

ORTHOTIC & PROSTHETIC SERVICES

THE BOSTON BRACE HANDBOOK

ORTHOTIC TREATMENT FOR YOUR SCOLIOSIS

KAPI'OLANI ORTHOPAEDIC ASSOCIATES

Pediatric Orthopaedics
Spine Deformity
Sports & Dance Medicine
Young Adult Hip Preservation

1319 Punahou Street
Suite #630
Honolulu, Hawaii 96826
Phone: (808) 945-3766
FAX: (808) 942-9837
www.kapiolani.org

Robert C. Drukin, M.D.
Division Head
Pediatric Orthopaedics
Associate Clinical Professor
Department of Surgery, John A.
Burns School of Medicine,
University of Hawaii

William E. Burkhalter, M.D.
Pediatric Orthopaedic Surgeon
Assistant Clinical Professor
Department of Surgery, John A.
Burns School of Medicine,
University of Hawaii

Jennifer R. King, D.O.
Pediatric Sports Medicine
Assistant Clinical Professor
Department of Surgery, John A.
Burns School of Medicine,
University of Hawaii

The Orthotist works closely with your doctors. This teamwork helps to assure high-quality treatment which is offered to patients from birth to adult.

This handbook explains the orthotic program to treat scoliosis, a curve of the spinal column. The Boston brace often stops and sometimes corrects the curving of the spinal column without surgery.

The Boston back brace is a common under-the-arm brace. It is the brace your doctor has recommended for your child. This handout includes important information on the wear and care of your child's orthosis. This important material will be helpful to you. Please read it carefully and continue to use the checklists provided.

Wearing a brace will challenge your child. The greatest part of the treatment will be your encouragement and positive attitude as a parent. With the advice and the how-to information in this handbook, you will feel confident while following your child's treatment plan. If you have questions after reading this booklet, ask your orthotist for help.

Scoliosis Orthosis (Back Braces)

The Scoliosis Orthotic Treatment Program

What is scoliosis?

When the spinal column curves noticeably to one side or the other, that is a condition called scoliosis. A normal spine is almost straight. A slight curving usually does not affect a child's normal development and ability. When the spine curves more than 10 degrees from a straight line, then it could be scoliosis.

About one million youngsters in the United States have scoliosis. Your child's scoliosis requires medical attention that includes a brace. When your child's spine keeps curving more as he or she grows, that is called progressive scoliosis. If that condition is not treated, then progressive scoliosis can cause other problems such as:

- back pain
- deformity in the rib cage and other areas than can be noticed
- respiratory problems if the curve becomes severe

How do you treat scoliosis?

There are two ways:

1. surgery
2. wearing a back brace without surgery

Your doctor considers many factors in his or her decision about which treatment method is preferable. The goal of a Boston System program is to stop the spine curve from progressing.

What is an orthosis?

An orthosis is simply a brace made to correct or support an existing deformity or deficiency in some part of the body. That is why doctors and technicians use the words “orthosis” and “brace” in similar ways.

Who is an orthotist?

Your orthotist is a trained specialist who works with braces. He knows how to use bracing for treatment of your child’s problem. His role is to direct the care that your doctor has ordered.

The First Step

Once your child’s doctor recommends orthotic treatment, the next appointment is with the orthotist. This begins the process of getting your child’s brace. During the first visit, your orthotist will do the following things.

1. Take different measurements of your child’s chest, back and waist (see fig. 2A).
2. Make a custom-molded cast of your child’s midsection or abdomen (chest and back area including waist). Making the cast takes only minutes. It is removed and then used as a mold for creating the brace (see fig. 2B).

The Next Step

It usually takes two to three weeks to make your child’s brace. Once the orthotic device is complete, you and your child visit the Orthotics office again to be fitted. You receive important information at this time.

The orthotist will:

- make sure the brace is the right size and fit,
- check that it works correctly, and
- show you how to put on and take off the brace.

You will then go over to your doctor’s office for an x-ray (see fig.3C)

To insure the brace is working. Once your doctor completes his or her exam, you can leave.

Follow-up Steps

After a few weeks with the brace, you and your child will return for a follow-up. Your orthotist will ask your child questions like:

- How does the brace feel?
- Can you feel the support where it is supposed to be?
- Are there any problems in putting it on or taking it off?
- How are you reacting to the brace?

Your orthotist checks on your child’s progress during this and other visits. The orthotist also solves problems as they occur. Follow-up visits are scheduled every four months in conjunction with your doctor visits.

What to Watch For

During the first two weeks, watch for:

- Any discomfort, redness or blister of the skin, or
- Any problems with the function or the support the brace is supposed to give.

If a problem occurs, call your orthotist right away. Even after the two-week visit, you can call if any problems come up. If you wait, the situation could get worse.

Boston Back Brace

How the Brace is Designed and Made

The Boston back brace is an under-arm brace. It wraps around the hips and ribs in such a way as to push the curve in the spine straight. Therefore, the brace can only work when it is being worn (see fig.4, person actually wearing brace).

