

JAY

Seating for Function and Mobility

**“A Clinical Perspective, Linking Clinical Thinking
with Technology”**

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Program director: Sharon Pratt, PT

Sharon Pratt has specialized in the field of seating and mobility for over 17 years. Graduating from Trinity College, Dublin, Ireland as a Physical Therapist, Sharon has experienced many aspects of the seating and mobility service delivery model and has lectured extensively on seating to varied audiences worldwide.

Since relocating to North America, Sharon has managed her own clinical practice in Toronto, Canada. She managed the seating and mobility devices category for several years as the senior policy coordinator for the Ontario governments Assistive Devices Program - “ADP” (funding agency). Moving then to Boulder Colorado to develop and manage the education department for Sunrise Medical she presented world wide on the topic of seating and mobility. From there, she became the global product manager for Jay Seating a world leader in the seating industry. Sharon then started an independent consulting business where she offered clinical consultation/client evaluation and prescription of therapeutic seating/positioning, educational seminars for therapists, suppliers and funding personnel, web based training development, as well as new product development consultation for manufacturers world wide. She has been instrumental in the development and launch of several seating programs in Western and Eastern Europe.

Presently Sharon is the Director of Education, Seating for Sunrise Medical, where she develops, presents and manages the content for all internal and external seating education programs. Sharon is involved with the ISO wheelchair standards working group, which is developing international standards for seating terminology and postural measurement.

Known to many as a dynamic and highly energetic speaker, Sharon’s extensive knowledge makes her a very skilled seminar instructor.

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Goals of Seating & Mobility

- Support postural alignment
 - Provide balance for function
 - Provide base of support for stability
 - Slow down or correct flexible deformity
 - Accommodate fixed deformity
 - Optimize functional tone
 - Inhibit non functional tone
- Protect skin integrity
- Facilitate function
 - Activity related functions
 - Physiological functions

Balance is affected by

- Position in space
 - Triggers many sensory organs
 - ▶ Righting and equilibrium reactions – create body’s desire to stay upright and midline
 - ▶ Less work is best....
- Support surface
 - Dictates where we balance our body’s center of mass
 - Determines where and how well we are supported

A Closer Look at Pelvic Stability

- Lateral pelvis stability
- Femoral loading
 - Consider the height difference between the ischial tuberosities and the femur
 - ~ 1 1/2” in an adult
 - Not present in very small children or infants

“Benchmark” Sitting Posture

- Pelvis level or slight anterior pelvic tilt
- Spinal curvature in optimal alignment
- Shoulder girdle above pelvic girdle
- Head balanced and aligned as midline as is functional
- Thighs/Femurs loaded
- Feet rested and loaded

With Pelvis in most ideal position...

Think about

- Posture
- Skin
- Function

Pelvic and Spinal Presentations

Posterior Pelvic Tilt

Clinical Considerations

- Trunk muscles unable to hold spine upright against gravity
- Limited hip flexion
- Abnormal tone
- Pathological reflexes in lower extremities or trunk
- Decreased lordosis
- Increased thoracic kyphosis
- Tight Hamstrings
- Decreased balance between major muscle groups

Technical causes:

- Seat depth too long
- Seat to floor height too high
- Footplates incorrect angle
- Footplates too low- inadequate foot loading
- Sling upholstery
- Back too vertical
- Squeeze hip angle too aggressive
- Arm rests too low
- Inadequate femoral/thigh loading
- Back does not support posterior pelvis

“So What”! If we have a Posterior Pelvic tilt?

- Think about – ask about
 - Swallowing

- Respiratory function
- Speech output/projection
- Digestion
- Neck / shoulder pain
- Mobility Function
 - ▶ Propelling
 - ▶ Egress from chair
- Skin

Anterior Pelvic Tilt

- **Clinical Considerations**

- Tight Hip flexors
- Tight Quadriceps
- Tightened spinal extensors
- Weakened abdominals
- Obesity
- Increased lumbar lordosis

- **Technical considerations**

- Anterior slope on seat
- Back too vertical
- Excessive lumbar contour

“So What”! If we have an Anterior Pelvic tilt?

