

# Advantages of the ADM Ankle Foot Orthosis and External Rotation Bar



ADM MODULAR BRACE SYSTEM



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# Why Create a new Clubfoot Brace?

The traditional boots and bar type of foot abduction brace first described in 1934 by the Sir Denis Browne of Great Ormond Street Hospital in London is recognised internationally as the standard of care orthosis for prevention of clubfoot relapse. Whilst the Denis Browne brace concept has not changed significantly over the years, C-Pro Direct's state-of-the-art ADM AFO and External Rotation Bar represents a significant advancement whilst staying faithful to the requirements set out by Dr Ponseti.

Every detail of the ADM AFO and External Rotation Bar has been designed to maximise clinical performance and patient compliance. The brace is lighter, stronger and has a pleasing modern appearance whilst incorporating many innovative design features to facilitate the very best clinical outcomes.

This document explains why and how, compared with all the current alternatives, C-Pro Direct's clubfoot ADM AFO and External Rotation Bar clubfoot brace:

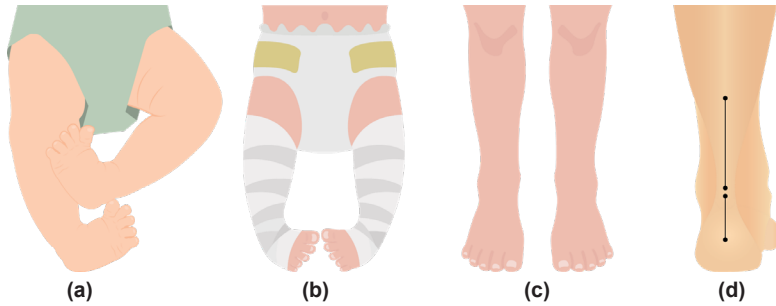
- Better promotes development of a straightened lateral border and reduced cavus deformity
- Better promotes increased foot mobility and range of motion
- Better secures the foot, fits more closely and comfortably and is 32% lighter in weight and stronger than the most popular alternative systems
- Reduces the risk of skin breakdown, blisters and sores
- Reduces costs if a change in brace type is required
- Encourages greater compliance with bracing protocols and carer / parent acceptance
- Reduces patient time in clinic and ensures the prescribed bar configuration is correctly applied
- Enables clubfoot patients to benefit from advanced manufacturing technology that has revolutionised modern mainstream footwear manufacture

Ultimately, these huge advantages translate into improved patient outcomes and lower treatment costs. This is why all clubfoot clinicians should now consider using the ADM Modular Bracing System.



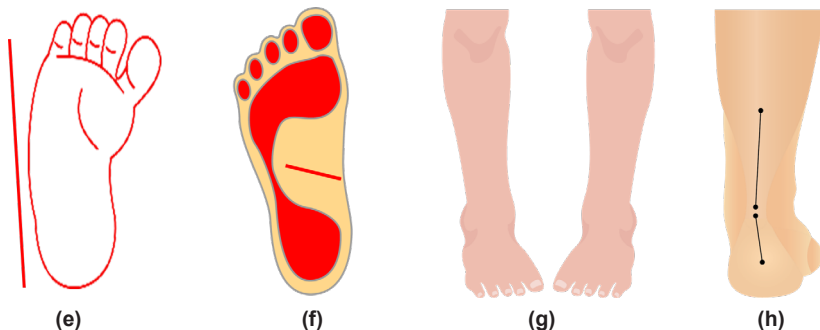
*C-Pro Direct's clubfoot bracing system sets new standards in clubfoot orthosis design that are unmatched by any other system. The result is improved clinical outcomes for clubfoot patients and reduced treatment costs.*

# Ponseti Method Clubfoot Correction, Relapse and Braces



Ponseti Method clubfoot correction involves a gentle process of expert manipulation of the clubfoot **(a)** and plaster casting of the affected feet **(b)**, which over a period of weeks results in the front / mid-foot **(c)** and hind-foot **(d)** being brought into correct alignment.

Ideally corrected clubfeet will have a normal shape and be flexible with good range of motions, so the feet can easily move upwards (Dorsiflexion) and outwards (Abduction).



Even well corrected clubfeet have a tendency to relapse i.e., gradually turn back into clubfeet. Clubfoot braces are typically worn initially for 23 hours per day and then during sleep to prevent the feet from relapsing.

A relapsing foot can be recognised by the outside edge (lateral border) of the foot becoming curved **(e)**, the foot arch becoming very high or even a crease line forming under the foot (cavus) **(f)**, the foot or feet becoming inverted or turning in **(g)** and re-occurrence of the heel varus deformity **(h)**.

