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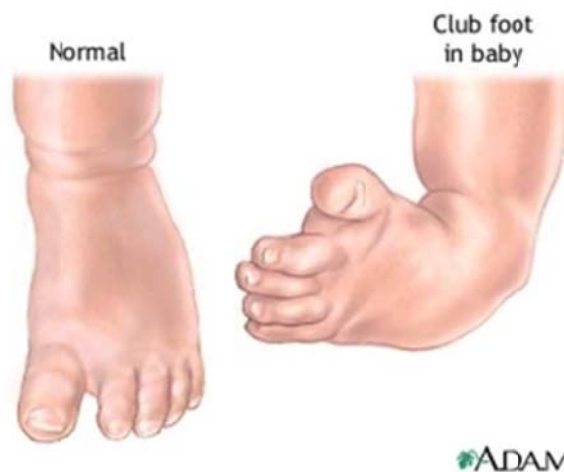
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CLUBFOOT (TALIPES EQUINOVARUS)

What is clubfoot?

Clubfoot is a common foot disorder. About 1 in 400 babies are born with clubfoot in the United States each year. Boys are affected twice as often as girls are. One or both feet may be affected. The most severe type of clubfoot is medically known as "equinovarus". This means the foot is twisted inward and downward. If both feet are clubbed, the toes point toward each other instead of straight ahead.



What causes clubfoot?

Clubfoot is a congenital birth defect, which means that an infant is born with the problem. The exact cause of clubfoot is still not clear. In the past, it was

thought that the baby's feet must have been twisted or cramped while still in the mother's womb. There have been other theories that point to causes such as nerve, muscle, or soft tissue disease. Heredity and other factors that can affect the normal growth of the fetus probably cause clubfoot.

How does clubfoot affect your child?

Clubfoot is not painful. It will not bother your baby until he or she begins to stand and to walk. Since the ankle is twisted, your child may not be able to walk normally because the feet will not lie flat on the floor. If both feet are affected, your child may walk on the balls of the feet. If the feet are badly twisted, children may walk on the sides, or even the top part, of the feet instead of the soles.

If clubfoot is left untreated, the deformity does not go away. It gets worse over time. An uncorrected clubfoot in the older child and adult can be unsightly and lead to problems with shoe wear.

How is clubfoot treated?

Treatment usually begins shortly after diagnosis. Initially, the foot is manipulated into the correct position. A cast that extends from the toes to the groin is then applied. The cast maintains the correction obtained by the manipulation and relaxes the tissues for the next manipulation. In this manner, the displaced bones and joints are gradually brought into correct alignment. Treatment should begin during the first week or two of life to take advantage of the favorable elasticity of the tissues at that age. One to two weeks later, the cast will then be removed, the foot re-positioned to obtain further correction and a new cast applied. This cycle may be repeated several times before acceptable correction is achieved.

Manipulation and serial casting are successful in about 50% of cases. The other 50% that do not obtain correction usually need further intervention such as surgical procedures.

Cast care at home

1. Check the circulation in the foot every hour for the first 6 hours after application and then four times a day. Gently press the toes and watch the return of blood flow. The toes will turn white and then quickly return to pink if the blood flow to the foot is good. This is called "blanching". If the toes are dark and cold and do not blanch (white to pink), the cast may be too tight. If this occurs, go to

your doctor's office or local emergency department and ask them to check the cast. If your child has a soft roll fiberglass cast, remove it.

2. Note the relationship between the tips of the toes and the end of the cast. If the toes seem to be shrinking back inside the cast, the cast has slipped down and correct pressures on the foot are not being maintained.

This might create skin pressure sores. Call the orthopedic clinic immediately, and tell the doctor that this has occurred. The cast needs to be changed.

3. Keep the cast clean and dry. The cast may be wiped with a slightly dampened cloth if it becomes soiled.

4. The cast should be placed on a pillow or soft pad until dry and hard. Whenever your child is on his/her back, place a pillow under the cast to elevate the leg so that the heel extends just beyond the pillow. This prevents pressure on the heel that could cause a sore.

5. Use disposable diapers and change the diaper often to prevent cast soiling. Keep the upper end of the cast out of the diaper to prevent urine/stool from getting inside the cast. Diapers with elasticized legs work well.

ALERT!!! Notify your doctor or the clinic nurse if you notice any of the following.

- any foul smelling odor or drainage coming from inside the cast
- red, sore, or irritated skin at the edges of the cast
- poor circulation in the toes (see #1 above)
- cast slipping off (see #2 above)
- child running a fever of 38.5°C/101.3°F or higher without an explainable reason, such as a cold or virus

A new cast will be applied every 5 to 7 days:

Soft roll fiberglass casts: Within 2-3 hours of the next appointment, find the end of the last roll that was applied and unravel all of the fiberglass material. Then remove the cotton padding. Bathe the child.

Plaster casts: The nurse will remove the cast with a special plaster knife; therefore, the cast must be softened the day you are coming to the clinic. To do this, put your child in a tub or sink, making sure that warm water is getting inside the cast (about 15-20 minutes). After the bath, wrap a soaking wet hand towel around the cast and cover with a plastic bag. A bread sack works well for this.

