Splinting

- Definition
- Types
- Contraindications & Complications
- Procedure
- Arm/foot spilints

Splint

A long, firm object used as a support for the bone to stays in a particular position

Temporarily immobilize a limb for pain and spasm, to decrease swelling, and to minimize further potential soft-tissue or neurovascular

Splint Types

Plaster rolls

Prepadded splints

Prefabricated splints

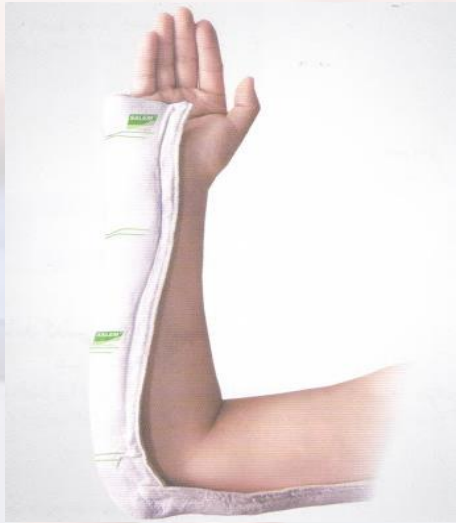
Plaster rolls

- Different size : 7.5- or 10-cm rolls
- Cuttable to the necessary length

Plaster strips

Manufactured precut splint sheets of varying lengths and widths

- Disadvantage is a potential deficiency of material for a large or tall individual.
- Excess material for a petite individual can easily be fixed by tearing out the excess.



Prefabricated splints

- Plastic shells lined with air cells, gel components or foam
- They are ready to use
- Use prefabricated splints as directed by the manufacturer for the intended body part

Splinting

Indications

- Immobilization of a variety of clinical conditions:
  - Fractures and dislocations
  - Deep lacerations that cross joints
  - Tendon lacerations
  - Inflammatory disorders (e.g., gout, tenosynovitis)
  - Deep space infections of the hands or feet
  - Cellulitis overlying a joint
  - Selected puncture or bite wounds

Contraindications & Complications

No absolute contraindications

- Ischemia
- Heat injury
- Pressure sores
- Infection
- Dermatitis
- Pruritis
- Joint stiffness
- Cast pain
- Compartment syndrome

Procedure

Plaster Splint Application

1. Standard Method
2. Alternative method

Equipment for plaster splints

Equipment for plaster splints

- Plaster Roll
- Stockinette
- Padding
- Elastic Bandages (2-, 3-, 4-, and 6-inch widths)
- Adhesive Tape
- Bucket
- Protective Gear (gowns or sheets, gloves, safety glasses)

Standard Method

1.Measure the length of plaster
2.Roll out the appropriate layers of plaster

8 layers for upper extremities, 12–15 for the lower

Place a single layer of stockinette over the extremity.
The stockinette should extend 10–15 cm beyond both ends of area to be splinted. 3-inch stockinette for the arm, and a 4-inch for the leg.

Wrap 2 to 3 layers of Webril around the entire area to be splinted, overlapping each pass by 25 to 50%.
Avoid wrinkling, which may cause pressure sores.

Submerge the plaster strips in a bucket of water until the bubbling stops.

Do not use water hotter than 24°C

Smooth the plaster between your fingers
and remove all excess water.
Lay the plaster out on a table
and smooth further to remove all wrinkles
and ensure uniform lamination of all layers.

Apply the plaster over the Webril and smooth it over the Extremity

Avoid using your fingertips

Fold the stockinette over the edge of the plaster and Webril.

Secure the splint to extremity with elastic wrap by proceeding in a distal-to-proximal fashion. Do not wrap the elastic bandage too tightly.

cover metal clips with tape

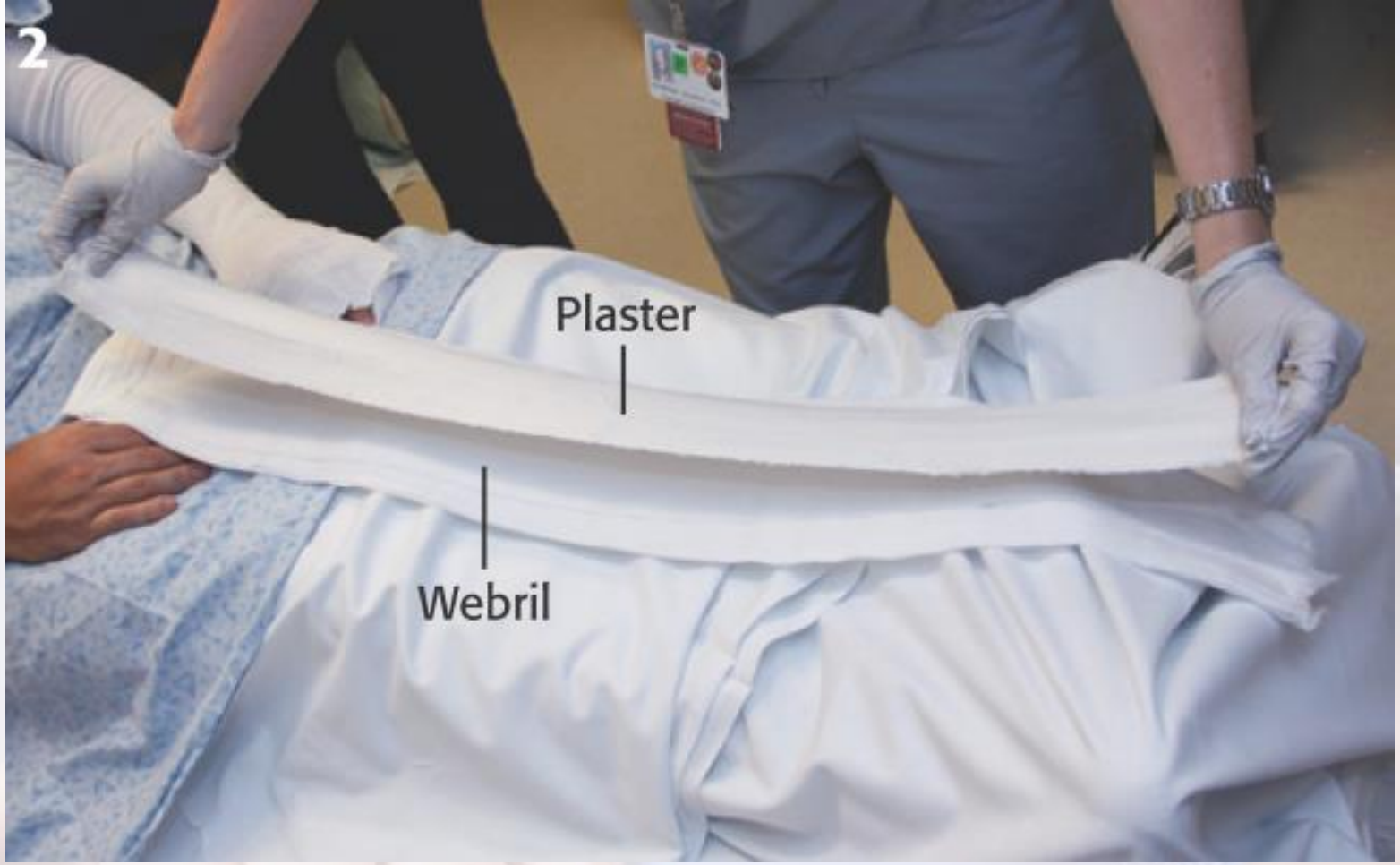
Place the extremity in the desired position, and use the palms of your hands to mold the splint to the contou of the extremity.

Again, avoid using your fingertips, whic may leave

indentations that result in pressure sores.

