

## **REASON FOR REFERRAL**

Patient was referred for wheelchair clinic.

A comprehensive wheelchair evaluation was requested at this time.

## **EVALUATION AND TREATMENT PRECAUTIONS**

No precautions were indicated per physician referral.

## **PERTINENT INFORMATION**

Information was obtained from caregiver report, chart review, and patient report.

Patient is an almost 6 year old boy who presents to this comprehensive wheelchair clinic assessment with his mother (father and brother also present at subsequent power trial session). Patient currently does not have a wheelchair and is carried by caregivers for mobility. He can crawl for limited functional mobility within the home. Patient also has a posterior walker which is difficult and non-functional for him to use. He experiences frequent falls and requires a helmet for protection when attempting to ambulate. Patient attends *SCHOOL NAME* where he is in entering the 1<sup>st</sup> grade (last year used wagon for mobility requiring caregiver assistance). He receives occupational and physical therapy in school as well as outpatient physical therapy 1x/week at *FACILITY NAME*. Outpatient PT has noted decline in function with progressing ataxia which is limiting Patient's ability to be safe and independent with functional mobility. Due to the progressive nature of his disease, the family is here to discuss power mobility for Patient – as was recommended by his outpatient therapist and discussed by his rehab physician as well. Family lives in a 1 story home with a basement. There are currently 4 steps to enter the home, and the family is looking into accessibility options including ramp access (given info on portable ramps today).

## **SUMMARY AND IMPRESSIONS**

Patient is an adorable 5 year, 11 month old boy with a progressive neuromuscular disorder. He is cognitively intact (extremely bright), and is being severely limited by his muscle weakness, ataxia, and medical condition. He can neither stand nor ambulate safely, independently, and functionally and is at a high risk for falling (falls frequently throughout the day when attempting to stand/ambulate). Also, Patient will have continual decline in function and progressing ataxia making him unlikely to ambulate at all in the future due to the progressive nature of his disease. A trial in an ultra-lightweight manual wheelchair was done and proved to be unsuccessful due to Patient's ataxia and decreased endurance. He is unable to functionally propel any type of manual wheelchair (including power assist wheels). He is dependent on power mobility for independent, safe functional mobility. Muscle fatigue will negatively affect his disease progression, and should be avoided at all costs. Having access to power mobility will allow Patient to independently participate in age appropriate activities with his able bodied peers. Early power mobility has been shown to promote cognitive development, psycho-social development, reduce learned helplessness, and improve overall quality of life. Patient clearly has a desire to move independently, and is currently dependent on caregivers for safe, functional mobility due to his medical condition. He is very bright, and has demonstrated the ability to use power mobility with age appropriate supervision during two trial sessions.

### **Therapeutic Problem List**

This assessment revealed the following problems:

1. Non-functional, unsafe ambulation requiring wheelchair for functional mobility.

2. Decreased strength and endurance with significant ataxia in all four extremities requiring power wheelchair for independence with functional mobility – unable to self propel any type of manual wheelchair functionally.
3. Progressive neuromuscular disease requiring power mobility and power tilt function for independence with mobility and to increase time tolerated in wheelchair as well as allowing gravity assisted positioning and decreased muscle demand for trunk stability. Also required for safety due to seizures.
4. Patient currently is being carried by his caregivers (which is neither safe nor age appropriate) for functional mobility.

### **Patient and Family Education**

Family verbalized and demonstrated knowledge and understanding of the condition and the family's role in maximizing functional independence.

Written and/or verbal education was provided to the family concerning adaptive seating and power mobility.

Family verbalized understanding of education provided.

### **RECOMMENDATIONS AND PLAN**

#### **K300 PS Junior Power Wheelchair**

The K300 is a compact front wheel drive wheelchair base with programmable electronics. It has an adjustable suspension and quiet, powerful motors. It has large front and rear casters for excellent ride and maneuverability both indoors and outdoors. It supports a variety of driving controls to meet individual needs. The PS Jr. is a durable, adjustable tubular seat frame with 1" tube diameter to accommodate other aftermarket seating. The frame is inherently growable in width from 11-16" and depth from 10-18" so that it can be customized and adapted to client needs. Its design includes height and rotationally adjustable armrests as well as the Uni-track system for lateral supports and other accessories, making the system extensively customizable.

