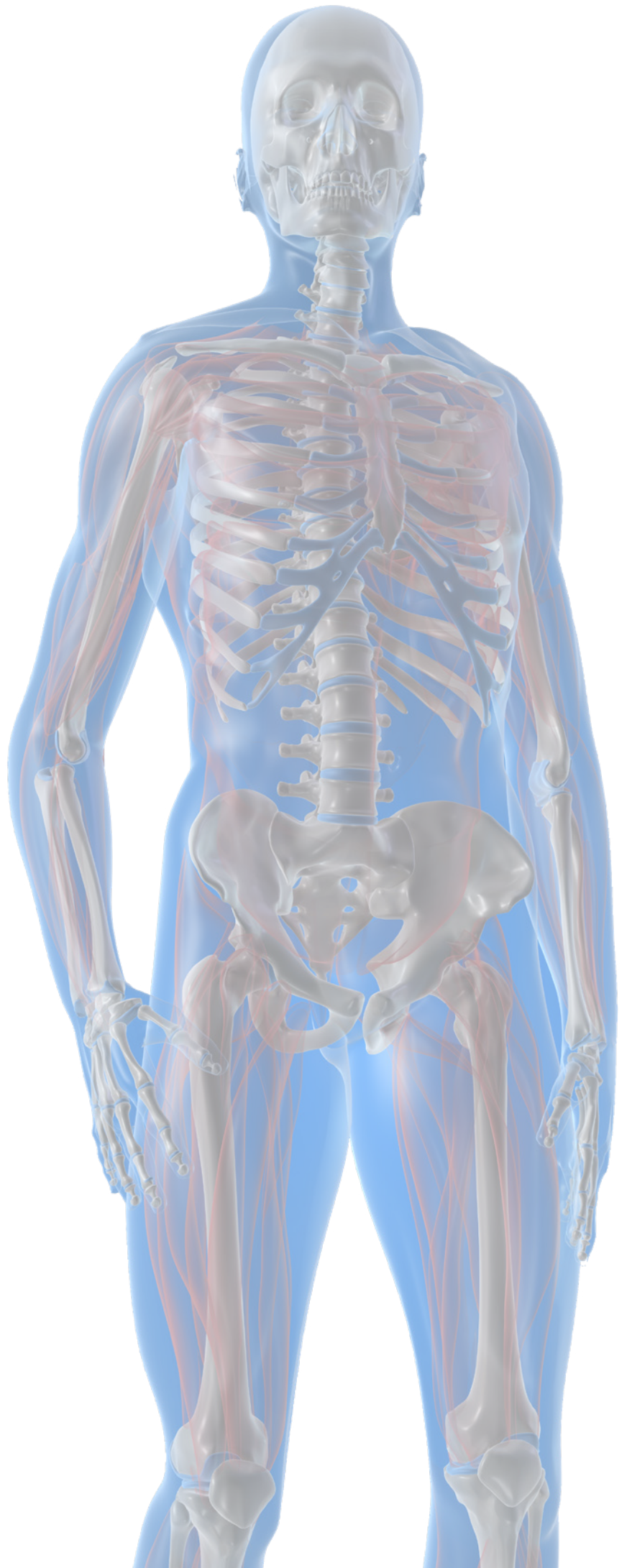


A Practical Guide to Casting

Soft Combination Casting

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Soft Combination Casting

Before applying a soft combination cast, you must have a good understanding of anatomy, physiology and the injury, to determine where the cast should be rigid and where it can safely be flexible. You should practice this technique before undertaking it on a patient and discuss its use with the Orthopaedic Surgeon.

This technique was developed by Jan Schuren, in early nineties, in the Netherlands, using a soft casting product combined with slabs of fibreglass, strategically placed where the cast requires rigidity and offloading. This allows the remainder of the cast to be very flexible. The slabs should create the two points of the 3-point fixation and the remainder of the close fitting cast creates the 3rd. Because the material is softer, the cast can be lined only with stockinette, and any bony areas minimally padded. This results in a close fitting, comfortable cast, which allows some muscle movement, and may reduce muscle atrophy and improve venous return.

The cast saw should **NEVER** be used on these casts. The material should be removed with a pair of bandage scissors, or unwound. There is a great benefit in using this type of cast on children, as removal avoids the use of the cast saw, which for many children is traumatic.

