

NEW WHEELCHAIR OR NEW SOLUTIONS?

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- 1) Plan
 - a) Review the more commonly seen postural challenges in those with an SCI and review the basics of a mobility seating evaluation
 - b) Address 10 areas of wheelchair and seating system that can be considered with a few simple, cost-effective interventions in each area for the more commonly seen postural issues. Look at what effect each has and cautions to consider.
- 2) Objectives
 - a) Attendees will be able to list several of the more common postural challenges in those with SCI (and other disabilities) and the basics of a mobility seating evaluation
 - b) Attendees will be able to list ten areas of wheelchair and seating system that can be considered for interventions
 - c) Attendees will be able to list at least two interventions for each of the ten areas addressed and how each can effect posture
- 3) Why not just order a new wheelchair
- 4) The First Step - A GOOD EVALUATION
 - a) What are the issues? Common postural challenges in SCI.
 - b) What are the goals? What is preventing achievement of those goals?
 - c) Evaluate the client
 - d) Evaluate the chair
- 5) Seat to Floor Angle
 - a) What does this effect?
 - i) More anterior angle
 - (1) Encourages anterior rotation of pelvis and, thereby, enhances trunk extension
 - (2) More dynamic position
 - (3) Encourages sliding forward on seat
 - ii) More posterior angle
 - (1) Encourages posterior pelvic rotation
 - (2) More stable position
 - (3) Assists in keeping pelvis back in seat
 - (4) Can improve thigh support
 - (5) Can help to neutralize pelvic rotation in anterior rotation
 - b) How can we accomplish?
 - i) Adjust axle housing
 - ii) Adjust seat frame
 - iii) Add wedge under cushion
 - c) Cautions
 - i) Skin- Transfers weight distribution
 - ii) Increasing seat angle and height may affect functional skills
 - iii) Increasing front seat height may affect access
 - iv) Decreasing seat angle may encourage sliding forward
 - v) May affect propulsion positively or negatively
 - vi) Anterior angle may create fatigue

- 6) Back Angle
 - a) What does this effect?
 - i) More open
 - (1) Increases seat depth
 - (2) Allows more freedom of movement of arms
 - (3) Allows gravity to assist balance
 - (4) Accommodates for fixed or functional kyphosis and for lack of hip flexion
 - ii) More closed
 - (1) Decreases seat depth
 - (2) Gives more upright posture
 - (3) Decreases extension tone
 - b) How can we accomplish?
 - i) Adjustable back angles
 - ii) Bent backposts
 - c) Cautions
 - i) Opening may make reaching more difficult
 - ii) Opening may encourage forward head positioning
 - iii) Closing may decrease stability anteriorly
- 7) Back Height and Gap
 - a) What does this effect?
 - i) Gap
 - (1) Increased
 - (a) Allows pelvis to move back into the chair
 - (b) Can assist with rotating pelvis when tilting
 - (c) Can allow room for extra tissue
 - (2) Decreased can assist in neutralizing anterior rotation
 - ii) Height
 - (1) Too high can restrict scapular and upper extremity movement
 - (2) Too low doesn't provide adequate support for trunk and/or for scapula
 - (3) If user is not stable, he/she will sacral sit
 - (4) If scapula retract over top of back when tilted, user will probably acquire significant pain
 - b) How can we accomplish?
 - i) Move back up/down if physical height of back is adequate
 - ii) Modify
 - iii) Switch to another back that is shorter, taller, or shaped differently
 - iv) Loosen flap and/or upholstery straps at bottom
 - c) Cautions
 - i) Be sure gap does not allow pelvis to rotate and move back so much that they become an anterior rotator
 - ii) Assure that back has sufficient padding to avoid excessive pressure on sacrum and/or PSIS
 - iii) Assure thoracic and scapular area are supported sufficiently in both upright and tilted/reclined position
- 8) Foot/Leg Rest Position
 - a) What does this effect?
 - i) Bringing feet back takes stretch off hamstrings

