Lightweight Manual Wheelchair

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Ergonomics of Manual Wheelchair Propulsion IOS Press

Wheelchairs will be in ever

greater demand in a rapidly aging society. Because of the special needs of aging users due to frailty and reduced reflexes in many cases it is important to give careful consideration to rather fundamental design properties. Inter alia it is very important to define clarify and design running turning and stability properties of the highest standards in manual wheelchairs. In particular we discuss these matters in regard to wheelchair behavior on sloping surfaces. In the present paper ve report on an analytical model for a 4 wheel manual wheelchair which shows good correlation with the existing experimental data relating to torque and speed when the wheelchair is moving on a level plane and when climbing a 3 degree slope. The rolling stability of the wheel chair on a slope is also discussed.

Biomedical Aspects of Manual Wheelchair Propulsion DIANE Publishing

Abstract: Current one-handed manual wheelchairs are difficult to propel because one arm can only provide half the power that is ascertained in a two-handed manual wheelchair. A power-assisted hemiplegic (one-sided paralysis) wheelchair was developed that can effectively be propelled with one arm while remaining maneuverable, lightweight, and foldable. An existing manual wheelchair was minimally modified and fitted with powerassisted components that could alternatively be attached to a wide

range of manual wheelchairs. The design implements a motor and gear train to power the wheel on the user's affected side, encoders on both rear wheels to track wheel position, and a heel interface on the footrest to control steering. A controls program was developed that analyzes wheel position and steering to respond to the motion of the hand-driven wheel. Extensive testing was performed to ensure design integrity. Testing results showed that the prototype successfully met and exceeded predetermined design specifications based on industry standard testing procedures. The design has the potential to deliver increased freedom to a considerable consumer base.

The Manual Wheelchair Training Guide Jones & Bartlett Learning

The Wheelchair Evaluation: A Clinician ' s Guide, Second Edition is an updated, practical, and concise reference on the wheelchair prescription process. It ' s perfect for students and clinicians in the health fields who work with physically disabled individuals in need of a wheelchair. This book is a portable, hands-on manual that implements a real-world approach to patient evaluation, choice of wheelchair components, documentation, and funding.

Manual Wheelchair for One-armed Operation Pax Press

At receptions, parties, networking events, or other social functions, able-bodied people move around the room from conversation to conversation carrying a drink and/or a little plate of food. People who use wheelchairs for mobility are limited by their need

to use their hands to push their wheelchair about the room. This thesis addresses this need through the design of a table that can attach to a manual wheelchair to hold food and drink. The table is engineered to be lightweight, small enough to fit in a backpack, hold a wine glass, and prevent food from sliding off its surface when the wheelchair goes over bumps. The thesis documents the design of the table- it is a simple, contemporary design made primarily of aluminum and vinyl. Preliminary mockups were built to test and refine the table concept and key details, while a detailed digital model for the final design was developed. Because the market for such a product is very small, the table will be manufactured by CNC machining and it will cost upwards of $100.

Design the Manual Wheelchair to Electric Wheelchair Taylor & Francis

This book provides a wide spectrum of readers with comprehensive but easily understandable protocols for the assessment and training of wheelchair skills. The Wheelchair Research Team at Dalhousie University and the Capital District Health Authority in Halifax (lead by the author) have focused on wheelchair safety and performance for three decades, as exemplified through the Wheelchair Skills Program. This is considered the top such program in the world. This new book is largely based on this program which has been accessed and utilized by over 75,000 people in 177 countries since 2007.

Wheelchair Skills Assessment and Training CRC Press

The guidelines focus on manual wheelchairs and the needs of long-term wheelchair users. The recommendations are targeted at those involved in wheelchair services, ranging from design and planning, to providing or supplying wheelchairs and their maintenance.

