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WHAT MAKES UP A SEATING SYSTEM?

CLINICAL CONSIDERATIONS FOR MATCHING CLIENT TO PRODUCT

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ALPINE | OCTOBER 4, 2024



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FACULTY DISCLOSURE

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 - Inpatient SCI rehab, Amputee inpatient rehab, wheelchair prescription writing, gait training, outpatient neuro
- Current Clinical Education Specialist, Motion Composites
- Based in Phoenix, Arizona
- Grew up in MO → MU Grad → GO CHIEFS & TIGERS

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GREETINGS FROM MOTION COMPOSITES INDUSTRY AWARDS



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MOTION COMPOSITES

MISSION, VISION & VALUES

“LEAD THE EVOLUTION OF MOBILITY FOR BETTER LIVING”

“DELIVER GLOBAL **OPERATIONAL EXCELLENCE** FROM INNOVATIVE DESIGN TO END USERS”



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EVIDENCE BASED PRACTICE

OUR FOUNDATION

CLINICAL EXPERTISE

BEST RESEARCH EVIDENCE

PATIENT VALUES

EBP

Integrating individual clinical expertise with the best available external clinical evidence from systematic research.
-David Sacket, 1996

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LEARNING OBJECTIVES

AT THE END OF THIS COURSE:

1. Interpret three critical measurements for back support and cushion prescription.
2. The participant will differentiate three properties of back supports and cushions and understand the clinical impact for the client.
3. Explain two examples of how positioning affects elements of wheelchair use, user health, participation in ADLs and valued occupations.

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IDEAL SEATED POSITION

- Slight anterior pelvic tilt
- Level pelvic landmarks
- Neutral rotation of the femurs
- Normal lumbar curves
- Neutral trunk alignment
- Level shoulders, squarely positioned over the hips
- Neutral cervical spine

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WHAT HAPPENS WHEN IT DOESN'T FIT?

- Sliding forward
- Pelvic Obliquity
- Scoliosis
- Kyphosis
- Pressure injuries
- Difficulty breathing
- Decreased independence
- Fatigue
- What about your own chair right now?

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FUNCTIONALLY WHAT HAPPENS WHEN IT DOESN'T FIT?

- Inappropriate wheelchairs can cause adverse consequences to physical functioning, safety, quality of life, and vocational and economic standings. (Eggers, 2009)
- Significant impact on:
 - Mobility
 - Transfers
 - Home access
 - Socialization
 - Economic standing
 - Mental health
 - Physical health



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PRESSURE INJURY RISK

Risk Factors

- Age / the elderly
- Previous injury
- Inability to weight shift or reposition
- Friction and shearing occurring (bed)
- Decreased sensory perception or altered sensation
- Decreased nutrition
- Moisture/Incontinence
- Cognition
- Co-morbidities
- Lifestyle
- Poor Pressure Management

RESOURCES

- Braden scale
- Norton
- NPUAP – *National Pressure Ulcer Advisory*
- CAWC – *Canadian Association of Wound Care*
- PMAT – *Pressure Management Assessment Tool*

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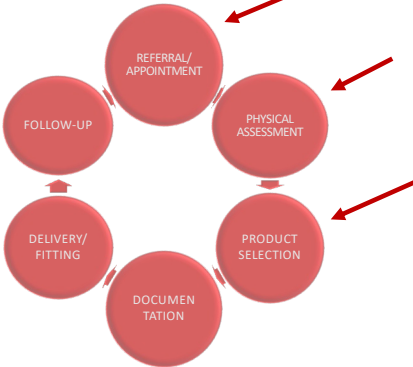
SEATING IS A SNAPSHOT IN TIME



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SEATING ASSESSMENT




A good understanding of the first three steps will give you the confidence for the last 3 steps.

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WHAT IS THE OVERALL MOBILITY GOAL?

- Independent mobility
 - Power vs manual
- Assisted mobility
 - Manual vs tilt in space
- Dependent mobility
 - Manual full support vs tilt in space



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CAN SEATING & MOBILITY BE LOOKED AT IN SILOS?

- Mobility Base
- Cushion
- Back Support

“for the seat to be fully functional, it needs to be in harmony with the backrest. The seat provides the base of stability, the backrest stability and balance for function. While seating is always the essential first step, it is always essential to think beyond the seat.”

Engström, B., & Engström, B. (2002). Ergonomic seating, a true challenge : seating and mobility for the physically challenged : risks & possibilities when using wheelchairs / Bengt Engström. Posturalis Books.

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24-HOUR POSITIONING

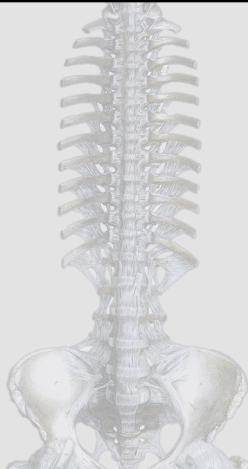
mobility management

24-Hour Follow Through

August 1, 2021 by Laurie Watanabe

- 24-hour positioning plan
- Wounds - not always the wheelchair's fault
- Clients are in unsupported position in bed for numerous hours

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PHYSICAL ASSESSMENT

Anatomy & Presentation

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MEASUREMENT & FINDINGS ASSESSMENT FORM

