Statement of Medical Necessity and Equipment Justification
Seating, Positioning and Mobility Assessment

PATIENT'S NAME: Katie Cutie
AGE: 20 years old
MEDICAL DIAGNOSIS: Cerebral Palsy
THERAPIST: Karen M. Kangas OTR/L
OTHERS PRESENT: Mom, Jim Slim (Permobil),Larry Barry(Invacare), Barry Best(USA's Best Medical)

Medical Necessity and Justification for Equipment

Identification of Needs

Katie is a 20 year old female with cerebral palsy. She is diagnosed as non-speaking, and with spastic quadraparesis and a "windswept" orthopedic anomaly (rotated pelvis and lower spine, causing the trunk to move somewhat laterally, as well a with some fixed rotation.). She utilizes an augmentative communication device to speak independently, as well as some idiosyncratic gestures and a vocal Yes/No.

She is in critical need of a new powered chair. Her current powered chair is no longer reparable, and its seating does not fit Katie. She obtained her previous powered chair August 1998. Although the powered system served her adequately, Katie needs a new powered chair to manage with head access. She also needs adaptive seating to adequately support her body and powered seat functions which will allow her to change positions independently throughout the day, preventing skin breakdown, and any muscle shortening, or loss of range of motion.

Medical Considerations

Katie is currently medically stable. She wears glasses and attends school daily. Katie has a history of multiple past orthopedic surgeries which have included various muscle releases, a spinal rod insertion, and the insertion and use of a baclofen pump.

Motor Assessment

Reflexes and Abnormal Muscle Tone/Range of Motion/ Motor Strength:

Although Katie's tone has decreased due to the introduction and use of baclofen, she can still be observed to demonstrate increased spasticity in all of her extremities. The control of her head and extremities is dependent on proximal stability (pelvic and shoulder girdle) rather than any distal control (hands and feet).

She has learned how to use various reflexive postures to assist her in initiating isolated movements, and often they are not even needed, especially for head control.

She does demonstrate an oblique pelvis and a "windswept" rotation through her trunk and pelvis. Since the spinal surgery, this rotation has been limited, although it is still observable and does impact Katie's postural security. It can be particularly observed by the position of Katie's left foot. Her left foot appears to be everted, however, it is instead a reflection of the rotation of the pelvis and hip. If this foot, is forced or strapped into a symmetrical posture, the entire lower extremity will cause additional rotation at the pelvis.

Katie does have an oblique pelvis (asymmetrical in two planes) although she does maintain some pelvic mobility, it is very limited due to the obliquity and the spinal rod placement.

Her upper extremities are able to exhibit some active shoulder flexion, some horizontal abduction, some shoulder extension, and limited elbow extension. Fine coordinated control is not evident (due to the cerebral palsy) and supination and pronation, as well as active wrist extension and finger use is almost nonexistent actively. Although Katie has limited active range distally, she is a determined young woman and is often able to demonstrate about half of a functional active range of motion within each upper extremity, excluding hand use. She uses this proximal, active control to "throw" her hands or "drop them" onto a switch she may need to use. She also is able to raise her arms, and often uses a raised arm for validating a "yes/no" response in communication. She has less control of her lower extremities, although again, she can demonstrate some active proximal hip flexion and adduction.

Voluntary, Isolated, Controlled Movements:

When Katie's shoulder girdle can be supported in a position over her pelvis, she is able to demonstrate full active control of her head and neck, and use her upper extremities with some accuracy. However, when this posture is compromised, she has great difficulty maintaining control of her head, or of weight bearing in her pelvis (to secure her trunk posture) and subsequently, she has great difficulty using her upper extremities at all.

Adequately supported seating is critical to Katie's voluntary control of her head, neck, and subsequently, her swallowing and respiration.

