Hands-On Postural Assessment for Seating

Part B · Hands-on assessment in sitting & supine · Summary of findings

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Measures use the standardised definitions in Waugh & Crane, *A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces* (2013). Diagrams are simplified drawings, not reproductions. Fields with a calculation fill in automatically in Adobe Acrobat Reader; in other PDF apps, fill them in by hand.

Person being assessed	Date of birth / age	Date

Clinician(s)	Setting / location	Others present

2 Assessment in sitting

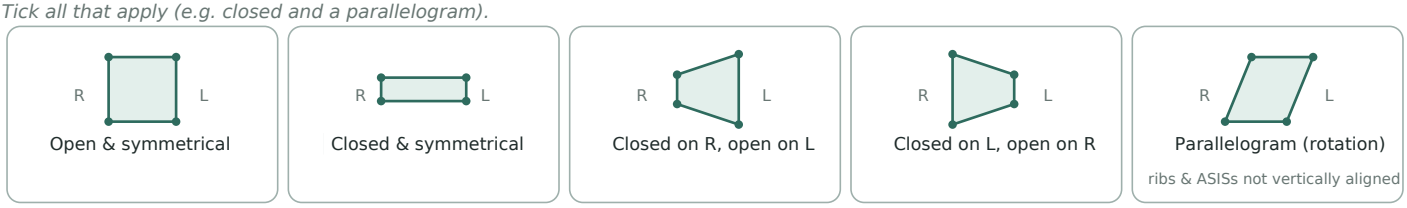
A snapshot of this moment. Complete with the person in their current seating system, **as they are**. Don't reposition them or change anything: leave lateral supports, arm supports, pelvic positioning belt etc. as found.

CURRENT SEATING SYSTEM Seat-to-back angle ____ ° (hip flexion the seating requires = 180° − this, e.g. 100° → 80°)

A Life Box relationship between the ribs and the pelvis

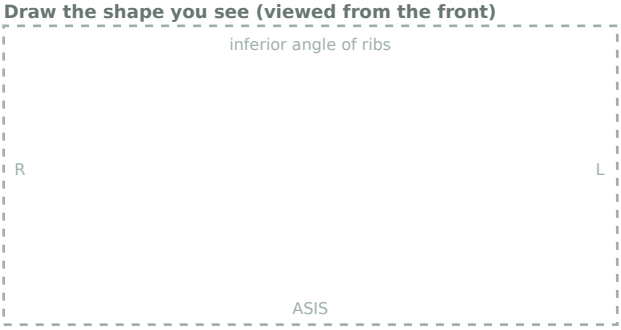
Landmarks: R and L ASIS, and the inferior angle of the ribs (lowest point of the rib cage) on each side. Picture the box joining these four points.

Tick all that apply (e.g. closed and a parallelogram).



IF PARALLELOGRAM: ribs shifted towards ◯ R ◯ L relative to the ASISs

Draw the shape you see (viewed from the front)



Open: space between the ASISs and the ribs
Closed: little space between the ASISs and the ribs
Symmetrical: same distance between ASIS and ribs on both sides

Notes

B Pelvic position

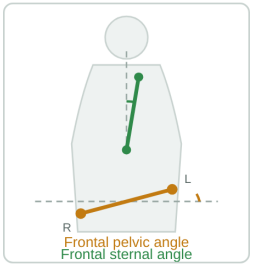
Frontal plane

◯ Neutral
◯ R pelvic obliquity (R side low)
◯ L pelvic obliquity (L side low)

IF MEASURED Frontal pelvic angle ____ ° ◯ R side low ◯ L side low

Frontal sternal angle ____ ° towards ◯ R ◯ L

Landmarks: Frontal pelvic angle: R and L ASIS; reference = horizontal. **Frontal sternal angle**: upper and lower sternal notch; reference = vertical (viewed from the front).

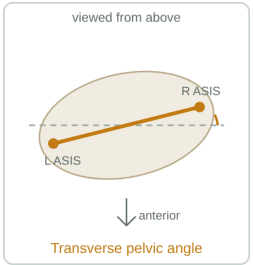


Transverse plane

◯ Neutral
◯ R pelvic rotation (L side forward)
◯ L pelvic rotation (R side forward)

IF MEASURED Transverse pelvic angle ____ °

Landmarks: R and L ASIS, viewed from above; reference = line across the seat (side to side).

