the child will learn.**

Using new equipment which will allow children who have never been mobile in any way, (and certainly not ambulatory), in short, who are very inexperienced with mobility, require completely different training strategies to be successful.

We must teach mobility first, encouraging independent control, before "driving skills" can be taught. We must work within familiar environments for initial mobility, not large parking lots and gymnasiums, or wide hallways, which are completely unfamiliar to the child. We must program and set up the equipment to allow the child to safely explore and learn the use of the equipment in direct control of the environments within which they live and learn.

Instead, we create a "driving environment" as if we were teaching children to drive an automobile, we overly control the situation, constantly demanding the child to listen and obey our commands. This method of learning may be helpful when a machine like a car is being taught to be responsibly managed, but it is certainly not helpful when attempting to teach a child to "walk" and for children with complex needs, "walking" and "mobility" is what they need to learn, not driving.

All children (and adults) learn motor control and postural control through the development of routines. All learning has sensory motor components, and so far, we have paid far too much attention to the motor components, ignoring the sensory integration required to act, and repeat an act. All human beings, not just children, learn by process. This process becomes a routine which is an activity which can be anticipated. The anticipation is the ability to know what will be required to perform the activity, and the knowledge of the beginning, the middle, and the end of the activity. To develop routines, practice which is moderately novel must occur.

Increasing the frequency of the activity, rather than the duration, is how routines develop. Allow the activity to not be managed by an arbitrary longer length of time expecting endurance, but rather allow the activity to be repeated, ended, and eventually expanded.
React to the child’s actions, rather than directing the child. If we directed all toddlers as they began to move, they would stop moving. Instead, we naturally support them emotionally. If they stop moving, we presume they intended to stop. So, also, must we support children who are developing experience with powered mobility. React to them, keep them safe, presume every action was intentional. When the chair and its programming and configuration are set up adequately, these actions of the child will be obvious, and under her control. Independence will be evident, although at first, fragile, in that it is not of a long duration, nor always able to be reproduced. However, if the child's actions are not obvious, and appear to be confused, or erratic or inconsistent, then, the chair is inadequately programmed, or the seating has been inadequately conceived.

When will real success and real independence be achieved. It is surprising how children with complex needs must meet expectations higher than ever expected of children with simple needs. Can any child's skills be predicted or anticipated? Can any adult's? No. Only an environment of support and curiosity can be provided to allow a child to demonstrate interest, and competence. Will every child who is in a powered chair be able to manage every unfamiliar environment efficiently? No, but then no child of any age, nor any adult of any age can manage every unfamiliar environment efficiently. However, all of us are able to demonstrate adequate and functional independent control as our personalities and experience and desire allow. Children with complex needs are no different. Some will learn quickly, and learn a lot, some will learn quickly, but only perform in some situations. All will demonstrate independent actions, and control in some environments. We can both tell you that, because it happens with the children we work with, every day, in all situations.

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