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Ponseti Clubfoot Management
A Parent's Guide to the Foot Abduction Brace

Congratulations on reaching this step in the clubfoot treatment!

It's exciting to see those feet looking so nice and straight, isn't it? Your doctor has undoubtedly stressed how important the brace is in retaining this correction. However, many parents have issues with the **Foot Abduction Brace** (FAB)—also called the Denis Browne Bar (DBB)—at first.

In this handout we present information related to the use of the FAB as well as practical tips and tricks aimed at preventing, detecting and solving the most common problems.

We sincerely hope that this handout can be of use to all of you as you start out with the FAB. It includes a section on modifying the shoes in order to make them more user friendly, instructions for putting the FAB on your child and a troubleshooting guide should serious problems (such as sores) arise.

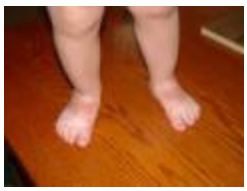
It may look like some kind of torture device, but babies can be perfectly happy, sleep peacefully and do just about *anything* while wearing the FAB. When it is worn correctly, this brace does work!

The information we present here is largely born of our experiences with our own children and the experiences of the many wonderful families from the online support group nosurgery4clubfoot. You are not alone on this journey.

Support and help from other parents is available to you online or by contacting the author of this handout directly. Join us at

http://health.groups.yahoo.com/group/nosurgery4clubfoot

For further information regarding the Ponseti protocol for clubfoot treatment, specifics on setting up the FAB and information regarding other braces (Mitchell brace, Ponseti brace, Dobbs brace and other orthotic devices), please refer to the references on the last page.



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Setting up and modifying your FAB

Following the Ponseti method serial casting, most babies will be placed into the standard foot abduction brace (FAB). This brace consists of a pair of white leather open toe boots attached to a fairly lightweight metal bar. The length of the bar is either fixed or adjustable. The shoes are typically screwed onto sole plates which then attach to the bar with a nut and bolt or a hex head screw. Other braces coming into use are similar in that the feet are connected with some kind of bar but the design of the shoes, bar or both is a little different. Here we are primarily focusing on the standard FAB that uses the **Markell Tarso Open Toe Boot #1644 or #1645**.

The shoes are called **straight last** shoes. This means that there is no left or right shoe and either shoe can be mounted on either side of the bar (most people find it easiest to have the shoes mounted so that the buckles are on the inside). The shoes have a strap, loose tongue and laces. Sometimes a child will be given reverse last shoes (it will look like they are on the wrong feet). However, the Ponseti method does not call for the use of reverse last shoes.

To start out, here are a few modifications you can make to the shoes in order to make them more user-friendly. We recommend modifying the shoes before using them for the first time or as soon as possible after they are given to your child.

♦Take the laces out and tie a knot in the middle of each lace. Then re-lace the shoes. Tie a knot at the very ends of each lace so they can't slip back through the holes. This way, you'll be able to pull the laces very loose without having to worry about needing to re-lace the shoes every time. The knot in the middle will help you keep the laces even.

♦Consider slitting the tongue keeper slit up to the top of the tongue (don't cut through the stitching though). This allows the tongue to sit low on the top of the foot. It also allows the top of the boot to be tightened up on the ankle so that the fatty baby calf doesn't pull the heel up and out. The tighter the ankle area, the more secure the foot will be in the shoe.

This is where the tongue sits before the keeper is cut.

Cut the tongue keeper slit here.

The tongue sits much lower after the tongue keeper is cut.

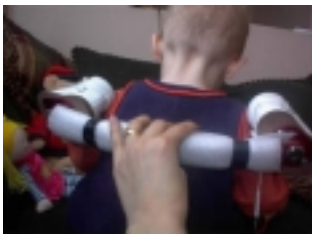
♦Install the strap in the lower slot on each side of the boot. For most feet, this is the best position for keeping the foot in the shoe. Some parents switch slots as the child's foot grows. As long as the foot is staying securely and deeply seated in the shoe, either slot is fine.

♦Punch an extra hole in the end of each strap. This way you can secure the strap in the buckle while you are putting the foot into the shoe. Longer straps do not usually need this extra hole, although it may be more convenient for the parents.