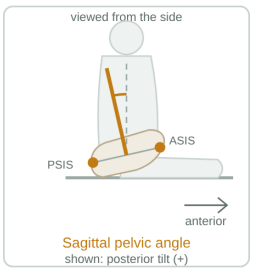


Sagittal plane

- ◯ Neutral
- ◯ Posterior pelvic tilt
- ◯ Anterior pelvic tilt
- ◯ Not applicable / unable to tell

IF MEASURED Sagittal pelvic angle ____ ° (+ posterior / − anterior tilt)

Landmarks: ASIS and PSIS (line perpendicular to the ASIS–PSIS line); reference = vertical, viewed from the side.



C Sitting footprint

A rough check of loading areas for symmetry, gaps and peak pressure. Score each area 0–3, then use **Notes** for finer grading (e.g. 2+, 2−, 3+++) and exact areas (e.g. lateral aspect of foot only, mid-femur only, inferior angle of scapula).
0 = no contact · **1** = contact, no load · **2** = optimal load · **3** = excessive load

Inferior support (seat & feet)	R (0 1 2 3)	L (0 1 2 3)	Notes (grading +/−, exact area)
Ischial tuberosity	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Greater trochanter	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Proximal femur	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Distal femur	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Feet	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	

Posterior support (back)	R (0 1 2 3)	L (0 1 2 3)	Notes (grading +/−, exact area)
Posterolateral pelvis	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Posterolateral ribs	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Scapula	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Shoulders	0 ◯ 1 ◯ 2 ◯ 3 ◯	0 ◯ 1 ◯ 2 ◯ 3 ◯	

Midline	Score (0 1 2 3)	Notes (grading +/−, exact area)
Sacrum	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Lumbar spine	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Thoracic spine	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Cervical spine	0 ◯ 1 ◯ 2 ◯ 3 ◯	
Occiput	0 ◯ 1 ◯ 2 ◯ 3 ◯	

Upper limb loading (R only / L only / both / none)

Other contact points (laterals, belt, head support)

Sitting comments

3 Assessment in supine

On a firm plinth or mat. **Pelvis-up** finds the optimal Life Box; **pelvis-down** finds what the hips, knees and ankles allow while that Life Box is kept.

A Pelvis-up · mobility & position

Goal: find this person's **optimal Life Box**, their **resting** position in supine. In each plane, assess mobility first, then record the optimal / resting position. Record **pelvis first, then trunk**. Measuring in supine: take the long axis of the plinth as the vertical reference (Y) and a line across the plinth as horizontal (Z).
Optimal = resting. Move slowly and **stop just before you feel any tension or stretch, or see any movement**. That point is the optimal position to record. If the Life Box (or a joint) can be pushed further but only against tension or stretch, that is no longer resting.

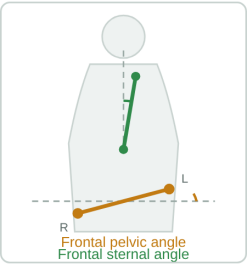
Frontal plane

◯ Able to achieve neutral
◯ R pelvic obliquity (L lateral trunk flexion)
◯ L pelvic obliquity (R lateral trunk flexion)

e.g. when the problem comes from the pelvis up, a **L pelvic obliquity** often goes with a **R lateral trunk lean**: the R side of the pelvis is hitched up towards the ribs because the R lateral trunk flexors are shortened (and the reverse for a R obliquity).

OPTIMAL / RESTING Frontal pelvic angle ____ ° ◯ R side low ◯ L side low

Frontal sternal angle ____ ° towards ◯ R ◯ L



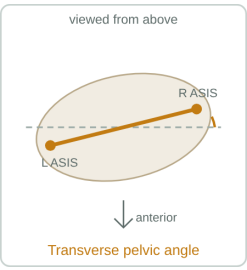
Landmarks: Frontal pelvic angle: R and L ASIS; reference = line across the plinth. **Frontal sternal angle**: upper and lower sternal notch; reference = long axis of the plinth.

