

Casting for DAFOs

Creating a cast that accurately captures the shape and volume of your patient's foot is the first step in the production of a DAFO brace. The following procedure, with some practice, will consistently produce casts suitable for brace fabrication that will result in a minimum of fit related problems in the finished brace.

Use of casting footplates to help establish and maintain the shape and volume of the foot during casting is recommended. When used in conjunction with a firm horizontal surface to support the patient's foot, the practitioner will have sufficient control of the foot to accurately maintain desired corrections to foot alignment.



Selecting the Correct Casting Footplate

- Use a casting footplate: 1) if the patient's foot is in a near balanced alignment or can be corrected to a near balanced alignment (not pronated – not supinated); 2) if the patient's foot anatomy (in corrected position) generally matches the shape and contours of the casting footplate.
- Select a wide (blue) footplate approximately $\frac{1}{4}$ inch longer than the foot and place it under the foot.
- Verify the foot is all the way to the back of the footplate (heel in contact with back edge of footplate) and that the gap between toes and footplate is still $\approx \frac{1}{4}$ inch. Using a longer footplate insures the finished brace will have extra room for growth.
- Gently push the sides of the footplate into the foot to verify the footplate perimeter conforms well with the foot. The casting tape will similarly compress the footplate around the foot during casting.



- Check the width of the footplate at the metatarsal heads. An ideal fit has the footplate in contact at the met-heads without actually compressing the foot.

If a small gap exists between the foot and footplate, the casting tape can probably compress the footplate enough during wrapping to close the gap. Continue with the next step to see if the fit of the narrow footplate is better.



- Select the same footplate length from the narrow (yellow) footplate set and position the footplate under the foot. Check the width of the footplate at the metatarsal heads.

If a small gap exists between the footplate and the met-heads (gap will be compressed during casting), then the narrow footplate is a better choice.

If the narrow footplate contacts the foot along the met-heads and is already compressing into the foot (as in this case), the wide footplate will be a better choice.



Preparing the Foot for Casting

- Apply one layer of cotton stockinette over the patient's foot. Position the footplate under the foot.



- Apply a second layer of stockinette over the foot and footplate.



- Slide the buffer strip between the layers of stockinette with the flat side of the buffer strip against the leg-foot (channel facing outward).

Note: Layers of cotton stockinette are used to add extra volume to the cast/plaster positive and to prevent the casting tape from adhering to the patient's skin. We recommend a minimum of 2 stockinette layers for sufficient extra volume for processing. If an additional layer of stockinette is required for any reason, place it over the foot before the footplate-buffer strip and final stockinette layers. This will make removal of the cast a little easier.



Wrapping the Foot

- Fill a bucket or similar container with room temperature to luke warm water (hot water may make the tape cure too fast).
- Put on latex or nitrile gloves.
- Tear the casting tape foil package open and remove roll of tape.



- Submerge the roll of casting tape in the water and hold the roll underwater for 5-10 seconds.

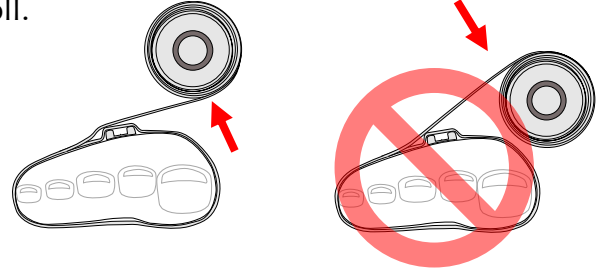
Tip: Keep the edge side of tape roll up while underwater. This allows the air to escape (bubbles) and allows the water to penetrate the inner layers of the roll.



- Remove the casting tape from the water and squeeze-out excess water.



- Unroll casting tape from the bottom of the roll.



- Place one wrap around the midfoot. Secure the loose end of the casting tape under the first wrap, then continue wrapping toward the toes.

- Overlap each previous layer of tape 25% – 50%. Pass the roll from hand to hand as it passes over and under the foot. With each wrap, pull on the tape to apply moderate tension. This tensioning will help compress the footplate to the foot.

Note: Beginning the wrap at the midfoot helps to secure the footplate in place under the longitudinal arch of the foot and holds the buffer strip in position.

- Wrap past the front edge of the footplate (past the toes), then return the roll in 1 or 2 long wraps to the midfoot area where the cast was started. Continue the wrap from the midfoot toward the hindfoot. Continue to tension the tape to compress the footplate.

- As you wrap the heel, try to minimize the overlap / layering of the tape in the instep region. The thinner the cast is in the instep, the easier it will be to cut and remove.