Further Reading:

KATZ, K., FOGELMAN, R., ATTIAS, J., BARON, E. & SOUDRY, M., 2000. Anxiety reaction in children during removal of their plaster cast with a saw, *Journal of Bone & Joint Surgery – British*, vol.83-B, no. 3, pp.388-390

KHAN, K.S., GRUFFERTY, A., GALLAGHER, O., MOORE, D.P., FOGARTY, E. & DOWLING, F., 2007. A randomised trial of 'soft cast' for distal radius buckle fractures in children, *Acta Orthopaedica Belgica*, 73(5), pp.594-597

PARIKH, S., SHARMA, N., ADJEI, M., PATEL, A. & SYMONS, S., 2016. Paediatric distal radius (buckle) fractures – improving compliance to the 'soft cast' guideline, *British Journal of Surgery*, 103, Suppl 6, pp.14-14

SILVA, M., SADIK, G., AVOIAN, T. & EBRAMZADEH, E., 2016. A Removable Long-arm Soft Cast to Treat Nondisplaced Pediatric Elbow Fractures: A Randomized, Controlled Trial

WHITE, R., SCHUREN, J. & KONN, D.R., 2003. Semi-rigid vs rigid glass fibre casting: a biomechanical assessment, *Clinical Biomechanics*, 18, pp. 19–27

5.1 Below Knee Soft Combination Cast

Below Knee

The position of the cast will depend on the injury being treated, but is most commonly applied at 90° flexion of the ankle, with the foot in neutral inversion/eversion (plantigrade). The knee should be held at an angle of 10-15° with the aid of a padded support (e.g. knee rest). This makes it easier to hold and maintain the foot in the correct position. It is very important not to let the ankle move during the application; it is all too easy to make ridges around the ankle.

The cast should extend from just below the knee, but allowing free movement of the knee joint, to the toes (see below).



Special Points

This cast, with a U stirrup of fibreglass, will only support an ankle injury. If the foot requires offloading, a second fibreglass slab should extend from the metatarsal heads/tips of toes to either the heel or just above the Achilles tendon.

If the cast is to be waterproof/water repellent polyester stockinette must be used, and the only padding should be Delta-Dry® if/where needed. Normal felt can be used in a non-waterproof cast.

Equipment Required

Basic trolley, see page 28 - plus:

- Stockinette 7.5cm
- Adhesive felt 2mm thick
- Delta-Cast® Soft 10cm x 2 rolls
- Delta-Lite® Plus 7.5cm x 1 roll for the splint
- Knee rest



Padding

- 1 These casts require 2 layers of stockinette.
- 2 Protection for cutting should be placed between these 2 layers; protection for bony prominences should be placed on top of the 2nd layer of stockinette.

Both malleoli and the head of fibula may require circles of adhesive felt or water-resistant alternative.

Application

When combining types of casting material use products from the same manufacturer.

Measure the slab. The position of the slab should be a U stirrup of 7.5cm fibreglass (if a large adult this might be 10cm wide). It should reach from at least 20cm proximally above the lateral malleoli, down around the heel, and up to at least 20cm proximally above the medial malleoli.

Pre-cut the 4 layer slab quickly from the fibreglass material and place aside. The number of layers in the slab may be increased if needed; this will be dependent on assessment of the patient.

- 3 Apply a 50/50 overlap of Delta-Cast® Soft casting material, creating 2 layers. Then place the pre-cut 4 layer slab, ensuring it is positioned to cover the heel strike area.

- 4 Follow this with other 50/50 overlap of the Delta-Cast® Soft casting material. Commence both bandages at the proximal end, and roll from lateral to medial, to prevent tension and to encourage the foot not to invert.

Mould the arches of the foot and around the Achilles tendon, and hold until the cast material is set, laminating throughout to smooth the cast and avoid any air gaps between the layers. The cast can be left as a full cast.

- 5 **If the cast is to be adjustable/removable, the split should be done where the removal strip has been placed, which may alter according to the injury and/or slab positions. If it is appropriate to do so, leaving the cast intact over the metatarsal heads will help maintain the cast's integrity.**

If the cast is to be adjustable/removable, cut through all layers using a lazy 'S' with scissors.

Use hook and loop straps or a cohesive bandage, to hold the cast together securely.

- 6 If the cast is being removed it may be easier to unwind the top layer, then cut with scissors.

The cast saw should never be used on any soft material.



5.2 Below Elbow Soft Combination Cast

Below Elbow

The position of the cast will depend on the injury and could be applied in slight dorsiflexion and neutral ulna/radial deviation of the wrist. For a true Colles fracture it will usually be applied in slight palmar flexion and ulna deviation of the wrist. The position of the wrist may affect where the best position for the slab is.

Proximally, the completed cast should extend from just below the elbow to allow full flexion there.

Distally, the palmar crease should be fully visible to allow full flexion of the metacarpophalangeal joints and dorsally, the cast should extend to the top of the knuckles. Trim around the thumb for comfort, as the thumb should be completely free.



Special Points

If the cast is to be waterproof/water repellent, polyester stockinette (e.g. Delta-Dry®) must be used, and where padding is needed it must be waterproof.

Equipment Required

Basic trolley, see page 28 - plus:

- Stockinette 5cm or 7.5cm
- Adhesive felt 2mm thick (or waterproof alternative)
- Delta-Cast® Soft 5cm or 7.5cm x1 have a spare roll available
- Delta-Lite® Plus 5cm or 7.5cm x 1 for the ridged splint
- Elbow rest



Padding

1 These casts require 2 layers of stockinette. Protection for cutting should be placed between these 2 layers, away from where the splint will be placed. Protection for bony prominences should be placed on top of the 2nd layer of stockinette.

