WHEELED MOBILITY ASSESSMENTS: GUIDELINES + A CASE STUDY

Jenna Kazmaier, SPT

Complex seating evaluations

Monsters Inc. Wallpaper. FanPop. http://www.fanpop.com/clubs/monsters-inc/images/34550940/title/monsters-inc-wallpaper. Accessed March 25, 2016.

OBJECTIVES

- **Make seating evaluations less scary!**
- Provide students an outline of **10 steps** for performing wheeled mobility assessments.
- Utilize a case study, CZ, to highlight key steps in the process.
- Address key subjective and objective components to a comprehensive wheeled mobility assessment.
- Help students gain understanding of common seating issues, causes and appropriate solutions.

The Accessible Icon Project. http://accessibleicon.org/. Published 2011. Accessed March 25, 2019.

MEET CZ

MEET CZ

- 30 year old male
- High speed MVA in 2007 - ejected through windshield.
- Sustained R-hemisphere TBI.
- Has not walked or stood independently since 2011.
- Current Mental Status: Rancho Los Amigos Level VI (confused-appropriate)

Old chair →

MEET CZ

- CZ can assist with ADLs
  - Min-A with rolling in bed
  - Mod-A with supine to sit
  - Mod-I with feeding/drinking
  - Mod-I with sitting balance
  - Max-A for posterior scooting

STEP ONE

Identify whether the patient needs wheeled mobility

HOW DO YOU KNOW IF SOMEONE NEEDS WHEELED MOBILITY?

A few considerations:

1. The patient is **non-ambulatory**
2. The patient is at a **high risk of falls** with ambulation in the home and/or in the community
3. Wheeled mobility would **significantly improve a person's level of independence** with mobility and ADLs

HOW DO YOU KNOW IF SOMEONE NEEDS WHEELED MOBILITY?

4. **Vitals** are in unsafe ranges during ambulation
5. Functional **incontinence** due to increased time with ambulation
6. The mobility limitation ***cannot*** **be resolved with a lesser assistive device** like a walker, cane, etc.
7. The individual will be **bed-bound without** appropriate wheeled mobility.

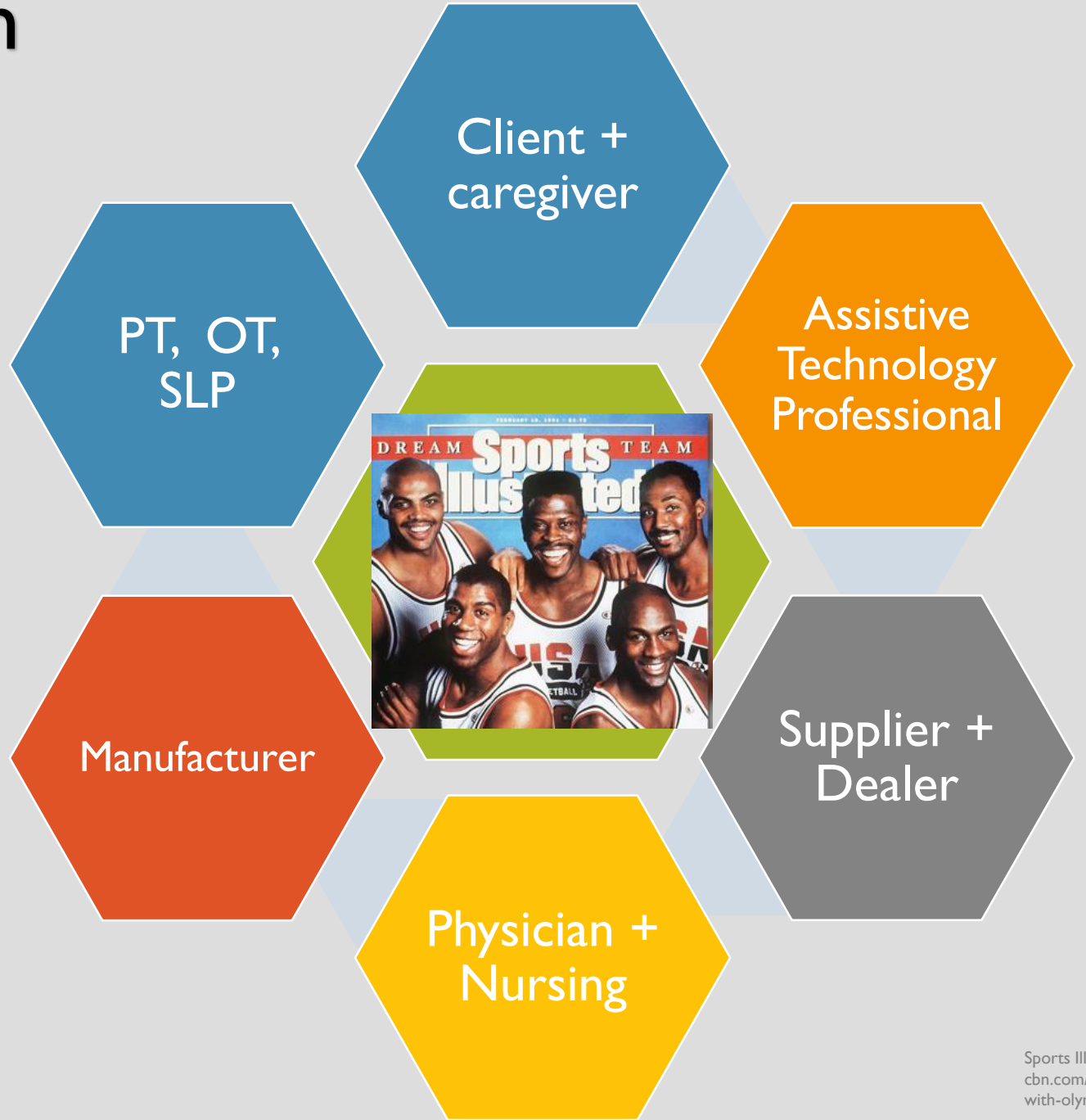
REFLECT… DOES CZ NEED WHEELED MOBILITY?

- YES
- Mainly due to inability to ambulate independently or with another assistive device
- Unfortunately, CZ spends the majority of his day either in bed or in a chair – thus, providing him with an appropriate wheelchair allows him (with assistance) to navigate his environment and socialize with others as often he desires.

STEP TWO: TEAMWORK

A team of professionals is required for proper seating evaluation and justification to insurance

Dream Team



Sports Illustrated. "Dream Team." ABS-CBN News. https://news.abs-cbn.com/sports/08/08/17/watch-25-years-ago-dream-team-capped-historic-run-with-olympic-gold. Published August 9, 2017. Accessed March 25, 2019.