Transverse plane · make sure the legs can move freely

◯ Able to achieve neutral
◯ R pelvic rotation, L side forward (L trunk rotation)
◯ L pelvic rotation, R side forward (R trunk rotation)

OPTIMAL / RESTING Transverse pelvic angle ____ °

Landmarks: R and L ASIS, viewed from above (from the head end in supine); reference = line across the plinth.



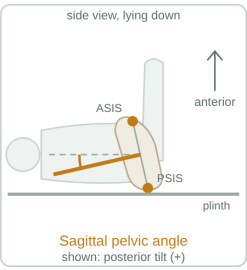
Sagittal plane

◯ Able to achieve neutral
◯ Posterior pelvic tilt (limited trunk extension)
◯ Anterior pelvic tilt (limited trunk flexion)

With a large **anterior pelvic tilt**: flex the legs as much as needed to bring the pelvis as close to neutral as possible (if there is lumbar mobility), then assess hip extension in pelvis-down (step 2).

OPTIMAL / RESTING Sagittal pelvic angle (pelvic tilt) ____ ° (+ posterior / − anterior)

Landmarks: ASIS and PSIS (line perpendicular to the ASIS–PSIS line), viewed from the side. In supine, measure relative to the trunk lying on the plinth.



Thoracic spine (mid-upper): extension

◯ Able to achieve thoracic extension
◯ Limited range, but able to achieve neutral
◯ Unable to achieve thoracic extension (will sit with a thoracic kyphosis)

If they can extend through the thoracic spine, support that extension in sitting. If they can't, accommodating the kyphosis is a key feature of the back support.

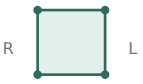
Shoulders: protraction

R shoulder
◯ Lies flat on the plinth ◯ Unable to lie flat (protracted)
Posterior acromion to plinth (cm): ____

L shoulder
◯ Lies flat on the plinth ◯ Unable to lie flat (protracted)
Posterior acromion to plinth (cm): ____

OPTIMAL LIFE BOX
Landmarks: R and L ASIS, and the inferior angle of the ribs on each side.

Tick all that apply (e.g. closed and a parallelogram).



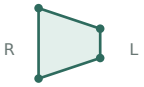
Open & symmetrical



Closed & symmetrical



Closed on R, open on L



Closed on L, open on R

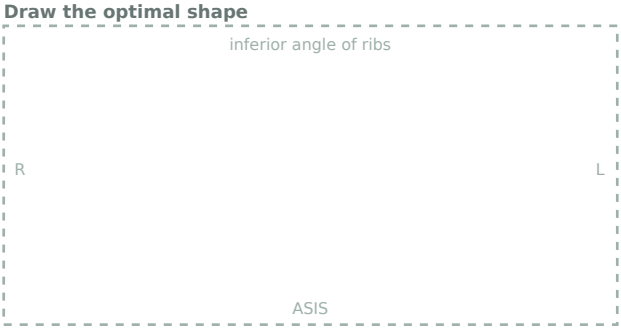


Parallelogram (rotation)

ribs & ASISs not vertically aligned

IF PARALLELOGRAM: ribs shifted towards ◯ R ◯ L relative to the ASISs

Draw the optimal shape



This person's optimal (resting) Life Box, taking the above into account. Note how far it opens before tension or stretch is felt:

Notes

Summary of pelvis-up: the position the pelvis will need to be in when sitting, e.g. "This person must sit with a L pelvic obliquity due to limited lateral trunk flexion..."

(B) Pelvis-down

Keep the optimal Life Box (from pelvis-up) for the rest of the pelvis-down assessment. For every movement (hips, hamstrings / knees, ankles, abduction / adduction, rotation), stop **just before** any tension or stretch is felt, or any movement of the pelvis or Life Box is seen. That point is the resting position to record.

1 · PELVIC TILT ANGLE

Pelvic tilt angle ° (+ posterior / − anterior). Leave blank to use the pelvis-up value.