If your child's FAB is not set up correctly, it may be very uncomfortable. Here are a few things to check to make sure your FAB is set up correctly.

Bar Length

♦Most FABs are set up so that the length of the bar is such that the baby's heels are shoulder-width apart. You can measure the width of your baby's shoulders and check that against the distance between the heels of the shoes when they are mounted on the bar. You can also eyeball this by holding the FAB up to your baby's shoulders as shown in the picture. In our experience, this is the most comfortable setting for most children although there is certainly a comfort range of up to about 2 inches (5 cm).



♦If your child's FAB is too short or too long and seems to be causing your child discomfort, it must be adjusted as quickly as possible. For those who are using the adjustable red bar, it is a matter of loosening the clamps and sliding the bar until you have the right fit. If you are using a fixed-length bar, you will need to get a new bar of appropriate length: contact your doctor and your orthotist.

Foot Abduction

♦In order for the brace to be effective, the shoes must be set at the proper degree of external rotation (abduction). This is 70° for each clubfoot and 20°-45° for a non-clubfoot. 70° of abduction may seem like a lot, but your baby's last cast will have been turned out at least that far so it is not an uncomfortable angle. If you saved your baby's last cast, you can check the abduction using a protractor. If the external rotation on the last cast is much less than 60°, consider talking to your doctor about another cast and proper abduction.

Set the heel of the cast on the mid-point of the straight edge of the protractor and line the knee of the cast up with the same edge. An imaginary line passing through the middle of the foot section should hit the 70° mark on the protractor.

♦Make a mark on the sole plate to show where the shoe lines up with the bar. This way, if you remove the shoes, or if they come loose for some reason, you can easily set them back to where they should be.

Dorsiflexion

♦Dorsiflexing the foot means tipping it up so that the toes point towards the head. The bar should be bent so that the feet are held in 10°-15° of dorsiflexion. The red adjustable bars are bent at either side, just under the boots. The non-adjustable bars, which are bent by the orthotist, may have 2 bends (one at each end) or a single curving bend in the middle.

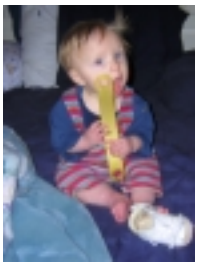
The longer bar has a bend at each end.

The shorter bar has one bend in the middle.

Kori's Tips for putting the FAB on a wiggly baby without causing pain or sores

♦Some parents feel most comfortable having the child sitting on their lap facing away from them while they put the brace on; others say it's easiest for them to have the baby lying down in front of them. Many parents work together installing the FAB, especially at first. If you can do it when your child is relaxed and calm, you will probably have a much easier time. Find out what works for you and your child.

♦You won't have to do this step forever—in fact before you know it, you'll be able to put the FAB on your child with your eyes shut—but it really does help for the first few months.



And this, of course, is the tasty gold bar!

At first, it is much easier to put the shoes on your child separate from the bar and then, when they are on nice and snug, attach the shoes to the bar.
If you have a **gold fixed-length bar**, taking the shoes off the bar is very simple: you just need to unscrew the nut on each shoe and the bar slips right off. Once you've taken the shoe off the bar, screw the nut back onto the bolt so that you don't lose track of it (and so that you don't get kicked with that sharp bolt).
If you have the **red adjustable bar**, it is harder to get the shoes back on correctly once they're off. Instead, take the bar itself apart by loosening the black clamps. Mark your bar so that you can easily set it back to the right length *before* taking it apart for the first time. This method will lead to wear on the clamps. Should they break, you can substitute metal automotive hose clamps (available at hardware or auto parts stores) in a pinch. Your orthotist can also provide you with replacement parts.

♦Open the shoe up as far as you can by loosening the laces up all the way to the knots and pulling the tongue up as far as it will go under the laces. If you punched a new hole at the end of the strap, buckle the strap into that hole loosely so that it doesn't get pulled into the shoe when the foot goes in.

