

U of T OCT 1100H
Seating and Mobility Day
April 25, 2019

MAT ASSESSMENT & STANDARDIZED MEASURES

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Why is assessment so important?

“A wheelchair is an extension of the user's body. Therefore, it is critical that any prescription for a new wheelchair must match the user's current expectations, preferences, physical needs and functional requirements that emerge out of his or her interactions with the environment.”

Batavia M, Batavia AI & Friedman R. 2001. Changing chairs: anticipating problems in prescribing wheelchairs. Disabil Rehabil. Aug 15; 23(12): 539-48

Why is assessment so important?

Studies show that clinically prescribed seating and wheelchair systems promote:

- good posture
- greater muscle efficiency
- participation in activities – encouraging learning, socialising, independence
- promote function and participation
- enhanced organ activity

Sprigle S, De l'aune W. 2013. Factors contributing to extended activity times during the provision of wheeled mobility devices. Disabil Rehabil Assist Technol. 2013 May;8(3):225-31. doi: 10.3109/17483107.2012.71343

Why is assessment so important?

Thorough assessment is essential to:

- choose the most appropriate wheelchair
- determine postural supports/seating needed
- decide what training and support is required



Assessment Framework

International Classification of Function (ICF)

1. Body structure and function
2. Activities and participation
3. Environment and devices

<https://www.who.int/classifications/icf/en/>



**World Health
Organization**

Assessment Components



Interview

- Demographic information
- Diagnosis
 - congenital or acquired condition
 - degenerative disease
 - secondary diagnoses/comorbidities
- Client goals

Interview

- Medical history
 - systems
 - neurological
 - respiratory
 - circulatory
 - bowel and bladder
 - skin integrity
 - height and weight
 - medications
 - pain

Interview

- Psychosocial
 - family and/or caregiver support
 - funding
- Cognition and behavior
 - attention, concentration, memory, problem solving, motivation, impulsivity
- Sensory and perceptual abilities
 - vision, hearing, tactile, proprioception

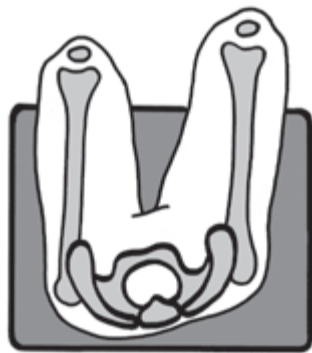
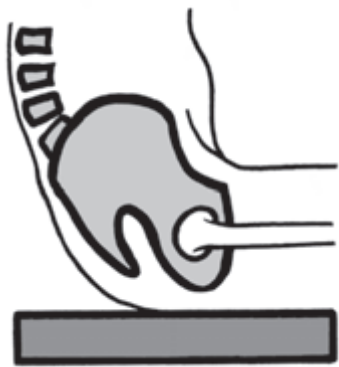
Interview

- Activities of daily living
 - self-care tasks
 - leisure activities
 - work requirements
- Environment
 - home
 - office
 - community
 - transportation

Physical/MAT Assessment

- Supine Evaluation
- Sitting Evaluation
- Range of Motion (ROM) – active and passive
- Manual Muscle Testing (MMT)
- Taking Measurements

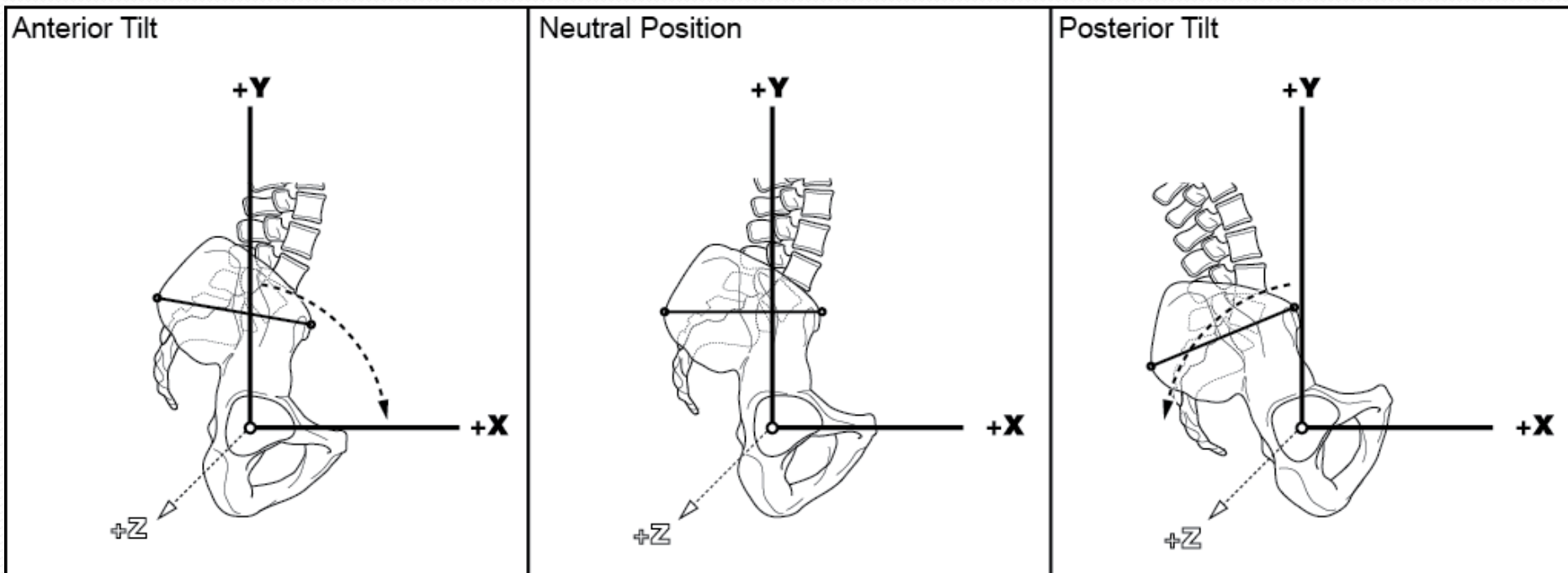
Physical/MAT Assessment



- Always begin assessment with the pelvis
- The posture of the pelvis will always affect the rest of the body

