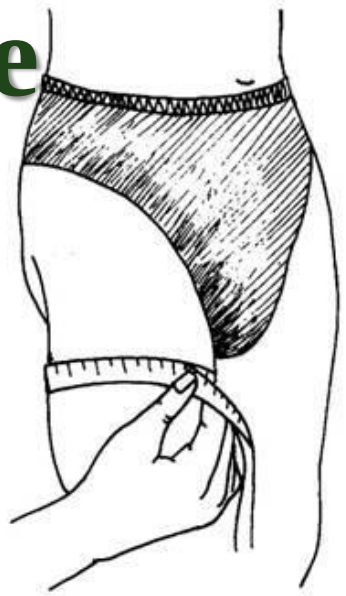
Trans-femoral Prosthetics

Chapter 6

Casting Procedure



Contents

- Introduction
- Materials needed for casting
- Identify for appropriate landmarks
- Measurements
- Hand casting and Casting Technique
- Negative cast checking
- Negative cast rectification

Introduction

- Taking a cast will let a P&O obtain a shape of the stump. With the cast, a P&O can do the rectification to produce a desirable socket for a patient.
- In TF, there are two techniques of taking a TF cast:
- Hand casting & brim casting
- At UMTY, a hand casting method is taught.

Material needed for TF casting

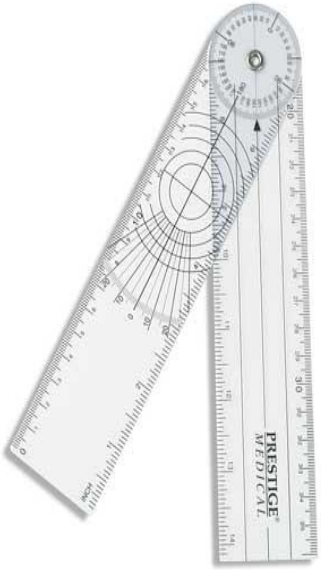
- Before your start casting, you should get all casting tools prepared.
- Make sure that you know how to use them properly.
- Read the TF UMTY manual book for material required for TF casting. (Page 41)

Identify appropriate landmarks

- Ischial Tuberosity
- Adductor longus tendon
- Margin and apex of the greater trochanter
- Interval marks (5 cm)
- End of femur
- Any sensitive areas

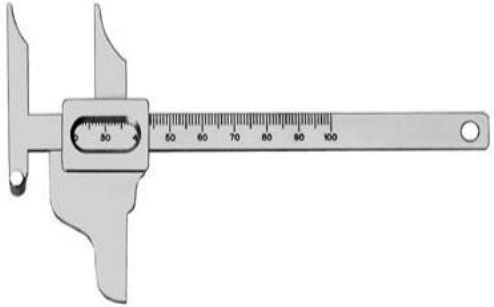
Measurements







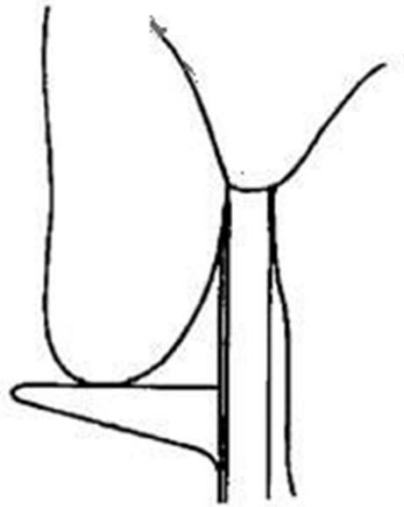


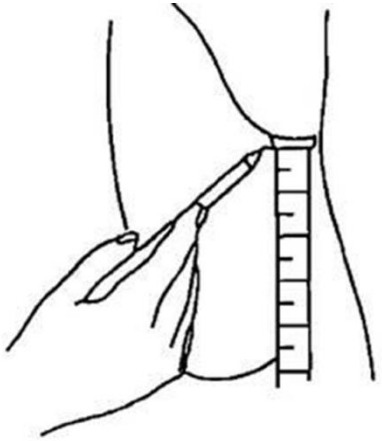


Measurements: *Length of the stump*

Procedure:

1. Identify IT bone
2. Place the perineal gauge hard against the IT bone and ensuring that the arm of the gauge is vertical/parallel to the stump.
3. Slide the movable end plate up until it touches the soft tissue and record the length. Similarly, now compress the soft tissue to obtain the stump femur length and record this measurement as well.
4. With the gauge still in position, mark the medial side of the stump 5 cm below the perineum.