♦Insert the foot into the shoe and bend the knee 90°. Push on the top of the knee and hold the sole of the shoe. Press the heel deeply into the back of the shoe and flex the toes upward (dorsi-flex) as far as possible. Make SURE the heel is seated well into the bottom and back of the shoe. When working with the shoes attached to the bar, follow the same procedure one foot at a time. If the child is unilateral (left or right clubfoot), start with the clubfoot.

♦With the knee still bent, press a finger on the strap where it goes through the tongue keeper slit: this will hold the heel in the back of the shoe. Buckle the strap but don't thread it through the lower portion of the buckle just yet. Dorsiflex the foot again and press on the bent knee with one hand and on the sole of the shoe with the other to make sure the heel is in properly. Re-tighten the strap: you may get it another hole or two tighter. If there is any wiggle or looseness, press the foot into the shoe again, put pressure on the strap and re-tighten.

♦Now try to pull the shoe off by bending at the ankle and dorsiflexing the foot. If the foot slips in the shoe, it is not tight enough: retighten using the above technique until the foot is secure in the shoe.

♦Center the tongue and pull it down over the toes so that the top of the tongue lies at or just below the ankle of the boot. The strap is essential to keeping the foot well seated in the shoe, it needs to be tight—probably tighter than you think it should be at first. Don't worry, if the heel is well-seated at the back of the shoe, you will not be able to make the strap too tight. If the foot cannot slip around in the shoe, blisters and friction sores cannot form. Pay attention to which hole on the strap you are using and remember to adjust as your baby's foot grows and the leather on the strap stretches out.

♦Pull the sock at the toes to make sure the seams aren't going to press into baby's toes. This also helps make sure the heel is well seated. Run a fingertip under the baby's toes to make sure that they have a little room to wiggle and that you haven't folded any of them under.

♦Tighten the laces nice and snug all the way up and tie them. The shoe should get a little tighter. In particular, make sure that the ankle area of the shoe is very tight. If you've been having issues with slipping, try lacing the shoes only to the second hole from the top and tying them off there.

♦Check whether the foot can slip out of the shoe at all. If it can, you will need to repeat the procedure. Most important is to put pressure on the knee and push the heel into the bottom of the shoe with the foot dorsiflexed (toes pointing toward the baby's head) all at the same time. This isn't easy at first, but it will soon become second nature. It is absolutely essential that your baby's feet not slip in the shoes. Slipping feet are not held in correction and can compromise the effectiveness of the FAB and lead to relapse. Slipping feet may also cause painful sores and blisters.

♦Once you have the shoes on both feet nice and snug, re-assemble the FAB. For the non-adjustable bar, this is a matter of slipping the bolts back through the holes in the bar, making sure the shoes are set at the right degree of abduction and re-tightening the nuts. Secure the nuts by hand, but take care to make them very tight. Not only do loose bolts not maintain correction, they also will strip the teeth on the aluminium bar. With the adjustable bar, you just need to set the pieces back to the right length and tighten down the clamps.

♦Until you are very comfortable with the process, you can expect to spend a fair amount of time and energy getting the FAB on your child. However, you—and your child—will get used to it. Veteran parents can get their child into a FAB in 4 minutes flat!

♦Over the first few days of FAB wear, you may want to take the FAB off your baby every few hours. This will allow you to check for beginning sores or blisters(both of which are often signs of improper foot position or slipping in the shoes). You will also get some good practice in putting the FAB on. A normal-tempered baby is usually a sign that you have the FAB on correctly and you don't need to keep checking so often.

Pad Your FAB!

It is very easy to make a simple pad for the FAB. This will help keep your baby's head as well as your shins, arms, walls, floors, crib slats and so on from being beat up by that metal bar. Buy a piece of pipe insulation foam at your local hardware store and cut it to fit on the bar between the shoes with a flap to cover the bolts. Tape it in place with althetic tape.

Some families have wrapped their FAB with carseat strap covers or bike handlebar tape. There is also a simple pattern to make FAB covers out of any material you want available at the nosurgery4clubfoot site.

Troubleshooting

♦You may not have any problems except for some fussiness over the first few days and nights. You can use an infant strength pain reliever (acetaminophen or ibuprofen) if you feel that it will help. This fussiness is perfectly normal for a child whose feet have been fully corrected and remain deeply seated in the shoes.

