Dorsal forearm plaster splint

**Indications**
- Wrist distortion
- Immobilization after wound care
- After removal of a circular plaster cast

**Recommended material**
- Tubular bandage, size 2 R
- Slab, 12 cm wide
- Padding, 15 cm wide

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Place a double layer (8-ply) of slab on the forearm, measure from the metacarpophalangeal joints to the elbow and cut.

Pull the tubular bandage over the dry plaster slab, avoiding creases.

Fold the slab covered by the tubular bandage like a concertina and immerse briefly. Squeeze out excess water.
Mould the moist slab thoroughly in one direction, using either your fingers or the edge of the immersion bath.

Apply the moulded slab onto the dorsal side of the arm, paying attention to the position of the wrist. Further mould to the shape of the arm.

When the splint has set, remove it and cut at distal and proximal end to achieve a correct fit.

Trim and round off proximal and distal edges.

Place one layer of padding into the splint if padding is required.

Re-apply the padded splint and secure with cohesive bandage.
Volar forearm plaster splint

**Indications**
- Wrist distortion, limitation of palmar flexion
- Immobilization after wound care

**Recommended material**
- Tubular bandage, size 2 R
- Slab, 12 cm wide
- Padding, 15 cm wide

Place a double layer (8-ply) of slab on the forearm, measure from the metacarpophalangeal joints to the elbow and cut.

Pull the tubular bandage over the dry plaster slab, avoiding creases.

Fold the slab covered by the tubular bandage like a concertina and immerse briefly. Squeeze out excess water.
Mould the moist slab thoroughly in one direction, using either your fingers or the edge of the immersion bath.

Apply the moulded slab onto the volar side of the arm, paying attention to the position of the wrist. Further mould to the shape of the arm.

When the splint has set, remove it and cut at distal and proximal end to achieve a correct fit.

Trim and round off proximal and distal ends and edges (arrows).

Place one layer of padding into the splint if padding is required.

Position the forearm in the padded splint and secure with cohesive bandage.
Place a double layer (8-ply) of slab on the forearm, measure from the metacarpophalangeal joints to the elbow and cut.

Fold the slab one-third lengthwise.

Cut out a wedge (arrow) about 5 cm from one end of the folded edge.

**Indications**
- Colles’ fracture, Loco typico, not dislocated
- Dislocated radial fracture after reduction

**Recommended material**
- Padding, 6 cm wide
- Crepe paper bandage
- Slab, 20 cm wide
Secure padding or partial padding of the forearm with a paper bandage, avoiding creases. Very experienced users do not use padding and only apply a paper bandage.

Briefly immerse the prepared slab and mould thoroughly after immersion.

Place the wider part of the slab on the dorsal side of the arm and pass the thumb through the hole. Allow the 1/3 of the slab to run out to the volar side.

Then mould the entire slab thoroughly to the shape of the arm, avoiding creases. Cut the slab to size along the palmar fold (on the inside of the palm).

When the splint has set, cut completely through the padding on the volar side of the arm.

Secure the plaster splint in position by encircling it with cohesive bandage.
Radial thumb plaster splint

Indications
- Ruptured collateral ulnar ligament
- Closed reduction after dislocation
- Immobilization after distortion

Recommended material
- Slab, 12 cm wide
- Padding, 15 cm wide if necessary
- Cohesive conforming bandage

Place a double layer of slab on the forearm and measure from the tip of the thumb to the elbow. Make a slit in the middle of the slab approx. 10 – 15 cm from one end.

Fold slab like a concertina, immerse briefly and mould thoroughly.

Place the slab on the radial side of the arm with the slit at the thumb. Guide one section on the palmar side around the thumb from the inside to the outside (1).
Guide the second slit section on the palmar side around the thumb from the outside to the inside (2).

Mould the entire slab to the shape of the arm, avoiding creases. Keep the slit on the top of the thumb free.

When the splint has set, carefully remove it in the direction of the arrow.

Trim and round off the thumb slit and the edges. Ensure that there are no creases on the inside of the splint, smoothen if necessary.

Place one layer of padding in the splint.

Re-apply the padded splint and secure with cohesive bandage.
Dorsal forearm cast splint

**Indications**
- Wrist distortion
- Immobilization after wound care
- Prevention of dorsal flexion

**Recommended material**
- Tubular bandage, size 2 R
- Cast bandage, 7.5 or 10 cm wide
- Cohesive bandage or Thermocast, 6 cm wide

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Place the tubular bandage on the arm, measure from the elbow to the fingertips and cut.

Wear gloves from now on.
Make a three or four-ply slab using a cast bandage which is 7.5 cm or 10 cm wide. Place it on the arm and measure from the elbow to the metacarpophalangeal joints.

Pull the slab apart at the ends to form a fan shape.
Pull the prepared and moistened tubular bandage over the slab. Avoid creases and immerse this bandage combination in water.

Place the immersed slab on the dorsal side of the forearm without further padding and mould thoroughly to the shape of the arm. Ensure that the wrist is in a functional position.

Remove the splint after approx. 3 – 4 minutes. The patient can then dry his/her arm.

Trim and round off the ends of the splint with the plaster shears.

Place one layer of padding directly onto the patient's skin or into the splint for protection and additional padding. Re-apply the padded splint.

Secure the splint to the forearm with cohesive bandage or with Thermocast.
Measure and cut a piece of tubular bandage which is twice the length of the forearm. Pull it over the forearm. The rolled-up end (1) is proximal to the elbow. Do not make the incision for the thumb (2) too big.

Apply circular padding and secure with a crepe paper bandage, avoiding creases.

Immerse the plaster bandage (8 cm wide) for approx. 3 seconds. Squeeze out briefly after immersion.

**Forearm plaster cast**

**Indications**
- Radial fracture after detumescence
- Severe wrist distortion
- Some cases of distal greenstick fractures

**Recommended material**
- Tubular bandage, size 2 R; padding, 6 cm wide
- Paper bandage, narrow
- 2 plaster bandages, 8 cm wide
Begin by applying the plaster bandage to the wrist, passing three times over the palm of the hand. Apply the rest of the bandage to the forearm.

Fold back the distal end of the tubular bandage at the metacarpophalangeal joints and the palmar fold (on the inside of the palm).

