

INFORMATION LEAFLETS FOR PARENTS / CARERS OF A CHILD



THE PONSETI TECHNIQUE

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Introduction

At CHI at Crumlin, we use the Ponseti Technique of plastering for treating Talipes Equinovarus. Ignatio Ponseti's method of treatment by repeated manipulation and casting, has received international recognition and is being widely adopted in many clinical centres.

Information about Talipes Equinovarus (clubfoot)

Children with Talipes do not have ordinary feet, which are "a bit turned in". These feet are designed by nature to be turned in. That is the way they want to be, and we are not sure exactly why this should be. We know there may be a generic component to it as Talipes is more common in some races than others and may tend to occur in particular families. However, the gene has never been identified and it is believed that other factors may contribute. What we do know is that all the affected tissues lie in the distribution of a single nerve. Other structures in the foot, with a different nerve supply, are not affected. This nerve is called the **tibial** nerve. It lies on the inner border of the leg and it is the structures on the inner border of the foot and ankle which are affected.

These include:

1. **Tendons:** The powerful *tibialis* posterior tendon, which is responsible for turning the heel bone in an inward direction, can be up to three times larger than normal. It is a very tight tendon as are the other two tendons which run with it.
2. **Ligaments:** The ligaments on the inner part of the ankle joint of a baby with talipes contain cells which are capable of contracting in a similar way to normal muscle cells. Ligaments are not normally able to contract at all. It is believed that the presence of these cells, which do not disappear until about the age of 3 or 4 years, are at least partially responsible for the tendency of treated club feet to relapse.
3. **Bones:** The *talus* bone which joins the ankle to the foot is an abnormal shape in babies with talipes and is spun round towards the inner border of the foot instead of pointing straight down to the big toe as it normally would.

In cases where only one foot is affected, the affected foot is likely to be smaller and broader than the opposite foot. There may be up to two or three sizes difference between the two feet, meaning that shoes of the same size cannot be worn. Where both feet are affected, one foot may still be smaller than the other. This difference in shoe size will persist throughout life and at the present time nothing can be done about it.

The calf muscles are usually thin and where only one foot is affected this may be particularly noticeable. Occasionally, the entire leg is shorter than the other.

The Ponseti Method of Plastering

The principle behind treating Talipes by repeated stretching and plastering is based on the principle of tension / relaxation. Every week, the baby's feet are stretched, and that stretch is maintained throughout the week by soft cast. During the course of that week, the tissues relax a little and that allows further stretch to occur the following week. Gradually the foot is brought round to a more normal position.

Ponseti recommends addressing the different deformities present in Talipes separately. We start by lining up all the bones in the forefoot (the metatarsals) with each other. Then we start to coax the inner border of the baby's foot into a straighter position. The heel bones then naturally follow the forefoot into a corrected position, without direct pressure being applied to them. The last thing to be addressed is the downward, or equines, position of the ankle.

To bring the foot up by plastering alone can take a long time, as this is the most resistant part of the foot deformity.

It also risks having the fore-foot come up, while the heel bones remain in their downward position, a so-called foot breech. To overcome these difficulties Ponseti has recommended that the Achilles tendon be divided surgically, by a small incision at the back of the heel. This procedure is performed under local anaesthetic.

It usually takes between six weeks and three months of plastering before the baby is ready for his / her Achilles tendon to be released. He / she is then placed in plaster for another couple of weeks. This is then changed to allow any further correction that might be necessary to occur. Although this is usually only necessary once, for more resistant feet two or three further plaster changes may be necessary before the foot is fully corrected. After a few weeks the Achilles tendon will heal completely.

What Next?

Once the foot is fully corrected it will be necessary to maintain that correction. Club feet want to be club feet and nature will work to put them back the way she wants them to be for the first few years of the child's life. After this the tendency for club feet to recur reduces significantly. We start by placing the baby in boots with a bar attached to hold the feet in the corrected position.