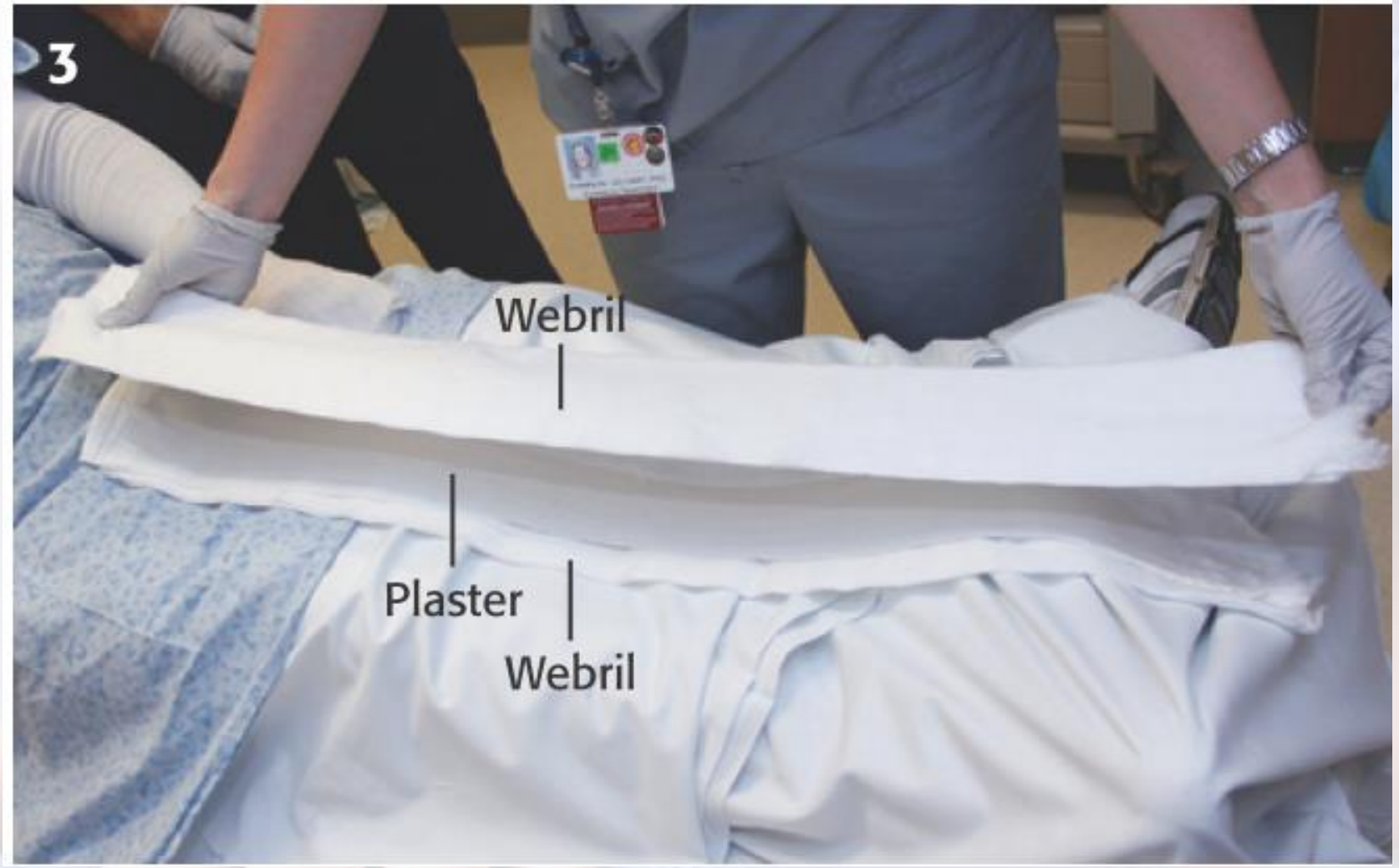
Alternative method

Measure the splint and apply stockinette
Additionally, premeasure 5 to 6 layers of Webril of the same length as the plaster. Soak and prepare the plaster.



Lay out 3 to 4 layers of Webril, which will serve as padding for splint.

Place the plaster (which has already been smoothed) on top of these layers of Webril.



Place an additional layer of Webril on top of the plaster, which will prevent it from sticking to the elastic wrap. Essentially, you are sandwiching the plaster between layers of Webril.

Apply the splint to the extremity. Enlist the help of an assistant to hold the splint in place.

Secure the splint to the extremity with elastic bandages by wrapping in a distal-to-proximal fashion. Remember to fold the stockinette over the edges of the plaster and Webril.

Prefabricated Fiberglass Splint Application

Equipment for preformed fiberglass splints

Equipment for plaster splints

- preformed fiberglass splints
- Padding
- Elastic Rap
- Stockinette
- Tape
- Scissors


1


2


3
Padding
Fiberglass


4


5


6


7


8

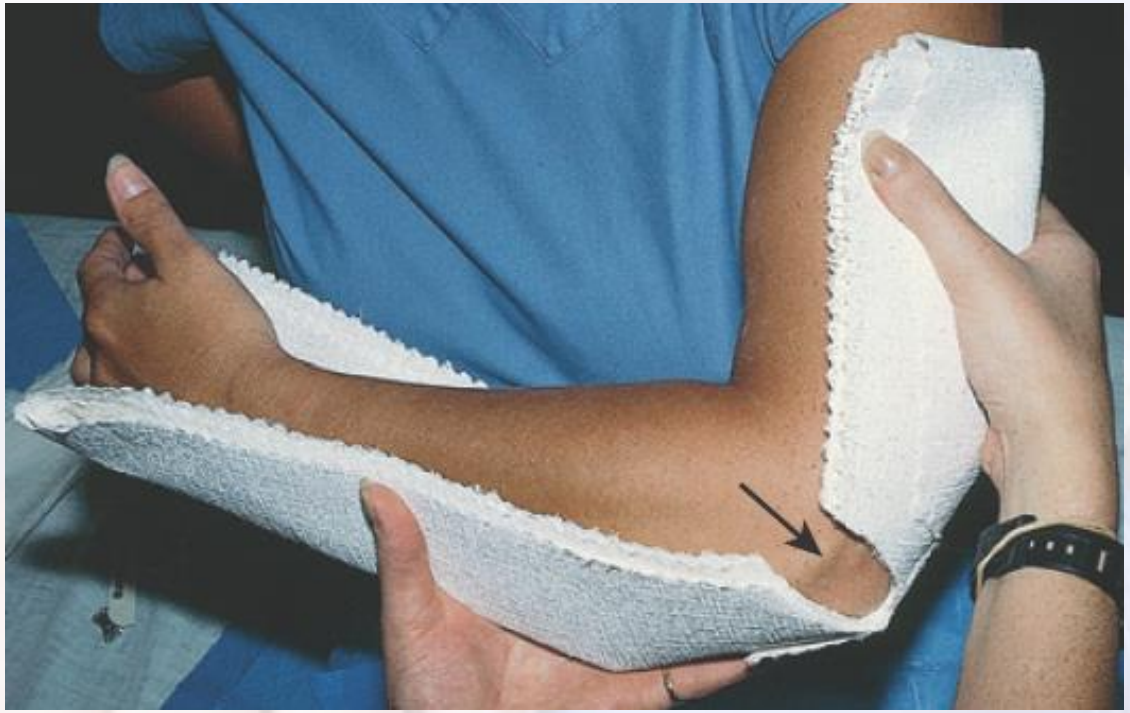

9


10

Notes

- Always use cool, clean water.
- Do not oversaturate plaster splint. Minimal water is required for fiberglass splints.
- Make the splint smooth when placing it on the patient to avoid bumps and pressure points
- Simply roll elasticbandages over the extremity without undue tension
- Leave fingertips exposed to check for circulation and sensation
- Emphasize and demonstrate splint elevation to patient

Notes



When preparing a splint (such as a long arm splint) that involves a right angle, cut out a notch (arrow) to allow a smooth bend

Additional padding

BOX 50.2 Areas of the Upper and Lower Extremity That Require Additional Padding

UPPER EXTREMITY

Olecranon
Radial styloid
Ulnar styloid

LOWER EXTREMITY

Upper portion of the inner aspect of the thigh
Patella
Fibular head
Achilles tendon
Medial and lateral malleoli

BOX 50.3 Effect of Water Temperature and Different Additives on the Setting Time of Plaster

Accelerates Setting Time	Slows Setting Time
Reusing the dip water	Cool dip water
Higher dip water temperature	Glue
Salicylic acid	Gum
Zinc	Borax
Magnesium	
Copper	
Iron	
Aluminum	
Salt	
Alum	