Physical/Mat Assessment

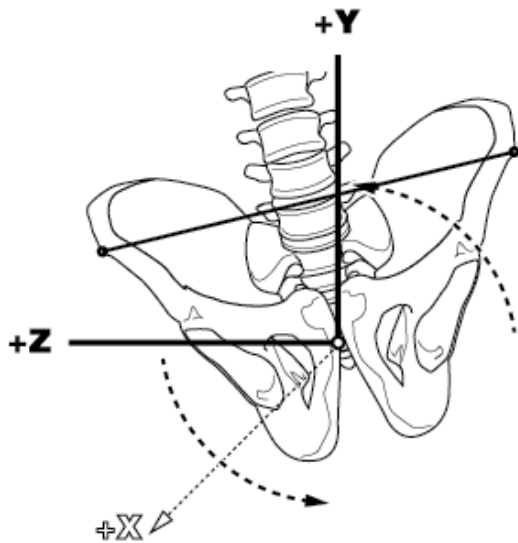
Sagittal plane



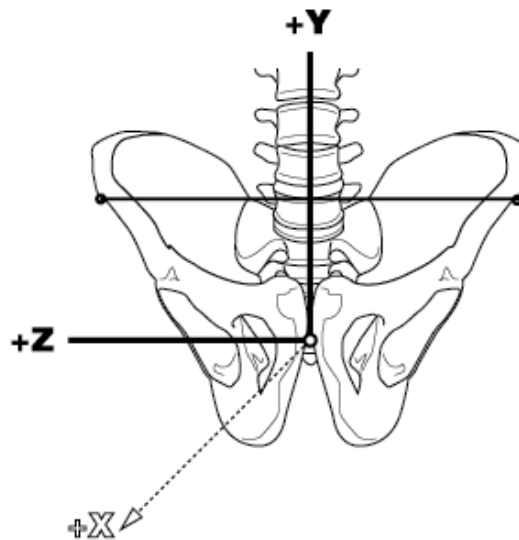
Physical/Mat Assessment

Frontal plane

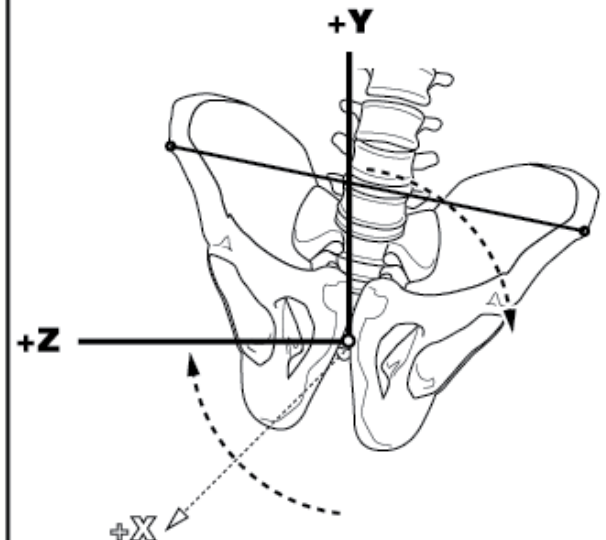
Right Pelvic Obliquity



Neutral Position

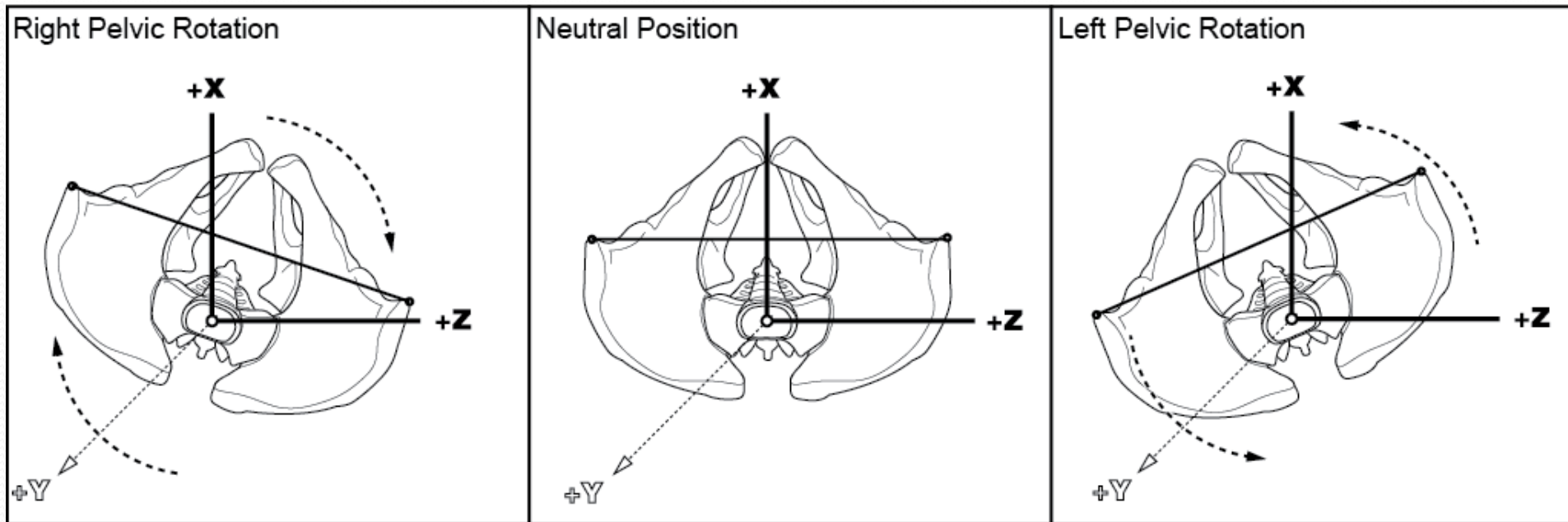


Left Pelvic Obliquity



Physical/Mat Assessment

Transverse plane



Supine Evaluation



- client lies supine with knees in flexion
- assessor holds the pelvis with thumbs on ASIS
- try to align the pelvis
- determine if the trunk is mobile or difficult to align
- observe and record any limitations

Supine Evaluation



- always start at the pelvis
- then the rest of the body
 - trunk
 - head and neck
 - lower extremities
 - upper extremities
- supine evaluation **reduces the impact of gravity on the body**

Supine Evaluation



Pelvis:

- anterior, neutral or **posterior pelvic tilt**
- neutral, right or **left pelvic obliquity**
- neutral, **right** or left forward **pelvic rotation**

Supine Evaluation



Trunk:

- lordosis, neutral trunk or **kyphosis**
- neutral trunk or **scoliosis**
- neutral or **trunk rotation**

Supine Evaluation



Head/neck:

- **flexion**, neutral or extension