MEASUREMENTS IN SITTING

Left	Right		
A	B	Buttock thigh depth	J
B	C	Lower leg length	K
C	D	Foot length	L
D	E	Ischial depth	M
E	F	Seat to elbow height	N
F	G	PSIS height	O
G	H	Inferior scapular height	P
H	I	Neck height	
I		Shoulder height (top)	
		Overall width (asymmetrical width for windowed legs, scoliotic posture or other postural asymmetry)	Overall depth (leg length discrepancy, accommodates adipose tissue or other posture)

This section completed by: Physician/Clinician Supplier ATP Supplier ATP on a separate document (check all that apply)

Wheelchair and Seating Evaluation: Jessica Presperin Pedersen, Jill Sparacio, Mike Babinec, Julie Piramo (2003,2007, 2014, 2018)

WC EVAL

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CORRECTABLE vs. NON-CORRECTABLE

- No longer "fixed vs "flexible" asymmetries
 - Correctable vs non-Correctable
 - Reducible vs non-reducible
- Fixed implies intervention is not needed
- Intervention may be unable to correct, but might be able to keep from progressing
- Accommodation

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PELVIC LANDMARKS

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Anatomy of the Pelvis

Female

Male

IT Width

- Female
 - ~ 5.1in (13.6 cm)
- Male
 - ~ 4.7 in (12 cm)

Fig. 1.27 Structure of the bony pelvis. A. In women. B. In men. The angle formed by the pubic arch can be approximated by the angle between the thumb and index finger for women and the angle between the index finger and middle finger for men as shown in the insets.

Standing, S., & Gray, H. (2008). *Gray's anatomy: The anatomical basis of clinical practice*. Edinburgh: Churchill Livingstone/Elsevier.

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The Ischial tuberosities are approximately 1.75 - 2.5 inches (4.45 - 6.35 cm) below the greater trochanters



RELATIONSHIP OF TROCHATER TO IT

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PELVIC POSITIONS

POSTURE in SITTING

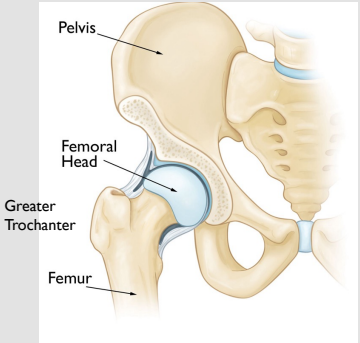
P E L V I S	Anterior / Posterior			Obliquity (viewed from behind)			Rotation - Pelvis			COMMENTS Tonal Influence Pelvis:
	Neutral	Posterior	Anterior	WFL	L low (Obliquity)	R low (Obliquity)	WFL	Right Anterior	Left Anterior	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> Non-Reducible (Fixed) <input type="checkbox"/> Partly Reducible <input type="checkbox"/> Reducible (Flexible) <input type="checkbox"/> Self <input type="checkbox"/> External Force <input type="checkbox"/> Tendency away from neutral			<input type="checkbox"/> Non-Reducible (Fixed) <input type="checkbox"/> Partly Reducible <input type="checkbox"/> Reducible (Flexible) <input type="checkbox"/> Self <input type="checkbox"/> External Force <input type="checkbox"/> Tendency away from neutral			<input type="checkbox"/> Non-Reducible (Fixed) <input type="checkbox"/> Partly Reducible <input type="checkbox"/> Reducible (Flexible) <input type="checkbox"/> Self <input type="checkbox"/> External Force <input type="checkbox"/> Tendency away from neutral			<input type="checkbox"/> Normal <input type="checkbox"/> Paralysis <input type="checkbox"/> Flaccid <input type="checkbox"/> Low tone <input type="checkbox"/> High tone <input type="checkbox"/> Spasticity <input type="checkbox"/> Dystonia <input type="checkbox"/> Pelvic thrust <input type="checkbox"/> Other:
Comments										

Wheelchair and Seating Evaluation: Jessica Presperin Pedersen, Jill Sparacio, Mike Babinec, Julie Piriano (2003,2007, 2014, 2018)

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FEMUR LANDMARKS

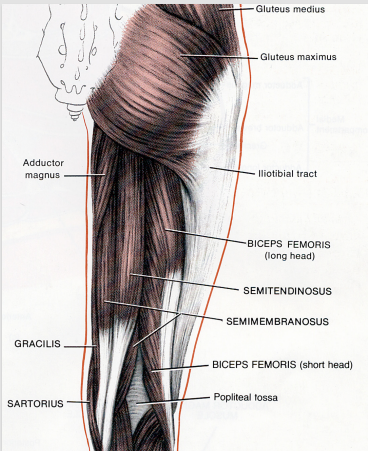
- Greater Trochanter
- Check abduction/adduction
- Rotation



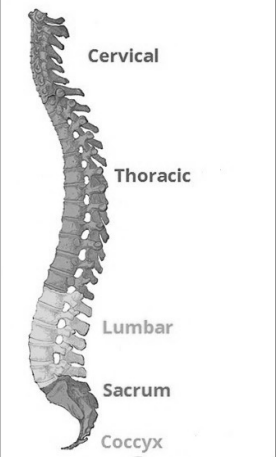
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INFLUENCE OF THE LOWER EXTREMITIES

- Strongly influences pelvic mobility
- Example: Tight hamstrings
 - Affect the amount of isolated hip flexion
 - May promote sacral sitting
- MUST be considered for backrest selection



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NORMAL SPINAL CURVES



- Cervical Lordosis
- Thoracic Kyphosis
- Lumbar Lordosis
- Sacral Kyphosis

Did the client ever develop normal spinal curves?