STEP THREE: THINK

Prepare yourself to think throughout your evaluation: "**HOW AM I GOING TO JUSTIFY THIS TO INSURANCE?"**

STEP FOUR: UNDERSTAND THE SEATING OPTIONS

K0001-K0005

Manual Tilt-in-Space

Powered Mobility

K0001

Standard height, sling-back and seat – intended for short-term use. Very heavy.

KN-700T Standard Wheelchair. Karman Healthcare. https://www.karmanhealthcare.com/product/kn-700t/. Accessed on March 25, 2019.

K0002

Hemi-height, sling seat and back, slightly lower seat-to-floor height – intended for short-term use. Very heavy.

K0003

Slightly more lightweight chair, with a lower achievable seat-to-floor height – still intended only for short-term use.

Light Weight Deluxe K0003 Wheelchair. HealthMegaMall. https://www.healthmegamall.com/prodView-Light-Weight-Deluxe-K0003-16-Seat-Width-Lt-Wt-Padded-Fixed-Full-Armrests-Black-FrameUpholstery_c11432_p87125.htm. Accessed on March 25, 2019.

K0004

The client requires adjustments and accommodations to seat dimensions not achievable by a basic wheelchair. The client utilizes the chair >2 hours/day and is unable to perform ADLs in a basic chair. Appropriate for longer term usage.

K0005

The client utilizes wheelchair full-time, requires customization (like camber angle, seat-to-back angle changes) which are not achievable by k0001-k0004.

Sharpe, L. K0004 and K0005 wheelchairs, from: Determining the Most Appropriate Mobility Base: Manual Wheelchair Comparison. Permobil. https://hub.permobil.com/blog/determining-the-most-appropriate-mobility-base-manual-wheelchair-comparison. Published July 19, 2018. Accessed March 25, 2019.

Manual Tilt-In-Space

Appropriate for an individual dependent for mobility and pressure relief, with need for custom seating adjustments for postural support, respiratory support, and safe positioning for swallowing.

Quickie Iris. Sunrise Medical. http://www.sunrisemedical.com/manual-wheelchairs/quickie/tilt-in-space-wheelchairs/iris?lang=en-CA#prettyPhoto. Accessed on March 25, 2019.

Power Chair

Appropriate for an individual who is unable to independently propel a manual wheelchair due to ROM, coordination, strength or pain issues. Furthermore, a powered mobility device must significantly improve their independence with ADLs.

Invacare TDX SP Power Wheelchair. Invacare. http://www.invacare.com/cgi-bin/imhqprd/inv_catalog/prod_cat_detail.jsp?prodID=TDXSP-CG. Accessed on March 25, 2019.

CZ's chair: **manual tilt-in-space**

40° of tilt allows caregivers to assist in pressure relief, and help to reposition CZ's pelvis

PRESSURE RELIEF[1–4]

Recommendations:

- ≥ 25° **tilt**

or

- 15°-25° **tilt** + 120° **recline**

- Every 20-30 minutes for 2 minutes, recommended for pressure relief.

STEP FIVE: FUNCTIONAL TESTING

Subjective questions and objective tests to consider administering

Categories:

Skin Integrity	Toileting	Respiration
Communication	Vision + Hearing	Cognition + Behavior
Mobility	Transfers	ROM + Strength

Skin Integrity[1,5]

- Can individual independently pressure relieve?
- Braden Scale for Predicting Pressure Sore Risk
- Sensation Testing
  - protective = 10g
- History of wounds
- How are they toileting?

Toileting[6]

- Use of briefs? Skin checks
- Posterior pelvic tilt? This increases pelvic floor resting tone, reducing the ability to void.
- Are they using intermittent catheterization?
  - Must be able to tilt back in their chair to perform this.

Respiration[7]

- Note respiration status
  - Vent? O2 dependent?
- Kyphotic posture:
  - reduces lung capacity
  - reduces expiratory flow
  - makes coughing/clearing more difficult

Communication

- Do they need communication mounts?
  - Work with an SLP
- Head position in chair – does their head position allow forward facing gaze for optimal communication?

Vision + Hearing

- Assess cranial nerves I, III, IV, VI, VIII
- Assess vision in lower-lighting settings
- Is there a shift in their vertical midline causing a head tilt?

Cognition + Behavior[8,9]

- Are they safe to drive a power chair or manual chair?
- The Test of Non-Verbal Intelligence Exam (TONI-3)
- The Power Mobility Screening Tool – assesses focus & concentration
- Test comprehension, digit-span recall

A NOTE ON COGNITION/BEHAVIOR

- Making this choice requires a **team**, and it can be very difficult
- The previous outcome measures are guides – they do not have set cut-points for deciding whether someone is appropriate for power mobility vs. a manual tilt-in-space.
- CZ was provided a manual tilt-in-space (as opposed to power) for several reasons:
  - Safety concerns at his residence – SNF
  - Rancho los amigo level 6 – confused appropriate. Judgement remains impaired and he demonstrates variable carry-over for new tasks.
  - Difficulty/fatigue with tasks requiring extended concentration.
  - Lower frustration tolerance.

Mobility

- Level of independence or assistance with:
  - Sitting Balance
  - Standing Balance
  - Ambulation
- Falls history
- Shoulder/UE ROM if self propelling (or using joystick)
- Use of orthotics

Transfers

- Level of independence with transfers
- Footrests + armrests need to be easily removable by client or caregiver

ROM + Strength

- ROM and strength tested in various positions:
  - Supine
  - Seated upright
  - Tilted back
- If tilted back for pressure relief, can they lift their arm against gravity to reach joystick?