- Right side flexion, neutral or **left side flexion**
- right rotation, neutral or **left rotation**

Supine Evaluation



- Hip flexion
- Hip extension
- Hip external rotation
- Hip internal rotation
- Knee flexion
- Knee extension
- Ankle planterflexion
- Ankle dorsiflexion
- Ankle inversion
- Ankle eversion

Supine Evaluation



- Also note influence of:
 - tone/spasticity
 - ATNR
 - contractures
- Other observations:
 - windswept deformities
 - hip subluxation
- Skin checks:
 - while client is supine, roll on side and check skin
 - check for areas of pressure, i.e. ITs, coccyx

Sitting Evaluation



- Your hands provide the support that will be provided by the wheelchair and postural supports
- Always start at the pelvis
- Then the rest of the body
 - trunk
 - head and neck
 - lower extremities
 - upper extremities

Sitting Evaluation



Pelvis:

- anterior, neutral or **posterior pelvic tilt**
- neutral, **right** or left **pelvic obliquity**
- neutral, right or **left forward pelvic rotation**

Sitting Evaluation



Trunk:

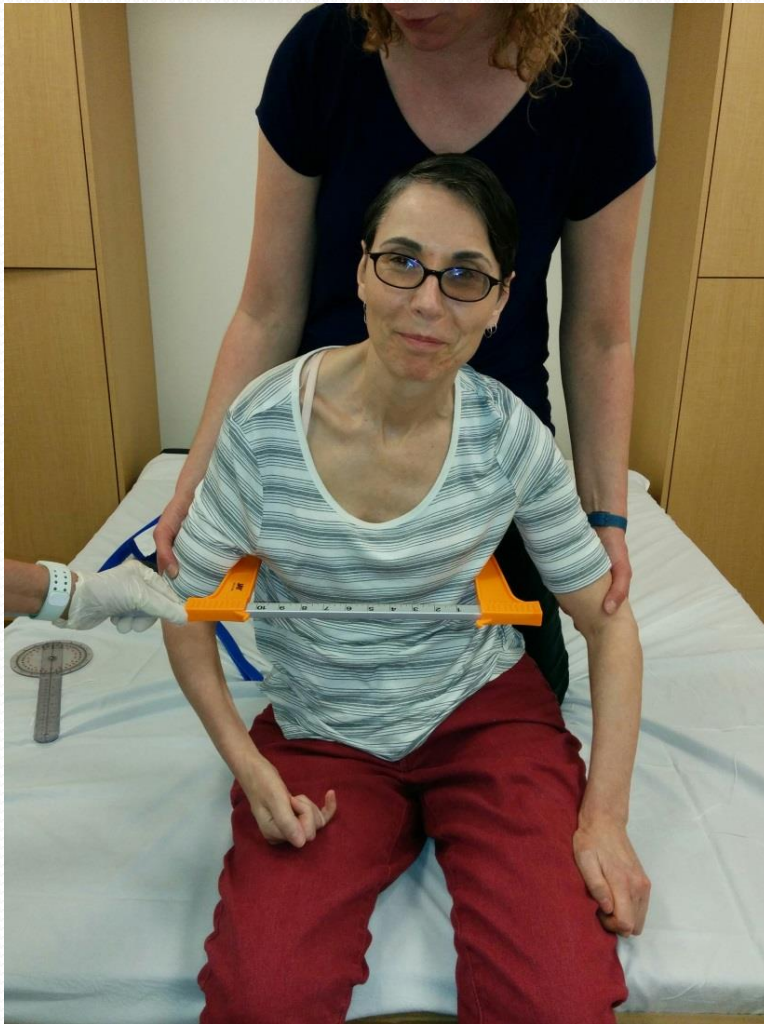
- lordosis, neutral trunk or **kyphosis**
- neutral trunk or **scoliosis**
- neutral or **trunk rotation**

