



Boston 3D Boston Night Shift



Boston 3D - Anterior



Boston 3D - Sagittal



Boston 3D - Transverse

#### Boston 3D® Scoliosis Brace

The Boston 3D® is the next innovation in the non-operative treatment of idiopathic scoliosis. Our clinical experts have combined knowledge of the three-dimensional scoliosis curvature with the latest in shape capture and CAD/CAM technologies. This enhanced brace design comes from the unique and selective shift/push/relief combination of corrective forces that are fabricated into each brace.

#### How the Boston 3D Works

Scoliosis is a three dimensional deformity, and the Boston 3D orthosis works to correct the spine in all three planes—coronal, sagittal and transverse. The custom-made Boston 3D features an improved brace design with a unique shift/push combination of forces that move the spine into a corrected position. Additional space is provided for rotational correction and breathing mechanics.

#### Custom Fabricated Using CAD/CAM Technology

To ensure maximal curve correction, the Boston 3D is custom designed for each individual patient. Shape capturing technology (scans) and precise measurements of the patient are obtained to create a three dimensional CAD/CAM model. Systematic analysis of the X-ray is performed to optimize the corrective forces (push/shift) creating an asymmetrical shape, while optimizing sagittal plane balance. The corrective forces are created in conjunction with open/void areas that allow for easier breathing mechanics.

#### **Boston 3D Results and Outcomes**

Patient outcomes are very important to Boston Orthotics & Prosthetics. Initial in-brace X-rays (X-rays with the brace on) show that most patients achieve greater than 50% correction of the primary curve when wearing the Boston 3D. The combination of in-brace curve reduction and adherence to the prescribed wear schedule has been shown in multiple studies to reduce the risk of curve progression. To aid in brace wear adherence, all Boston 3D braces are equipped with the iButton thermal sensor.

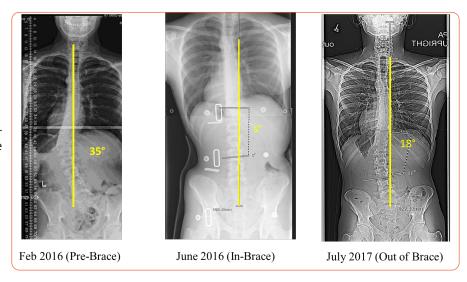
Art.no	Model
BOP-3D-F-01	Standard white
BOP-3D-F-02	Colour sheet
BOP-3D-F-03	Random pattern
BOP-3D-F-04	Logo spot

All Scoliosis Brace are available with the iButton. For order please add -IB at the end of art.no. See example (BOP-3D-F-01-IB) More information at www.embreis.com

# Bracing Results for Boston 3D®

# Outstanding Curve Correction with the Boston 3D®

Patient outcomes are very important to Boston Orthotics & Prosthetics. Our bracing outcomes are determined by comparing an X-ray before bracing with an in-brace X-ray, followed by an out-of-brace X-ray usually after the bracing is complete. Most patients achieve greater than 50% correction of the primary curve when wearing the Boston 3D® according to the prescribed wear schedule.



#### Curve Correction is Better Than the Boston Original

SINGLE CURVE							
Thoracic Thoracolumbar							
3D	Original	3D	Original				
57%	52%	62%	55%				
	DOUBL	E CURVE					
Prima	Primary curve Secondary Curve						
3D	Original	3D	Original				
51%	47%	58%	45%				

The charts above show the average curve correction for the Boston 3D compared to the Boston Original for thoracic and thoracolumbar curves in single and double curves.





# **Boston Night Shift Scoliosis Brace**

The Boston Night Shift is a nocturnal brace used in the non-operative treatment of idiopathic scoliosis.

A nighttime brace takes advantage of the recumbent position. Some studies suggest that most growth occurs at night. For some curves, nighttime wear has shown to be as effective as full-time (more than 14 hours per day).

The Boston Night Shift has built-in correction in all three planes of motion. Since gravity is not working against us, the internal pushes do not have to work so hard. It applies direct, opposing forces to straighten curves.

Because wearing a brace all day can be tough for young teenagers, having the option of wearing a brace at night tends to improve compliance to prescribed wearing time.

