ORTHOTICS AND PROSTHETICS

[PT 308]

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LECTURE NOTES FOR 3rD GRADE BPT STUDENTS

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DEPARTMENT OF PHYSIOTHERAPY, FACULTY OF APPLIED HEALTH SCIENCES

TISHK INTERNATIONAL UNIVERSITY

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LECTURE OUTLINE

- Learning objectives
- Orthosis
  - Definition
  - Components/materials
  - Function/indication
  - Classification/types
- Review
- Reading resources/additional materials

ORTHOSIS AND PROSTHESIS

COURSE OBJECTIVES

- Define orthoses including functions and indications
- Classify the types of orthoses
- Describe the physiotherapist's role in orthotics
- Identify challenges in orthotics and potential solutions

ORTHOTICS

ORTHOTICS AND PROSTHETICS

ORTHOTICS

Definition

- Orthotics is the science concerned with orthoses designed to support, align, prevent, or correct deformities, or improve the function of a body part.
- **Orthoses = Braces**
- Orthosis: is an appliance or a medical device used to support, align, prevent or correct deformities or improve the function of a part of a body.
- Splint: is an appliance used to support/immobilize part of a body.
- Caliper: is a device applied to lower limb to support or control a joint.

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ORTHOTICS

Function/indications

1. Immobilization of a joint or body part
2. Prevent deformity
3. Correct deformity (e.g. scoliosis brace)
4. Maintains correction
5. Protection from injury or post-surgery recovery
6. Relieve weight bearing
7. Facilitates ambulation
8. Relieve pain or pain management (e.g. knee braces)

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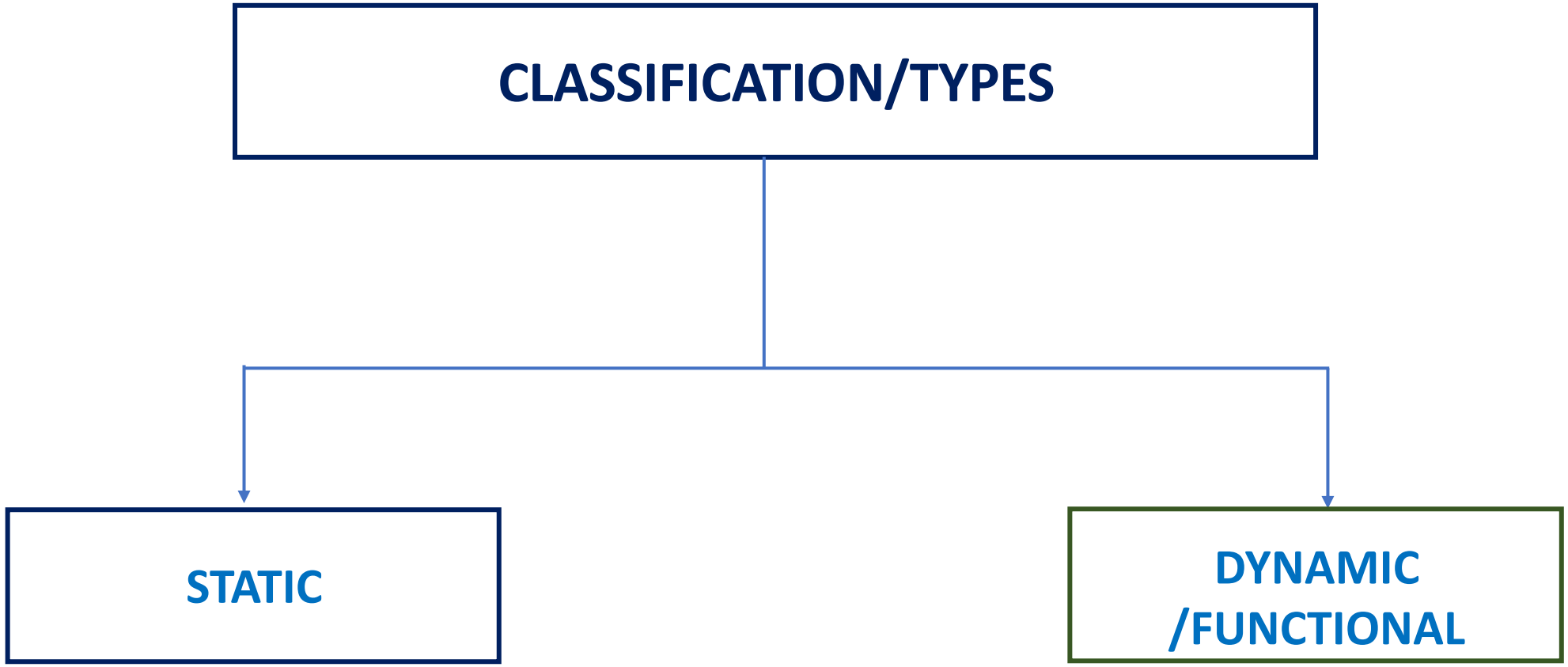
ORTHOTICS

Classification/types



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Classification/types

Static orthoses

1. Orthoses that does not allow motion during use.
2. Primarily used for protection, support, or positioning.
3. Typically used in the early stages of injury or recovery.

Dynamic or functional orthoses

1. Orthoses that allow motion during use.
2. Primarily used to improve ROM or function.
3. Often used in rehabilitation and recovery phases to encourage movement.