Clubfoot braces must have design features to address the tendency to relapse in all these ways.

*Even well corrected clubfeet have a tendency to relapse. C-Pro Direct's ADM External Rotation Bar and orthosis has advanced features to address all requirements*

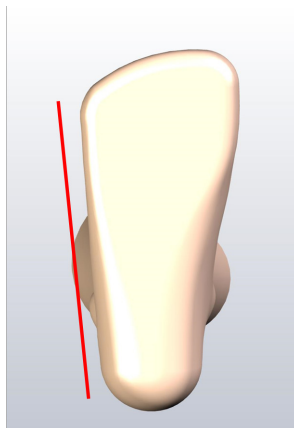


## Promoting a Straight Lateral Border



(a)

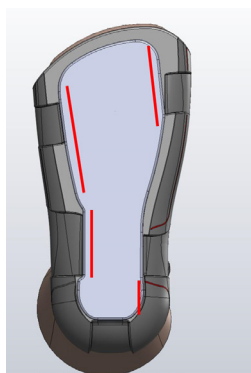
The Lateral border of corrected Clubfeet has a tendency to relapse into a curved shape



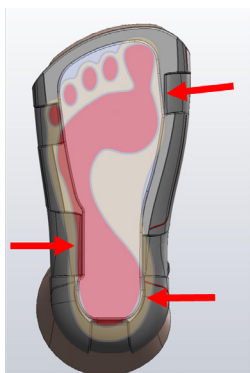
(b)

ADM AFO foot lasts and liners have a perfectly straight lateral border

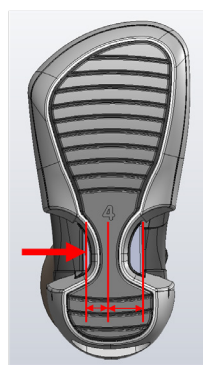
A problem with clubfeet is the tendency, even after correction, for the front foot to turn inwards (adduct) relative to the hind-foot and the lateral border to become curved **(a)**. Unlike all other clubfoot AFOs the ADM AFO is built around a left and right foot last. The foot last has the form of a perfectly corrected foot with a straight lateral border **(b)**.



(c)



(d)

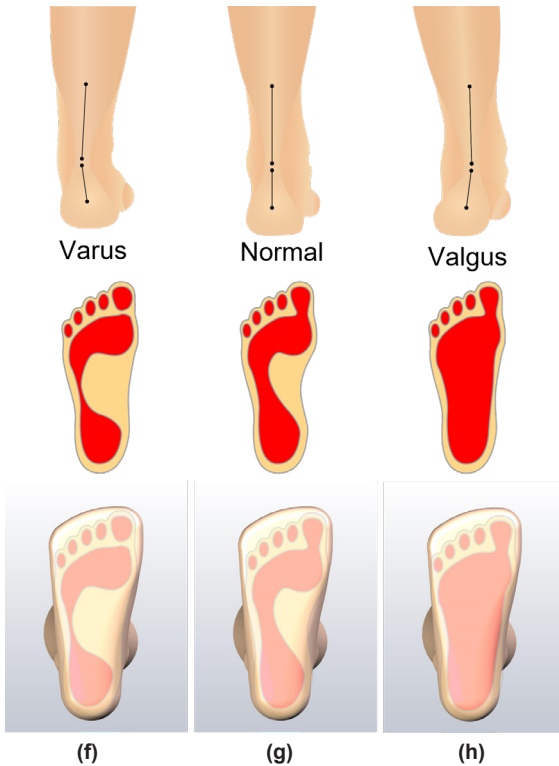


(e)

The sandal construction includes a rigid counter **(c)** that is profiled to promote a perfect foot shape. The combination of the profiled counter and straps apply forces to the medial aspect of the front and rear of the foot and lateral aspect of the midfoot **(d & e)**. This holds the foot in the required shape and prevents the development of a curved lateral border. This level of correction cannot be achieved with traditional symmetrical straight last clubfoot AFOs.

*The ADM AFO has greater support for promoting a straight lateral foot border than can be achieved with traditional straight last clubfoot AFOs.*

## Preventing Cavus Relapse



The last has no arch support. The bracing objective is not to create a permanently overcorrected foot in valgus, but to resist and reverse the tendency of clubfoot to relapse in to varus.

Clubfeet, even when corrected, tend to have a higher foot arch than the norm **(f)**. The ADM AFO sandal liner footplate is therefore almost flat (with almost no arch support) to promote an overcorrection of the foot **(h)**.