Tilt used in calculations:

2 · HIP FLEXION / EXTENSION (ONE MEASUREMENT)

Start with the hip in the position where the **optimal Life Box (from pelvis-up) is kept**, with the knee relaxed. Slowly flex / extend the hip. **Stop just before** any tension or stretch is felt, the pelvis moves (posterior tilt when flexing, anterior tilt when extending, or an obliquity), the Life Box changes, or pain / tone appears. Limited flexion and limited extension are the same measurement seen from either end: record the resting position below, and the range if useful.

Hip flexion (traditional goniometry) measured against ◯ trunk ◯ pelvis

	R	L
Hip flexion (goniometry)	°	°
Thigh-to-trunk angle	°	°
Thigh-to-pelvis angle	°	°
Hip flexion vs trunk (auto = 180° − thigh-to-trunk)	°	°
True hip flexion (auto = 180° − thigh-to-pelvis)	°	°

Range where the pelvis / Life Box stays at rest (optional): R from ° to ° L from ° to ° hip flexion

e.g. "From 70–80° hip flexion there was no movement in the pelvis / Life Box; above 80° there was a posterior pelvic tilt; below 70° there was tension and an anterior pelvic tilt."

Landmarks: hip flexion: axis over the greater trochanter; stationary arm along the lateral midline of the trunk (or pelvis); moving arm along the lateral midline of the femur towards the lateral femoral condyle. **Thigh-to-trunk**: lateral hip centre point (axis), lateral lower neck point, lateral femoral condyle. **Thigh-to-pelvis**: ASIS and PSIS (perpendicular to the ASIS–PSIS line), lateral hip centre point, lateral femoral condyle.

Hip flexion and the seating angles add up to 180°. Thigh-to-trunk = 180° − hip flexion measured against the trunk · Thigh-to-pelvis = 180° − hip flexion measured against the pelvis (true hip flexion) · **With a pelvic tilt**: thigh-to-pelvis = thigh-to-trunk + pelvic tilt (posterior +, anterior −). Example: hip flexion 85° (against trunk), posterior tilt +15° → thigh-to-trunk 95°, thigh-to-pelvis 110°, true hip flexion 70°.

R hip: what happened just past the resting position?

- Tension / stretch
- Posterior pelvic tilt (flexing further)
- Anterior pelvic tilt (extending further)
- Pelvic obliquity
- Life Box closed or shifted
- Pain
- Tone
- Other

L hip: what happened just past the resting position?

- Tension / stretch
- Posterior pelvic tilt (flexing further)
- Anterior pelvic tilt (extending further)
- Pelvic obliquity
- Life Box closed or shifted
- Pain
- Tone
- Other

3 · KNEE EXTENSION / FLEXION

R knee limited by

- ◯ Hamstrings (knee extension limited)
- ◯ Rectus femoris (knee flexion limited)
- ◯ Joint (e.g. contracture: no extra muscle tension)
- ◯ Other

L knee limited by

- ◯ Hamstrings (knee extension limited)
- ◯ Rectus femoris (knee flexion limited)
- ◯ Joint (e.g. contracture: no extra muscle tension)
- ◯ Other

Hamstrings (e.g. with limited hip flexion / posterior pelvic tilt / sliding): keep the hip flexed to the resting angle found above. Extend the knee and **stop just before** any hamstring tension or stretch is felt, or the pelvis moves (posterior tilt, obliquity or a change in the Life Box).

Rectus femoris (e.g. with limited hip extension / anterior pelvic tilt): flex the knee and **stop just before** tension or stretch, or the pelvis is pulled into an anterior tilt. This person may need more knee extension, with the foot in front of the foot support.

Joint (less common, but possible): e.g. a knee contracture, where there is no additional muscle tension and the pelvis doesn't move, but the knee simply has no further movement. Record the angle where the movement stops.

	R	L
Thigh-to-lower-leg angle	°	°
Knee flexion (auto = 180° − thigh-to-lower-leg)	°	°

Range where the pelvis / Life Box stays at rest (optional, thigh-to-lower-leg): R – ° L – °

Landmarks: thigh-to-lower-leg: lateral femoral condyle (axis), lateral hip centre point, lateral malleolus.