- ii) Bringing footrests in can help to control abduction and rotation and decrease pressure on hangers
- iii) Bringing footrests down can increase leg support and bring legs in to more neutral position
- iv) Bringing footrests up can level out thighs to keep person from sliding forward on seat
- v) Improves foot support by adjusting amount of contact
- vi) Shortens overall length if foot/legrests, feet are brought back
- b) How do we accomplish?
 - i) Loosen, lengthen, move heel loops (or remove them if good calf strap)
 - ii) Adjust footplates back and in
 - iii) Loosen or lengthen calf strap/pad
 - iv) Switch from elevating legrests to standard
 - v) Lower footplates or raise cushion front for support under thighs
 - vi) Move hangers back
- c) Cautions
 - i) Make sure heels clear casters
 - ii) Make sure there is sufficient ROM in knees, ankles, hips or feet will slide forward off footrests
 - iii) Make sure ground clearance is sufficient
 - iv) Make sure knees aren't too high for necessary access
 - v) Make sure feet are well supported
- 9) Pelvic Guides
 - a) What do these affect?
 - i) Keep hips centered in wheelchair
 - ii) If obliquity is long-standing or created by function/spasticity should consider even if it does not appear pelvis is shifting
 - iii) Decreases windswept positioning
 - b) How do we accomplish?
 - i) Adding to wet-weather guards
 - ii) Adding to armrest panel
 - iii) Adding lower lateral
 - iv) Constructing removable pad
 - v) Constructing non-removable pad
 - vi) Teaching positioning
 - c) Cautions
 - i) If tendency is to shift strongly, need to be sure it is well padded
 - ii) If contour or height is not sufficient, pelvis may shift over onto it
 - iii) If too thick, may over correct
 - iv) Instruction is essential for proper use
 - v) May prevent armrest from flipping back
- 10) Cushion Modifications
 - a) What do these effect?
 - i) Positioning and support of legs
 - ii) Control, stability, positioning, and support of pelvis
 - iii) Improvement in pressure distribution for comfort and skin integrity
 - iv) Decreases risk of trauma
 - b) How do we accomplish?
 - i) Commercially available accessories

- ii) Custom
 - (1) Strategically placed and sized foam will add contour to cushion
 - (2) Modifications
 - (3) Manufacturer mods
 - iii) Cautions
 - (1) Additions and subtractions create pressures- be sure there is sufficient protection
 - (2) Assure mods do not effect function such as adductor wedges impacting transfers
 - (3) Assure mods do not impact skin for clients who sit differently on cushion for some activities
 - (4) Assure add-on is sufficient to control
- 11) Trunk Supports
- a) What do these effect?
 - i) Correction of scoliosis, leaning
 - ii) Stability/Safety for mobility and function
 - iii) Balance
 - iv) Ability to use upper extremities
 - v) Comfort
 - vi) Decrease in fatigue
 - vii) Decrease ability to move
 - viii) Stability versus mobility
 - b) How do we accomplish?
 - i) Commercially available
 - ii) Custom Mods
 - iii) Contoured Backs
 - iv) Corsets
 - c) Cautions
 - i) Need to be adjustable in all planes
 - ii) May need 3 points of control
 - iii) Evaluate in dynamic as well as static postures when determining placement
 - iv) May require extra padding for pressure relief
 - v) Need to slowly correct or accommodate for tight or fixed postures
 - vi) Need to be monitored for fit with any changing of clothing and weight
 - vii) Need to increase wearing time on corsets
 - viii) May need to be swingaway for functional tasks
- 12) Lumbar/Pelvic Supports
- a) What do these effect?
 - i) Can control posterior rotation of pelvis
 - ii) Support lumbar curve
 - iii) Can decrease anterior rotation of pelvis
 - b) How do we accomplish?
 - i) Commercially available add ons/ins
 - ii) Adjustable upholstery
 - iii) Custom manufactured
 - c) Cautions
 - i) Assure flexibility of lumbar spine
 - ii) Placement/Size
 - iii) Upper trunk balance
 - iv) Skin

13) Armrests and Drive Control

- a) What do these effect?
 - i) Reaching can cause rotation, scoliosis, anterior collapse, and pain
 - ii) Too close can cause shoulder and wrist strain from hyperextension
 - iii) Too low can exaggerate subluxation and encourage scoliosis
 - iv) Too high can cause shoulder and neck pain
 - v) Insufficient support can cause pain and leaning
 - vi) Can widen or narrow for improved fit
- b) How do we accomplish?
 - i) Joystick
 - ii) Armrests
 - iii) Pads
- c) Cautions
 - i) Asymmetry

14) Headrests

- a) What do these effect?
 - i) If inadequate neck control, headrest should support head in all directions, control asymmetry
 - ii) Use of head switches can encourage asymmetry
 - iii) If adequate neck control, the headrest should just support the head when in a tilted or reclined position
 - iv) Too far forward will encourage forward head position, rounding of shoulders
 - v) Too far back will encourage cervical extension, problems with swallowing, visual field, pain
- b) How do we accomplish
 - i) May need to reverse the standard bracketry configuration
 - ii) Most headrest hardware allows for adjustment on multiple planes
 - iii) Can add on lateral pads or reposition
 - iv) Can switch to different size, contour of pad
 - v) Can change switches to opposite side
 - vi) Baseball cap anterior control
- c) Cautions
 - i) This should be the last thing that is addressed
 - ii) Teach client that if headrest isn't correct, they probably aren't positioned correctly
 - iii) Anything that encourages asymmetry should be switched side to side frequently if possible (switches, breath controls, etc.)
 - iv) Unless client doesn't have neck control, shouldn't contact in upright position

15) Conclusions and questions

Speaker Bio

Cindy Smith, PT. Out-Patient Therapy Coordinator at Craig Hospital in Englewood, CO. Has been in the Out-patient SCI program at Craig for over 17 years and is an integral team member in both Seating/Positioning Clinic and Skin Clinic