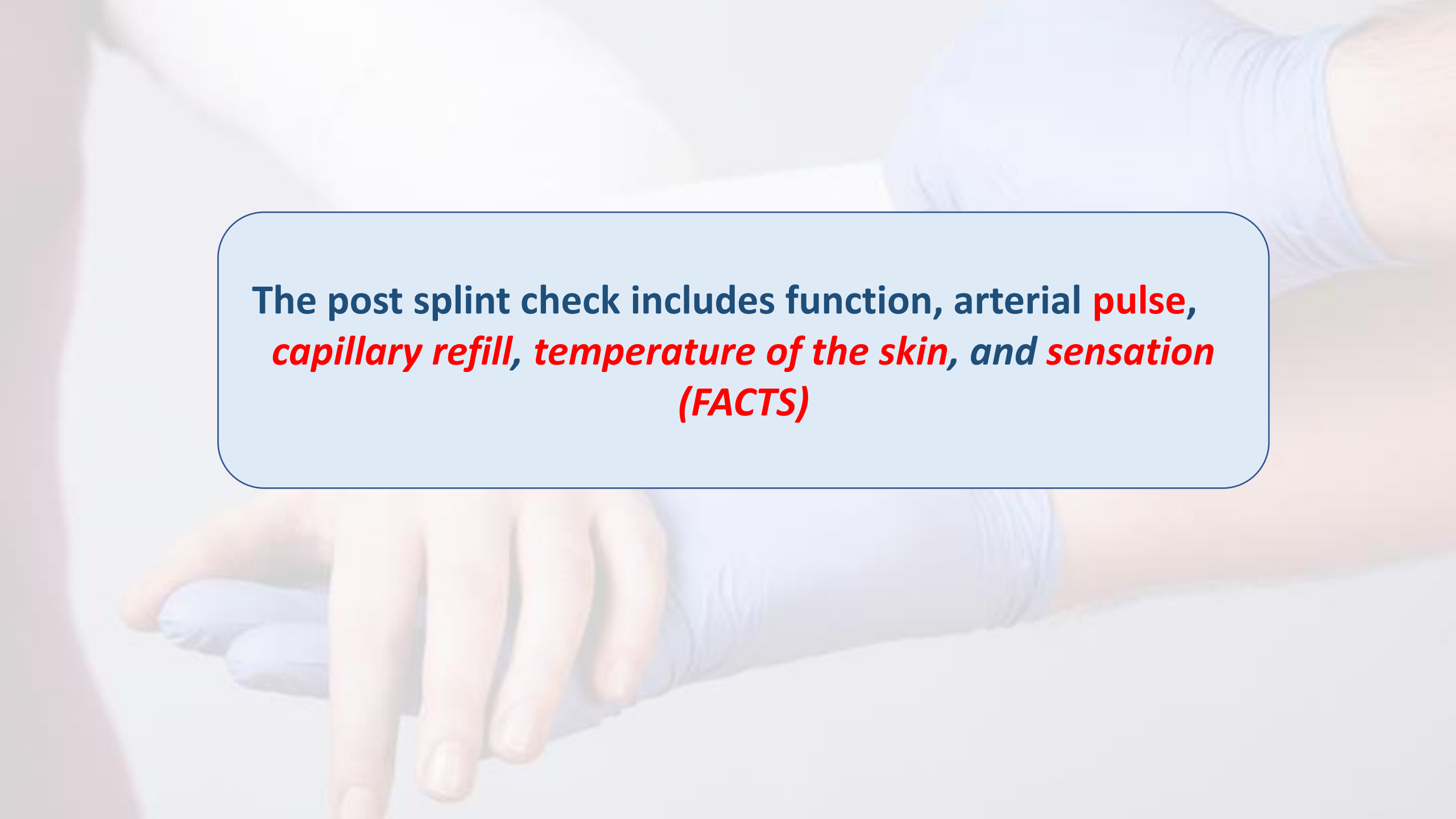
BOX 50.4 Variables That Increase Heat Production During Crystallization

MAJOR

Increased splint thickness
Setting time[a]
High dip water temperature[b]
Wrapping the extremity for support while drying

MINOR

High humidity
High ambient temperature
Reusing the dip water



The post splint check includes function, arterial pulse, *capillary refill, temperature of the skin, and sensation (FACTS)*

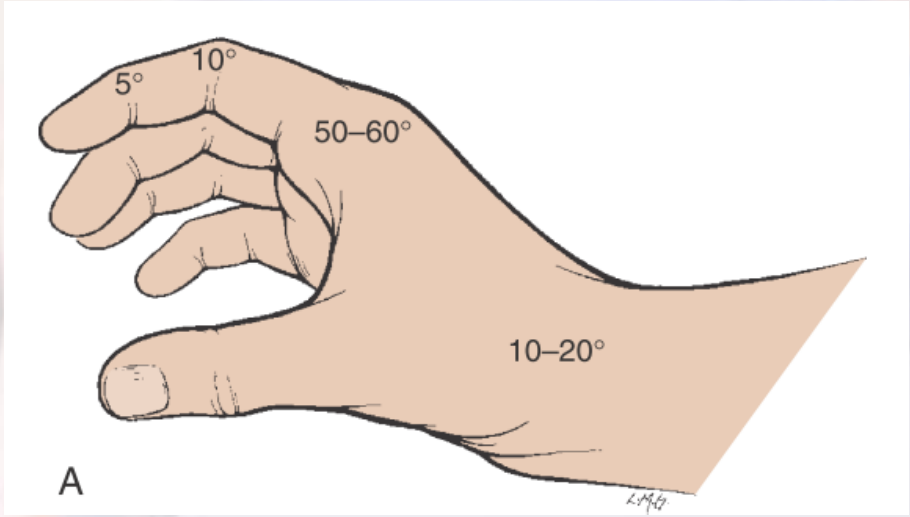
UPPER EXTREMITY SPLINTS

UPPER EXTREMITY SPLINTS

- Long Arm Posterior Splint
- Double Sugar-Tong Splint
- Forearm Sugar-Tong Splint
- Volar Splint
- Thumb Spica
- Ulnar/Radial gutter

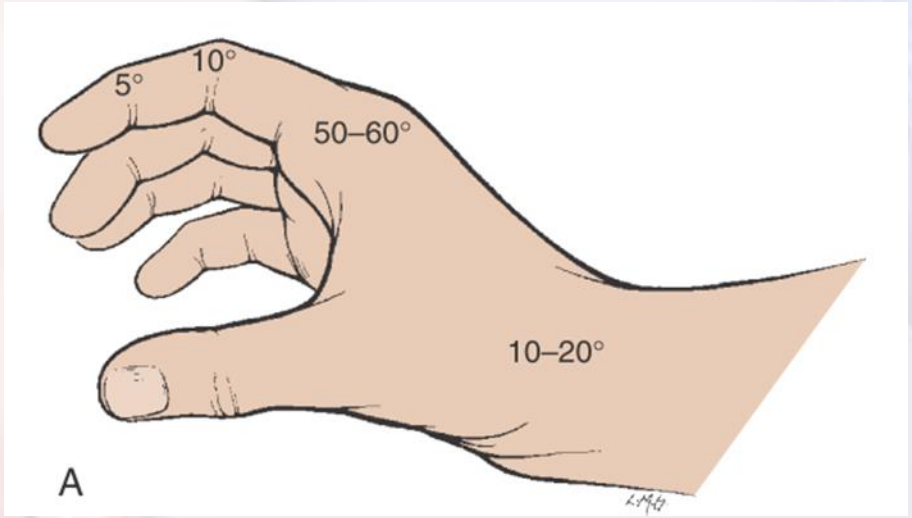
Wineglass position (position of Function)

A safe splint position for the hand and fingers for short-term splinting (7-14 days)



Wineglass position

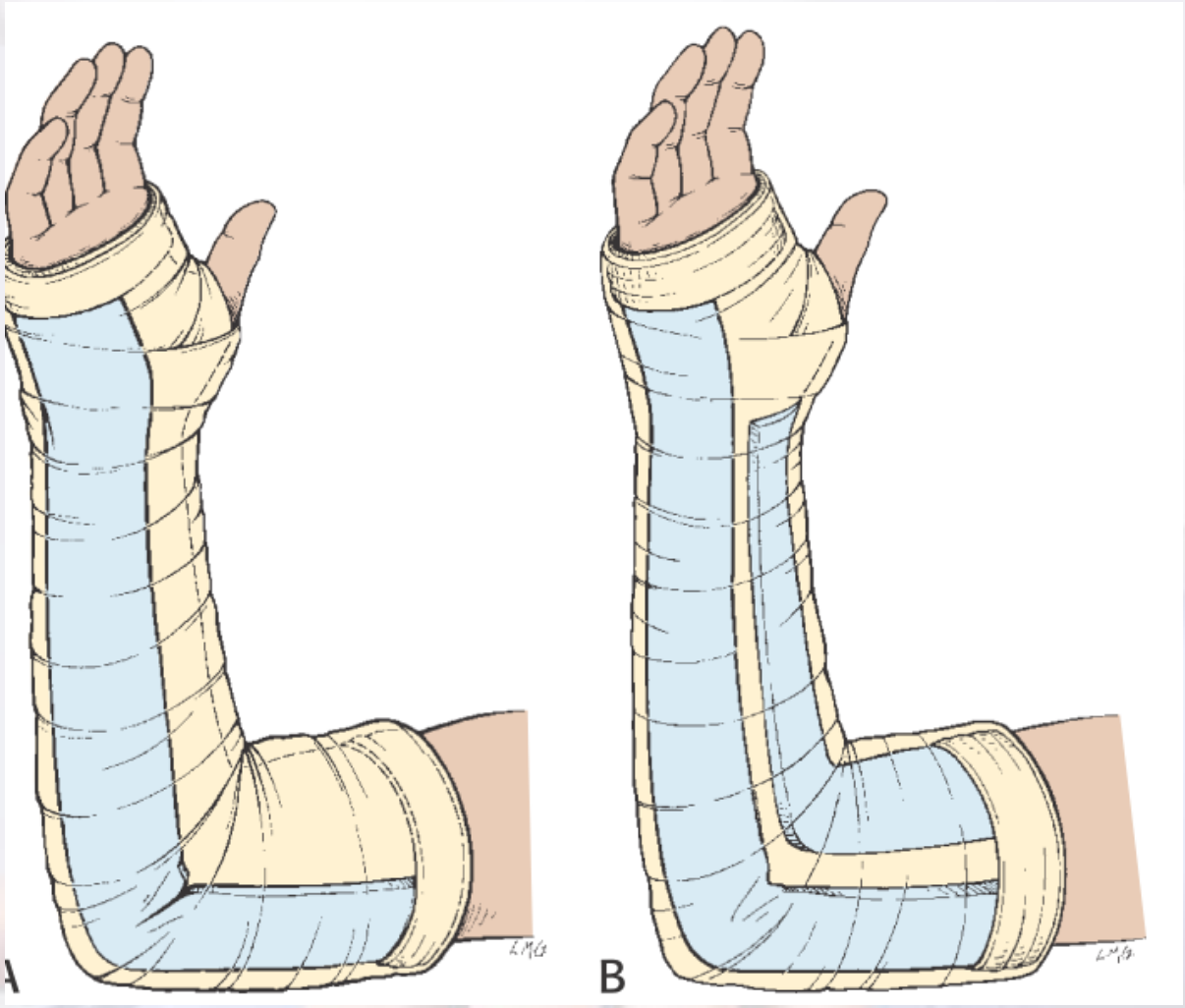
Wrist should allow alignment of the thumb with the forearm, the metacarpophalangeal (MCP) joint should be moderately flexed, and the interphalangeal joints should be only slightly flexed. The thumb should be abducted away from the palm.