R knee: what happened just past the resting position?

- Tension / stretch
- Posterior pelvic tilt
- Anterior pelvic tilt
- Pelvic obliquity
- Life Box closed or shifted
- Pain
- Tone
- Other

L knee: what happened just past the resting position?

- Tension / stretch
- Posterior pelvic tilt
- Anterior pelvic tilt
- Pelvic obliquity
- Life Box closed or shifted
- Pain
- Tone
- Other

4 · ANKLE DORSIFLEXION / PLANTARFLEXION

Keep the hip and knee at the angles found above. Dorsiflex the ankle slowly and **stop just before** any tension is felt in the Achilles tendon / gastrocnemius, the knee or hip angle changes, the pelvis moves (e.g. a posterior pelvic tilt, or pelvic rotation to bring the origin and insertion of gastrocnemius closer together), the Life Box changes, or pain or tone appears.

	R	L
Lower-leg-to-foot angle (< 90° dorsiflexion, > 90° plantarflexion)	°	°

Landmarks: lower-leg-to-foot: lateral heel point (axis), lateral femoral condyle, lateral malleolus, lateral toe point.

R ankle: what happened just past the resting position?

- Tension in the Achilles / gastrocnemius
- Posterior pelvic tilt
- Pelvic rotation
- Change in knee or hip angle
- Life Box closed or shifted
- Pain
- Tone
- Other

L ankle: what happened just past the resting position?

- Tension in the Achilles / gastrocnemius
- Posterior pelvic tilt
- Pelvic rotation
- Change in knee or hip angle
- Life Box closed or shifted
- Pain
- Tone
- Other

R foot at rest (for the foot support)

Sole: ◯ Neutral ◯ Inverted ◯ Everted °

Angle: ◯ Straight ◯ Toes out ◯ Toes in °

L foot at rest (for the foot support)

Sole: ◯ Neutral ◯ Inverted ◯ Everted °

Angle: ◯ Straight ◯ Toes out ◯ Toes in °

5 · HIP ABDUCTION / ADDUCTION (KEEP THE LEG AT THE HIP AND KNEE FLEXION ANGLES FOUND ABOVE)

Record the resting position: stop just before any tension or stretch, or any pelvic rotation.

R hip

- ◯ R able to achieve neutral without pelvic rotation
- ◯ R limited abduction: rests in ____ ° adduction
- ◯ R limited adduction: rests in ____ ° abduction

L hip

- ◯ L able to achieve neutral without pelvic rotation
- ◯ L limited abduction: rests in ____ ° adduction
- ◯ L limited adduction: rests in ____ ° abduction

Landmarks: thigh line from the hip joint centre to the centre of the patella, compared with a line perpendicular to the ASIS–ASIS line (neutral). Watch the ASISs for pelvic rotation.

Range at rest (optional, write add / abd): R ____ to ____ L ____ to ____

R hip: what happened just past the resting position?

- ☐ Tension / stretch
- ☐ Pelvic rotation
- ☐ Pelvic obliquity
- ☐ Life Box closed or shifted
- ☐ Pain
- ☐ Tone
- ☐ Other ____

L hip: what happened just past the resting position?

- ☐ Tension / stretch
- ☐ Pelvic rotation
- ☐ Pelvic obliquity
- ☐ Life Box closed or shifted
- ☐ Pain
- ☐ Tone
- ☐ Other ____

6 · HIP INTERNAL / EXTERNAL ROTATION

Same leg position. Stop just before any tension or stretch, or any pelvic obliquity.

R hip

- ◯ R able to achieve neutral without pelvic obliquity
- ◯ R limited IR: rests in ____ ° ER
- ◯ R limited ER: rests in ____ ° IR

L hip

- ◯ L able to achieve neutral without pelvic obliquity
- ◯ L limited IR: rests in ____ ° ER
- ◯ L limited ER: rests in ____ ° IR

Landmarks: with hip and knee flexed, lower leg line from the tibial tuberosity to the midpoint of the ankle, compared with vertical (neutral). Watch the ASISs for pelvic obliquity.