Apply the second plaster bandage from the proximal to the distal side. Pass once around the hand and the folded tubular bandage.

Pull the tubular bandage from the proximal to the distal side over the plaster which is still moist.

Thoroughly mould the tubular bandage into the moist plaster.

Trim the distal edge when the cast has set. Ensure that the palmar fold, basal joint of the thumb and the metacarpophalangeal joints are free.
Forearm scaphoid plaster cast

**Indications**
- Non-dislocated scaphoid fracture
- Slightly dislocated scaphoid fracture, treated conservatively

**Recommended material**
- Tubular bandage, size 1 R + 2 R
- Padding and paper bandage
- 2 plaster bandages, 8 cm wide

Pull the tubular bandage (1 R) with a slit ulnar side over the thumb. Measure and cut a piece of tubular bandage (2 R) which is twice the length of the forearm. Pull it over the forearm. Make incision for the thumb.

Use padding to pad the forearm and thumb. Secure all of the padding with the crepe paper bandage, avoiding creases.

Immerse the plaster bandage (8 cm wide) for approx. 3 seconds. Squeeze out briefly after immersion.
Begin by applying the plaster bandage to the wrist, passing three times over the hand and including the thumb.

Fold back the distal end of the tubular bandage at the metacarpophalangeal joints and at the tip of the thumb.

Apply the second plaster bandage from the proximal to the distal side. Pass once around the hand and thumb. Cover with the folded back tubular bandage.

Pull the tubular bandage from the proximal to the distal side over the plaster which is still moist and mould thoroughly.

Trim and round off the distal end when the cast has set. Ensure that the palmar fold and the metacarpophalangeal joints are free.

Finished plaster bandage. The thumb is in opposition to the index finger, gripping objects is possible.
Iselin or metacarpal extension plaster cast

**Indications**
- Non-dislocated metacarpal fractures
- Dislocated metacarpal fractures

**Recommended material**
- Tubular bandage, size 1 R + 2 R; Tape, 3.75 cm
- Padding and paper bandage (narrow)
- 2 plaster bandages, 8 cm wide

Pull the tubular bandage (1 R) over the finger to be extended and secure with skin adhesive. Measure and cut a piece of tubular bandage (2 R) which is twice the length of the forearm. Pull it over the forearm.

Use padding to pad the forearm. Secure all of the padding with the crepe paper bandage, avoiding creases.

Immerse the plaster bandage (8 cm wide) for approx. 3 seconds. Squeeze out briefly after immersion.
Apply the immersed plaster bandage from the distal to the proximal side. Pass three times over the palm of the hand.

Fold back the distal end of the tubular bandage (2 R) over the plaster, exposing the palmar fold.

Apply the second plaster bandage from the proximal to the distal side. Pass once around the hand and cover the folded back tubular bandage.

Pull the tubular bandage from the proximal to the distal side over the plaster which is still moist and mould thoroughly into the moist plaster.

Trim edges. Cut crepe paper bandage (P) to approx. 3 cm wide with a sharp knife and insert. Extend the finger to the proximal side of the forearm using tubular bandage (1 R).

Use Tape to secure the extension tube to the forearm plaster bandage.
Pull a tubular bandage (2 R) over the forearm. Make a small incision for the thumb. Apply narrow padding to the arm, beginning with the metacarpophalangeal joints. Wrap the circular padding around the arm towards the proximal side. Fold back both ends of the tubular bandage (arrows), cover the padding with a foam bandage avoiding creases and secure. Wear gloves from now on. Starting at the wrist, wrap a narrow cast bandage in the prone position. Guide the bandage laterally over the back of the hand to the thumb.

**Indications**
- Secondary cast in radius fractures
- Primary cast for severe wrist distortions without swelling

**Recommended material**
- Tubular bandage, size 2 R
- Padding, 6 cm wide + foam bandage
- 1 cast bandage, 7.5 cm wide
A proximal to distal incision in the bandage, e.g. a T-shaped cut, simplifies application of the bandage between the index finger and the thumb.

Guide the narrow part of the bandage through the thumb and index finger, folding the cut edges inwards.

Starting at the edges, fold the flaps of the incision inwards and guide the bandage over the thumb saddle joint. A padding edge should be clearly visible.

Wrap the bandage between the fingers and thumb again. Repeat this a third time if necessary.

Wrap the rest of the bandage in a proximal direction with approx. 2/3 overlap. The bandage is completed approx. two fingerbreadths distal to the elbow.

The bandage should be well modelled, particularly to the palm.
Scaphoid synthetic cast

Indications
- Non-dislocated scaphoid fracture
- Slightly dislocated scaphoid fracture, treated conservatively
- Primary cast becomes secondary cast

Recommended material
- Tubular bandage, size 1 R + 2 R
- Padding, 6 cm wide + foam bandage
- 1 cast bandage, 7.5 cm wide

Pull a tubular bandage (1 R) over the thumb. Make a 3 - 4 cm slit on the ulnar side to enable the tubular bandage to fit easily over the thumb saddle joint.

Pull a tubular bandage (2 R) over the forearm. A small incision made beforehand enables good connection with the thumb.

Wrap synthetic padding around the forearm, including the thumb. Fold back the distal and proximal ends of the tubular bandage.
Wrap the entire padding with a thin foam bandage and secure without creasing. This results in a smooth surface.

Wear gloves from now on. Starting from the wrist, wrap a cast bandage which is 5 or 7.5 cm wide from the radial to the dorsal side to the metacarpophalangeal joint of the little finger.

Guide the bandage from the ulnar side of the hand to the palmar side. A proximal to distal incision at approx. thumb level simplifies application of the bandage between the thumb and index finger.

Let the narrow part of the cast bandage run between the thumb and index finger from the dorsal to the palmar side. Guide the cut ends around the thumb.

Make another turn around the metacarpophalangeal joints and guide the bandage to the thumb from the dorsal side. Make a distal to proximal incision in the bandage and guide the narrow part around the thumb.