Sitting Evaluation



- Assess head and neck:
 - A/PROM
 - strength
 - position
- Assess upper extremities:
 - A/PROM
 - strength
 - ATNR
 - hypo/hypertonic
 - hand function
 - gross motor
 - fine motor
 - coordination

Taking measurements



- Body measurements relate to the size of the wheelchair and postural supports
- To take accurate measurements:
 - use a firm tape measure
 - use calipers to increase the accuracy
 - measure in the most upright, comfortable and functional posture

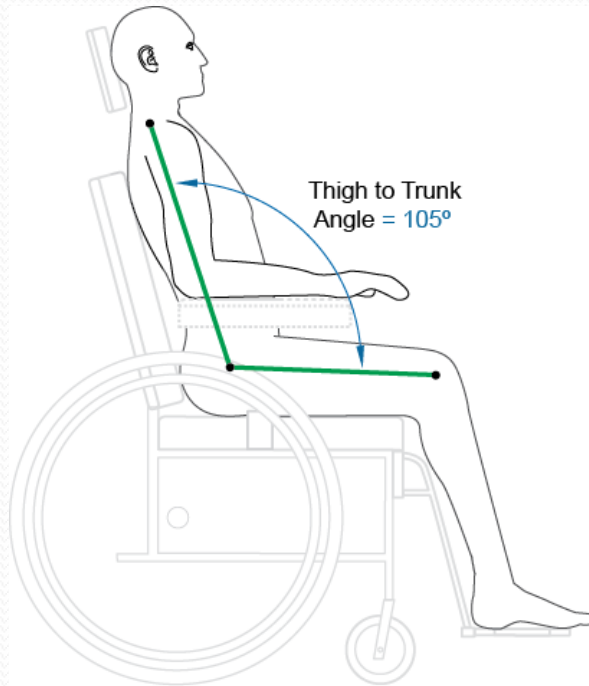
Taking measurements

- ISO Standardized Measures for Seating Supports and Seated Posture
- Standardized measures are important for:
 - improving communication
 - reducing inefficiencies
 - reporting outcomes
 - justifying cost
 - doing research

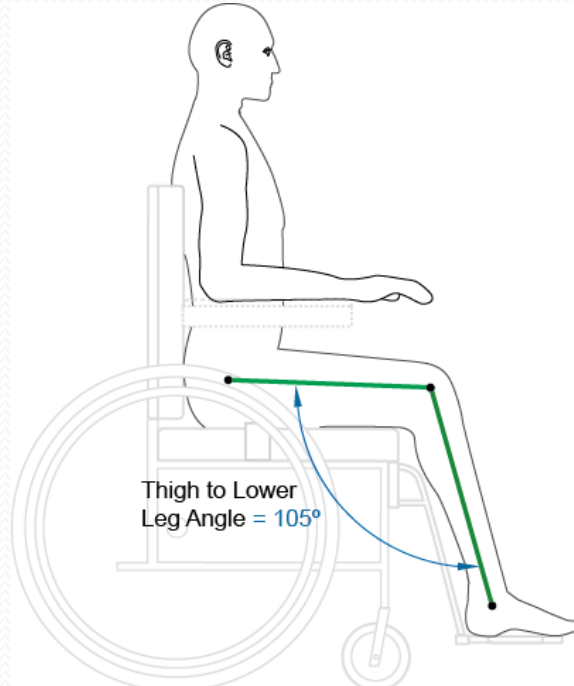
Taking measurements

- ISO defines a global coordinate system for quantifying measures of the person and their seating support surfaces
- Measures of the person
 - Relative body segment angles
 - Linear body measures
- Measures of the seating support surface
 - Relative support surface angles
 - Linear support surface measures

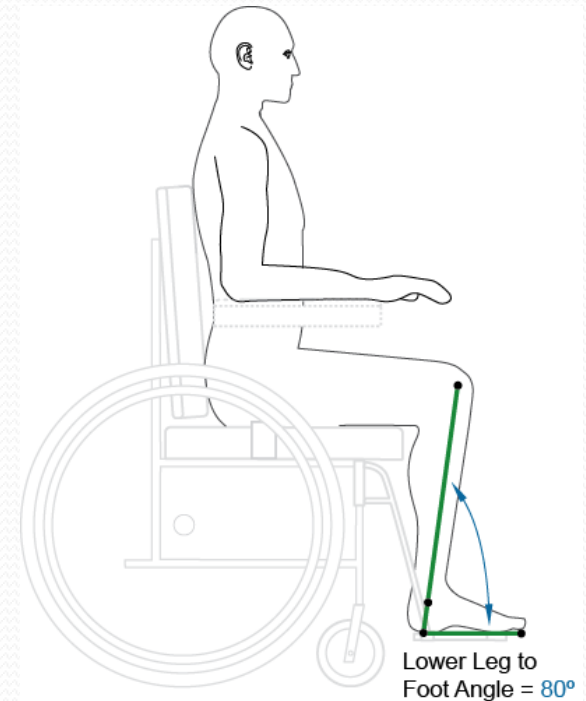
Relative body segment angles



THIGH TO TRUNK ANGLE



THIGH TO LOWER LEG ANGLE



LOWER LEG TO FOOT ANGLE

Thigh to trunk angle



Landmarks used:

- greater trochanter
(center of rotation)
- lateral femoral condyle
- lateral lower neck point

Thigh to lower leg angle



Landmarks used:

- lateral femoral condyle (center of rotation)
- greater trochanter
- lateral malleolus

