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ASSISTIVE TECHNOLOGY CLINIC

Leaders in Innovative Rehabilitation

Seating and Mobility Day
University of Toronto
OCT 1100H
April 25, 2019

- Presenters:
- Karen Hall M.Sc.OT Reg (ON)
- Andree Gauthier B.Sc.OT Reg.(ON)
- Jessica Comay B.Sc.OT Reg.(ON)

- Facilitator:
- Samantha Silvestri BCRS, OTA/PTA

University of Toronto
Seating and Mobility Day
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Time	Topic	Format
10:00 - 10:30	Introduction to Seating and Mobility Gryfe Therapeutic Seating Principles **Jessica Comay**	Lecture: Whole class Room 132
10:30 – 11:00	Wheelchair and Seating Service Provision Steps **Andree Gauthier**	
11:00 – 11:30	Mat Assessment and Standardized Measures **Karen Hall**	
11:30 – 11:45	Break	
11:45 – 1:00	Mat Assessment Practice Session	Small Groups: Hands on Practice with Facilitators TRI – University site
1:00 – 2:00	Lunch	
2:00 – 2:40 2:40 – 3:20 3:20 – 4:00	Equipment Practice Sessions <u>Session 1:</u> Seating **Andree Gauthier** <u>Session 2:</u> Manual Wheelchairs **Jessica Comay** <u>Session3:</u> Power Wheelchairs **Karen Hall**	3 Groups: Class to be divided into 3 groups. Each group will have a 40 minute rotation in each session. Rooms: 132, 140, 150
4:00 – 4:10	Break	
4:10 – 4:35	Case Based Learning	Small Groups: Group work within study groups
4:35 – 5:00	Case Discussion	Whole Class Room 132

WHEELCHAIR PRESCRIPTION

- So really what's the big deal?

- Many people (therapists included) believe that
- When someone needs a wheelchair all you have to do is plunk them into a folding seat with wheels and away they go.

- But that couldn't be further from the truth .

WHEELCHAIR PRESCRIPTION

IT'S REALLY IMPORTANT!

- Wheeled mobility devices are vital for improving a clients' quality of life (Gryfe, et al. 2007) and or engagement in social, leisure and community activities (Bell & Hinojosa, 1995).

- "Occupational Therapy needs to be able to extend beyond wheelchair prescription to enable occupations with clients."Rudman, D., Hebert D., Reid, D. Canadian Journal of Occupational Therapy: 73 (3):141-52, 2006, June.

ENSURING BEST PRACTICE

1. RESNA – Rehabilitation and Engineering Society of North America–Position Papers
   http://www.resna.org/knowledge-center/position-papers-and-provision-guides

2. ISO–International Standardization Organization – Standardized Seating Measures
   http://www.pva.org/atf/cf/%7BCA2A0FFB-6859-4BC1-BC96-6B57F57F0391%7D/Lib_Waugh%20Guide%20to%20Seating%20v2%20Measures%20Revised%20Ed.compressed.pdf

3. WHO World Health Organization – Wheelchair Service Training Package
   http://www.who.int/disabilities/publications/technology/English%20Wheelchair%20Guidelines%20(EN%20for%20the%20web).pdf?ua=1

Goals of Positioning

- Correct the flexible, accommodate the fixed
- Skeletal alignment/symmetry
- Improve postural control
- "Normalize" muscle tone
- Inhibit abnormal or primitive reflexes
- Proximal stability for distal control/function
- Pressure relief and comfort

https://www.resna.org/sites/default/files/conference/2018/ATP-Fundamentals/Seating.pdf

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http://www.who.int/disabilities/publications/technology/English%20Wheelchair%20Guidelines%20(EN%20for%20the%20web).pdf?ua=1

ENSURING BEST PRACTICE

4. Assistive Devices Program (ADP)
http://www.health.gov.on.ca/en/pro/programs/adp

5. Dalhousie University Wheelchair Skills Program (RL Kirby)
http://www.wheelchairskillsprogram.ca/eng/index.php

6. Canadian Best Practice Guidelines – Pressure Ulcers
http://www.onf.org/system/attachments/168/original/Pressure_Ulcers_Best_Practice_Guidelines_Final_web4.pdf

7. NSW – New South Wales guide for spinal cord injury seating
http://www.aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating

METHOD "GRYFE" PRINICIPLES

- The method for the development of the six therapeutic seating principles, involved
- Naturalistic inquiry- based on years of observation and practice in the field,
- Inductive and abductive reasoning- which when analyzed and examined, led to patterns and concepts that emerged.
- Integration of these patterns and concepts contributed to the development of a systematic statement of principles.

