

REASON FOR REFERRAL

Patient was referred for a comprehensive wheelchair evaluation.

EVALUATION AND TREATMENT PRECAUTIONS

No precautions were indicated per physician referral.

PERTINENT INFORMATION

Information was obtained from patient report, chart review, and caregiver report. *PATIENT NAME* is 30 year old young woman who presents to this assessment with her husband who is her primary caregiver. *PATIENT NAME* currently does not own any type of mobility equipment and is using a borrowed power wheelchair while receiving inpatient rehabilitation services. *PATIENT NAME* is a college graduate and worked as a computer programmer prior to her injury. *PATIENT NAME* hopes to continue working in this capacity and would like to be as independent as possible. She is an extremely active young lady who enjoys playing and watching sports, attending blue grass festivals, and other community activities. *PATIENT NAME* also is active in her church community. *PATIENT NAME* is desperately in need of a power wheelchair with multiple power seat functions to improve her overall independence and sitting tolerance. *PATIENT NAME* is adapting her home to allow access for a power wheelchair and her family is looking into accessible vehicle options for transportation. *PATIENT NAME* has chosen to work with *DME SUPPLIER NAME* for her equipment needs.

SUMMARY AND IMPRESSIONS

PATIENT NAME is an extremely bright 30 year old young woman who is currently being limited functionally by her lack of mobility due to a diving accident resulting in C5 complete tetraplegia (spinal cord injury). Without power mobility, *PATIENT NAME* would be unable to participate independently in any functional activities and would be bed or chair confined. *PATIENT NAME* is completely non-ambulatory and is unable to functionally propel any type of manual wheelchair nor use a power scooter. She has demonstrated safe use of a power wheelchair during her rehab stay, and her operational skills are not in question. She requires multiple power seat functions (tilt/recline/elevating legrests/adjustable seat height) to promote independence, improve sitting tolerance, provide range of motion, and reduce the risk of skin breakdown. Please refer to RESNA's position on these power seat functions in the following documents:
http://www.rstce.pitt.edu/RSTCE_Resources/Resna_Position_on_Tilt_Recline_Elevat_Legrest.pdf
http://www.rstce.pitt.edu/RSTCE_Resources/Resna_position_on_seat%20elevation.pdf

Therapeutic Problem List

This assessment revealed the following problems:

1. Non-ambulatory requiring wheelchair for functional mobility.
2. Unable to functionally propel any type of manual wheelchair or power scooter due to decreased endurance, strength, and muscle fatigue requiring power mobility for independence.
3. Abnormal tone requiring drive wheel suspension in the wheelchair base to reduce risk of eliciting spasms.
4. Abnormal posture requiring adaptive seating system and power seat functions for appropriate positioning.
5. Absent sensation below level of lesion increasing risk for skin breakdown.

Patient and Family Education

Patient and 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 patient and family concerning power mobility, power seat functions and funding options.

Family verbalized understanding of education provided.

RECOMMENDATIONS AND PLAN

C500 RS (Rehab System) Power Wheelchair Base

The C500 is a powerful front wheel drive wheelchair base with rugged dual independent suspension and programmable electronics. It is made to handle well in indoor and rugged outdoor terrain. The C500 can support a variety of seating systems, power seat functions, and alternate driving controls to meet the individual needs of CLIENT, and it is easily adapted for growth, changes in medical needs and pressure relief, and for alternative driving access.

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.

The RS (Rehab System) is a complete powered seating system with full recline, power tilt (15° anterior/60° posterior), full elevating legrests, and 10" vertical seat elevation. The system also offers 3 options for memory seat positions to assist with positioning for functional activities such as catheterization/toileting in the wheelchair, transferring in/out of the wheelchair, access under tables or vehicle console for driving, and also reduces the risk of skin breakdown by allowing the user to achieve the appropriate position for pressure relief movements (as prescribed by the medical team). Furthermore, the RS seating system offers maximum built-in adjustability in seat sizing to accommodate growth in both width and depth. The VertiFlex backrest offers tremendous flexibility in the individually adjustable elements. These elements can be adjusted to properly support an individual's postural deformities such as kyphosis and also can allow for rotational flexibility in the backrest for improved functional benefits. The individual adjustability in the width of the segments/elements of the back provide a more custom fit which can directly impact proper seating and positioning. In addition to sizing options, the adjustable shock/spring system in the backrest reduces vibration to the body which will further assist with managing abnormal muscle tone or spasticity. Finally, the RS seating system is equipped with a unique armrest design which allows for the most appropriate and natural upper extremity positioning and support for safe operation of the power wheelchair as well as improved sitting tolerance.

The following power seat functions are required on the C500 RS and for this client:

Power Tilt and Recline

Power tilt and recline allow independent adjustment of back and hip angle and has multiple medical and functional benefits:

- Offers maximum pressure relief and postural support
- Offers the most functional positions for eating, self care, reaching, and repositioning
- Best position for bowel/bladder management
- Recline alone can cause sliding forward and increase posterior pelvic tilt; the addition of tilt reduces shear when returning to neutral position from recline.
- Best to address circulatory issues and blood pressure management
- Allows multiple changes in position for more comfortable sleeping
- Best for increasing sitting tolerance and comfort
- Most effective means of reducing edema with elevating legrests
- Most effective means of reducing respiratory distress
- Facilitates therapy interventions
- Provides most options for transfer for one or two assistants, or independently
- Allows for the most comfortable sleeping positions for some
- Tilting before reclining minimizes shearing along the trunk

- Anterior tilt can facilitate transfers such as stand-pivot transfers and improve access underneath public areas such as counters, vanities, tables, desks, etc.).