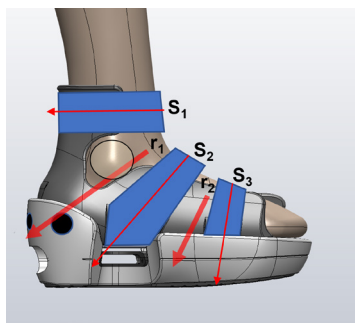
*The low-arch last prevents recurrence of the cavus deformity*

## Comfort, Securing the Foot and Mobility

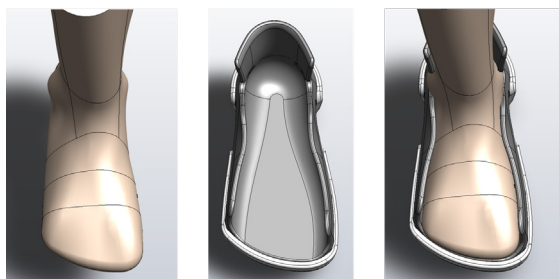
Many clubfoot patients will experience skin problems at some time during their treatment. The ADM AFO has already been shown to have resolved skin issues that occurred with other leading clubfoot brace systems. This is because every detail of the ADM AFO is engineered to maximise comfort, increased foot security and promote greater foot mobility.

Clubfoot braces work only if the ankle joints around the foot are free to move and the foot is firmly secured to the AFO. An AFO that blocks foot motion obstructs the action of the foot abduction brace and increases the stresses on the patient. If the foot slips in the AFO then the corrective action of the brace can be seriously compromised. Foot slippage often leads to skin breakdown and blisters and sores, which can be very serious.

It is relatively easy to secure the foot well, but block foot motion. It is also easy to enable foot motion, but without adequately securing the foot. The ADM AFO has been designed to satisfy both requirements and then manufactured using materials that are lighter, more malleable and more comfortable than any other clubfoot orthosis.



The ADM AFO straps  $s_1$ ,  $s_2$  and  $s_3$  are angled so that the resultant forces on the foot  $r_1$  and  $r_2$  hold the foot securely in the AFO liner. The straps are positioned and liner is cutaway so that Tibio Talar Joint (TTJ) and Sub-Talar Joint (STJ) motion is not blocked by the AFO straps.



Foot security in the sandal is further enhanced through the use of left and right sided lasts. These fit the contours of the foot more closely and therefore hold the foot more securely than symmetrical sandals. Feet are not symmetrical.

*The ADM AFO fits more closely than traditional straight lasted AFOs and has a strap system that both secures the foot well and allows for foot mobility*

The ADM AFO is light in weight, soft and comfortable and therefore well tolerated by young babies and children. The AFO is robust to withstand the demands of everyday use, but around 28% lighter than the lightest commercially available alternative and 32% lighter than a typical foot abduction brace configuration.

Compared with the synthetic rubber (TPE) material used in other leading clubfoot sandals the ADM liner is almost three times stronger, naturally cushioning (as it is made from millions of tiny air-filled cells), highly malleable so that it can take the shape of the patient's foot and incredibly light in weight.



The extremely high strength to weight ratio of the ADM AFO is achieved by moulding the liner and mid-sole parts in foamed EVA and laminating them around a rigid counter. The orthosis is finished with natural rubber outsole, which provides a tough wear resistant underside.

C-Pro Direct is proud to have partnered with a major modern sport shoe manufacturer. Our collaboration means clubfoot patients can benefit from the very latest advancements in manufacturing and materials technology that have revolutionised footwear design in recent years.

*The ADM AFO is stronger, softer, more malleable and 32% lighter than the lightest alternative products. Patients using the ADM AFO are benefitting from the huge technological advances that have revolutionised the sports shoe industry in recent years*



## User Centred Design

Every detail of the design and construction of the ADM AFO is based on delivering the very best possible clinical outcomes for patients.

Our design philosophy has also been to create an AFO that is convenient to use, modern and visually appealing. The ADM AFO is much less clinical in appearance than other clubfoot orthosis. Combined with extreme comfort and low weight this helps to motivate carers and patients to accept and achieve the very tough bracing protocol required to achieve long term successful clinical outcomes.



Ideally the patient's heel should be positioned fully down and to the rear of the AFO liner, though sometimes this is not possible at first. The ADM AFO has both side and rear heel view ports  $p_1$  and  $p_2$  so that heel position can be readily determined. We also provide a simple depth tool to assist parents and carers to monitor patient progression over time.