#### **Features**

- Built-in pushes to control curves
- · Worn only while sleeping
- Used for weaning out of a bracing program
- Brings the curve to balance, does not over-bend the spine
- Custom-made from cast, scan or measurement

Art.no	Model
BOP-NS-F-01	Standard white
BOP-NS-F-02	Colour sheet
BOP-NS-F-03	Random pattern
BOP-NS-F-04	Logo spot

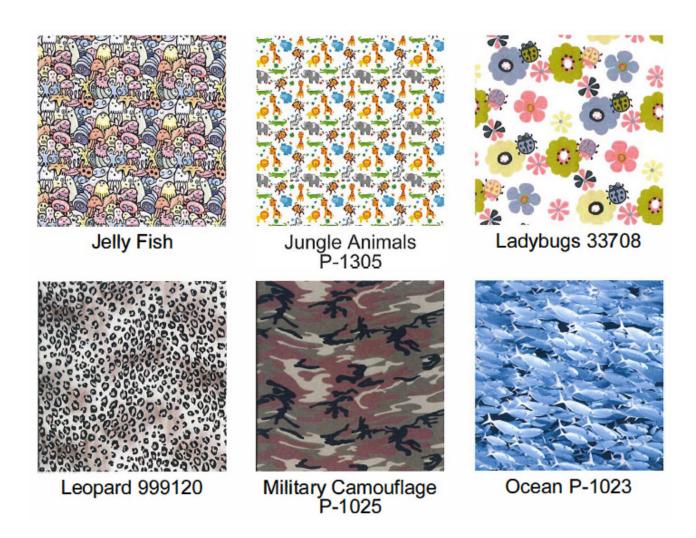
All Scoliosis Brace are available with the iButton. For order please add -IB at the end of art.no. See example (BOP-NS-F-01-IB) More information at www.embreis.com



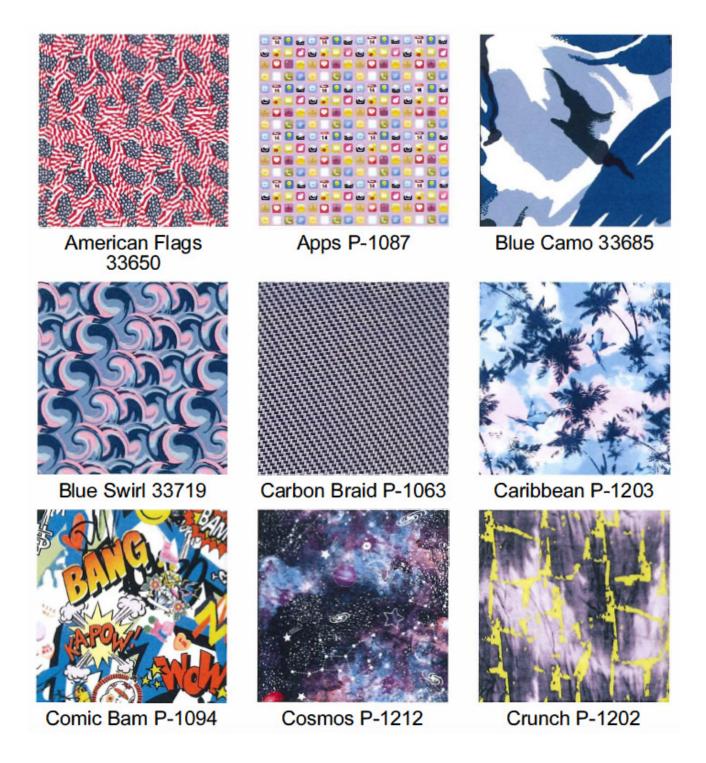
#### **Customize Your Scoliosis Brace**

You can customize the scoliosis brace using any of the standard decorative transfer patterns we have available. There is also a online tool were you can see, test and print all pattern. Here is the link https://www.bostonoandp.com/transfers/brace/

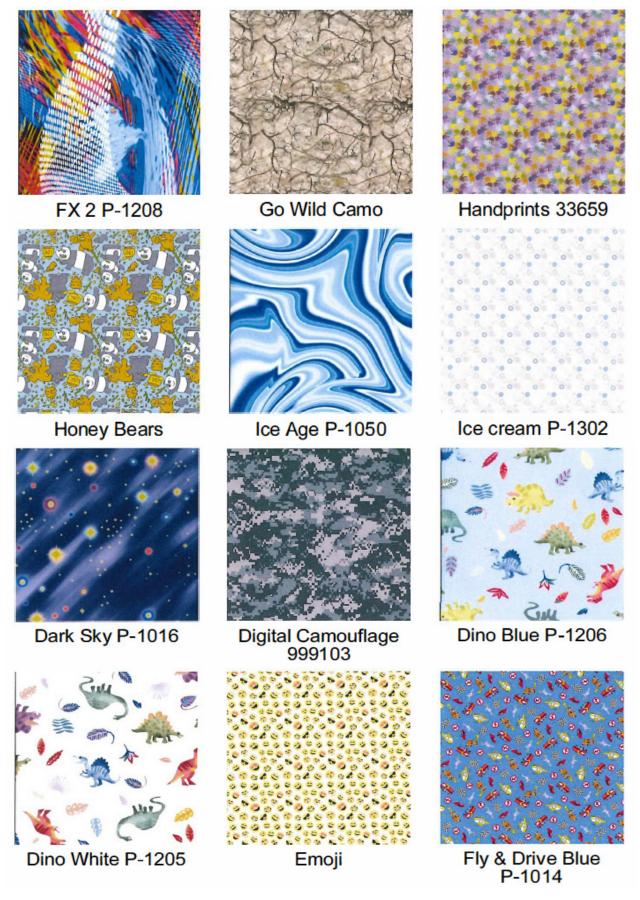
\*Please note that this online tool and prints serves as a general representation of what a Boston O&P scoliosis brace will look like after a transfer is selected. The size of the transfer on the brace and printer colors vary, so printouts using the online tool should not be considered exact replicas of either the transfer or the brace.