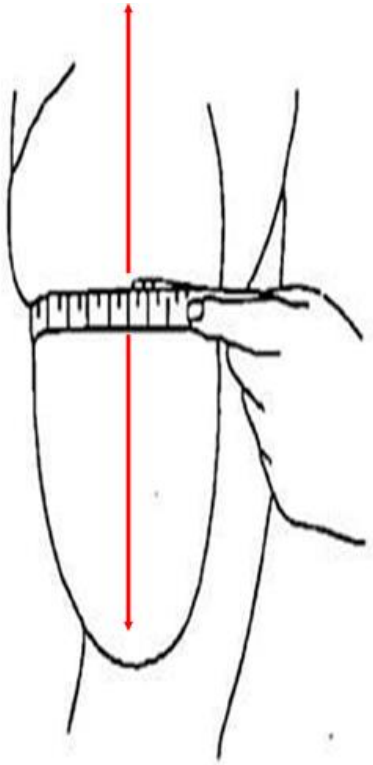




Measurements: *Circumferences*

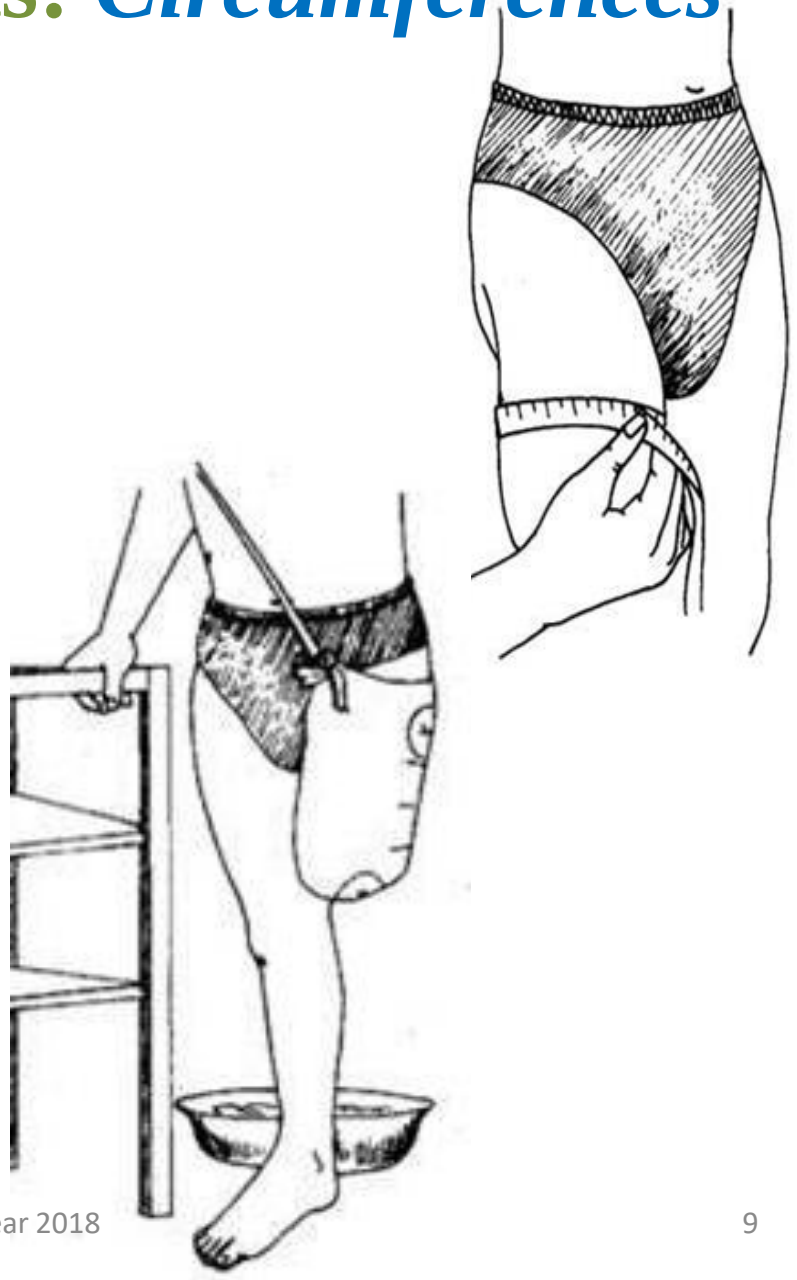
1. First measurement is at perineal level. *The measurement tap is placed inferior to pubis ramus and inferior to the IT bone*.

- *Problem arises, particularly when gluteal tissue is captured in the circumference, measurement is much bigger.*



Measurements: *Circumferences*

2. Second measurement is at 5cm below the perineal and continue down with interval measurements.



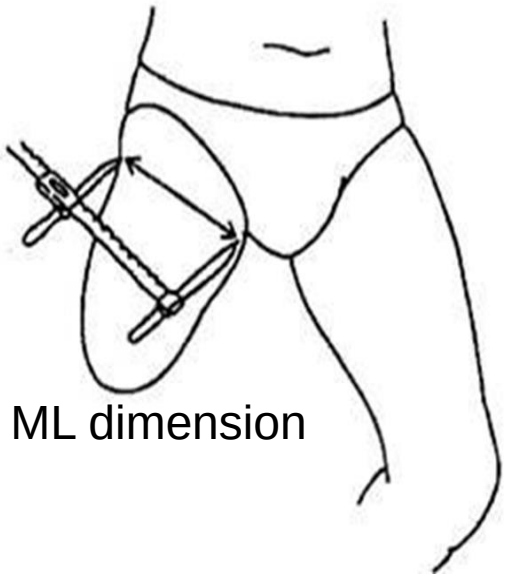
Measurements: *Circumferences*

Keeping communication with the patient is very important and useful. Sometimes, experience patients can tell you how he/she is feeling about your measurements or marking.



Measurements: *ML dimension*

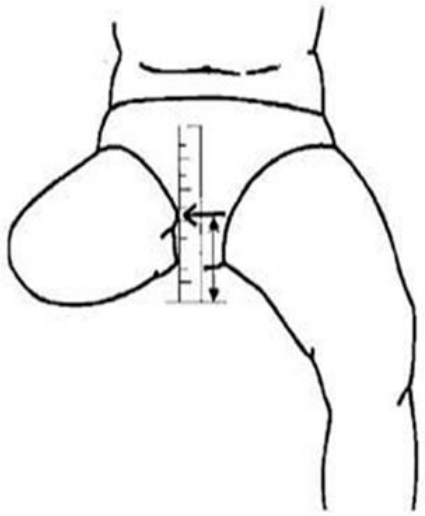
- With Calipers, measure the incline (not horizontal) distance from the greater trochanter to groin at the origin of adductor logus.