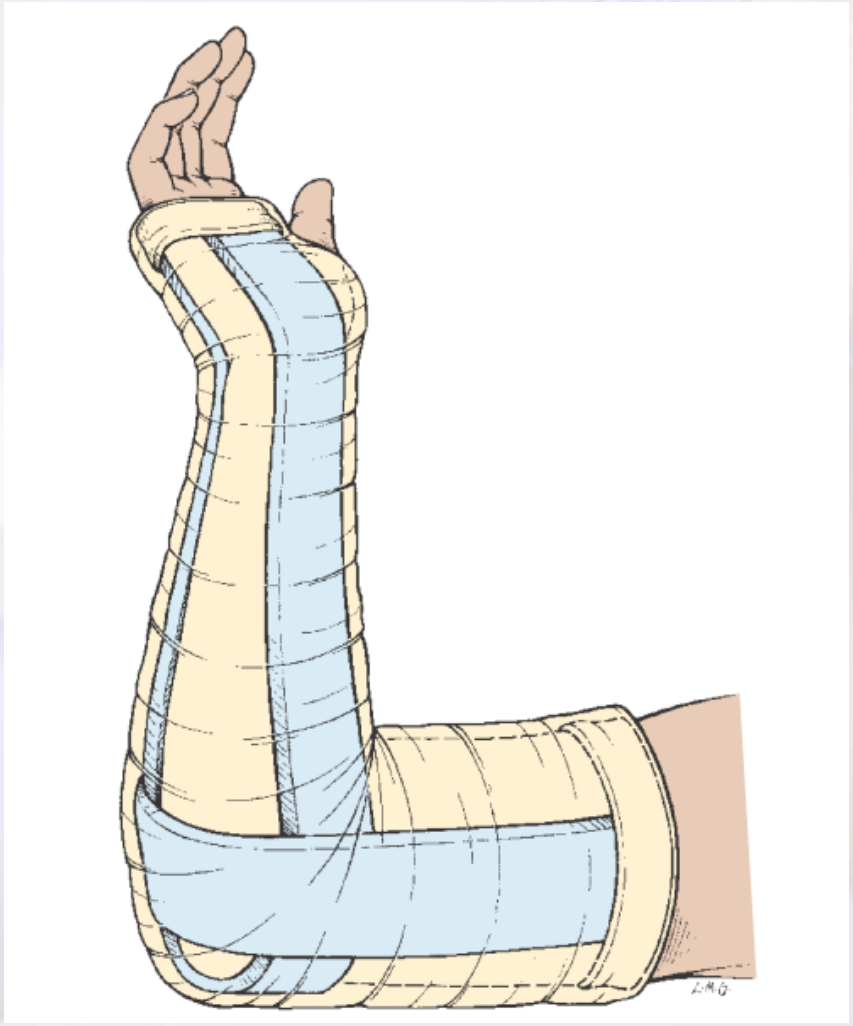
Intrinsic position

For longer splinting, the fingers should be extended to prevent flexion contractures.