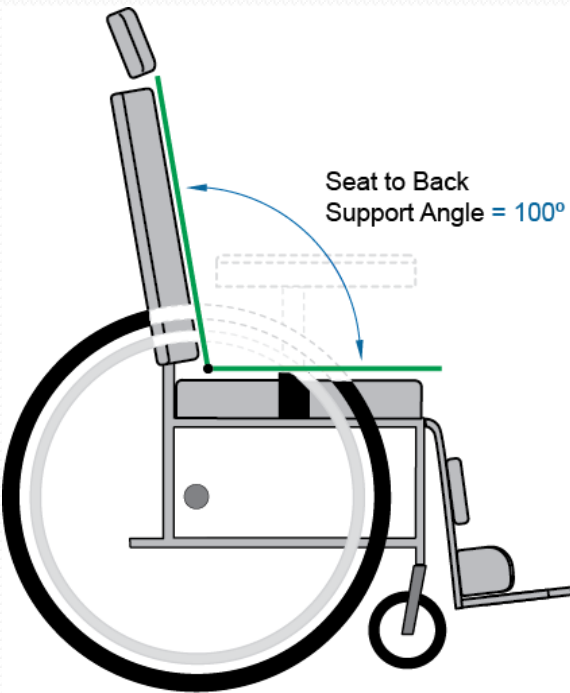
Lower leg to foot angle



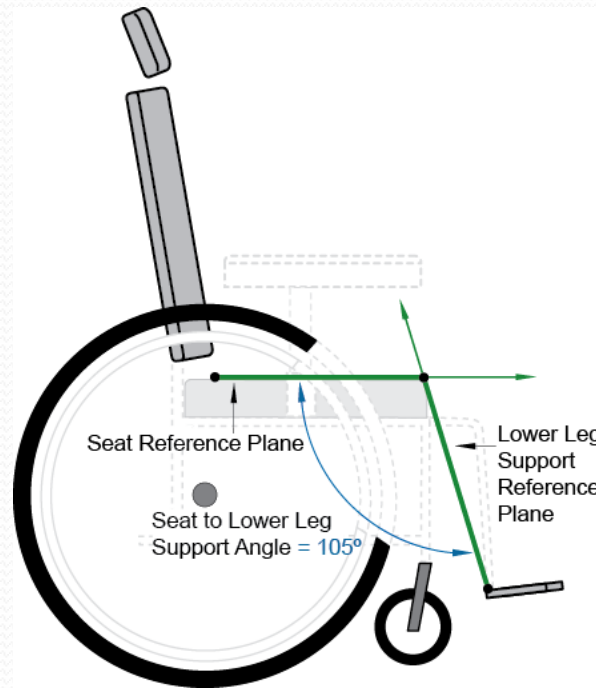
Landmarks used:

- lateral heel point
(center of rotation)
- lateral femoral condyle
- lateral toe point