Seating and Wheeled Mobility Pro Juventute
Ensure successful wheelchair prescription. This practical, pocket-sized book will guide you through the wheelchair prescription process utilizing a real-world, easy-to-understand approach. Through this approach you will learn how to successfully evaluate and recommend a wheelchair for your patients.
Manual Wheelchairs--a Guide DIANE Publishing
For the manual wheelchair (MWC) user, loss of lower extremity function often places the burden for mobility and activities of daily living on the upper extremities. This e-book on Wheeled Mobility Biomechanics contains current research that provides insights into the mechanical demands and performance techniques during tasks associated with MWC. Our intent was to contribute to advancing the knowledge regarding the variables that promote or hinder an individual ' s capacity to handle the daily manual wheeled mobility demands and gain greater insights into upper extremity loading consequences, predictors of pain onset and injury, and ultimately identify strategies for preserving health and functional mobility for the MWC user.
Guidelines on the Provision of Manual Wheelchairs in Less Resourced Settings Patient-Centered Guides
Manual wheelchairs are commonly used for everyday mobility among people with lower limb impairments, including persons with spinal cord injury (SCI). Manual wheelchair users often experience pain and chronic overuse injuries in their upper extremities, limiting their mobility and their ability to complete daily activities. The

repetitive trauma of propelling a wheelchair may be a contributing factor to upper extremity pain and injury. The anatomy of the upper extremities is not designed for the number of repetitions and the amount of force involved in everyday wheelchair propulsion. Research has been conducted to identify recommendations for decreasing the number of repetitions and the amount of force involved with manual wheelchair propulsion; however, training on how to use a wheelchair, specifically propulsion training, is often not implemented during rehabilitation. Important steps in identifying strategies for teaching wheelchair propulsion and skills include exploring devices for training, understanding health care professional and wheelchair user perspectives of wheelchair training, and training based on motor learning approaches. Therefore, the overall goal of this project was to further explore methodology for training of new manual wheelchair users. To this end, we conducted three studies (Chapters 2-4). In study 1 (Chapter 2), we tested a wheelchair dynamometer roller system, the WheelMill System (WMS), on its use in simulating different surfaces (i.e., overground and ramps) and assessing propulsion variables that can be used for training new wheelchair users. We identified that the WMS has the ability to accurately simulate flat overground movement; however, the accuracy of the WMS was poor in simulation of ramps. Modifications to the software model and the addition of visual feedback may improve the accuracy of the simulation of ramps. The WMS was accurate in the quantification of biomechanical propulsion variables. In study 2 (Chapter 3), we identified perspectives of health care professionals and

manual wheelchair users to assist in prioritizing the focus of wheelchair skills training of new manual wheelchair users. During focus groups, health care professionals and manual wheelchair users discussed if and how wheelchair propulsion biomechanics were taught and important skills that should be included in training. Results indicate that propulsion biomechanics were introduced but not addressed in detail. Important training components discussed include propulsion techniques, transfers in an out of the wheelchair, providing maintenance to the wheelchair, and navigating barriers such as curbs, ramps, and rough terrain. Health care professionals and manual wheelchair users identified many of the same skills as important but ranked them in a different order. In study 3 (Chapter 4), we piloted a wheelchair training program implementing aspects of motor learning for new manual wheelchair users and measured the impact of this program on wheelchair propulsion biomechanics and overall wheelchair skills. Post-training wheelchair biomechanics changed, as well as propulsion performance overground. Wheelchair skills did not change significantly post-training. Wheelchair training has the potential for change; however, there are many challenges associated with implementing training programs for new manual wheelchair users. Together, these results contribute knowledge to evidence-based approaches to teaching new manual wheelchair users with SCI how to efficiently and effectively use their wheelchairs. Specifically, we obtained information about technology for simulating and assessing manual wheelchair propulsion, perspectives of stakeholders with

regard to the manual wheelchair training process, and methodology for training new manual wheelchair users.

The Wheelchair Evaluation

Mobility is fundamental to health, social integration and individual well-being of the human being. Henceforth, mobility must be viewed as being essential to the outcome of the rehabilitation process of wheelchair dependent persons and to the successful (re-)integration into society and to a productive and active life. Many lower limb disabled subjects depend upon a wheelchair for their mobility. Estimated numbers for the Netherlands, Europe and USA are respectively 80.000, 2,5 million and 1,25 million wheelchair dependent individuals. Groups large enough to allow a special research focus and conference activity. Both the quality of the wheelchair, the individual work capacity, the functionality of the wheelchair/user combination, and the effectiveness of the rehabilitation programme do indeed determine the freedom of mobility. Their optimization is highly dependent upon a continuous and high quality research effort, in combination with regular discussion and dissemination with practitioners. The book intends to give a state of the art view on the current fundamental, clinical and applied research findings and their consequences upon wheelchair propulsion, arm work, wheelchair training and possible consequences of a wheelchair confined life style. Also its implications for rehabilitation, as well as alternative modes of ambulation and activity in the wheelchair confined population, such as functional electrical stimulation and its possible future developments, are dealt with.

