

WHO'S RESTRAINING WHOM? BARRIERS IN WHEELCHAIR PROVISION FOR THE ELDERLY

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A person in a seated position must be stable and secure in order to maximize functional potential. The use of physical restraints is in direct opposition to the principle of autonomy. When prescribing mobility devices, the chair design must address physical, perceptual, cognitive and social needs. A secure and comfortable seated position must be created in order for a functional movement to begin. Once movement begins, it must be stress free and “do no harm” to the client’s physical and emotional sense of well being. If this does not occur, a client will tend to slide out of position during mobility. As a result, the client no longer attempts activity and often restraints are applied to “hold” them in the chair. Manual, wheeled mobility needs to be provided in a manner that will not only address the physics of movement, but also maximize positioning and postural control with gravity assistance. Improperly prescribed mobility devices can result in clients not realizing their potential, because they have not been provided with the opportunity to prove a difference in functioning.

Have you ever asked yourself, “should I use a regular wheelchair or dynamic tilt in space”, when working with a client who requires increased positional support. What is the impact that each modality has on functionality and can it alter how your client functions overall in the end? Too often tilt in space may be ordered as an easy way to “keep a client in their chair” and as a result, many long term care facilities have considered tilt in space to be a form of restraint. Is it a restraint or a method of positioning?

A good mobility evaluation involves assessment and consideration of many client factors including physical, functional and lifestyle. These and many other factors play a role in determining the prescription of seating components and wheelchair frames/design. How do product design features meet specific client needs? How do you know what cushion or back will work the best and once installed, does the chair design and set up really make a difference? How do you balance the client’s needs and wants for function with theoretical concerns for pressure management and postural support? Establishing a list of priorities and goals is essential in developing a mobility system that will not only meet the client’s physical needs, but also address functional and lifestyle concerns. Just as important is the need to ensure that the prescribed wheelchair and seating system is set up appropriately on delivery. As well, it is important that care givers are trained on the set up of the chair, functioning of the client in the chair, and transfers into the wheelchair in order to maximize positioning and function. With respect to education, can we learn from what we do on a daily basis? Do our past mistakes help us to learn more about how positioning affects mobility, and how that combination affects functionality?

The wheelchair should be considered for adjustability in centre of gravity, wheel access, as well as floor access for foot propulsion which can be altered by changing the anterior/posterior tilt of the chair or seating. Seat depth and width will affect positioning as well as seat to back angles and overall chair orientation in space. Armrest height is important for trunk control and may need to be adapted higher or lower than “standard” armrest heights. Footrest positioning is very critical. Too often this is the last “set up” of the chair when indeed it may fully change the whole seated position. Consider under cuts on the seating with a shorter wheelchair seat/frame depth to allow for foot loading on 90 degree footrests while a lightly longer upper cushion length will still support the thigh. Custom hangar attachments may be considered to allow for the footrests to be angled in order to accommodate a windswept position.

When considering manual wheelchair mobility one must investigate varying methods of propulsion and the benefits of each and the requirement to maximize set up for performance. Ensuring the appropriate prescription and set up of a manual wheelchair will ultimately preserve function and

posture, reduce the use of restraints and promote a sense of well being and quality of life for our clients. The prescription and functionality of lightweight adjustable axle wheelchairs, as well as manual dynamic tilt wheelchairs must be reviewed for safety, agitation reduction and self propulsion. When looking at chair frame design and weight it is important to remember the client's balance point within the chair as well as safety with propulsion. Remember that centre of gravity is affected by axle position, caster placement, and caster orientation and is with respect to the client's centre of gravity when they are sitting in their final seated orientation and seating system. Centre of Gravity refers to the "Balance Point" of an individual's Centre of Mass in relation to the wheelchair. C.O.G. is affected by axle position, caster placement, and caster orientation as well as the placement of the seating system in the wheelchair. Changing the axle position forward or back, will affect rolling resistance and change propulsion efficiency. It can also change turning radius, downhill turning tendencies and caster flutter. The axle position also changes the hand contact angle or the availability of handrim surface area used by the client in propulsion. This can alter the amount of muscle effort used by the client, joint excursion, and stroke frequency.

Seat to floor heights as altered by the rear axle and caster placement will also change the biomechanics of propulsion. A lower seat position can improve push biomechanics by greater hand contact with the handrim changing the upper extremity range of motion requirements. Adjusting the wheelchair configuration to each individual client allows the wheelchair to enhance postural support which is critical for optimal functioning of the client.

Propulsion technique is often determined by amount of supported sitting or stability provided once seated support is determined. It is critical to observe if mobility is maintained or changed. Manual propulsion can occur in a variety of manners.

Environment, speed, distance and time are critical factors in determining if a client is to use manual propulsion or power. Foot vs. hand propulsion will change the configuration and set up of a wheelchair as well as the seating components required for support. If

the above factors are not considered for each individual elderly client, then you have put them in a restraining wheelchair...regardless if they have a seatbelt in place or not!

References:

1. Buck, Sheila. More Than 4 Wheels: Applying clinical practice to seating, mobility and assistive technology. 2009. Revised 2017

Speaker Bio:

Sheila is an Occupational Therapist from Ontario, Canada and has been actively working in the field of seating and mobility for over 20 years. She provides consultation, assessment and treatment in the area of seating & mobility, accessibility, and ergonomics, through her company Therapy NOW!. Sheila has spoken extensively across Canada, the US and Ireland on seating and mobility issues. She has also authored, "More Than 4 Wheels: Applying Clinical Practice to Seating, Mobility and Assistive technology", a practical guide to seating and mobility for dealers, manufacturers and therapists interested in the field of assistive technology.