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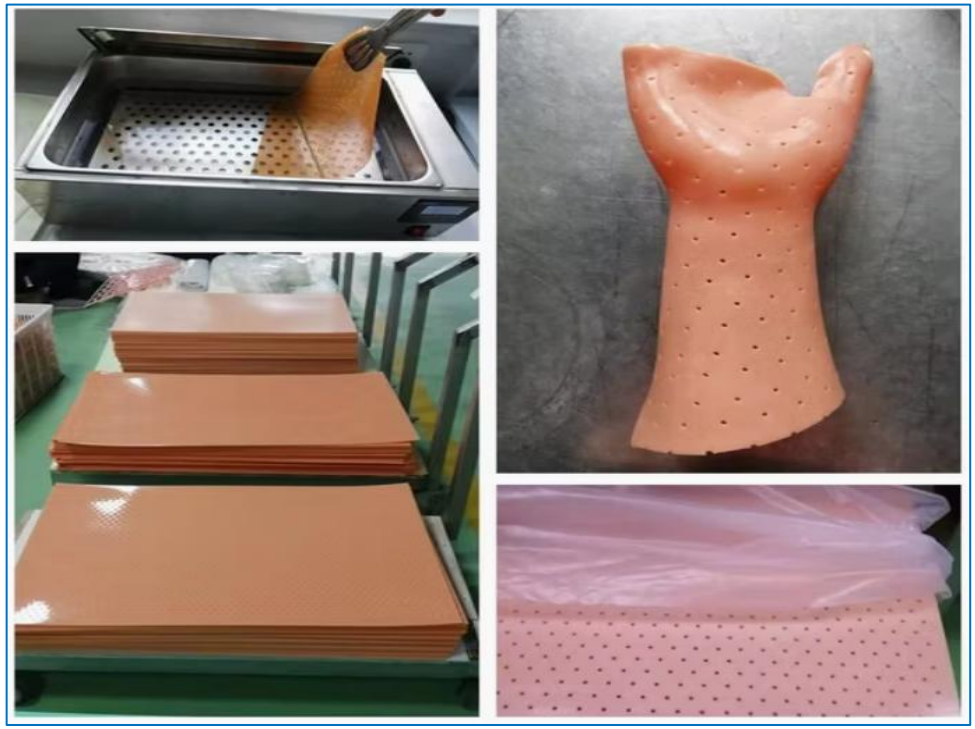
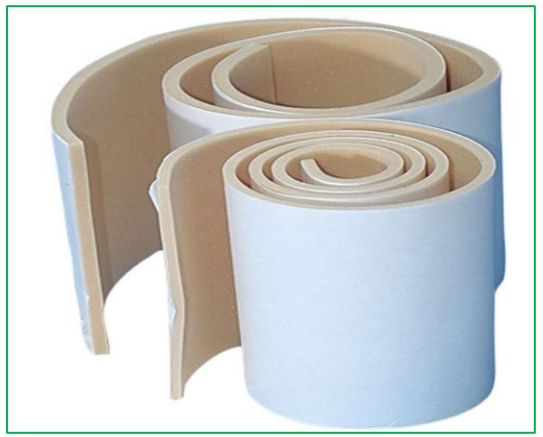
Materials used in orthoses

The following are typically used in making an orthosis

1. Thermoplastic materials (e.g., polypropylene).
2. Aluminum or steel for support.
3. Foam for padding.





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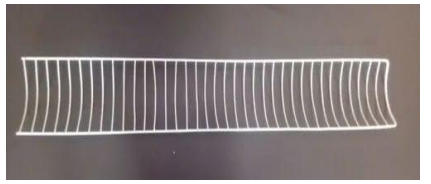
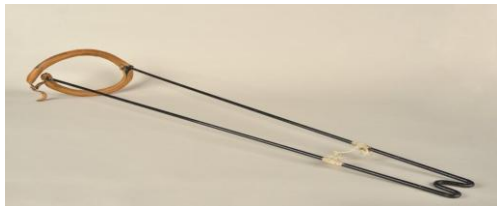
ORTHOTICS

Common orthoses/braces, splints and their uses

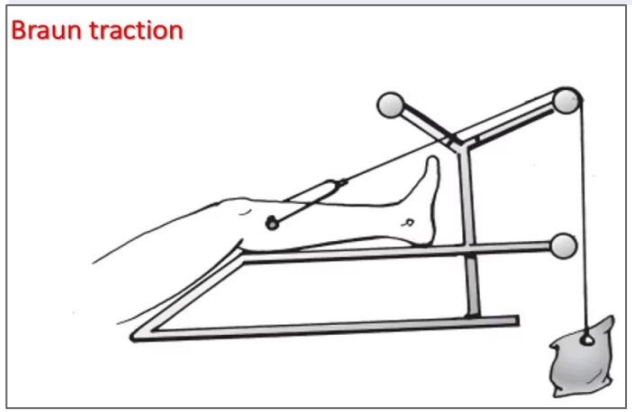
Orthosis	Uses
Crammer-wire splint	Emergency immobilization
Thomas splint	Immobilization/reduction of femoral fracture
Bohler-Braun splint	Immobilization/reduction of LL fracture
Aluminum splint/stack splint/Frog splint	Immobilization of fingers