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ABNORMAL SPINAL CURVES

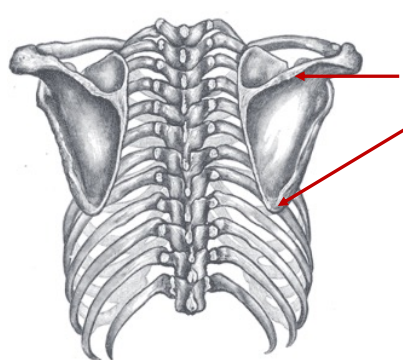
SCOLIOSIS
ROTATION
PELVIC OBLIQUITY

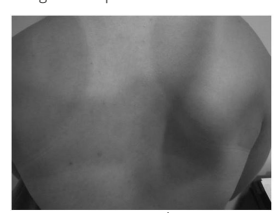
KYPHOSIS
FORWARD HEAD POSTURE

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SHOULDERS/SCAPULA



- Posterior spine of the scapula
 - Elevated/neutral shoulder position
- Inferior angle of scapula



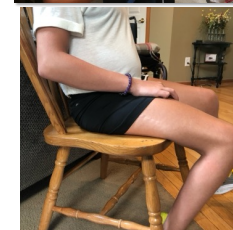



Winging scapula

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PHYSICAL ASSESSMENT

- Sitting
- Supine
- Posture/Balance
- ROM
 - Shoulder, hips, knees, ankles
- Do findings in Supine match in Sitting?

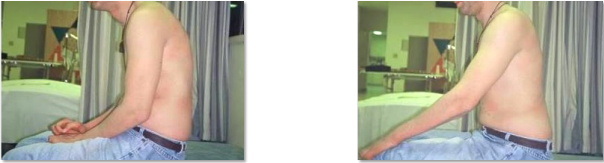





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ASSESSMENT WRAP-UP

- In sitting, people shift their bodies into abnormal postures
 - Seeking stability and to alleviating pain and pressure
- Where is the abnormal posture?
 - Pelvis
 - Spine
- Once you identify the issues, determine if you are going to correct or accommodate




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THE PURPOSE OF THE BACK SUPPORT

- Support pelvis and trunk
- Provide lateral support
- Provide attachment point for external supports
- Provide ability to dial-in seat to back angle
- Allow for pressure distribution
- Allow functional movement of the thoracic area




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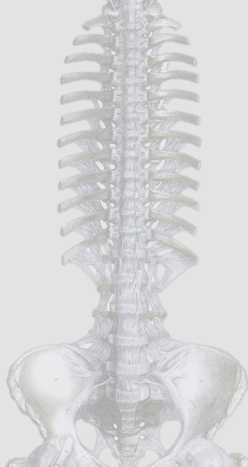
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THE PURPOSE OF A CUSHION

- The ideal cushion should provide
 - Pelvic/trunk stability
 - Positioning
 - Comfort – over time
 - Pressure reduction / offloading
 - Freedom to move for I/ADLs, propulsion & transfers
- Leads to improved function of the upper limbs
- Provides a base of support for functional reach
- Allows independent transitions in posture



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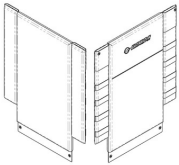
PRODUCT SELECTION

Categories, Materials, Sizing & Options

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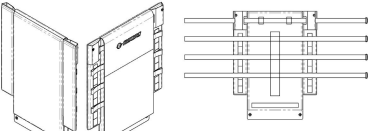
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UPHOLSTERY/SLING BACK



- Upholstery alone is not enough to provide long term postural support
- Easy to fold the wheelchair with the back support
- Not designed to offer posterior pelvic support
 - Allows posterior tilt
- Stretches over time reducing effectiveness of postural support

TENSION ADJUSTABLE BACK



- Tighten and loosen straps to adjust tension to meet client's minor positioning needs
- Can stretch over time which can compromise posture
- Upholstery is not designed to last forever
- Easy to fold the wheelchair with the back support

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USE EVIDENCE ALONG WITH CLINICAL FINDINGS

- Alternative to standard upholstery
- Improved posterior support of pelvis and trunk
- Trunk stability facilitates UE function
- Potential environmental disadvantage
 - Folding Frame requires more safety education of client/caregiver
- Standard on chairs
- Flexible material and wears over time
- Conforms to client's back
 - Promotes kyphotic posture and posterior pelvic tilt
- Promotes long term postural deformities
- Does not require removal with folding frames

Presperin Pedersen J, Smith C, Dahlin M, Henry M, Jones J, McKenzie K, Sevigny M, Yingling L. Wheelchair backs that support the spinal curves: Assessing postural and functional changes. J Spinal Cord Med. 2020 May 14:1-10. doi: 10.1080/10790268.2020.1760530. Epub ahead of print. PMID: 32406808.