- Think about – ask about

- Spinal muscle fatigue
- Bladder issues
- Function
- Foot placement
- Skin
 - ▶ Central pressure
 - ▶ Hamstring tendons

Pelvic Obliquity

- **Clinical considerations**

- Asymmetrical Muscle Strength
- Asymmetrical muscle tone – trunk and /or lower extremities

- Asymmetrical soft tissue/muscle mass
- Asymmetrical bone structures
- Asymmetrical hip flexion
- Scoliosis

■ **Technical considerations**

- No solid base of support
- Wheelchair too wide
- Arm support too low/too high
- Seat does not support trochanters

“So What”! If we have a Pelvic Obliquity?

- Think about – ask about
 - Instability
 - ▶ Fixing
 - ▶ Increased tonal patterns
 - Limited range of motion
 - Function
 - Skin
 - ▶ Low IT – possibly greater trochanter
 - ▶ Rib Cage

Pelvic Rotation

■ **Clinical considerations**

- Asymmetrical muscle tone (trunk and /or lower extremities)
- Asymmetrical hip abduction
- Asymmetrical hip adduction
- Asymmetrical hip flexion
- Leg length discrepancy
- Posterior dislocated or subluxed hip
- Unilateral foot propeller

■ **Technical Considerations**

- Trunk not supported
- Back support does not support posterior pelvis
- Seat to floor height too high for foot propulsion
- Footrest height not adjusted for asymmetrical hip flexion limitation

Best practices in the preservation of skin integrity

What is Skin?

- Outer covering of the body
- Primary means of defense
- 2 square meters
- Weighs 6 - 8 lbs
- 1/3 circulating blood volume
- Many sensory mechanisms
- Two Major Layers
 - Epidermis & Dermis
- Subcutaneous tissue lies beneath the dermis

Pressure Ulcer - Definition

- **Localized areas of tissue necrosis that develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time**
(National Pressure Ulcer Advisory Panel)

The Healing Process

- Skin integrity is never the same as intact skin even when “healed”
- Do not “reverse stage” during the healing process

Statistics

- More than one million affected in U.S.
- Estimated 60,000 deaths per year
- Estimated national cost of treatment:
 - \$2.2 - 3.6 billion per year
- Incidence (Meehan 1994):
 - 15% of acute care patients
 - 19% of home care patients
 - 23-27% of nursing home patients

Pathophysiology - Extrinsic Factors

- External physical forces
 - Pressure
 - Friction

- Shear
- Moisture
- Heat

Remember...

- Pressure is but one of the many contributing factors when identifying the risk for decubitus ulcers

Shear & Friction

- **Shear** - Distortion of tissue caused by forces working against the tissue in a parallel motion
 - Caused by gravitational forces pulling client towards the ground
 - ▶ The body is pulled in one direction against the support surface which is static
 - Stretches, thins and kinks blood vessels to occlude or reduce flow
- **Friction** – damage to outer tissue layers due to skin sliding against support surface
 - Like a “burn” from rubbing against the bed sheets

Friction/Shear forces in seating

- Sliding forward in the seat
- Repetitive movements:
 - Transfers
 - Recline and return
 - Activity in the chair
 - ▶ Movement of ischial tuberosities

Intrinsic Factors

- Poor nutrition
- Incontinence
- Muscle atrophy
- Aging skin
- Orthopedic deformities
- Excessive body heat
- Disease
 - ▶ Diabetes, cancer, AIDS
 - ▶ Radiation, drug therapy
- Impaired circulation
 - ▶ Venous insufficiency
 - ▶ Arterial insufficiency
- Decreased mental status
- Smoking

Prevention

Early Intervention

- Principle components:
 - **Identify at-risk individuals**
 - Protect against extrinsic factors
 - ▶ Pressure, friction and shear
 - Affect intrinsic factors
 - ▶ Maintain and improve tissue tolerance
 - Reduce incidence through education

Risk Assessment

- Select a valid & reliable tool
 - Braden Scale – Norton Scale & Waterlow Scale
- Use clinical judgement
- Assess upon admission
- Reassess periodically
- Document
 - A picture is worth a thousand words!

