Ponseti Method for Clubfoot Correction: A Caregiver’s Guide
Although clubfoot can be mild or severe, all cases require a proper medical evaluation. Clubfoot will not resolve on its own. The clubfoot is not painful to the infant who does not yet walk. However, if left untreated, a child will learn to walk on the outer edge of the foot instead of the bottom, develop painful calluses, be unable to wear shoes and have lifelong painful feet that often severely limit activity and employment.

How Often Does Clubfoot Occur?
About one baby in 1,000 in the United States is born with clubfoot. The occurrence does vary with ethnicity. People of Chinese descent have the lowest occurrence, with 0.39 cases per 1,000 live births, whereas Polynesians have the highest occurrence at 6.5 to 7 per 1,000 live births. The ratio of clubfoot among males to females is 2:1 across ethnic groups. Both feet are affected in 50 percent of clubfeet cases, and when one side is affected, the right side is more frequently involved than the left.

What Causes Clubfoot?
Though the cause of clubfoot is still unknown, a genetic basis is likely. Other theories include:
- Abnormal stunting of foot development prior to birth.
- Abnormality of nerves, vessels or muscles in the leg and foot that causes the abnormal development.
- Exposure to unknown environmental chemicals or medications.

Unfortunately, there currently is no method of preventing clubfoot. It is unlikely that anything that occurred during pregnancy caused the foot deformity.

Treatment Goals
Successful correction of clubfoot occurs when a combination of treatment approaches are used. Casting, surgery, and bracing may all be needed to correct the clubfoot. The best outcome for clubfoot occurs when parents and professionals work together. Your Orthopedic surgeon and clubfoot clinic team will monitor your child’s progress and work with you to achieve the best outcomes for your child.

What is Clubfoot?
Clubfoot refers to a foot deformity that is diagnosed at birth, or in some instances, by ultrasound (making a picture of internal organs by bouncing sound waves off them and recording the echoes) done before the baby is born. It is one of the most common newborn orthopedic (pertaining to the bones) conditions. Clubfoot presents with the heel tilting in and down and the forefoot turned in. Clubfoot can be corrected soon after birth; and, with proper treatment, the foot can look and function much like a normal foot.

Each of the following characteristics may be present in a clubfoot:
- A clubfoot is usually smaller and wider than the unaffected (normal) foot.
- The calf (back portion of lower leg) can be smaller on the clubfoot side.
- One or both feet may be affected.

Most children born with clubfoot have no other congenital (present at or before the time of birth) problems. When clubfoot occurs without other problems, it is referred to as idiopathic (“unknown” cause). Clubfoot may be associated with a chromosomal (structures in the nucleus of a cell that contain the genes) abnormality, as a part of a syndrome (collection of other birth defects), or neuromuscular (brain and spinal cord) disorder that secondarily disrupts the structure of the foot. Medical examinations by your doctor or blood tests may be able to determine whether your baby’s clubfoot has a known cause.
Tendoachilles Lengthening (TAL):
The achilles tendon is the tendon at the back of the foot running from the heel to the calf muscle. A minor surgical procedure, called a TAL (Tendo-Achilles Lengthening), is often done if it stays tight. This is performed in the operating room minor procedure room also called the Starlight Room. This procedure is required to complete the casting correction in most feet. Pain control is typically obtained from sedation in the operating room. The Achilles tendon is then completely divided and a final cast is applied. The tendon re-grows at the proper length and strength by the time the cast is removed 3 weeks later. The incision is well healed at this point. At the end of the treatment, the foot should appear slightly overcorrected and assume a flatfoot shape. The foot will return to normal in a few months. You will also notice skin folds where the foot was stretched. These will go away with time, typically a couple of months to years.

Clubfoot and Research Initiatives
As a patient in our clinic, you will likely be invited to participate in approved research studies (a process of collecting information about a specific question in order to find an answer). Your doctor, physical therapist, and/or research nurse will explain the research studies that are available to you and your child; and will answer any questions you may have about participation in clubfoot research. No research will be conducted on you or your child without your permission. Your participation is voluntary.

