Child's Name: Rachel
Date of Birth: 10-30-92
Date: 5-1-03

Powered Mobility and Positioning Evaluation
Medical Justification for Equipment

Identification of Need:

Rachel is a 10-year-old child with diagnosis of Cerebral Palsy. She is nonverbal, nonambulatory, and cannot propel a manual wheelchair. Rachel is in need of a system to provide mobility specifically adapted to her physical needs. A Power Tiger with power tilt and an ASL driver control is being recommended.

Current Motor Status:

Rachel presents with high tone and ataxic movements. She struggles to regulate pressure for a task and physically responds "all or nothing". When force is required, she frequently over and under targets. If force is not necessary, Rachel's accuracy with pointing dramatically improves. Because Rachel also struggles to maintain grasp of items, (frequently dropping them), most items need attached for her to be able to interact and play.

In short sitting, Rachel is unable to sit without supports. She loses her balance and lacks protective extension reactions to catch herself. Rachel is able to scoot on the floor in a modified W sit position leading with her L arm. Again, grading motion is difficult—she bumps into objects and lacks the ability to easily navigate around items on the floor.

When placed in standing, Rachel will accept weight through her lower extremities, but must be fully supported. When attempting to take steps, both feet supinate excessively and her right lower extremity abducts and internally rotates unless physical assist is provided.

She is dependent for eating and must be fed, not only because of lack of accuracy bringing food to mouth, but is at risk for choking. Consequently, she has all her meals prepared with similar textures. Rachel is dependent for other ADL's including transfers, dressing, bathing, etc.

Equipment Trial:

Rachel has driven numerous power chairs, including chairs manufactured by Invacare, Permobil, and Quantum as well as a chair mostly distributed in England, the Bobcat. She has driven with multiple methods as well, including the joystick, mechanical switches, and electronic switches. Switches were placed at both her head and her hands.

The joystick was too much information—she could occasionally proceed forward, but lacked the fine motor control to regulate her pressure. She struggled to turn as she intended and had difficulty releasing to stop, especially when excited. When using mechanical switches, Rachel was physically unable to sustain the pressure to continue moving. She would push, stop, push, stop, push…. Given experience, this cycle continued without improvements. However, when proximity switches were used (do not

require pressure for activation), Rachel was able to access the commands with greater accuracy and maintain contact.

Because the chair was a demo, switches were velcroed on the armrest for her use. Due to her ataxia, Rachel frequently knocked the switches off, making further progress difficult. A temporary setup with switches placed more midline on a Bogon mount was also attempted—her accuracy improved, but again, due to her high tone and ataxic movements, the Bogon mount was not sturdy enough to remain stable and would move as she tried to access a command. However, while the switches remained midline, Rachel did well before they shifted out of position. Rachel needs a chair of her own where these switches are mounted in a consistent location for Rachel to further expand her mobility skills.

Because Rachel experienced success with the loaner Power Tiger, this chair will be duplicated for her use. It will include seating and mounts specific to Rachel's needs. The programming capabilities of the Mark IVA electronics allowed Rachel to proceed over thresholds and turn on carpet even at slow speeds. When the directional commands were separated out, the chair responded the way Rachel expected. Changing between modes of the chair is simplified with Invacare's electronics—for ease of learning, only a single switch hit is required. With other chairs, a variety of switch activations is required to proceed through the chair's menu options—single, double, timed, scrolling, etc. which becomes confusing as a child is learning the system.

Current Means of Mobility:

Rachel has a Quickie 2 manual wheelchair, providing her with dependent mobility. Due to her right side involvement, she is unable to propel a manual wheelchair and must be pushed. A demo Power Tiger with an ASL driver control was loaned to Rachel as per family request. During this time, Rachel's family have become excited about Rachel moving on her own and are willing to implement a mobility program with her.

