Trans-Femoral Cast Rectification

Objective

At the end of this lecture, students will gain knowledge and be able to perform:

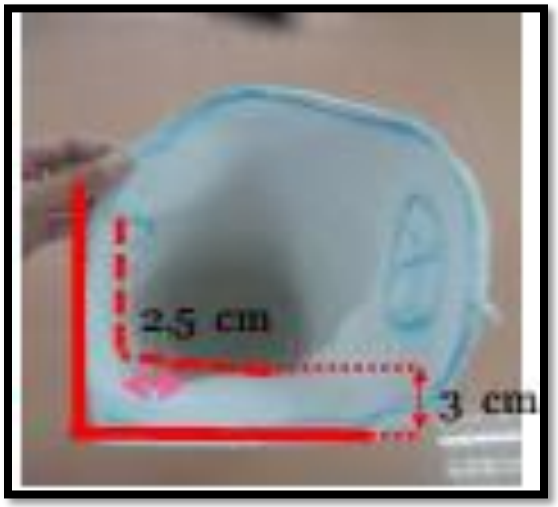
- Negative cast rectification
- QL shape in cross sectional overview of negative cast
- Positive cast rectification
- Test socket preparation

Preparing the Negative cast

Trim the cast

- **Anterior**
  - Height from IT level = 5cm
- **Medial**
  - Parallel to LOP
  - 1.5 cm flare
- **Posterior**
  - Perpendicular to LOP
- - Posterior shelf should be 3 cm from the wall (From the medial wall 2.5 cm)
- **Lateral**
  - Height from IT level = 5-7 cm





TF Cast Rectification

* Negative cast rectification
  - Alignment of the cast
    - Frontal plan
    - Sagittal plane
  - Cast length
  - AP diameter
  - ML diameter
  - Top circumference
  - Overall shape

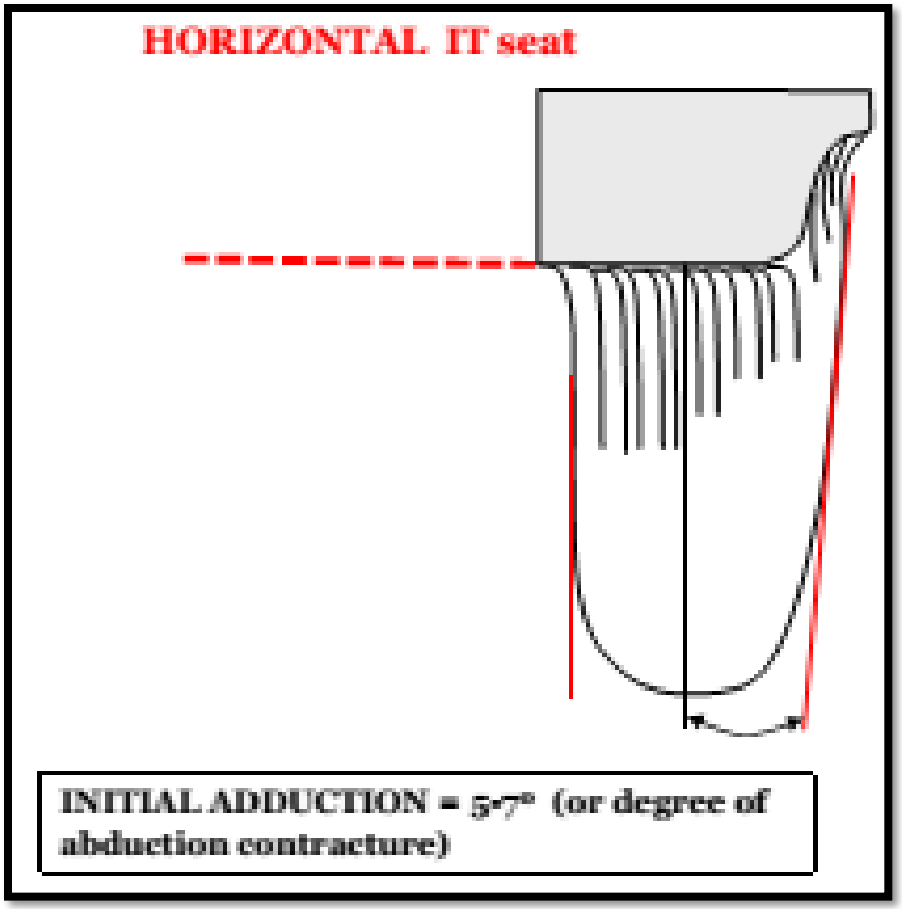


* Positive cast rectification
  - Medial wall
  - Anterior wall
  - Lateral wall
  - Posterior wall
  - Circumference
  - Adductor and ramus relief
  - Stump length
  - Trim line

