

To Whom It May Concern:

XXXX Rojas is a 17yr. 11mo. old student who attends Highland Park High School. XXXX has a diagnosis of cerebral palsy, quadriplegia with increased muscle tone in his trunk and all extremities, more significant on the right. He experiences fluctuating muscle tone with poor isolated motor control that increases with intentional movement. Asymmetrical Tonic Neck Reflex (ATNR), Moro and extensor reflexes influence positioning, balance and the quality of his motor control. XXXX drives an Invacare TDX5 Storm Series power wheelchair. The wheelchair was purchased for him in 2004 and modified for upgraded electronic control of environmental and computer controls in 2008. His fluctuating muscle tone and reflexes prevent him from walking independently or propelling a manual wheelchair. XXXX is an excellent driver for both indoor and outdoor travel. He navigates the crowded hallways, cafeterias and classrooms of the high school safely and without assistance. Outdoors, he controls his wheelchair on uneven sidewalks, up/down inclines, across intersections and on a variety of terrains for participation in home, school and community activities.

XXXX is left handed and has more functional movement in his left upper extremity. He has approximately full range of motion in his upper extremities. His left leg flexes to 90° and lacks 10° of full extension at the hip. His right leg flexes just beyond 100° and lacks 10° of hip extension. He has full abduction/external rotation on the right and abduction to 25°/external rotation to 20° on the left. He has bilateral knee flexion to 110° and full knee extension. XXXX wears bilateral ankle foot orthoses that maintain his ankles in neutral dorsiflexion for stability in standing and transfers. He requires moderate support and assistance for standing pivot transfers between his wheelchair and bed, toilet, stander mat table or alternate furniture. XXXX is very strong and is able to assist transitions from sit to stand; however, he is unable to grade his movements or to safely use grab bars to maintain standing. In a standing position, he is able to take a few steps forward with support, but has difficulty taking steps laterally or backwards. In sitting, he benefits from posterior and lateral trunk supports due to the unpredictability of involuntary movements. He sits with forward flexion when unsupported and is able to maintain this posture for brief periods of time. XXXX academic program includes resource time that allows him to use a Grandstand Stander for alternative positioning and physical education classes that allow him to stretch on the mat table. He uses his power chair for all mobility within his home, the educational environment and community in order to maintain independent mobility. He is transported in his power wheelchair in a family owned lift equipped van with wheelchair tie-downs and occupant securement straps.

XXXX' current wheelchair is greater than 6 years old and has an extensive history of repairs. He has grown and no longer fits the dimensions of the seating system. The postural supports no longer provide adequate pelvic or trunk control, causing him to slide forward on the seat surface and lean to his right. XXXX has worked with the physical therapist on the Assistive Technology Team for several years to improve his seating and positioning and integration of his wheelchair driver controls and his computer for increased access to educational materials and communication. XXXX and XXXX, RTS/ATP from **the wheelchair supplier**, met to evaluate XXXX' wheelchair, seating and alternative positioning needs. His priorities included maintaining independent mobility, comfort and support within the seating system, increased independence alternative positioning and the potential for using his driver controls to access environmental controls within his home and continued computer access as he prepares for transition out of high school. In his post-school setting, he will not have opportunities to use the stander or alternative positioning throughout his day; therefore, the evaluation included trials of 3 power wheelchairs (Invacare FDX, Permobil C500 and Levo C3) with tilt, recline and standing features included in the seating systems. Following indoor and outdoor trials of these wheelchairs, an extended trial of the Invacare FDX was arranged through the manufacturer in order for him to trial the wheelchair and

sit-to-stand features at school and within his home. The following power wheelchair base, seating system components and external supports are recommended for XXXX Rojas:

Invacare FDX Power Wheelchair Base, including 4-wheel drive power base, Motion Concepts Sit-to-Stand seat frame, shock absorbing suspension system, chest belt, battery charger, height adjustable flip-up armrests, flat free tires fixed seat depth and back angle, ANSI/RESNA WC-19 vehicle tie down locations: The Invacare FDX power wheelchair has a front wheel drive base for improved wheel drive control on inclined (15°) and uneven surfaces, providing increased stability and curb climbing (4") ability. As a front wheel drive base, it has a small turn radius, making it ideal for indoor maneuverability. The low seat-to-floor height facilitates work at standard tables and desks as well as transfers between the wheelchair and toilets and beds. The standard seat frame is easily adjustable for growth in width and depth to accommodate physical growth and postural changes over time. Motion Concepts seat frames were designed with low shear sit-to-stand seat frames that match natural extension of the hips, knees and back of the user to maintain alignment of joints as weight is shifted from seat surfaces to lower extremities. The seat frame is adjustable for seat-to-back angle, lower leg length, seat height, armrest height and knee support height, depth, angle and width. The Invacare FDX uses Invacare proprietary electronics for wired or wireless integration of driver controls with environmental controls, computers and communication systems as needed by the individual user. Invacare electronic components are modular and can be added as needs change over time. Over a several month period of time, XXXX trialed the Invacare FDX with Motion Concepts Sit-to-Stand frame, the Levo C3 and the Permobil C500 with the school environment, outdoors, in the community and at home. He utilized the standing feature throughout the day for pressure relief and repositioning, to increase independence in transfers and for toileting. XXXX, his therapists and family determined that the FDX with Motion Concepts seat frame provided the optimal sit-to-stand and stand-to-sit positioning and alignment for him and that the FDX base had better maneuverability and stability in all environments than the alternative chairs trialed. His current Invacare TDX-5 power wheelchair is in disrepair and is greater than 6 years old. It no longer meets his needs for independent mobility and the seating system does not provide appropriate postural supports. XXXX requires a new power wheelchair that will meet his adult needs for positioning in sitting, mobility and independent standing. **He has a diagnosis of cerebral palsy, quadriplegia with spasticity and significant fluctuations in muscle tone that interfere with all fine and gross motor functions. He is very intelligent and an excellent driver who immediately learned how to operate the features of tilt, stand and mode changes to utilize his communication system through the joystick.** XXXX requires powered mobility because he is unable to walk and cannot propel a manual wheelchair. He is unable to shift his weight or reposition himself effectively within the wheelchair during the day due to reflex activity interference. The XXXX power wheelchair with standing features is recommended for XXXX because he is an experienced wheelchair driver who is unable to perform mobility related activities of daily living such as sit-to-stand transfers, maintain balance in standing, utilize the standing position for work at counter heights or maintain his range of motion at hips/knees independently.