EQUILIBRIUM

- Before getting into the principles, the first thing to recognize is that for a client to engage in life; and participate in his/her meaningful occupations,

- He/she must be comfortable and pain free, in a state of what I term “equilibrium”.

EQUILIBRIUM

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- Equilibrium: “a state of balance, a condition in which opposing forces equalize one another so that no movement occurs” (Webster’s Dictionary Guralink, 1976)
- A sense of being well balanced, whether pertaining to posture, or a condition of mind or feeling.

THE SCIENCE OF SEATING

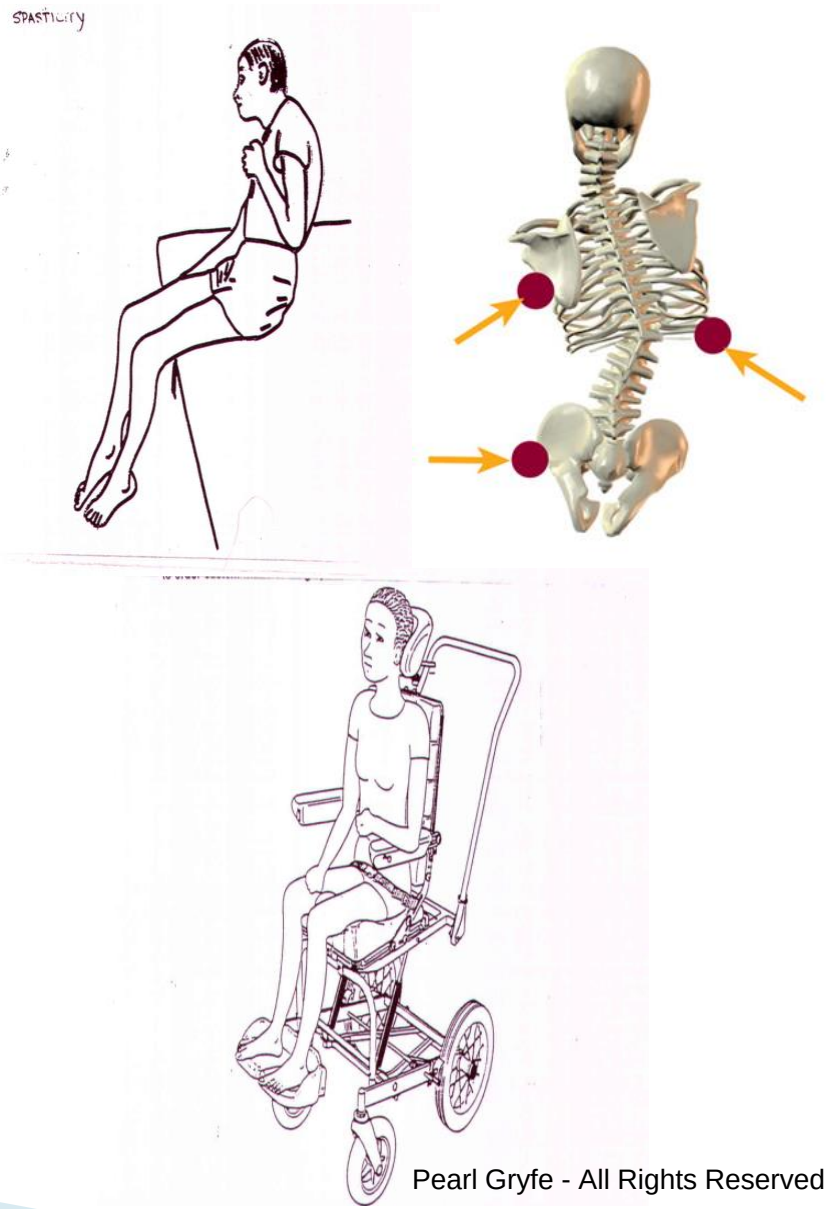
- When forces acting on a body are unbalanced, the body is pushed in the direction of greater force. (Newton's Law)
- There are four forces we need to consider
- Compression →←
- Tensile ←→
- Shear ⇆
- Torque ●↻

THE SCIENCE OF SEATING

- In order for a body to be in a state of equilibrium two conditions must exist:
- The sum of all linear forces acting on the body in all directions and all planes of movement must = 0
- The sum of all moments or rotational forces acting on the body must also = 0

EQUILIBRIUM

- When balance is secured, a high degree of stability is ensured.
- A body which is stable, has the ability to resist forces which tend to destroy balance.