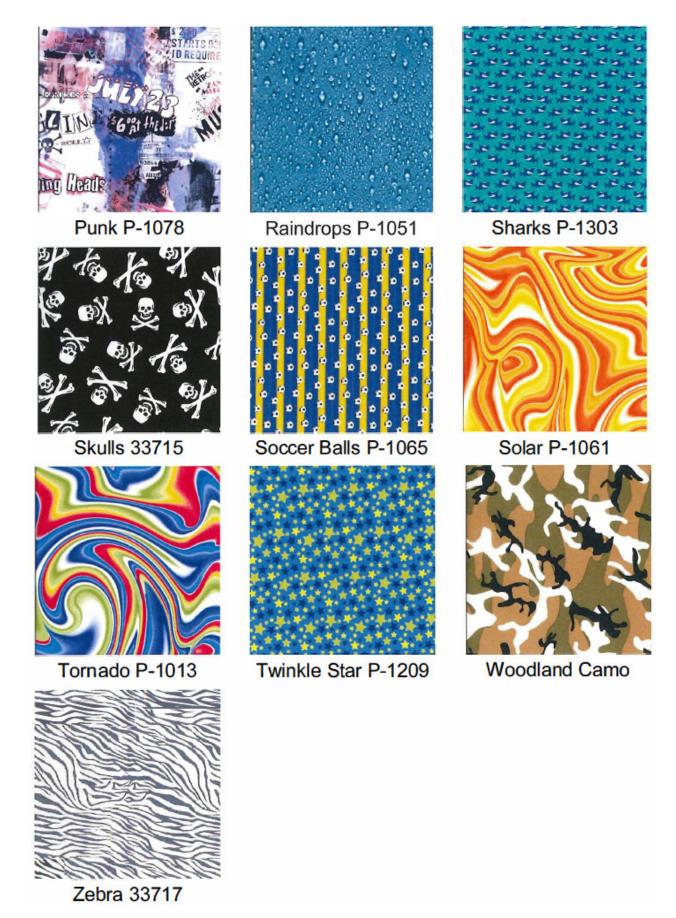






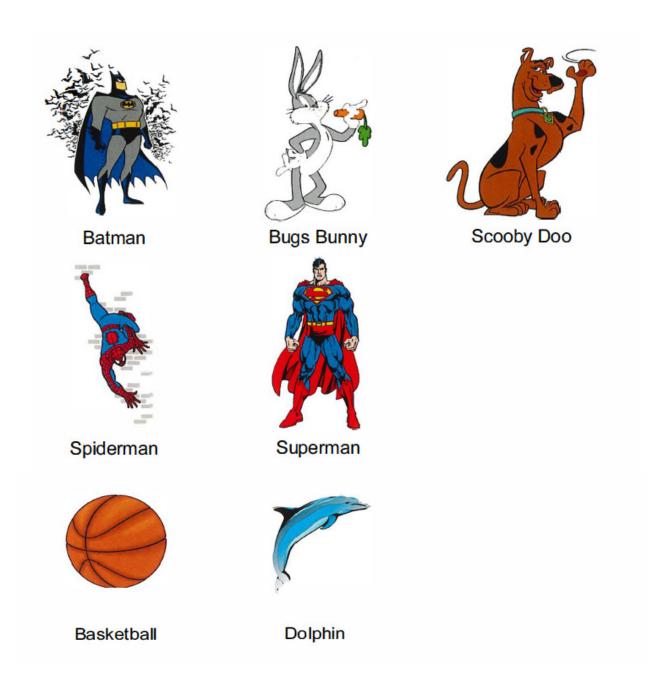












	Boston 3D C	Order Fo	rm
Date:	Due Date:		Contact:
Ship To:	Account:		Phone:
Address:	PO#:		Fax:
City: State: Zi	p: Ship Via:		Email:
Patient Name:			First Time Wearer: ☐ Yes ☐ No If no, specify Troch/Axillary
Array Saura III.( )	Att (II.)		Axillary Extension: Left Right
	Wt:(kg) Diagnosis:		Troch Extension: ☐Left ☐Right
**Bivalve scans require measurements below  Circ. M/L A/P	<u>Measureme</u>	Scan La	abel:
$\wedge$	Spine of Sca	p	Lumbar/TL Thoracic
Axilla	Axilla Inf. Ang. Sc	ар	Edition/TE Thoracic
			Apical vertebra
Xyphoid	Waist		Cobb angle
	Gluteal Fold		Scoliometer reading
	V.		Chart completion <b>Necessary</b> for brace fabrication
Waist	Д Хур	ohoid	
			<b>Scoli T's</b> (Customer Service will determine the right size for your patient based off the measurements
Pubis	\\\		provided)  White Single Quantity:
Trochanter	Waist	hia	☐ Silver ☐ Double Quantity:
	X   X   Pu	bis ASIS anterior la	teral relief
Opening Liner P	lastic Transfer	Pads	Gusset: Straps iButton
□ Posterior □ 3/16" aliplast □ 5/32" o		5" Installed	□ No □ White Send □ Yes □ No
☐ Anterior ☐ Unlined ☐ Other:		_	iButton  □ Voc □ Black
☐ 1/8" Partial liner		☐ Other:	Drill Hole Tyes No in Plastic
Lumbar Reinforcement:   Yes	□ No		Foam cut out only
CLINICIA	N ↑	BOSTON	D&P ↓
<u>Lumbar / TL</u>	CAD specs determined by	Boston O&P	Thoracic Extension
☐ Left ☐ Right			☐ Left ☐ Right
TL Extension: Yes No	Apex	- <b>Apex</b> cm	
		LEV*	Height cm
Height			
cm	LEV*	cm	
cm	*Lower End Vertebra		
<b>Axillary Modifications</b>	<u>Finish Heights</u>	(from waist)	Notes:
☐ Left ☐ Right	Xyphoid: Axilla	:	
☐ Outset Axilla: mm		ngle Scap:	