  If so, may need additional head controls

STEP SIX:
SUPINE MAT ASSESSMENT[10]

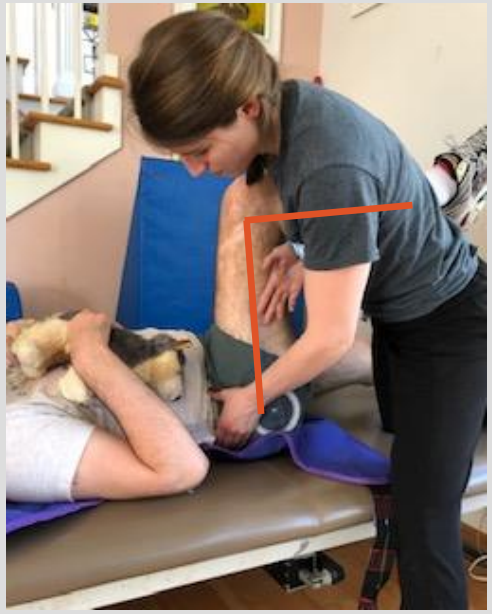
While taking measurements, consider how reflex activity, muscle tone, ROM limitations and orthopedic asymmetries impact positioning

PART ONE – MEASURE HIP FLEXION[10,12]

Directions:

- ✓ Keep knees flexed to 90° & hand on ASIS.
- ✓ Flex hip just until you feel a posterior pelvic rotation. STOP.
- ✓ Extend hip slightly out of posterior pelvic tilt until neutral (or a slight anterior pelvic rotation).
- ✓ Measure hip flexion at this angle

GOAL – this gives the **seat-to-back angle**



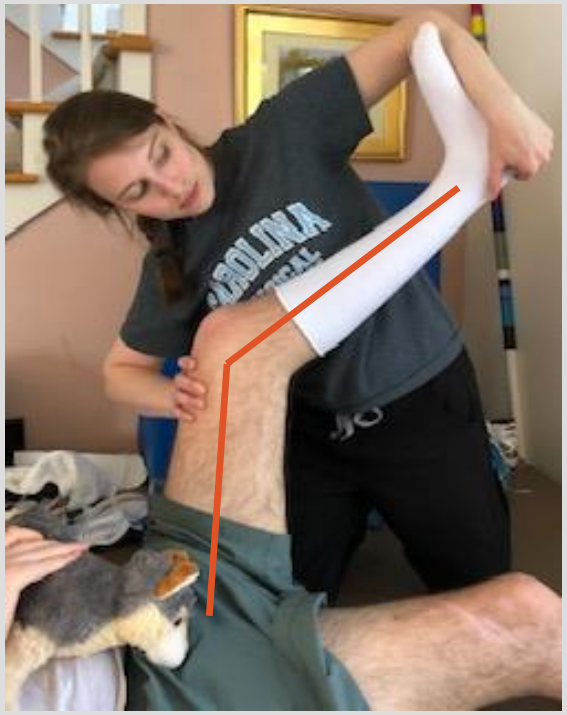
83° on the left

90° on the right

PART TWO – MEASURE KNEE EXTENSION[10,12]

Directions:

- ✓Situate patient in supine with hips flexed to the previously found angle from part one, and knees flexed to 90°.
- ✓Keep that hip angle and extend knees slowly until you feel either hamstring tightness or a posterior pelvic tilt. Measure.



GOAL *- Helps determine* ***knee angle in seated***

50° on the right
47° on left

PART THREE – MEASURE ANKLE DORSIFLEXION[10,12]

Directions:

- ✓With hips flexed (to angle in step one) and knees flexed, measure available dorsiflexion.

GOAL *- This will be utilized for* ***foot plate angle.***

Note:
CZ utilizes custom AFOs which accommodate and support his foot shape

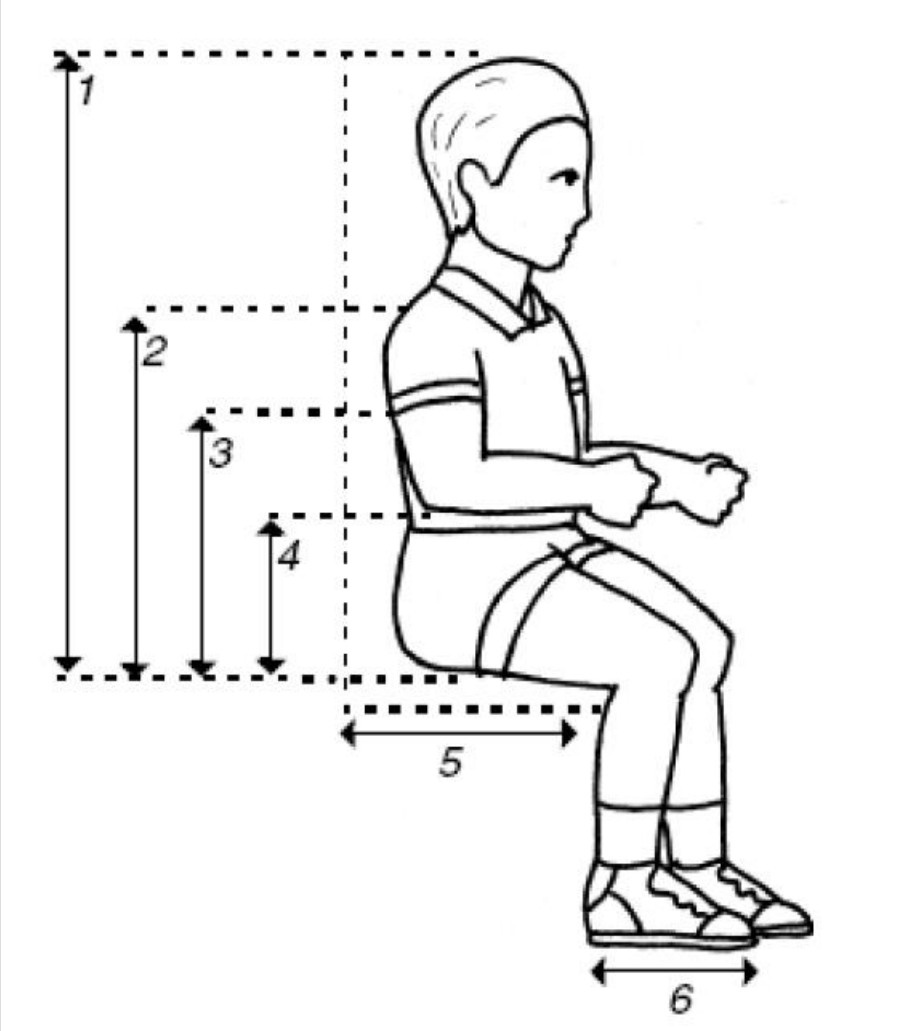
PART FOUR – OTHER THINGS TO CHECK[12]

- ✓ **Reflex activity:** ATNR can cause postural changes and asymmetries
- ✓ **Pelvic Symmetry** – Find both ASIS and look for any rotations or obliquities
- ✓ **Lateral Flexibility of Spine** – Compare bilaterally. More movement unilaterally may indicate curvature development (scoliosis).