Braden Scale

- High Risk: Total score ≤ 12
- Moderate Risk: Total score 13-14
- Low Risk: Total score 15-16 under 75
- Low Risk: Total score 15-18 over 75

Identifying Level of Risk

(This is an example of questions asked in Sharon's clinical practice)

- High Risk Factors
 - Does client have a history of skin trauma?
 - Does client have a presence of skin trauma?
 - Can the client do an independent weight shift?
 - ▶ Is it effective?
 - ▶ Is client consistent???
- Moderate Risk Factors
 - Client is very bony in the sitting surfaces and is active

- Monitor and document interventions and outcomes

Client Education

- Out of chair activities
- Weight shift
- Skin Inspection
- Equipment maintenance

Protect Against Pressure, Friction and Shear... in Bed

- Reposition in bed every 2 hours
 - Use written schedule
- Avoid direct contact of bony prominences
- Do not use donut type devices
- Avoid trochanters (side-lying)
- Use “rule of 30”
- Use lifting devices
- Use appropriate support surfaces
- Prevent moisture accumulation and temperature elevation at support surface-skin interface

The Hands on Assessment Process

- Referral
- Interview
- Evaluation
- Objectives
- Equipment parameters
- Product options
- Equipment simulation
- Equipment prescription
- Training and delivery
- Follow up
- Successful outcome

Client Interview

- Medical and surgical history
- Self management skills
- Psychosocial skills
- Cognitive status
- Visual/perceptual deficits
- Life roles and goals
- Existing seating and mobility equipment
- Environmental demands
- Occupational demands
- Transportation
- Funding
- Preference for power or manual
- Ability to maintain equipment

A suggested process for the mat evaluation

- 1) Observe in existing equipment
 - Front
 - Side and
 - Back
 - Get as much information as possible from the client / caregiver about what they perceive the negatives and positives to be
 - Document everything!

Mat Evaluation- Supine

- On a firm surface
- Looking for the available pelvic/spine/lower extremity joint ranges/flexibility as related to the seated position

- Pelvis-Spine relationship
 - Anterior / posterior
 - Lateral side flexion
 - Rotation

- With pelvis in optimal position and knees flexed, assess hip-pelvis relationship
 - Flexion
 - Ab / Adduction
 - Rotation

- With pelvis and hip in optimal alignment for seating, assess:
 - Knee extension
 - ▶ Hamstring range
 - Ankle and foot
 - ▶ Dorsi/plantar flexion

- Trunk
 - Contact with surface
- Head
- Shoulder
 - Scapular excursion
 - Joint abnormalities

- Anatomical Measurements
 - Trochanter to trochanter
 - Firm surface to back of knee
 - Chest depth

Why Do Trochanteric Measurement?

- Lateral pelvis stability
- Femoral loading
 - Consider the height difference between the ischial tuberosities and the femur
 - ~ 1 1/2” in an adult
 - Not present in very small children or infants

Three circumstance for considering when measuring seat depth

- Tight Hamstrings
- Foot Propelling
- Active – tight front end
 - Needs space for hands to transfer legs

- Skin inspection
 - Weight bearing surfaces
 - ▶ Areas of redness
 - ▶ Open sores

Sitting Evaluation

- On a firm surface with thighs and feet supported
- Accommodate for orthopedic findings from supine:
 - Observe
 - ▶ Posture
 - ▶ Balance

Balance - Is it-

- Independent?
- Hands Dependent?
- Fully Dependent?

Pelvis –Spine/Pelvis- Hip Flexibility

- Anterior / posterior range
- ASIS level / obliquity
- Rotation
- Feeling for resistance to movement
- Looking for point of support – no resistance

– **With pelvis in optimal alignment, assess trunk:**

- What is clients' optimal position?
 - ▶ The happy spot!
- How much posterior support is needed?
- Is lateral support needed?
- Is there a unique shape to be accommodated?
- Even with posterior and lateral support – is orientation in space required?