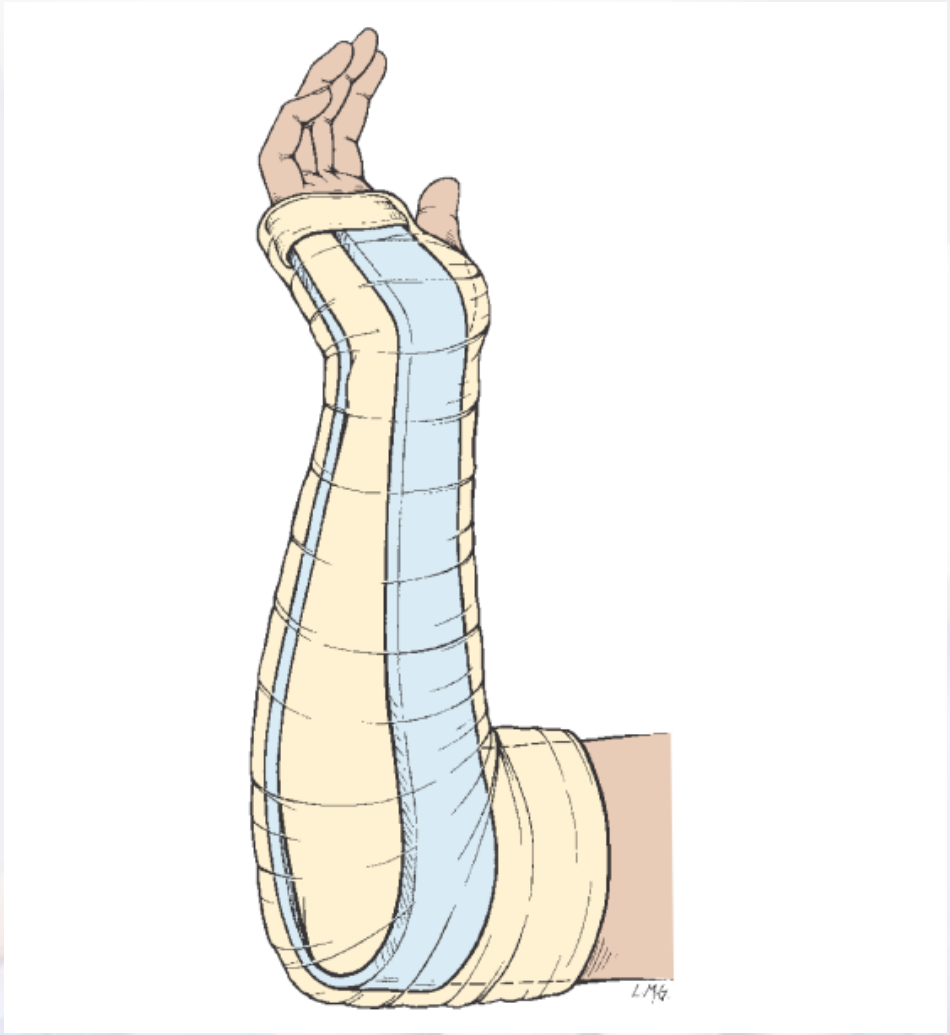
MCP joint is flexed at 90 degrees



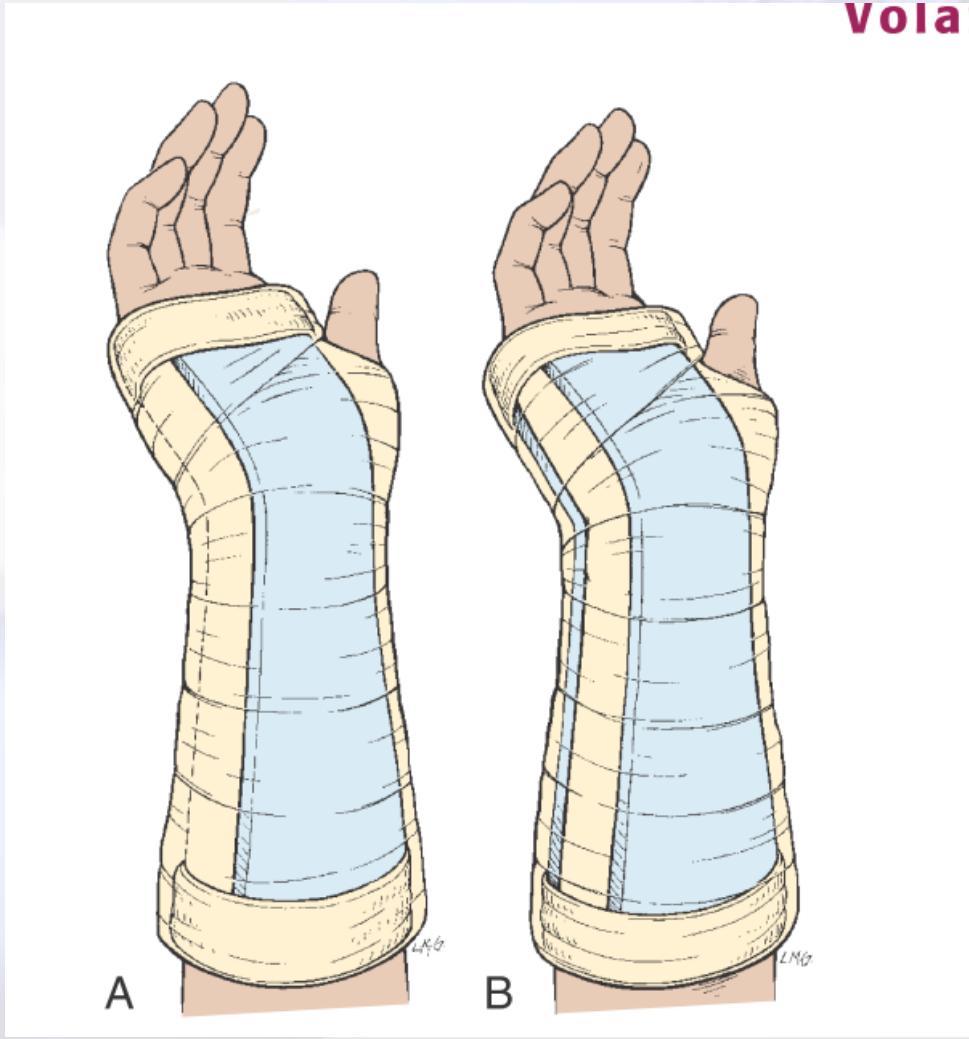
Long Arm Posterior Splint



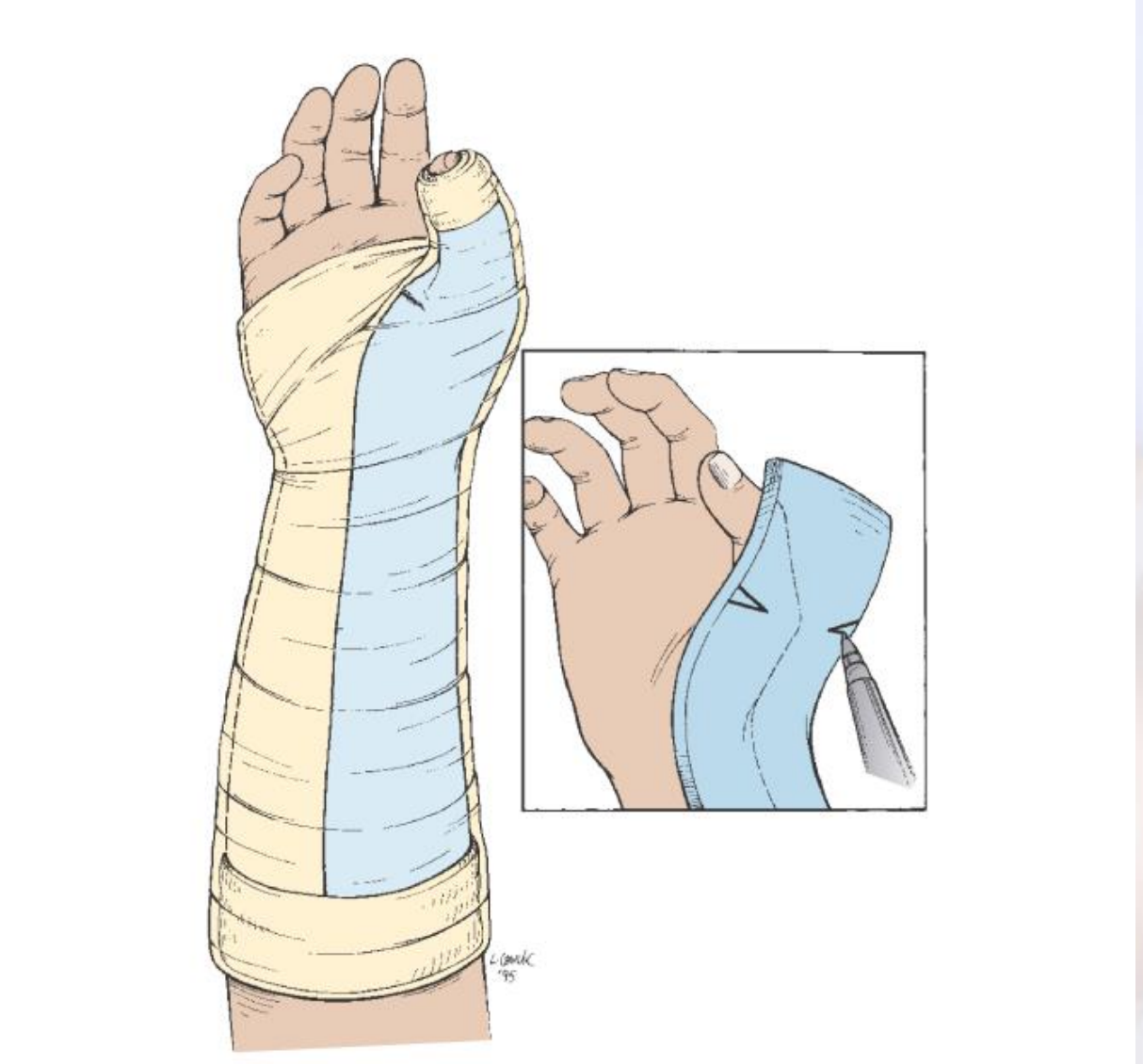
Double Sugar-Tong Splint



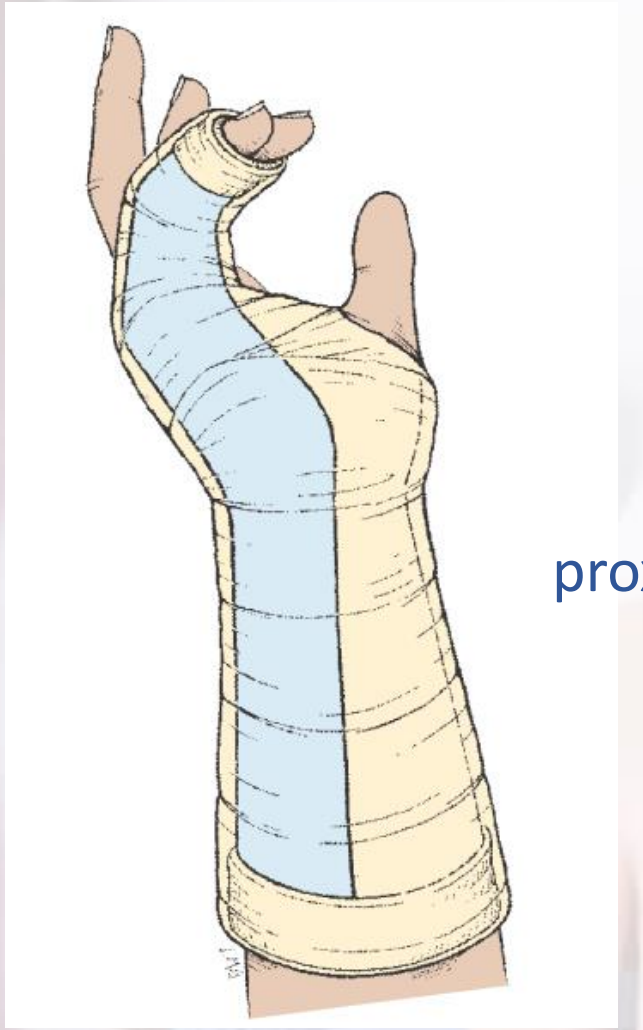
Forearm Sugar-Tong Splint



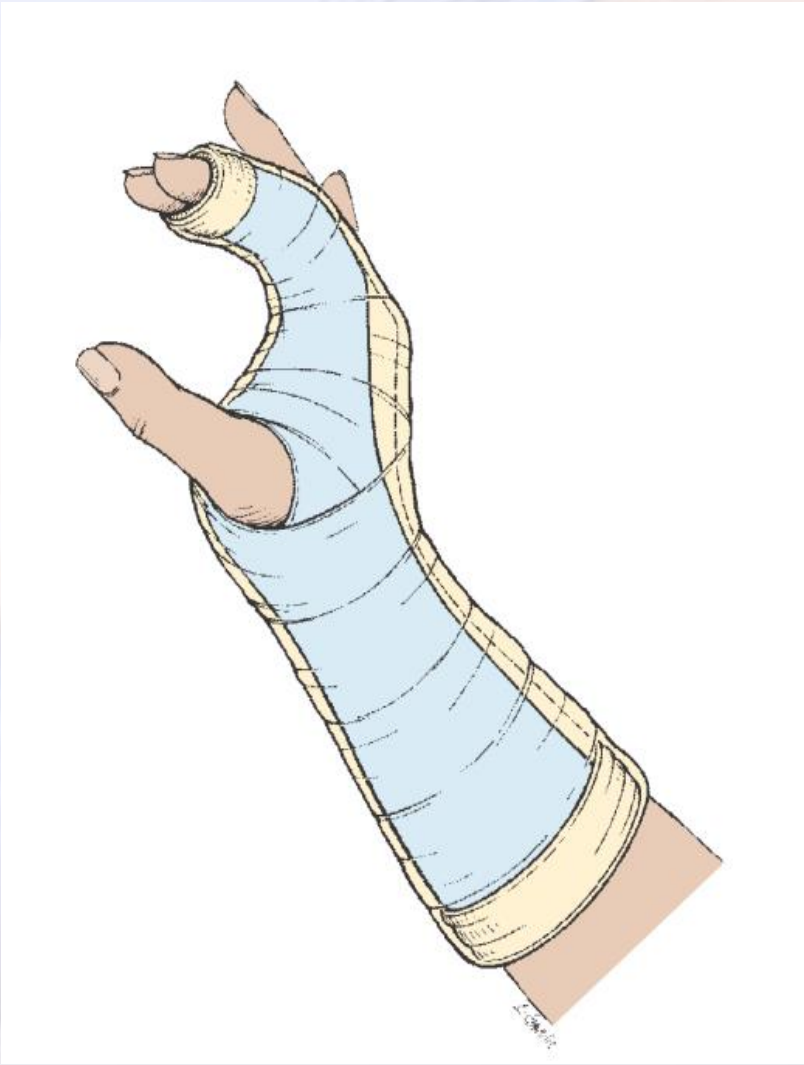
Volar Splint



Thumb Spica Splint



Wrist 10° to 20° Extension
MCP joint 50° flexion
proximal and distal interphalangeal joints
in 10° to 15° flexion