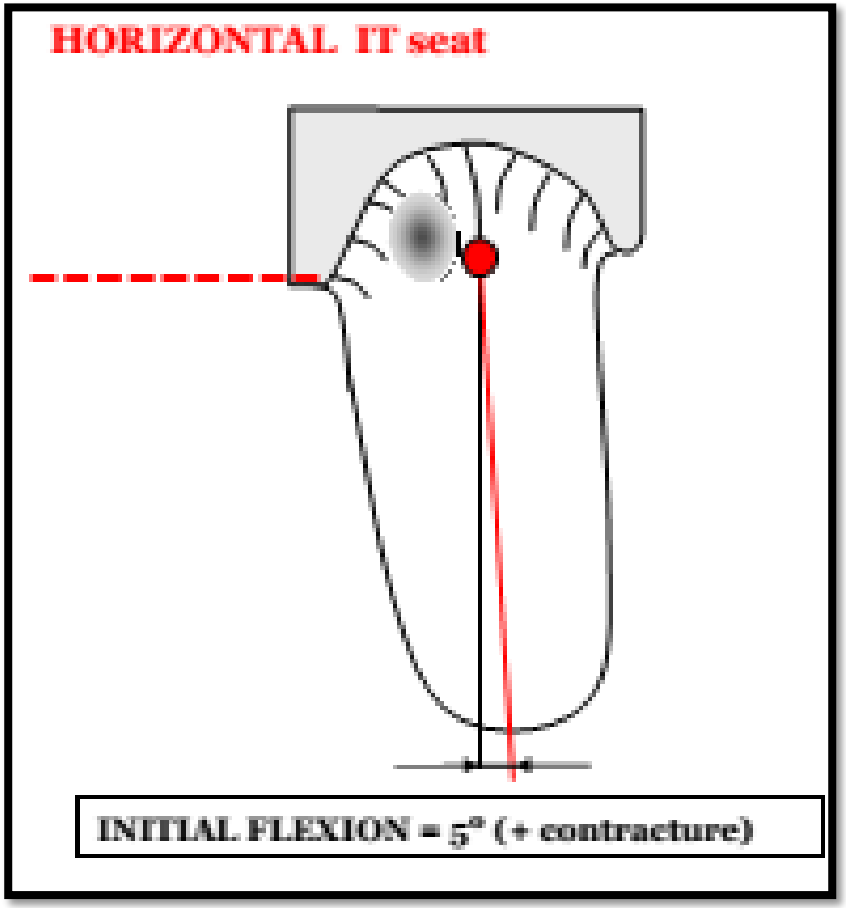


Cast Alignment

Posterior View



Lateral View



Check all the Measurements

Check all measurements of the cast. Write them down and compare them to the measurements taken of the patient.

Decide what will be the goal measurements, according to the guidelines.

	FIRM	AVERAGE	SOFT
LONG	2.5 CM	3.0CM	3.5 CM
MEDIUM	2.5 CM	3.0 CM	3.5 CM
SHORT	3.0 CM	3.5 CM	4.0 CM

Reduction Table Set up the Goal of cast reduction

	Stump Measurements	Cast Measurements	Goal Measurements
Circumference at Ischial level **Circumference at** ***5 cm below*** ***10 cm below*** ***15 cm below***			
Cast diameter AP **Cast diameter ML**			
Stump length			

Guidelines for Goal Measurements of the cast

- Circumference at 5 cm below Ischial level should be less than patient's measurement. The reduction is generally 2 cm. However,
  - Less is taken away if the top reduction is smaller.
  - More is taken away if the top reduction is bigger than average.
- Circumferences at all intervals below is 0.5 cm smaller than the patient's measurement

Guidelines for Goal Measurements of the cast

- The reductions for circumferences below the Ischial level are less to leave space for the tissues to accommodate when they are pulled down from the top and when they are contracting.

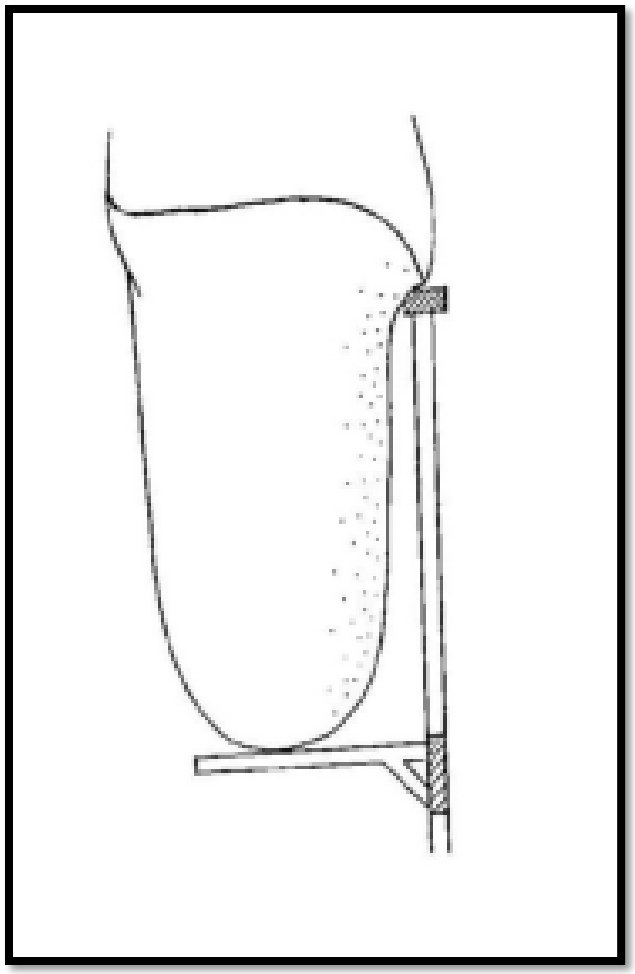
- The amount of the reduction depends on the length of the stump, firmness of the stump tissues and the size of the stump.
  - Reductions will be less if the stump is long, firm and/or small.
  - Reductions will be more if the stump is short, soft and/or big.