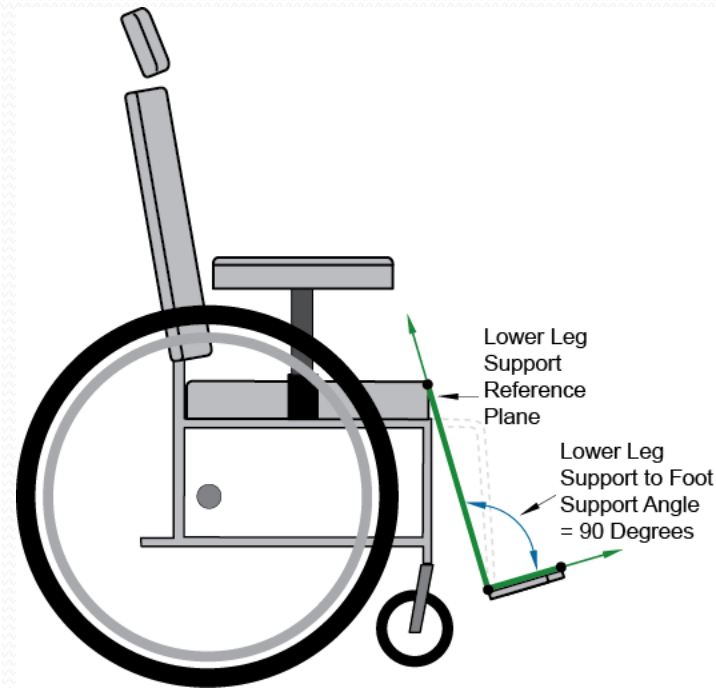
Relative support surface angles



SEAT TO BACK SUPPORT ANGLE

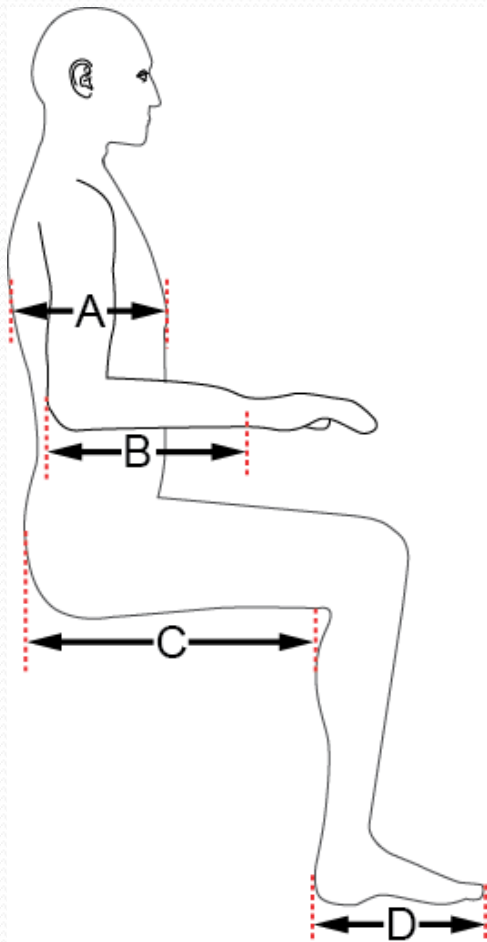


SEAT TO LOWER LEG
SUPPORT ANGLE

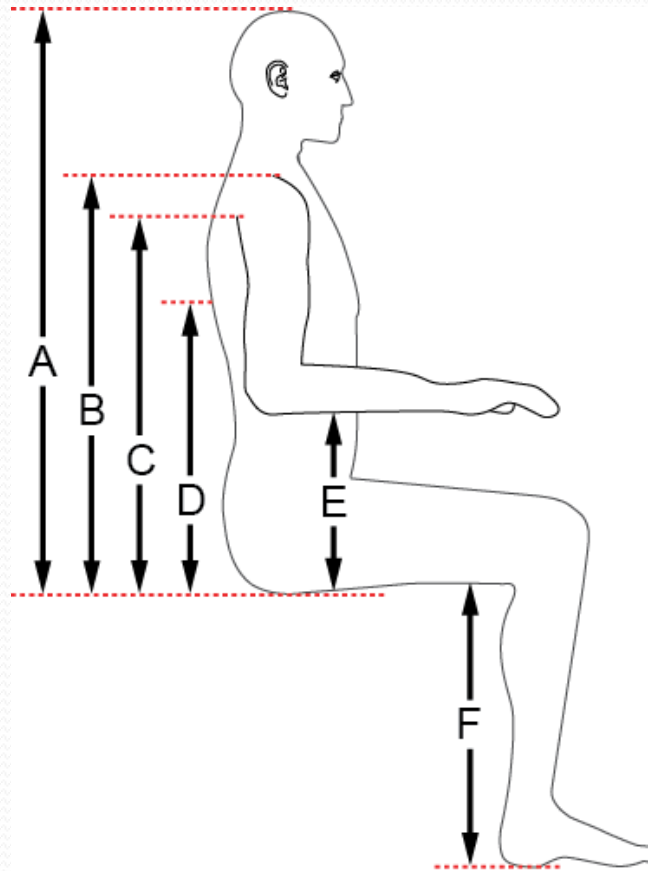


LOWER LEG SUPPORT/FOOT
SUPPORT ANGLE

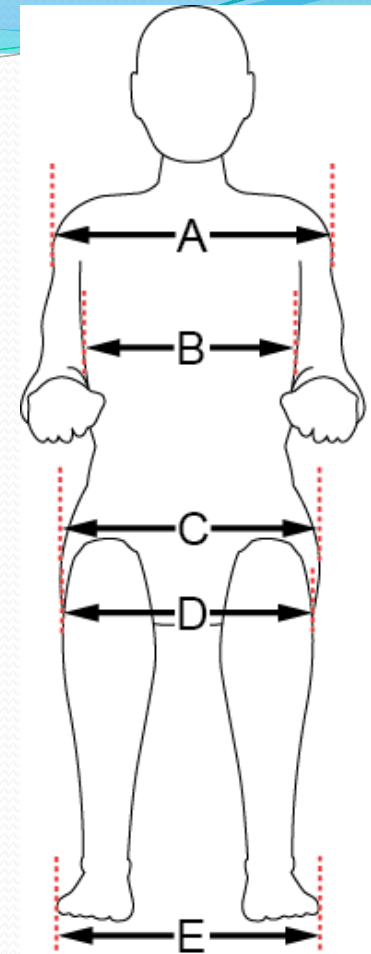
Linear body measures



- A – Trunk Depth
- B – Forearm Depth
- C – Buttock/Thigh Depth
- D – Foot Depth

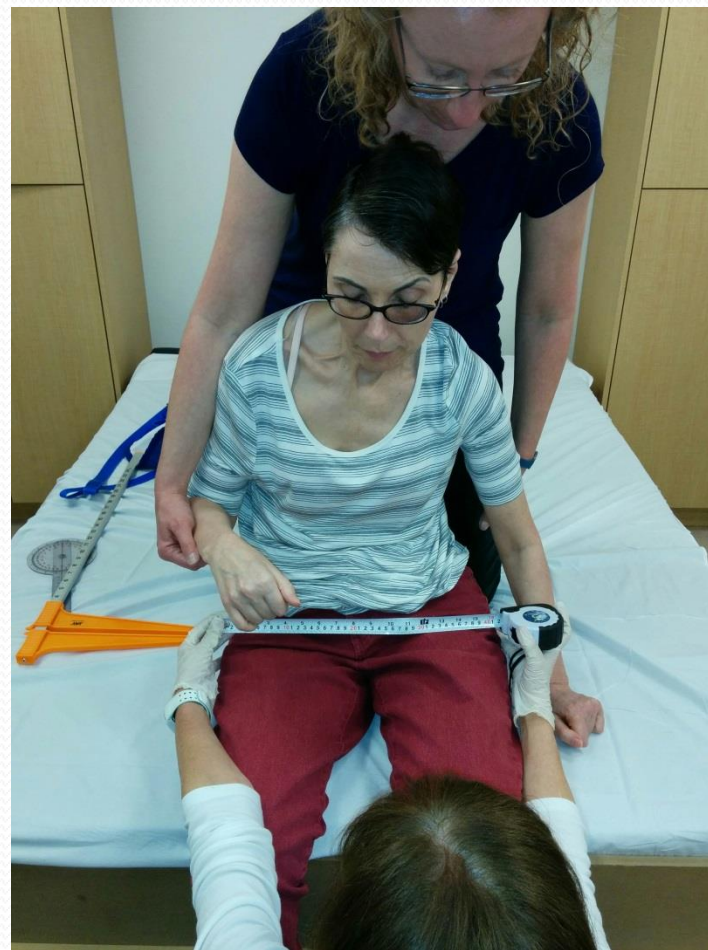


- A – Maximum Sitting Height
- B – Shoulder Height
- C – Axilla Height
- D – Scapula Height
- E – Elbow Height
- F – Lower Leg Length