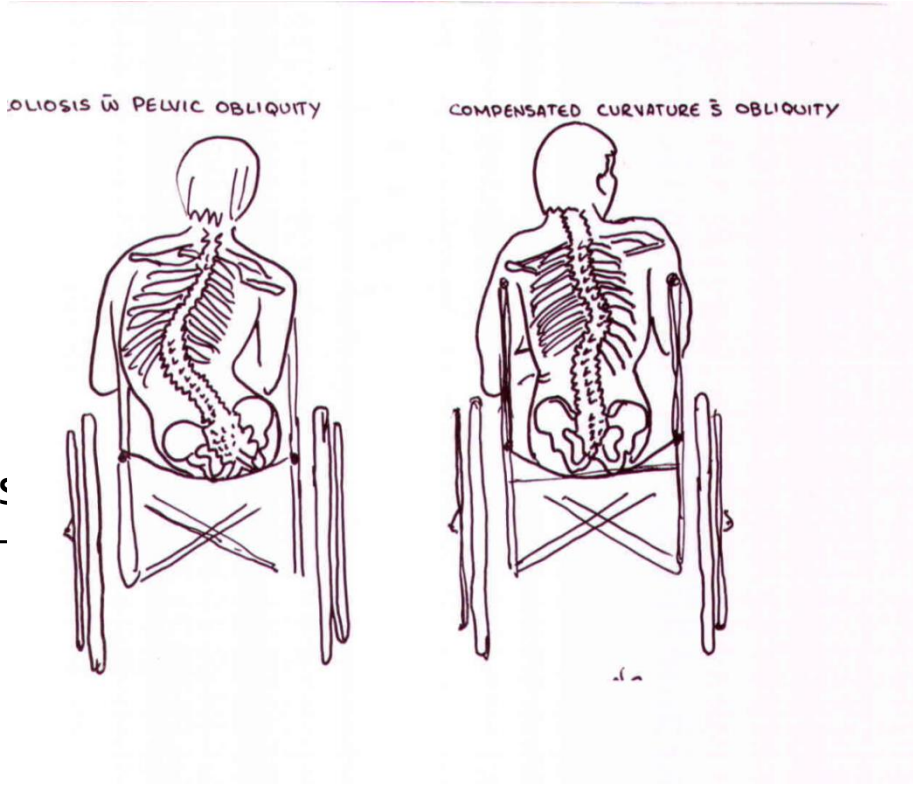


EQUILIBRIUM

- So the goal of seating is to establish equilibrium or a sense of well being
- To achieve equilibrium
- You apply the therapeutic principles.

THERAPEUTIC PRINCIPLE #1
ENSURE STABLE BASE OF SUPPORT

- Ensuring the appropriate size of base of support increases stability
- The firmer the support surface the more stable the base
- In sitting the pelvis provides the base of support – COG - acts as the body's anchor