▪ **With pelvis and trunk in optimal alignment**

- Assess
 - ▶ Head position and balance
 - ▶ Control and Function

Anatomical measurement guidelines

- Avoid loose or baggy clothing
- Use firm surface
- Keep tape straight - do not curve around the client
- Measure both right and left sides
- Use a form to record measurements
- If there is a long delay between initial evaluation and funding approval, re-measure
 - ▶ Especially with pediatric clients

Anatomical measurements in sitting:

- Widest part – is it the hips?
- Trunk width
- Back of buttock to popliteal fossa
- Popliteal fossa to heel
- Seat surface to back support height
- Seat surface to occiput
- Seat surface to flexed elbow
- Feet width

Review Assessment Form

- Summary of
 - Interview
 - Pictures
 - Clinical assessment findings
 - ▶ Posture
 - ▶ Skin
 - ▶ Function
 - Measurement chart

Document Findings

- Summarize
 - Posture
 - ▶ Flexible – Reducible/correctable
 - ▶ Flexible – Not reducible – accommodate
 - ▶ Fixed – accommodate – slow down progression
 - Skin risk
 - ▶ Low
 - ▶ Moderate
 - ▶ High
 - Function
 - ▶ Top 4 priorities

Identify Objectives

- Pelvis
 - Accommodate
 - Correct
 - Maintain
- Hips
 - Accommodate lack of flexion
 - Accommodate or correct abduction
- Knees
 - Hamstring accommodation
- Ankles / feet
 - Accommodate fixed deformities
- Spine
 - Curves needing accommodation or correction

- Is support needed for midline
- Where is optimal position for supports
- Skin
- Balance
- Function
- Comfort
- Prioritize objectives to guide compromise

Seating/Mobility Evaluation Report

Name: _____ Age: _____ Sex: M/F _____

Diagnosis: 1- _____
2- _____

Primary Care Giver: _____

Funding source: _____

Medical History (surgeries, skin, and contraindications):

Reason for Referral:

Current seating and mobility equipment & any accessories
(Size, model, date purchased, state of disrepair, type of funding received):

Living Environment: _____

Any notable critical dimensions: _____

Transportation: _____

Employment Type: _____

School: _____

Recreation/Hobbies: _____

Self-Care Skills:

Name: _____

Additional Technological needs:

Insert picture if applicable:

List likes and dislikes for presently used equipment:

Describe in detail how this client presents in existing equipment:

Describe any pressure mapping that has been done with detail on results:

Assessment findings summary

Name: _____

	ASSESSMENT FINDINGS	OBJECTIVES (GOALS)	PRODUCT PARAMETERS	PRODUCT
Pelvis/Spine				
Pelvis/Hips R & L				
L.E.'S R&L Hamstring range Knees Ankles Feet				
SKIN High risk Moderate risk Low risk Why?				
Trunk/Spine				
U.E.'S R& L Shoulders Elbows Hands				

	ASSESSMENT FINDINGS	OBJECTIVES (GOALS)	PRODUCT PARAMETERS	PRODUCT
	NECK/C.SPINE			
	HEAD			
	SITTING BALANCE Independent Hands Dep. Dependent			
	REPOSITION/ FUNCTIONAL WEIGHT SHIFT Independent? Effective? Consistent?			
	PROPULSION Method. Hands Hands Feet Feet only Power			
	TRANSFERS			
	TONAL ISSUES Where? List: Triggers Inhibitors			

Measurement Chart

Name: _____

	ANATOMICAL MEASUREMENTS	SEATING SYSTEM DIMENSIONS	WHEELCHAIR DIMENSIONS
TROCHANTER TO TROCHANTER			
ISCHIAL WIDTH			
HIPS OR WIDEST POINT			
SEAT DEPTH R/L			
LOWER LEG R/L			
FOOT LENGTH			
FOOT WIDTH			
SCAPULAR HEIGHT R/L			
PSIS HEIGHT R/L			
SHOULDER HEIGHT R/L			
SEAT TO TOP OF HEAD			
SEAT TO BENT ELBOW			
TRUNK WIDTH Note points of measurement			

Name: _____

	ANATOMICAL MEASUREMENTS	SEATING SYSTEM DIMENSIONS	WHEELCHAIR DIMENSIONS
TRUNK DEPTH			
FOREARM LENGTH			
*FLOOR TO TOP OF HEAD (Taken in mobility base)			
SEAT TO OCCIPUT (N)			

*Must take measurement in simulated system

Plan:

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Date: _____

Translation of assessment findings to product parameters

Consider...