Current Body Measurements

Seat to shoulder	**18 1/2"**
Shoulder to head	**9 1/2"**
Seat to axilla	**14"**
Seat to elbow	**6"**
Shoulder width	**16"**
Chest Width	**12 1/2"**
Hip Width	**15"**
Back of chair to BACK of knee, L	**17"**
Back of chair to BACK of knee, R	**16 1/2"**
Back of chair to FRONT of knee, L	**20 1/2'**
Back of chair to FRONT of knee, R	**19 1/2"**
Knee to heel, L	**14 1/2"**
Knee heel, R	**15 1/2"**
Approximate Weight	**105 lbs.**
Approximate Height	**5' 2"**

Current Means of mobility

Katie is not mobile. She is totally dependent for all mobility. However, since she was 8 years old she has been able to be independent in mobility with the use of a powered chair and head switch access. Her current powered chair is not working and is beyond being reparable. The custom seating no longer accommodates her body's unique orthopedic anomalies and she is unable to maintain an upright posture within it.

Katie's last powered chair also had powered tilt, recline, and elevating legrests which she was able to control using switch access. These powered seat functions supported her ability to independently change positions throughout the day to prevent any future contractures, muscle shortening, and skin breakdown. She also utilized electronic, proximity switches within her head array/head rest. Using electronic switches which require no pressure (zero pressure), enabled Katie to develop strong driving skills with minimal head movement or fatigue. Using proximity switches (activated by "skin touch") allowed the switches to be embedded within a padded headrest so that Katie could utilize the head rest when tilted, or when being transported in a van.

Katie continues to need a powered chair with electronic head switches, as well as adequate, supportive seating, and powered seat functions.

Equipment Trials

Equipment Used:

1. Permobil's Corpus with powered tilt, recline, legrest elevation and seat elevation; front wheeled drive chair
2. Invacare's TDX with powered tilt, recline, legrest elevation and seat elevation; center wheeled drive chair

Means of Activation

With both systems, Katie manages the systems through the use of proximity switches mounted within a headrest (Head array).

Sensory Motor Processing Needed

Katie does need as much auditory feedback as is possible within the system's controls. She is not able to "read" or "observe" the visual display, but she is very able to attend to the machinations of the chair by auditory "beeps" signaling her she is either changing modes, or going into reverse, or ready to drive.

Both systems provide auditory feedback within their modes of operation, and programming.

Results of Trial:

Katie was able to drive both chairs. Since both systems were "demonstration" equipment, of course, the seating on them was not adequate, nor exactly fit for Katie's body. However, we were able to simulate well enough the postures she needed, so that she could, indeed experience driving with the systems, utilize the seat functions, and we could take them into her family's van to assure an adequate fit.

The Permobil system, today, was almost as complete as would be needed for Katie. Permobil's "standard" configuration of adaptive seating even appeared to fit Katie.

The Invacare system was not complete. The TDX only had powered tilt and was too large of a seating system itself.

The management of the electronics to move from driving to managing seat functions is different with both chairs. Katie had opportunities to manage both, and she could do this. She previously had Invacare's electronics, and was still familiar with them. However, she did understand Permobil's differences, and felt she could manage them also.

Since the Invacare chair was not fully configured, and since both chairs appeared to work adequately, we decided to plan a future second equipment trial. We could then utilize a fully functional Invacare system, and Katie and her family would be able to go home and discuss features of each system, to assist them in their decision along with the therapist at the next trial.

Upon the second trial, Katie was able to determine that she preferred the Permobil system. She was able to maneuver smaller spaces and turns with the front wheeled drive system. She was adequately supported in the seating system it provided, and she could manage moving through its menus from driving to independent control of seat functions.

Powered Chair Recommendations

Katie needs supported adaptive seating. She needs a **padded, supported planar back** to be shoulder height now that is able to be contoured slightly to better support her spine, especially in the lumbar region. She needs **swingaway bilateral trunk supports** which are able to provide more contact through the trunk, but less at the front of her chest.

She needs a seat with enough depth to accommodate her leg length with **bilateral hip guides** to assist in lower extremity alignment. Since she currently demonstrates an asymmetry at the pelvis, the hip guides need to be split so that they can be fitted separately to each lower extremity. The hip guides will assist in hip stability as well as placement of the thigh. This lower extremity alignment directly relates to the position of the pelvis. Katie's seating needs to allow her pelvis to move forward or back as she is seated, yet not to "fall" forward or back. She needs a **Bodypoint dual pull padded positioning belt**, for pelvic support without any pressure, yet efficient adjustment for whether she is wearing a coat or not.