Range at rest (optional, write IR / ER): R ____ to ____ L ____ to ____

R hip: what happened just past the resting position?

- ☐ Tension / stretch
- ☐ Pelvic rotation
- ☐ Pelvic obliquity
- ☐ Life Box closed or shifted
- ☐ Pain
- ☐ Tone
- ☐ Other ____

L hip: what happened just past the resting position?

- ☐ Tension / stretch
- ☐ Pelvic rotation
- ☐ Pelvic obliquity
- ☐ Life Box closed or shifted
- ☐ Pain
- ☐ Tone
- ☐ Other ____

Pelvis-down comments (end-feel, pain, tone response, reducible vs non-reducible)

(C) Measurements & observations in supine

LOWER LIMB CIRCUMFERENCE

Checks for asymmetry in thigh mass that could contribute to a pelvic obliquity. Less mass under one side lets that side sit lower. The solution is to raise the seating surface under the low side to make up for the missing mass, so the pelvis sits level.

Level	R (cm)	L (cm)	Difference
5 cm above the patella (5 cm up from the superior pole, same level both sides)			
Proximal thigh, as close to the groin as possible (same level both sides)			

CHEST WALL (OPTIONAL, E.G. GOLDSMITH INDICES OF BODY SYMMETRY; TRAINED MEASURERS)

Landmarks: crook lying with the pelvis and shoulders level; measure at the level of the xiphoid process: xiphoid process to the lateral border of the chest on each side, and chest depth at the xiphoid.

Xiphoid to lateral border, R (cm)

Xiphoid to lateral border, L (cm)

Depth at xiphoid (cm)

Width (R + L)

Depth : width ratio

Right : left ratio (1 = symmetrical; <1 anticlockwise, >1 clockwise)

Rib flare

☐ None ☐ R rib flare ☐ L rib flare

Sternal–spinal line

- ◯ Sternum in line with the spine
- ◯ Deviated to R
- ◯ Deviated to L

Other observations in supine (chest shape, skin, windsweeping, head position)

LINEAR BODY MEASURES (OPTIONAL · WAUGH & CRANE FIG. 4.2 · CM, MEASURE AS DEFINED THERE)

Measure	R / single	L	Measure	R / single	L
Trunk depth			Forearm depth		
Buttock / thigh depth			Foot depth		
Lower leg length			Maximum sitting height		
Shoulder height			Axilla height		
Scapula height			Elbow height		
Shoulder width			Chest width		
Hip width			External knee width		
External foot width			Other		

4 Summary of findings

Who this person is, and what matters to them

Key health & function considerations (skin, respiration, feeding, pain, sleep, mobility, equipment)

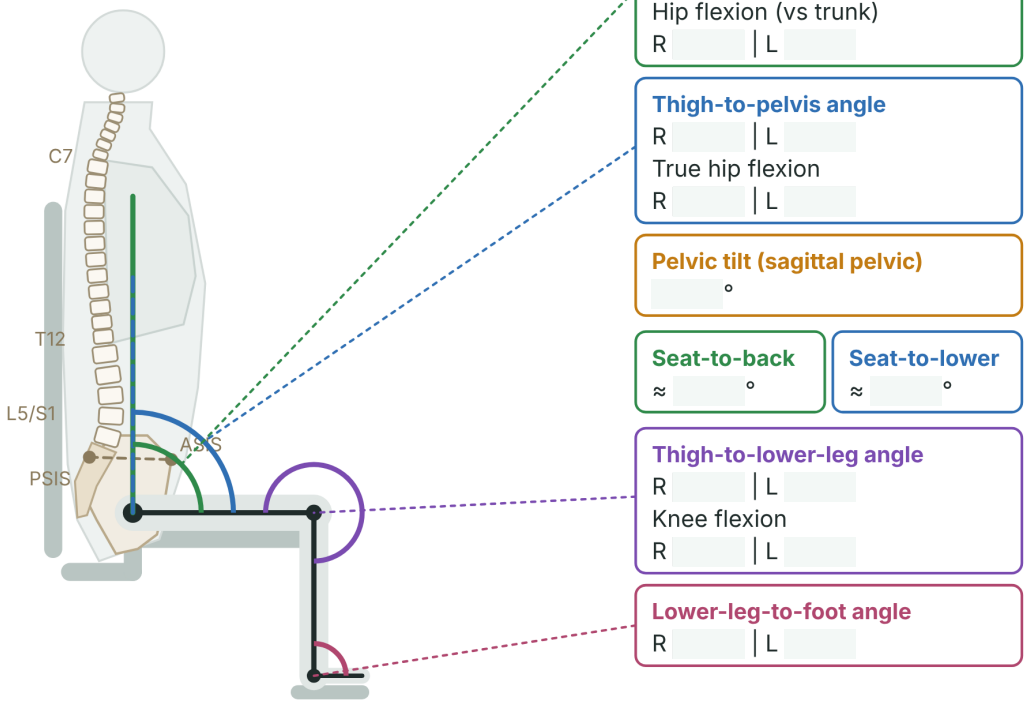
Assessment in sitting (current seating, as found)