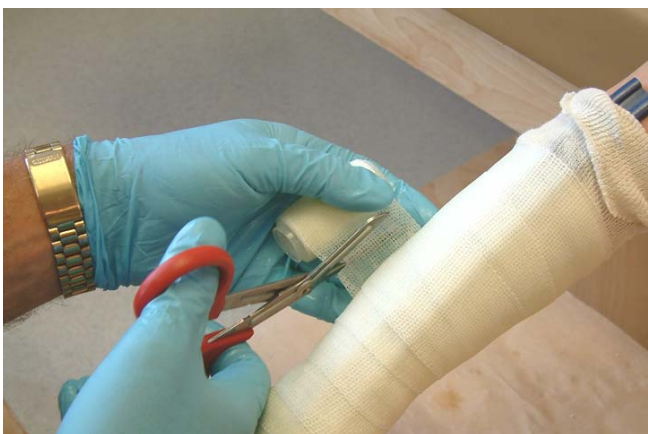
- Maintain an overlap of the tape as you wrap under the heel.



- As you continue wrapping up the leg, reduce the tension applied to roll while wrapping. Tension the tape enough for an even application without banding.



- Cast high on the leg – even for short DAFOs (up to the fibular head). If a higher brace is required in the future, this cast will be high enough to capture the needed shape.



- At the top of the cast, add an additional wrap or two, then cut-off the remaining roll. Smooth the cut end down onto the cast.
- Rub the casting tape with your hands to help bond the tape layers together.



Manipulate Foot-Ankle to Corrected Position

- With the wrapping complete, place the patient's foot onto the horizontal surface and position the patient's knee and foot such that the ankle dorsiflexion angle and medial-lateral alignments are in the optimal position. An assistant may be required to help maintain the patient's knee position.



- Correct and hold the patient's hindfoot position with one hand. With the other hand, correct and hold the forefoot position.



- If the patient is active, focus on maintaining the alignment corrections. If the patient is relatively still and corrected alignments are easily maintained with one hand, use the fingers of the other hand to massage the casting tape around key landmarks – ankles, Achilles tendon, heel, instep, navicular, met heads and toes.



Cut and Remove Cast

- When the casting tape begins to feel rigid (3-5 minutes total), it has cured enough to be cut and removed from the patient's foot. Use a Stanley #961 hooked blade in a standard utility handle to cut the fiberglass along the buffer strip.

CAUTION: Keep your free hand out of the pathway of the knife.



- Begin by placing the hooked blade in the buffer strip channel at the top of the cast. Pull-push downward, guiding the blade along the buffer strip channel.
- If the casting tape shreds and/or distorts when you begin to cut, you may need to allow more cure time in order for the cast to become harder.
- If the cast is firm but difficult to cut (thick cast, hard cast or dull blade), use a slow rocking / wiggling motion to help the blade cut through the fiberglass strands.
- As the knife approaches the instep, position the knife handle a little to one side so that you can pull the knife through the instep bend.
- Continue guiding the knife along the buffer strip until the knife blade cuts through the end of the casting tape.
- If necessary, use scissors to cut any residual sections of the stockinette that the knife did not sever.
- Remove the buffer strip.
- Pull open the cast and pull it away from the foot.
- Remove the footplate.



- Realign the cut edges and smooth out any deformities caused by cutting and removing.
- Write the patient's name on the cast.
- Tape the cast closed with the edges matched.
- Place cast(s) in open air for an additional 2+ hours to allow full cure. Protect cast(s) from being distorted or misshapen until fully cured.



- Features of a Good Cast:
- Smooth, even wrap with little distortion.
 - Good definition of key landmarks.
 - Ankle, hindfoot and forefoot alignments at or close to desired alignments of finished brace.
 - Complete coverage – toes to above height of brace.
 - No distortion due to pre-cure cut-off.



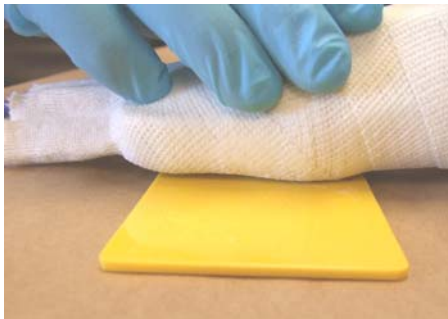
Posting with Cascade Footplates



Each set of Cascade's 'PollyEthel' casting footplates contains a set of plastic shims to be used for posting the patient's foot during casting. Each set includes 1/16, 1/8, 3/16 and 1/4 inch shims. These can be used alone or can be combined to get a suitable posting height.



For a Varus Post: Place the shim or combination of shims of the desired posting height under the 1st metatarsal head immediately after wrapping the foot with the casting tape. The shim should be inserted far enough to raise the 1st met-head to the desired height, but not so far as to raise the entire forefoot. Maintain consistent downward pressure across the top of the met-head region until the casting tape becomes rigid enough to hold the posted alignment.



For a Valgus Post: Place the shim or combination of shims of the desired posting height under the 5th metatarsal head immediately after wrapping the foot with the casting tape. The shim should be inserted far enough to raise the 5th met-head to the desired height, but not so far as to raise the entire forefoot. Maintain consistent downward pressure across the top of the met-head region until the casting tape becomes rigid enough to hold the posted alignment.