Why more plaster is reduced at the proximal part of the cast but less down to the distal?

- Purposes
- Provide suspension
- Compress the soft tissue and give a close fit
- Prevent rotation of the socket on stump

Length of the cast

- Measure the same way as patient's stump.
- In general, the cast is longer than the patient's measurement
- For a normal stump with good distal padding, the cast should be the same length as the stump
- If the stump is bony with no distal tissue cover, then the cast should be 1-2 cm longer than the patient's measurement



Medial Wall

- **Flatten medial wall**

*Transverse View

- Parallel to LOP

* Medial view

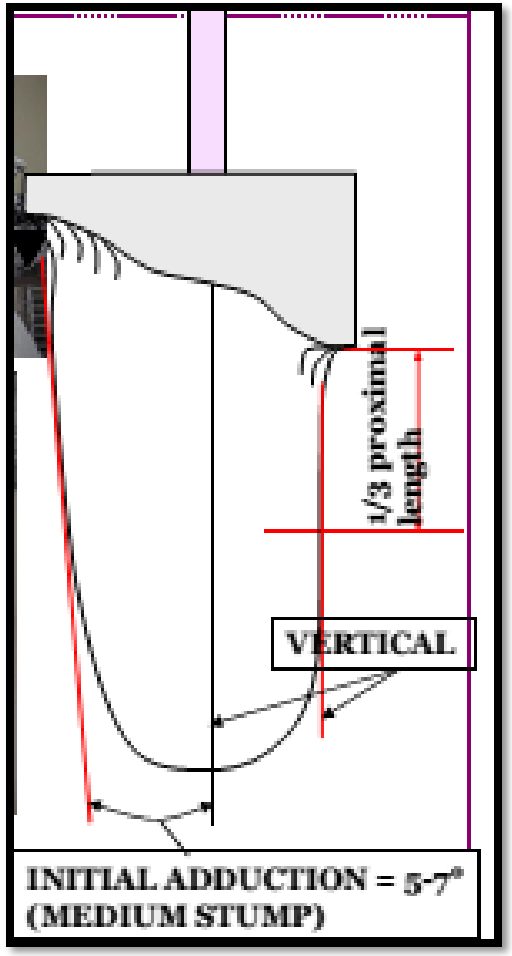
-Flatten proximal 1/3 of the stump

* Anterior view

- Vertical to the floor or parallel to frontal plan alignment