Application

The positioning of the slab will depend on the injury.

When combining types of cast material use products from the same manufacturer.

Measure the slab and pre-cut a 3 layer slab quickly from the fibreglass material, and place aside. The number of layers in the slab may be increased if needed; this will be dependent on assessment of the patient.

2 Apply a 50/50 overlap layer of soft casting material, creating 2 layers.

3 Then position the pre-cut, 3 layer, fibreglass slab, ensuring that it does not reach the edges of the cast, as these should be kept soft.

4 Follow this by another 50/50 overlap of the soft casting material.

Commence both bandages at the proximal end, rolling from within out so that the bandage is brought up through the grip, thereby spreading the heads of the metacarpals. Pass through the grip 3 times in total. Cut off any excess bandage.

5 Mould into the palm and hold until the cast material is set, laminating throughout to smooth the cast and avoid any air gaps between the layers. The cast can be left as a full cast.

If the cast is to be adjustable/removable, the split should be as far away from the injury as possible. If it is suitable to split to the thumb hole only then do so.

Use hook and loop straps, or cohesive bandage, to hold the cast together securely.



5.3 Cylinder Soft Combination Cast

Cylinder

The knee is usually held in about 5°-10° flexion for comfort. If the patella is fractured, or there is damage/repair to the extensor mechanism, the knee is held in extension. Support the limb fully throughout the application. Hold the foot against the chest and use the hands to support the knee.

Proximally, the cast should extend from as high up towards the groin as possible, allowing for comfort.

Distally, the cast should extend down to 3cm above the malleoli (see below).



Special Points

If the cast is to be waterproof/water repellent, polyester stockinette (e.g. Delta-Dry®) must be used, and where padding is needed it must be waterproof.

Equipment Required

Basic trolley, see page 26 - plus:

- Stockinette 10cm (polyester)
- Thick adhesive felt 2mm & 5mm
- Delta-Cast® Soft 10cm or 12.5cm x 3 or 4 rolls
- Delta-Lite® Plus 10cm or 12.5cm x 1 or 2 rolls (for the splint)



Padding

1 These casts require 2 layers of stockinette. Protection for cutting should be placed between these 2 layers; protection for bony prominences should be placed on top of the 2nd layer of stockinette.

A 7.5cm strip of 5mm adhesive felt should be placed 3cm above the malleoli. A circle of adhesive felt may be needed to protect the patella and/or the head of fibula. A water-resistant padding alternative can be used.

Application

When combining types of cast material use products from the same manufacturer.

The position of the 2 fibreglass slabs should be down the medial and lateral sides, from mid-calf to mid-high.

Measure and pre-cut the 4 layer slabs quickly from the 10cm or 12.5cm fibreglass material and place aside. The number of layers in the slab may be increased if needed, this will be dependent on assessment of the patient.

2 Apply a 50/50 overlap of soft casting material, creating 2 layers. Commence at the distal end of the cast, leaving 2.5cm of the felt showing, and rolling from lateral to medial to prevent tension.

3 Then position the two pre-cut 4 layer fibreglass slabs, followed by another 50/50 overlap of soft material.

4 Before initial setting takes place, the cast should be moulded well with the palms of the hands on the medial and lateral sides of the thigh, above the femoral condyles.

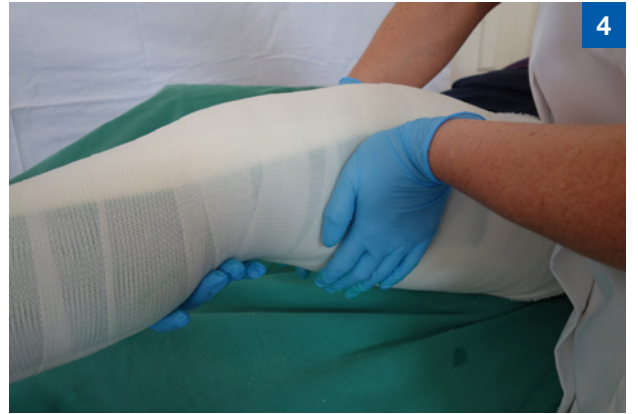
This helps to prevent the cast from slipping down the leg. Laminate to smooth the inside of the cast and avoid any air gaps. Maintain the position of the knee throughout until the cast is set. The cast can be left as a full cast.

5 If the cast is to be adjustable/removable, cut through all layers with scissors using a lazy 'S'. Avoid cutting over the patella.

Use hook and loop straps, or a cohesive bandage, to hold it together securely.

If the cast is being removed it may be easier to unwind the top layer, then cut with scissors.

The cast saw should never be used on any soft material.





Further information can be
obtained from Essity.
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essity

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