The **seat cushion** itself, should allow a more supported upright posture. She will also need a neoprene, stretch (yet supportive) **chest support/harness** to be worn for safe traveling.

Support in an upright position will assist Katie in obtaining more trunk righting support which she requires for increased lung expansion, and to assure adequate swallowing. The **armrests** need to be desk length and height adjustable.

Katie also desperately needs the ability to **tilt the seat**, which will alleviate any future pressure or skin problems on the ischial tuberosities. The tilting allows for a change in her body's orientation in space and pressure relief to her buttocks. When fully tilted she will need a **headrest** for safe support at that time. Since she operates the chair with her head, the headrest will need to be one which can allow for head support, as well as head control of driving. The tilting function also allows support for assistance in swallowing. The head can be supported, in a slightly flexed, yet upright posture, while the trunk is aligned to prevent swallowing problems. The system should also be set up to allow for **5 degrees of anterior tilt**, so that Katie can shift her pelvis anteriorly and readily get under tables and desks.

The tilt function is also important in assisting postural control when managing hills, uneven terrain, or going down a ramp. The tilt allows the patient to be held in a posture which prevents the feeling of "falling out" of the chair.

Katie will also benefit from an **elevating seat** for a safer transfer for both her and her family and other caregivers. The elevation allows the transfer to take place at a safer level for both the patient and the caregiver. Seat elevation also increases visual range, especially when traversing indoor, unfamiliar or obstacle filled environments.

She also needs the powered **recline function**, especially the 15 degrees necessary for Katie to open up her hip angle, and allow herself to accommodate her pelvic posture and support her trunk (without which she could also develop pressure either on her pelvis, spine, or

scapulae). She needs the **powered elevating legs** to allow for lower extremity stretching which also assists in the prevention of contractures or muscle shortening. The powered legs will require **calf supports** so that her legs will not "fall through" when she is tilted or reclined, and can be supported when they are extended.

With the use of powered elevating legrests, powered recline and powered tilt, simultaneously, the patient can also truly raise her feet above her heart, preventing any development of edema as she goes throughout the day, not standing and moving, due to her disability. As Katie ages, she spends increasingly more time in this system each day. It is vitally important that body movement continue to occur to maintain health to her circulatory system, her genitorurinary tract, her gastro-intestinal system besides her musculo-skeletal system.

Push handles on the back of the chair are needed for control of the chair after transfers or in case of an emergency when power is unavailable and "free wheeling" (pushing) of the chair is needed. **Backpack hooks** are also needed. This small expense is not a luxury but rather a necessity with patients like Katie. She must have feeding equipment with her constantly, as well as other items like a change of clothes, and any medications/or tissues, etc. Backpack hooks made by the manufacturer, which actually fit on her chair, allow these items to be safely transported without loss when using powered seat functions.

Changing positions within a seating system is critical. Often powered seat functions are thought to be "luxuries" rather than the critical, medically necessary changes in posture required all day, every day. Katie is no longer a young child. She is placed within her seating system in the morning, and is located in it, until bedtime. It is difficult for her to be managed by others out of her chair, and she is unable to change positions herself.

Movement within our seating systems is critical to all human beings. Our bodies digest better, void better, and are more alert after changing position. Our internal organs and their subsequent role in the physiological process of system function need us to change postures, especially moving upright against gravity, as well as moving into a seated posture, and a lying down posture to ensure adequate functioning.

Changing postures promotes increased respiration capacity as it allows the trunk to fully extend and subsequently the lungs to expand. Straightening the lower extremities (powered leg elevation) and matching it to hip extension (powered recline) allows the pelvis and hips to stretch out, allowing a different and more complete relationship with the trunk, shoulder girdle and head and neck. This adds to increased strength, control of posture, and range of motion in the head, neck and upper extremities.

The practice of moving from lying down, to a seated posture, to a tilted posture and then vice versa, also maintains the body's active alertness. Movement and mobility, control of transitional postures, and change in body postures is the foundation for visual and perceptual attention, and focus. It is why we can become "antsy" or our "minds wander" if we are seated in one posture for too long a time. Providing equipment which will support movement in all planes, and replicate the transitions of movement is critical for anyone who does not control their own body's mobility.