THERAPEUTIC PRINCIPLE #2
ACHIEVE GOOD PELVIC ALIGNMENT

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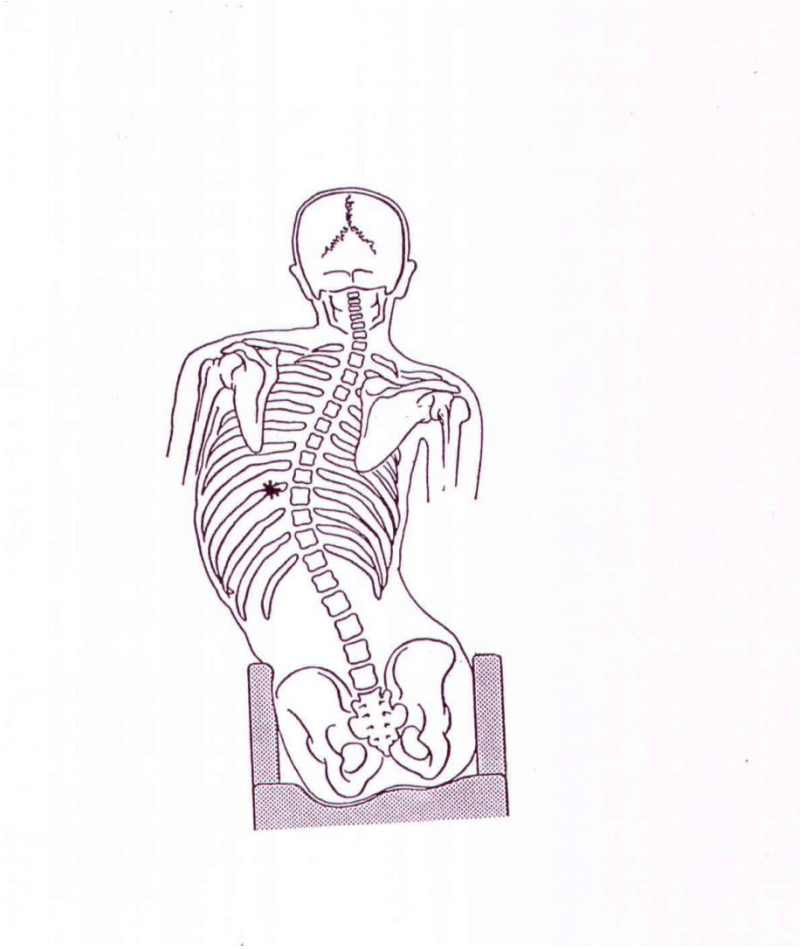
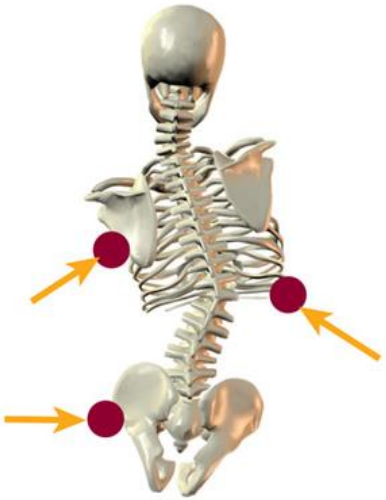
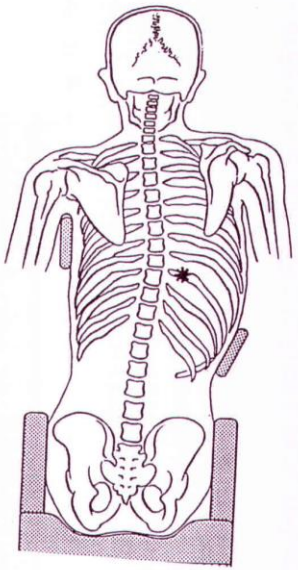
- An un-level pelvis (pelvic obliquity)
- Promotes lateral flexion of the spine and tends to increase patterns of spinal rotation
- This may contribute to digestive and respiratory
- (*breathing) problems, and pressure sores
- Pelvic stability (or lack of it) will influence all other parts of the body



PELVIC ALIGNMENT

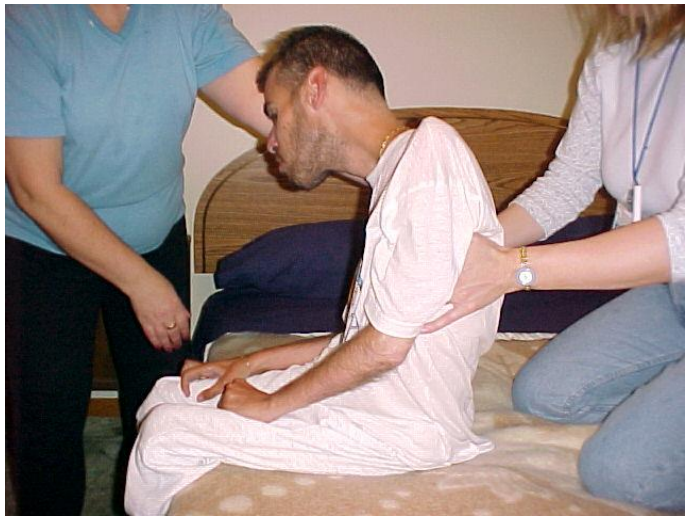
- If mobile you can correct the pelvic alignment
- Good pelvic alignment will promote digestion, respiration and allow for better pressure distribution