Measurements: *ML dimension*

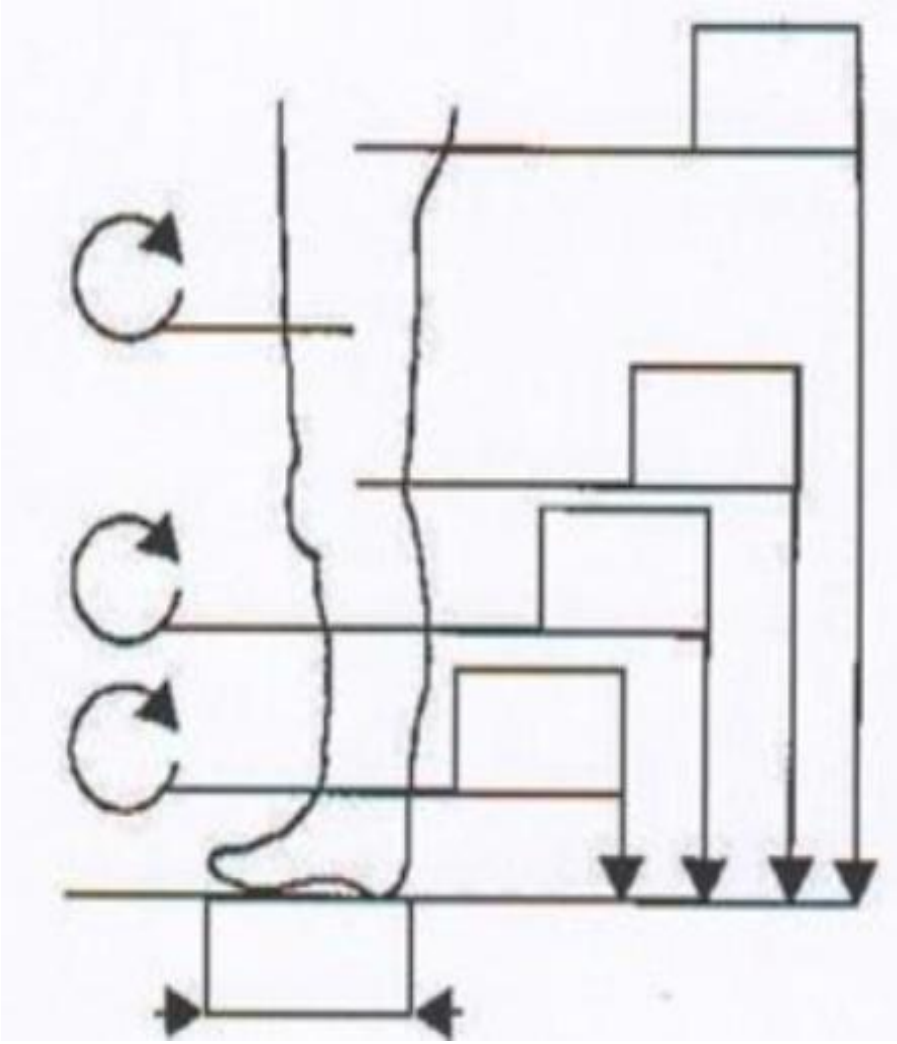
- Using ruler to measure the AP dimension.
  - Patient is sitting on a hard chair without padding.
  - Measure the vertical distance from the chair surface to the anterior part of the adductor longus tendon.
  - While you are measuring this, ask the patient to adduct his/her stump against you. This will make the tendon become more visible.

AP dimension



Measurements: *Sound Side*

- *Why we need to take measurements on the sound side either for TF?*



Measurements: *Sound Side*

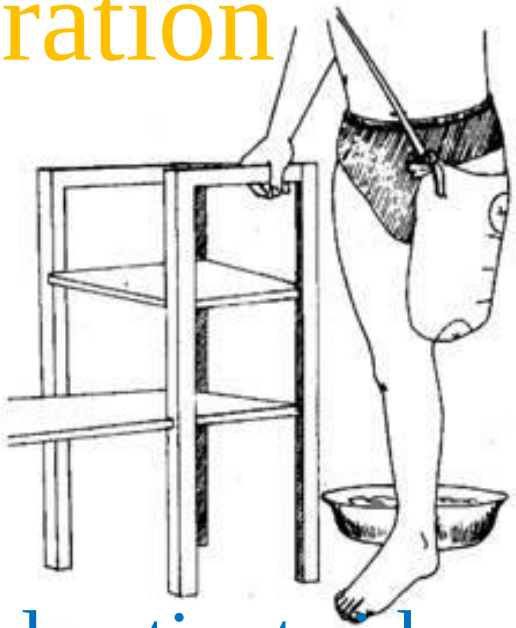
- *To determine :*
  - *the total length of prosthesis(Ischial to floor)*
  - *the length for thigh section*
  - *the length for tibia section (knee axis to floor)*
  - *The size of the foot*
  - *Make cosmesis*

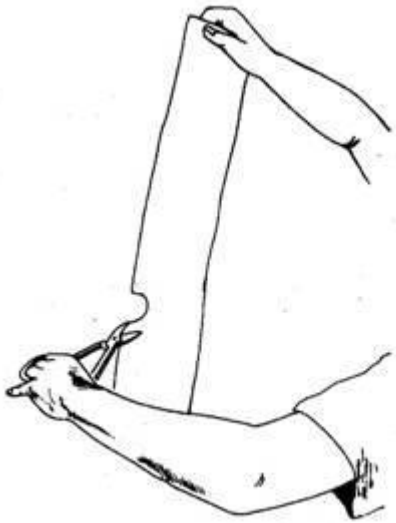


Hand Casting

Preparation

- 5-layer plaster slab
- It'd be big enough to go around the proximal stump and 10% over size.