- Medial shelf 2cm





Anterior Wall

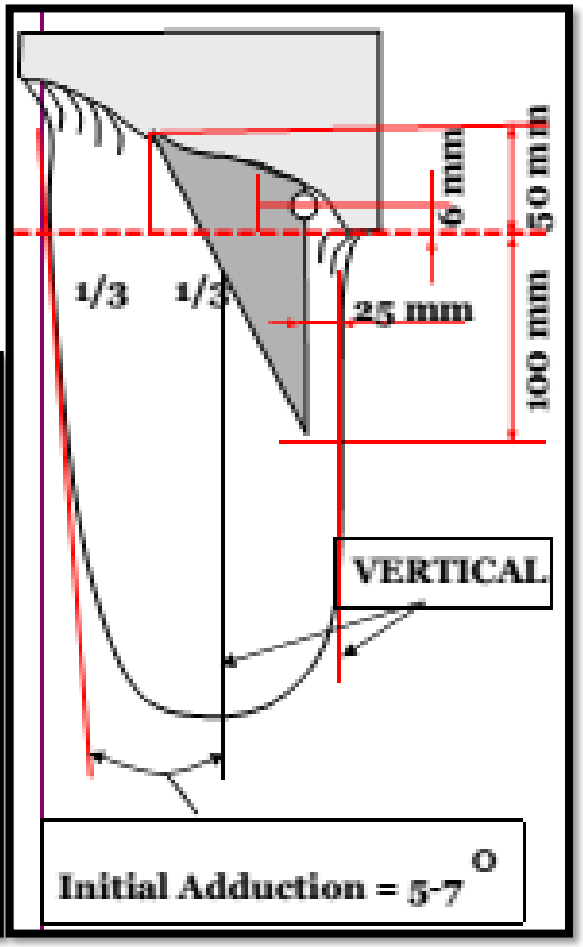
- Modify Scarpa's triangle

  * Blending smoothly from the deepest point to the boundaries

  * Recheck AP diameter

  * The trim line is 5 cm higher than the level of ischial seat





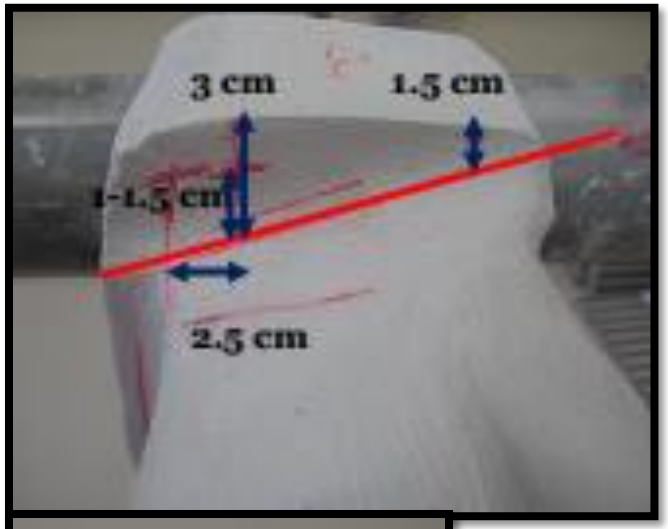
Lateral Wall

- Follow the proximal shape of pelvis region of the patient.
- Iliofemoral angle probably may help
- The top trim line is 2 – 4 cm higher than anterior trim line.
- Check ML diameter



Posterior Wall

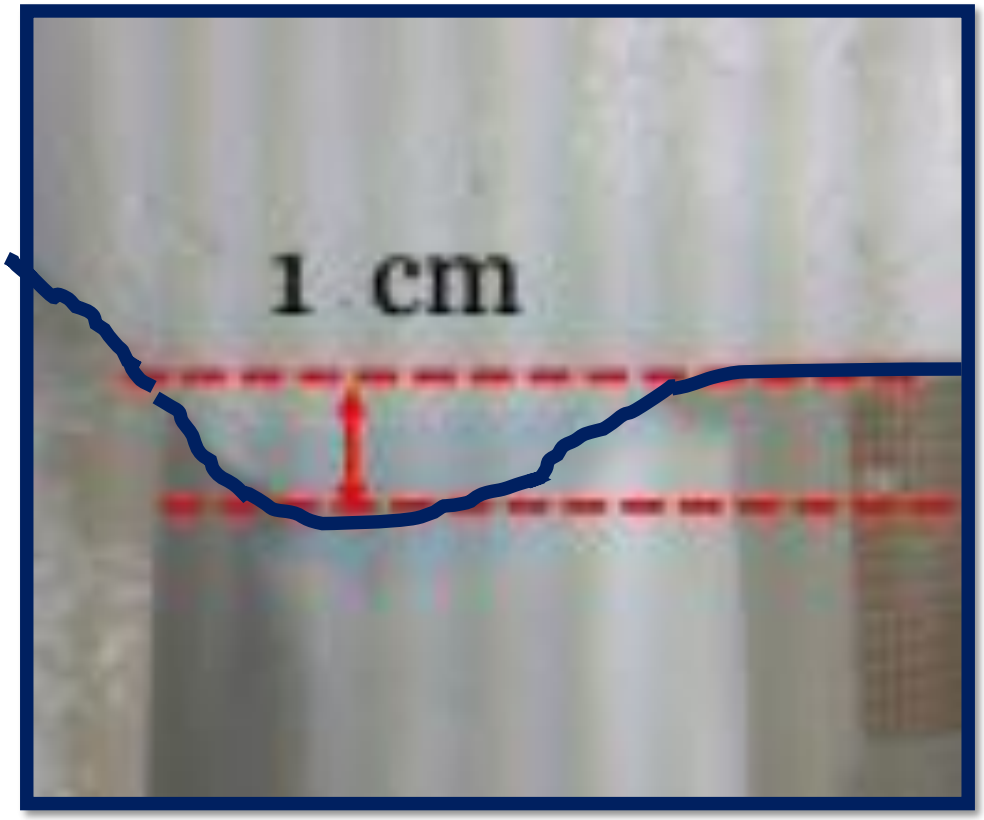
- Posterior shelf
  - 2.5cm from medial to lateral
  - 3cm from the posterior wall to the shelf
- Posterior lateral corner
  -1.5cm from the posterior wall to the shelf
- Check the angle between medial wall and posterior wall (97- 100 degrees)