Continue winding the bandage around the forearm in a proximal direction with 2/3 overlap. Mould the palm and the entire cast thoroughly.
Forearm brace after Sarmiento

Indications
- Replacement of primary cast in Colles’ fractures after 1 – 2 weeks
- 1 to 2 weeks after primary management of radial fractures, Loco typico

Recommended material
- Tubular bandage, size 2 R
- Padding, 6 cm wide + foam bandage
- 2 cast bandages (7.5 cm + 5 cm wide)
- Velcro straps

After removing the primary cast, pull the tubular bandage (2 R) over the forearm. Make an incision to expose the thumb and use a traction device for fingers to extend the arm.

Wrap the padding around the forearm and fold back both ends of the tubular bandage.

Cover the padding with a thin foam bandage, making sure that there are no creases. Pay attention to avoid creases! The structure is similar to that of the short, upper arm synthetic cast. 

Wear gloves from now on.
Make a three-ply slab using a cast bandage which is 7.5 cm wide and immerse it in water. Apply the slab to the dorsal side of the forearm and secure it by wrapping the remaining cast bandage from the forearm to the elbow around it.

Use a pair of plaster shears to trim the applied cast at the distal and proximal ends. Check the following functions: Free elbow flexion, limited dorsal extension of the wrist.

Fold back padding at the trimmed ends, cut off if necessary. Ensure that a padded edge of at least 1 cm remains.

Wrap a cast bandage which is 5 cm wide around the cast to reinforce the cast and secure the padded edges.

The brace should allow complete flexion of the wrist and elbow joint but prevent the last 45° of extension.

The brace can be cut on the volar surface and held together with Velcro straps either directly after application or after one week.
Thumb taping

Indications
- Contusion, distortion
- Insufficient capsule/ligament system of the thumb
- Straining, distortion of collateral ligaments

Recommended material
- Cohesive, protective bandage in individuals allergic to adhesives
- Tape, 3.75 cm wide

Strip (1) runs in the direction of the arrows from the back of the hand across the palm from the ulnar to the dorsal side.

This strip (2) runs from the dorsal side over the saddle joint of the thumb, is used for securing and ends on the palm.

In the same way as (1) and (2), strip (3) runs from the ulnar to the dorsal side across the palm of the hand in the direction of the arrows and then back again to the ulnar side. It crosses over the saddle joint of the thumb.
Split a 25 cm long piece of Tape (3.75 cm wide) in the middle but do not split the last 2 cm. Apply the non-split side to the inside of the thumb and secure in a semi-circular manner.

One part of the split strip initially runs from the thumb via the volar side towards the ulnar side. It then closes over the saddle joint of the thumb coming from the dorsal side.

The second part of the split strip runs similarly to the first part between the thumb and index finger via the dorsal side to the ulnar side. The strip ends coming from the volar direction.

All applied strips are then secured with cover strips from the proximal to the distal side.

Make a small slit in the middle of a 10 cm long piece of Tape (3.75 cm wide) and apply it as an anchor at the web space of the thumb.
Wrist taping

Indications
- Distortion, contusion
- Straining of the ulnar and radial ligaments
- Irritation of the metacarpal joints

Recommended material
- Cohesive, protective bandage in individuals allergic to adhesives
- Tape, 3.75 cm wide

The anchor (1) runs circularly without tension and slightly overlapping in the distal third of the forearm. Like anchor (1), anchor (2) runs from the palm to the dorsum of the hand.

Strip (3) runs from the dorsal anchor (2) across the saddle joint of the thumb and across the radial side of the wrist to anchor (1).

The dorsal strips (4 + 5) are applied in the same way as strip (3). They are applied slightly staggered and overlapping towards the ulnar side.
Strip (6) runs from the palmar to the dorsal side across the radial side of the wrist to anchor (1). Strip (7) runs in a similar way but in the other direction. A flat figure of eight is formed.

Three semi-circular securing turns (8 - 10) are applied over the dorsal side of the hand / wrist and are kept open on the volar side.

On the palmar side, strip (11) runs in the direction of the arrow from anchor (2) to anchor (1). Mould the Tape thoroughly around the saddle joint of the thumb, avoiding creases!

Both strips (12) and (13) run in the direction of the arrows like strip (11). However, they are shifted towards the ulnar side.

Strips (14) and (15) run around the wrist from the palmar to the dorsal side and are secured with strip (16).

The bandage is closed first on the volar side and then on the dorsal side with semi-circular cover strips.
Upper arm plaster splint

Indications
- Non-dislocated forearm fracture
- Olecranon fracture, conservative or after surgery
- Non-dislocated fracture of the radius head
- Monteggia's fracture, Galeazzi's fracture after surgery

Recommended material
- Slab, 12 cm or 15 cm wide
- Padding, 15 cm or 20 cm wide
- Cohesive conforming bandage

Place a double layer of slab on the arm, measure from the metacarpophalangeal joints to the armpit and cut.

Fold slab like a concertina, immerse briefly and then mould thoroughly.

Above the elbow, cut the set slab to the midpoint and then guide the proximal end of the slab to the upper arm.
The incision causes the upper arm section to overlap the lower arm, thus stabilizing the elbow angle (arrows).

A single slab layer (4-ply) can be applied diagonally to reinforce the angle.

Thoroughly mould the entire slab. Ensure good contact at the overlapping area. Smooth out any creases.

When the splint has set, remove it and then trim around the edges and round off with your fingers. If necessary, smooth out the overlap inside the splint.

Place one layer of padding (15 cm or 20 wide) into the splint.

Re-apply the padded splint and secure with cohesive bandage.
Pull a tubular bandage over the arm which is twice the length of the arm. Place the rest (1) rolled up in the armpit. Do not make the incision for the thumb (2) too big.

Starting on the distal side, apply padding with circular turns. Additional layer of padding for the olecranon.

Secure the entire padding without creases using a crepe paper bandage.
Apply an immersed plaster bandage (8 cm wide) from the distal to the proximal side. Then continue with a bandage which is 10 or 12 cm wide.

Fold back the distal end of the tubular bandage. The palmar fold and the dorsal metacarpophalangeal joints are free.

Complete and stabilize the bandage with the rest of the plaster bandages. Cover the folded over tubular bandage at least once.

Pull the proximally rolled up tubular bandage distally over the plaster which is still moist. Slight twisting prevents creasing.

Thoroughly mould the tubular bandage into the moist plaster. Do not change the position of the plaster during the setting phase.