FIXED PELVIS

- Sometimes one cannot achieve any correction
- because the pelvic position is fixed
- so there will be no movement in the pelvis

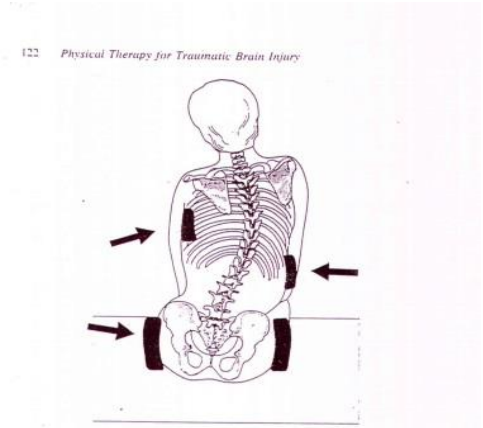


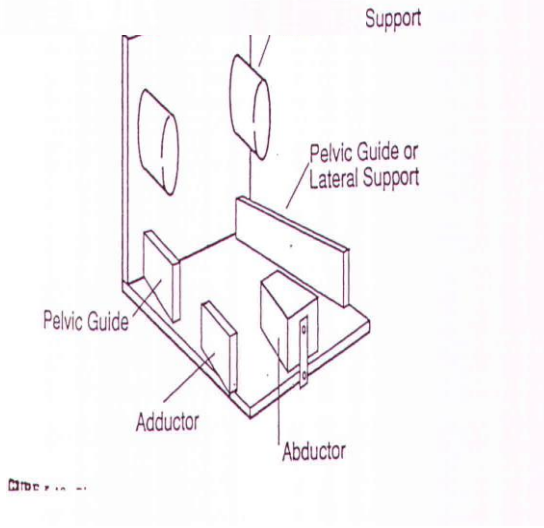
THERAPEUTIC PRINCIPLE # 3 ACCOMMODATE FIXED POSITION

- Accommodate the fixed or difficult to correct position of the pelvis

THERAPEUTIC PRINCIPLE # 3 ACCOMMODATE FIXED POSITION

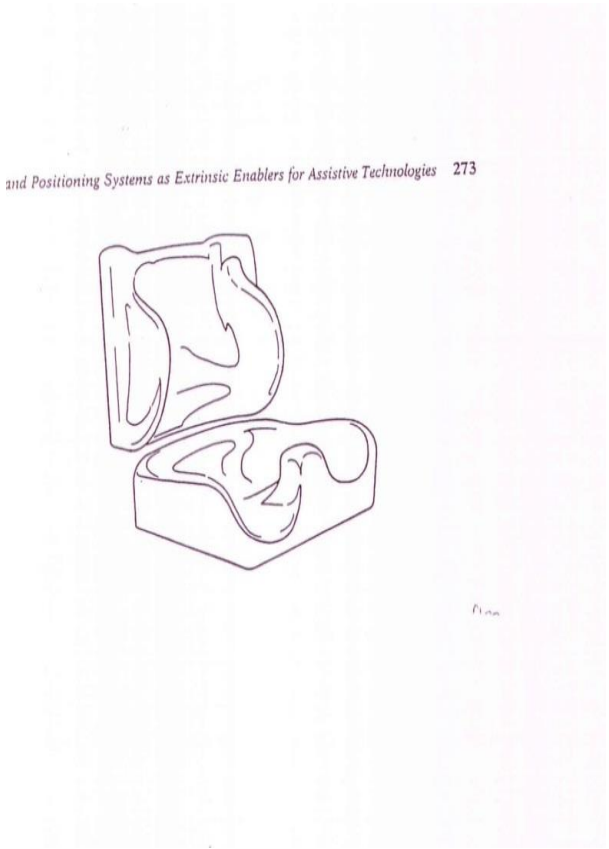
- Accommodate fixed positions
- Planar systems: just offer some well placed supports
  - lateral trunk support
  - lateral pelvic support
  - lateral knee support
  - medial knee support





CUSTOM MOLDED SYSTEMS

- Custom Molded seating – for those with severe fixed postures
- Seat and back are constructed around the posture
- For these clients good pelvic alignment may mean:
- The position where the client's head is balanced over the pelvis
- Minimizing the impact of gravity.