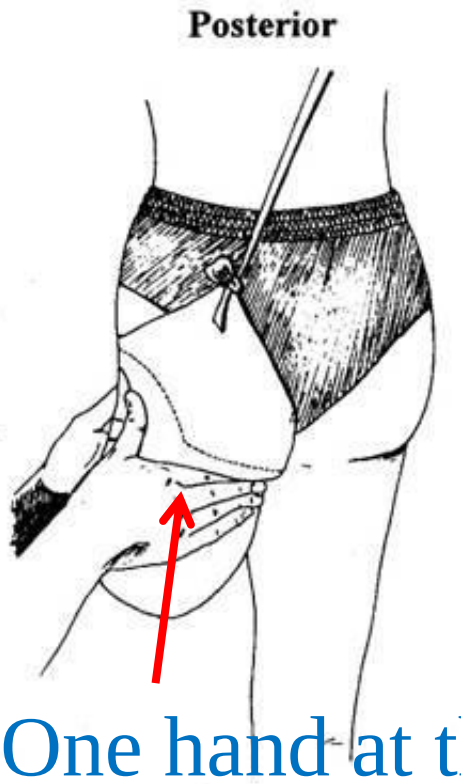


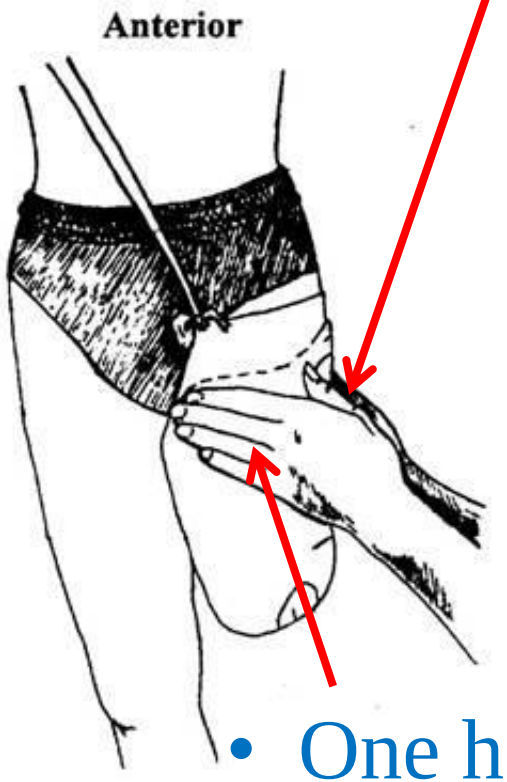


- Stand patient sideways beside a cast chair
- Make a notch for adductor tendon

Hand Position

- Greater Trochanter is between both thumbs





- One hand at the posterior aspect
- One hand at the anterior part

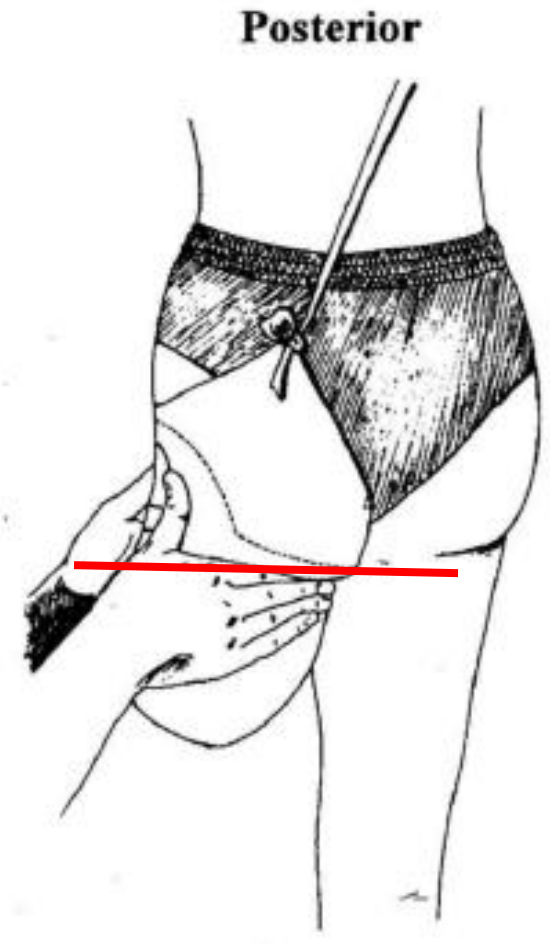
Hand Position

- Hand on the front
  - The tip of your middle finger should be placed on the adductor tendon at the insertion
  - Shape the anterior wall with your palm
  - The first finger will define the approximate border of the cast