The ADM AFO tongue pad provides soft and seamless cushioning under the mid and top straps ( $t_1$ ). The tongue pad is made from a material that stretches in all directions and is covered in a layer of soft lycra (a similar form of construction to that used for knee and ankle supports).

The tongue pad is completely seamless providing a smooth malleable cushion under the dorsal aspect of the foot; a high-risk area for redness and sores.

The tongue pad connects the mid and top straps making the AFO easy to fit and remove.

*The ADM AFOs user centric design, extreme comfort and less clinical appearance promote greater compliance with the tough clubfoot bracing protocol.*



## More Bracing Options

The Denis Browne boots and bar is the standard of care for clubfoot bracing. For the majority of cases it is the first choice of brace, but for a myriad of reasons the boots and bar is not always right for every patient at every stage of their treatment.

To cater for brace users requiring an alternative brace C-Pro Direct has created the Abduction Dorsiflexion Mechanism (ADM). With over 30,000 ADMs deployed many clubfoot patients are benefitting from the availability of a different method of foot abduction bracing.



Denis Browne style (Boots and Bar)  
foot abduction brace

The ADM AFO is the only clubfoot AFO that can support both the Denis Browne Brace and Abduction Dorsiflexion Mechanism. This means that patients and clinicians have greater freedom to consider alternative treatment options should the need arise.



Abduction Dorsiflexion  
Mechanism



Devices with an ADM Side Clip can be attached to the ADM AFO. This includes the ADM and the ADM External Rotation Bar. The ADM AFO will also connect with Dobbs articulating bars in the near future.

*The ADM AFO is the only clubfoot orthosis that works with both Denis Browne style foot abduction braces and Abduction Dorsiflexion Mechanisms. Support for Dobbs articulating bars will also be coming in the near future.*

## A simple Patient Centric Bar System

The design philosophy for the ADM External Rotation Bar reflects that of the AFO. It is effective in function, light in weight, modern in appearance and built for convenience.

Resistance to clubfoot bracing is most often linked to the bar. Most commercially available external rotation bars are complex metallic devices requiring adjustments and the use of wrenches and screwdrivers to configure them. Bar configuration can take time and once outside of the clinic parents or carers may reconfigure them without appreciating the consequences.



30 degree clip



60 degree clip

The ADM External Rotation Bar functions just like other similar Denis Browne bars. But there are no adjustments to be made. Instead you select the clip representing the required setting for each foot eg., 70, 60, 45, 30 degrees and choose the length of bar required from the kit. The bar component (above centre) is free of charge and clips are guaranteed for life.



The result is a bar that functions like other external rotation bars, but which is pre-configured to the needs of the patient, has no screws or adjusting parts, is easy to use and extremely light in weight. An ADM external rotation bar configuration for a size 5 sandal weighs just 80 grammes. That is 43% lighter than other leading bar products.

*A typical ADM External Rotation Bar configuration weighs around 80 grammes. That is 43% lighter than other leading bar products.*



An ADM External Rotation Bar can be fully assembled to the required configuration in less than 30 seconds without the aid of any tools. All that is required is to select the bar, insert the clip and twist until the precision spring plungers click into place.



**Select and Insert Clip**

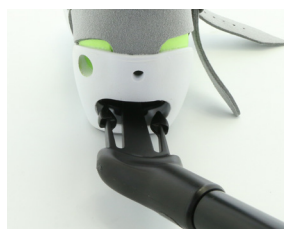


**"click"**



**Twist and Click**

The ADM External Rotation Bar delivers significant patient and cost benefits. Clinicians and carers can both be assured the patient is using the prescribed brace configuration. Carers do not need to worry about how to adjust bars and clinicians do not need to spend valuable time training parents. Instead clinicians can focus their time gaining commitment from carers to the required bracing protocol.



Parents and carers report a strong preference for the ADM External Rotation Bar. They like the simplicity and minimal lightweight design. Patients using an ADM External Rotation Bar system benefit from a lighter and more appealing brace that is easy to use and worry free. This positively encourages compliance with bracing protocols and contributes to the achievement of the best possible clinical outcomes.

*Use of the ADM External Rotation Bar system saves valuable clinical time and provides both clinicians and carers with assurance the prescribed brace configuration has not been altered.*

## TRY NOW

Contact us to try out the world's most advanced Clubfoot bracing system



[www.c-prodirect.com](http://www.c-prodirect.com)

0044 (0) 1732 860 158

[enquiries@c-prodirect.com](mailto:enquiries@c-prodirect.com)

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**C-Pro Direct Ltd. 7a Enterprise Way, Edenbridge, Kent UK. TN8 6HF**