Trim the distal end (1) and note the dorsal edge of the padding. Round off palmar and dorsal edges if necessary.
Upper arm synthetic cast

**Indications**
- Non-dislocated forearm fracture
- Forearm greenstick fracture
- Isolated ulnar fracture

Usually applied as secondary cast

**Recommended material**
- Tubular bandage, size 2 R (in rare cases size 3 R)
- Padding, 6 + 10 cm wide
- Foam bandage
- Cast bandages, 5 cm und 7.5 cm wide

Pull a tubular bandage over the arm and wrap narrow padding around it. Fold back the tubular bandage at the ends, forming a padded edge.

Wrapping the padding with a crepe paper bandage or a thin foam bandage ensures that the padding surface has no creases.

Wear gloves from now on.

Begin with lateral to medial wrapping of the wrist using a narrow cast bandage. Make a slit dorsally at the level of the thumb saddle joint.
Guide the narrow part of the bandage between the thumb and index finger. Fold the cut parts inwards so that the edges are rounded. Repeat this step three times.

Make sure that there are no sharp edges after the fingers and thumbs have been wrapped. Continue wrapping the arm in the proximal direction with 2/3 overlap.

Wrap the elbow bent at 90° with figure-of-eight turns. Use the second bandage to complete bandaging from the proximal to the distal side starting on the upper arm.

A switch to a forearm brace which includes the olecranon is possible. Cut off the marked part of the cast with the oscillating saw.

Fold back the padding. Ensure that there is a sufficient padded edge at the elbow.

Secure the folded back padding with a 5 cm cast bandage or Thermocast. Free elbow flexion but limited extension in both cases.
Upper arm brace after Sarmiento

**Indications**
- Humerus fracture after hanging cast removal
- Humerus fracture after primary management

**Recommended material**
- Tubular bandage, size 2 R or 3 R
- Padding, 6 cm wide
- Foam bandage + Velcro straps
- 1 cast bandage, 7.5 cm wide

Pull a tubular bandage of appropriate size over the upper arm. Make a slit on the axillary side.

Wrap narrow padding around the arm from just above the elbow to the shoulder joint.

Fold back the tubular bandage at the distal and proximal ends, forming a padded edge.
Wrap the padding completely with a foam bandage to secure it well and to simplify cast removal (prevents the cast from adhering).

Wear gloves from now on.
Wrap a cast bandage (7.5 cm wide) around the arm, beginning on the distal side. The turns of the bandage should overlap by about 2/3.

The bandage should be ellipsoidal on the upper arm to keep the armpit free and completely grip the upper arm muscle.

The bandage must be moulded well. Correct position only if indicated.

When the cast has set, use the oscillating saw to cut open the cast as marked, first on the outside and then on the inside. Zigzag cutting prevents the parts from slipping later.

Protect the skin with padding. Apply the brace and secure it with Velcro straps.
The first bandage turn (1) starts in the direction of the arrow from above the olecranon to distal, radial. The elbow is bent to 90° and the wrist is in neutral-zero position.

A strip (2) is wound around the forearm without tension. This is used as an anchor and for securing.

An upward turn (3) runs across the radial side of the elbow towards the upper arm and is wound around it. This turn is then guided on the inside in the same way as turn (3).

**Indications**
- Distortion + contusion of elbow joint
- After cast removal in elbow dislocation

**Recommended material**
- Elastic adhesive bandage, 6 or 8 cm wide
- Tape, 3.75 cm wide
The bandage runs from the distal side across the medial side of the upper arm to the ulnar side of the forearm and runs back to the radial side of the forearm as an anchor (5).

Turn (6) is staggered, proximally across the forearm. It winds around the elbow on the radial side and is led upwards to the upper arm as a strip (7).

Turn (8) is wound around the upper arm in the direction of the arrow. Turn (9) runs through the elbow and ends on the ulnar side of the elbow.

The end of the elastic adhesive bandage is secured with Tape. Non-elastic strips of Tape may be applied laterally and medially for additional support. These Tape strips are secured and reinforced with two V-shaped strips.
Dorso/plantar lower leg splint

**Indications**
- Preoperative and postoperative in ankle joint fractures
- Calcaneal fracture
- Severe distortion of the ankle joint

**Recommended material**
- Slab, 20 cm wide
- Padding, 20 cm wide
- Cohesive conforming bandage

Place a double layer of slab (8-ply) on the lower leg, measure from the hollow of the knee to the tip of the toes and cut.

Make an approx. 10 cm long incision in the middle of a slab piece (4-ply) which is 30 cm long.

Briefly immerse the long slab, place it on the dorsal side of the lower leg and guide over the heel towards the plantar side.
Immerse the slit slab and insert the heel through the slit. Move ends (arrows) towards the plantar and dorsal sides respectively. The lateral and medial parts of the slit slab are for stabilization.

Thoroughly mould the entire slab, ensuring that the 90° angle of the ankle joint is maintained. Continue moulding as long as the cast is still moist.

Hold the position of the foot when the splint is setting. Do not change position during and after the setting time.

When the splint has set, carefully remove it in the direction of the arrows.

Then trim and round off all edges with your fingers to obtain a good fit. Pay attention to the contours of the toes and the length in the hollow of the knee.

Place one layer of padding (20 cm wide) into the splint. Re-apply the padded splint and secure with cohesive bandage.
Lower leg plaster cast

**Indications**
- Primary management of severe capsular/ligament injury of the ankle joint
- Non-dislocated Weber A fracture
- Postoperative ankle joint fracture (open splitting cast)

**Recommended material**
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; crepe paper bandage
- 2 plaster bandages, 15 cm wide; 1 slab, 12 cm wide

Pull a tubular bandage over the lower leg which is twice its length. Place the rest rolled up proximal to the hollow of the knee (arrow).

Starting distally, apply narrow padding with circular turns. Complete the bandage on the lower leg with wider padding. Additional layer of padding for the malleolus (1) and the head of the fibula (2).

Secure the entire padding without creases using a crepe paper bandage.
Immerse a plaster bandage (15 cm wide) and then apply it without creases starting from distally from the metacarpophalangeal joints.

Immerse prepared slab and apply it (single layer on the lower leg, double layer on the foot). Thoroughly mould the slab so that it adheres itself.