STEP SEVEN: SEATED MEASUREMENTS

Take note, the ATP will commonly be assisting with (or doing) these measurements

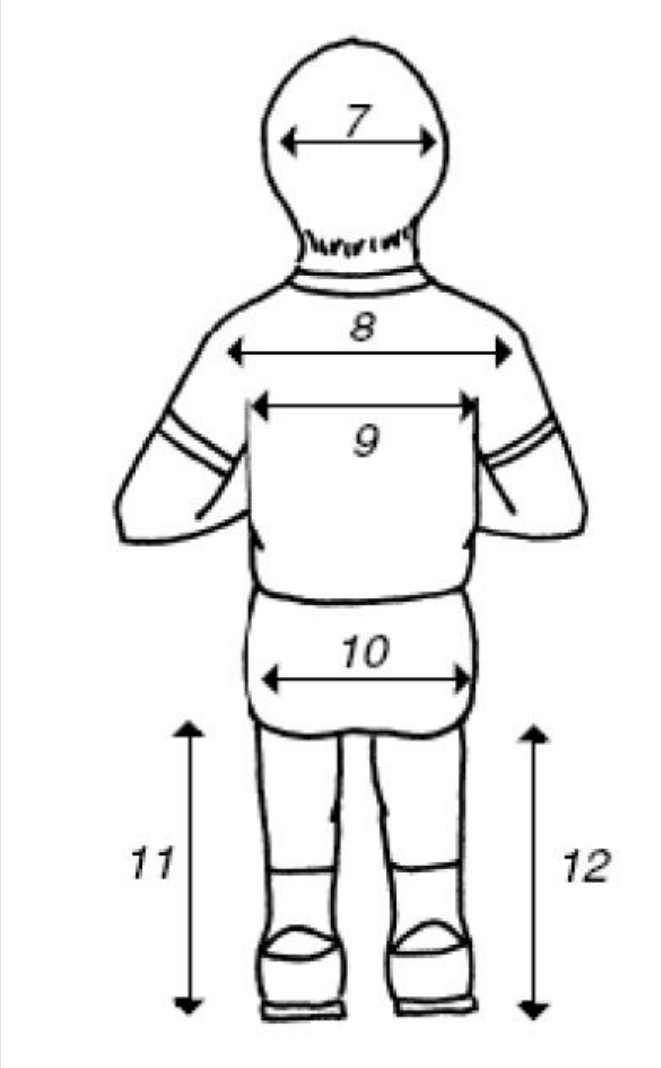
MEASUREMENTS[10,11]



- 1 – distance from seat to top of head
- 2 – distance from seat to top of shoulder
- 3 – distance from seat to inferior angle of scapula
- 4 – distance from seat to iliac crest
- 5 – upper leg length (typically subtract 2”)

Functional Mobility & Wheelchair Assessment. Houston Methodist Hospital. Published 2015. Available at: https://www.numotion.com/blog/october-2017/best-practice-houston-methodist-functional-mobili. Accessed March 25, 2019.

MEASUREMENTS[10,11]



- 7 – head width
- 8 – shoulder width
- 9 – chest width
- 10 – hip width
- 11 – lower leg length (left)
- 12 – lower leg length (right)

Functional Mobility & Wheelchair Assessment. Houston Methodist Hospital. Published 2015. Available at: https://www.numotion.com/blog/october-2017/best-practice-houston-methodist-functional-mobili. Accessed March 25, 2019

STEP EIGHT: POSTURAL ASSESSMENT[10,12]

Pelvis, Spine, Head

Distal control starts with a well aligned pelvis

PART ONE – **THE PELVIS**

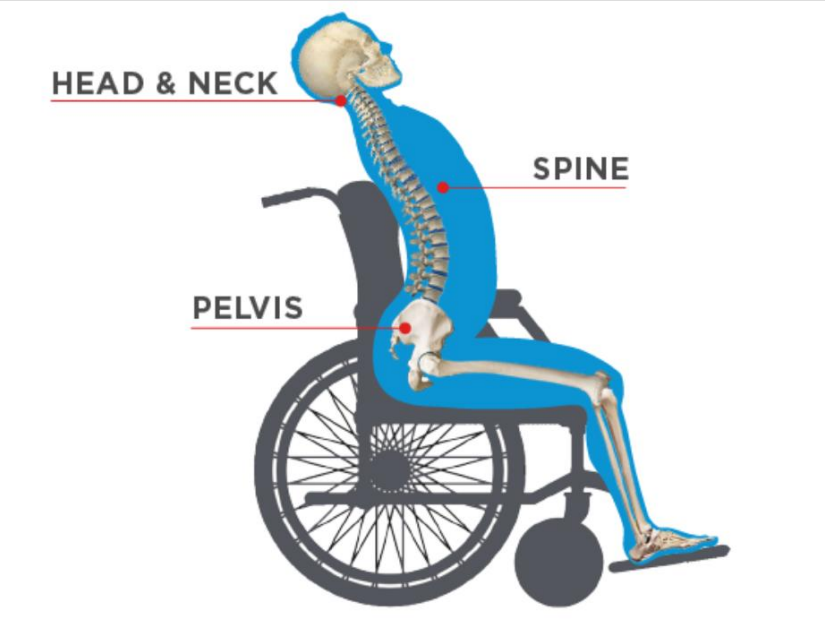
<u>4 main pelvic abnormalities to look for:</u>

1. Anterior Pelvic Tilt
2. Posterior Pelvic Tilt
3. Pelvic Rotation
4. Pelvic Obliquity

Are these postures **FIXED** or *flexible*?

- If fixed – accommodate the chair for proper positioning
- If flexible – reposition to find pelvic neutral

ANTERIOR PELVIC TILT
POTENTIAL PROBLEMS[10,12,14]



Mullis S, Endsjo A, and Sharpe L. Anterior pelvic tilt. Permobil. https://hub.permobil.com/wheelchair-seating-and-positioning-guide. Published 2017. Accessed on March 25, 2019.

