

INTRODUCTION

The Boston Soft Body Jacket (“B.S.B.J”) is an effective means of treating spinal deformities due to a variety of etiologies. Its use is enhanced when applying the principles of the team approach.

WHAT IT IS

The Boston Soft Body Jacket is a spinal orthosis, designed to make control more effective and comfortable for patients who cannot tolerate a rigid orthosis. The orthosis remains flexible while providing support with strategically placed reinforcements.

The Boston Soft Body Jacket is fabricated with the standard 3/16 inch foam liner and 1/8 inch high density foam outer shell. Interposed between the two layers of foam are a variety of 1/8 inch Co-polymer reinforcements. The reinforcements supply rigidity to the orthosis. Each orthosis may be customised by varying the thickness and material of the reinforcements. The orthosis is fabricated with a standard anterior opening but may be customised to accommodate any desired opening.



INDICATIONS FOR USE

- ◆ Neuromuscular Scoliosis
- ◆ Cerebral Palsy
- ◆ Myelomeningocele
- ◆ Muscular Dystrophy
- ◆ Postural Positioning
- ◆ Improve Seating
- ◆ Postoperative protection
- ◆ Pain Relief

CHARACTERISTICS OF THE BOSTON SOFT BODY JACKET

Adaptability to Patients

Due to the flexibility to the foam, and the ability to strategically place the reinforcing stays, the BSBJ can be used to treat a variety of etiologies.

Acceptability

In order to be effective, a brace must be accepted and worn by the patient. Due to its soft features, edge pressure on the patient is negligible. The BSBJ's external contours are aesthetically pleasing and are generally accepted by patients and parents. The Boston Softy Body Jacket is lighter in weight than a conventional TLSO.

Materials

The internal liner is made of 3/16 inch thermofoam. The external foam shell is made of 1/8 inch high-density thermofoam. The orthosis is flexible yet durable. In most cases, the inherent strength of the material used, together with the reinforcements in the brace, provide sufficient rigidity for support. Braces for patients with severe problems may require the use of stronger reinforcements.

Reinforcements can be either removable or permanent. **Removable reinforcements** can be cut to the desired length during the fitting stage. This allows the orthotist more flexibility in determining the finished trim lines.

Permanent reinforcements give the brace a better cosmetic appearance and require some additional measurements to be provided. The brace is available in 30 stock sizes and is fabricated with 0° or 15° of lumbar lordosis.

Head Support

An additional Head Support can be added to the Soft Body Jacket for those patients requiring a degree of head control. The Head Support is made with a 3/16 inch foam liner, internal reinforcement, and 1/8 inch high-density outer foam.

The Head Support is attached to an aluminium two piece posterior support and slotted into the posterior of the Boston Soft Body Jacket. It is easily removed if required. It offers both occipital and lateral support to stabilise the head.

The standard opening is Anterior, however, Bi-valved, Posterior, and Lateral openings are also available if required. Each brace is supplied with Velcro fasteners. The Velcro fasteners are double sewn onto Dacron material to provide sufficient strength to the straps. The Velcro fasteners are secured to the brace with 2 piece speedy rivets.

MEASURING, FITTING AND FABRICATION

Patient Evaluation by the Orthotist

Patient measurement and selection of an appropriate Boston Soft Body Jacket Module.

1. Fashion stockinette to the appropriate width and length to cover the patient, or use a cash shirt. The stockinette over the underwear preserves the patient's modesty and provides a sense of security.
2. Eliminate wrinkles in the stockinette or cast shirt, after it is applied to the patient.
3. The patient should be supine while measurements are taken. Snug circumferential measurements are taken of the hips (at the trochanteric level) waist and the chest at the xyphoid level. (See Fig 1)

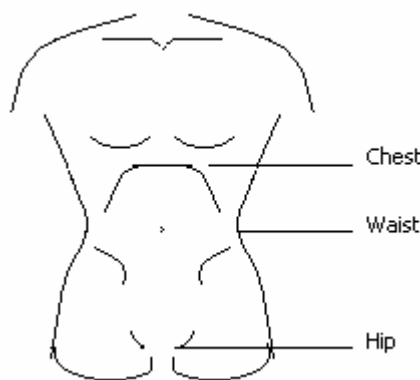


Fig.1

4. Select the module size from the size chart, with reference to the patient's data sheet. Refer to page 9 – 10 for size chart. However, it is important to point out that "Custom Made" Boston Soft Body Jacket can be fabricated on request. In these cases, all measurements on the Universal Spinal Measurement Form must be recorded together with the required degree of lordosis.