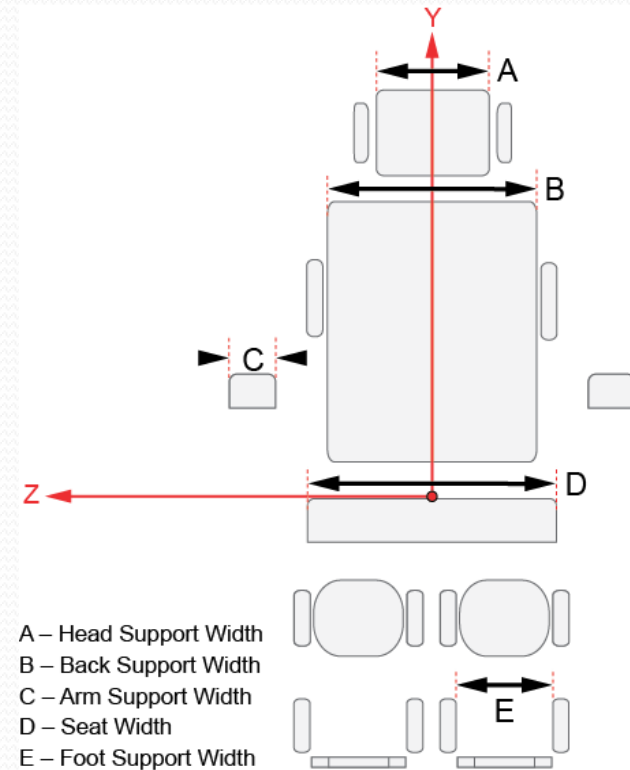
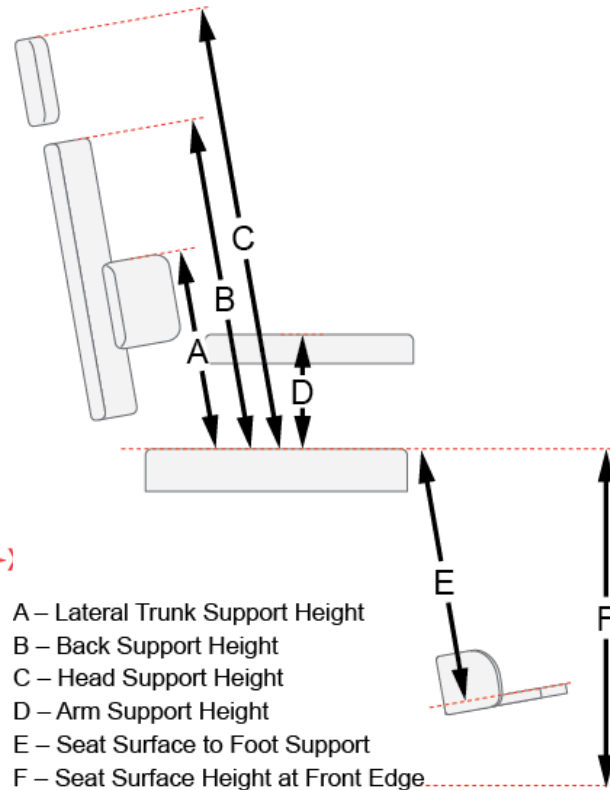
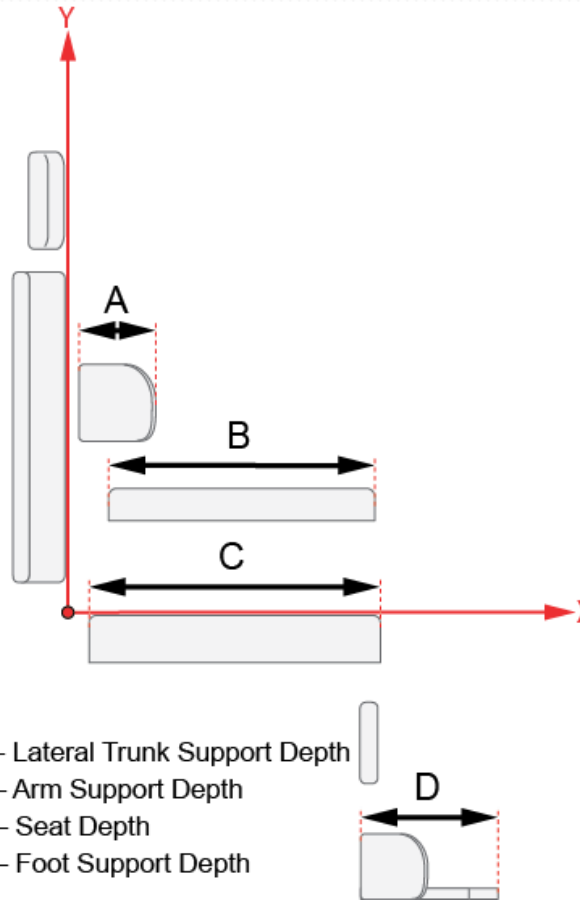