Crammer-wire splint

Thomas splint



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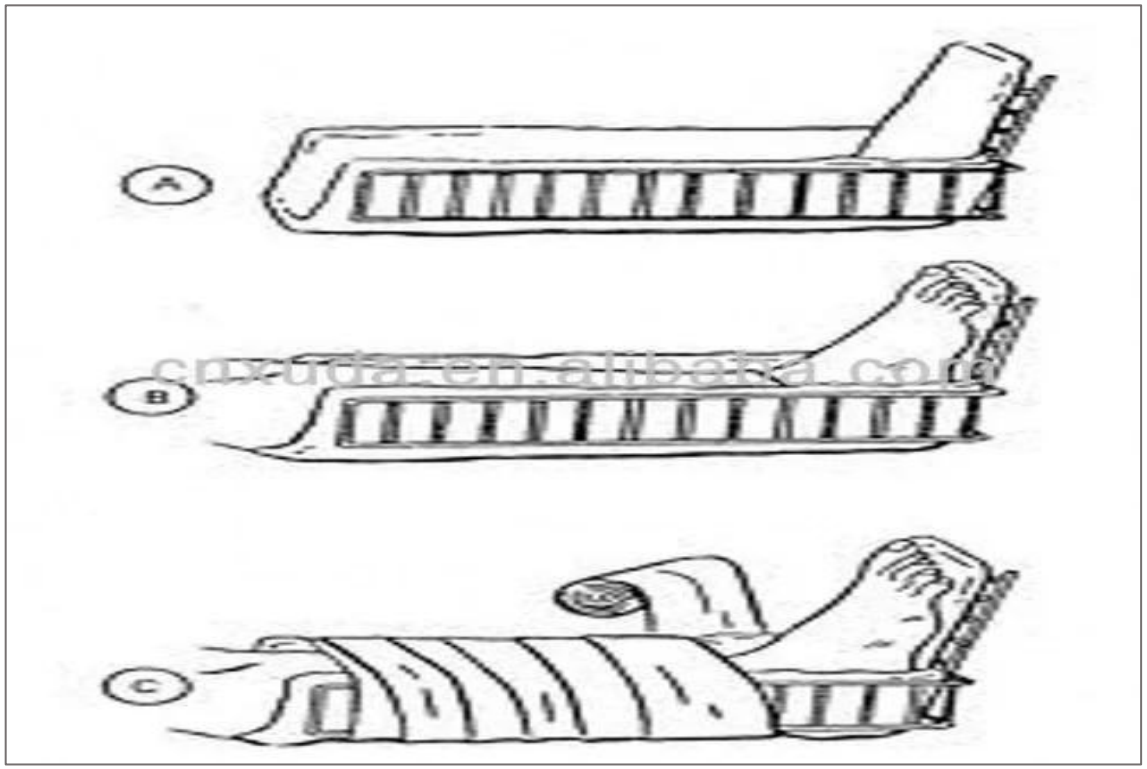

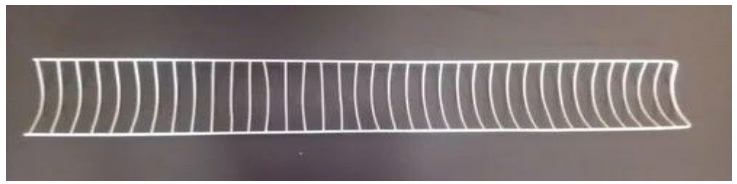

Crammer-wire splint	**Used for emergency immobilization e.g. limb fracture before applying permanent treatment.**

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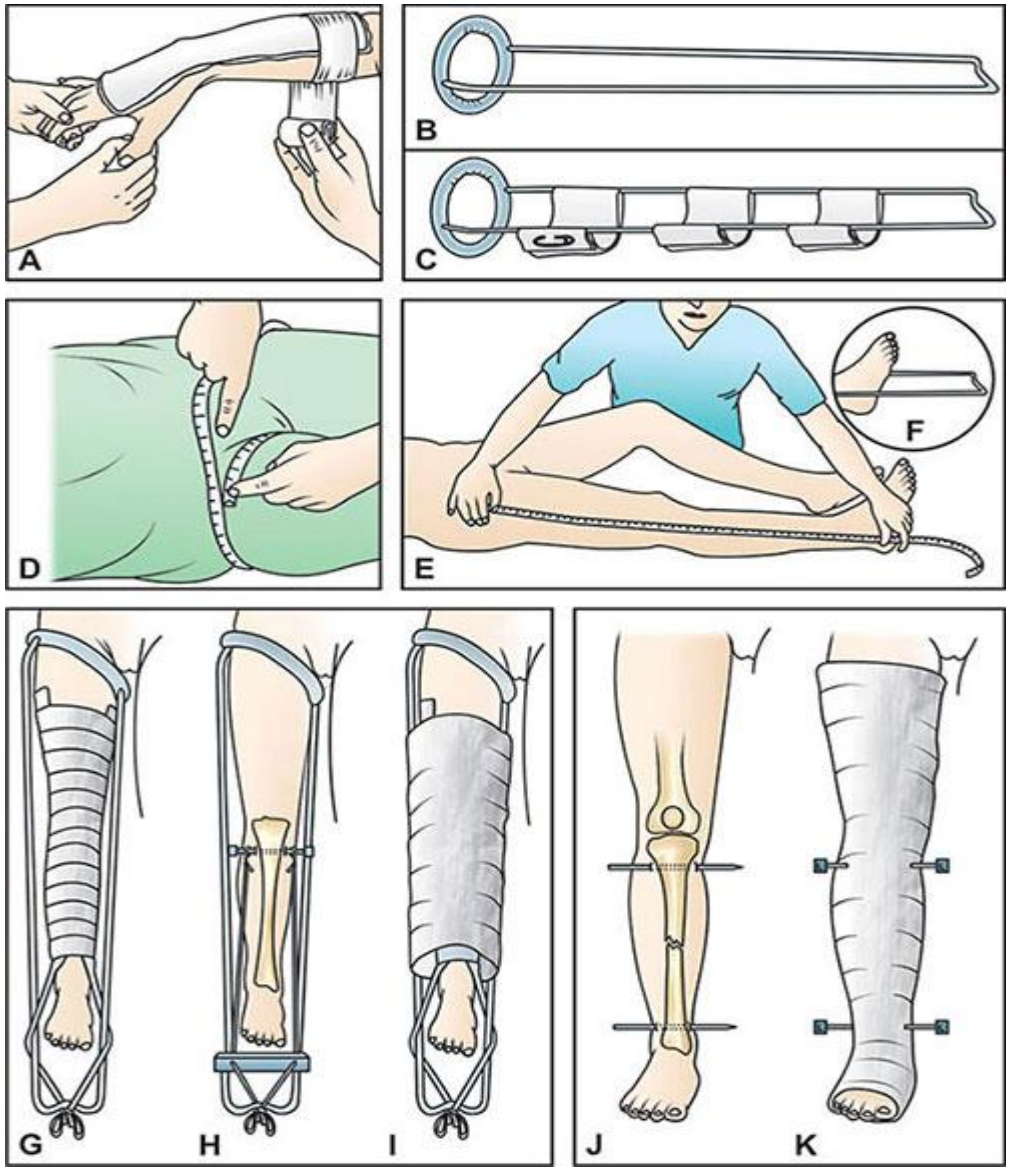