- Pressure at the pubic symphysis & coccyx
- Hyperextension of cervical & thoracic regions
- Upward gaze reduces social interaction
- Increased risk of aspiration
- Hip flexor contractures

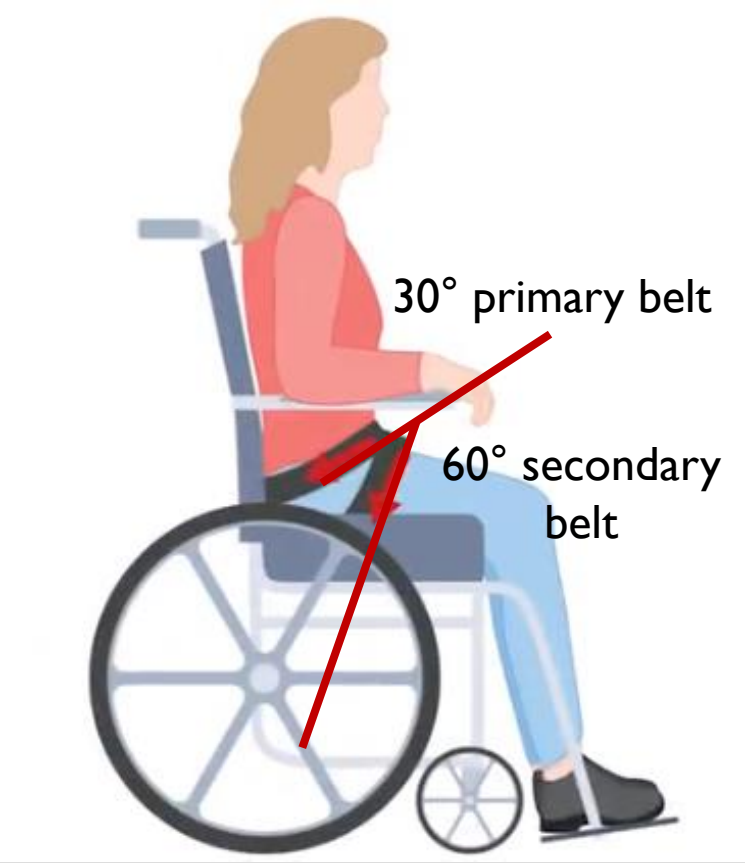
ANTERIOR PELVIC TILT
CAUSES + SOLUTIONS[10-14,19]

CAUSES

- Low muscle tone
- Muscle weakness
- Lordosis

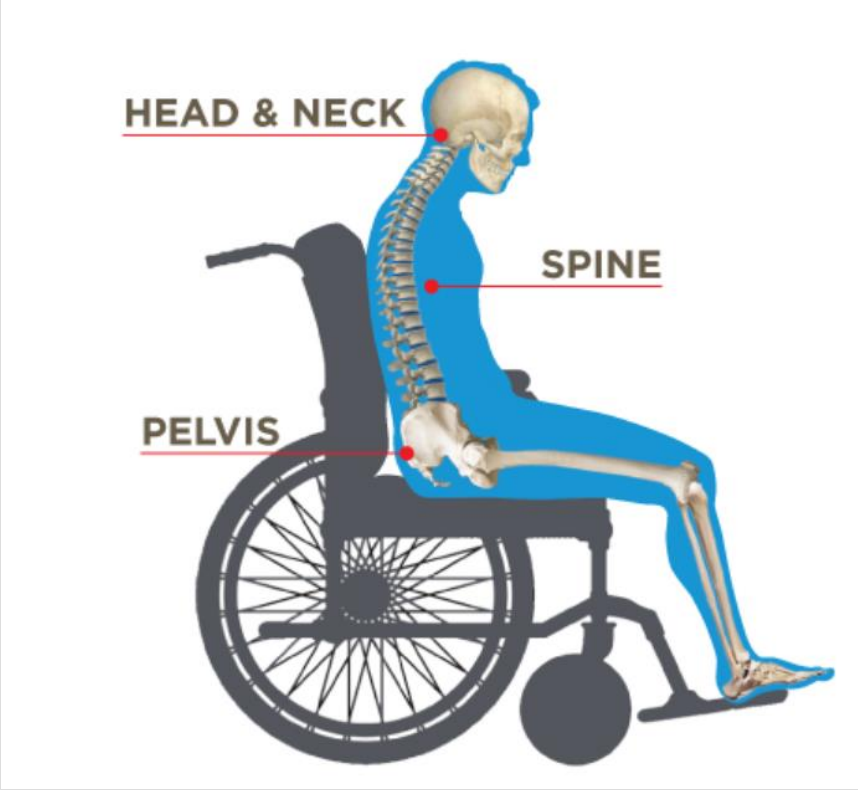
SOLUTIONS

- Four-point pelvic positioning belt
  - Primary belt placed at a 30° angle
  - Secondary belt at 60° to maintain the angle of the primary belt.
- Belly Binder or abdominal panel.
  - Contacts lower ribs and ASIS
  - These can also assist with respiration.



Lang, M. Pelvic Positioning Guide. MedBridge. Available at: https://www.medbridgeeducation.com/. Accessed on March 25, 2019.

POSTERIOR PELVIC TILT
POTENTIAL PROBLEMS[2,10,12,14-15]



Mullis S, Endsjo A, and Sharpe L. Posterior pelvic tilt. Permobil. https://hub.permobil.com/wheelchair-seating-and-positioning-guide. Published 2017. Accessed on March 25, 2019.

- Kyphosis
- Shallow breathing, pneumonia risk
- Difficulty clearing lung secretions
- Risk of sacral pressure sores
- Constipation + difficulty voiding
- Downward gaze reduces communication

POSTERIOR PELVIC TILT
CAUSES + SOLUTIONS[3-4,10,12]

Causes	Solutions
Low abdominal tone	• Biangular back (standard angle is 7°)
Tight hamstrings	• Open seat to back angle AND/OR: • Decrease thigh to calf angle
Wheelchair depth is too long	• Correct the length! Typically, depth is the distance from posterior buttock to popliteal fold MINUS 2 inches.
Limited hip flexion	• Open seat to back angle >90°

POSTERIOR PELVIC TILT
CAUSES + SOLUTIONS[3-4,10,12]

Causes	Solutions
Sliding forward on seat	• Contoured seat • Angle pelvic belt at 60° • Ability to tilt back to prevent sliding
Extensor tone	• Pelvic positioning belt at 60° • Anti-thrust seat • Increase **flexor synergy** with hip + knee flexion, hip abduction and ankle DF

POSTERIOR PELVIC TILT
SOLUTIONS (CONTINUED)

Contoured seat or anti-thrust seat, prevents forward sliding

Clinical benefits of Tilt-In-Space. Medical Products Group. https://www.mpg-inc.net/tilt-in-space-wheelchair.htm. Accessed on March 25, 2019.

Pelvic belt angled at 60° prevents forward sliding of femurs and posterior tilt of pelvis

Lange, M. Pelvic Positioning Belts. Seating Dynamics. https://www.seatingdynamics.com/2017/11/15/bread-butter-dynamic-backs-pelvic-positioning-belts/. Published November 15, 2017. Accessed on March 25, 2019.

