TRACTION MADE EASY!

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NZONA Study Morning

21st February 2009

TRACTION MADE EASY!

- Introduction
- Purposes of Traction
- Classification of traction
- Mechanics of traction
- Traction Apparatus
- Complications
- Traction Practical – simple skin traction
  - Hamilton Russell
  - Fixed Thomas

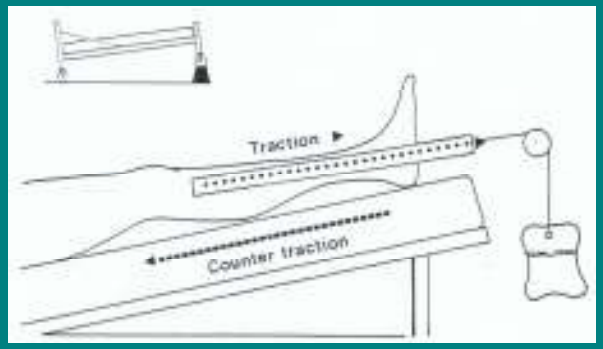
HISTORY

- 1860 Gurda Buck developed a traction system.
- 1880 Bryant introduced Bryant's or Gallows traction.
- 1890 Thomas Splint (Hugh Owen Thomas 1834 – 1891)
- 1903 Balkan War & introduction of Balkan beam.
- 1909 Martin Kirschner uses wires.
- 1911 Fritz Steinmann introduces thicker pins and a stirrup
- Robert Hamilton Russell (1860- 1933) developed below-knee skin traction with sling under the knee, weights & pulleys.
- 1972 – Denham introduces the threaded pin.
- ……And so on with names such as Fisk, Pearson, Tulloch Brown.

TRACTION

- Definition:

…… “the application of a pulling force to an injured or diseased part of the body or an extremity with countertraction, a pull in the opposite direction” (Schoen, 2000).

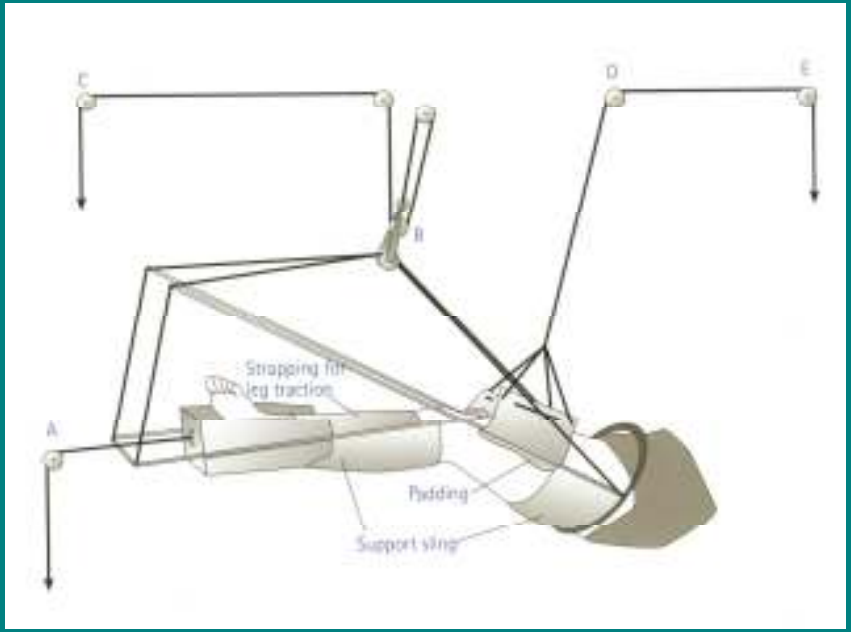


PURPOSES OF TRACTION

- To reduce a fracture & realign bone fragments.
- To maintain skeletal length & alignment.
- To reduce & treat dislocations.
- To immobilise to prevent further soft tissue damage.
- To prevent the development of contractures.
- To relieve muscle spasms.
- To lessen deformities.
- To rest a diseased joint.

CLASSIFICATION OF TRACTION

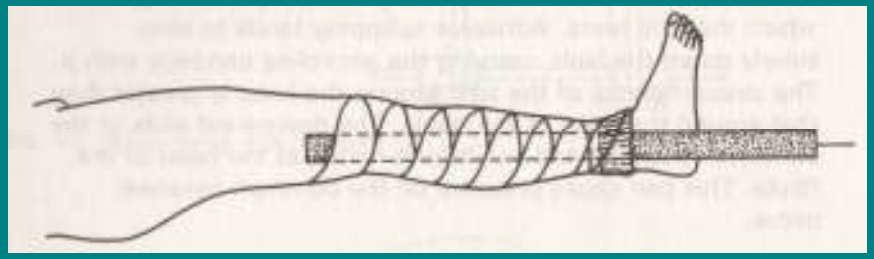
- **Static** force promotes immobilisation.
- **Dynamic** force promotes movement.



