

Lumbosacral Orthoses

Chairback brace

The chairback brace, shown below, is a short, rigid lumbosacral orthosis (LSO) with 2 posterior uprights that have thoracic and pelvic bands. The abdominal apron has straps in front for adjustment in order to increase intracavitary pressure. The thoracic band is located 1 inch below the inferior angle of the scapula. The thoracic band extends laterally to the midaxillary line, and the pelvic band extends laterally to the midtrochanteric line. Place the pelvic band as low as possible without interfering with sitting comfort. Position the posterior uprights over the paraspinal muscles. Uprights can be made from metal or plastic. The brace uses a 3-point pressure system and can be custom molded to improve the fit for each patient. The chairback brace costs approximately \$440.



Chairback brace (side view).

Indications for the use of a chairback brace include the following:

- Unloading of the intervertebral disks and the transmission of pressure to soft-tissue areas
- Relief of low back pain (LBP)
- Immobilization after lumbar laminectomy
- Kinesthetic reminder to the patient following surgery

Motion restrictions associated with the chairback brace include the following:

- Limits flexion and extension at the L1-L4 level
- Minimally limits rotation
- Limits lateral bending by 45% in the thoracolumbar spine

Chairback Ortho-Mold brace

The chairback Ortho-Mold brace is similar to the chairback brace, but it has a rigid plastic back piece custom-molded to the patient. The plastic back can be inserted into the canvas-and-elastic corset. The chairback Ortho-Mold brace costs approximately \$500-\$600.

Indications for the use of a chairback Ortho-Mold brace and its motion restrictions are the same as the chairback brace noted above.

Williams brace

The Williams brace is a short LSO with an anterior elastic apron to allow for forward flexion. Lateral uprights attach to the thoracic band, and oblique bars are used to connect the pelvic band to the lateral uprights. The abdominal apron is laced to the lateral uprights. The brace limits extension and lateral trunk movement but allows forward flexion. The Williams brace costs approximately \$500.

The brace is indicated for the treatment of spondylolysis and spondylolisthesis, being used to provide motion restriction during extension. The device is contraindicated in spinal compression fractures.

Motion restrictions of the Williams brace include the following:

- Limits extension
- Limits side bending at the terminal ends only

MacAusland brace

The MacAusland brace is an LSO that limits only flexion and extension. This brace has 2 posterior uprights but no lateral uprights. The 3 anteriorly directed straps connect with the abdominal apron to provide increased support. The MacAusland brace costs approximately \$510.

Indications for the use of a MacAusland brace are similar to those for the chairback brace. (See the indications for the chairback brace.) Motion restrictions include limitation of flexion and extension at the L1-L4 level.

Standard lumbosacral orthotic corset

The standard lumbosacral orthotic corset has metal bars within the cloth material posteriorly that can be removed and adjusted to fit the patient. The anterior abdominal apron has pull-up laces in the back that are used to tighten the orthosis. The abdominal apron can come with a Velcro closure for easy donning and doffing. The corset, which increases intracavitary pressure, has a lightweight design and is comfortable to wear. Anteriorly, the brace covers the area between the xiphoid process and the pubic symphysis. Posteriorly, it covers the area between the lower scapula and the gluteal fold. The average cost of the corset is approximately \$150.

Indications for the use of a standard lumbosacral orthotic corset include the following:

- Treatment of LBP
- Immobilization after lumbar laminectomy

Motion restrictions associated with the corset include the limitation of flexion and extension.

Rigid LSO

The rigid LSO, shown below, is a custom-made orthosis that is molded over the iliac crest for an improved fit. Plastic anterior and posterior shells overlap for a tight fit. Velcro closure in the front is designed for easy donning and doffing. Multiple holes can be made for aeration to help decrease moisture and limit skin maceration. The rigid LSO can be trimmed easily to make adjustments for patient comfort, and it may be used in the shower if necessary. A rigid LSO costs approximately \$500-700.



Custom made plastic lumbosacral orthosis (LSO) with hip spica. Indications for immobilization with the rigid LSO with hip spica include the following:

Rigid LSO with hip spica

A rigid LSO with hip spica uses a thigh piece on the symptomatic side and extends to 5 cm above the patella. The hip is held in 20° of flexion to allow sitting and walking. After the orthosis is applied, some patients require a cane for ambulation. The average cost of a rigid LSO with hip spica is about \$1100.

Indications for immobilization with the rigid LSO with hip spica include the following:

- Lumbar instability at L3-S1
- Lumbosacral fusion with anchoring to the sacrum - Postoperative

Motion restrictions associated with the rigid LSO with hip spica include the following:

- Limits flexion and extension
- Limits some rotation and side bending

New brace designs for LSOs include strapping systems that pull the brace inward and up, improving the hydrostatic effect in order to relieve pressure on the lumbar spine. The better fit helps limit migration. Some low-profile designs take pressure off the hip and rib area, which, in turn, improves patient compliance. Low-profile braces fit more easily under clothing. These braces can treat areas from L3-S1.

Some spinal braces have an interchangeable back with an open center or a flat back design for postoperative patients. The same brace can be interchanged with a back that has an indentation to fit the lordotic curvature of the lumbar spine for pain management purposes. Braces with interchangeable parts allow an LSO to be converted into a TLSO with a large back support and an attachment for a sternal extension to prevent unwanted flexion. The sternal extension has straps that attach to the LSO.

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