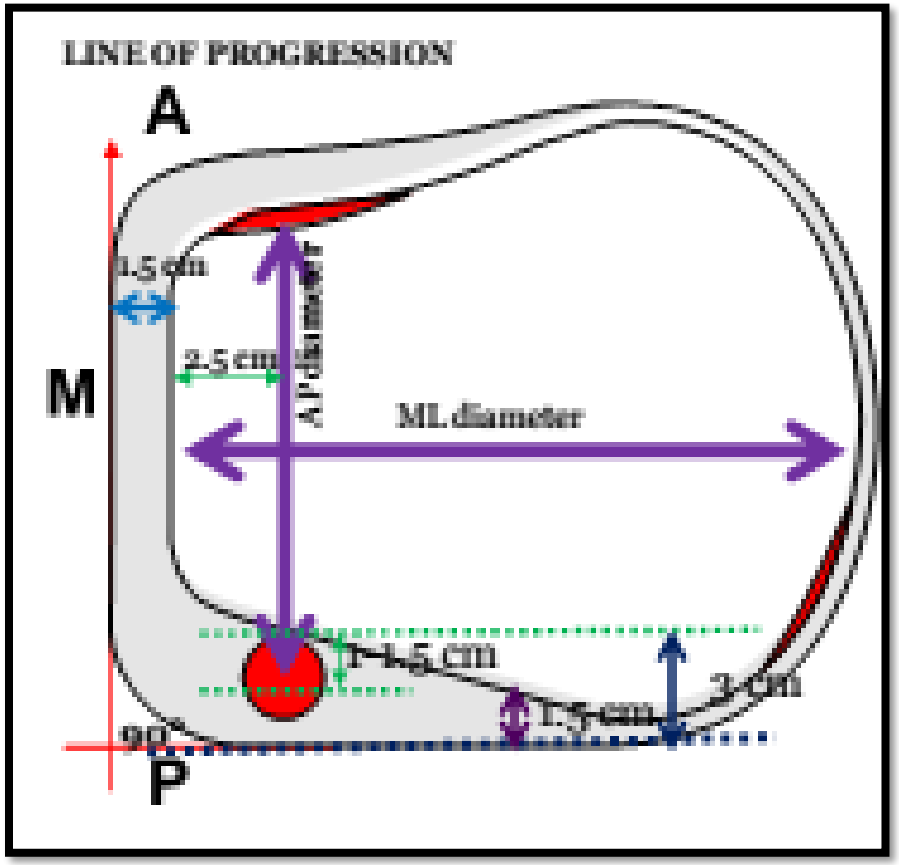


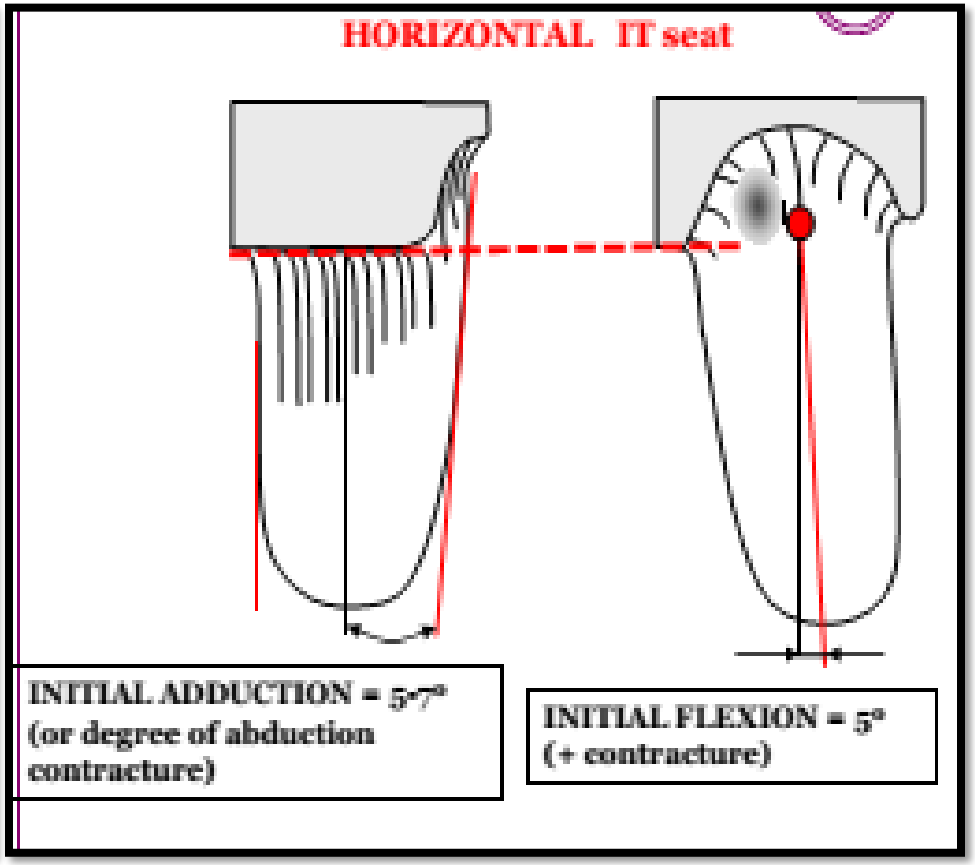
Adductor and Ramus relief

- Build up antero-medial corner
  - To provide adductor relief
  - To provide ramus relief
  - 1 cm distally from IT level