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RIGID/SOLID BACK




- Postural positioning in 3 dimensions
 - Height/length
 - Width
 - Depth/lateral supports
- Must be removed to fold the wheelchair
- Available in many different shapes and sizes
- Angle adjustable through mounting hardware
- More support for the pelvis

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CUSHION CATEGORIES

- General use
- Pressure relieving
- Positioning
- Combination




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CUSTOMS

- Backs & Cushions
- Custom configured v molded
- Increased support for non-correctable deformities
- Precise correction or accommodation of atypical postures
- Can offer more consistent pressure relief for needs not met by off the shelf products
- Requires specialized technician or training to procure
- Can be cumbersome to remove or fixed in place



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SUPPORT MATERIALS




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FOAM

- Varying quality
 - Density vs firmness
 - Open vs closed cell
 - Polyurethane vs Visco-elastic
- Lightweight
- Optional layers with different properties
 - Can have temperature control properties
- Cushion Specific Properties
 - Stable surface
 - Mild-Moderate positioning properties
 - Low maintenance
 - No set-up required



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GEL

- Fluid vs molded
- Known to be heavier
- Naturally, cooler temperature
- Moderate stability
- Positioning dependent on use of other materials
- May require maintenance
- Susceptible to leaks
- May require set-up



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AIR

- Free flowing, encapsulated, compartmentalized
- Adjustable/customizable
- Lightweight
- Less stability
- Varying positioning properties
- Washable
- Limited failsafe
- Higher maintenance
- Requires detailed set-up




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HONEYCOMB

- Lightweight
- Stays a cooler temperature
- Stable surface
- Moderate positioning capabilities
- Very durable
- Low maintenance
- No set-up required




<https://www.wheelchair-works.com/wheelchair-seat-cushion.html#honey>

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COMBINATION/ HYBRID

- Variety of support materials
- Can be a more customized approach
- Weights vary based on materials
- Moderate-high positioning
- Degrees of failsafe
- Maintenance varies by material
- Set-up varies by material
- Transitions between materials can be cumbersome
- Cushion Specific Property
 - Stable for independent transfers




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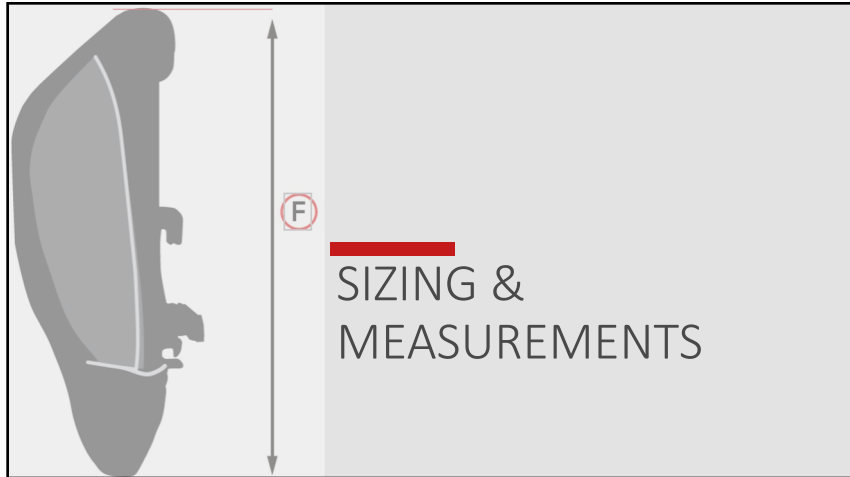
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SEATING TECHNOLOGY

- Products using electric/computerized technology for added features of monitoring



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STANDARDIZED TERMINOLOGY FOR SEATING MEASURES

The Main Goal: Promote the adoption of standardized terms and measures in the field of wheelchair seating

<https://www.ncart.us/uploads/userfiles/files/GuidetoSeatingMeasuresRevisedEdition.November2013.pdf>

Logos for FIA (Fédération Internationale de l'Association des Paralysés) and Assistive Technology Partners are visible at the bottom.

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MEASURING A BACK SUPPORT

- Understanding how a product is measured will help you select the proper one for a client
- This can vary between manufacturers
 - Length
 - Width
 - Depth
 - Laterals

NXT OPTIMA AND OPTIMA DEEP SIZES - INCHES (CM)											
WHEEL	DEEP			HYDROSLIDER SEAT							
19 (48.3)	7 (17.8)	9 (22.9)	11 (27.9)	13 (33.0)	15 (38.1)	17 (43.2)	19 (48.3)	21 (53.3)	23 (58.4)	25 (63.5)	27 (68.6)
19 (48.3)											
20 (50.8)											
21 (53.3)											
22 (55.8)											
23 (58.4)											
24 (60.9)											
25 (63.5)											
26 (66.0)											
27 (68.6)											
28 (71.1)											
29 (73.7)											

The NXT Optima allows for optimal pelvic positioning while providing proper support to the user's thoracic region.

NXT OPTIMA BACK DIMENSIONS - INCHES (CM)											
	19 (48.3)	20 (50.8)	21 (53.3)	22 (55.8)	23 (58.4)	24 (60.9)	25 (63.5)	26 (66.0)	27 (68.6)	28 (71.1)	29 (73.7)
A	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
B	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
C	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
D	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
E	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
F	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5

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IMPORTANT BACK SUPPORT MEASUREMENTS

- Length of the back support
- Match to measurements taken from client
- More involved positioning
 - Measure from seat to top of shoulder height
- Less involved positioning
 - Measure from seat to inferior angle of the scapula
- Measure bilaterally in case of scoliosis and/or a pelvic obliquity

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IMPORTANT BACK SUPPORT MEASUREMENTS