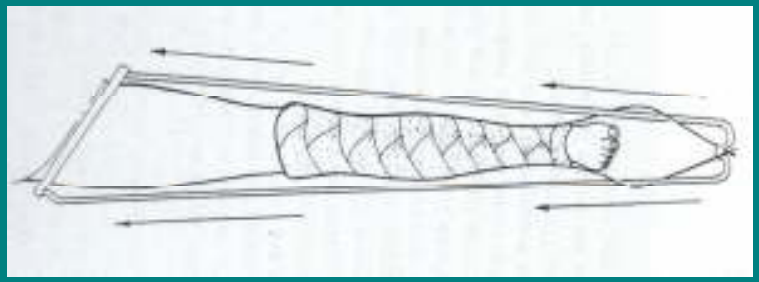
Reverse Dynamic slings for flexion contractures of the knee

CLASSIFICATION OF TRACTION

- Running traction exerts a pull in one plane.

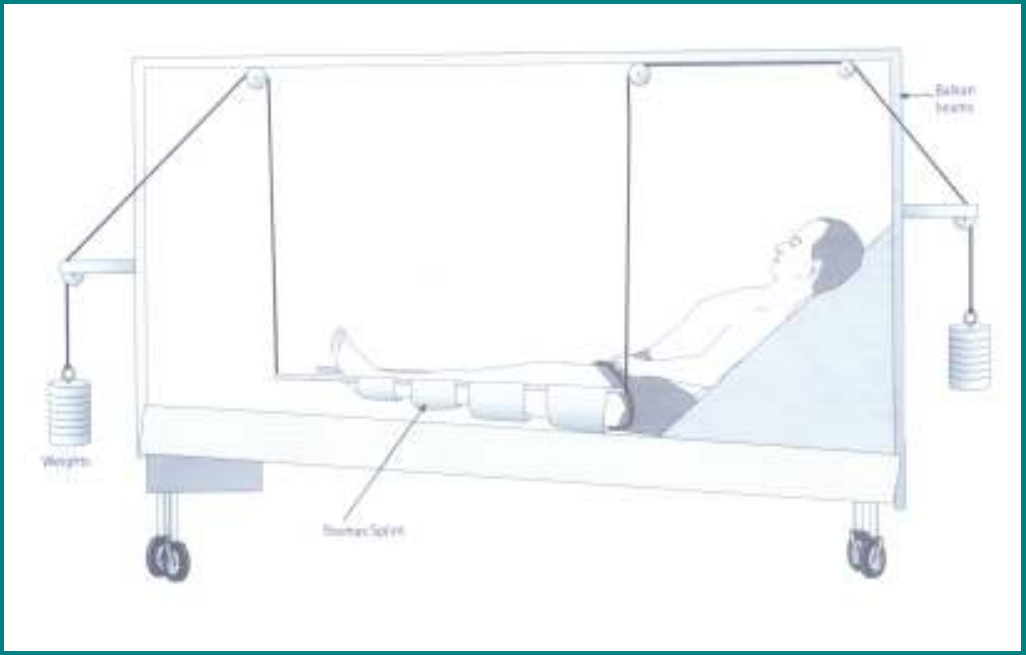


- Fixed Traction – a pull between two fixed points.



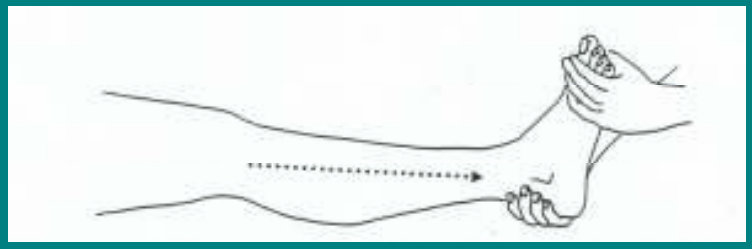
CLASSIFICATION OF TRACTION

- Balanced suspension uses traction to suspend a part of the body without pulling on the part.