PELVIC ROTATION
POTENTIAL PROBLEMS[12,14,16]

- Asymmetric position in chair – one ASIS more forward
- Spine rotates in same direction as pelvis
- Causes cervical lateral flexion

Mullis S, Endsjo A, and Sharpe L. Pelvic Rotation. Permobil. https://hub.permobil.com/wheelchair-seating-and-positioning-guide. Published 2017. Accessed on March 25, 2019.

PELVIC ROTATION
CAUSES + SOLUTIONS[12,14,16]

Causes	Solutions
ROM limitations in hip	• Attempt to find pelvic neutral. • If minor windswept posture required for an trunk/head alignment, its OK. • If major windswept posture, can use combo of medial + lateral knee blocks. • Use pelvic belt at 60° angle. **Direction of pull important**. Tighten the belt down on the side rotated forward.
Scoliosis	• Attempt to find pelvic neutral, allow some windswept posturing of LEs while ensuring client's head is forward for communication
Unequal thigh length (due to hip dislocation, heterotrophic ossification)	• Create asymmetric seat depths for each femur
ATNR (or other reflex activity)	• Break the tone pattern: Increase hip abduction, hip flexion and ankle DF through molded cushioning and seat angle

PELVIC ROTATION + WINDSWEPT POSTURE

Problems:

1. Anterior rotation of right pelvis
2. Windswept posture (IR + adduction of R LE and ER + abduction of L LE)
3. Right pelvis shifted laterally

PELVIC ROTATION + WINDSWEPT POSTURE

Solutions:

1. **Medial knee block** for the right leg to reduce pelvic anterior rotation and internal rotation at hip (windswept posture).
2. **Lateral knee block** for the left leg reduces external rotation at hip (windswept posture).
3. **Lateral block** at right hip to prevent lateral shift

PELVIC OBLIQUITY
POTENTIAL PROBLEMS[11-14,16]

- One ASIS sits higher, causing lateral flexion of spine toward higher ASIS
- Scoliosis
- Poor positioning for communication

Sherman, S. Practical Seating Considerations-Pelvic Obliquity. Sunrise Medical. http://www.sunrisemedical.ca/blog/practical-seating-considerations-pelvic-obliquity. Published March 18, 2011. Accessed on March 25, 2019.

PELVIC OBLIQUITY
CZ

- Right ASIS higher
- Head and thoracic spine laterally flex to the right
  - This prevents him from falling left

PELVIC OBLIQUITY
CAUSES + SOLUTIONS[11-14,16]

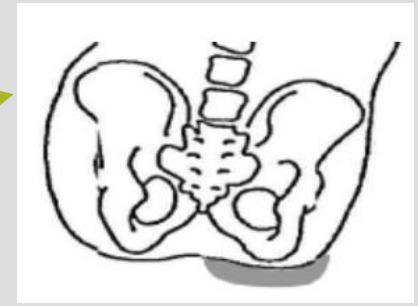
CAUSES

- Scoliosis
- ATNR
- Orthopedic issues: surgeries, leg length discrepancies, heterotrophic ossification
- Uncomfortable
- Windswept posture

SOLUTIONS

- If **FIXED** –
- Add a wedge under the **higher** ischial tuberosity
- If ***flexible*** –
  - Add a wedge under the **lower** ischial tuberosity.
  - Utilize **a four-point belt** with primary belt over femurs (labeled a 90° angle) and add a secondary belt if a pelvic tilt exists as well.

Sherman, S. Pelvic Obliquity. http://www.sunrisemedical.ca/blog/practical-seating-considerations-pelvic-obliquity. Published March 18, 2011. Accessed March 20, 2019.

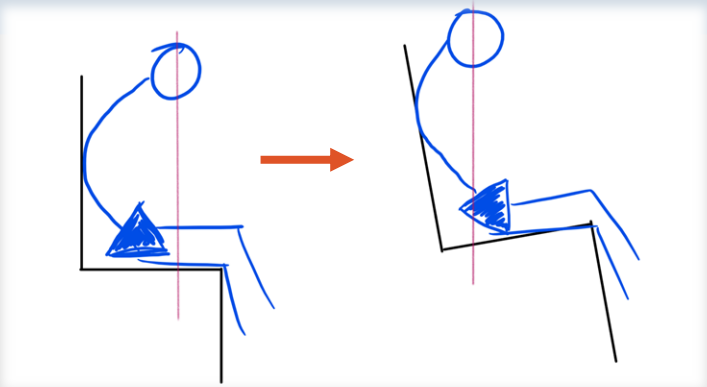


4 Point Padded Centre-Pull Hip Belt. Spex. https://www.spexseating.com/products/pelvic-positioning/4-point-padded-centre-pull-hip-belt. Accessed on March 25, 2019.

PART TWO: **THE SPINE**
KYPHOSIS[12,14]

Fixed

Goal: Align head over pelvis
- Posterior tilt of chair
- Open seat to back angle



10° posterior chair tilt can help align head over pelvis

Flexible

- Utilize anterior and posterior trunk support, like this 'H-style shoulder harness' (also called shoulder straps) which do not restrain glenohumeral ROM, and help extend trunk.

H-Style Shoulder Harness. BodyPoint. https://www.bodypoint.com/ecommerce/product/shns/h-style-shoulder-harness. Accessed on March 25, 2019.

THE SPINE:
SCOLIOSIS[12,16,17]