#### **Front Wheel Drive**

Front wheel drive has many unique benefits:

- Maneuverability - Front wheel drive wheelchairs have a very small turning radius.
- Intuitive driving - in contrast to rear wheel drive chairs, front wheel drive configurations are very intuitive to drive, especially for the first time driver. When turning around an obstacle (such as a corner), you pull up close to it as opposed to taking a wide swing around it.
- Curb climbing - because the drive wheels are in the front, they pull the weight instead of pushing it. In combination with good traction on the drive wheels, it enables better curb or threshold climbing and negotiation of soft terrain, such as grass or gravel.
- Smooth drive - because of the obstacle climbing capabilities, the ride will be much smoother, which enhances CLIENT tolerance to driving. This provides prolonged sitting and driving tolerance". A smoother ride also reduces tone and helps reduce startle reflexes, thereby enhancing function.
- Accommodation of knee flexion contractures - due to the lack of casters spinning on the front, knee flexion contractures and tight hamstrings can easily be accommodated without the need to raise the seat to floor height.

### **Suspension**

This wheelchair comes standard with an improved shock absorbing system to decrease jolts and bumps when driven over uneven terrain such as grass or gravel. This will help to maintain sitting balance and maintain contact with the controller to safely drive the wheelchair. Suspension allows all four wheels to remain on the ground and also absorbs jolts from the terrain that can cause pain and increased pressure or shearing to the wheelchair user due to increased movement. The smoother driving is less likely to trigger abnormal reflexes or spasms, making sitting tolerance, posture, and driving better. This system will also decrease wear and tear on the wheelchair frame.

### **Power Tilt**

Power tilt allows independent orientation in space and has multiple medical and functional benefits:

- Provides powered orientation in space, 30 or 45 degrees
- Compensates for limited trunk stability
- Allows independent orientation change
- Reduces shear along back and seat, especially when used in conjunction with recline
- Maintains proper position in relation to AAC devices, computer
- Allows for safer negotiation of inclines
- Improves respiration and digestion
- Slows inevitable progression of neurologically based spinal deformity
- Provides some control of edema (best when used with elevating legrests)
- Inhibits triggering of abnormal tone or reflexes

### **Power Adjustable Seat Height**

The power adjustable seat height allows vertical adjustment of the seat height by the wheelchair user. Elevation increases reach and allows more independence. It facilitates lateral transfers by allowing a level transfer or transfer from a higher to lower surface, which is gravity-assisted. It also facilitates forward transfer by allowing legs, hips to be more extended, thereby lessening the strain for the user to perform a stand-pivot transfer. Moving/driving while elevated allows better eye contact and allows better positioning for reaching, which can lead to independence in many activities, such as eating, cooking, and hand washing. Vertical rise has psychosocial benefit of eye-to-eye contact, and further benefits the user by reducing neck strain. Medications can be kept out of reach of children but remain accessible.

### **Multiple Seat Function Control Kit**

The Multiple Seat Function Control Kit describes the electronic components that allow the user to control two or more of the following actuators from a single interface (e.g., proportional joystick, touchpad, or non-proportional interface): power wheelchair drive, power tilt, power recline, power shear reduction, power leg elevation, power seat elevation, power standing. It includes a function selection switch which allows the user to

select the motor that is being controlled and an indicator feature to visually show which function has been selected. This feature is contained both in a separate membrane switch box and integrated into the wheelchair drive interface.

### **Compact Advanced Joystick for R-net**

The Compact Advanced Joystick for R-net is a proportional upgraded joystick that is separate from the controller box. The programmable electronics have separate drives and switch options available to safely meet different access, environmental, and terrain needs. The joystick is more compact and can be placed closer to the frame and may also be placed in multiple locations for better hand access. The joystick may also be turned for optimal access to the buttons. This feature has the potential to make the overall profile of the wheelchair smaller for maneuvering. When using multiple power options or alternative drive controls, this type of upgraded joystick is needed along with the expandable controller.

### **Swing-Away Joystick Mount**

A swing away joystick mount allows the joystick to be swung in or out at any angle to allow closer access to tables and counters. It also can facilitate forward transfer by safely moving out to the side. The joystick can also be placed at any angle for better hand access.

### **Expandable Controller with Harness**

The expandable controller is the power module located in the base of the chair that allows the input device to communicate with the drive motors and gear box. The expandable controller is needed for multiple power options on a base as a non-expandable controller (in the form of an integrated joystick and controller) will not accommodate these features. An expandable controller is used in conjunction with an upgraded joystick (Pilot + or R-net). An expandable controller is also required when any alternate drive controls are being used on a power wheelchair. With R-net, the expandable controller can accommodate up to six different types of drive inputs.