Fold back the distal end of the tubular bandage at the toes and over the slab (arrows). Mould and round off soft plaster edges with your fingers.

Apply the second plaster bandage (15 cm wide) from the proximal to the distal side. Avoid creases and wrap at least one turn of plaster bandage around the folded back tubular bandage.

From the proximal to the distal side, pull the rolled-up tubular bandage over the plaster cast while it is still moist.

Mould the tubular bandage thoroughly into the moist cast. Cut off excess tubular bandage at the toes and trim and mould again.
Lower leg plaster walking cast

Indications
- Secondary treatment of Weber A fracture
- Severe capsular/ligament injury after detumescence
- Fracture of the big toe basal joint

Recommended material
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; crepe paper bandage
- 2 plaster bandages, 15 cm wide; 1 slab, 12 cm wide
- Walking cast heel

Pad completely as for lower leg plaster cast. Secure with crepe paper bandage, avoiding creases.

Apply the plaster bandage (15 cm wide) in circular turns. Mould briefly and smoothen.

Apply slab over the plaster bandage. Single layer (4-ply) from the proximal to the distal side, double layer (8-ply) to the sole of the foot.
Secure slab with the second plaster bandage (15 cm wide) from the proximal to the distal side. Apply as much plaster as possible around the calf.

Trim slab to fit properly at the toes and fold back the distal end of the tubular bandage over the slab (arrows). All toes are free yet have plantar support.

Place an immersed, slit slab (15 cm wide) over a suitably sized walking cast heel. The walking surface is free. 2/3 of the slab are placed on the medial side.

Use this slab to secure walking cast heel to the cast. Mould 2/3 into the arch of the foot.

Use a plaster bandage (12 cm wide) to secure the walking cast heel in the direction indicated by the arrows. Begin at the toes, passing over the heel to the distal side and then complete with a figure of eight.

Pull back the tubular bandage over the plaster cast which is still moist and mould in thoroughly. Trim excess tubular bandage.
Lower leg synthetic cast without toe protection

Indications
- Secondary management of ankle joint injuries
- Secondary cast in paediatric tibia fractures

Recommended material
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; foam bandage
- 2 cast bandages, 7.5 cm wide

Apply tubular bandage (length of lower leg + 15 cm) and padding. Additional layer of padding for the head of the fibula, malleoli and edges.

Fold back the tubular bandage at the proximal and distal ends, ensuring that about 1 – 2 cm of padding still projects (subsequent edge padding).

Secure the entire padding without creases using a foam bandage so that a smooth surface is formed.

Wear gloves from now on.
Make a 3 to 4-ply sole plate using a cast bandage which is 7.5 cm wide. Immerse the bandage and the slab and then apply to the base of the foot, medially to laterally.

Then wrap the bandage over the metatarsus, around the ankles and around the metatarsophalangeal joints from below.

Wrap the forefoot approx. 3 times from the distal to the dorsal side. Then guide the bandage over the side of the foot between the heel and the lateral malleolus to the middle. Cover the heel and finish off the bandage proximally.

Use another cast bandage (7.5 cm wide) to complete bandaging of the lower leg. The turns of the bandage should overlap by about 2/3.

Include the head of the fibula in the bandage. Curve the bandage around the lateral edge using its transverse elasticity.

Mould the bandage thoroughly after it has been applied. Both the longitudinal and the transverse vault of the foot can be shaped very well using the ball of the thumb.
Lower leg synthetic cast with toe protection

Indications
- Secondary management of lower leg injuries
- Fracture of the big toe basal joint

Recommended material
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; foam bandage
- 2 cast bandages, 7.5 cm wide; one 5 cm wide

Use a piece of tubular bandage to form a toe protector (cap).

Apply tubular bandage (length of lower leg + 15 cm) and padding. Fold back the ends of the tubular bandage and secure the entire padding without creases using a foam bandage. *Wear gloves from now on.*

Form a distally fanned, 3 to 4-ply sole plate with a cast bandage (7.5 cm wide) and secure it to the foot with the rest of the bandage, wrapping medially over the lateral malleolus to the metatarsus.
Wrap the bandage around the metatarsophalangeal joints from the sole over the side of the foot, then between the heel and ankle to the medial side. Repeat the turn and cover up the heel.

After the heel has been enclosed, continue wrapping until the bandage is used up. Complete bandaging the lower leg using another bandage (5 cm wide), overlapping it by about 2/3.

Adapt the toe plate to the shape of the toes, then mould it and cut to size with plaster shears.

Fold a piece of cast bandage in two. Edge the toe plate with the folded, round edge and apply the slab piece towards the heel.

Use the rest of the bandage (slab) to secure the walking cast heel. Fill out the plantar arch with cast bandage and make 2 - 3 figure-of-eight turns over the walking cast heel.

Use up the rest of the bandage with a complete turn around the toes and then back to the lower leg. Mould the entire cast thoroughly. Now remove the toe protector.
Complete padding with tubular bandage and padding from the metatarsophalangeal joints to beyond the patella and knee joint (enclosure of the knee joint).

Fold back the tubular bandage distally at the metatarsophalangeal joints. Secure the entire padding without creases using a foam bandage. **Wear gloves from now on.**

Form a 3 to 4-ply sole plate with a cast bandage (7.5 cm wide) and secure it to the foot with the rest of the bandage. Include the plantar side of the metatarsophalangeal joints.

**Indications**
- Early functional management of fibula and tibia fractures
- Step by step management of tibia fractures,
  1. Thigh plaster cast, 2. Functional synthetic cast

**Recommended material**
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; foam bandage
- 2 cast bandages, 7.5 cm wide; one 10 cm wide
Wrap the first bandage from the middle of the foot over the lateral malleolus to the back of the foot, including the metatarsus and the metatarsophalangeal joints.

Wrap the ankle joint with a figure of eight and reinforce the lateral margin. The heel is enclosed in the final turn. Now continue bandaging the lower leg in prone position.

Finish bandaging the lower leg with the cast bandage which is 10 cm wide. Include the patella and the knee joint (approx. 110° flexion). Mould the bandage at the head and tubercle of the tibia (slight depression).

