# What is clubfoot?

Clubfoot can cause permanent disability if not treated early.

## Description

Clubfoot is the most common musculo-skeletal congenital disorder where one or both feet are turned inwards at the ankle and pointed down. The foot is rigid and the tendons are tight. The foot cannot be stretched into a normal position.

The medical term for clubfoot is Congenital Talipes Equinovarus (CTEV). Clubfoot is a source of permanent disability if not treated early and effectively.

In South Africa, the rate of clubfoot occurrence is approximately 1 in 500 births. Around 2 000 children are born every year with clubfoot.

The cause of clubfoot is still unidentified, but it is thought to be a combination of genetics and environment. Clubfoot can run in some families and if a parent has clubfoot, the chance of having a child with clubfoot is increased.

Clubfoot can be either unilateral or bilateral (one or both feet) and it occurs in males approximately twice as often as females (occurring in 2:1 boys to girls)

Clubfoot is usually idiopathic (occurring alone with no other conditions), but it can also sometimes be associated with neuromuscular problems or syndromes, for example Arthrogryposis and Myelomeningocele (spina bifida).

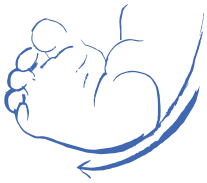
Postural or positional 'clubfoot' is due to the position of the baby in utero, the foot is flexible and usually responds to passive stretching and does not need Ponseti treatment.

## How to identify clubfoot

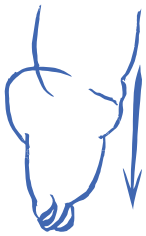
Diagnosis of clubfoot deformity is by physical examination, often just after delivery when the newborn is examined. Clubfoot is identified by four characteristics, The four components of a clubfoot deformity can be remembered with the acronym CAVE (cavus, adductus, varus, and equinus). All four characteristics must be present for a true clubfoot to be diagnosed.

**Cavus (midfoot)** a high arch on the inside of the foot.

**Adduction (forefoot)** the foot is curved inward or medially (bean shaped) toward the big toe.



**Varus (hindfoot)** the heel is turned inward and fixed (not passively correctable)



**Equinus (hindfoot)** the ankle points downward. This is normal ankle movement called plantar flexion, but in clubfoot it is fixed (not passively correctable).

The Pirani Score is used to assess clubfoot. There are 6 measures (3 of the hindfoot and 3 of the forefoot, each with a possible score of 0, 0.5 or 1. A severe clubfoot will score 6, a successfully treated clubfoot will score 0. Pirani score is used to score the foot at each casting appointment until the score is 1 or 0.5 because the foot is still in Equinus, which is when the foot is ready for an Achilles tenotomy.

**Careful examination of the entire child is necessary to rule out neurologic or syndromic feet:**

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|---|---|
| **General health:** | Birth complications, term; developmental delays; hearing; vision |
| **Spine:** | Sores, hair, lumps may indicate spina bifida. Note curvatures and abnormalities. |
| **Hips:** | Check for full range of movement, dislocation |
| **Upper and lower limbs:** | Movement, tone, contractures |

If clubfoot is suspected, refer immediately to an orthopaedic surgeon for assessment.
Do not start with massage or any other therapy until a diagnosis of clubfoot has been confirmed or ruled out.

## Management

The Ponseti Method is the gold standard for management of clubfoot. Treatment should start soon after birth, within the first two weeks of life if possible.

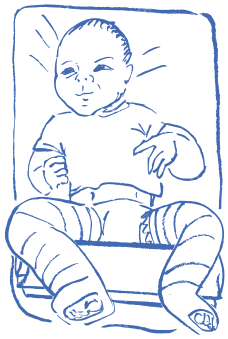
# Treatment of clubfoot

**Clubfoot is treatable! Follow the plan for the best results.**

## The treatment of clubfoot is in two phases:

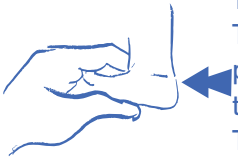
### 1. Correction Phase

**Manipulation and Casting:**



The foot is manipulated and a full-leg plaster cast is applied with the foot in the stretched position. The cast is removed weekly and more manipulation and casting is required until the foot is in the correct position. There is a specific technique to the casting that must be followed for success. In infants with idiopathic clubfoot, the method generally takes about 4 to 6 weeks of serial plaster casts to reach 60 to 70 degrees of abduction. For more complex cases, more casts are often required, typically around 9 casts. If more casts are used, then this has to be re-assessed and checked if the casting technique is incorrect, or the clubfoot is complex. Casting should be done by two people, one to manipulate and hold the foot, and one to apply the plaster cast. The parent is the third person involved during casting, to calm and keep the baby still.

**Tenotomy:**



Towards the end of the process, a percutaneous Achilles tenotomy (under local anaesthetic) is performed on about 80% of all patients. This is a minor procedure that clips the Achilles tendon to drop the heel into the correct position (approximately 15 degrees of dorsiflexion). This can be done with local anaesthetic. General anaesthetic or sedation is usually only required for older children. The tenotomy is done to lengthen the tendon and increase dorsiflexion (heel stretch). The foot is then recast for 3 to 4 weeks.

### 2. Maintenance Phase

**Bracing:**

After correction is achieved, clubfoot deformity has a strong tendency to recur. To prevent recurrence, a foot abduction brace (boots and bar) must be worn full-time for 3 months (removed for an hour for bathing), and then at night and naps for at least 12 hours until age four. The clubfoot brace is a medical device that consists of shoes attached to an adjustable bar at a specific width and angle (60 degrees of abduction and 15 degrees of dorsiflexion). The brace helps to keep the feet in the corrected position while the child sleeps and is the most effective way to avoid recurrence.

During the day the child can wear normal shoes or go barefoot. It is not necessary to wear special shoes for walking.

Stretches can be done by the caregiver when out of the brace to encourage the foot to maintain correction during this phase.

## Prognosis

The Ponseti method is 95% effective in correction, and if done by a well-trained healthcare professional with caregivers following the aftercare at home correctly, the child can be assured of a flexible and normal foot. The Ponseti method is suited to low resource settings and it is not necessary to have a lot of theatre time allocated for clubfoot because the Ponseti method is a non-invasive method requiring in most cases only minimal surgery, usually under local anaesthetic. Parent education and adherence is vital for a successful treatment outcome.

**Steps**

**Steps is the only non-profit organisation in South Africa focused on the treatment of clubfoot. Steps improves the lives of children by training healthworkers, supporting clubfoot clinics, advocating in the community and sourcing and supplying the essential clubfoot braces. Steps works in partnership with the South African Paediatric Orthopaedic Society and partners with state health hospitals and clinics to improve adherence to treatment and long-term outcomes. Steps is based in Cape Town and works nationally.**
**Contact Steps: www.steps.org.za**

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