### **Angle Adjustable Back Canes**

The angle adjustable back canes allow back/hip angle adjustment from 85 to 115 degrees. This allows the hip angle to be set to a more comfortable position to accommodate hip contractures, provide better trunk or head stability, and increase respiratory capacity.

### **Miniflex Seat Cushion**

The Miniflex seat cushion provides a comfortable seating surface for pediatric chair users.

### **Bodypoint Padded Hip Belt**

The padded hip belt provides safety, and its additional comfort will make it more likely to be used.

### **Headrest, Adjustable/Removable**

A contoured adjustable angle headrest is medically necessary to provide posterior and lateral support to the cervical spine and head. This headrest is used for positioning and head control and comes with the necessary hardware to mount the headrest pad to the wheelchair backrest.

### **Headrest, Removable Hardware**

Adjustable hardware is required so that the headrest is properly placed to provide optimal support to CLIENT's head and cervical spine. This headrest is also removable for ease of transfers in and out of the wheelchair and to reduce the wheelchair's overall height when traveling.

### **Lateral Supports, Swing-Away**

Thoracic lateral supports are curved, removable, height adjustable trunk supports for the Ergo back. These are necessary to provide lateral support to the trunk and spine, which will promote midline positioning and prevent falling or leaning to either side. They are needed to support and limit a weak trunk by providing aggressive support to sit in a functional upright position. They also assist in reducing or preventing spinal deformity and are mounted on removable, swingaway hardware for ease of transfers.

### **Thigh Supports**

Thigh or hip supports are multi-position, angle adjustable pads on removable hardware. These pads can be placed at the hips or anywhere along the length of the thigh to align the legs due to high or low tone or windswept deformity, or to prevent excessive abduction and external rotation of the hips, which can contribute to hip dislocation.

## **ASSESSMENT RESULTS**

### **Report of Symptoms**

No pain was reported during evaluation.

### **Medical History**

History of present condition: Progressive Neuromuscular Disease, Ataxia  
Past Medical History: MRI, CT Scan, Developmental Delay, Seizures  
Physicians/clinics involved in care: Dr. \_\_\_\_\_ (Neurology), Dr. \_\_\_\_\_ (Pediatric Rehabilitation), Dr. \_\_\_\_\_ (Primary Care)  
See medical record for complete medical history.

### **Range of Motion**

Upper extremity passive range of motion: grossly within functional limits (passively)  
Lower extremity passive range of motion: grossly within functional limits (passively) except tightness noted in bilateral Hamstrings (popliteal angle 45 degrees bilaterally) and Heel Cords (R1 -35 degrees; R2 +15 degrees bilaterally)  
Trunk range of motion: at risk for scoliosis – tends to sit with rounded posture (kyphotic) and posterior pelvic tilt. Elevated scapula on the right with questionable spinal rotation.

### **Strength**

Strength was significantly limited throughout trunk and extremities.

### **Muscle Tone**

Muscle tone was increased throughout. (+) ataxia, (+) clonus in bilateral gastroc/soleus, (+) spasticity in bilateral quadriceps

### **Endurance**

Muscle fatigue was present throughout, and noted to be significant.

Endurance was poor - significantly limits activities of daily living and frequent rest breaks are required.

Tolerance to upright was normal in sitting.

**Sensation**

Sensation appeared to be grossly intact – difficulty achieving adequate pressure relief noted and is expected to worsen as disease progresses.

**Functional Skills**

Head control: within functional limits

Upper extremity function: unable to propel any type of manual chair functionally, unable to perform adequate pressure relief movements, and limited to accessory power controls, significant ataxia (requires tremor dampening in the programmable electronics of the power wheelchair)

Trunk control and sitting balance: sat with support, and showed inadequate balance reactions in sitting

Lower extremity function: non-functional, unsafe ambulation with frequent falls and progressive loss of lower extremity function

Transfers: with assistance required or dependently lifted

Cognitive function/behavior: alert, age appropriate cognitive skills, and adequate for safe use of recommended equipment as evidenced by trial sessions.

\_\_\_\_\_  
Physician Name

\_\_\_\_\_  
Therapist Name

Date Signed: \_\_\_\_\_

Date Signed: \_\_\_\_\_