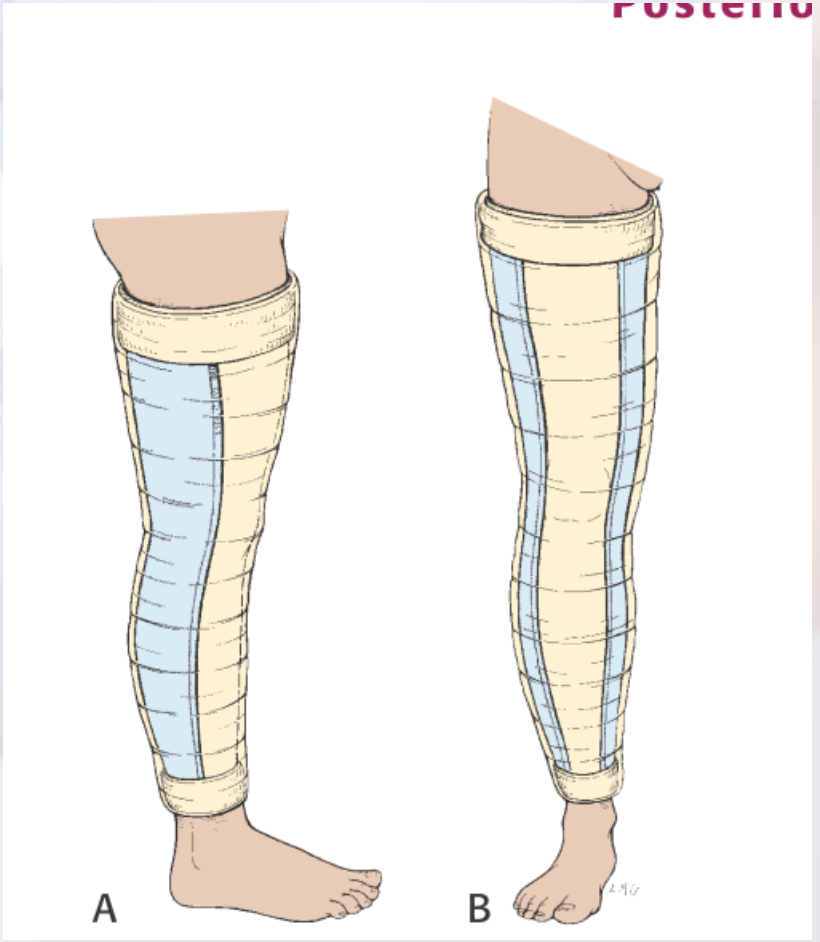


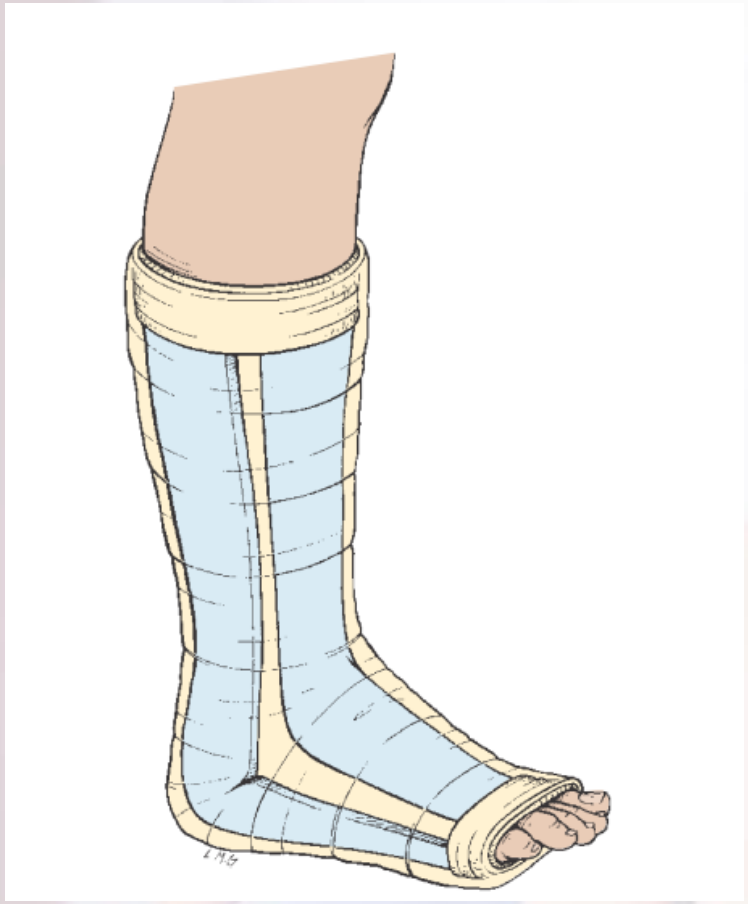
Ulnar Gutter Splint

Radial Gutter Splint

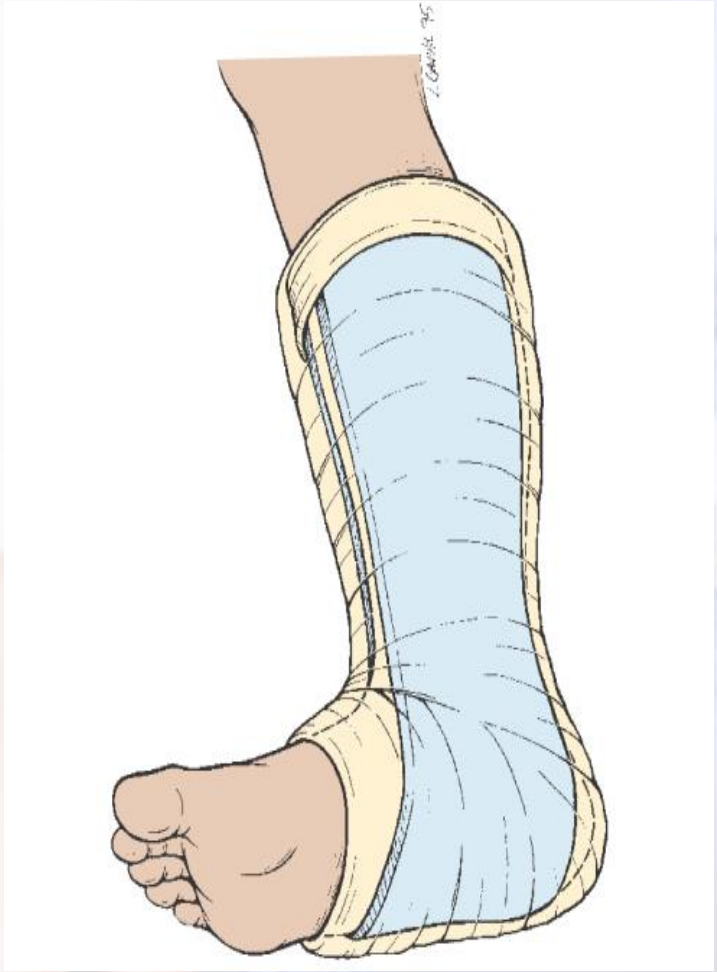
LOWER EXTREMITY SPLINTS

- Posterior Knee Splint
- Knee Immobilizer

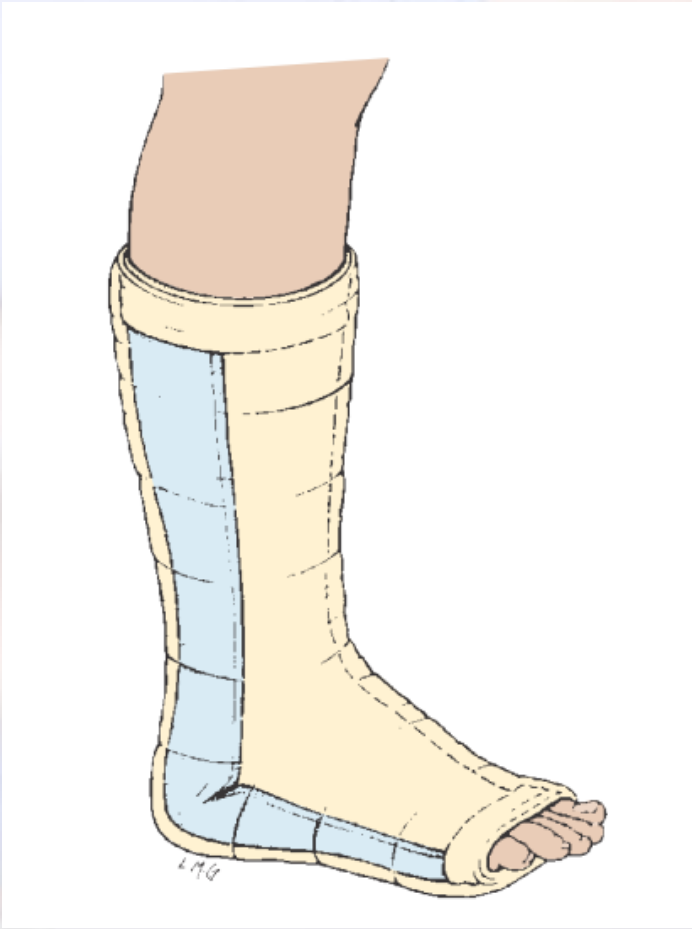




Anterior-Posterior Ankle Splint