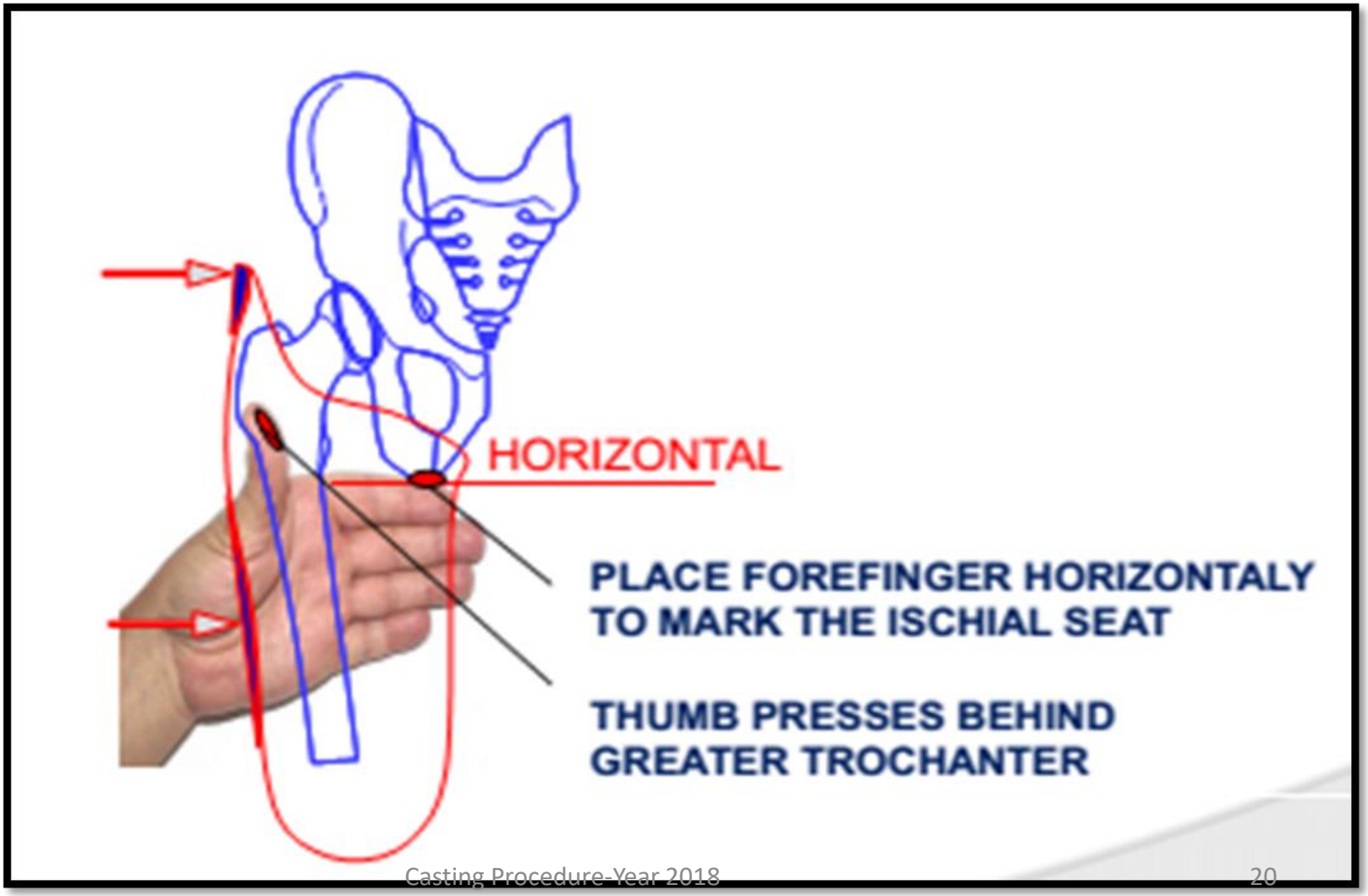


Hand Position

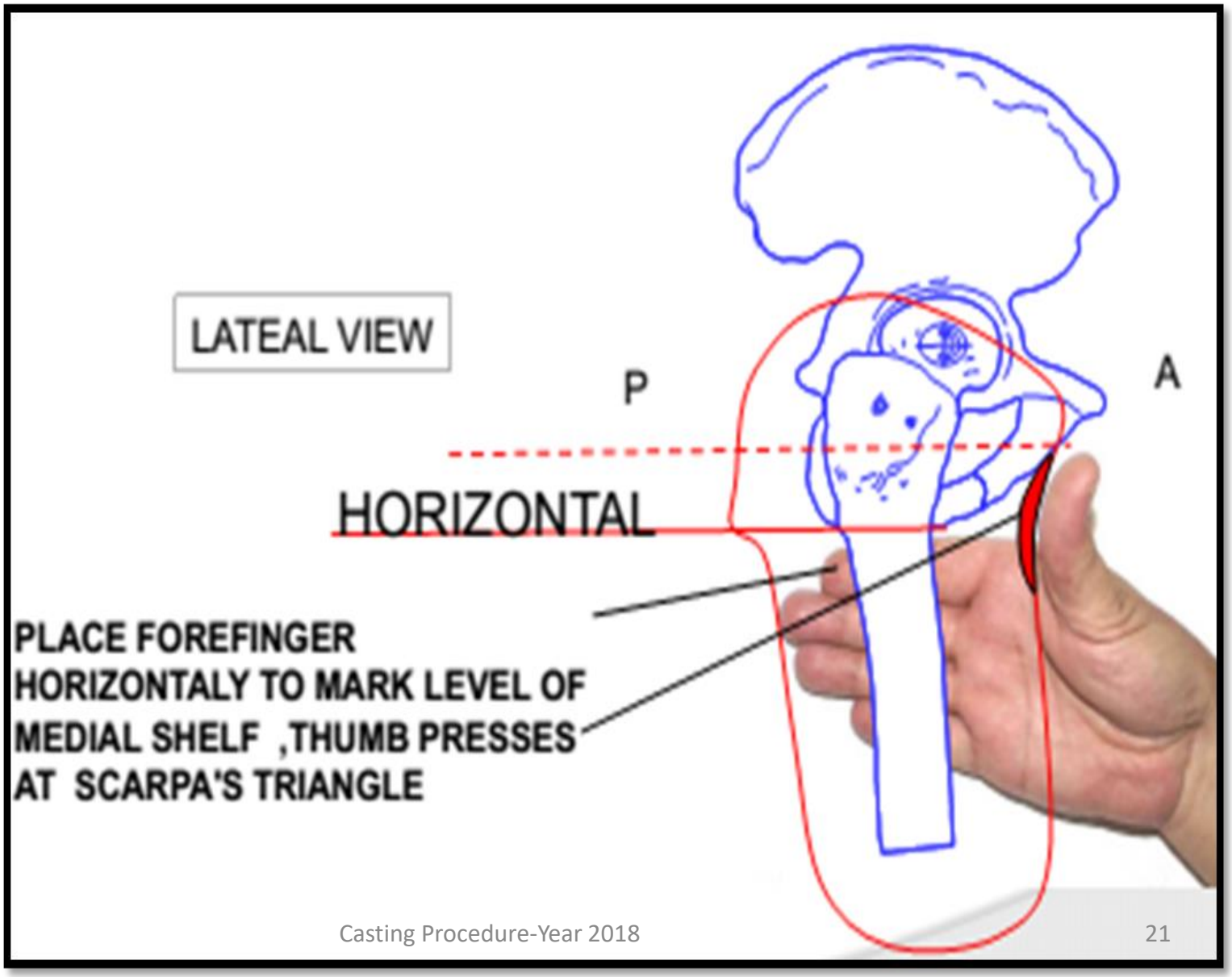
- Hand on the back
  - The first finger should be placed directly under the ischial tuberosity, which would be about 1 cm from the fingertip.
- *Have an assistant to help molding the lateral wall and medial wall (the medial wall should be parallel to the line of progression*



