



Al-Mustaqbal University
Collage of Engineering
Prosthetics and Orthotics Engineering
Third Stage

ORTHOTICS III

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Spinal orthosis

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INTRODUCTION

- A spinal orthotic device is an external apparatus applied to the body to limit the motion of, correct deformity in, reduce axial loading on, or improve the function of a particular spinal segment of the body. Spinal orthoses may also be used in the treatment of spinal fractures.
- A spinal orthosis is a back brace that is designed to hold your spine in place and decrease the chance that the curve in your spine will become worse as you grow. By wearing a spinal orthosis, 80% (8 out of 10) of curves will stay the same size. Some curves may get smaller. That is a nice bonus, but it is not to be expected. Your orthosis will be custom-made to fit you.
- For the orthosis to work properly, it must be worn full-time, which is 22 to 23 hours per day
- Low back pain syndrome affects nearly 80% of all persons during their life time. Research studies have shown that 70% cases recovered within one month, 26% within 3 month and only 4% remain affected for longer than 6 months

INDICATION OF SPINAL ORTHOSIS

- To reduce pain/spasm in the spinal column.
- To restrict movements in the spine.
- To correct deformity in spine.
- To provide support to weak spine.

CHARACTERISTICS OF GOOD SPINAL ORTHOSIS

- The orthosis should be simple, comfortable, durable, and can be used by a common person.
- It should be cosmetically acceptable to patient.
- It should be easy to prepare and repair.
- It should be affordable.

MATERIAL USED IN FABRICATION

- Drill Cloth
- Leather
- Plastic
- Foam
- Aluminum Stripes/Sheet
- Velcro strap and elastic



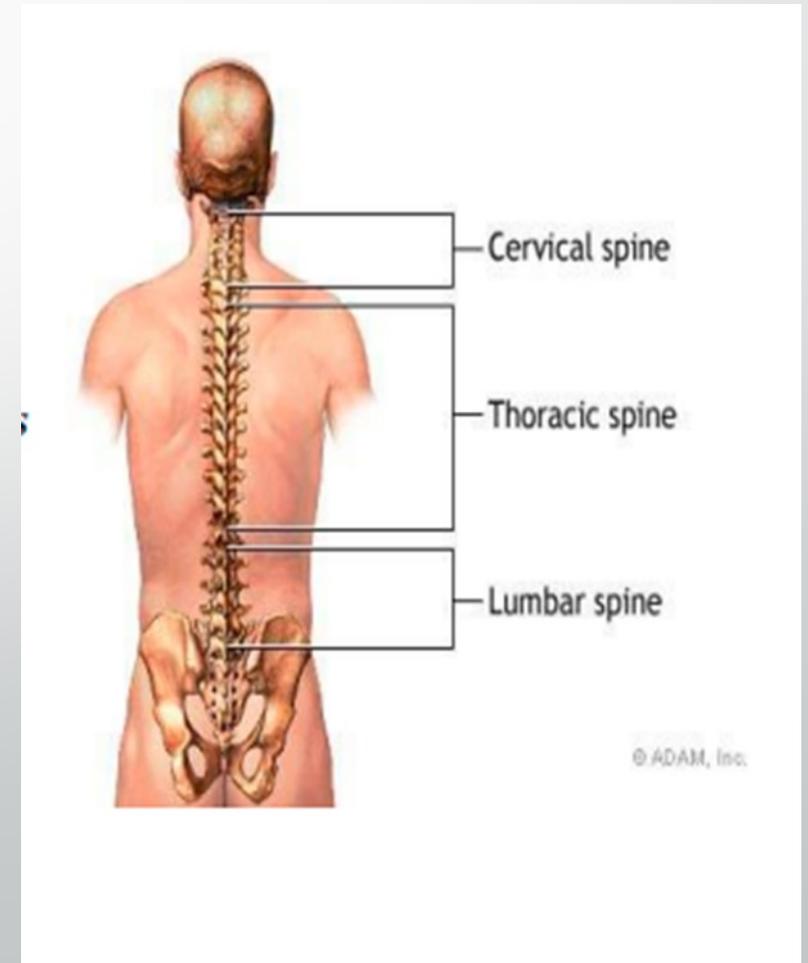
History of Spinal Orthotics:

- The first evidence of the use of spinal orthoses can be traced back to Galen (131 to 201 AD).
- Primitive orthotic devices were made of items that were readily available during this period: leather, whalebone, and tree bark.
- Ambroise Pare (1510 to 1590) wrote about bracing and spinal supports. Technology has revamped the field of orthotics, with new stronger, and lighter materials.
- Although materials available for orthotic construction have changed, the types of pathologic conditions treated have remained virtually constant for years.
- The primary goal of modern orthoses is to aid a weakened muscle group or correct a deformed body part.