She is in need of a system put together with components specifically chosen to meet her individual needs--with mounts that will **not** move as she attempts to activate the commands. The driving commands need to be mounted where she can consistently access them and other functions of the chair need to be added and mounted for her use as well. The seating system needs to provide appropriate support for Rachel to increase control of her trunk, which will translate into improvements with upper extremity accuracy. Rachel is very motivated to move and becomes noticeably animated as she activates the commands placed for her use. When driving herself, Rachel was also more active in her interaction, being less worried with transitions/novel tasks.

Transportation of Power Wheelchair:

Rachel's grandparents own a van with a lift. This will be used to transport Rachel's chair. The ASL on/off modification will allow the seating frame to be taken off the base for transporting with Rachel's mother and in smaller vehicles as well. A set of lightweight portable ramps will make this possible and have been included in the itemized list below.

Medical Equipment Components with Justification:

Invacare Power Tiger with Orbit Seat and Mark IV Electronics:

The Power Tiger/Orbit combination has been clinically shown to be both durable and adjustable over time. This system will accept the positioning and mounting components Rachel requires. The Orbit Seat is adjustable to accommodate for growth. The Com 3, 4 module with interface cable will allow Rachel to use the same switches she uses for driving for other functions. The Mark IV electronics have many parameters that can be adjusted to match Rachel's capabilities and need adjusted ongoing as she is learning. These parameters include speed, acceleration/deceleration, sensitivity, torque, power level, standby, among others. Programming is critical to Rachel's success and can be done using the Easy Remote Programmer.

ASL Products:

Rachel lacks the fine control to use a standard joystick. Therefore, proximity switches will be used. These are electronic switches that do not require pressure for activation. They will be arranged inside the Eclipse Tray where Rachel can access each one in isolation. The Eclipse Tray will be attached to the Gatlin mount for placement and then can be swung out of the way for transferring in and out of the chair.

Because proximity switches need power and have a 3 prong end, the dual proximity switch box is needed to convert these 2 switches to monoplug outputs and provide a power source—these can then be plugged into other functions of the chair, including drive select, reverse, reset/mode change, etc. Because these will not be mounted inside an enclosure, these will be covered in foam and made into shapes to eliminate rough edges/corners.

The cover for electronics will provide a means of mounting the ASL electronic components neatly and protecting these from damage. The on/off modification will allow the seating system to be taken off the Tiger base for transporting. The chair will not be able to be broken down without this modification, hindering transport options. The interface cable will be used in conjunction with the Com 3, 4 module as already mentioned. Rachel is nonverbal. Given auditory prompts that she can hear at her ear through the speaker mod, she will be able to access a communication device for making medical needs known.

The Ancillary Input Control will be used during the training process as Rachel learns mobility skills. During this time, her family can assist her in unfamiliar environments and have an overriding stop for safety. Rachel will gain skills and become more confident as she is given various opportunities to practice in safe environments at home and out in the community.

Stealth Power Tilt:

Rachel is unable to transfer in and out of her wheelchair. She needs a means to change her position frequently throughout the day. Currently, Rachel attends school ½ day due to fatigue and medical issues. Power tilt will allow Rachel to rest during the day and tilt back to drive with the least amount of effort, conserving her energy for participating in other learning activities. With tilt, Rachel will be able to tilt back allowing gravity to help stabilize objects against herself for carrying from one location to another. Rachel can be shown how to use tilt to reposition herself back in her chair if she

has slid forward. When Rachel is going over unlevel terrain or down a ramp, changing her tilt position will help maintain stability over different surfaces and slope angles. Visual orientation can easily be adjusted by activating the switch to tilt back to view individuals standing or items on a wall for instance, and activate the switch again to tilt forward to view peers or items on the floor.

Rachel will use her headrest when she is tilted. This headrest will swingaway and remove to clear the opening in the vehicle for transport.