- Angles
- Shape
- Orientation
- Materials
- User's level of function
- Environment
- Comfort

Pelvis to Thigh – Seat to back Angle

- Assessment goal
 - Maintain pelvis/thigh angle as close to 90° as possible for sitting without negatively impacting pelvis to spine alignment
- Technical considerations
 - Seat to back angle

Thigh to lower leg – Lower leg assembly angle

- Assessment goal
 - With pelvis in the optimal position and thighs loaded, maintain lower leg in best position for loading the foot while respecting hamstring range relative to seating
- Technical consideration
 - Lower leg assembly angle
 - Footplate to knee relationship

Greater than 90°

- If greater than hamstring range can tolerate with the pelvis and hips in optimal alignment, hamstrings will pull the pelvis forward, pelvis will rotate rearward, client slides.
- Ability to load feet may be compromised
- Maneuverability may be compromised

Less than 90°

- If angle is greater than quadriceps range can tolerate, pelvis may be pulled into anterior tilt with compensating trunk hyperextension and imbalance
- Ability to load feet may be compromised
- Seat support and caster interference?

Lower leg to foot – Footplate angle

- Choose the appropriate footplate angle to:
 - Position the ankle in the most optimal angle
 - Accommodate fixed ankle positions

- Reduce the risk of eliciting clonus or primitive reflexes

Foot plate angle less than 90°

- Foot loading and stability may be compromised
- Consider impact on tone

Foot plate angle greater than 90°

- Foot loading and stability are compromised
- Seat to floor height?
- Consider impact on tone

Shape... Unique

- Influences
 - Natural anatomic contouring
 - Orthopedic deformity
 - Weight
 - Height
 - Body mass
- Consider Pelvis/Lower extremity assessment goals
 - ✓ Lateral stability
 - ✓ Inferior, fwd. /rearward stability
 - ✓ Posterior stability
 - ✓ Posterior- lateral stability
 - ✓ Maximize support area
- And, Pelvic/Spinal assessment goals
 - ✓ Posterior pelvic stability
 - ✓ Posterior lateral pelvic stability
 - ✓ Lumbar support
 - ✓ Posterior thoracic support
 - ✓ Lateral thoracic support

Seat shape considerations...

- Pelvic contour width
- Pelvic contour depth
- Pelvic contour length
- Femoral support length

Seat Shape – Pelvic contour width

- If too wide:
 - Trochanters not supported

- Lateral instability
- Ischials bottom out
- Common with bariatric clients
- Common with pediatrics

Seat Shape- Pelvic contour Depth

- Too shallow
- Femurs not loaded
- Encourages sliding and
- May not provide optimal pressure distribution

Seat Shape –Pelvic contour Length

- Assessment goals
 - Support buttocks while loading femurs for pelvic stability
 - Ischials need to be protected
- Too long
 - Inadequate femoral loading
 - Pelvis unstable
 - Ischials slide forward into PPT
- Too short
 - No respect for ischial excursion
 - Ischials with activity will bang into front wall of contour causing potential skin trauma

Seat Shape – Femoral loading area

- Assessment goals
 - Stabilize the pelvis
 - Position the lower extremities
 - Redistribute load
- Too Long
 - Pulls pelvis forward
- Too short
 - Not enough surface contact area
 - Ischials may have increased load
 - Lower extremities may not be optimally positioned

Secondary Supports

- Additional supports to help secure optimal posture
 - Flat or curved
 - Adjustable or fixed
 - Removable or fixed
- Contoured supports conform more closely to client's shape
 - Assists in distribution of pressure over broader surface