Power Articulating Elevating Legrest

Power articulating elevating legrests allow legrest elevation and articulation, which maintains leg extension while elevating. They improve circulation and reduce or prevent edema. They maintain stretch and range of motion for short range and can accommodate for range of motion deficits. Power elevating legrests provide change of position due to pain or neuropathy and can facilitate better bowel/bladder management. They can increase clearance to navigate thresholds and slopes by raising up. The powered feature also allows legrests be tucked back more than normal to shorten wheelbase for maneuverability.

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.

The following components are also required for this client:

Retractable Joystick Mount

The retractable mount allows the joystick to be moved to the side and back for clearance without rotating. This makes it easier to drive up to tabletops and counters with the joystick pointing forward. 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.

R-net Remote Joystick

The R-net Remote Joystick 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 LCD screen enables the users to view charge, speed, profiles, etc. R-net also provides for up to eight individually programmable profiles. Mono jack ports will allow specialty switches and controls to be used to operate the on/off and mode function. This is needed when the standard push or toggle buttons are not accessible due to lack of activation strength or limited active range of motion. When using multiple power options or alternative drive controls, this type of upgraded joystick is needed along with the expandable controller.

T-Handle Joystick Knob

The T-handle allows more gross motor movements from the elbow and shoulder to control the joystick and facilitate turns in clients with poor grasp/fine motor control.

Expandable Controller

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.

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.

Ergo Back

The Ergo back is an ergonomic contoured backrest, and is a component of the Corpus seating system. Aside from providing comfort, it accommodates unstable trunk position secondary to decreased trunk and upper extremity coordination and postural control. Standard back upholstery and linear seating orthoses are inadequate for postural support due to CLIENT's need for contoured support to achieve symmetrical positioning. Using the provided adjustable lumbar and lateral supports, the trunk is aligned and sustained in a comfortable position. This support increases stability, safety, and potential for increased function in various situations, such as transport in a vehicle or on different environmental terrains. The recommended orthosis simulates the contours of the trunk and provide stability for positioning and can reduce the risk of developing spinal deformities. The backrest is customizable upon ordering, and is further adjustable with the use of postural supports and in conjunction with seat functions.

Ergo Seat Cushion

The Ergo seat cushion is made from various densities of foam and has a removable, easily washable upholstered cover. It provides contours to match the normal anatomic contours of the pelvis to enhance stability, positioning, and comfort.

Height Adjustable Armrests

Height adjustable armrests are necessary to create proper support for the shoulder, elbows and trunk. The adjustable height feature allows for placement of the armrest pads at a height that does not elevate the shoulders and creates trunk support. It also allows a tray to be set at the proper height for optimal function. Height adjustable armrests can facilitate transfer and weight shift and allows repositioning. Seat cushions can raise seat height significantly, and armrests that are too low may cause slouching of the shoulders, head and trunk.

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, Short or Long

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.

Calf Supports

The calf supports are angle and height adjustable pads that attach to the legrests. These padded calf supports are necessary to support the lower legs when the leg is elevated, or to keep feet from tucking under and getting stuck behind footplates when in the neutral seated position. Calf supports are especially important when using a tilt-in-space power seating system. The padding relieves pressure by providing an additional surface to distribute pressure, and has a mild contour to fit the lower leg.

Upper Extremity Support

A wheelchair tray table is necessary to assist in upper trunk positioning and upper extremity support. It also provides a horizontal surface for working or eating, or to facilitate carrying of essential items. The necessary hardware to mount the tray to the wheelchair frame is angle adjustable for better visual access to the items on the tray, and is removable for transfer.

Batteries

The batteries are gel sealed, and two are necessary to power the wheelchair. They are maintenance free and are safe for travel on the road or in the air. Group 24 batteries are necessary to provide adequate power to the wheelchair due to add on power systems such as power tilt-in-space or recline and to increase the range of driving on a single charge.

ASSESSMENT RESULTS

Report of Symptoms

No pain was reported during evaluation.

Medical History

History of present condition: Spinal Cord Injury – due to diving accident July, 2007 – resulting in complete C5 tetraplegia

Past Medical History: unremarkable prior to accident

Physicians/clinics involved in care: Dr. _____ (Neurosurgery), Dr. _____ (Rehabilitation), Dr. _____ (Orthopedics)

See patient's medical record for complete medical history.

Range of Motion

Upper extremity passive range of motion: passively within functional limits

Lower extremity passive range of motion: passively within functional limits except for: tightness noted in bilateral hamstrings and heel cords due to immobilization.

Trunk range of motion: at risk for scoliosis and kyphosis due to inadequate postural control.

Strength

Strength was absent below level of lesion (lower extremities, trunk, and limited activity of upper extremities – gross movements initiated at shoulder).

Muscle Tone

(+) Spasticity in bilateral lower extremities – elicited by force/vibration or quick stretch

Endurance

Muscle fatigue was present throughout all innervated muscle groups.

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

Tolerance to upright was normal in sitting.

Sensation

Sensation was absent below level of lesion due to spinal cord injury.

Functional Skills

Head control: within normal limits

Upper extremity function: unable to independently propel any type of manual chair or power scooter for functional distances, uses right upper extremity with T-handle joystick for access to power mobility using gross shoulder/elbow movements

Trunk control and sitting balance: sat with total support for postural control – tends to lean to the right with rounded shoulders and kyphotic posture

Lower extremity function: no functional movement

Transfers: with maximum assistance required

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

Therapist Name

Physician Name

Date Signed: _____

Date Signed: _____