- Width
- Appropriate width allows proper lateral support without limiting function
- Not always the same as wheelchair width
- Appropriate depth allows proper contact with the back support and contouring without limiting function
- Can add an external lateral

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MEASURING A CUSHION

- Understanding how a product is measured will help you select the proper one for a client
- This can vary between manufacturers
- Width
- Depth
- Thickness
- Contouring
- External components

A – Seat Depth
B – Seat Width
C – Seat Thickness

Fig. 5.8: Basic seat dimensions

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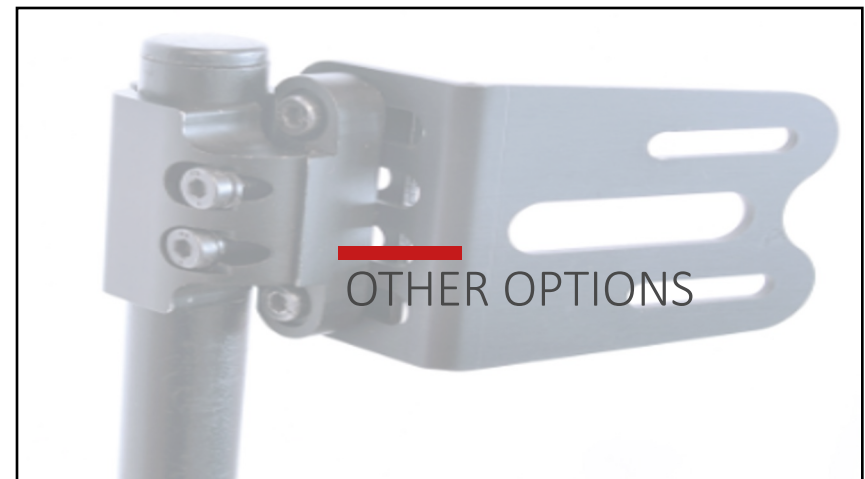
CUSHION THICKNESS

SEAT THICKNESS

- Product
 - The thickness from top to bottom of the unloaded seat in the area intended for pelvic loading
- Client
 - When in a neutral seated position, ITs are approx. 1.75-2.5 inches (4.45-6.35 cm) below greater trochanters

Fig. 5.14: Seat thickness

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HARDWARE/ATTACHMENTS

- Adjustability
- Fixed
- Attachability
- Removability
- Weight
- Weight capacity
- Durability
- Compatibility
- Attachability





50°
Angle Adjustability of 50°



Accommodates Asymmetrical Posture

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SHELL

- Shape
- Weight
- Adjustability
- Material
- Attachment points




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UPHOLSTERY

- Material
- Stretch
- Envelopment/Immersion
- Infection control
- Temperature control
- Wash-ability
- Durability
- Friction
- Moisture Control





MOISTURE VAPOR

TOP LAYER is permeable and breathable

AIR FLOW

BOTTOM LAYER allows air flow

SINGLE LAYER wick moisture away from the body

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CASE STUDY: ANNA

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ANNA : AGE 15

- Cerebral Palsy
- Dystonia
- Multiple hip surgeries for relocation
- Partially reducible scoliosis, kyphosis
- Utilizes multiple mobility devices
 - Power Wheelchair
 - Manual Wheelchair
 - Reverse Rolling Walker with Platforms
 - Tennis chair




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ASSESSMENT FINDINGS

	Left Side	Right Side
Top of Shoulder	19	20
Inferior Angle of Scapula	13	14
Buttock to Popliteal	15	16
Knee to Heel	15	15
Shoulder Width	16	
Trunk Width	13	
Hip Width	13	



Scoliosis: currently reducible
Rotation
Pelvic Obliquity

Kyphosis: with support is correctible

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GOALS FOR ANNA

MOBILITY GOAL

- Self-propel ultralightweight manual wheelchair



PRESSURE DISTRIBUTION & LATERAL SUPPORT

- Correct and accommodate scoliosis, rotation and kyphosis
- Doesn't want tall back on manual chair, it blocks her function
- Easy maneuverability
- Would prefer upholstery



BASE OF SUPPORT

- Comfort
- Skin/joint health
- Noommel
- Independent sitting & active lifestyle
 - Must accommodate for limitations
 - hip flexion limitation and obliquity

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EVALUATION, ASSESSMENT, & TRIALS

MEASUREMENTS & FINDINGS

- Using measurements which are asymmetrical inferior angle of scapula
 - Right: 14 in
 - Left: 13 in
- Back length selection: 9 or 13 inches
 - To allow for placement above PSIS and below Inferior Angle of Scapula
- Trials NXT Optima
 - 13 in length (no photo)
 - 9 in length, regular contour and deep



Tension Adjustable



Optima 13-inch
std depth (3" contour)



Optima 9-inch
deep depth (6" contour)




Optima 9-inch
std depth (3" contour)

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EVALUATION, ASSESSMENT, CUSHION TRIALS

CORNER ASSESSMENT



TRIAL CUSHION



MEASUREMENTS & FINDINGS

- Hip width 13 inch
 - Selected based on growth pattern, diagnosis, dystonia, function, client goals
- Pelvic Obliquity
 - Left side ½" higher
- Trial Cushion
 - Vicair Adjuster
 - Accommodates for pelvic obliquity
 - Allow accommodation as needed

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FINAL Rx



NXT Optima
9 inch, std (3" contour)