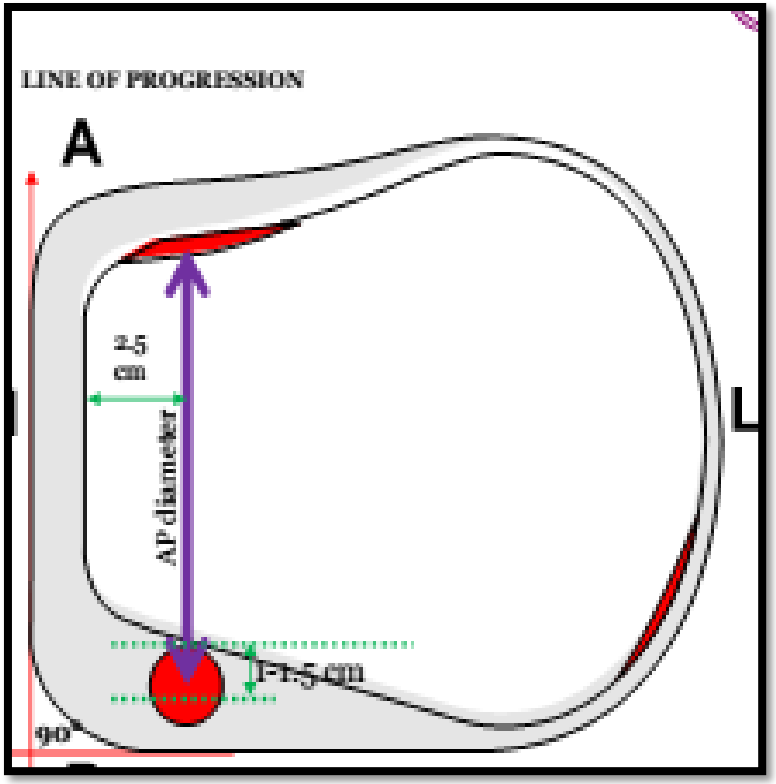
Overall shape





Check AP Diameter

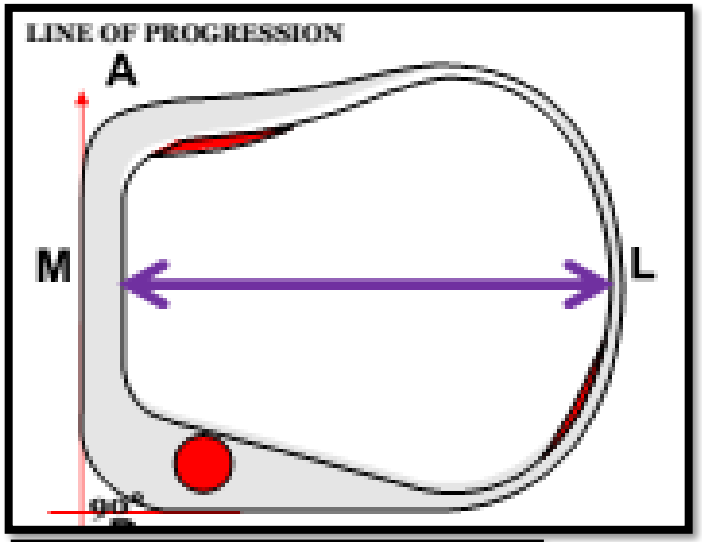
- Measure from anterior to position of IT bone (1-1.5 cm)
- **This measurement MUST be 1.5 cm smaller than the patient's measurement, for patients of normal size.** It may be slightly less for very small, or more for very large patients.
- This will ensure that the IT bone sits on the seat and not inside the brim.
- If it is too big, remove from area under the ischial seat.



Adjust M-L diameter

- The ML diameter of the cast should be measured as the same way as you measure during casting.

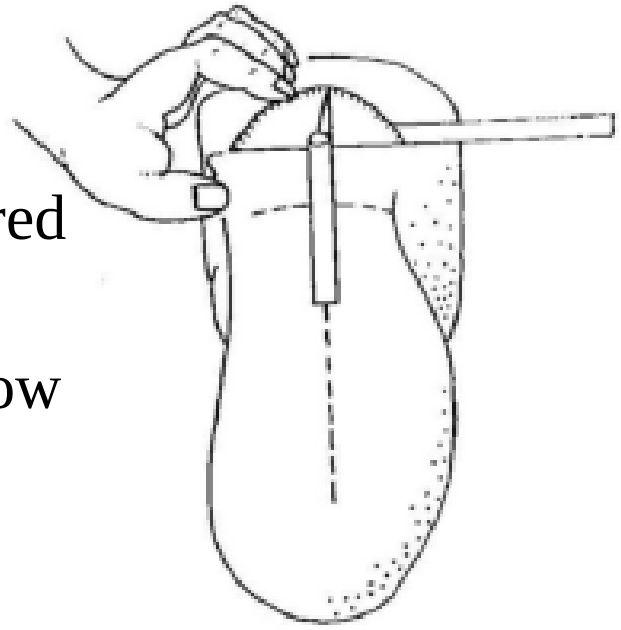
- If it is bigger than the patient's measurement, take plaster from the lateral wall with respect of the greater trochanter.





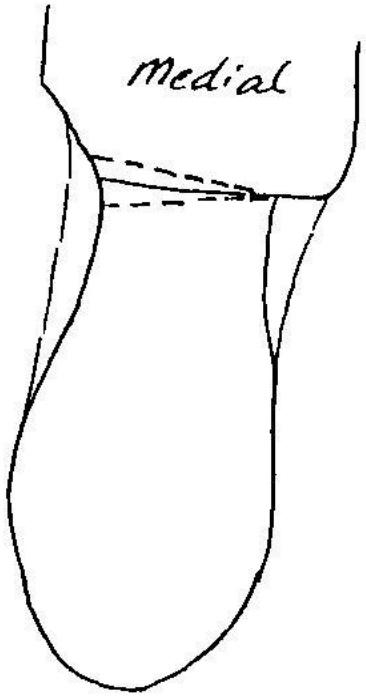
Adjust the Flexion angle

* The flexion angle of the cast is measured by placing one arm of the protractor along the medial wall and the other on the long axis (mid-line) of the cast, and subtracting this measurement from 90.
* The flexion angle refers to the flexion compared to the vertical.
* The final flexion angle of the cast should follow what you have decided during patient assessment.
* (This will generally be about 5 flexion).