How is Clubfoot Treated Using the Ponseti Method Instead of Surgery?
Ideally, non-surgical treatment (Ponseti method) is started as soon as possible after birth. Treatment consists of gentle stretching of the clubfoot to stretch the tightened tissues. A long leg plaster cast is then applied. The cast is designed to go above the knee because the baby can kick off a short cast. The cast is removed and reapplied every week. On average, five casts are required to correct the clubfoot. The casting process continues for approximately 4 to 6 weeks. You will want to check the toes in the cast from time to time. When the baby is calm and has not had the legs dangling, the toes should be pink. If you cannot see the toes, it may mean the cast has slipped and the cast molds are not in the correct location. A slipped cast can cause significant injury to the foot and should be removed as soon as possible. Contact our nurse immediately if you think your child’s cast has slipped. After hours or on the weekend, call the orthopedic hotline at 901-287-6767.
How Can You Help Care for Your Child in a Cast?

Diapering
Changing your child’s diaper frequently will help to keep the casts from becoming dirty.

Feeding
When feeding the baby on your lap, place a small pillow or folded blanket between yourself and the baby’s cast. This will keep the cast from hurting you when the baby kicks.

Dressing
Traditional clothing with attached footwear is usually not large enough to cover casts. Sweat suits or loose-fitting clothes work well. Pants with snaps or velcro closures on the inner leg seam often make dressing easier. It may be easier for girls to wear dresses. Boys may be more comfortable in onesies. Extra large socks help keep toes warm in cold weather. Remember that the cast keeps the leg warm. Thus, legs and feet tend to sweat if too much clothing is used. Try not to over-dress your child.

Bathing
Sponge baths must be given while the baby is in a cast. Careful attention to the diaper area is needed since the baby cannot be placed in the water. In no case should the child be allowed to get into the tub or shower. Keep cast edges out of the diaper. Be sure to use the correct size diaper to keep leakage from the top of casts.

Safety
Check car seats, swings, carriers and other baby equipment to make sure the casts do not keep safety belts, pads and other safety equipment from working properly. Check to see that the additional weight of the cast does not overbalance an infant seat used on the floor or in a grocery cart. Beware of the length of time the child’s legs are hanging down when sitting and check for swelling of the toes.

Sleep
Casts do not normally cause sleeping problems. However, if the baby is ill or teething, the casts may make it harder for the baby to get in a comfortable position to fall asleep.

Playing and Cuddling
The baby will be heavier and a little harder to hold but still needs lots of hugging and cuddling. Be sure to use only toys that are approved for the baby’s age. Tummy time is an important part of development and can still be done while casts are in place. Physical therapists are available to assist with gross motor development and answer any questions.

Positioning
Repositioning often can help a fussy baby. Elevate casts and legs for added comfort. Use a rolled up blanket or towel to elevate brace and or casts for comfort.

Mobility
Wagons, strollers, carriers and other equipment for mobility are very useful. Make sure the child is strapped in safely. Babies almost always enjoy motion and often a short ride will comfort them when fussy. Remember to limit time with legs dangling to decrease swelling and discomfort.

Homecare Instructions
If casts crack or break down, use heavy tape to support the cast until you can return to the clinic.

Daily Care:
1. Sponge bath
2. Check skin around cast edges for redness or sores
3. Look for signs of infection or pressure.
4. Keep cast clean and dry

Signs of infection:
1. Swelling
2. Redness
3. Severe pain
4. Foul odor

Signs of cast pressure:
1. Loss of movement - baby does not wiggle toes
2. Toes become white or bluish in color
3. Toes become cold to touch
4. Toes slip back into cast

Cast problems:
1. Cast slips or comes off
2. Cast cracks, breaks or has soft spot
3. Object gets into cast
Use of the Ponseti Method in Older Children
Some older patients visit our clinic for the first time (1-12 years of age) who have received no previous treatment, alternative casting methods resulting in under corrected clubfeet, or major surgical reconstruction that resulted in a relapse. We apply the Ponseti method successfully in these difficult situations. There is no patient with clubfoot for whom the Ponseti method should not be attempted. However, the success rate with casting alone is often lower for older children or for clubfeet that have relapsed following a prior treatment.

What is involved in Post-Casting Care?
Three weeks after the final cast is removed, your child is fitted into a brace (foot abduction orthosis) designed to prevent the clubfoot deformity from recurring. Your clubfoot clinic team will decide which brace is best for your child. Parents will be instructed on use of the brace in the clinic. Even when well corrected, the clubfoot has a tendency to relapse until the age of approximately three years. THE BRACE MUST BE WORN AS DIRECTED TO PREVENT THE CLUBFOOT FROM COMING BACK. If worn as prescribed, there is a 95 percent chance that no other treatment will be necessary. Use of the brace will not cause developmental delays of your child. Children will still learn to crawl and walk even in the brace.