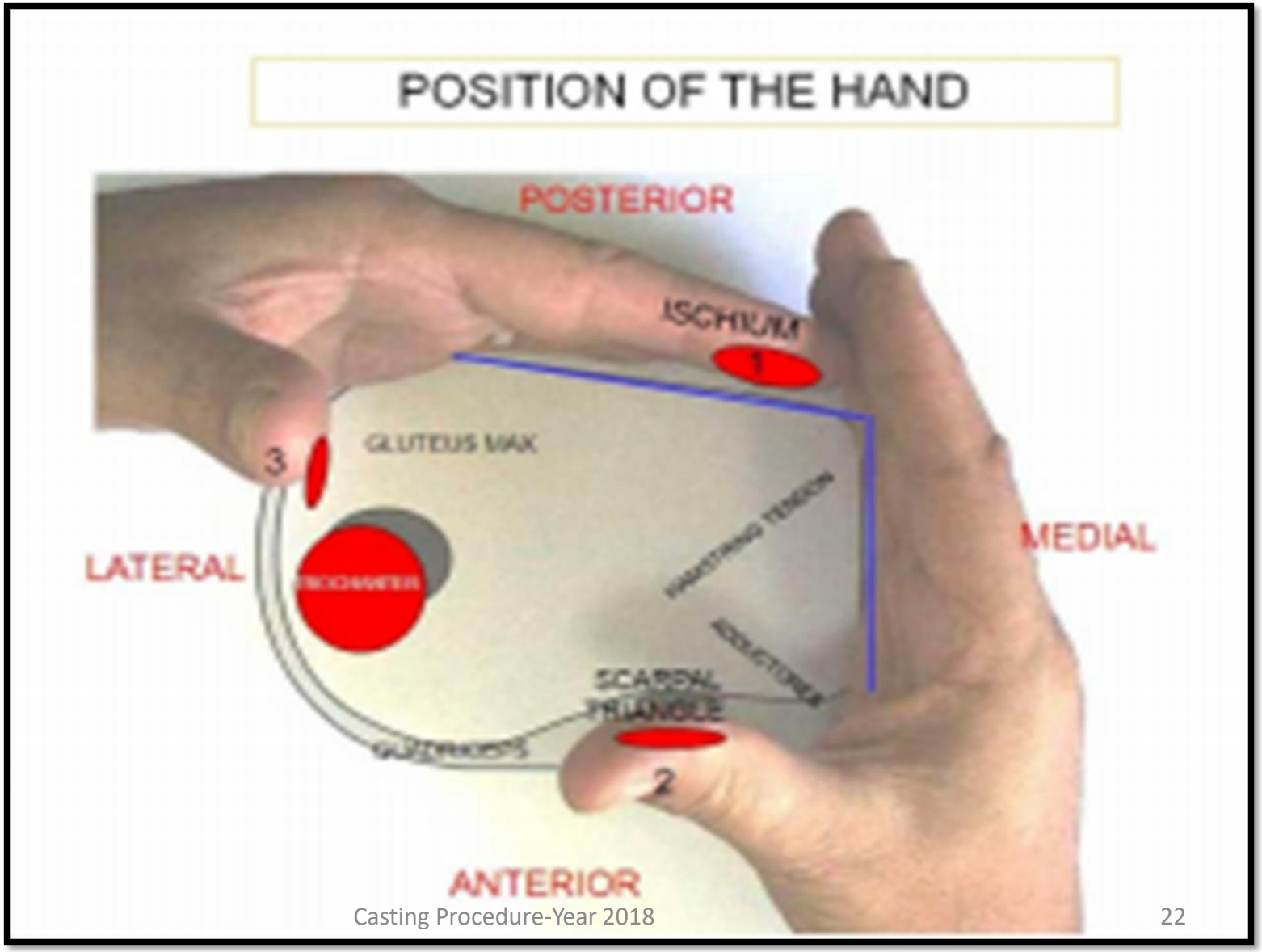
Hand Position



Hand Position



Hand Position



Work with your partners practice positioning your hands





Casting Technique

Apply slap to the proximal of the stump gently and overlap at the trochanter.



Continue wrapping around the waist and down ward along the stump



Casting Technique



Reference lines



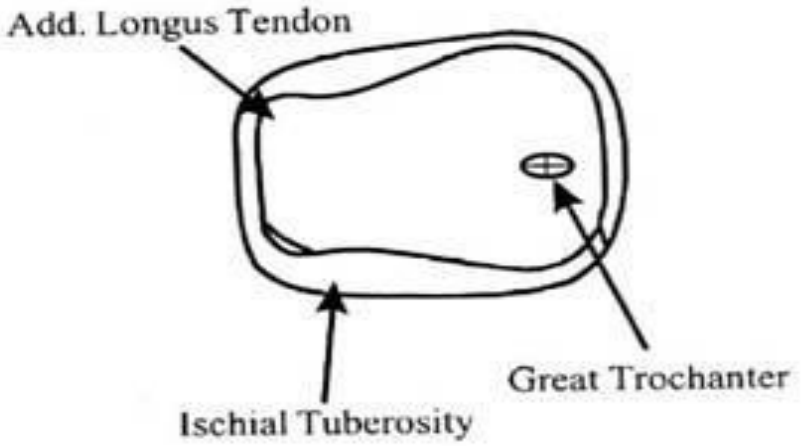
Reference lines should be drawn on the cast before removing it from the patient.

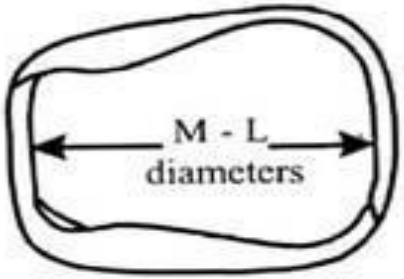
- ***Anterior line***
- ***Lateral line***
- ***Line of progression (bottom line or medial hand)***