♦The cause of the fussiness is not likely to be more than muscle tenderness and skin sensitivity following the casting period. It will get better with time. It's fine to use a little lotion on your baby's dried out skin, but try to keep it off of the feet themselves as this can cause slipping in the shoes. If your baby's skin seems to be sensitive, use a firm touch—a gentle touch can be even more irritating.

♦Many babies new to the FAB seem frustrated at not being able to move their legs independently. Show your child how to move both legs together by playing gently with the bar, moving it from side to side and up and down. You probably won't need to do this very much, they figure it out on their own pretty quickly.

♦If your baby is irritable, consider co-sleeping the first few nights so everyone gets some sleep. With a pillow under your baby's feet to prop up the FAB, you and your baby can lie on your sides to nurse.

♦If your child is not tolerating the FAB past the first few days, cries in pain all of the time, wakes up every half hour or less through the night and seems unhappy and miserable and if you see evidence of blisters or sores forming, there is a problem that you need to tackle and rectify. We hope that this guide can help you do just that. As always, we encourage you to post to the nosurgery4clubfoot online support group if you need help, reassurance and sympathy.

♦You may see red spots on your child's feet. Usually red spots are nothing to worry about and they should fade during your child's daily break from the FAB. **Pressure sores** are a different story. These start as dark red areas that keep getting darker until they turn purple or black. Eventually, they become open sores that can become infected. They will not get better unless the pressure against them is relieved.

♦Some parents have resorted to cutting a large hole in the heels of the shoes thereby relieving pressure so that their baby can continue to wear the FAB while the sore heals. After cutting the hole, many parents have found that they were not getting the heel down all the way. While this is a short-term fix for the larger problem of properly fitting the shoes, it can be helpful if you have concerns about whether you are getting the heel all the way down.

Markell has recently released a new shoe design incorporating the hole in the heel. These shoes are available in the smaller sizes: 0000, 000, 00, 0 and 1. Contact your orthotist or the Markell shoe company if you are interested in these shoes. http://www.markellshoe.com

♦**Blisters**—which can also become open sores when the skin breaks—are caused by slipping or friction of the foot against the inside of the shoe. First of all, make sure that your baby's socks fit well and are not bunching up and causing friction. There can be absolutely no slipping out of the shoes, even after a few hours of wear. If the feet do slip eventually, the shoes need to be tighter in the first place. Again, it is important to get the heel as snug in the back of the shoe as possible.

♦You should do everything you can to make sure your baby stays in the FAB. A clubfoot has an extraordinary tendency to relapse: these little feet can show signs of relapsing within hours. However, you need to listen to your child and follow your heart. Do *not* keep putting the FAB on a child who has a weeping sore. This is painful and you wouldn't put a tight shoe on your own foot with a sore like that. Occasionally, a baby will be placed back in casts to maintain the correction while a sore heals.

♦If nothing you do seems to help, you may want to consider that your child's foot has lost some correction or that it was never fully corrected to begin with. The FAB will not complete the correction and will be very uncomfortable. If you feel that you need to seek a second opinion, go for it. Chances are we can help you find an experienced doctor in your area.

♦Some atypical clubfeet respond very poorly to the standard FAB. These feet are short, plump, sausage feet with a deep transverse skin fold across the sole of the foot and another crease above the heel. You should seek the opinion of an experienced doctor if this describes your child's foot. Additional information can be found at: http://adifferentfoot.freeservers.com

♦Occasionally, problems will come up when a baby's hours in the FAB are first reduced. These are almost always due to the hours being reduced too dramatically, from 23 hours a day to "nights only" (roughly 12 hours for most children). It is important for avoiding both immediate tolerance problems and future problems with correction that a baby's time in the FAB be reduced slowly. The recommended protocol is full-time (23/7) wear for the first three months followed by 20/7 for a month, then 16-18 hours a day until the child is walking. Only at that point should the time in the FAB be dropped down to "nights and naps". Most doctors are recommending that in most cases the FAB be worn until the child is at least 4 years old.