	Seat:		
Inset Axilla:mm		Troch Left	
└ Posterior Extension: ☐ Yes ☐ No		Right	
			Rev. 40 7/20

	Bos	ton Night	Shift Orc	der Form	
Date:		Di	ue Date:	Contact	:
Ship To:		Ad	ccount:	Phone:	
Address:		PC	D#:	Fax:	
City:	State:	Zip: Sh	nip Via:	Email:	
Patient Name:					<u>Impression</u>
	Ht:(cm)	NA/tr/Len)	Diagraphic		Scan Standing
Age: Sex:		Wt:(kg)	Diagnosis:		Measure only
Scan Label:			nts (cm) in Supine	Prev	rious Wearer: Yes No
Circ. M/L  Axilla  Xyphoid  Waist  Trochanter	Pubis		Xyphoid Pubis	Axilla	Spine of Scap  Inf Angle Scap  Waist  Troch
Lordosis		ominal Shape	Ma	<u>terials</u>	<u>Transfer</u>
☐ Match scan/cast	<ul><li>☐ Neutral</li><li>☐ Match so</li></ul>	can/cast	☐ 1/8" copoly	☐ 1/4 "aliplast	Brace:
☐ 15 degrees		all □ Medium □ Large	☐ Other:	Other:	☐ Tongue: <b>1/16" PE</b>
Other:		red, please include A/P hoid, waist and pubis			
Brace	Design	noid, waist and pubis	Finish Heights in CM	(from waist)	Scoli T's (Customer Service will
	<b>_</b> _	Anterio		<u>Lateral</u>	determine the right size for your patient based off the measurements provided)
Axilla:	☐ Left ☐ Rig	ght Xyphoid:	Axilla:		☐ White ☐ Single
Thoracic Extension:	☐ Left ☐ Rig	Posteri	Thoraci		☐ Silver ☐ Double ☐ Quantity:
Lumbar:	P S S Pad 1/2" [P S [P	Angle Scapula  Straps:  Whi	□ Vos □ No		_ Notes:
Trochanter Extension: Thoracic Relief:	☐ Left ☐ Rig	Foam c			Rev. 21 8/20
				¥	Kev. 21 8/20

# **Boston 3D Order Form Instructions**

Reminder – this form is for the technicians and goes with the flow of fabrication. All items on this form need to be completed to ensure customer service and manufacturing are able to fabricate the desired orthosis.

PLEASE DO NOT use this as your clinical note.