CUSTOM MOLDED SEAT

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THERAPEUTIC PRINCIPLE # 4
LIMIT ABNORMAL MOVEMENT PATTERNS

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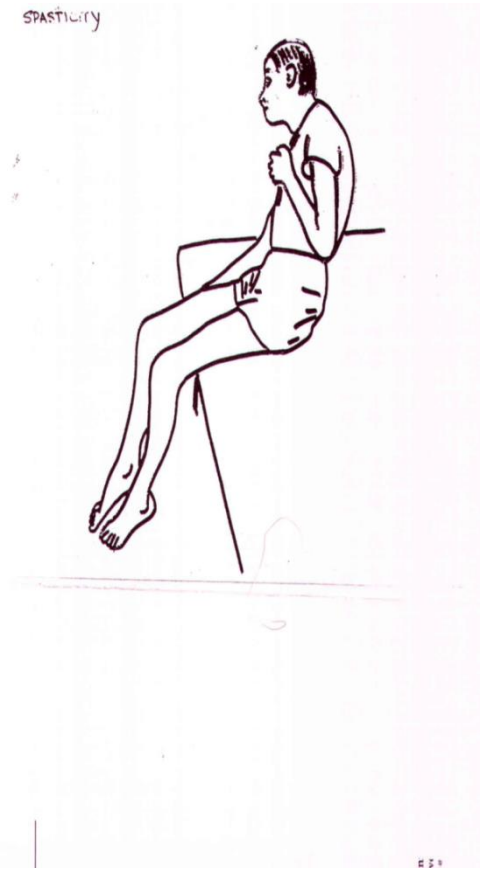
- First must determine what intiates the pattern (ie. Primitive reflexes –ATNR, STNR, Spasticity, extensor/flexor tone)
- Need to determine the source of the problem and address that
- Provide surfaces to prevent undesired movement patterns



ATNR / STNR

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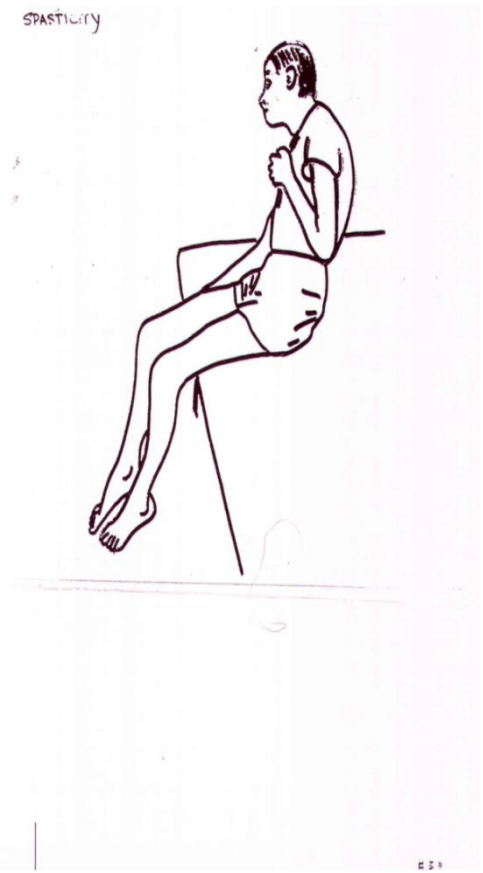
LIMIT MOVEMENT PATTERNS

- Requires good problem solving skills to facilitate improved function
- First must determine what initiates the pattern (ie. Primitive reflexes –ATNR, STNR, Spasticity, tonal patterns)
- Need to determine the source of the problem and address that
- Provide surfaces to prevent undesired movement patterns
- Don't want to block all movement