Thomas splint	Used for immobilization/reduction of femoral shaft & distal fractures

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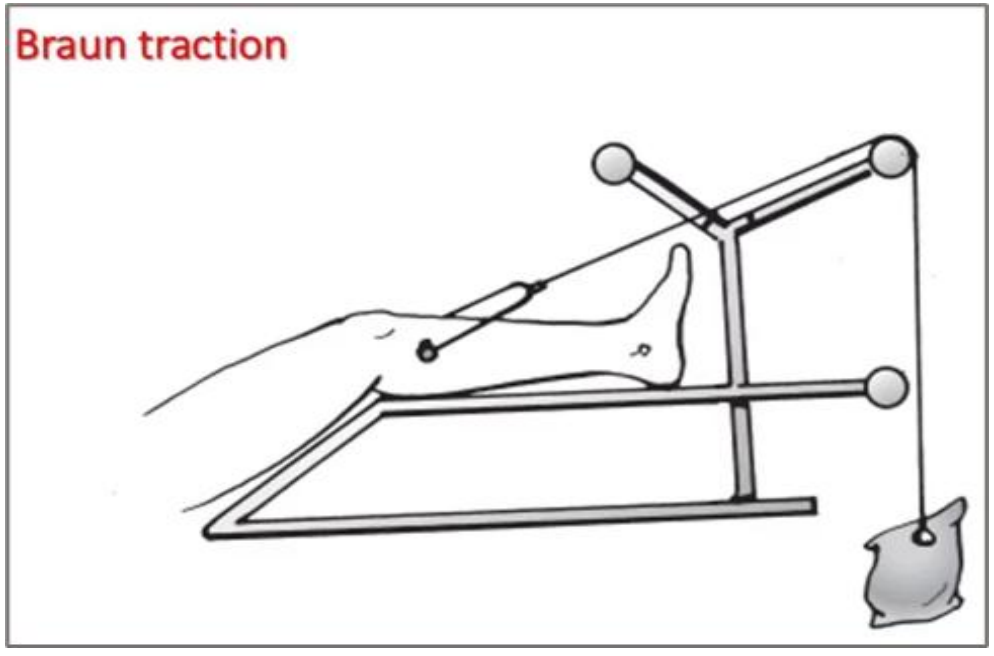