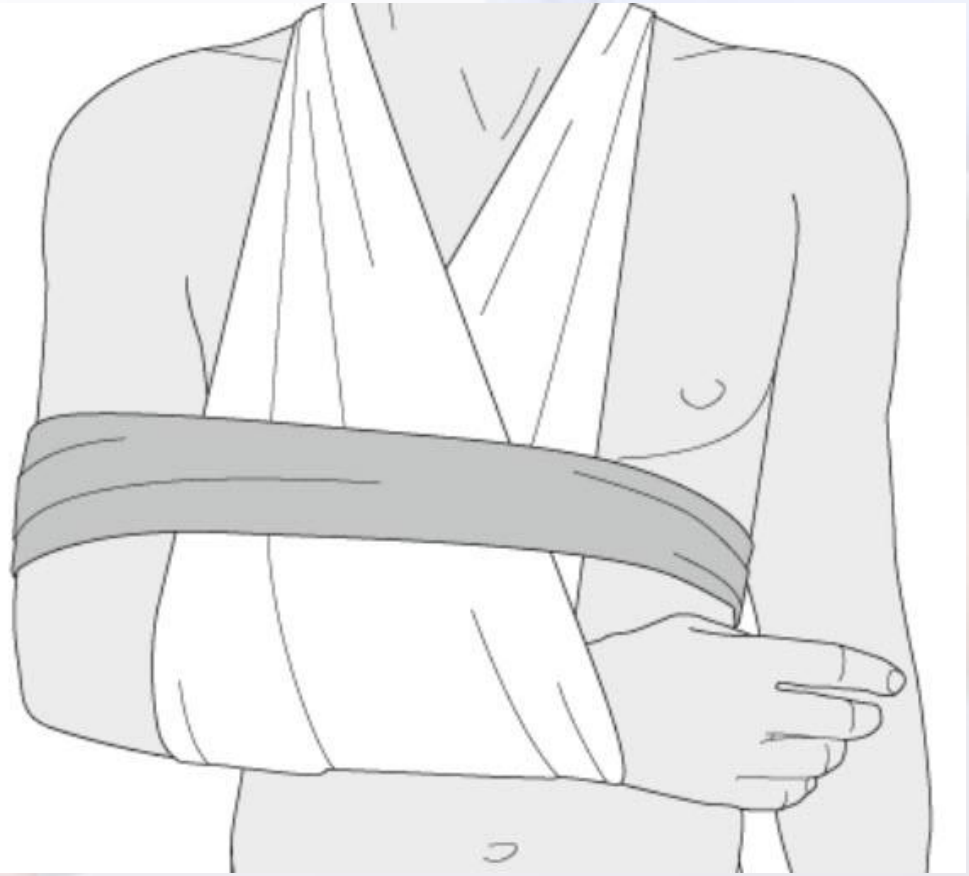


U-Splint (or Stirrup/Sugar-Tong Splint)



Posterior Ankle Splint

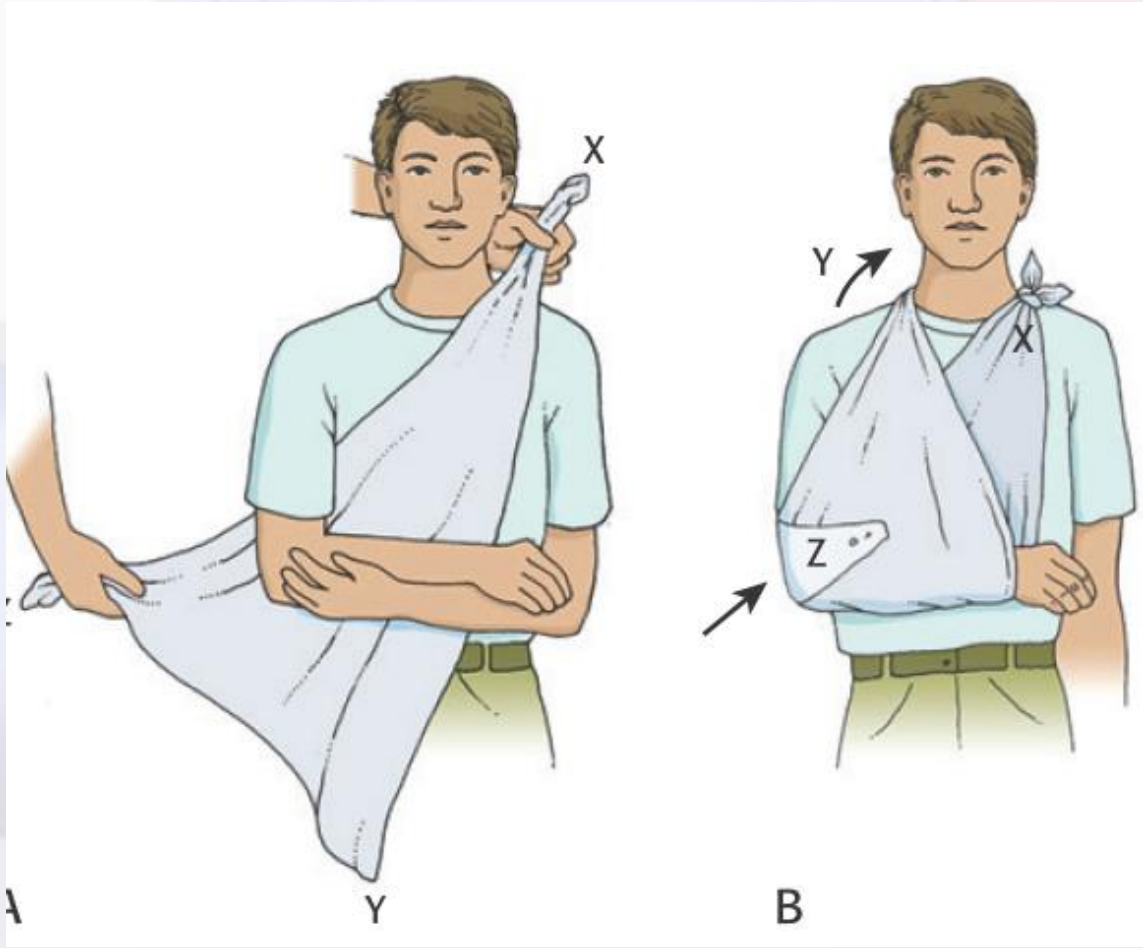
Arm Sling



Arm Sling

Application

1.Place tip X over the uninjured shoulder.
2. Bring tip Y over the injured shoulder to enclose the arm
3. Draw tip Z around the front and pin.