Fixed

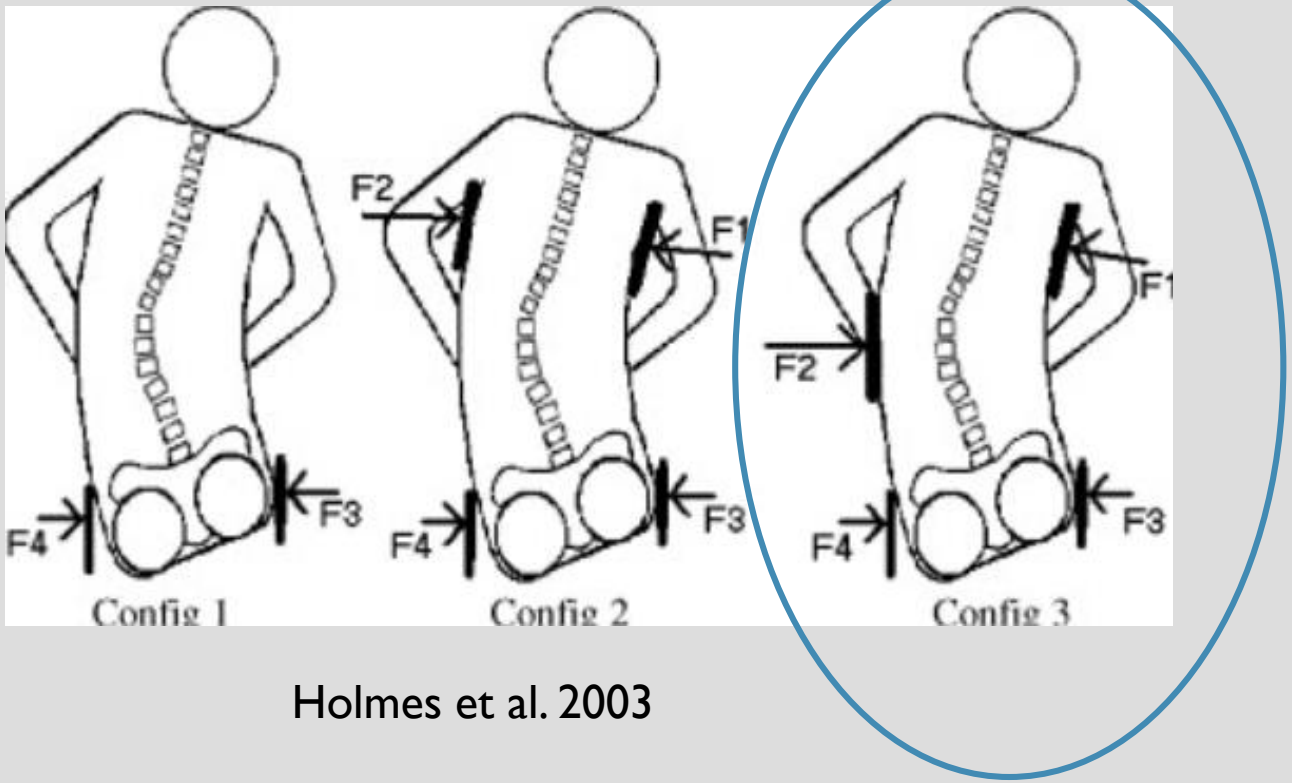
- A fixed scoliosis can result from long-term pelvic rotation.
- Solution: allow the client to face forward, even if that means their pelvis must remain slightly rotated.

Flexible

- Find neutral pelvis that still allows the trunk and head to face forward

THE SPINE: **SCOLIOSIS**[17]

- Use of a 3-point force correction system is evidenced as the superior seating system to manage scoliosis.
- Corrects a **flexible** deformity, without worsening a pelvic obliquity. If **flexible** pelvis, would also build up cushioning under the lower IT.



Holmes et al. 2003

Holmes KJ, Michael SM, Thorpe SL, Solomonidis SE. Management of scoliosis with special seating for the non-ambulant spastic cerebral palsy population--a biomechanical study. *Clin Biomech (Bristol, Avon)* 2003;18(6):480-487

SPINE CURVATURE:
CZ

During the mat assessment, try hand placements to correct the patient's posture – these hand placements will ultimately become guides in the chair.

Hint – two people really helps. One person can facilitate his LEs, while the other facilitates the trunk.

PART THREE:
THE HEAD[12]

KEYS:

- Positioning the pelvis and trunk **first** helps find the optimal head/balance relationship
  - Head needs to be aligned over pelvis so client has forward gaze for communication
- Use broad surface areas/larger head rests for better pressure distribution

POTENTIAL CAUSES OF **POOR HEAD POSITION**[12,18]

Causes	Solutions
Hyperextension of neck (possibly due to tone or reflex activity)	• Tighten shoulder strap system (reducing kyphosis, aligns head) • Change pull of gravity by opening seat-to-back angle OR tilt (or both) • Suboccipital support in addition to occipital support
Decreased head control or decreased tone	• Use of lateral supports, suboccipital supports and occipital supports • Use of devices like the i2i system
Visual midline shift	• Work with a behavioral optometrist in addition to above solutions

EXAMPLES OF **HEAD SUPPORTS**[18]

Whitmyer Headrest Systems. Permobil. https://permobil.co.nz/whitmyer-headrest-systems. Accessed on March 25, 2019.

Whitmyer headrest system, with occipital support AND sub-occipital support. **Prevents hyperextension.**

I2i system – great for someone with **poor head control**. Supports sub-occipital and lateral portions of head. Has optional anterior (in red) chin support.

I2i Upper Torso Support Series. Stealth Products. https://stealthproducts.com/about/i2i-upper-torso-system. Accessed on March 25, 2019.

CZ HEAD POSITION

- Able to achieve a more neutral cervical position in a **gravity minimized position**.
- A more supportive head support like the i2i might be beneficial for easing him into a more neutral position in sitting, as long as his pelvis and trunk were aligned in neutral.
- **HOWEVER:** CZ would need continual repositioning of his pelvis/trunk in order to use an i2i… which may not be feasible with so many rotating caregivers.

STEP NINE: THE EXTREMITIES

Now that the pelvis, spine and head are properly aligned, think about optimal extremity positioning to assist with ADLs.

LOWER EXTREMITY[12,16]

Joint	Problem	Solution
Hip	Reduced hip flexion, causing posterior pelvic tilt	Open seat to back angle
Hip	Increased hip flexion (tone or range)	Utilize straps at foot plate for LE position
Hip	Pain when 'properly' seated	Assess ROM limitations. If allowing some excess hip adduction (or abduction) provides relief in hip flexion for optimal seating, that is OK

LOWER EXTREMITY[12,16]

Joint	Problem	Solution
Hip & knee	Tight hamstrings, causing posterior pelvic tilt	Decrease thigh-to-calf angle and/or increase seat-to-back angle
Hip & Knee	Extensor tone, causing increased hip adduction and internal rotation, as well as "knock knees"	Contoured seat with medial knee block (should not contact the groin and should be either removable or swing-away for transfers)
Hip & Knee	Increased hip abduction, excessive knee out angle	Lateral knee block (broad contact) or lateral thigh block

LOWER EXTREMITY ELEVATING LEG RESTS[3,4,12]