Duration of active treatment

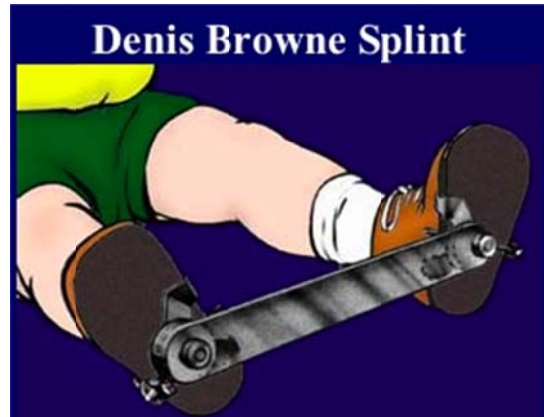
Four to seven casts (each extending from the toes to the upper thigh, with the knee at a right angle), over a period of four to seven weeks, should be sufficient to correct the clubfoot deformity. Even very stiff feet require no more than eight or nine casts to obtain maximum correction. X-rays of the foot are not necessary, except in complex cases, because the surgeon can feel the position of the bones and the degree of correction with his/her fingers.

Completion of active treatment

A minor procedure is required to complete the correction in most feet. The back of the ankle is made numb, either with a numbing cream or an injection, after which the Achilles tendon is completely divided with a narrow scalpel. A final cast is applied. The tendon regenerates at the proper length and strength by the time the cast is removed 3 weeks later. At the end of the treatment, the foot should appear slightly overcorrected, assuming a flatfoot shape. It will return to normal in a few months.

Maintaining correction - the foot abduction brace (Denis Brown Splint)

Clubfoot deformity tends to relapse after correction. To prevent relapses after removal of the last cast, a foot abduction brace must be worn, regardless of whether or not the Achilles tendon was cut. The foot abduction brace consists of straight-bordered, high-top, open-toed shoes that are attached to the ends of an adjustable aluminum bar. The distance between the heels of the shoes equals the width of the baby's shoulders. Modifications to the shoes are made to prevent them from slipping off. The shoe on the clubfoot is outwardly rotated 70 degrees and on the normal foot (if the child has only one clubfoot), 45 degrees. The brace is worn 23 hours a day for at least 3 months and, thereafter, at night and during naps for 2 to 4 years.



During the first and second nights of wearing the brace, the baby may be uncomfortable as he/she adjusts to the legs being tethered together. It is very important that the brace not be removed, because recurrence of the clubfoot deformity will almost invariably occur if the splint is not worn as prescribed. After the second night, the baby will have adapted to the splint. When not required to wear the brace, ordinary shoes can be worn.

The foot abduction brace is used only after the clubfoot has been completely corrected by manipulation, serial casting and, possibly, Achilles tendon release. Even when well corrected, the clubfoot has a tendency to relapse until the child is approximately 4 years old. The foot abduction brace, which is the only successful method of preventing a relapse, is effective in 90% of the patients when used consistently as described above. Use of the brace will not delay the child's development with regard to sitting, crawling, or walking.

Wearing instructions for the foot abduction brace

1. Always use cotton socks that cover the foot everywhere the shoe touches the baby's foot and leg. Your baby's skin may be sensitive after the last casting, so you may want to use two pairs of socks for the first 2 days only. After the second day, use only one pair of socks.
2. If your child does not fuss when you put the brace on, you may want to focus on getting the worst foot in first and the better one in second. However, if your baby tends to kick a lot when putting on the brace, focus on the better foot first, because the baby will tend to kick into the second shoe.

3. Hold the foot into the shoe and tighten the ankle strap first. The strap helps keep the heel firmly down into the shoe. Do not mark the hole on the strap that you use because, with use, the leather strap will stretch and your mark will become meaningless.

4. Check that the child's heel is down in the shoe by pulling up and down on the lower leg. If the toes move backward and forward, the heel is not down, so you must retighten the strap. A line should be marked on the top of the insole of the shoe indicating the location of the tips of the child's toes; the toes will be at or beyond this line if the heel is in proper position.

5. Lace the shoes tightly, but do not cut off circulation. Remember: the strap is the most important part. The laces are used to help hold the foot in the shoe.

6. Be sure that all of the baby's toes are out straight and that none of them are bent under. Until you are certain of this, you may want to cut the toe portion out of a pair of socks so you can clearly see all the toes.

Helpful Tips for the foot abduction brace

1. Expect your child to fuss in the brace for the first 2 days. This is not because the brace is painful but because it is something new and different.

2. Play with your child in the brace. This is key to getting over the irritability that is often due to the inability of the child to move his/her legs independently of each other. You must teach your child that he/she can kick and swing the legs simultaneously with the brace on. You can gently push and pull on the bar of the brace to teach your child to flex and extend his/her knees simultaneously.

3. Make it routine. Children do better if you make this treatment a routine in your life. During the 2 to 4 years of night and naptime wear, put the brace on any time your child goes to the "sleeping spot." The child will know that when it is that time of day, the brace needs to be worn. Your child is less likely to fuss if you make the use of this brace a part of the daily routine.