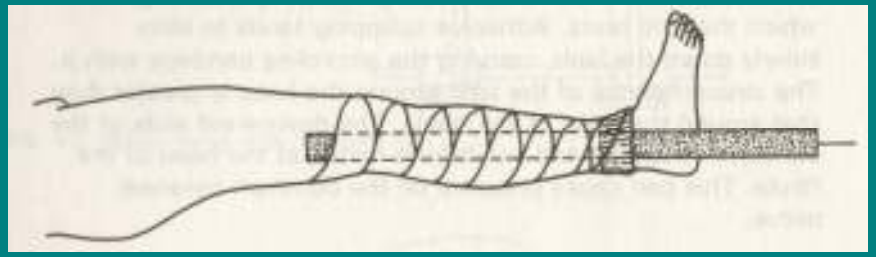


CLASSIFICATION OF TRACTION

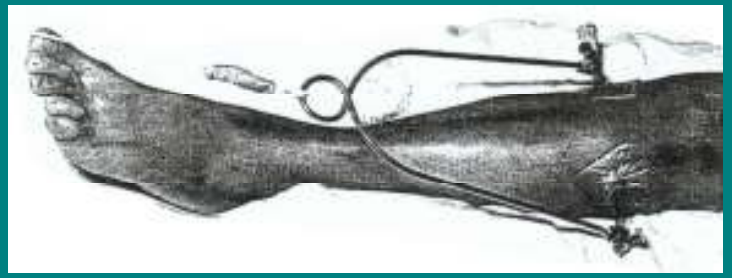
- Manual traction



- Skin Traction



- Skeletal Traction

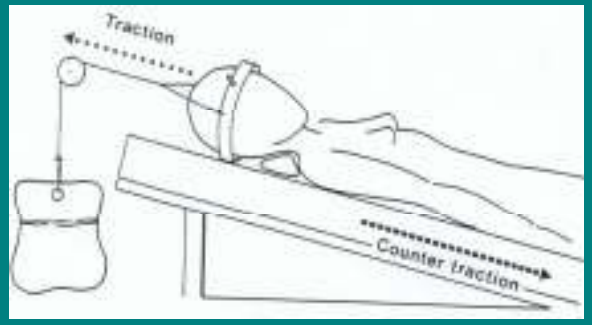


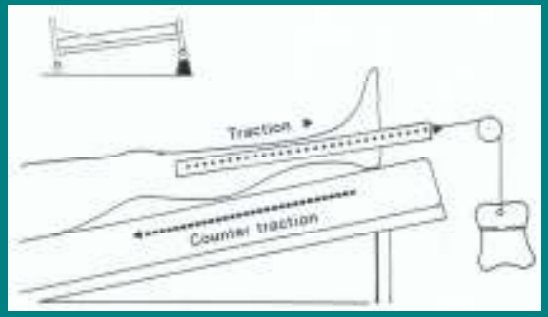
MECHANICS OF TRACTION: Countertraction

- to overcome muscle spasm & prevent patient being dragged towards the traction pull.

  1. Weights & pulleys apply & direct the traction pull.

  2. Countertraction provided by weight of patient's body when bed is tilted away from the traction pull.





MECHANICS OF TRACTION: Countertraction

- Fixed traction systems – traction & countertraction are exerted between two fixed points.

  (Weights or bed elevation is not required to achieve traction & countertraction.)

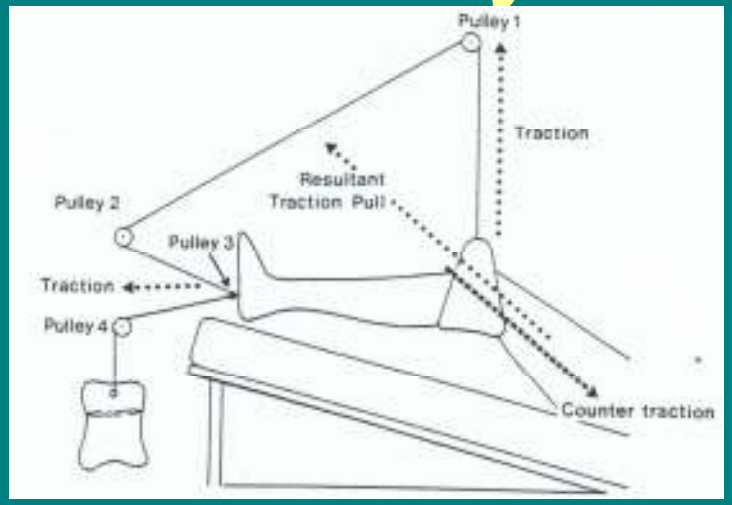
MECHANICS OF TRACTION: Position of the Pulleys

- Determines the action & direction of the traction pull.
- The number of pulleys in the line of traction effects the amount of pull exerted.