Elevating leg rests (ELRs) – controversial

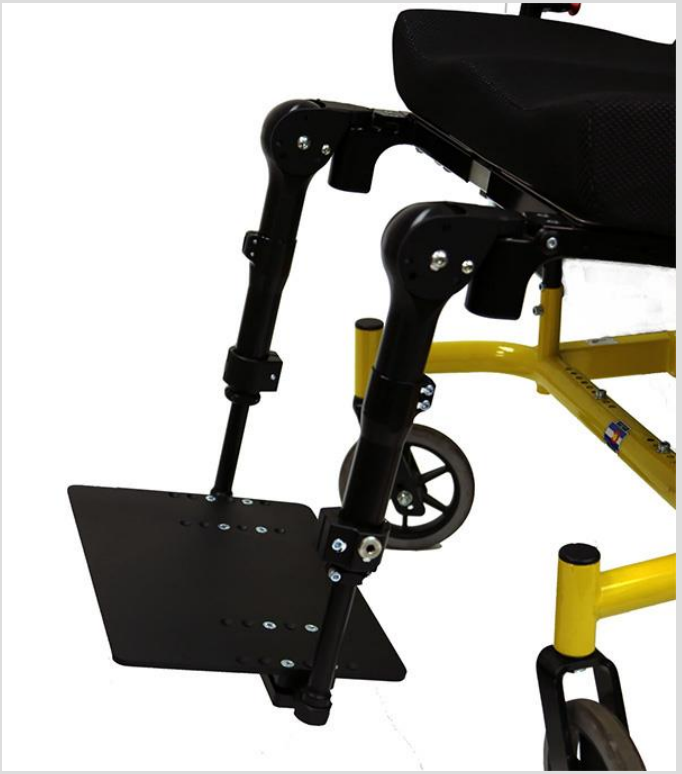
- **Tight hamstrings? Posterior pelvic tilt?**
  - ELRs will likely only worsen this problem.
  - ***Articulated*** ELRs may prevent the tilt.
- **Edema?**
  - LEs need to be ≥30cm above the heart.
  - Thus, need tilt + recline + ELRs to achieve this

CZ's non articulated ELRs do not withstand the force he exerts on them. When elevated without seat tilt, they prevent full femoral contact on his seat.

LOWER EXTREMITY FOOT PLATES[12]

- **Separate footplates** – two, separate footplates, angled differently
  - Good if knee flexion ROM differs bilaterally
- **Dynamic footrest hanger** – allow an individual to push into a non-rigid, energy absorbing footplate(s).
  - Reduces effect of stretch reflex
  - Makes footrest more durable
- **Adjustable footplates** – to accommodate PF, DF, inversion and eversion
  - Helps evenly distribute pressure

Dynamic Footrest Hanger
*** Can have two, separate ones**



Dynamic Footrests. Seating Dynamics. https://www.seatingdynamics.com/footrests/dynamic-wheelchair-footrests/. Accessed on March 20, 2019.

UPPER EXTREMITIES[12,19]

Problematic Postures	Potential Causes	Solutions
Shoulder protraction • Can lead to GH subluxation	Kyphotic posture Low or high tone	- Shoulder straps (like the H-strap from Bodypoint) - Shoulder retractors
Shoulder retraction • Can lead to anterior GH dislocation	Startle reflex Increased tone Compensation to extend trunk	- Posterior supports behind scapula to promote some forward flexion - Forearm straps*
Elbow extension • Can lead to elbow dislocation	ATNR or startle reflex Extensor tone	Elbow trough for positioning - Forearm straps*

* Forearm straps: RESNA recommends these as a last resort, as they can be restraining.

STEP TEN:
JUSTIFY IT ALL TO INSURANCE

IMPORTANT COMPONENTS

- Diagnosis + History
- Neuromuscular status – sensation, tone, reflexes
- Pain
- Mobility-related ADLs
- Social and living situation
- Seating and positioning recommendations
- Goals achievable with seating system

KEY TAKEAWAY FOR LETTERS OF JUSTIFICATION

- Every component or part needs to be justified in a functional context.
- Denial does not *necessarily* mean "no." It may just mean more details are required for justification.

EXAMPLES OF JUSTIFICATION

- **Bodypoint PivotFit Shoulder Harness**. Anterior support required to correct kyphotic posturing which increases aspiration risk, reduces swallowing and independent feeding ability, and reduces communication ability.
- **3" padded, removable arm rest**. 3" wide armrest required for upper extremity support to reduce current shoulder subluxation. Removable armrests required to maximize independence with transfers. Padded component required to prevent pressure injuries over bony prominences.

TAKEAWAYS

CZ's Chair and
Major Challenges

CZ'S CHAIR SOLUTIONS

- Use of lateral trunk supports
  - Increases trunk stability to maintain upright position
  - Can help prevent scoliosis
- Use of right hip guide
  - Prevents right hip from shifting laterally
- Use of lateral knee guides
  - Can help reduce excessive hip abduction, which may cause posterior pelvic tilt

ANOTHER VIEW

Right hip guide

Knee guides

Lateral trunk guides

CZ'S CUSHION

VICAIR Adjuster X Cushion

Vicair Adjuster X Cushion. Available at: https://www.medicaleshop.com/comfort-company-adjuster-x-cushion-with-vicair-technology.html. Accessed on April 5, 2019.

- Similar style as a ROHO cushion, with independently adjustable chambers (filled with individual air-filled pockets).
- This allows accommodation for pelvic asymmetries like posterior pelvic tilt and pelvic obliquities.

MAJOR CHALLENGES:

- **Perfect alignment all the time is often not reality**
  - CZ moves A LOT. Once his pelvis shifts, the rest of his body moves as well.
    - This makes head supports tricky – unless his pelvis is **always** well aligned, his head won't contact a head support.
    - Even with the best thought out system, the patient may not look perfect on a daily basis.

MAJOR CHALLENGES:

- **Parts break:**
  - CZ imposes strain with his stronger leg onto the leg rest, causing damage.
  - CZ lives in a SNF, with a lot of rotating staff who are unfortunately not trained in specific maintenance/care for his chair.
  - **Consider simplicity** when choosing parts – all caregivers should be able to adjust parts and help patient reposition.
  - Getting parts fixed can take weeks – months ☹
    - Often takes some ingenuity & advocacy from family
      - Currently his leg rests are held together by a bungee cord!

WHEELED MOBILITY ASSESSMENTS: TAKEAWAYS

- A **mat assessment** provides valuable information and allows you to determine whether postures are **fixed** or **flexible.**
- The **pelvis is the key** for trunk control and distal extremity functional control.
- **Head position** is critical to optimize **communication** and social ability.
- Work as an **interdisciplinary team**! An ATP in particular is a critical team member.

TAKEAWAYS FROM CZ

- ✓ Educating caregivers and family regarding positioning is crucial to make the most of his positioning in the seated system.
- ✓ Minimizing seating components (and keeping them simple) helps CZ, who has many caregivers involved.
- ✓ He is active and his equipment needs to be durable!
- ✓ Ultimately, CZ's wheeled mobility needs to optimize his ability to participate in daily life ☺

A "thumbs up" from CZ

THANK YOU!

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