Adjust the Flexion angle

- If the flexion angle of the cast is too small, add plaster to the anterior aspect of the medial wall.
- If the flexion angle of the cast is too big, remove plaster from this area.
- After that you can make room for ramus. Do not add or remove plaster from the area near the ischial seat.

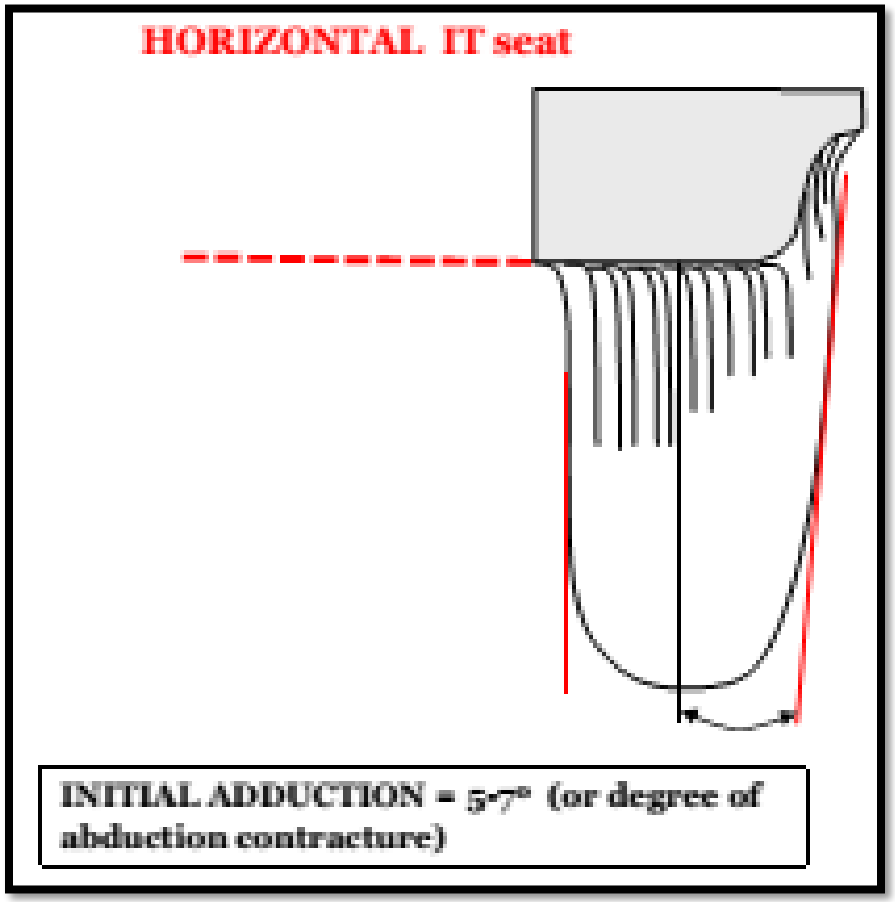


Adjust Adduction Angle

To measure the adduction angle,

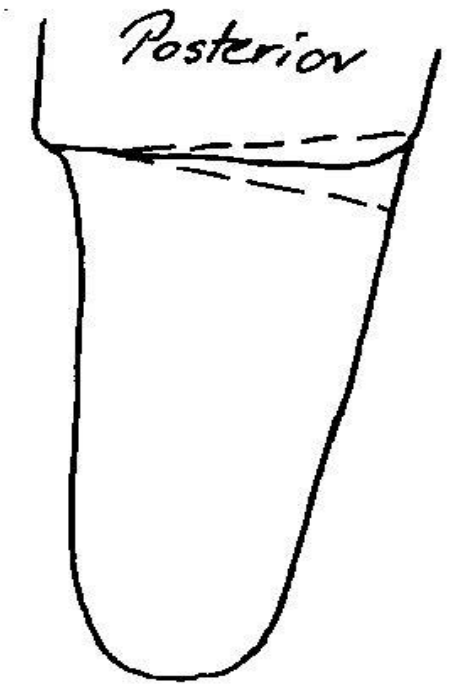
- Place one arm of the protractor along the ischial seat
- Place another arm along the lateral wall of the cast
- Subtract this measurement from 90