Seating and Miscellaneous Components:

When Rachel is provided with appropriate postural supports, she has greater stability for participating in daily activities—for feeding and using her upper extremities more effectively. She will need a seating system that provides stability for driving her power wheelchair. A planar back and seat has been unsuccessful in providing Rachel with sufficient pelvic and trunk stability. However, the OBSS system by Ottobock will provide Rachel with the contact she needs to gain more control over her trunk and body movements. With this system, bags are used in which air is vacuumed out. An impression of Rachel in a functional sitting posture is achieved. Data is entered in the computer and a custom seating system is duplicated from the information. The seat and back are then attached to the frame using adjustable hardware for appropriate placement.

Again, Rachel will need items attached to her chair securely in a position she can access. A variety of mounts are being recommended to provide stable placement with the flexibility of modifying the location as Rachel's needs change. The Stealth Gatlin with eclipse tray has already been explained above in the ASL section. Other mounts will be needed to mount her communication device, ancillary switches, and Mark IV components that cannot be mounted in the ASL protective cover. These too will swingaway/remove for getting Rachel in and out of the chair.

The chest support and tray will provide anterior trunk and upper extremity support, especially when she is fatigued. In order for the tray to be used in conjunction with the Daessy mount, a custom cutout with top drop clamps is necessary. A pelvic belt is required, not only for safety, but for adequate positioning as well.

Itemized List of Recommended Medical Components:

Invacare:

Power Tiger Base
Orbit Seat with custom non flipdown back and rigidizing bar
Mark IVA Electronics
Tilt' n Space Option
T-Arms, Desk Length Adj. Height—no charge
6" x 2" Semi-Pneumatic Casters—no charge
90 degree Swingaway Footrests with Extension
Adjustable Angle Flip Up Footplates
Calf Strap
Quad Link Retractable (2)
Easy Remote Programmer
Com 3 and 4 Module with interface cable (included later)
Flat Free Tire Inserts

Adaptive Switch Labs Components:

Tray Array Package with proximity switches, ASL interface box, quick disconnects, and reset switch.
Partial Eclipse Tray Driving Platform with Gatlin Mount
Interface Cable
On/Off Modification
Ancillary Speaker Modification
Ancillary Input Control
Protective Cover for Electronics
Proximity switches (2) with one power source, quick disconnect, and mono outputs for other chair functions
To eliminate rough edges, switches will be covered in vinyl and made into shapes

Stealth:

Power Tilt for Tiger Base
Mark IV Electronic Component Mount
Swingaway Mount for Display
Swingaway Mount for Single Switch
Headrest with Lateral Assembly
Swingaway/Removable Mount for Headrest

Ottobock:

Custom Molded OBSS System Seat and Back, Mounting Hardware

Adaptive Engineering Labs:

Dynaform One Piece Chest Support

Bodypoint:

Pelvic Belt

Daedalus Technologies:

Device Folding Side Mount with Sidemount Clamp and adapter plates

MK Battery:

Pair of 22NF Batteries

Therafin:

Tray with top drop clamps and easel

CF Rehab:

Lightweight Portable Ramp

In order to determine which chair with driver control would adequately meet Rachel's needs, multiple combinations were tried. Rachel's family was actively involved in this evaluation and determination process. They seeked out information and products to try, attending multiple expos and educational classes.

Because Rachel experienced success with the Power Tiger and ASL driver control, this combination was chosen. Careful consideration was given to each component. Items were included in order to make the chair functional for Rachel. Given a power wheelchair with power tilt and separate electronic switches for driving, Rachel will be able to experience mobility and gain skills through experience in multiple environments. Rachel's family continually assists her gain functional outcomes and will

follow through with training recommendations. Please promptly consider the provided information and contact me if you have any questions or need further clarification.

****Rehab Supplier of Choice**: Rachel's family has chosen to provide the recommended equipment.
Contact Name:
Phone Number:
Fax:

Thank you,

_____
Christina Mayer, PT
Physical Therapist

_____
Physician Signature
**no substitutions, no deletions without physician approval