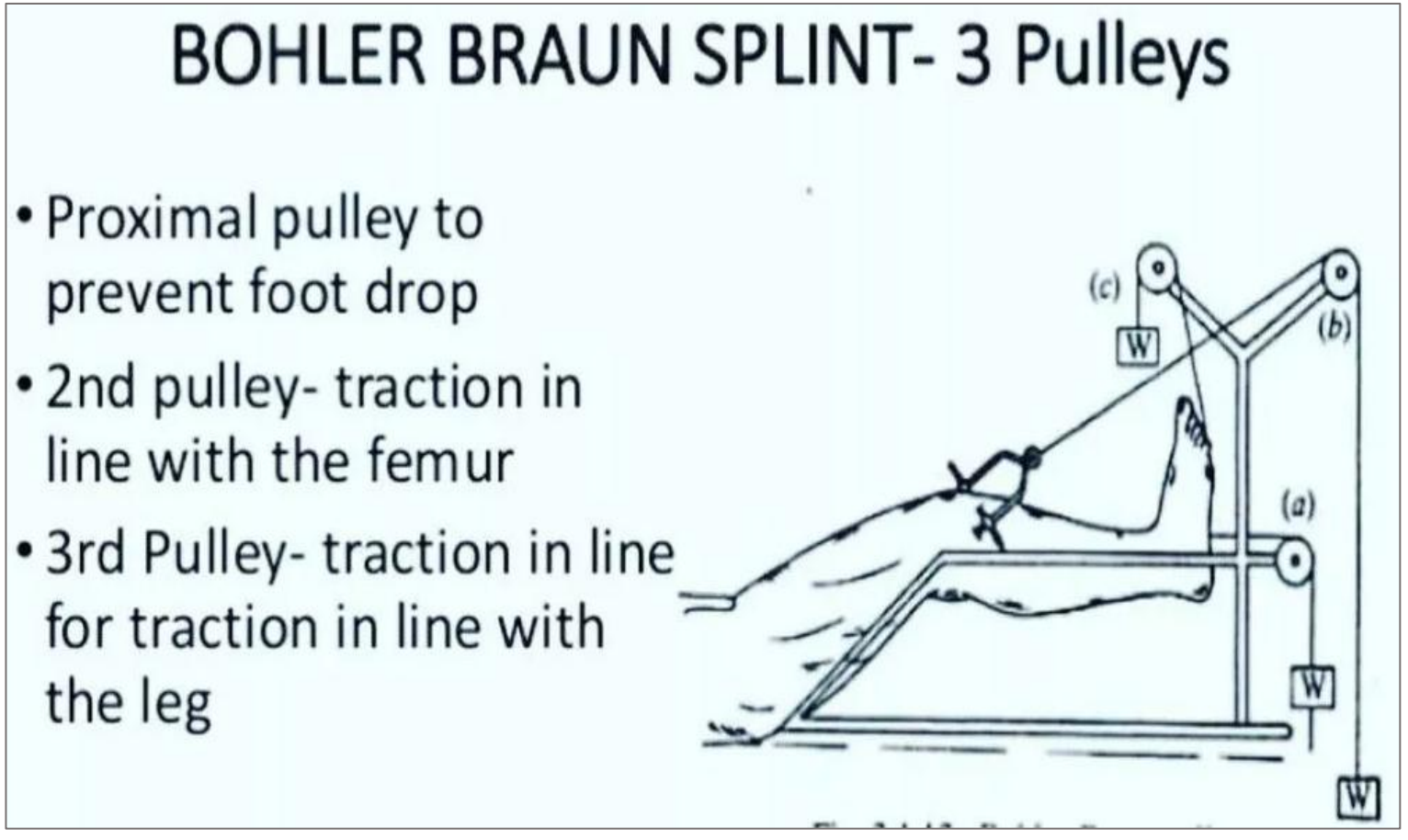

Bohler-Braun splint	**1. Used for stabilization of lower limb fracture e.g. femoral, proximal tibia** **2. Post-surgical stabilization to maintain correct alignment of bones.**

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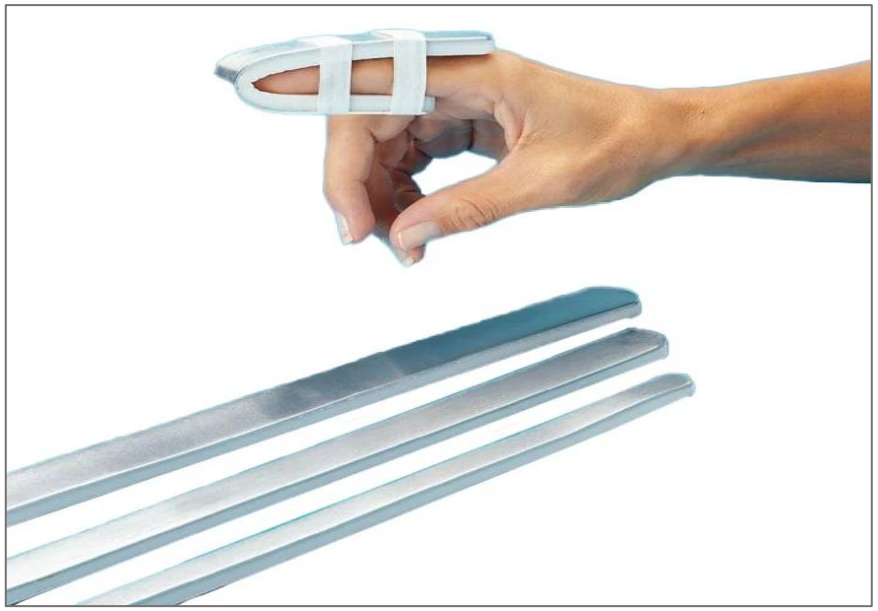

Aluminum splint	It is lightweight & flexible used for immobilization of interphalangeal joints

Frog splint	Typically U-shaped Used for immobilization of interphalangeal joints e.g. mallet finger

Stack splint	Used for immobilization of finger e.g. Mallet finger Keeps finger straight