Vicair Adjuster

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SUMMARY

- Many back selections could meet Anna's needs
- Important to remember
 - Client input
 - Comfort
 - Function
 - Aesthetics
 - Balance with clinical findings
 - Correction
 - Protection
 - Accommodation

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BRINGING IT ALL TOGETHER

It is not just the back, the cushion or the wheelchair, it is how they all interact together

Important to assess the entire person and their goals

Understand the properties of back supports and match them to the user

Use a holistic approach to maximize outcomes



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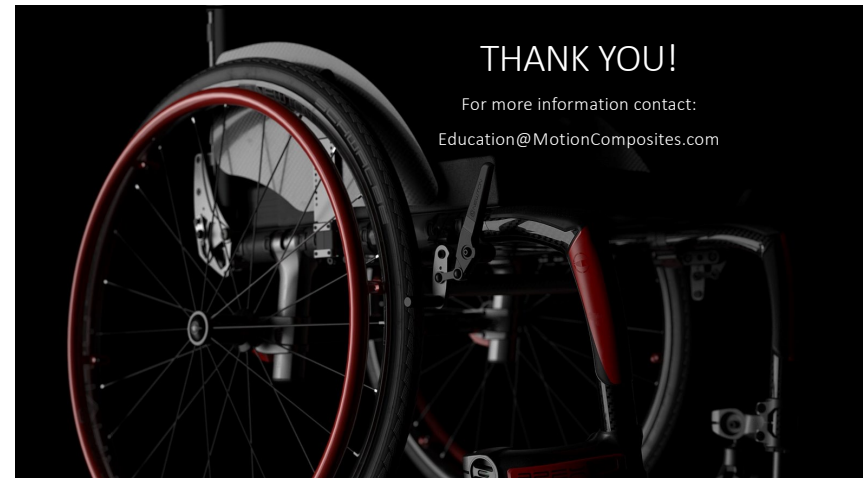
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SEATING RELATED OBJECTIVE MEASURES

- Can help to provide objective data to funding sources on why seating intervention or specific seating is required by the client
- Handouts provided online

1. Wheelchair Outcome Measure
 - Can be used to trial different seating solutions in their home environment to see what works best from a functional and satisfaction standpoint
2. Seating Identification Tool
3. Braden Scale – skin assessment tool

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REFERENCES

1. Jessica Presserin Pedersen, Cynthia Smith, Margaret Dahlin, Molly Henry, Janell Jones, Kelly McKenzie, Mitch Sevigny & Lindsey Yingling (2020) Wheelchair backs that support the spinal curves: Assessing postural and functional changes, *The Journal of Spinal Cord Medicine*, DOI: [10.1080/10790268.2020.1760530](https://doi.org/10.1080/10790268.2020.1760530)
2. ISO 16840. Wheelchair Seating, Section 1 - Vocabulary, reference axis convention and measures for body posture and postural support surfaces, International Organization for Standardization, TC-173, SC-1, WG-11., 2006
3. Kobara, K., Osaka, H., Takahashi, H., Ito, T., Fujita, D., & Watanabe, S. (2015). Influence of rotational axis height of back support on horizontal force applied to buttocks in a reclining wheelchair. *Prosthetics and Orthotics International*, 39(5), 397–404.
4. Lange, M. L., & Minkel, J. (2018). *Seating and wheeled mobility: A clinical resource guide*. Thorofare, NJ: Slack Incorporated.
5. Marina Timm & Kersti Samuelsson (2016) Wheelchair seating: A study on the healthy elderly, *Scandinavian Journal of Occupational Therapy*, 23:6, 458-466, Medola, F. O., Elui, V. M. C., Santana, C. D. S., & Fortulan, C. A. (2014). Aspects of Manual Wheelchair Configuration Affecting Mobility: A Review. *Journal of Physical Therapy Science*, 26(2), 313–318.
6. Nace, S., Tiernan, J., & Ni Annaidh, A. (2019). Manufacturing custom-contoured wheelchair seating: A state-of-the-art review. *Prosthetics and Orthotics International*, 43(4), 382–395.
7. Presserin Pedersen J, Smith C, Dahlin M, Henry M, Jones J, McKenzie K, Sevigny M, Yingling L. Wheelchair backs that support the spinal curves: Assessing postural and functional changes. *J Spinal Cord Med*. 2020;May;31(1):10. doi: 10.1080/10790268.2020.1760530. Epub ahead of print. PMID: 32406813
8. Requejo, P. S., Furumasa, J., & Mulroy, S. J. (2015). Evidence-Based Strategies for Preserving Mobility for Elderly and Aging Manual Wheelchair Users. *Topics in geriatric rehabilitation*, 31(1), 26–41.
9. Waugh, K. and Crane B. A clinical application guide to standardized wheelchair seating measures of the body and seating support surfaces (Rev. Ed). Denver, CO: University of Colorado Denver (363 pgs) 2013.
10. <https://mobilitygmt.com/24-hour-follow-through/>

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THE WhOM

Part I: PARTICIPATION

Instructions for Administration:

Ask the client to identify activities they perform in their wheelchair that are important to them by asking the two questions outlined below. Have the client score the importance of these activities and then ask them to rate their current level of satisfaction in performing these activities. If the client has scored their satisfaction with an activity ≤ 7 , determine the underlying conditions (wheelchair/seating device or environmental barriers) that impair performance of this activity to assist with intervention planning.