Saw off the surplus part of the cast in the hollow of the knee. The medial and lateral area of the collateral ligament as well as one fingerbreadth proximal to the knee cap should remain covered. The hollow of the knee is left free.

Pull the tubular bandage and padding back over the edges of the cast. Function test, flexion > 90°, extension limited.

Another cast bandage (7.5 cm wide) is then applied distally from the proximal end, including the proximal padding edge.
Alternative technique: Functional lower leg synthetic cast after Sarmiento

**Indications**
- Early functional management of fibula and tibia fractures
- Step by step management of tibia fractures,
  1. Thigh plaster cast, 2. Functional synthetic cast

**Recommended material**
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; foam bandage
- 2 cast bandages, 7.5 cm wide; one 10 cm wide

Pad with tubular bandage and padding.
Additional padding for the ankle, head of the fibula and patella.

Fold back the tubular bandage distally at the metatarsophalangeal joints. Secure the entire padding without creases using a foam bandage. **Wear gloves from now on.**

Form a 3 to 4-ply sole plate with a cast bandage (7.5 cm wide) and secure it to the foot with the rest of the bandage. Include the plantar side of the metatarsophalangeal joints.
Wrap the bandage from the middle of the foot over the lateral malleolus to the back of the foot, including the metatarsus and the metatarsophalangeal joints.

Wrap the ankle joint with a figure of eight and reinforce the lateral margin. The heel is enclosed in the final turn. Now continue bandaging the lower leg in prone position.

Apply a two-ply slab from a cast bandage (10 cm wide) from lateral to medial in such a way that the ends meet above the patella.

Secure the slab from proximal to distal with the rest of the bandage. Use an additional cast bandage if necessary. Mould the bandage at the head and tubercle of the tibia.

Saw off the surplus part of the cast in the hollow of the knee. The medial and lateral area of the collateral ligament as well as one fingerbreadth proximal to the knee cap should remain covered. The hollow of the knee is left free.

Pull the tubular bandage back over the edge of the cast at the proximal end. Secure margins and stabilize the bandage with another cast bandage.
Lower leg synthetic cast with shell and Velcro straps

Indications
- Immobilization after ankle joint operation
- Immobilization of lower leg in extensive soft-tissue injuries
- Early functional management with temporary immobilization

Recommended material
- Tubular bandage, size 2 R or 3 R
- 2 padding bandages, 6 cm wide; foam bandage
- 2 cast bandages, 7.5 cm wide; one 10 cm wide
- Velcro straps

Cut a piece of tubular bandage (length of lower leg + approx. 15 cm) and apply to lower leg without creases.

Apply padding in circular turns. Wrap the narrow padding from the distal side covering the metatarsophalangeal joints to the proximal side.

Fold back the tubular bandage over the padding at the distal and proximal ends. Secure the entire padding without creases using a foam bandage.

Wear gloves from now on.
Apply the lower leg synthetic cast as described for the lower leg plaster cast, beginning with a 3 to 4-ply sole plate covering the plantar basis of the metatarsophalangeal joints.

Apply an additional cast bandage (10 cm wide) to complete the lower leg cast. The layers should overlap by approx. 2/3.

Mould the lower leg cast thoroughly and wait until the cast has set completely.

Using an oscillating saw, saw open the cast first laterally with zigzags and then medially in the same way.

Take off the upper part of the cast and fix the Velcro straps medially at the zigzag parts, either with hot glue or some clips.

Re-apply the upper part and secure it with the Velcro straps. If a reduction in leg circumference requires an adjustment, simply cut off some more millimetres at both edges.
Lower leg synthetic cast with integrated plantar support

Indications
- Early functional management of lower leg fractures
- Management subsequent to application of a lower leg synthetic cast after Sarmiento

Recommended material
- Tubular bandage, size 2 R or 3 R
- Padding (one 10 cm bandages or two 6 cm bandages)
- Foam bandage
- 2 cast bandages, 10 cm wide
- Plantar support

Pad the lower leg with a tubular bandage and synthetic padding. Fold back the tubular bandage over the padding at the proximal end.

Secure the entire padding without creases using a foam bandage. Only wrap the padding on the foot over the heel and both malleoli up to the metatarsus. **Wear gloves from now on.**

Make a 2-ply slab from a cast bandage 10 cm wide with a length reaching from the lateral femur condyle to the opposite medial side.
Immerse the slab and apply at the length determined beforehand. Secure the slab from the proximal to the distal end with the rest of the bandage.

Finish bandaging the lower leg with another cast bandage. The forefoot remains free! Mold the entire cast thoroughly.

Once the bandage has set, the plantar part is cut off with plaster shears or a saw. However, both malleoli should still remain covered (see line in the diagram).

Pull back the tubular bandage proximally from the distal end so that the padding edge is approx. 1 – 2 cm wide.

Mount the plantar support and close it with a Velcro strap over the metatarsus.

Fix the plantar support to the cast with another narrow cast bandage. Dorsal extension and plantar flexion of ankle remain free.
Combined, reinforced, elastic ankle taping

Indications
- Severe distortions
- Capsule ruptures
- Partial ruptures of fibular ligaments

Recommended material
- Elastic adhesive bandage, 6 or 8 cm wide
- Tape, 3.75 cm wide

Secure the start of the elastic adhesive bandage with a semi-circular Tape strip. Guide the bandage with longitudinal extension around the heel towards the plantar and medial side.

Continue with the bandage over the lateral malleolus and guide the bandages proximally, ...

Then over the medial malleolus and wind it around the ankle joint.
The descending joint turn runs over the lateral side of the calcaneum towards the distal and plantar side.

Guide the bandage from the medial side of the foot over the dorsum of the foot towards the proximal side and wind around the joint from the medial side.

Then guide the bandage over the lateral malleolus to the distal and plantar side, enclosing the medial side of the heel. The forefoot is covered with circular turns.

Depending on the remaining length of the bandage, repeat the turns 1 - 3 times. The final turn ends on the proximal side.

The first stabilizing Tape strip runs from plantar over the lateral side of the ankle and ends on the dorsomedial side. This strip is to be repeated 1 - 3 times, overlapping the previous by 1/3.