Method

The Boston brace is made from a mold that is taken from the cast of the torso. The orthotist shapes the mold to properly fit and support your child. After all adjustments are finished, the plastic for the brace is heated and molded. Once cooled, it is cut out and customized for your child.

Material

The Boston brace is made of high-tech plastics. It will come with a foam inner liner. The thickness of the brace is based upon the amount of support your child requires. The brace opens in the back with two strap closures that can be tightened for the best fit.

Wear and Care of Your Brace

After a short time, wearing a brace becomes routine. However, your child will have to get used to the brace in the beginning. Young people adapt to a brace at different paces. As an individual, your child will be more or less sensitive to pain and discomfort. Talk with your child and work together to set a pace for reaching the goal of wearing the brace as your orthotist and doctor instructed.

The average adjustment period is two to three weeks. By then, you want your child to comfortably wear the brace every day for the prescribed time period. Your child may accomplish this goal in a shorter or longer time. If it takes longer than three weeks, do not be alarmed or discouraged. Keep pressing toward the goal with positive words and actions.

REMEMBER, your child should wear the brace bit by bit, until you reach the full time goal. The only way to insure brace failure is to not wear the brace.

As a helpful reminder, the following checklists review the steps in putting on (donning) and taking off (doffing) a brace, and for monitoring the skin. Continue to follow these tips.

Donning and Doffing the Orthosis

Two people are needed to put the brace on, your child and you. You are the helper, your child is the wearer. Two People are able to put the brace on correctly without too much twisting of the brace of the child.

Your child should wear a cotton undershirt under the brace. For girls, the bra is worn under the brace.

Putting on the brace:

1. Hold the brace in your left hand and stand behind your child. Your child stands in front of you.
2. Reach around your child with an arm on each side. Spread open the brace wide enough to slip onto your child. The brace will be in front of your child with the opening at the back of the brace (see fig. 5, illustrating first two steps in one).
3. Your child can step into the brace.
4. Keep all straps outside the plastic girdle.
5. Make sure the brace is not twisted and that it faces straight ahead. The opening of the brace should be in the middle of the back Position the brace as the orthotist demonstrated during the fitting.

To fasten the brace, you may use the “side-lying method.”

Your child will need to lie down on a bed or floor, whichever is more comfortable. Your child will lie on his/her side with knees bent in a V-shape, around 45 degrees (not all the way to an “L” or 90 degrees). (see fig.6)

1. Keep the buckles on the top, away from the bed or floor.
2. Lean on the side of the brace to push the opening together. As you do this, pull on the straps to tighten the closing. You will tighten to the line on the strap that was marked by your orthotist. This line is your mark.
3. When the brace is on as tightly as possible, snap close the buckles.
4. Once the brace is completely on, check the fit once more.

Alternatively, the brace may be fastened while standing. The child should stoop slightly bending the hips and knees 30 degrees. The brace may then be tightened beginning with the middle or interior strap and tightening the upper strap last. Make sure the brace does not ride up.

Taking off the brace:

1. This can be done while standing up (see fig. 7).
2. Loosen and undo the straps.
3. Hold the brace open enough so your child can step backward out of the brace.

Cleaning the Brace

1. Wash in lukewarm water.
2. Use a mild soap solution such Ivory or an anti-bacterial liquid dish detergent like one made by Dial.
3. Rinse thoroughly in clean water or under a running faucet or shower.
4. Dry with a terry cloth towel. Clean the towel after each use.

Getting Used to the Brace

The Skin Game

For the first few days, watch more closely for skin irritation or lots of soreness. If redness or numbness occur on the skin during the day, leave the brace off for 30 minutes and recheck the area. If the redness disappears during that time, your child is O.K.

Of skin breakdown (soreness, red or raw skin) does not go away, leave the brace off and call your orthotist immediately. You may need to leave the brace off for one day to allow your child's skin to heal. Make an earlier follow-up appointment with your orthotist if your child's brace or skin problems keep happening.

Where to check skin for redness?

Check the skin over boney areas such as the ribs and hip bone.

1. Watch the areas where the skin touches the edge of the brace.
2. Look for reddened areas, blisters and/or rashes.
3. Talk to your child about how the brace feels: ask if there is any severe pain, etc.

How to protect your child's skin?

It is important to prevent skin breakdown. Everyone's skin is different.

You will need to check the skin often. The skin under the brace also needs to be toughened up. These tips will help you win the skin game.

1. Bathe daily (bath or shower).
2. Apply rubbing alcohol with your hands to all parts of the skin that the brace covers. Pay close attention to any pink areas and to areas the brace presses against.
3. Wear a cotton undershirt, tubular knit without side seams. Girls often prefer a sleeveless tank top.
4. Do not use creams, lotions or oil-based powder. They soften the skin too much and can cause it to break down. Check with your orthotist to see if a non-oil-based powder may be used.
5. A loose brace moves around and will rub against your child's skin. This is another reason for your child to wear the brace as tightly as possible.
6. A dirty brace hurts your child's skin. Clean the brace daily.

Sometimes the skin over the waist and hips becomes darker. There is no reason to worry. This is common and is not a problem. When the orthotic treatment is over, this dark skin color will disappear.