The standard sizes have been designed to minimise the number of custom-made braces needed. Orthotic facilities with considerable experience in fitting the Boston Soft Body Jackets have found that by carrying a reasonable inventory of stock modules, they are able to meet all their needs by performing minor adjustments to the standard sizes. Standard sizes have been found to work best in the Cerebral Palsy population.

5. The waist measurement is most important and should be used first to determine the proper size. Due to the flexibility of the modules, they can be 2 cm larger or smaller at the inferior and superior borders (i.e. hips smaller while the chest is larger, or vice versa).
6. In a Head Support is required, then circumferential and medial lateral measurements of the head are needed. These measurements should be taken 2 cm superior to the eyebrow level.

TRIM LINES

Lines are drawn on the module with a wax pencil or a whiteboard marker to indicate where the foam is to be cut away. There are referred to as the trim lines.

Standard Trim Lines

Anterior inferior Trim Lines is kept as low as the patient can tolerate. For Adolescents, the added length below allows the more growth without replacing the module and prevents the soft tissues from being pinched between the symphysis pubis and the brace. The midpoint should extend over the pubis when the patient is standing. The trim lines for the thighs allow just 90° of flexion for sitting on a firm chair. Depress the patient's thigh by inserting one finger between the brace and the thigh when the patient is sitting in this 90° position to determine whether the brace fits properly. See Figure 2. (The standard trim lines may be altered if more than 90° of hip flexion is necessary.)



FIG.2

Lateral Inferior

The standard lateral trim line flows from the anterior inferior line, passing approximately 1 cm above the top of the greater trochanter, flowing down to the posterior inferior line. See Fig. 3



Fig.3

Posterior Inferior

The standard posterior inferior trim line extends as low as possible, but not more than one finger width from the seat or a firm chair when the patient is sitting with hips flexed at 90°. Establishing this line too high will result in increased lumbar lordosis and often unsightly bulges of soft tissues. See Fig. 4.



FIG.4

Opening (Anterior/Posterior/Lateral):

The width of the opening should not be less than 2 cm or more than 5 cm when the brace is completed and should be vertical on the patient. See Fig.5

Fig.5

Anterior Superior Trim Lines (L.S.O.):

The standard anterior superior trim line is allocated at the base of the sternum to prevent impingement upon the xyphoid process. See Fig. 6.

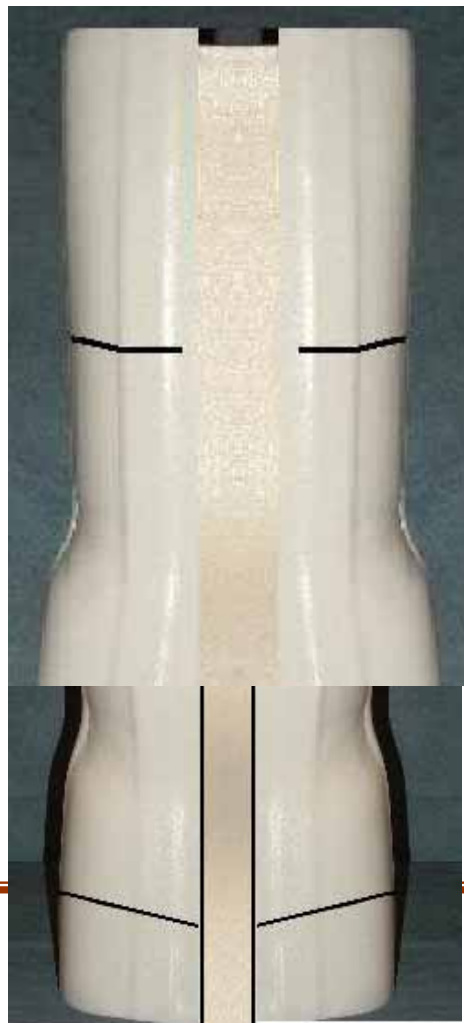


Fig.6

Anterior Superior Trim Lines (T.L.S.O.):

The standard anterior superior trim line originates 2.5 cm below the sternal notch. The trim line flows into the lateral trim line. See Fig 7.