Finally, apply 2 V-shaped tapes from the heel to the ends of the first strips. Complete taping with semi-circular anchors.
Functional ankle taping

Indications
- Moderate to severe distortions
- Capsule/ligament ruptures
- Ligament insufficiency

Recommended material
- Cohesive, protective bandage in individuals allergic to adhesives
- 1 roll of Tape, 3.75 cm wide

A cohesive, protective bandage should always be applied in the initial phase because the bandage is changed regularly. Secure the cohesive bandage distally and proximally with anchors.

Apply three lateral strips to prevent supination and total plantar flexion. Guide them from the plantar side over the lateral malleolus to the dorsomedial side.

In alternating order, apply three ascending and three transverse U-strips.
Apply a heel lock to secure the heel. The medial U-strip is approx 5 cm longer than an ordinary U-strip and the lateral length is measured to the head of the fibula.

The shorter strip runs from the medial side over the dorsum of the foot, covers the lateral malleolus and ends at the dorsomedial side of the heel.

The longer strip begins over the navicular bone on the plantar side, runs along the lateral part of the foot over the dorsum of the foot. It continues towards the medial malleolus and from the lateral side of the heel towards the plantar base of the big toe.

The lower leg is covered from the proximal to the distal side with approx. 50% overlap. Apply all cover strips without tension.

The foot is covered by semi-circular strips, initially from the plantar side and then from the dorsal side. Apply the strips from the proximal to the distal side with a slight overlap.

Make a short incision in the Tape between the third and fourth toe to allow the metatarsus to spread. Close the incision with a semi-circular strip under weight bearing.
Support shoe made of Thermocast

Indications
- Fractures, distortion of cuboid bone, cuneiform bones
- Metatarsal fractures

Recommended material
- Padding for between the toes
- Thermocast bandage, 7.5 cm wide
- Velcro strap

Apply some padding between the toes. Under normal circumstances, full padding is not required when using Thermocast.

To soften the Thermocast bandage (7.5 cm wide), immerse it in warm water with a temperature of approx. 70 °C or 158 °F. Use tongs to take it out of the water and let excess water drip off.

Make a sole plate from 3 – 4 layers of Thermocast and secure with a figure-of-eight turn. Cut off the remaining bandage.
Apply a heated Thermocast bandage (7.5 cm wide) around the foot in a figure-of-eight manner, closing towards the centre.

Mould the applied shoe thoroughly and cut the Thermocast after a short waiting time (approx. 2 minutes) from the dorsal part of the foot in the direction of the toes.

Using plaster shears, cut the Thermocast shoe to achieve a perfect fit. If necessary, briefly immerse the shoe in warm water (70 °C or 158 °F) to simplify the cutting.

Heat up the cut edges again with warm water and smoothen or round the edges with your fingers.

Very briefly immerse the trimmed shoe in warm water and apply the mouldable cast shoe to check the final fit. Mould the applied shoe thoroughly while it is warm.

Finally, attach a Velcro strap to the customized shoe to secure the Thermocast shoe to the foot.
Ankle brace made of Thermocast

**Indications**
- Insufficiency of capsule/ligament structure
- Postoperative management after ligament surgery
- Protection during extreme stress

**Recommended material**
- Skin protecting cream (of your choice)
- Thermocast bandage, 5 cm wide

The skin does not have to be prepared unless there is skin irritation. If this is the case, appropriate skin protection and wound care is advised.

To soften the Thermocast bandage (5 cm wide) immerse it in warm water with a temperature of 70 °C or 158 °F. Use tongs to take it out and let excess water drip off.

The bandaging turn starts distally, plantar and runs around the metatarsophalangeal joints towards the prone position and continues over the metatarsus.
From plantar, the bandage runs between the lateral malleolus and heel to the dorsal side over the Achilles tendon towards the medial malleolus.

Both malleoli are covered with a circular turn. Continuing the bandage on the medial side, it runs between the medial malleolus and heel towards the plantar side.

It then lifts up the lateral side of the foot over the dorsum and then encircles the ankle in a second turn.

The bandage then runs from the Achilles tendon and is wrapped around the lateral side of the heel.

It then runs to the plantar side and goes to the medial and dorsal side around the ankle before it is wrapped medially around the heel.

The final turn runs from the medial and plantar to the lateral side, the lateral side of the foot is supported once again and the bandage is completed with a spiral on the distal side of the lower leg.
Dorsal thigh plaster splint

Indications
- Preoperative and postoperative prepatellar bursitis
- Severe distortions
- After arthroscopy

Recommended material
- Slab, 20 cm wide
- Padding, 20 cm wide
- Cohesive bandage or Thermocast, 10 cm wide

Place a double layer (8-ply) of slab on the leg, measure from the heel to the gluteal fold and cut.
Pull the tubular bandage (4 R) over the dry slab, avoiding creases.
Briefly immerse the slab covered by the tubular bandage and mould it thoroughly.
Place the slab on the dorsal side of the leg and mould to the desired shape.

When the splint has set, carefully remove in the direction of the arrows.

Trim and round off the distal and proximal edges using plaster shears.

Line the splint with a layer of padding (20 cm wide) and re-apply.

Secure the padded plaster splint with cohesive bandage. Optimum fixation is achieved by using Thermocast.
Full leg synthetic cast applied when standing

Indications
- After lesions of knee ligaments
- Patellar dislocations, bursitis
- Postoperative management after ligament surgery

Recommended material
- Tubular bandage, size 3 R up to 5 R
- 2 padding bandaging (10 cm and 15 cm wide)
- Foam bandage
- 3 – 4 cast bandages, 10 or 12.5 cm wide

Slip an appropriately sized tubular bandage (length of leg + 20 cm) over the lower leg and thigh. A walking cast heel placed under the heel makes it easier to keep the knee joint in angular position.

Start padding by wrapping 3 turns of synthetic padding around both malleoli and continue to the proximal side.
Pad the head of the fibula with 3 layers of padding and complete padding up to the thigh. The proximal end should have 3 layers.

Fold back the distal and proximal ends of the tubular bandage padding. Secure the entire padding without creases using a foam bandage. **Wear gloves from now on.**

Depending on the size of the leg, begin wrapping around the lower leg with a cast bandage which is 10 or 12.5 cm wide from the distal to the proximal side. The turns should overlap 2/3. Use a second bandage to continue bandaging the lower leg.