An audio review of this document is available at: <a href="https://vimeo.com/418561786">https://vimeo.com/418561786</a>

#### **Demographics:**

Date:		l		Due Date:	Contact:	
Ship To:				Account:	Phone:	
Address:				PO#:	Fax:	
City:	State:		Zip:	Ship Via:	Email:	

Customer service uses this section to initiate the fabrication process. All of the above is entered into our system. In the event we need to contact you, the treating orthotist, or if you have a question on the fabrication, having this information entered allows for easy retrieval.



#### Patient Name, Age, Sex, Height, Weight, Diagnosis

We will keep a secondary record for you showing the patient's age, sex, height and weight as well as the diagnosis. This information may assist in justifying a new orthosis.

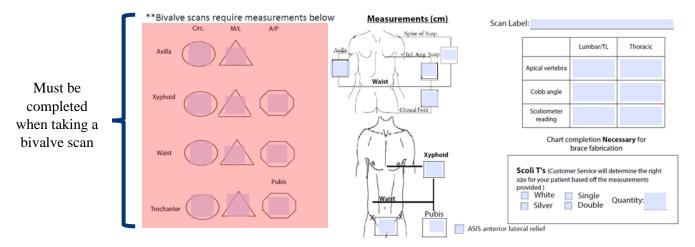
Make sure the patient's name is legible.

Age and Sex are needed to complete our records in the event you need the manufacturing record. Height is broken down into feet and inches to ensure proper record keeping. Weight is requested to be in pounds. Diagnosis is needed to complete records.

#### **First Time Wearer:**

Indicate if this is the first scoliosis brace for the patient. If it is a first brace, check yes, and proceed to the measurements section. If it is not the first brace, indicate the current placement of the Axillary and Troch Extensions. This will allow the CAD team to know if a brace design change will occur so they can notify the fitting clinician.

#### **Measurements:**



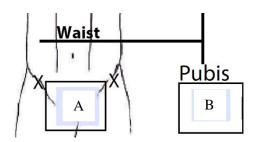
We no longer require circumferential, ML, AP or linear measurements when taking a <u>single standing scan</u> of the patient. This includes the ASIS to ASIS measurement.

If taking a <u>bivalve scan</u>, <u>all measurements are required</u>: circumferential, ML, AP and linear measurements to the anatomical landmarks.

#### **Linear Measurements**

Linear measurements are to the anatomical landmark regardless of scan type. The axilla measurement is to the maximum height under the arm needing an axillary extension. If, as is the case of a Thoracolumbar curve, the axilla may be well below the maximum axillary measurement, please provide the maximum height to assist in fabrication. The finish height section will assist in determining the finish measurements.

#### **ASIS** measurements



If ASIS to ASIS linear measurement (A) is provided, using a cloth tape measure to follow the patient's body contours is recommended.

Waist to pubis measurement (B) is measured using the linear measuring device.



#### **ASIS** anterior lateral relief



ASIS anterior lateral relief box is checked for patients requiring additional relief at the anterior lateral aspect of their ASIS.



#### Scan label

Scan Label:
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Scan label is required to make sure the correct scan is modified.

Captevia: File name is auto-populated. The file will include both scans if taking a bivalve scan.

Laser scanner: Patient's first initial, last name; scan number; clinicians' initials; the word scoli; date of scan

i.e. patient John Smith is seeing clinician Jane Doe on April 1, 2020 for his first brace.

Scan Label: jsmith#1jdscoli04012020

Bivalve scan: Follow the sequence above and add \_ant and \_post after the date jsmith#1jdscoli04012020\_ant; jsmith#1jdscoli04012020\_post

All other linear measurements are needed for fabrication and design.

#### **Clinical Measurements**

	Lumbar/TL	Thoracic
Apical vertebra		
Cobb angle		
Scoliometer reading		

Chart completion **Necessary** for brace fabrication

The above chart must be fully completed to monitor outcomes and provide guidance for shift/push magnitudes. Please indicate the numerical values for Apical vertebra, Cobb angle, and scoliometer reading in the designated box. Apical vertebra: denote the apical vertebra for the curve(s) (Example- T9 or L3). Cobb angle: indicate the angle of the selected curve(s) in degrees (Example: 35deg). Scoliometer reading: document your findings from the scoliometer reading to determine the degree of rotation of the curve(s) (Example: 9 deg). Both the Cobb angle measurement and the scoliometer reading will help to determine the push magnitude built into the brace.

#### Scoli T's

Scoli T's (Custor	mer Service will	determine the right
size for your patien	nt based off the	measurements
provided)		
White	Single	Ouantitus
Silver	Double	Quantity:

Indicate if you are providing the patient with a Boston Scoliosis T shirt. There are a few options.

Standard or silver (note that the silver is not to be worn when being x-rayed). Also, there are two underarm flaps or a single. The T-shirts do not have a front or back, so a single axilla can be left or right. The size is determined from the submitted measurements.