Fig. 7

Posterior Superior Trim Line (L.S.O.):

The standard posterior superior trim line originates at the level of the eighth thoracic vertebra, just inferior to the scapula. The trim lines flow posterior/laterally to the xyphoid process anteriorly. See Fig. 8.



Fig.8

Posterior Superior Trim Line (T.L.S.O.):

The standard posterior superior trim line originates at the spine of the scapula. The trim line flows into the lateral trim line. See Fig. 9.



Fig.9

The Lateral Superior Trim Line

The standard lateral trim line originates 5 cm below the level of the axilla. (The patient should have full range of motion in the arms.) See fig.10



Fig.10

FABRICATION OF THE BRACE

1. Remove excess foam with scissors or an edge trimmer.
2. Establish smooth flowing lines using a belt sander. Fine sanding is necessary to prevent any nicks, which can lead to the foam tearing. See Fig.11 & 11A



Fig.11



fig.11

3. Cut copolymer reinforcements approximately 2.5 cm less than the inferior and 2.5 cm less than the superior trim lines of the brace. Round the ends of the reinforcements on a belt sander. Push the reinforcements into the brace between the two layers of foam until they are positioned 2.5 cm from the superior edge of the brace. Glue the inner and outer foam together. Reinforcements may be heated and shaped as needed. See Fig.12



Fig.12

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4. Set the opening of the brace, with the edges parallel, measure the distance between the centre of the anterior stays on either side of the opening. Select the appropriate length of fasteners and loops. Fig.13. Attach the fastener and loop at the waist level first using speedy rivets. Attach the other two fasteners and loops 1 cm from the superior and inferior edge of the reinforcements. Fig.13A



Fig.13A



Fig.13

Initial Patient Fitting

With the patient lying supine and knees flexed, slip the module around the body and position properly. Exert medial force on the module with your hands and force down on the iliac crests. The width of the anterior opening should not be less than 2 cm or more than 5 cm at top or bottom. The module should be taped on the initial fit.

Final Fitting

1. With the patient lying supine with knees flexed, slip the brace around the body and position properly.
2. Exert medial force on the module with your hands and force down on the iliac crests.
3. Secure the fasteners, middle first, then top and bottom.
4. With the fasteners secured, the opening should be no less than 2 cm or no more than 5 cm, vertical and parallel. The brace should be able to prevent any internal movement.
5. Sit the patient upright. The edges of the brace should not be uncomfortable in any area.
6. The inferior anterior edges of the brace should flow into the patient's sitting lines at the thigh when they are flexed at 90°. The interior posterior of the brace should not be touching the firm surface on which the patient is sitting.
7. The anterior superior edges of the brace should flow into the axilla, as should the posterior superior edge.
8. Remove the brace from the patient and check if there are any signs of the irritation.
9. When the fitting a head support to a soft body jacket:
 - a. Contour lower section of posterior support bar to patient profile.
 - b. Slide lower section into slot provided in posterior reinforcement.
 - c. Contour upper section of posterior support bar to lower section.
 - d. Attach upper section to lower section with screws.
 - e. Trim head support as required.

Aeration of the Brace:

In some parts of the world any apparel can become uncomfortable due to extreme heat. Wearing a brace in such extreme climates can become intolerable. Aerating the Soft Body Jacket will help make it more tolerable. It should be noted however that perforations weaken the brace slightly, so care must be taken not to drill too many holes.

- a. There should be no holes within 5 cm of the edges of the brace.
- b. There should be fewer holes in the areas of high stress.

Patient Hygiene

The Boston Soft Body Jacket should be cleaned daily with soap and water, and thoroughly rinsed, especially if patients have considerable incontinence, drooling or vesicostomes. A terrycloth towel can be used to dry the brace.