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Orthosis	Uses
Cock-up splint	For radial nerve palsy (Hand drop)
Volkmann's splint	For Volkmann's Ischemic contracture (VIC)
Knuckle bender splint	For stabilization of tendon injury
Aeroplane splint	For brachial plexus injury (e.g. Erb's palsy)
Toe-rising splint/foot drop splint	For foot drop

Volkmann's splint

Cock-up splint

Knuckle bender splint

Aeroplane splint

Food drop splint

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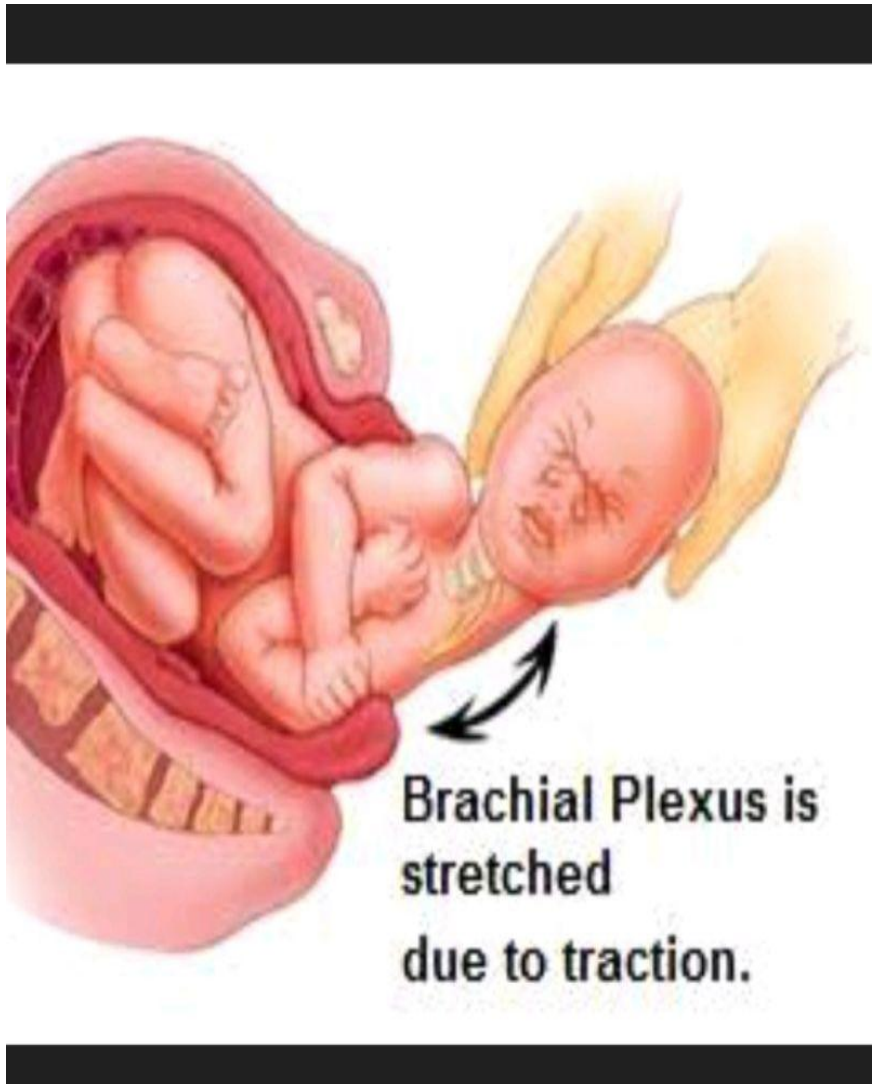