#### **Boston 3D design**

<u>Liner</u>	Plas	<u>stic</u>	<u>Pads</u>	<b>Opening</b>	<u>Transfer</u>	Gusset:	<u>Straps</u>	<u>iButton</u>
3/16" aliplast	<b>■</b> 5/32" co	poly	.5" Installed	Posterior	Brace:	Yes	■ White	Yes
Unlined	Other:		.5" un-installed	Anterior		■ No	■ Black	■ No
1/8" Partial liner Lumbar Reinforcem		□ No	Other:					■ Foam only

#### **Liner and Plastic:**

Standard liner choice is 3/16" aliplast. Unlined provides the most low-profile orthosis. The partial liner consists of 1/8" foam just superior and inferior to the waist. Crest rolls are included. Plastic is 5/32" copoly. We find that this works for 90% of the patient population. If a different plastic choice is desired, write it in the "Other" section.

#### **Lumbar Reinforcement:**

The lumbar reinforcement is defined as a built-in corrugation positioned superior to inferior just lateral to the posterior opening that assists in maintaining the lumbar push. When treating patients with a higher BMI, an unlined or partially lined brace where primary lumbar control is needed, a reinforcement may be necessary.



#### **Pads**

Pads are pre-trimmed and skived per the curve pattern and brace design. Pads may be pre-installed to ease the fitting process. Let us know how you want to receive your .5-inch pads.

#### **Opening**

There are two options for the opening – anterior or posterior. Let us know your patient's preference.

#### **Transfer:**

Patients may choose their transfer using the Boston O&P transfer tool. (https://www.bostonoandp.com/transfers/brace/). Write the brace *transfer name* in this section.

#### **Gusset:**

The gusset is an elastic cover for the window. If a gusset is chosen, the color will match the strap choice.

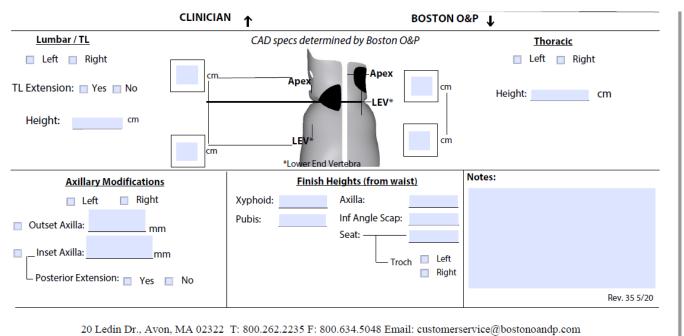
#### **Straps:**

Standard straps are white. Indicate the color of the straps requested by the patient. Strap transfers are no longer an option here as they decrease the life and integrity of the straps.

#### iButton:

The iButton adherence monitor is standard of care for the Boston Brace 3D. Indicate if the patient/parent agree to have the iButton installed or not. Note: The iButton needs to be activated (launched) at the time of fitting. Software is available to launch and download iButton data.

# The section below is your choice – Boston O&P can complete this section or you can specify the brace design



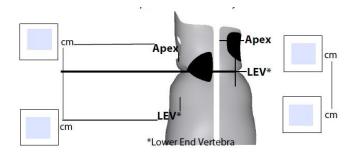
#### Lumbar/Thoracolumbar (TL); Thoracic

Indicate the side of the curve, left or right. If a lumbar or thoracolumbar curve does not exist, leave this section blank.

#### **Thoracolumbar (TL) Extension:**

Indicate if a TL extension is needed. For TL curves where the vertebral bodies that make up the curve are all to the left or right of the CSL, a TL extension is recommended to help with the coronal plane correction. A TL extension is also recommended for a single thoracic curve with a compensatory lumbar curve that is linearly deviated from the CSL to the opposite side of the thoracic curve. The extension in this case acts as a hold to prevent the lumbar curve from further shifting away from CSL. Height indicates the mid-sagittal length from waist.

#### **Schematic drawing**

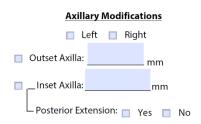


After blue printing the x-ray, transfer the linear distances from waist to apical vertebra and lower end vertebra (bottom of the curve) for both the TL/L curve and Thoracic curve. If no curve exists, NA is added to the boxes.

#### **Thoracic Extension:**

This is the length from waist to the midline (the midpoint of the Anterior/posterior dimension of the patient) of the rib corresponding to the apical vertebra. Always evaluate your patient and using your hands, verify the height of the extension. There are times, in larger more linearly deviated curves, that the extension may be above the midpoint of the apical rib. The height of the extension is determined by analyzing both the radiograph and clinical presentation of the patient. Height indicates the midsagittal length from waist.