Human beings require mobility not only of ambulation but change in position. Spastic quadraparesis and quadriplegia do prevent this, but with adequate adaptive equipment, these postures and mobility can now occur. Mobility is critical to stable and good health, including circulation, respiration, and elimination. It is critical that we provide our patients with the ability to be mobile within their seating systems, not just mobile within an environment.

With the electronics available today, (with microchip technology) programmability is available to the user. Chairs can be programmed to perform in a particular way. This is critical when using alternative access for control of the chair. The chair's speed is fixed, but with multiple separate drives, speed can be increased when needed. Katie needs accurate control of turning and the speed as well as the sensitivity of the chair's switches to its performance. He also needs acceleration and deceleration to assist him in higher speeds, so that there is a gradual change when he starts and stops. Otherwise, he could startle or be "thrown" and lose control of his already limited control when stopping or starting.

The **electronics** needed must have **multiple drives**, be **programmable**, and be able to accept alternative head switch access. Katie needs to be able to control all of the seat functions as well, through her head switch controller/array. She needs to be independent in not only moving through space, but changing body positions while seated throughout the day. If the system does not include separate drives, then Katie cannot truly have control of speed, as it needs to be "preset" due to her digital switch driving method. In the past, when joysticks were used, both power and direction were controlled by the same "switch" or "driving method." However, when alternative switch access is necessary for independent control, then speed and direction are controlled separately. With separate drives, a drive can be preprogrammed for indoor use, with a separate drive for outdoor use, and/or control for safely getting into the van or into the house. These can be set up for individual environments and competent control for Katie.

Katie requires zero pressure, **proximity switches to drive**, 3 of them, located within the **Elite padded head support with mini- lateral swingaway side supports**. This allows accurate, and safe placement of the switches to Katie's head without concern for her poking or hitting her eyes, when turning (or if having a reflexive reaction), as well as placement for consistency of control of driving. Katie will need an additional proximity switch to function as a **"reset"** or "change mode" switch, (another **proximity switch**, mounted near her hand) which allows her to manage "reverse" in driving, and to choose to manage her powered seat functions.

A **fiber optic switch** can be mounted in an attached mount at one side of the head mounting hardware. This switch will allow Katie to operate her augmentative communication device. The fiber optic switch is located within tubing which can be then moved in to use, and out of the way for eating or transfers, yet it is also a zero pressure switch, allowing Katie to use her limited range of motion. In order for this switch to work with the chair's electronics (and gain power safely from the chair's batteries), a **power source for Permobil's electronics** will be needed as well as a **power source splitter.** (These additional parts are actually a part of the head switch array interfacing with Permobil's electronics.)

A **speaker needs to be located in the right lateral switch pad**, along with the proximity switch. Katie utilizes her augmentative communication device through the use of auditory scanning. She will be able to "hear the scan" from the speaker in her right headrest "pad" to choose the message she wants to "select" to be "spoken" to others.

When driving with alternative access, when body postures are limited and need to be controlled by changes within the system, a **visual display** is needed for the driver to have visual cues as to the chair's performance. This and the head switches (with the additional reset switch) are then the configuration which replicate the standard joystick. Although Katie will not be as dependent on this display visually, it is the part of Permobil's electronics which acts as the driver controller of the chair. The **visual display** needs to be mounted on a a **stable swingaway mount**, so that it can be moved out of the way for transfers, but is not located in Katie's path when driving.

A powered chair weighs at least 250 lbs, so it is not able to be readily pushed for any distance in a "free wheeling" mode. **Attendant control** is critical to manage the chair when Katie is not in the chair, like at bedtime, if it needs to be moved into a better position for transfer in the morning. **Attendant control** is also very important in case of any emergency, or in case Katie becomes ill in her chair and the chair must be moved.

To program the chair's electronics, Katie's family needs a **remote programmer** for the controller so that her chair can be "programmed" for the chair's performance to match her specific needs within her environment, so that it can always be managed safely. This allows them to change the performance of the chair if it is needed in a particular situation, as well. Katie's family is quite adept at managing programmable electronics since she had them in her last chair, and since she utilizes an augmentative communication device.