THERAPEUTIC PRINCIPLE #5 MINIMIZE RESTRAINTS

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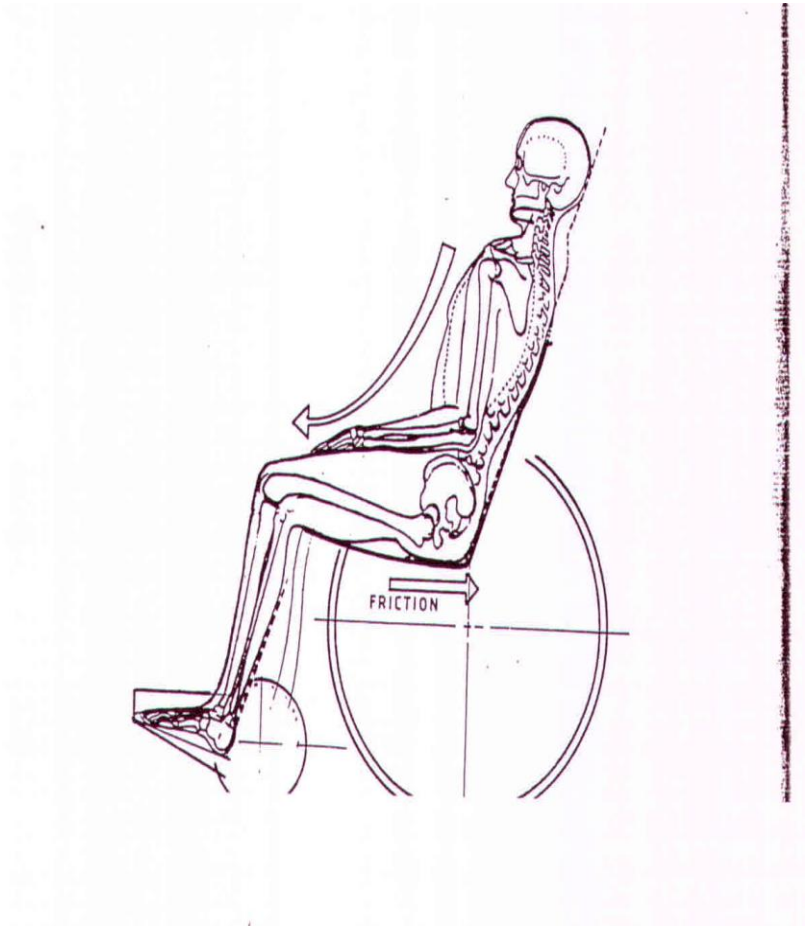
Check system measurements and angles and support surfaces:

- Seat depth
- Thigh to trunk angle
- Thigh to lower leg angle
- Lower leg to foot angle



MINIMIZE RESTRAINTS

- Once you've checked all the angles
-
- Look at the weight bearing and support surfaces
- Which leads us to Principle #6

THERAPEUTIC PRINCIPLE # 6
PROVIDE OPTIMUM PRESSURE RELIEF

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Why is this important:

- Prevent skin breakdown, generally over boney prominences
- Skin breaks down as a consequence of unrelieved pressure
- Leading to avascular necrosis (tissue death).

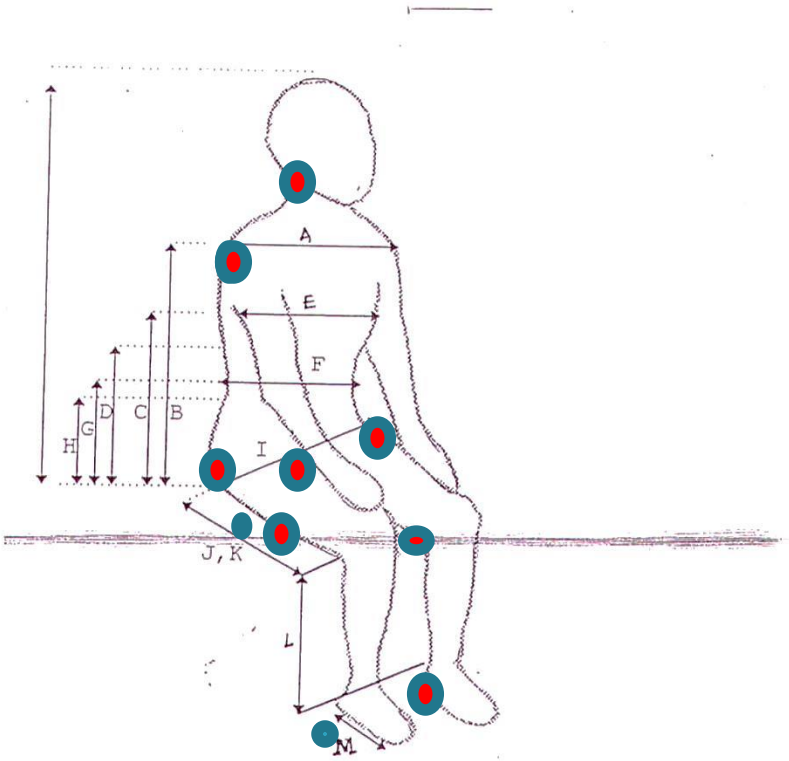
Other influences on pressure:

- Shearing forces/ Spasticity
- Friction
- Moisture
- Decreased Mobility

AREAS OF SKIN BREAKDOWN

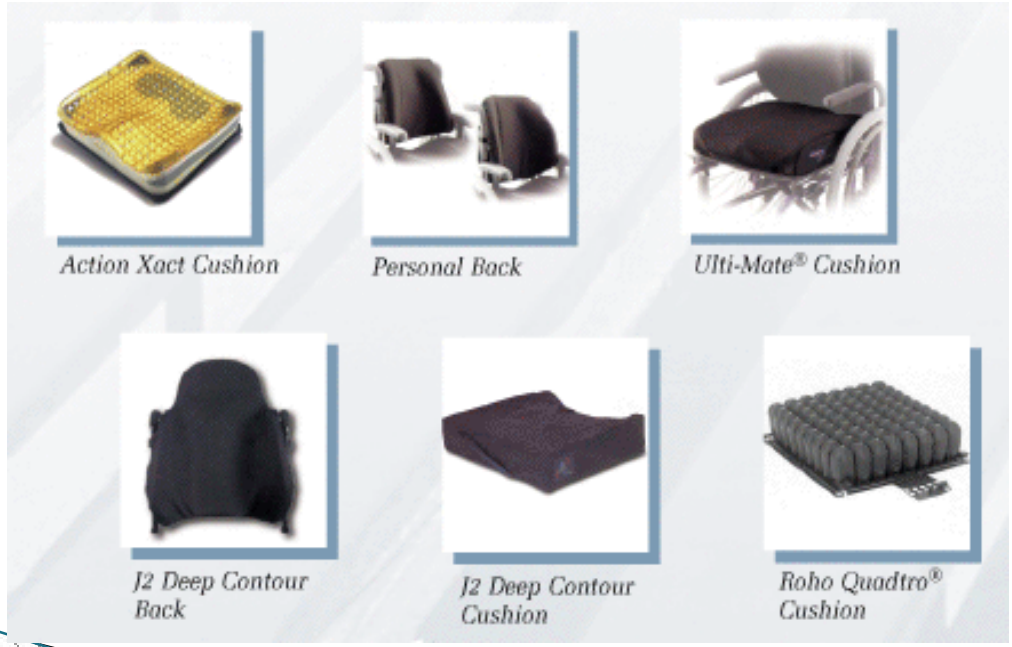
- Any area of the body that bears weight

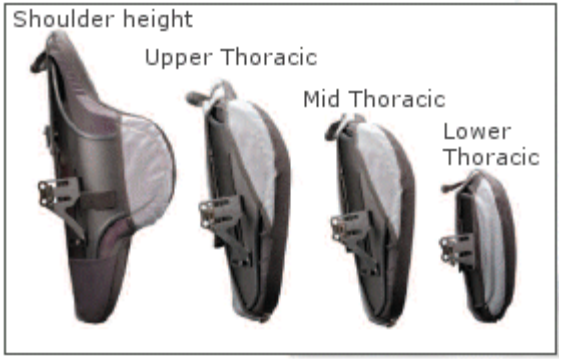
- Occiput / ears
- Acromion Processes
- Greater Trochanters
- Ischial Tuberosities
- Sacrum
- Thighs
- Popliteal fossa
- Medial /lateral malleoli



PRESSURE RELIEF

- Look at weight bearing areas
- and properties of support surfaces:
- Cushion – air, foam,gel
- Back – planar, modular or molded





OTHER PRESSURE CONSIDERATIONS

- Once you've Checked the angles
- Examined the weight bearing surfaces – ensure maximum weight distribution
- Provide dynamic changes of position
  - Tilt, Recline, Elevating Legs

REVIEW

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- #1 – Ensure a stable base of support
- #2 – Achieve good pelvic alignment
- #3 – Accommodate fixed deformities
- #4 – Limit abnormal movement patterns
- #5 – Minimize restraints
- #6 – Provide optimum pressure relief

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THANK YOU

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