#### **Axillary Modifications:**





The axillary modifications consist of either an outset or inset axilla. The inset axilla may also be coupled with a posterior extension. Indicate left or right side.

#### **Outset Axilla**

Used in thoracolumbar and low (T11 presenting like a thoracolumbar) thoracic curves when the patient is decompensated to same side as the curve. It consists of a lateral (under arm) section. It provides a counter force to the primary thoracolumbar extension but does not restrict the patient from shifting in the coronal plane. The height is at the level of the inferior angle of scapula.

#### **Inset Axilla**

Used for single thoracic and double curves. The under-arm section generates a medially directed vector and is rectangular in shape to allow for a large window relief. Useful when a medially directed vector is needed for decompensation and/or the patient presents with a high waist and short torso and additional height of the thoracic window is needed.

#### **Posterior Extension**

The posterior portion controls shoulder rotation and is trimmed 3cm superior to the axillary height. It is useful when the patient presents with a posteriorly rotated shoulder girdle

#### Finish heights from waist:

#### Finish Heights (from waist)

Xyphoid:	Axilla:		
Pubis:	Inf Angl	e Scap:	
	Seat: —	<del></del> -	
		Troch	Left Right

Finished heights have been reorganized and simplified. They go from lateral to posterior to anterior (all superior to inferior). All measurements are in centimeters. The anatomical lengths provided above are used for modifying the scan. These measurements are used to finish the orthosis.

#### **Notes**



In the event a special request is made by the patient, or there is some unique anatomy or brace design needed that is not captured in the above sections, the notes section is where you may document this information.

# **Boston Night Shift Order Form Instructions**

Reminder – this form is for the technicians and goes with the flow of fabrication. All items on this form need to be completed to ensure customer service and manufacturing are able to fabricate the desired orthosis.

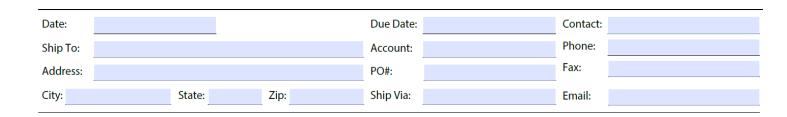
PLEASE DO NOT use this as your clinical note.

This form is for the fabrication of the Boston Night Shift orthosis.

All items in bold are required and represent the recommended standard.

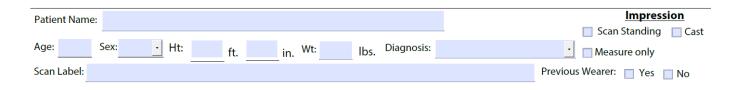
The iButton is standard of care for our scoliosis patients. Discuss this with the parents/caregiver.

An audio review of this document is available at: Boston Night Shift Order Form Instructions Demographics:



Customer service uses this section to initiate the fabrication process. All of the above is entered into our system. In the event we need to contact you, the treating orthotist, or if you have a question on the fabrication, having this information entered allows for easy retrieval.

#### Patient Name, Age, Sex, Height, Weight, Diagnosis:



We will keep a secondary record for you showing the patient's age, sex, height and weight as well as the diagnosis. This information may assist in justifying a new orthosis.

Make sure all information is legible.

Age and Sex are needed to complete our records in the event you need the manufacturing record. Height is measured in cm. Weight is requested to be in kg. Diagnosis is needed to complete records.

		_
Scan	laha	л.
Scall	lant	

	Scan Label:	
Scan	Scan label is required to make sure the correct scan is modified.	
Captevia: File name is auto-populated. The file will include both scans if taking a bivalve		

Captevia: File name is auto-populated. The file will include both scans if taking a bivalve scan.

Laser scanner: Patient's first initial, last name; scan number; clinicians' initials; the word scoli; date of scan

i.e. patient John Smith is seeing clinician Jane Doe on April 1, 2020 for his first brace.

Scan Label: jsmith#1jdscoli04012020

Bivalve scan: Follow the sequence above and add \_ant and \_post after the date

Anterior section: jsmith#1jdscoli04012020\_ant Posterior section: jsmith#1jdscoli04012020\_post

#### **Impression**

# Impression Standing C

🔲 Scan Standing 🔲 Cast

Measure only

Indicate how the patient's shape was captured. A standing scan is preferred. Please follow our scanning instructions.