Primary Use of powered chair

Katie will be using this chair for independent mobility. She will also be able to reposition herself in the chair throughout the day independently.

How will the chair be transported?

Katie is currently transported by her family in a van with a lift. We were able to bring this chair within her van, as we did with the equipment trial. It will take a bit of practice becoming used to the front wheeled drive situation, but the system did fit into the van adequately at the equipment trial.

SPECIFIC EQUIPMENT RECOMMENDATIONS

******Please note:*** *These specific items are the exact items that this person needs. The specifications and brands themselves should* ***not*** *be changed. They have been chosen with great care, for durability, ease of use, compatibility, and accessibility and for this individual's own particular needs.*

1. Type of chair

Permobil Corpus C300
w/standard Corpus seating
w/desk length, height adjustable armrests
w/swingaway trunk supports
w/trunk lateral support
w/bilateral adjustable hip guides
w/standard center mounted legrests
w/standard flip up footplates
w/universal adjustable headrest mount
w/powered tilt
w/powered recline
w/powered elevating legrests
w/powered seat elevation
w/push handles
w/back pack hooks
w/R-net expandable controller (electronics) & visual display
w/attendant control
w/remote programmer

w/gel cell batteries
From: Permobil Inc., 6961 Eastgate Blvd., Lebanon, TN 37090; 800-736-0925; FAX: 800-231-3256
Local: USA's Best

2. Additional Adaptive Seating

a. Bodypoint dual pull, padded pelvic positioning belt
w/push button closure
b. Stealth's swingaway display mount
c. Stealth's Elite headrest
1). CP #275 Comfort Pad (back pad with low profile, small)
2). CPS-9-B Bilateral hardware for swingaway lateral pads
3). #910 Bilateral "mini" lateral switch pads; please note, the right one will also need to house the speaker, so it may need to be larger
d. Stealth's #FO 650, fiber optic switch mount (to attach to hardware of headrest)
From: Bodypoint Designs, Inc., 704 NE Northlake Way, Seattle, WA 98105; 800-547-5716
From: Stealth Products, Inc., 103 John Kelly Drive, P.O. Box 458, Burnet, TX 78611; 800-965-9229
Local: USA's Best

3. Switches & Interfaces

a. 3 proximity switches to be housed within Stealth headrest above
b. 1 proximity switch, #ASL 204, to act as "reset" switch (will plug into ASL interface box)
c. Fiber Optic switch with swingaway hardware, and monoplug jack (to go into augmentative communication device's port; not through chair's menu)
d. Power Source for Permobil's electronics
e. Power Source splitter box for Permobil's electronics
From: Adaptive Switch Labs, Inc., 125 Spur 191, Suite C, Spicewood, TX 78669; 800-626-8698
Local: USA's Best

4. Delivery Assembling, Instruction, Training

This is another critical piece of this entire chair actually working. This whole chair needs to be assembled and checked, so that each piece fits, and to change a piece if it does not. This system must be safe and fit Katie adequately. This is the final customization and one of the most important parts of the entire process. Both the therapist and the dealer/vendor need to be involved, working together.

5. Choosing a medical supplier/dealer.

The Cutie's have chosen USA's Best as a local dealer, with my support. Their representative, Barry Best has had a great deal of experience in seating and positioning. Mr. Best and USA's Best have demonstrated to me over the years, that they provide excellent technical and service support as well as remaining certified in installation and service by having completed the various manufacturers educational courses.

If there are any questions regarding the costs of the chair and the components, please call Mr. Best first, and/or the manufacturers. I have chosen the components based on my expertise as a therapist dealing with seating and positioning of complex and complicated patients. The choice of items is mine, the delivery and putting together is both the vendor/dealer's and my responsibility. Any cost questions are for the vendor. I choose products as to the patient's needs and the match between the features of the product and the needs of the patient, not their cost, but

their value. If there are products which have equal characteristics and a price variation is noticeable, cost effectiveness is always considered.

If there are any questions or concerns regarding this report, please do not hesitate to contact me.

Karen M. Kangas OTR/L Date
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Physician Date