Back support

- Choose the appropriate back shape to:
 - Support optimal trunk position and maintain optimal pelvic position
- Pelvic/Spinal assessment goals
 - Posterior pelvic stability
 - Posterior lateral pelvic stability
 - Lumbar support
 - Posterior thoracic support
 - Lateral thoracic support

Posterior Pelvic/Sacral support

Not Present

- Pelvis will collapse into a posterior rotated position
- Flattening of the lumbar spine
- Hips slide forward

Posterior – Lateral pelvic support

Lateral pelvic support

Not present

- Pelvis & spine may become asymmetrical
- Pelvis may collapse posterior
- Flattening of the lumbar spine
- Hips slide forward

Lumbar support- Contour shape

Not enough

- Lumbar area may collapse
- Pelvis will rotate rearward

Too much

- Pelvis rotates forwards
- Trunk falls forward, or
- Pelvis rotates rearward
- Hips slide forward

Thoracic support height

Too low

- Lumbar spine not supported
- Thoracic loading not optimal
- Trunk collapses in client with poor trunk control

Too high

- Function may be compromised
- In absence of correct shape, may push trunk forwards

Thoracic support contour/Shape

– Goal – Optimize thoracic loading surface contact area

Not enough – too flat

- Forward collapse of trunk
- Incorrect head and neck position

Too much contour

- Inhibits function
- Encourages collapsed trunk posture

Lateral thoracic support

Depth

- Too shallow
 - May not provide adequate lateral stability
- Too deep
 - May compromise function

Vertical placement range

- Not enough range will compromise success of three point correction

Orientation

- Assessment Goals
 - ✓ Orientate the client **and** seating/mobility system in a position relative to gravity, providing optimal functionality and ability to stay upright in the system
- Technical considerations
 - Mobility base choice
 - ✓ Seat frame angle adjustability
 - ✓ Overall length of frame
 - ✓ Seat to floor height
 - ✓ Ability to interface with seating

Too vertical

- Unable to hold head and neck upright against gravity even with correct angles and shapes
- 5° - 25° of orientation may be necessary for postural stability without compromising function and visual orientation
- 45° – 60° for pressure/load redistribution

Too tilted

- Client may pull forward- away from back support
 - Visual orientation may be negatively impacted
 - Function may be compromised
- Everything affects everything!

Recline:

- Open seat to back angle

- Fixed or dynamic

Tilt:

- Change of position in space while maintaining seat to back angle
 - Fixed or dynamic

Fixed Recline

- Accommodate fixed open hip angle
- Reduce effects of gravity
- Improve visual field for clients with fixed kyphosis
- Can cause sliding

Fixed Tilt

- Maintain optimal joint angles and position
- Reduce effects of gravity
- Improve visual field for clients with fixed kyphosis

Who is Appropriate for Tilt or Recline

- Cannot independently change position
 - Risk for skin breakdown
 - Compromised sitting tolerance
- Cannot maintain pelvic/trunk/head position or balance against gravity for prolonged periods
- Risk of respiratory complications
- Risk of digestive complications
- Risk for postural hypotension
- Risk of autonomic dysreflexia

- To provide change in position while:
 - Accommodating lower extremity contractures
 - Maintaining visual field
 - Maintaining specific seated position
 - Especially significant with contours or secondary supports
 - Minimizing the risk of extensor spasticity
 - Eliminating shear forces caused by recline/return

When Might Dynamic Recline Be Better Than Tilt?

- To provide change position while:
 - Providing means of performing bladder and/or bowel care while in the chair
 - Allows more supine position for catheterization
 - Reducing the risk of back flow of urine into the bladder during prolonged pressure relief
 - Providing means of supine transfers
 - Providing change in joint angles for increased sitting tolerance for clients with sensation

When is Both Tilt and Recline Appropriate?