Even if the baby has one affected foot, both feet are placed in boots, as the bar between them acts as a splint and holds the affected foot in an outwardly rotated position. This is important as the child's shin bone is likely to be inclined and rotated inward. The bar helps to overcome this problem. If one foot is unaffected its boot is left in a more neutral position on the bar. The soles of the boots are moulded so that they encourage a stretch along the inner border of the foot.

The boots and bar are worn full time for three months and then at night time and nap time until the child is four years old.

It is impossible to over-stress the importance of wearing these boots and bar, even if at the beginning the baby does not like them! Without them relapse is almost certain, although even with the boots and bar, relapse is possible. In relapse cases the child will respond well to a few weeks back in plaster but rarely will surgical correction be needed again.

Ponseti Technique and Surgery

The aim of the Ponseti Technique is to avoid **surgery** of the foot. This is not because surgery does not work (it does!), but rather to spare a child from having surgery.

However, the Ponseti Technique is only successful in 90% of cases (even in the hands of Dr. Ponseti himself) and for the remaining 10% of children, foot surgery is likely to be necessary. Even for those children for whom the technique is successful, around two-thirds will require some sort of procedure in their pre-school years. The most likely procedure is the transfer of a tendon (the tibialis anterior) from the inner to the outer border of the foot. This is because this tendon is often excessively strong with Talipes and tends to pull the child's foot up and in, so that he walks on the outer border of the foot. By moving the tendon to the outer border of the foot it should become flatter on the ground. Other possible procedures include:

- Planter fasciotomy: dividing tight bands of fibrous tissue on the sole of the foot
- Posterior release: more formal operation to lengthen the Achilles tendon and release the ankle joint to allow the foot to come to a neutral position.



The Team

- Ms. P. Kelly – Consultant Orthopaedic Surgeon.
- Mr. J. Noel – Consultant Orthopaedic Surgeon.
- Orthopaedic Senior Registrar.
- Olga Gallagher - Clinical Nurse Specialist.
- Ailish McIntyre - Clinical Nurse Specialist.
- Catherine Howells - Clinical Nurse Specialist.
- Suzanne Donaghy- Clinical Nurse Specialist.
- Marie O Mir - Physiotherapist.
- Aoife Foy - Physiotherapist.
- Clare O Dempsey - HCA

Our Ponseti Clinic is held on a Thursday afternoon from 1.30pm to 5.00pm in the Out Patients Department.

At first you will be required to attend weekly with your baby until he / she is ready to go into boots and bar, after that the visits will become less frequent.

Things to Look Out For

Plastering can cause skin problems. The skin can be under pressure, either directly from the plaster over-lying it, or indirectly from the amount of stretch applied during correction. If the baby's skin is found to be bruised or blackened following removal of a plaster, it will be allowed to rest out of cast until it has settled.

How to Deal with Problems

You may notice some problems with your baby's cast at home. These can include:

- Toes are pale, purple or blue.
- The cast has slipped. (This means the baby's foot is not in a good position)
- There is rubbing at the top or bottom of the cast.
- The cast gets wet or soiled.
- The baby is unsettled and there is no other obvious explanation.

Should any of these matters arise it is important you contact us as soon as possible so that we can see the baby and take appropriate action. You should phone the hospital on 01 4096100 and ask for the Clinical Nurse Specialist in Plaster Care on bleep 8336 or Extension 2377 (voicemail) and leave a message.

If the problem develops in the evening, at the weekend or on a bank holiday, phone the hospital on 01-4096100 and ask to speak to the Orthopaedic Registrar on call, explain that your baby is attending the Ponseti clinic and that you have a problem.

If you feel the problem will not wait until the baby can be seen in the hospital, it is possible to un-wrap the cast and the plaster bandages will come off exactly the same way as they went on. Let us know as soon as possible if you do this so that we can replace the plaster. Little feet relapse quickly once the cast is removed, until correction is achieved.

Sláinte Leanaí Éireann



Children's Health Ireland

References

Information Booklet, The Ponseti Technique, Ms. Catherine Duffy, Consultant Orthopaedic Surgeon, Musgrave Park Hospital, Belfast.

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