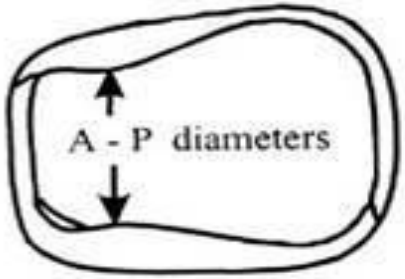
Checking the negative cast

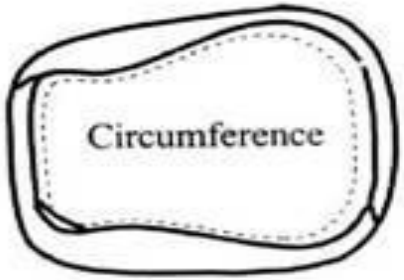
Checking the negative cast

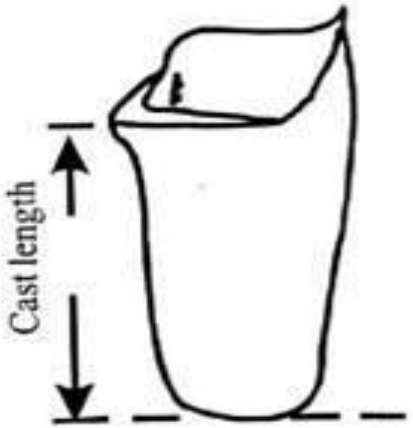
- General strength of the cast
- Stump marks position
- A-P and M-L diameter
- Top circumference
- Length of cast
- General shape of the cast


Add. Longus Tendon
Great Trochanter
Ischial Tuberosity


M - L
diameters


A - P diameters


Circumference

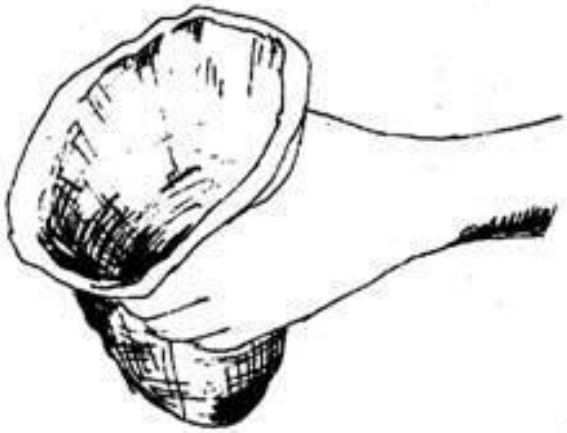

Cast length

Rectification of the negative cast

1. Check hand position and the shape of the cast. Sometimes, we can change to obtain the quadrilateral shape of the cast by the gentle hand pressure.
2. Mark the trim line and cut off the unnecessary part
3. Make cuts vertically down to the corners of the cast at the adductor corner, posterior and lateral. The posterior brim that is made for an ischial seat should be horizontal with the respect to adduction angle.

Cut away unnecessary





Small adjustment



Cut corners

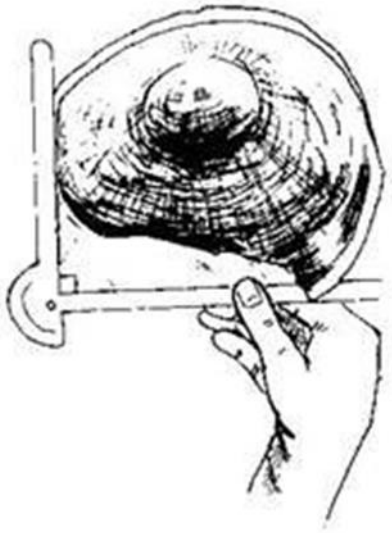
Rectification of the negative cast

4. The posterior brim that is made for an ischial seat should be horizontal with the respect to adduction angle.

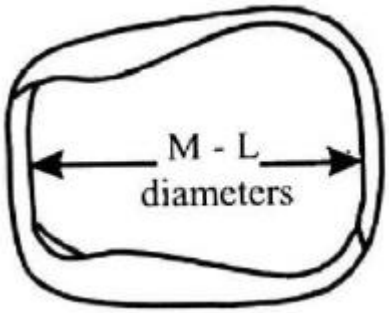
5. Medial brim is made horizontally with respect to the flexion angle and line of progression. When doing this, don not change the position of the ischial seat.

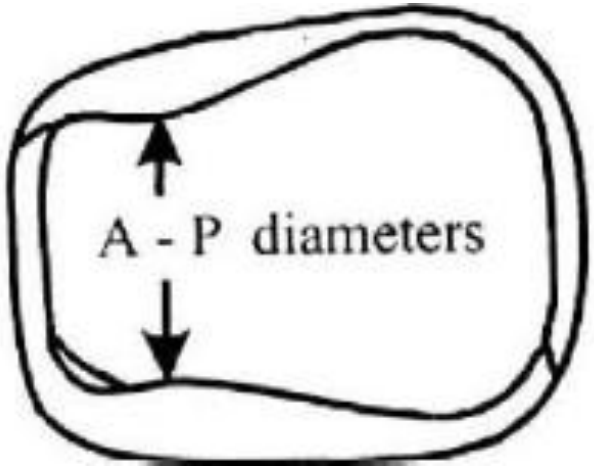
Rectification of the negative cast

5. Trim the posterior aspect of the posterior flare to be 90 to medial brim



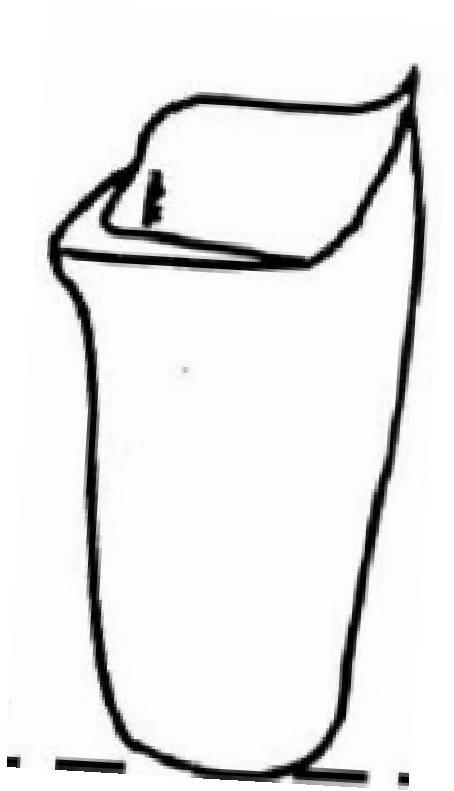
5. Adjust AP & ML by adding plaster powder