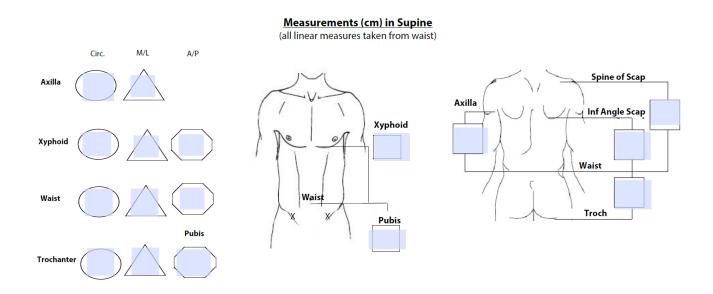
#### **Previous Wearer:**

Previous Wearer: Yes No

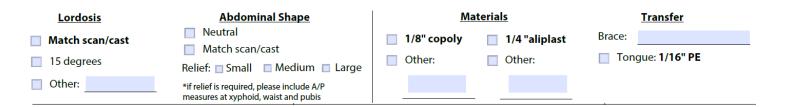
Let us know of the patient has worn a night time brace before. If so, our technicians will notify you if there is a design change.

#### **Measurements:**

All Circumferential, ML, AP and linear anatomical measurements are required. We recommend taking these measurements in supine.



#### **CAD modification/ Brace Materials**



#### **Lordosis:**

The standard is to match the patient's lordosis as captured in the scan. The goal is sagittal balance, so minor adjustments may be made in CAD. Let us know the desired lordosis for your patient.

#### **Abdominal Shape:**

We do not provide any abdominal compression. Neutral would be a flat/convex abdomen dictated by the patient's measurements/shape. If a scan (recommended) or cast is provided, we will match the presentation.

The relief is relative to the patient's size. The small, medium and large is to provide guidance to our CAD technicians. Provide AP measurements at the xyphoid, waist and pubis if a relief is requested.

#### **Materials:**

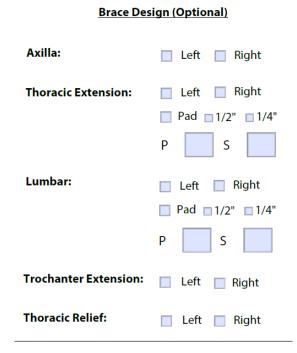
1/8-inch co-poly and ¼ inch aliplast are the standard plastic/liner for the Night Shift. If your patient requires something different, indicate the thickness and plastic/foam type required.

#### **Transfer:**

Patients may choose their transfer using the Boston O&P transfer tool. (https://www.bostonoandp.com/transfers/brace/). Write the brace *transfer name* in this section.

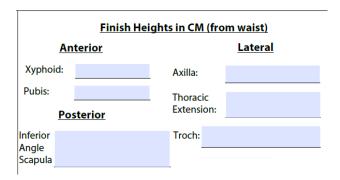
Indicate if a tongue is requested.

#### **Brace Design: Optional**



The brace design is determined by the x-ray blueprint and the patient presentation. This section is optional. Our CAD technicians will complete. The P and S boxes are for internal communication.

#### **Finish Heights**



All finished heights are to be in CM and are taken from the waist.

#### **Straps:**

Straps:	White	■ Black
Juaps.	MAILICE	Diack

Standard straps are white. Indicate the color of the straps requested by the patient. Strap transfers are no longer an option here as they decrease the life and integrity of the straps.

#### iButton:

# Send iButton Send iButton Orill Hole in Plastic Foam cut out only

The iButton adherence monitor is standard of care for the Boston Brace 3D. iButtons may be transferred to a patient's subsequent brace.

Indicate if an iButton is to be sent with the brace.

If the patient has an iButton, and just needs to have the hole drilled into the brace, check no to send the iButton, and yes to drill a hole in the plastic.

If you only want the foam removed from the brace, regardless of whether an iButton is to be sent or not, and no hole drilled into the plastic, check the foam cut out only.

#### Scoli T's:

<b>Scoli T's</b> (Customer Service will determine the right size for your patient based off the measurements provided)			
<ul><li>☐ White</li><li>☐ Single</li><li>☐ Double</li></ul>			
Quantity:			

Indicate if you are providing the patient with a Boston Scoliosis T shirt. There are a few options.

Standard or silver (note that the silver is not to be worn when being x-rayed). Also, there are two underarm flaps or a single. The T-shirts do not have a front or back, so a single axilla can be left or right. The size is determined from the submitted measurements.

#### **Notes**



In the event a special request is made by the patient, or there is some unique anatomy or brace design needed that is not captured in the above sections, the notes section is where you may document this information.



### Links and more information

- Customize Your Scoliosis Brace https://www.bostonoandp.com/transfers/brace/
- Order Instructions Boston 3D https://vimeo.com/443425964
- FAQ Boston 3 D https://www.bostonoandp.com/faq/boston-3d/
- Order Instructions Boston Night Shift https://vimeo.com/454450212
- Boston O & P Education https://vimeo.com/user112919953

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