Motion Concepts Standing Seat System: A power standing seat system is recommended for XXXX because he has a diagnosis of cerebral palsy, quadriplegia with spasticity and significant fluctuations in muscle tone that interfere with all fine and gross motor functions. He is very intelligent and an excellent driver who immediately learned how to operate the features of tilt, stand and mode changes to utilize his communication system through the joystick. XXXX requires powered mobility because he is unable to walk and cannot propel a manual wheelchair. He is unable to shift his weight or reposition himself effectively within the wheelchair during the day due to reflex activity interference. In elementary and high school, he has utilized an Easy Stand stander for passive standing to maintain bone

integrity during growth and to increase range of motion at his hips and knees. XXXX is unable to transfer to standing or maintain standing without external support. He has never been an independent walker. Children with diagnoses of cerebral palsy frequently experience hip subluxation and dislocation due to inadequate formation of the hip joint because the acetabular cup and angle of the femoral neck develop through standing, weight bearing and walking. XXXX has had excellent orthopedic management throughout his childhood and has a daily program designed to maintain range of motion, joint integrity and bone strengthening through exercise and standing. He is unable to perform the exercises independently and cannot transfer to the stander independently. As he approaches adult hood, it is critical that he maintain his range of motion and bone integrity in order to continue to assist in standing pivot transfers. A wheelchair that allows him to stand will provide him a means of independently maintaining these abilities. The sit-to-stand mechanics of the Motion Concepts sit-to-stand system mimic the natural biomechanics of the sit-to-stand and stand-to-sit movements, preserving ankle, knee and hip joint alignment bilaterally. Adults with cerebral palsy frequently develop excessive shortening in their hip and knee flexors and lose the ability to perform standing transfers because they are unable to maintain the same level of physical exercise and alternative positioning that they had in school. Employment and reduced caregiver assistance extend the number of hours that adults sit in their wheelchairs each day. XXXX has the ability to stand, attain pressure relief and re-position himself independently through the stand feature of the Motion Concepts sit-to-stand system, which will reduce the amount of assistance he will require and improve his opportunities for employment.

Motion Concepts Powered Tilt-in-Space feature: XXXX would benefit from power tilt-in-space feature necessary to assist in positioning and pressure relief. The tilt-in-space design on the Motion Concepts seat frame takes the user's center-of-gravity into consideration at all points of the tilt phase as the seat frame tilts backward in space along bilateral glides on the base frame, rotating the user backwards around the user's center-of-gravity. This allows the user's weight to be evenly distributed over the wheelbase at all times during the tilt phase. Thus, the frame and user are more stable throughout and during the tilt phase. XXXX' existing TDX power wheelchair has tilt-in-space, and he has used the feature to relieve hip discomfort when sitting for prolonged times. He will continue to use his wheelchair for all mobility related activities for greater than 10 hrs. daily. XXXX frequently slides forward on the seat cushion and is unable to re-position himself without the tilt feature because he is unable to perform a wheelchair push-up and scoot his hips back on the cushion. He uses the tilt feature to allow gravity assist to return his hips/pelvis to the rear of the seat cushion. The Motion Concepts system allows 50° of tilt, which is sufficient for him to achieve pressure relief by tilting and leaning laterally from side to side. Without power tilt, XXXX must rely on caregiver assistance to perform pressure relief and re-positioning.

Motion Concepts Power Recline System: XXXX requires power recline intermittently throughout his day to reduce muscle spasms and provide pressure relief. He has a diagnosis of cerebral palsy, quadriplegia and will use his powered mobility base for greater than 10hours a day in his home, school, work place and community. XXX is unable to transfer independently from his wheelchair to alternative positioning to reduce muscle spasms. He has benefited from intermittent supine positioning to reduce muscle tone in his hips and knees and to reduce pressure over his ischial tuberosities from extensive sitting. A powered seat system that includes recline allows XXX to remain in his wheelchair and independently perform weight shifts and pressure management as he pursues his education and works in the community. Independent pressure management and positioning greatly reduces his need for adult assistance and increases his opportunities for employment.