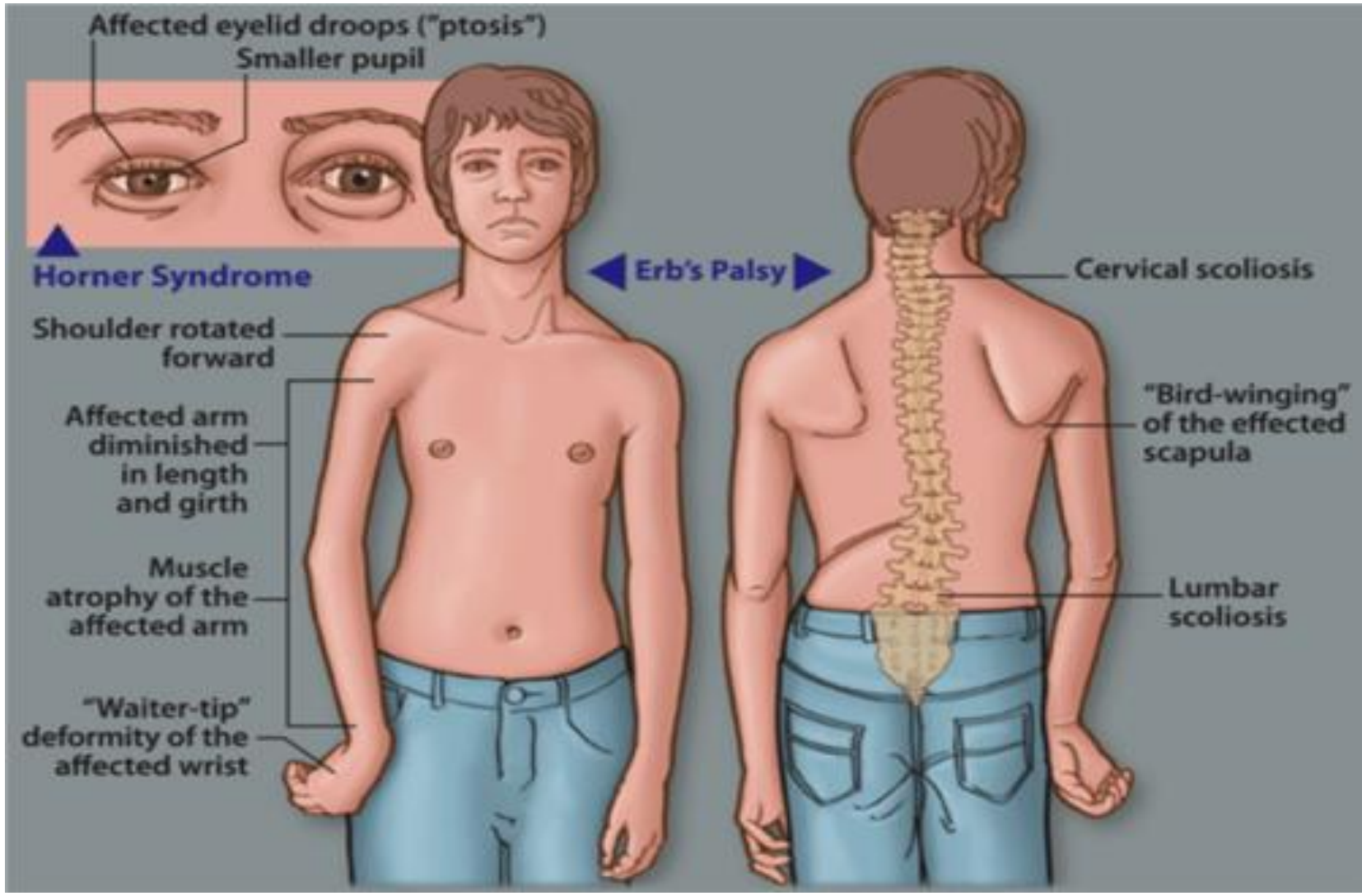

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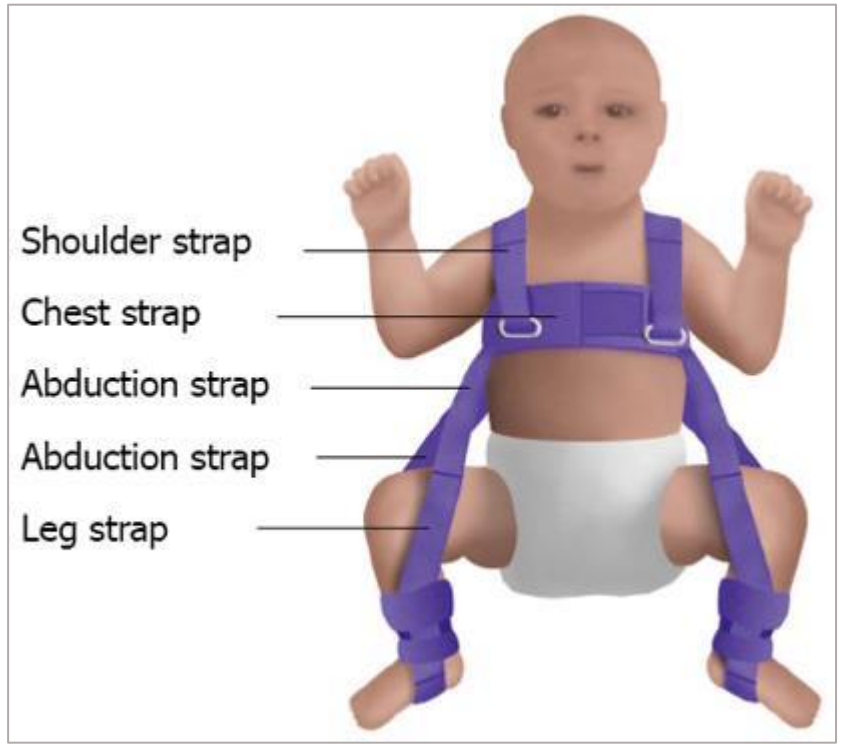
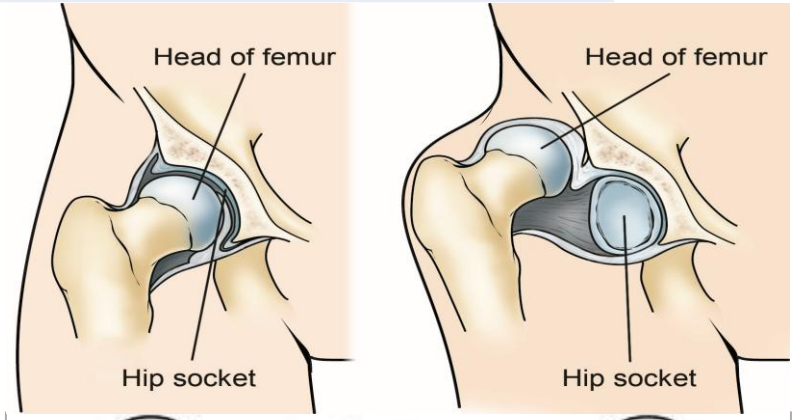
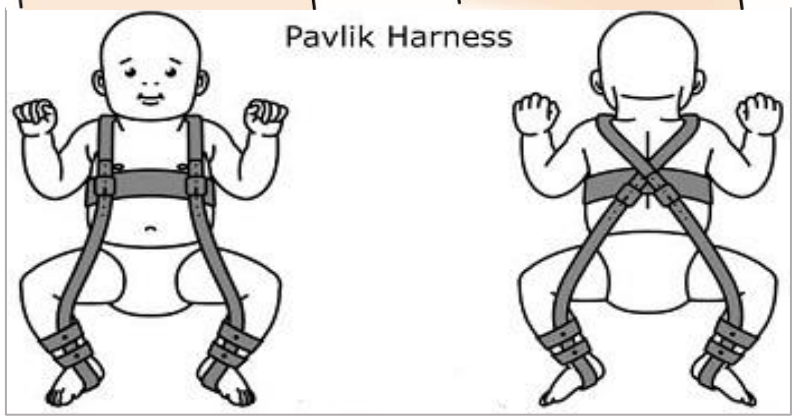
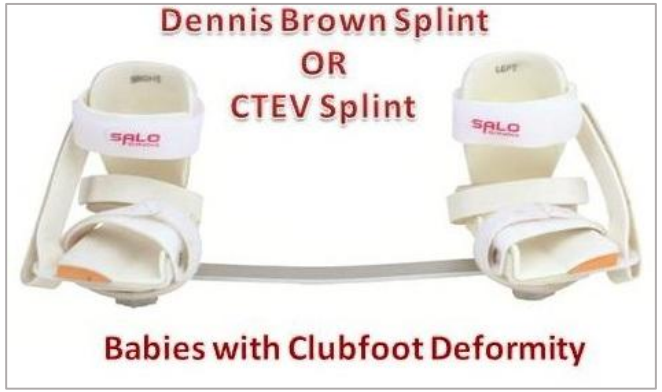
Orthosis	Uses
Von Rosen splint (Pavlik harness)	For developmental dysplasia (or dislocation) of the hip (DDH)
Dennis Brown/Steenbeck splint	For congenital talipes equinovarus (CTEV)