1) Some people use their wheelchairs because they want to participate in activities in or around their home, such as preparing meals, watching TV, or gardening. What activities in your home would you use your wheelchair to perform?

Use this numerical scale to help fill in the table:
 0 1 2 3 4 5 6 7 8 9 10

Initial assessment Date:				Reassessment Date:	
Participation goals: <i>Eg. Making a meal Watching favourite TV show</i>	Importance <i>How important is this activity to you?</i> (0 - 10) 0 = Not at all important 10 = Extremely important	Satisfaction 1 <i>How satisfied are you with your current level of performance of this activity?</i> (0 - 10) 0 = Not satisfied at all 10 = Extremely satisfied	Importance x Satisfaction 1	Satisfaction 2 <i>How satisfied are you with your current level of performance of this activity?</i> (0 - 10) 0 = Not satisfied at all 10 = Extremely satisfied	Importance x Satisfaction 2
i.					
ii.					
iii.					
iv.					
v.					
Total of importance x satisfaction 1 scores =			Score 1 <input style="width: 50px; height: 20px;" type="text"/>	Total of importance x satisfaction 2 scores =	
Change in satisfaction = Score 2			<input style="width: 50px; height: 20px;" type="text"/>	- Score 1	<input style="width: 50px; height: 20px;" type="text"/>
			= <input style="width: 50px; height: 20px; border: 2px solid black;" type="text"/>		

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2. Some people use their wheelchairs because they want to participate in activities outside of their home such as dog walking, going for coffee, to work or to the park. What activities outside of your home or in your community would you use your wheelchair to perform?

Use this numerical scale to help fill in the table:
 0 1 2 3 4 5 6 7 8 9 10

Initial assessment Date: _____				Reassessment Date: _____	
Participation goals: <i>Eg. Walking the dog Visiting my sister Watching a hockey game</i>	Importance <i>How important is this activity to you?</i> (0 - 10) 0 = Not at all important 10 = Extremely important	Satisfaction 1 <i>How satisfied are you with your current level of performance of this activity?</i> (0 - 10) 0 = Not satisfied at all 10 = Extremely satisfied	Importance x Satisfaction 1	Satisfaction 2 <i>How satisfied are you with your current level of performance of this activity?</i> (0 - 10) 0 = Not satisfied at all 10 = Extremely satisfied	Importance x Satisfaction 2
i.					
ii.					
iii.					
iv.					
v.					
			Score 1 Total of importance x satisfaction 1 scores = <input style="width: 50px;" type="text"/>	Score 2 Total of importance x satisfaction 2 scores = <input style="width: 50px;" type="text"/>	
Change in satisfaction = Score 2 <input style="width: 50px;" type="text"/> - Score 1 <input style="width: 50px;" type="text"/> = <input style="width: 50px; border: 2px solid black;" type="text"/>					

Name / ID #: _____

THE WhOM

Part II: BODY FUNCTION

Use this numerical scale to help fill in the table:
 0 1 2 3 4 5 6 7 8 9 10

Initial assessment Date: _____	Reassessment Date: _____	
<u>Questions</u>	<u>Time 1</u>	<u>Time 2</u>
<p>1. <i>How would you rate your comfort while sitting in your wheelchair? (0 – 10)</i></p> <p>0 = Not at all comfortable 10 = Extremely comfortable</p>		
<p>2. <i>How satisfied you are with the way your body is positioned in your wheelchair? (0 – 10)</i></p> <p>0 = Not at all satisfied 10 = Extremely satisfied</p>		
<p>3. <i>Over the past month have you had any episodes of skin breakdown on your bottom? (Please circle)</i></p>	Y N	Y N
<p>3a. <i>If yes, in your opinion, how severe has your skin breakdown been? (0 - 10)</i></p> <p>0 = Not at all severe 10 = Extremely severe</p>		
<p>Change in scores Q1 T2 ____ - T1 ____ = ____ (change)</p> <p>Change in scores Q2 T2 ____ - T1 ____ = ____ (change)</p> <p>Change in scores Q3a T2 ____ - T1 ____ = ____ (change)</p>		

Example of completed outcome measure

Name / ID #: _____

THE WhOM

Use this numerical scale to help fill in the table:
 0 1 2 3 4 5 6 7 8 9 10

Initial assessment Date: _____				Reassessment Date: _____	
Participation goals: Eg. Walking the dog <i>Visiting my sister</i> <i>Watching a hockey game</i>	Importance <i>How important is this activity to you?</i> (0 - 10) 0 = Not at all important 10 = Extremely important	Satisfaction 1 <i>How satisfied are you with your current level of performance of this activity?</i> (0 - 10) 0 = Not satisfied at all 10 = Extremely satisfied	Importance x Satisfaction 1	Satisfaction 2 <i>How satisfied are you with your current level of performance of this activity?</i> (0 - 10) 0 = Not satisfied at all 10 = Extremely satisfied	Importance x Satisfaction 2
i. Walking the dog	4	3	12	7	28
ii. Making meals	6	4	24	6	36
iii. Attending recreational programs	8	5	40	9	72
iv. Using the computer	8	3	24	9	72
v. Visiting my sister	9	4	36	8	72
			Score 1 Total of importance x satisfaction 1 scores =	Score 2 Total of importance x satisfaction 2 scores =	
			136	280	
Change in satisfaction = Score 2 280 - Score 1 136 = 144					