Shape the seat and gluteal area

Adjust the AP



Remember:

- Minor problem modify
- Major Problem Recast

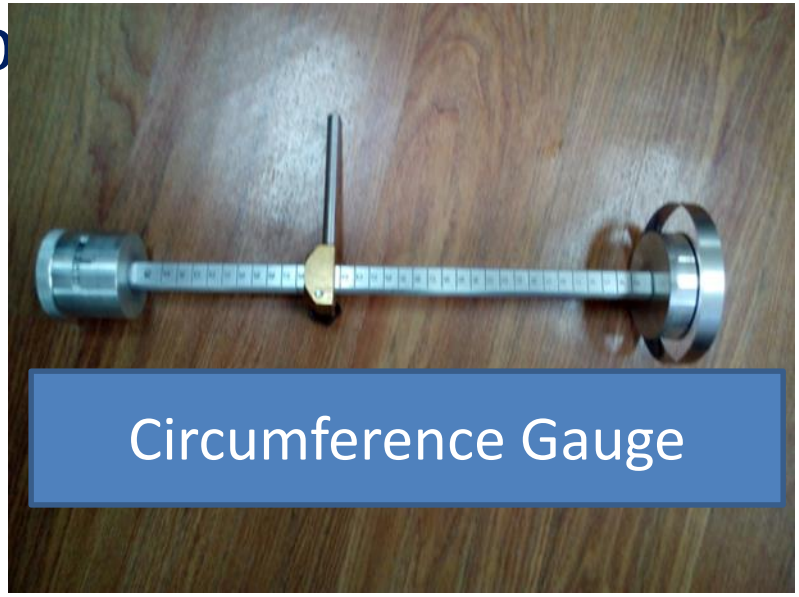
8. Check internal circumference. If too big, adding plaster on the quadriceps muscle. If any dimensions are smaller than the measurement chart, they can be recorded and adjusted later during positive cast rectification



8. Smooth internal surface and paint it with Vaseline or soap water.

9. Fill in the cast

10. Fabricate a check socket and fit.



Alternative Casting – Brim casting



- Brims can pre-shape the proximal part of the cast.
- It can be made out of metal or plastic.
- Brims can be split or not splint.
- The splint brims allow the adjustment in size. It can be adjusted by 3 cm.



Alternative Casting – Brim casting



- Metal brims usually allow for casting in a weight bearing position.
- Plastic brims are usually not suitable for weight bearing casting.



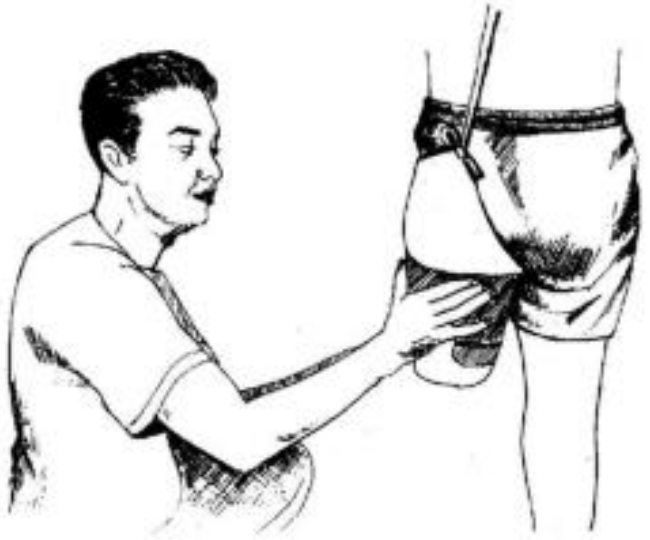
Alternative Casting – Brim casting



- Procedure

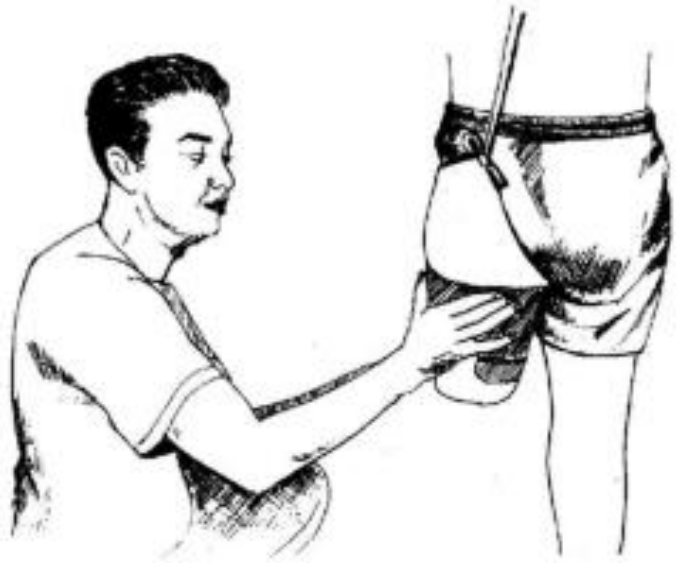
1. Select the one which is closest in circumferences.
2. Fit the brim to the patient over the top of the casting sock. Check the fit at the key areas of
   - the ischial seat, trochanter and adductor longus tendon.

"It is not possible to adjust the medial wall AP diameter, but this diameter can be changed when the cast is rectified."



Alternative Casting – Brim casting

3. When the fit of the brim is seen good, have your assistant or using straps to hold the brim firmly in place in contact with the ischial seat



- correct flexion and adduction angle must be respected.

Alternative Casting – Brim casting

4. Apply the plaster bandage. Begin from the proximal to distal. Flatten the lateral wall during the curing process and take care to maintain distal contact.

5. When the plaster is set, remove the cast. It can then be blocked off and filled.

6. Rectification process

Remember:

Brims do not give a perfect fit; therefore, rectification is always needed

What to do if the selected brim is a bit loose?

- wrap the plaster then apply the brim.



QUESTION?