Wear and Care of Your Brace

The Brace Game

It takes time to get used to an orthosis. It's a lot like breaking in new shoes. The following schedule lets your child gradually get comfortable with the brace. There are four stages. It might be helpful to think of them as the four bases of a baseball diamond. The goal is to run from base to base until you cross the home plate.

First Base

Your child's goal in reaching first base is to wear the brace for six straight hours. This is the first base on the way to winning. Here's the play-by-play for first base:

1. Put on the brace properly and have your child wear it for two hours.
2. Take the brace off and use the rubbing alcohol on your child's skin.
3. Check your child's skin.
 - If the skin is PINK, put the brace back on for two or more hours. Check the skin again. If it's still pink, put the brace on for a third two-hour period.
 - If the skin is RED or sore, leave the brace off for 30 minutes and then put on again.
4. You are the referee for your child. You will need to know the difference between pink and red skin. The orthotist will explain this to you when you first get your child's brace.
5. The first quarter usually can be played in five days.

Your child must be able to wear the brace for a full six hours before moving to second base. During the school year, this activity is easily done after school.

Second Base

Now it's time to move on. The goal for the second base is to wear the brace for a full 10-hour period. It may be hard to do this during school, so you will want to work with your child over the weekend.

Hopefully, it will take only two to three days to reach second base.

1. Start by putting the brace on for six hours. Check the skin and rub with alcohol.
2. Put the brace back on for another two hours. Check the skin again and give the alcohol rub. If all is in the "pink", repeat again. This will give you 10 hours.
3. If the skin is RED and sore at any time, call time-out. Wait 30 minutes before putting the brace back on.

Once you reach the goal of ten hours and touch the second base, you can enjoy an early seventh inning stretch. This means your child can try sleeping the brace. If your child can sleep in the brace as well as wear it during the day for 10 hours, then it's time make your way toward home.

Third Base

Your child is on the way to home plate. During the run to third base, your child's goal is to wear the brace for 16 hours.

1. You can all the next six hours in three steps of two hours. You can all them either during school or after school.
2. Always check the skin and use rubbing alcohol after each time period.
3. Getting to third base is a challenge. Many children are nervous about wearing the brace to school at first. You may want to start on a Monday after your child has worn the brace for a long time on a Sunday.
4. If all goes well, your child will land on third base in two or three days.

Home Plate

Now it's time to go for home plate and score the winning run. At home plate, your child will wear the brace the prescribed amount of time every day of the week, generally 20 hours per day.

1. Your child should be sleeping in the brace overnight. During the day, you add whatever added time is needed for wearing the brace.
2. When your child is out of the brace, you should care for the skin, wash the brace and do the exercises explained later in this handbook.
3. You should care for the skin at least twice more during the day.

The Game Plan

Here is a game plan that gets you to home plate. Try this schedule:

- Before bed: Wash the brace. While it dries, your child can do the exercises, take a bath or shower and you can give skin care. Put on a clean undershirt and put on the brace for the night.
- In the morning: Take the brace off for skin care. Put on another clean undershirt. Wear the brace for the day.
- Afternoon or after school: Take the brace off for skin care again. Put on a clean shirt and then put the brace back on.

Once your child is comfortable in the brace, continue to keep up the skin care routine. Do not slack off just because your child can wear the brace for longer periods.

On first, second or third base, you may loosen the brace during meals if needed. It is a good idea for your child to eat smaller portions more frequently. If your child eats too much at one time, he/she may feel sick. Eating without the brace can cause your child to throw-up. So, eat with the brace on and eat smaller meals more often.

Like any game or sport, you and your child will have to put in the time and effort to win. You are a winning team. Many others have done it and you can too. Please consider your orthotist and therapist as your coaching staff. They are always ready to help and encourage you.

Exercises (Physical Therapy)

Your therapist can show you and your child exercises to do when not wearing the brace. These exercises keep your child limber and keep the muscles from getting weak.

Doing the exercises right will make the brace feel much better to wear. These exercises are important. They are your physical therapy program. Exercises and the brace add up to winning results!

Clothing

Every team has a uniform. The most important part of your uniform will be the undershirt talked about earlier. Here are some other clothing tips to keep in mind:

- Loose fitting clothes will hide the brace better
- Pants will usually be one size larger than normal
- Pants with elastic waist bands or drawstrings may fit easier

Activity

What can your child do in the back brace? Well, how about gym, basketball, baseball, horseback riding, tennis, biking, etc. You can even swim in your brace if needed. Make sure you wash the brace with clean, fresh water if you swim in it.

When biking, you may need to raise the seat. Sometimes a brace can interfere with peddling. Check with your doctor or orthotist about specific activities. Your child should not see a back brace as something that will keep them from playing and having fun!

Organized competitive sports are not inconsistent with brace treatment in scoliosis. Generally, the physical demands of the sport will be restricted in the brace and areas of rubbing will be problematic. The brace may be discontinued for practices and competitions, seeking to keep brace wear at least 20 hours per day. Longer durations out of the brace should be “made up” on previous or subsequent days to allow at least 140 hours brace wear per week.