The clinician's priority should be to determine which spinal motion to control.

TYPES OF SPINAL ORTHOTICS

- CO: Cervical orthosis
- CTO: Cervical thoracic orthosis
- CTLSO: Cervical thoracic lumbosacral orthosis
- TLSO: Thoracic lumbosacral orthosis
- LSO: Lumbosacral orthosis
- SO: Sacral orthosis





CONT.

- Cervical Region
 - Cervical collar
 1. Soft
 2. Hard
 3. Adjustable
 4. Correctable
 - SOMI Brace (Sterno Occipito Mandibular Immobilizer)

CONT.

- Dorso-Lumbar Region:
 - Taylor's Brace
 - ASH Brace
 - Milwaukee Brace
 - Underarm Plastic Spinal Orthosis
- Lumbo-sacral region: Lumbosacral corset/ Frame.

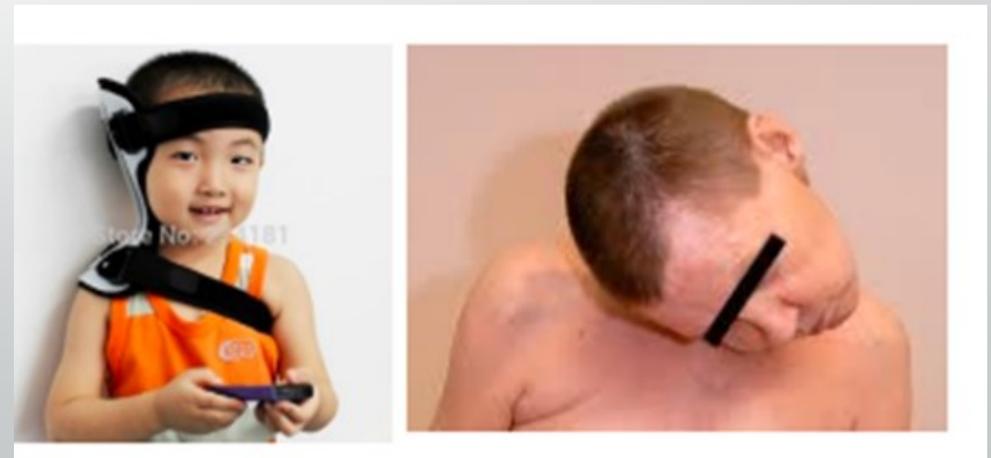
CERVICAL REGION:

- Simple cervical collar: The measurement is taken in the following manner. The front height is taken from tip of chin to upper notch of sternum and circumference of neck is taken.
- It is made by plastic sheet with foam padding where Velcro is attached to both the ends.
- It is indicated in acute cervico-spondylitis, cervical radiculopathy, vertigo and traumatic lesions of cervical spine.
- It is also used as a part of first aid to cervical spine for transportation.



CONT.

- Adjustable cervical collar: The height can be adjusted by making 2 circular pieces and attached in central with the help of Velcro.
- Corrective cervical collar: It is given for torticollis cases along with proper cervical spine exercise



SOMI BRACE

- It is known as sterno-occipito mandibular immobilizer and available in different sizes and accordingly fitted around cervical spine.
- It prevents cervical movements and it is suitable in traumatic lesions of cervical spine.
- Parts of SOMI Brace
 1. Steel rods: Two on front and two on back. The front rod provides support to chin and sternum and back rods supports occiput area of the skull and back (interscapular region).
 2. Supports: two, one for chin and other for occiput area.
 3. Fasteners: two, one each on right and left side of neck.



DORSO LUMBAR REGION

- Taylor's Brace: Seventeen vertebrae make dorsolumbar spine. The maximum movement is at the junction of dorsolumbar spine
- Measurement:
 1. Circumference of pelvic region.
 2. Circumference of lower chest.
 3. Height from upper border of sacrum to lower cervical

PARTS OF TAYLOR'S BRACE

- The back and pelvic belt is attached to distal tips of strips.
- Two axillary long straps are also attached to upper border of upright. It is available as high and low types of brace.
- Sometimes lumbosacral corset is also attached with this brace. It is commonly indicated for traumatic, tubercular lesion and also in spinal tumors