Life with the FAB

As with any new medical device, the FAB takes some getting used to and requires some working around. Here are a few general tips and tricks related to daily life with an infant and older child in the FAB.

♦**Clothing concerns:**

Use medium thickness cotton socks with small seams. The Old Navy, Gymboree, Baby Gap socks with the rubber grippers on the bottom work very well. They run 7pairs for $10 at Old Navy. You might as well stock up: baby socks get lost on a regular basis. Tights work with the FAB as well, the thicker the better.

During the initial three-month period of full-time wear, most people dress their babies in outfits that snap along the inseam.

Outfits with attached feet are out, but many parents simply cut off the feet of outfits they would still like to use.

♦**Equipment concerns:**

Most infant carseats and convertible carseats work perfectly well with the FAB.

Try to find an infant swing and highchair that you can place your baby in without having to remove the FAB.

Infant carriers such as the Baby Bjorn and Kelty Koala work very well as you can put your baby in them without having to remove the FAB. It may take a little time to find a comfy position, but the FAB should not interfere with wearing your child in a sling.

♦**Sleeping concerns:**

If your child seems uncomfortable at night, check the length of the bar and adjust it if necessary. A too short bar is a frequent culprit for nightime restlessness.

Many children wake themselves up at night because their FAB has become tangled in their covers. Using heavier pajamas or a sleep sack will eliminate this problem. A simple sleep sack pattern is available at the nosurgery4clubfoot site.

Make putting the FAB on part of your bedtime routine. Many children wind up so that they have a hard time going to bed *without* the bar or even ask for it to be put on when they are tired! You will be amazed at how quickly this just becomes part of your everyday.

References

For information regarding the Ponseti method of treating clubfoot, please refer to the following:

Dr. Ponseti's website at the University of Iowa:
http://www.vh.org/pediatric/patient/orthopaedics/clubfeet/index.html

A very informative booklet in pdf format:
http://www.global-help.org/publications/cf.2.pdf

A comprehensive list of links concerning the Ponseti method:
http://members.tripod.com/ponseti_links-ivil/

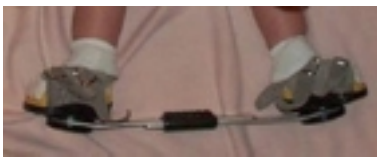
Specific information regarding how to set up the FAB is available at:
http://members.tripod.com/ponseti_links-ivil//id9.html

For information concerning alternatives to the standard FAB, refer to the following:

When a child is utterly miserable in the FAB, it is natural to wonder about other bracing options available. A very commonly used device in the treatment of clubfoot is the **Ankle-Foot Orthotic** (AFO). This is a molded plastic boot secured with velcro straps that is meant to hold the foot in a neutral position. While it may look much easier to deal with day-to-day, it cannot hold the foot in external rotation and has been shown to be useless for a Ponseti-corrected foot. Its cousin the **Knee-Ankle-Foot Orthotic** (KAFO, Wheaton Brace) does allow the required external rotation. However, it immobilizes both the knee and the ankle which can lead to significant muscle atrophy.

Two new versions of the FAB have been introduced over the past few years. Each has features that set it apart from the standard FAB, yet they function in much the same way and are at least as effective as the FAB you are using.

The **Dobbs' Brace** is an FAB designed by Dr Matthew Dobbs of Children's Hospital of St Louis, MO. It is very similar to the standard FAB with an articulated bar so that the baby can move her or his legs independently. This brace may be used with the Markell boots or with custom-made molded plastic shoes (modified AFOs). For more information, contact Dr Dobbs at: mattdobbs@earthlink.net



The **Ponseti Brace**, or Mitchell Brace, has been developed in Iowa City by John Mitchell in close collaboration with Dr Ponseti. Originally reserved for use in cases of atypical clubfoot, it is now being more widely used. This FAB sports soft leather sandals instead of the Markell boots. It is currently being hand-made on demand. For more information, visit: http://www.mdorthopaedics.com

Please keep in mind that we are not medical professionals but parents of children with clubfoot. This guide is meant as a help to parents who are new to the FAB and should not take the place of physician supervision.

Please send any comments regarding this guide to Naomi Powell
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