Skin Care

It is important to prevent skin breakdown, i.e. sore, red raw skin. To protect the skin, the patient should:

1. Bathe daily (bath or shower)
2. Apply rubbing alcohol to all parts of the skin that the brace covers, especially where the skin is pink, this is done to toughen the skin. (alcohol treatments should cease after two weeks)
3. Avoid the use of creams and lotions under the brace – they soften the skin.
4. Observe skin frequently when the brace is first used, looking for pressure areas.
5. Always wear a 100% cotton undershirt or a lycra-cotton blend, these should be tubular knit, with the side seams (Boston “T”)
6. If there is skin breakdown (sore, red, raw skin) the brace must not be re-applied until the skin heals – one day or more.

Size	Chest cm	Waist cm	Hips cm	Catalog Number	
				0 Degrees	15 Degrees
Juvenile					
J1	49	40	54	SSB-00J1	SBB-15J1
J2	51	42	58	SSB-00J2	SBB-15J2
J3	54	45	62	SSB-00J3	SBB-15J3
J4	56	47	64	SSB-00J4	SBB-15J4
Youth					
Y1A	55	51	66	SBB-00Y1A	SBB-15Y1A
Y1	56	46	67	SBB-00Y1	SBB-15Y1
Y2	60	47	71	SBB-00Y2	SBB-15Y2
Y2A	62	55	72	SBB-00Y2A	SBB-15Y2A
Y3	63	48	75	SSB-00Y3	SBB-15Y3
Y3A	69	57	78	SSB-00Y3A	SSB-15Y3A
Y4	64	51	79	SSB-00Y4	SSB-15Y4
Y4F	66	57	80	SSB-00Y4F	SSB-15Y4F
Y5	68	52	82	SSB-00Y5	SSB-15Y5
Y5F	68	58	82	SSB-00Y5F	SSB-15Y5F
Y6	73	56	84	SSB-00Y6	SSB-15Y6
Y6A	78	68	84	SSB-00Y6A	SSB-15Y6
Y7	69	54	86	SSB-00Y7	SSB-15Y7
Y7F	70	60	86	SSB-00Y7F	SBB-15Y 7F
Y7A	73	69	86	SSB-00Y7A	SBB-15Y 7A
Y8	75	58	88	SSB-00Y8	SBB-15Y8
Y8F	75	64	88	SSB-00Y8F	SBB-15Y8F
Y8A	83	72	90	SBB-00Y8A	SBB-15Y8A
Y9	72	60	92	SSB-00Y9A	SBB-15Y9
Y9F	78	68	92	SSB-00Y9F	SBB-15Y9F

Size	Chest cm	Waist cm	Hips cm	Catalogue Number	
				0 Degrees	15 Degrees

Adolescent					
A1	76	62	94	SSB-00A1	SSB-15A1
A2	84	70	94	SSB-00A2	SSB-15A2
A2A	75	66	96	SSB-00A2A	SSB-15A2A
A3	80	68	97	SSB-00A3	SSB-15A3
A4	88	76	97	SSB-00A4	SSB-15A4
Soft Boston Overlap Brace					
1	66	51	71	SSB-001	SSB-151
1D	58.5	45	71	SSB-001D	SSB-151D
2	71	61	76	SSB-002	SSB-152
2D	63.5	51	76	SSB-002D	SSB-152D
3	76	71	81	SSB-003	SSB-153
3D	74	66	81	SSB-003D	SSB-153D
4	84	76	86.5	SSB-004	SSB-154
4D	69	58.5	86.5	SSB-004D	SSB-154D
5	89	81	91.5	SSB-005	SSB-155
5D	76	66	91.5	SSB-005D	SSB-155D
6	94	86.5	96.5	SSB-006	SSB-156
6D	84	74	96.5	SSB-006D	SSB-156D
7	99	91.5	101.5	SSB-007	SSB-157
7D	91.5	81	101.5	SSB-007D	SSB-157D
8	109	96.5	109	SSB-008	SSB-158
8D	91.5	84	109	SSB-008D	SSB-158D
9	114	100	114	SSB-009	SSB-159
9D	94	87	114	SSB-009D	SSB-159D
10	117	104	117	SSB-0010	SSB-1510
10D	101	96	117	SSB-0010D	SSB-1510D