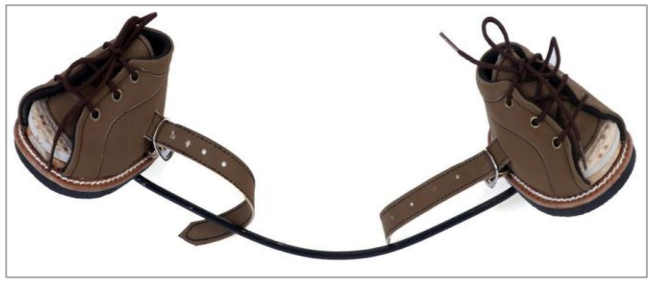


Pavlik harness









Denis Brown splint

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Orthosis	Uses
Cervical collar	For neck immobilization
Philadelphia collar	For neck immobilization (rigid support)
Four-post collar (SOMI brace)	For cervical spine injury
Halo vest	For cervical spine injury, TB cervical spine
Lumbar corset/belt	For lumbar immobilization, low back pain
Anterior spinal hyper extension (ASHE)/Tarlor's brace	For dorso-lumbar spinal injury
Milwaukee brace, Boston brace	For scoliosis
Patella tendon bearing (PTB) brace	For weight bearing to distal LL (ankle & heel) e.g. in below knee amputation

Cervical collar

Philadelphia collar

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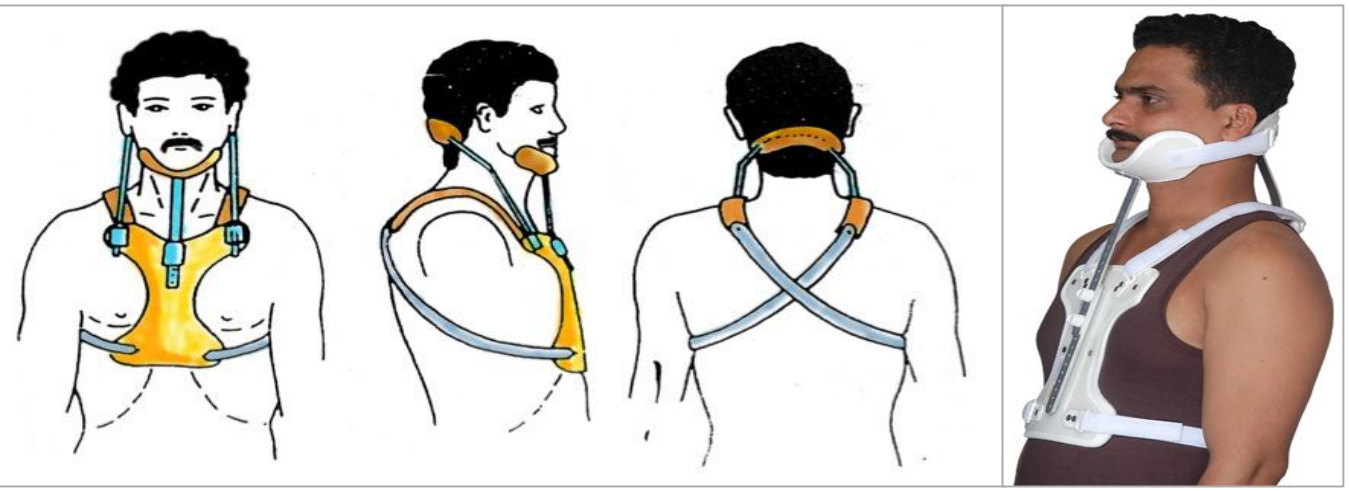
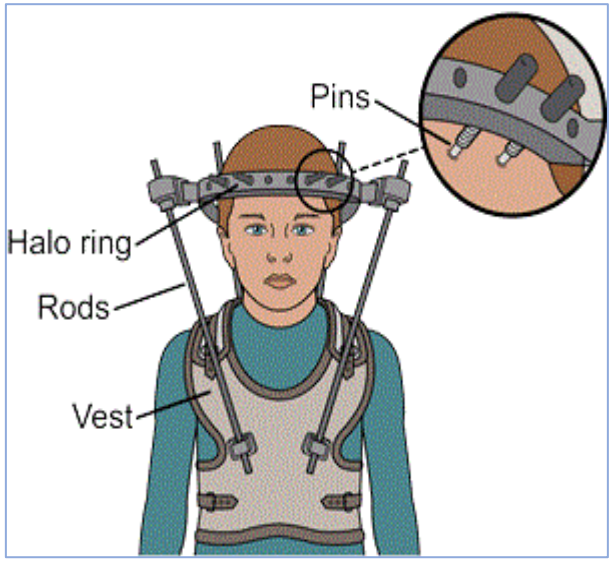


Four-post collar (SOMI brace)



Halo vest

Lumbar corset/belt

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ORTHOTICS

ASHE brace

Taylor's vest

Boston brace

Milwaukee brace

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ORTHOTICS

PTB brace

ORTHOTICS AND PROSTHETICS

REVIEW

OTHER READING SOURCES

TEXT

1. *Chinnathurai, R., Sekar, P., Kumar, M. R., Manoj, K. N., & Kumar, C. S. (2010). Short textbook of prosthetics and orthotics. Jaypee Brothers Medical Publishers (P) Ltd.*
2. *Shurr, D. G., & Michael, J. W. (2001). Prosthetics and orthotics (2nd ed.) Prentice Hall.*
3. *Chui, K. K., Jorge, M., Yen, S.-C., & Lusardi, M. M. (2019). Orthotics and prosthetics in rehabilitation (4th ed.). Publisher.*
4. *Wilson, A. B. (Ed.). (Year). Orthosis and prosthesis (M. Dolan, Managing Ed.). Editorial board: A. L. Muilenburg, H. F. Gardner, A. Guilford, H. B. Hanger, S. Paul, R. E. Tooms, & W. L. M. Publisher.*
5. *Sinha, A. G., Tripathy, S. K., & Sharma, R. (2022). Orthoses, prostheses & assistive devices for physiotherapists [Kindle edition]. Jaypee Brothers Medical Publishers (P) Ltd.*

THANKS FOR LISTENING