- When tilt is needed for maintaining position and managing tone during weight shifts, but recline is needed for bladder and/or bowel management or gastrointestinal feedings
- When tilt alone is not sufficient for pressure relief, but contractures or positioning makes recline alone inappropriate

Materials

Solid – Fluid Comparison

- Solids
 - ✓ Do not move or flow
 - ✓ Offer a resistance, due to elastic property
 - ✓ Point of deepest compression is point of highest peak pressure
 - ✓ Often do not address shear in a positive way
- Fluids
 - ✓ Move and flow, needing a container to hold them
 - ✓ Conform to bony prominences
 - ✓ Pressure is more equalized unless bottoming out occurs
 - ✓ Reduce shear

By nature Solids are more stable

- Considerations
 - What is the shape?
 - ▶ Planar vs. contoured
 - ▶ Soft foam vs. dense foam
 - ▶ Single vs. multiple density
 - Does it support natural anatomic contouring
 - ▶ How well?
 - Is it customizable to accommodate / support unique shapes and angles?

Fluids- Stability

- Related to viscosity of the fluid
(How easily it flows when displaced)
- Multiple V's single compartments
- Fluids alone, are not as stable as solids

Solids are best choice for stability

Materials / Skin Management

- Pressure reduction
 - Pressure = F/A
- Shear reduction
- Moisture reduction
- Heat Management

Materials - Pressure Reduction and Re-distribution

- Solids – related to product design
 - Planar systems
 - Pressure is highest at the points of deepest immersion
 - Contoured systems
 - Matching anatomic shape reduces peak pressures
- Fluids
 - Conform to bony prominences/shapes
 - Pressure is more equalized at point of contact
 - Must consider depth of immersion for high risk vs. moderate risk client

Materials - Shear Reduction

- Solids
 - Do not move, some offer more elasticity than others
 - Shearing may occur with client movement
- Fluids
 - Move or flow
 - Significantly reduce shear with client movement

Moisture / heat management

- Foams
- Gel (non fluid type)
- Fluids
- Cover Material

Fitting Process

Are the Hips to the Back of the Chair?

Considerations:

- Cushion contour and length
- Footrest height
- Footrest orientation
- Seat angulation
- Posterior pelvis not supported
- Back angle not correct
- Open hip angles not accommodated
- Unilateral open hip angle not accommodated
- Pelvic positioning belt

Are the Hips Level?

Considerations:

- Inadequate pelvic support
- Is the system too wide?
- Pelvic obliquity
- Is a build up necessary?

Are the Legs in Best Position?

Considerations:

- Cushion length
- Femoral loading
- Footrest height and orientation
- Solid seat

Correctable abduction:

- Lateral thigh supports

Correctable adduction:

- Medial thigh support

Correctable windswept:

- Combination medial/lateral thigh support

- Leg Length discrepancy cut
- Foot plate position

Is the Cushion Bottoming Out?

Considerations:

- Contour dimensions – Is the pelvis supported adequately?
- Does the cushion need adjusting?

Adjust Back Height

Considerations:

- Is posterior pelvic support adequate?
- Is posterior thoracic support adequate?

Adjust Pelvic Support

Considerations: 90, 60 or 45 degree?

Adjust Back Angle

Considerations:

- Trunk balance
- Visual orientation
- Optimize posterior pelvic support

Adjust Lateral Trunk Supports

Considerations:

- Support/correction
- 3 point system aligned correctly
- Impact on axillae

Check

Skin

- Redness

Function

Comfort

A note from the author:

A large part of the content of this seminar is based upon personal experiences over the last 18 years. I wish you great experiences as you continue with your seating and mobility assessments...

Thank you for attending this course!

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Information Resources

- **AHCPR**
P.O. Box 8547
Silver Spring, MD 20907

- **RESNA** (Rehab Engineering and Assistive Technology Society of North America)
1700 North Moore Street Suite 1540
Arlington, VA 22209-1903
(703) 524-6686
e mail - info@resna.org
website – www.resna.org

- **NRRTS** (National Registry of Rehab. Technology Suppliers)
P.O. Box 4033
Lago Vista, TX 78645-4033
(512) 267-6832
e mail – info@NRRTS.org
website – www.nrrts.org

- **NPUAP** (National Pressure Ulcer Advisory Panel)
1321 Duke St.
Suite 304
Alexandria, VA.22314
(703) 548-3100