Now wrap the knee joint crosswise to stabilize it. Continue bandaging up the thigh with a third bandage.

Wrap the bandage ellipsoidal on the proximal side of the thigh, lower on the medial than on the lateral side. A fourth bandage is required sometimes.

Mould the completed full leg cast supracondylar over the knee joint. This ensures that no pressure is exerted on the patella yet there is still support from the bandage.
Knee support taping for collateral ligaments

Indications
- Straining and distortion of collateral ligaments
- Slight tears
- Lateral / medial instability
- Straining of meniscus

Recommended material
- 1 – 2 elastic adhesive bandages, 8 cm wide
- Tape, 5 cm wide
- Tape, 3.75 cm wide

Anchors (1+2) run circularly in the proximal third of the thigh. Anchors (3+4) are circular on the distal lower leg.

Secure strip (5) with Tape initially at anchors (1+2) and then at anchors (3+4) after great stretching towards the distal side. Lead to the middle at the patella.
All of the following strips are applied symmetrically if the medial part is involved. Strip (6) is secured on the dorsal side of the thigh. Strip (6) is drawn from the thigh across the lateral region of the knee, goes around the lower leg and ends at anchors (3+4).

Similarly to strip (6), strip (7) runs from the ventral side of the thigh across the lateral side of the knee joint to the dorsal side of the lower leg.

Strip (7) goes around the lower leg from the medial side and leads onto the lateral side of the lower leg to anchors (3+4).

A strip (8), split on both sides and measuring 10 cm in width and approx. 1 m in length, is applied across the lateral side of the knee joint. The course of the split strip ends (8) is across the knee, thigh and lower leg in the direction of the arrows. The strips are covered with an adhesive bandage on the thigh and lower leg.
Support taping for the Achilles tendon

**Indications**
- Achillodynia
- Postoperative support after tenosuture
- Pain at the insertion of the Achilles tendon at the heel bone

**Recommended material**
- Elastic adhesive bandage, 10 cm wide
- 1 – 2 rolls of Tape, 3.75 cm wide

Apply anchors (1+2) of Tape in the proximal third of the lower leg.

Split the support strip at one end to about 30 cm. Cut off the medial part of the split bandage at an angle over the ball of the big toe.

Use the lateral split part as an anchor (3) around the metatarsophalangeal joints and secure it. The secured strip is guided under relatively high tension towards anchors (1+2) where it is secured.
A second split strip from an adhesive bandage (8 cm wide, length = double length of lower leg) is secured on the sole with a strip over anchor (3).

The medial part of the split strip (4) encircles the heel from the medial side, across the Achilles tendon, is wound around the lower leg in a spiral and leads to anchors (1+2).

The lateral part of the split strip encircles the heel from the lateral side and has a course like strip (4). This restores the neutral-zero position of the heel.

The plantar side of the foot is covered with semi-circular Tape strips. The dorsal side is covered under weight bearing.

The lower leg is covered under weight bearing on the dorsal side from the distal side to the proximal side.

The ventral side of the lower leg is covered in the same way with semi-circular Tape strips.
Support taping for the calf muscles

Indications
- Strained muscles and distortion
- Ruptured muscle fibres
- Ruptured muscle bundles

Recommended material
- Elastic adhesive bandage, 10 cm wide
- 1 – 2 rolls of Tape, 3.75 cm wide
- Cohesive, protective bandage

The medial part of the split adhesive bandage (10 cm wide) runs around the heel, then around the middle foot and on the lateral side back to the anchor. The lateral part is applied in the same way.

Anchors (1+2) go from proximal to distal near the tibial crest, anchor (3) connects anchors (1+2) distally. Strip (4) runs from the lateral to the medial side from anchor (1) to anchor (2).

Similarly to strip (4), an additional strip (5) also goes in the direction of the arrows from the medial to the lateral side, from anchor (2) to anchor (1).
The following strips run in pairs from distal to proximal up to the edge of the injury (arrow), forming a spica and overlapping by 50%.

Anchor (6) which is applied proximally connects anchors (1+2). Strip (7) then runs downwards from anchor (1) to anchor (2).

Strip (8) supplements strip (7) as a spica and also runs downwards from anchor (2) to anchor (1).

The following spica strips are also applied downwards to the proximal edge of the injury and overlap 50%.

The protruding, injured area is covered with semi-circular Tape strips.

The ventral side is covered with strips under maximum weight bearing, i.e. in the standing position. The foot only has to be covered completely if there is a risk of oedema.
Angular positions - Neutral - 0 - Method

Shoulder joint
- Shoulder girdle general (incorporates scapula and clavicle movement)
  - Flexion/extension 180/0/40

Elbow joint
- Flexion/extension 150/0/0
- Supination/pronation 90/0/90

Hip joint
- Adduction/abduction 30/0/40
- Outer rotation/inner rotation 60/0/40 (prone position, knee bent)

Knee joint
- Flexion/extension 150/0/05

Ankle joints
- Dorsal extension/plantar flexion
  - Neonates: 70/0/60
  - Six years old child: 35/0/45
  - 40 years old adult: 20/0/35
  - 70 years old adult: 15/0/35
- Supination/pronation 30/0/20

Wrist joint
- Flexion/extension 80/0/70

Finger joints
- Adduction/abduction
  - Second finger; 60° in total
- Flexion finger joints:
  - Distal interphalangeal joint: 80°
  - Proximal interphalangeal joint: 100°
  - Metacarpophalangeal joint: 90°

Thumb joints
- Adduction/abduction 40° in total
- Flexion of interphalangeal joint (20° overextension) 100° in total

Shoulder girdle general
- Flexion/extension 150/0/40
- Outer rotation/inner rotation 40/0/10 (with 90° abduction)

Toe joints, big toe
- Flexion/extension interphalangeal joint 0/0/90
- Flexion/extension metatarsophalangeal joint 70/0/45

Deviation of axis in metatarsophalangeal joint:
- Up to 15° is physiological; approx. 25° is the mean value for hallux valgus

Lasègue's signs:
- The extended leg is bent in an absolute supine position.
- Below 80° is a positive sign of sciatica, or meningeal irritation.