- A – Shoulder Width
- B – Chest Width
- C – Hip Width
- D – External Knee Width
- E – External Foot Width

Linear body measures

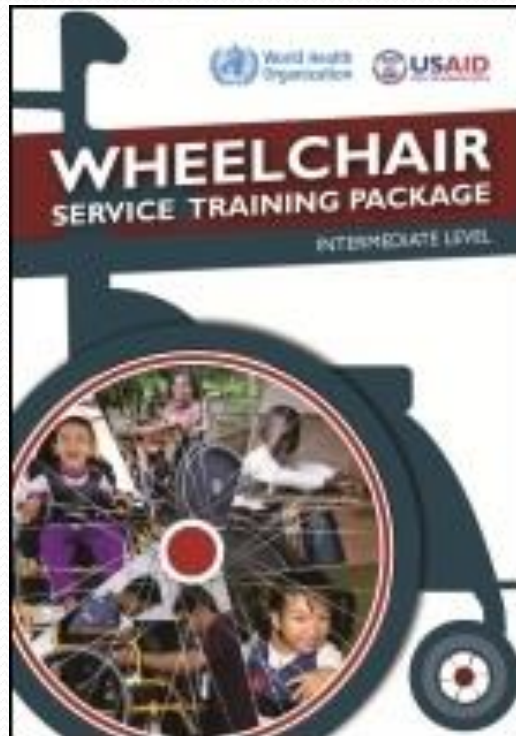


Linear support surface measures



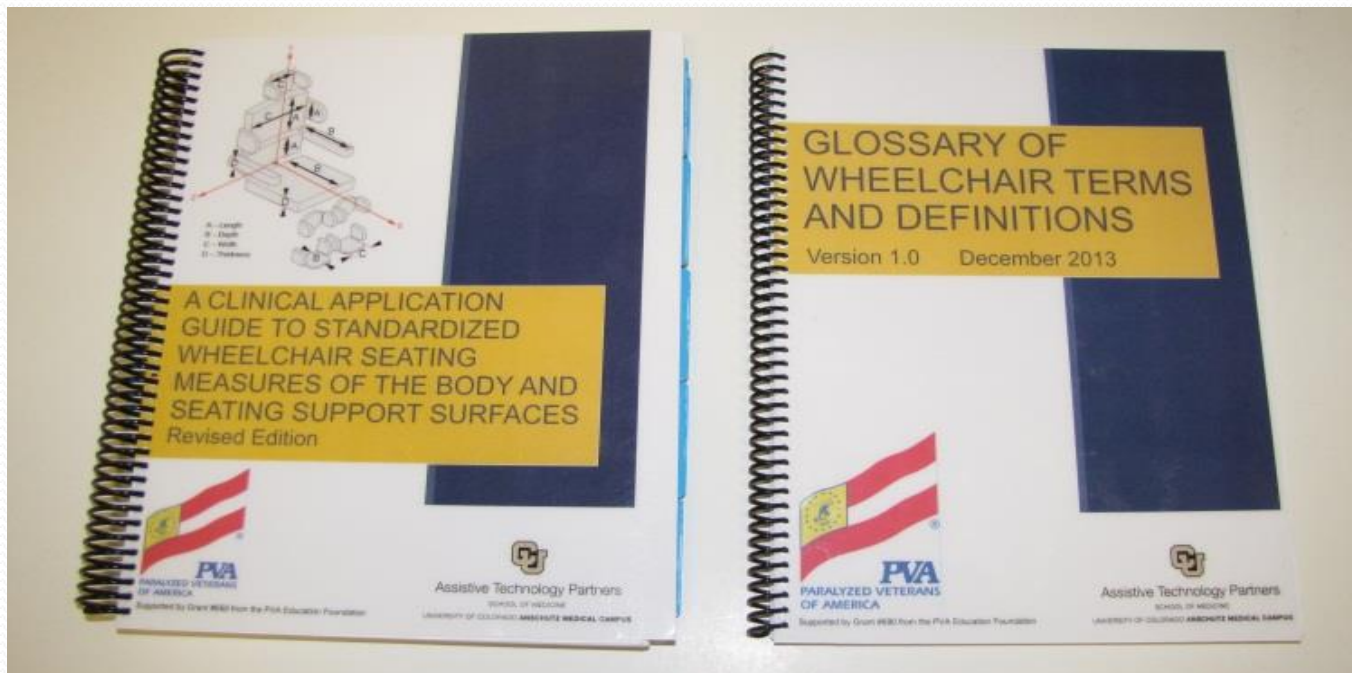
References

*World Health Organization Wheelchair Service Training Package
Reference Manual for Participants Intermediate Level, 2013*



References

A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces, 2013



QUESTIONS?



Next Steps

- 11:30 – 11:45 Break
- 11:45 - 1:00 MAT Assessment Practice Session
 - Whole class meets at **TRI**
 - Break out into small groups
 - Bring handouts to complete
- 1:00 – 2:00 Lunch break

Next Steps

- 2:00 – 4:00 Equipment Practice Sessions
 - Break out into 3 groups
 - Each group will have 40 minutes in each session
 - Bring handouts to complete
 - Session 1: Seating (Andree Gautier) Room 132
 - Session 2: Manual Wheelchairs (Jessica Comay) Room 140
 - Session 3: Power Wheelchairs (Karen Hall) Room 150

Next Steps

- 4:00 – 4:10 Break
- 4:10 – 4:35 Case studies
 - 10 groups (2 groups per case)
- 4:35 – 5:00 Case studies
 - group discussion in room 132