4. Pad the bar. Bicycle handlebar tape works well for this. By padding the bar, you will protect your child, yourself, and your furniture from being hit by the bar when the child is wearing it.

5. Never use lotion on any red spots on the skin. Lotion makes the problem worse. Some redness is normal with use. Bright red spots or blisters, especially on the back of the heel, usually indicate that the shoe was not worn tightly enough. Make sure that the heel stays down in the shoe. If you notice any bright red spots or blistering, contact your physician.

6. If your child continues to escape from the brace, and the heel is not down in the shoe, try the following.

- a. Tighten the strap by one more hole.
- b. Tighten the laces.
- c. Remove the tongue of the shoe (use of the brace without the tongue will not harm your child).
- d. Try lacing the shoes from top to bottom, so that the bow is by the toes.

7. Periodically tighten the screws on the bar. Tools have been provided.

Long term monitoring

Following full correction of the clubfoot, clinic visits will be scheduled every 3-4 months for 2 years, and then less frequently. Your physician will decide on the duration of bracing depending upon the severity of the clubfoot and the tendency for the deformity to relapse. Do not end treatment early. Yearly visits will be scheduled for 8 to 10 years to check for possible long term relapses.

Relapses

If the deformity relapses during the first 2-3 years, weekly manipulations and casts are reinstated. Occasionally, a second Achilles tendon release is needed. In some cases, despite proper bracing, a minor operation is needed when the child is older than 3 years to prevent further relapses. The operation consists of transferring a tendon (the tibialis anterior) from the inside border of the foot to the center of the foot.

Severe clubfoot

Although the results are better if extensive bone and joint surgery can be avoided altogether, 5-10% of infants born with clubfoot have very severe, short, plump feet with stiff ligaments that are unyielding to the stretching and casting. These

babies need surgical correction after it is clear that attempts have failed to improve the deformity with a series of casts.

Find experienced doctors

A surgeon with limited experience in the treatment of clubfoot may succeed in correcting a mild clubfoot, but most cases require experienced hands for success. Poorly performed manipulations and casts will delay proper treatment and will make appropriate treatment difficult or impossible. Referral to a pediatric orthopedic surgeon with expertise in this non-surgical (Ponseti) correction of clubfoot should be sought, certainly before considering surgery.

What is the purpose of surgery?

The goal of corrective surgery is to have an adequate foot for normal footwear, activities and cosmesis by the time the child is ready to walk. The surgery used to treat clubfoot is called a Complete Subtalar Release. The purpose of this surgery is to move your child's twisted foot or feet back into place. Surgery involves releasing some or all of the tight tendons and ligaments in the foot and repairing them in the lengthened position. After the surgery, the foot will be serially casted to maintain its corrected position. The results of the treatments above are usually good. However, despite corrective surgery, the calf of the affected leg is usually slightly thinner than the normal one and the affected foot may be slightly smaller than normal. With expert early treatment, most children grow up to wear regular shoes, take part in sports and lead full, active lives.

How is the surgery done?

- The ligaments will be cut to release the bones and to lengthen the tendons.
- The foot will be put into the proper position.
- The bones will have pins put in them to help keep the foot in place.
- The tendons will be stitched together again.

- A plaster cast will be put on the foot. It will start at your child's toes and run up to the top of the thigh. The cast will hold the foot in place.

How long will the hospital stay be?

The surgery will take 2 to 3 hours. Afterwards, your child will stay in the hospital for about 2 to 4 days when only one foot is operated on. If both feet are operated on, on 2 different days, your child will spend 6 to 8 days in the hospital. The doctor will decide how long the hospital stay will be.

What follow-up care is needed after surgery?

While in the hospital, your child will stay in bed. The casted leg will be supported in a sling in order to keep the foot above your child's heart. This helps to prevent swelling. Once your child is home, keep the casted foot up on pillows for one more week. Blankets or pillows can be placed underneath the mattress at the end of the bed. Be sure to have the foot above the level of your child's heart. High chairs and most strollers cannot be used because they put your child's feet lower than the heart.

How often will the cast be changed?

During the 1 to 4 weeks after surgery, your child will have another operation to change the cast. Your child's doctor will decide how often the cast needs to be changed. About 4 to 6 weeks after the first surgery, the cast will be changed again, but this time the pins will be taken out. Your surgeon will let you know the schedule to follow for the cast changes. All of the cast changes will be done as a day surgery. This means your child will be able to go home with you the same day of the surgery after he or she is fully awake and comfortable.

What care should be continued?

After about 6 to 8 weeks, the final cast will be removed. You will be shown how to do stretching exercises to your child's foot. You will also receive a prescription for special shoes your child will wear. The doctor will tell you how many hours each day the shoes should be worn. As your child grows older, he or she will visit the orthopedic surgeon often for check-ups. The doctor will tell you when to make an appointment

ALERT!!! Call your child's doctor, nurse, or clinic if you have any questions or concerns or if your child:

- Has any problems with the cast.
- Has special health care needs that were not covered by this information.

For more information visit web site at Global-help.org