Wearing Schedule:
It is absolutely necessary that the brace be worn 23 hours a day for three months and then 12-14 hours a day (naps and nighttime) for 3 years.

Helpful Tips for Children Wearing a Brace
• Expect your child to be fussy in the brace for the first 2 days. The brace is not painful, but your child has to get used to something new and different.
• Play with your child while he is in the brace. For a solid bar type brace, it is helpful to teach your child coordinated kicking movement with his/her legs so that they kick up and down at the same time. If an articulating motion bar is chosen, it can allow for independent movement of your child’s legs.
• Children do better if you develop a fixed routine for wearing the brace. Put the brace on anytime your child goes to sleep. This routine will make it easier for your child to know that the brace is always worn during sleep. Your child will be less likely to fuss if you follow a set routine.
• Try not to remove the brace when your child is fussing, so that they do not associate fussing with brace removal. Remove the brace when the baby is calm and happy.

Complex Idiopathic Clubfeet
A small percentage of idiopathic clubfeet are more resistant to treatment and are termed complex idiopathic clubfeet. These feet tend to be stiffer and have a characteristic appearance.

Clubfoot Surgery Options
Surgery may be required if the casting and bracing treatment fails to correct the clubfoot. It may also be necessary if the clubfoot recurs and does not respond to casting and bracing. The specific surgical procedure and extent of surgery will depend on the type and extent of the clubfoot.

Tendon Transfer:
If the tendon on top of the foot is too strong, it may need to be surgically moved to another part of the foot. The purpose of this surgery is to help prevent recurrence of the clubfoot later as the child grows.

Comprehensive Surgical Release:
A more comprehensive surgery may be needed if the foot does not respond to Ponseti casting or if the clubfoot recurs. The extent of the surgery will depend on the severity of the deformity. It usually involves lengthening many tendons of the foot. It may also require surgery to release many of the smaller joints in the arch and back of the foot.
• If your child continues to come out of the brace, try the following:
  - Tighten the middle strap first, using your thumb to hold the foot in place.
  - Try double-socking or place one sock under the insert and one on top to help pad and take up extra room in the brace.
  - Remove the tongue of the insert.
  - Try a thinner or thicker sock or one with letters on the sole.

• It is very important that your child wear his braces according to the schedule outlined by your physician and therapist. Failure to wear the brace as recommended by the physician and/or physical therapist could cause your child to lose correction and may require additional casting or surgery.

• Please contact your child’s orthotist or the Orthopedic Clinic Coordinator (901-287-6747) with any questions regarding your brace.

• Please call if the brace becomes too small; if you notice areas of redness that don’t go away; or if you have trouble keeping your child in the brace.

Always bring your brace with you to each and every clubfoot clinic appointment so that it can be repaired or replaced as needed.

What is involved with Follow-up Care?
Regular clinic visits are important after casting or surgery. During the bracing years, your child will visit us on a regular schedule for a clinical examination and to ensure that the brace is fitting well. Noncompliance with bracing may lead to recurrence. Approximately every six months, your child will outgrow the brace and require a new one. Periodically, an x-ray of your child’s feet and legs will be done to ensure good correction is maintained.

IMPORTANT:
IF YOUR CHILD STOPS WEARING THE BRACE, HE OR SHE WILL LOSE CORRECTION AND POTENTIALLY REQUIRE ADDITIONAL CASTING AND/OR SURGERY. IT IS CRITICAL TO WEAR THE BRACE FOR THE RECOMMENDED AMOUNT OF TIME.

### How Can You Help Stretch Your Child’s Feet?

#### Stretches

**Ankle Dorsiflexion**

**Starting position:** Lay child on back.

**Hand placement:** Place one hand on your baby’s extended knee (Fig. 1). Grasp your baby’s foot with the palm of your other hand placing your index finger above the heel. Now you can gently flex the ankle up and extend it down.

**Motion:** Pull heel down and bend ankle as much as possible (Fig 2).

![Figure 1](figure1.png)  ![Figure 2](figure2.png)

**Ankle Eversion**

**Starting position:** Lay child on back.

**Hand placement:** Stabilize with one hand on leg just above the ankle. (Fig. 3).

**Motion:** Stretch forefoot out (Fig. 4).

![Figure 3](figure3.png)  ![Figure 4](figure4.png)