A Guide to Obtaining and Repairing Manual Wheelchairs

Manual wheelchairs are generally designed with a fixed frame, which is not optimal for every situation. Spontaneous changes in seating configuration can ease transfers, increase participation in social activities, and extend reaching capabilities. These changes also shift the centre of gravity of the system, altering wheelchair dynamics. In this study, rigid body models of an adjustable manual wheelchair and test dummy were created to characterize changes to wheelchair stability and maneuverability for variations in backrest angle, seat angle, rear wheel position, user position, and user mass. Static stability was evaluated by the tip angle of the wheelchair on an adjustable slope, with maneuverability indicated by the ratio of weight on the rear wheels. Dynamic stability was assessed for the wheelchair rolling down an incline with a small bump. Both static and dynamic simulations were validated experimentally using motion capture of real wheelchair tips and falls. Overall, rear wheel position was the most influential wheelchair configuration parameter. Adjustments to the seat and backrest also had a significant impact on both static and dynamic stability. For wheelchairs with a more maneuverable (or 'tippy') initial configuration, dynamic seating changes could be used to increase stability as required.

Turning Characteristics and Stability of Manual Wheelchairs on a Slope

Details the prescription considerations for individuals with physical disabilities. Compares conventional and lightweight wheelchairs, and factors in functional assessment. Examines the

technical aspects of seat cushion selection, factors that affect the ergonometrics of wheelchair operation, and the influence of powered mobility. Also covers wheelchair standards and current directions in wheelchair research. Appendix covers "Types of Wheelchairs". Over 100 photos, charts and drawings. Index.

Manual Wheelchairs

Seating and Wheeled Mobility: A Clinical Resource Guide presents clinical assessment considerations when working with a person with a disability who may need wheelchair seating for postural support, skin integrity, or a wheelchair base to best meet dependent or independent mobility needs. Michelle L. Lange and Jean Minkel have designed this text to support occupational and physical therapists, complex rehabilitation technology suppliers, and even third-party payers who are interested in wheelchair seating and mobility assessment and applications. Seating and Wheeled Mobility provides a wide spectrum of information from foundational information for those practitioners who are new to the field to in-depth, population-specific information for practitioners who perhaps have not worked with a particular population in the past. Information sharing, opportunities for demonstration and trial, and patience on the part of the clinician working with the person with a disability are all critical precursors to the actual process of making equipment recommendations. Seating and Wheeled Mobility is divided into sections, each addressing a different area of clinical practice. The first section is an in-depth presentation of the assessment process and the critical understanding of pressure management needed by the clinical team when working with a client population who rely on wheeled mobility. The second section focuses on postural support. Also included is a completely updated method to measure and describe the seated person and related

support surfaces needed when recommending a device. The third section lays the foundation for clinical decision making around the assessment for and application of the most appropriate wheeled mobility device. The fourth section provides in-depth clinical applications for each category of mobility devices. Also addressed is proper documentation to assist in the funding of these devices. The fifth section provides population-specific information regarding the clinical application of position, pressure management, and functional mobility as it applies to the pediatric, geriatric, and bariatric populations, as well as persons with both degenerative and complex neuromuscular impairments. The last section presents additional considerations when working with persons who are aging with a disability, environmental assessments, transportation, and the application of standards. Seating and Wheeled Mobility: A Clinical Resource Guide provides the depth and breadth of the clinical practice of wheelchair seating and mobility to both those who are new to the field, as well as seasoned professionals.

The market for wheelchairs : innovations and federal policy

The longtime wheelchair user and ergonomics consultant guides the reader through the selection process, covering the different features and options available, wheelchair maintenance, and wheeling techniques.

Basic Manual Wheelchair Adjustments

The Rolling Resistance and Power Requirements of a Manual Wheelchair on a Number of Outdoor Surfaces

Choosing a Wheelchair

The Wheelchair Evaluation

Manual Wheelchairs - a Guide

Modelling the Stability and Maneuverability of a Manual

Wheelchair with Adjustable Seating