Finger Splints

Finger Splints

- Thumb Spica
- Ulnar/Radial gutter

Figure-of-Eight Thumb Splint

- **Indications**
- Skier’s/gamekeeper’s thumb (ulnar collateral ligament injury)

Figure-of-Eight Thumb Splint

Application

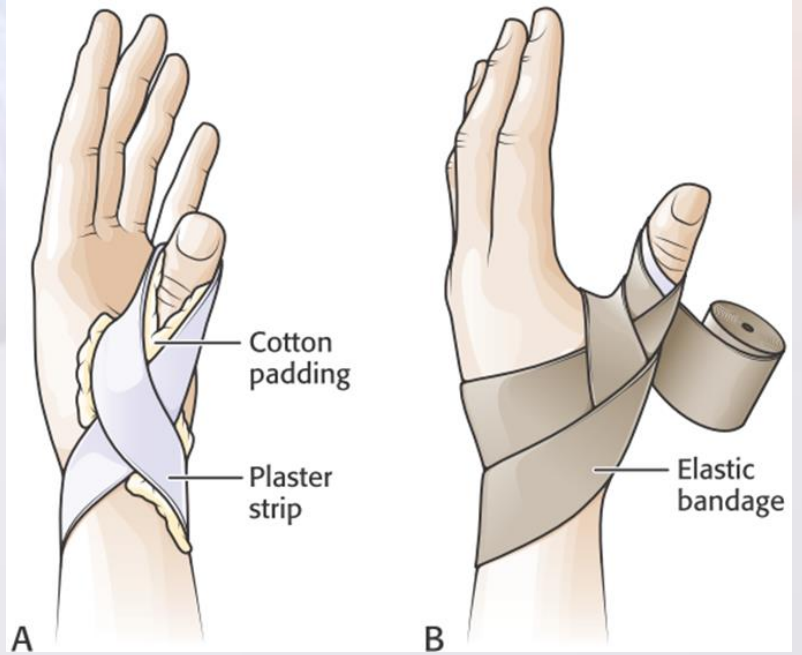
1. Cut a length of Webril and plaster approximately 14-16 inch long.

Center the splint on the web space, cross over the dorsal aspect of the thumb in a figure-of-eight fashion, and overlap the cut edges around the styloid process of the ulna.

2. Wrap with a small elastic bandage while overlapping in a

figure-of-eight formation.

Mold and position the splint after placement.

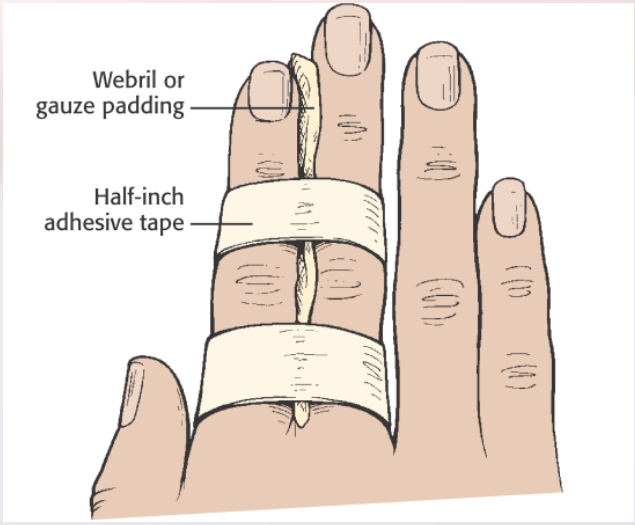


Buddy Taping or Dynamic Splinting

Buddy Taping

Taping between the digital joints (toes or fingers) allows the normal adjacent finger to protect the collateral ligament of its injured neighbor.

Place Webril between the digits to prevent maceration of the skin.



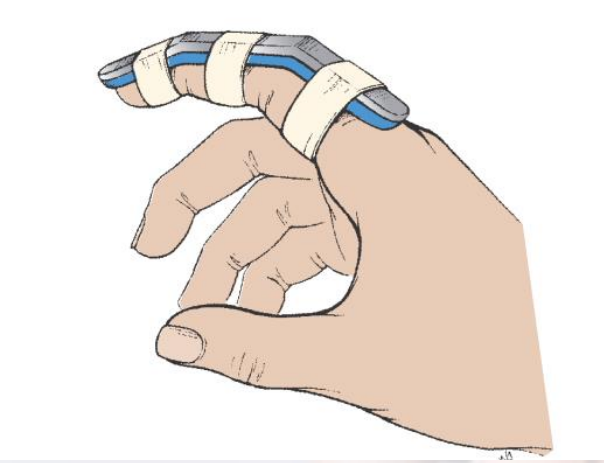
U Shaped Aluminum Splint

- Used most commonly in **distal phalangeal fractures**

U Shaped Aluminum Splint

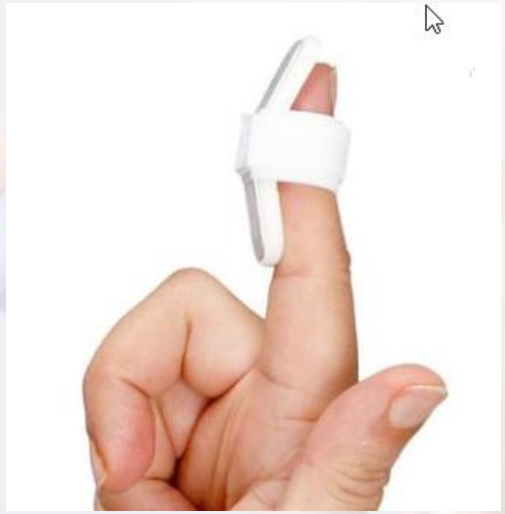
Application

The aluminum splint wraps from the dorsal fingertip around to the volar fingertip and immobilizes only the distal interphalangeal joint in extension



Mallet Finger Splint

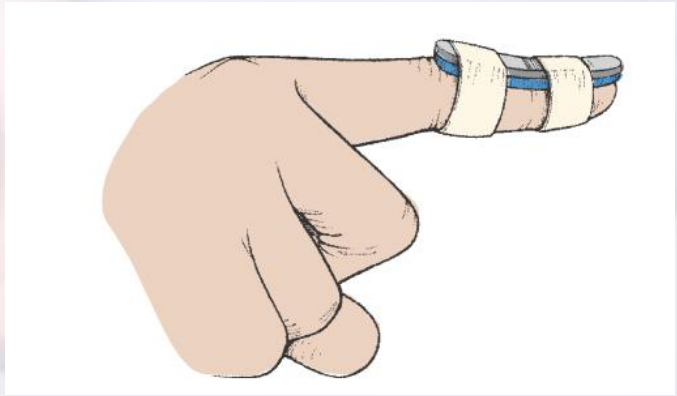
It is used in cases of **mallet finger** or **avulsion of the extensor tendon** from the base of the distal phalanx with or without an avulsion fracture



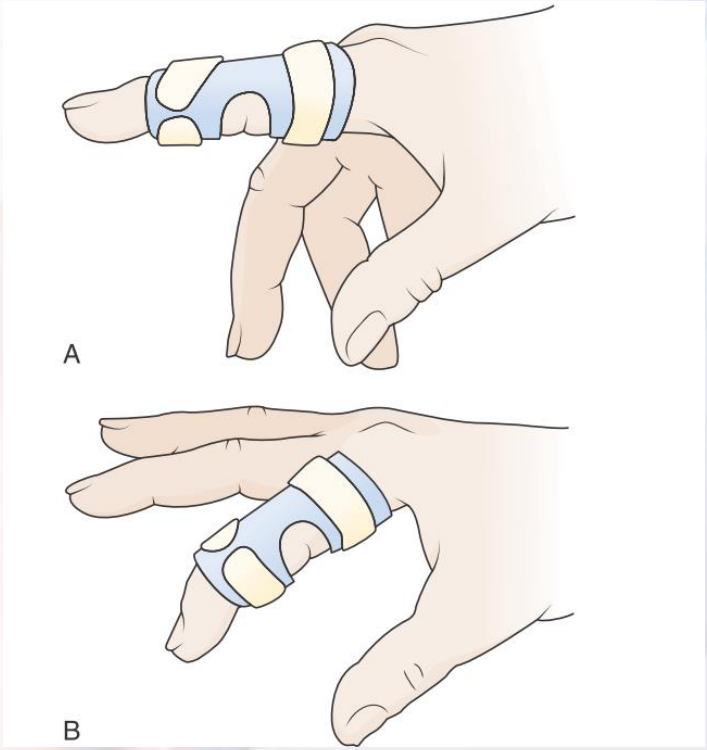
Mallet Finger Splint

Application:

- Distal interphalangeal joint is placed in slight hyperextension with a padded dorsal splint, an unpadded volar splint, or a prefabricated mallet finger splint.



Boutonnière splint



Thank you for your attention