Assessment in supine (pelvis-up & pelvis-down)

Measures for the seating system · side view

Reference figure only: write this person's measurements at each angle. In Acrobat Reader they copy across from the supine pages; seat support angles use the more limited side.

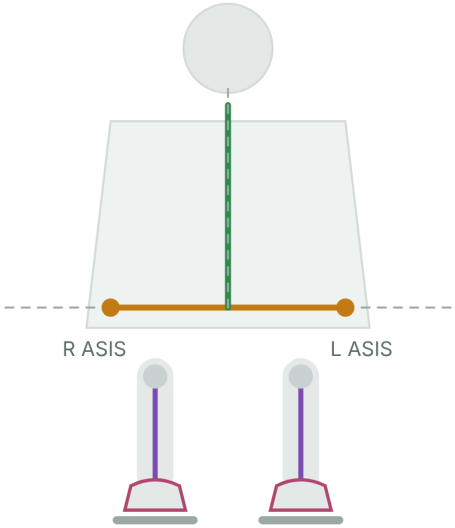
Upright trunk: hip angle shown through the thigh



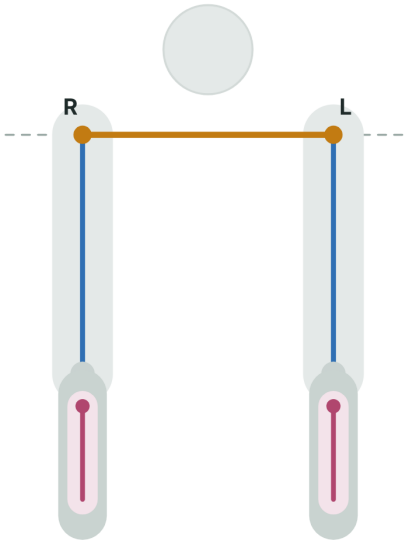
Reference figure: fills in from this person's measures (upright, or reclined / tilted posterior).

Frontal & transverse planes

Front view (person facing you: their R on your left)



View from above (facing down the page)



Frontal pelvic ∠:
Frontal sternal ∠:
R hip IR/ER:
L hip IR/ER:
Feet: R .

Transverse pelvic ∠:
R hip abd/add:
L hip abd/add:
Feet: R .

Was a seating solution simulated?
◯ No ◯ Yes

Simulation details

Person / family / carer concerns

Recommendations & follow-up plan

Clinician signature | **Name & registration (e.g. CORU)** | **Date**

References

1. Waugh K, 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; 2013. Definitions and landmarks used here are from Figs 2.3, 2.5, 2.8, 2.10, 2.25, 2.27 & 4.2. Diagrams on this form are simplified drawings, not reproductions.

2. ISO 16840-1:2006. Wheelchair seating, Part 1: Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces.

3. NPIAP, EPUAP, PPPIA. *Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. The International Guideline*, 4th ed. Haesler E (Ed.). 2025. internationalguideline.com.

4. World Health Organization. *Wheelchair provision guidelines*. Geneva: WHO; 2023.

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