Normally, it is about 5-7 degrees adduction



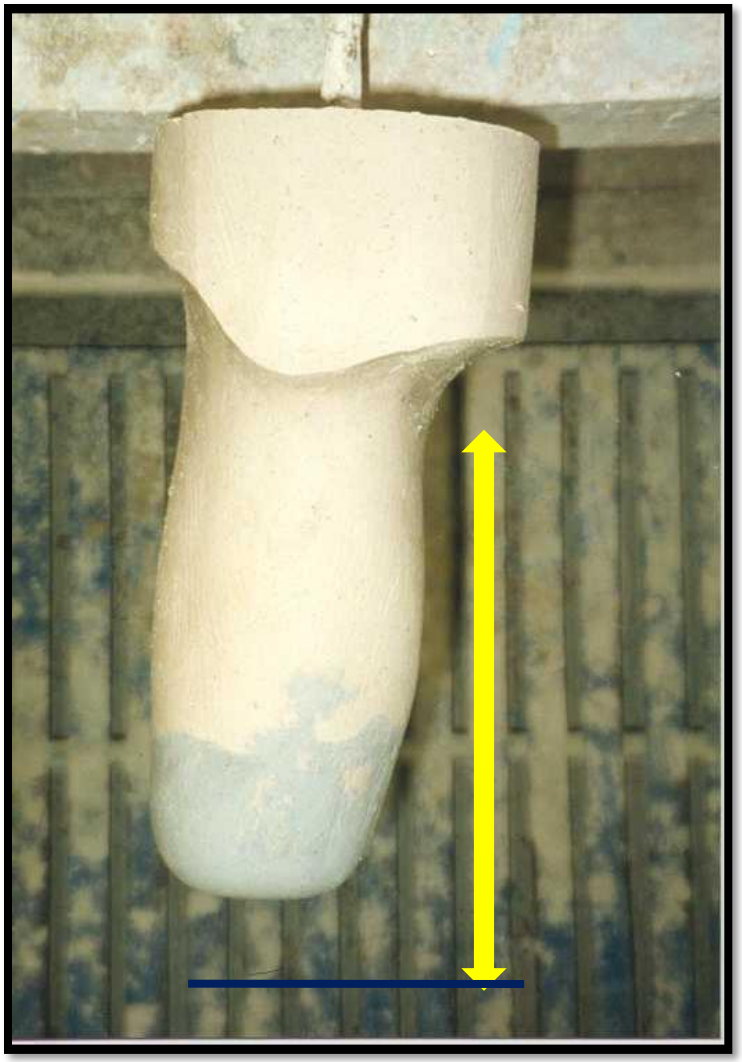
Adjust the Adduction Angle

- To adjust the adduction angle, plaster can be added to or removed from the lateral aspect of posterior seat



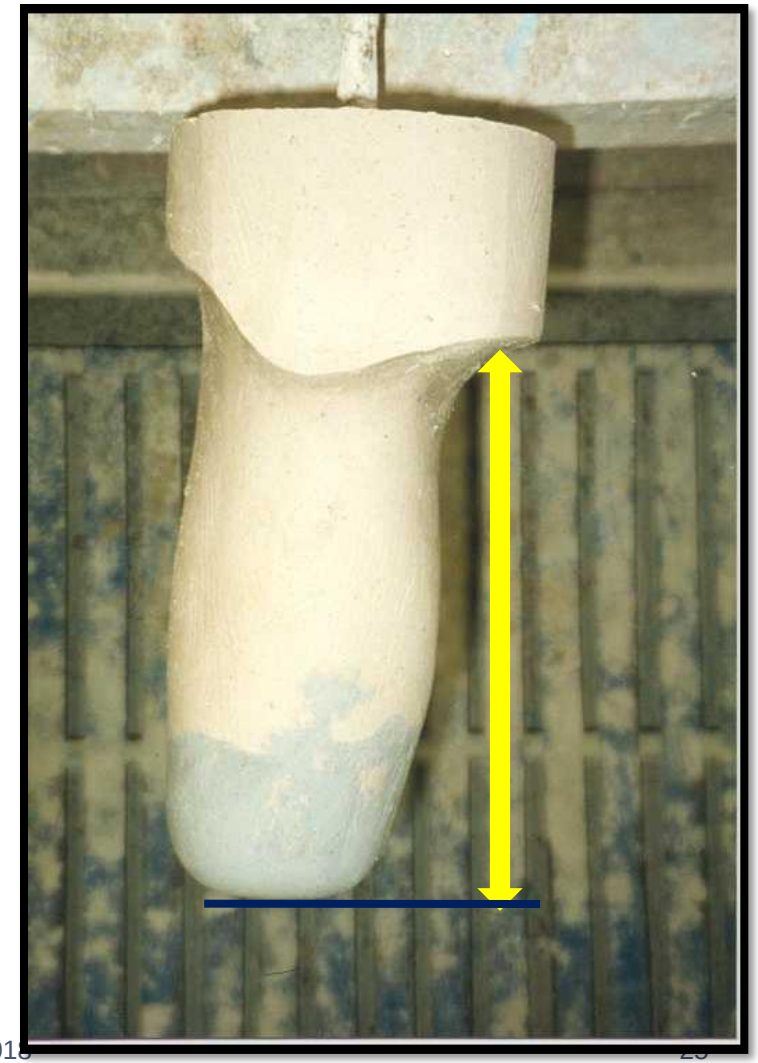
Adjust the TF Cast length

- Cast length is measured the same way as the patient's stump.
- Normally, it is measured from the ischial tuberosity to the distal end of stump



TF Cast Length

- The goal for the cast length will vary depending on the condition of the distal end of the stump
- Stump that has good distal padding, the cast should be the same length as the stump
- Make the cast 1-2 cm longer than patient's measurement for the stump that does not have distal tissue to cover



Special Note:

- Keep checking the circumference of the cast to match the goal measurement.
- If the circumference of the cast is still bigger than the measurement goal, but the ML and AP are correct, reduction can be made at every corner.
- The final cast has a tear drop shape when looking from medial or lateral aspect.
- The tear drop shape should be slightly large at the anterior aspect as the quadriceps muscles need more space than the hamstring muscles.

Finishing The cast

- Check all measurements again
- Flexion and adduction angle meet your goal
- Make sure that your cast is really smooth
- No shape corners



Questions….?

Thank You