SEATING IDENTIFICATION TOOL (SIT)

ASSESSMENT DATE: _____

WITHIN THE LAST FOUR (4) WEEKS	YES	NO
1) Has the individual had red areas on their bottom?	2	0
2) Has the individual had an open pressure sore on their bottom?	2	0
3) Has the individual had red areas on their back?	1	0
4) Has the individual had an open pressure sore on their back?	2	0
5) Has the individual reported or demonstrated behaviours that indicate they could be in discomfort or pain while sitting for any length of time? (such as moaning, grimacing or agitation)	1	0
6) Has the individual had difficulty propelling their wheelchair? <i>(if the individual does not propel their wheelchair, circle 0)</i>	1	0
7) Has the individual required repositioning as a result of sliding or leaning?	1	0
8) Has an anti-slide device such as a foam bolster, pommel, roll bar, posture pal, or posey restraint been used?	1	0
9) Have rolled blankets, pillows or homemade devices been used to prevent leaning?	1	0
10) Has the individual not been using a wheelchair seat cushion? <i>(do not include linens, pillows, incontinence pads, or home made foam cushions.)</i>	2	0
11) Has the individual tipped their wheelchair or been at risk of tipping their wheelchair?	1	0
OVERALL SCORE		

The overall score is the sum of all items. Scores greater than or equal to two, indicate a need for intervention. Intervention may include formal assessment or education.

SCORING THE SIT

The SIT consists of 11 items that assess five areas related to wheelchair and seating issues (skin conditions, or pressure areas, discomfort behaviours, mobility, positioning and stability). All of the item responses are recorded as either a yes or no. A score is given for a positive response (yes) to all items. All responses are scored as 1 except for items 1, 2, 4 and 10 which are weighted as 2 (see table below). These items were weighted with a score of 2 as they are considered to leave the individual at a higher level of risk of other health complications. The responses are summed to provide a total score that ranges from 0 (no need for intervention) to 15 (serious need for intervention). A score of 2 or higher is indicative of a need for a formal intervention by a therapist with wheelchair and seating experience.

Category	SIT Item Numbers	Score Weight
Skin condition or Pressure Area	1,2,4 3	2 1
Discomfort	5	1
Positioning	7,8,9 10	1 2
Mobility	6	1
Stability	11	1

The Seating Identification Tool (SIT) Manual is used with permission from the Author.

William C Miller, PhD, OT

Francine Miller, BSc OT

BRADEN SCALE – For Predicting Pressure Sore Risk

SEVERE RISK: Total score ≤ 9 HIGH RISK: Total score 10-12						DATE OF ASSESS →			
MODERATE RISK: Total score 13-14 MILD RISK: Total score 15-18									
RISK FACTOR		SCORE/DESCRIPTION				1	2	3	4
SENSORY PERCEPTION Ability to respond meaningfully to pressure-related discomfort		1. COMPLETELY LIMITED – Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation, OR limited ability to feel pain over most of body surface.	2. VERY LIMITED – Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness, OR has a sensory impairment which limits the ability to feel pain or discomfort over ½ of body.	3. SLIGHTLY LIMITED – Responds to verbal commands but cannot always communicate discomfort or need to be turned, OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	4. NO IMPAIRMENT – Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.				
MOISTURE Degree to which skin is exposed to moisture		1. CONSTANTLY MOIST – Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	2. OFTEN MOIST – Skin is often but not always moist. Linen must be changed at least once a shift.	3. OCCASIONALLY MOIST – Skin is occasionally moist, requiring an extra linen change approximately once a day.	4. RARELY MOIST – Skin is usually dry; linen only requires changing at routine intervals.				
ACTIVITY Degree of physical activity		1. BEDFAST – Confined to bed.	2. CHAIRFAST – Ability to walk severely limited or nonexistent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	3. WALKS OCCASIONALLY – Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	4. WALKS FREQUENTLY – Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.				
MOBILITY Ability to change and control body position		1. COMPLETELY IMMOBILE – Does not make even slight changes in body or extremity position without assistance.	2. VERY LIMITED – Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	3. SLIGHTLY LIMITED – Makes frequent though slight changes in body or extremity position independently.	4. NO LIMITATIONS – Makes major and frequent changes in position without assistance.				
NUTRITION Usual food intake pattern ¹ NPO: Nothing by mouth. ² IV: Intravenously. ³ TPN: Total parenteral nutrition.		1. VERY POOR – Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement, OR is NPO ¹ and/or maintained on clear liquids or IV ² for more than 5 days.	2. PROBABLY INADEQUATE – Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement OR receives less than optimum amount of liquid diet or tube feeding.	3. ADEQUATE – Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally refuses a meal, but will usually take a supplement if offered, OR is on a tube feeding or TPN ³ regimen, which probably meets most of nutritional needs.	4. EXCELLENT – Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.				
FRICTION AND SHEAR		1. PROBLEM- Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.	2. POTENTIAL PROBLEM – Moves feebly or requires minimum assistance. During a move, skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	3. NO APPARENT PROBLEM – Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.					
TOTAL SCORE						Total score of 12 or less represents HIGH RISK			
ASSESS	DATE	EVALUATOR SIGNATURE/TITLE			ASSESS.	DATE	EVALUATOR SIGNATURE/TITLE		
1	/ /				3	/ /			
2	/ /				4	/ /			
NAME-Last		First	Middle	Attending Physician		Record No.	Room/Bed		