Information Package on

Wheeled

Mobility

KT4TT Intervention Tools - Series C:2 (2012)

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Information Package

on the use of

Power *Tilt* Systems

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in everyday life

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- Appendix 1: Journal Publication on Power Tilt Systems Sonenblum, S. E., Sprigle, S., and Maurer, C. L. (2009). Use of power tilt systems in everyday life. *Disability and Rehabilitation Assistive Technology, (4)*1, 24-30

Section A

Power Wheelchair User Need Area

A recent study of power tilt wheelchair users by Sonenblum, Sprigle, and Maurer (2009) found that users significantly under-utilize the tilt feature in their power wheelchairs.

Despite the known consequences of not performing pressure-relieving tilts (PRTs), many full-time wheelchair users, some who spend twelve or more hours in their wheelchair, are not tilting frequently enough or to the angle necessary for their own well-being. Approximately 75% of individuals currently using tilt-in-space wheelchairs are able to both verbally describe and physically demonstrate an optimal PRT (Sonenblum and Sprigle 2011). However, these same individuals **do not** perform more PRTs than their counterparts who do not use their systems for pressure relief. ***Therefore, lack of PRTs does not appear to be a result of poor understanding about the need for PRTs or the correct method of performing a PRT.***

One main reason why wheelchair users do not fully achieve PRTs is because their perception of the tilt angle is misconceived (Sonenblum et al 2009). Some participants in this study claimed to fully tilt their wheelchair; however, it was tilted much less than their wheelchair allowed.

Consequently, pressure ulcers continue to be a major problem for many wheelchair users. Although pressure relief schedules and appropriate wheelchair cushions can minimize the possibility of a pressure ulcer, research shows that wheelchair users are simply not taking the proper precautions. The incidence rate of pressure ulcers remains unnecessarily high - 24% of people with a spinal cord injury (SCI) acquire a pressure ulcer during their rehabilitation hospital stay and more than 50% of people with SCI acquire one in their lifetimes (Sonenblum et al 2009).

Multiple researchers recommend relieving pressure through the use of frequent tilts, ranging from 15-30 seconds every 15-30 minutes to 60 seconds every hour at a tilt of more than 30 degrees, preferably 45 degrees. In the aforementioned study on the use of power tilt systems for pressure relieving tilts, Sonenblum, Sprigle, and Maurer (2009) determined that the median subject in their study performed only 3.1 small tilts (less than 15 degrees) per hour while in their wheelchairs and only 1 PRT (30 degrees or greater for 60 seconds) every 7 hours. Using the researchers' most conservative recommendation, 15 seconds every 30 minutes, the median subject was fulfilling only 28.5% of the PRTs required and the time intervals spent in a PRT were not spaced optimally for tissue health.

Section B

Wheelchair Industry Need Solution

Utilizing the Sonenblum, Sprigle, and Maurer research, manufacturers now have the opportunity to significantly reduce the occurrence of pressure ulcers among power wheelchair users and decrease long term healthcare costs incurred by third party payers. This can be accomplished by designing and incorporating an automatic timed alert/reminder system in power tilt wheelchairs that notifies the wheelchair user when to tilt. The system then signals the user when they have reached an optimal PRT angle and signals the user again when the PRT angle has been maintained for a sufficient period of time, ensuring optimal tissue health. Incorporation of this tilt reminder system into a power tilt wheelchair will influence and encourage the wheelchair user to increase the frequency of PRTs and decrease the number of ineffective, partial tilts thus greatly reducing the incidence of pressure ulcers.

A second element of the reminder system is a user override feature to delay the notification for a short predetermined amount of time. This feature is necessary if the wheelchair user is in a social situation where they are unable to tilt at the prescribed time (e.g. person is in a meeting or crossing a street). This feature would allow the wheelchair user to delay the PRT until a more suitable time, but would continue to serve as a reminder of the need to perform a PRT for their wellbeing.

Section C

Business Opportunity For Wheelchair Manufacturer

Not only will the inclusion of a reminder system in power tilt wheelchairs have a positive health impact on wheelchair users, it will also have a positive financial impact on manufacturers. Manufacturers would be seeking additional reimbursement from third party payers for inclusion of the reminder system in their wheelchairs through lobbying efforts. The justification for reimbursement is one that the cost for reimbursing the reminder system will be more than offset by the significant reduction in costs of treating pressure ulcers. Wheelchair users who have the reminder system will be tilting more frequently and, therefore, the incidence rate of pressure ulcers among owners of a wheelchair with the built in reminder system should dramatically decrease. In 2006, the average hospital charge per pressure ulcer patient was approximately $48,000 and the hospital treatment cost associated with stage IV pressure ulcers and related complications was approximately $124,000. This represents a minimum annual outlay of $11 billion to the U.S. health care system (Brem et al 2010). The low cost reminder system will enable third party payers to save thousands of dollars in hospital costs that would have been incurred had the wheelchair user not had the reminder system built into their wheelchair.

Section D

Target Market /Market Size

The U.S. census estimates that in 2002 there were 2.7 million wheelchair users 15 years and older and 121,000 wheelchair users under 15 years of age, based on their estimate of 0.2% of 60.6 million children under 15 years of age (Steinmetz 2002). A more recent figure of wheelchair users from 2005 data from the national Survey of Income and Program Participation (SIPP) shows that number climbing to 3.3 million wheelchair users among the U.S. non-institutional population ages 15 and older (Brault 2008).

Using the 2002 data, of the 2.7 million people who used wheelchairs, 25% or 670,000 people use electric powered wheelchairs (Cooper and Cooper 2003). **Of the electric powered wheelchair users, 50,000 have a specialized seating wheelchair, or an electric powered wheelchair that includes power seat functions.** In 2002, based on the above numbers, 50,000 power wheelchair users with specialized seating systems would have been candidates for incorporating a tilt reminder system into their wheelchair. According to Cooper and Cooper (2003), this market segment has rapid growth, which is evidenced by the 2005 SIPP data. As these numbers continue to increase, the market for electric powered wheelchairs, as well as their accessories and features, will continue to expand and grow (Cooper and Cooper 2003) thus presenting a significant market opportunity for a manufacturer incorporating a tilt reminder system into their wheelchairs.

Section E

Intellectual Property Status

The research paper, "Use of power tilt systems in everyday life" written by Sharon Eve Sonenblum, Stephen Sprigle, and Christine Maurer (2009), is copyrighted. However, a free copy of the paper "Use of power tilt systems in everyday life" is included with this information package. The research paper included in the folder and other information contained in this package are free for private use as well as lobbying use. Please contact the Journal of Disability and Rehabilitation: Assistive Technology for permission to distribute additional copies of the paper and the information contained within. In addition, the concept for incorporating a tilt reminder system into powered wheelchairs is free for use by all.

Section F

Technical Assistance

Where can I find out more about the use of Power Tilt Systems in everyday life?

The person to contact with any questions pertaining to this publication is: **Sue Arnold**

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Section G

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Sonenblum, S. E., Sprigle, S., and Maurer, C. L. (2009). Use of power tilt systems in everyday life. Disability and Rehabilitation Assistive Technology, (4)1, 24-30

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Section H

Appendix

Appendix 1 Journal Publication on Power Tilt Systems

Sonenblum, S. E., Sprigle, S., and Maurer, C. L. (2009). Use of power tilt systems in everyday life. *Disability and Rehabilitation Assistive Technology, (4)*1, 24-30