Single pulley systems the traction pull = amount of traction weight applied.

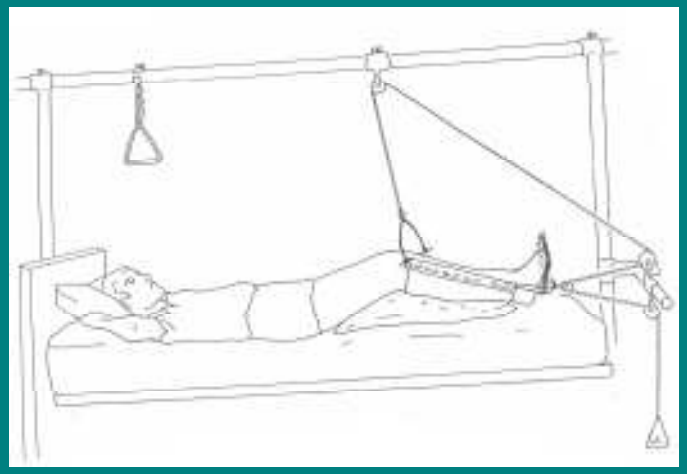
MECHANICS OF TRACTION: Position of the Pulleys

(Hamilton Russell)



Two pulleys in the line of same traction weight = double the amount of pull.

(Tulloch Brown)



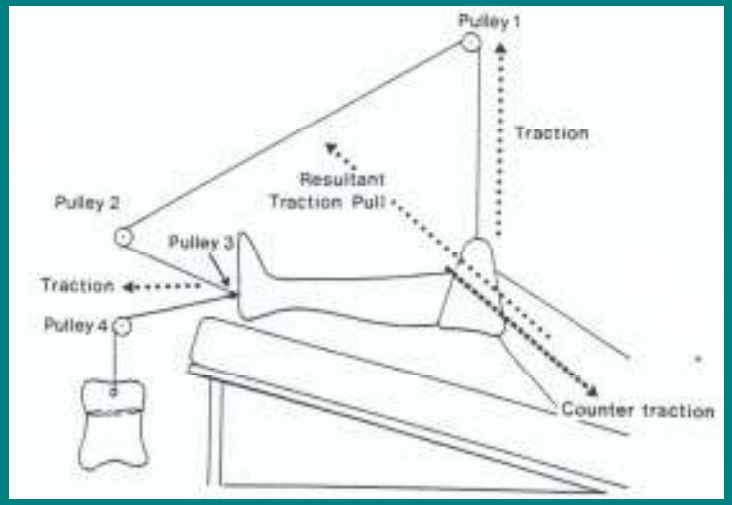
MECHANICS OF TRACTION: Vector Forces

- By applying traction forces in two different but not opposite directions to the same body part, a resultant force is applied.

- The direction of the resultant

  pull is determined by the

  position of the pulleys.



MECHANICS OF TRACTION: Friction

- Friction reduces resistance to the traction pull & can reduce the efficiency of the traction force.
- Presence of friction cannot be eliminated but it can be minimised.

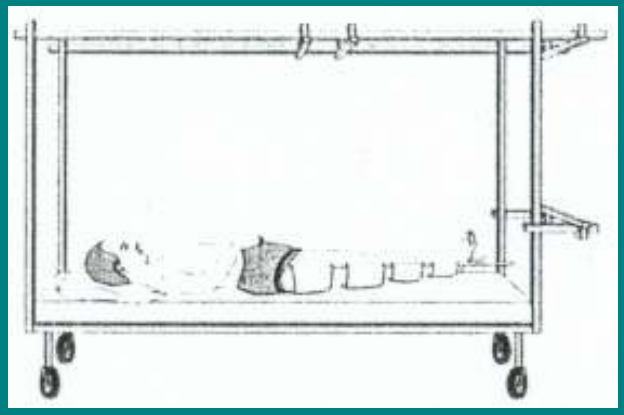
✓ Pulley wheel runs freely
✓ Traction cord fits centrally in pulley groove
✓ Weights not resting on floor/bed
✓ Footplate not resting on bedframe
✓ Mattress not sagging under patient
✓ Bedclothes not resting against traction cords

APPARATUS

- Balkan Beam
- Bed & mattress
- Aids to move patient –

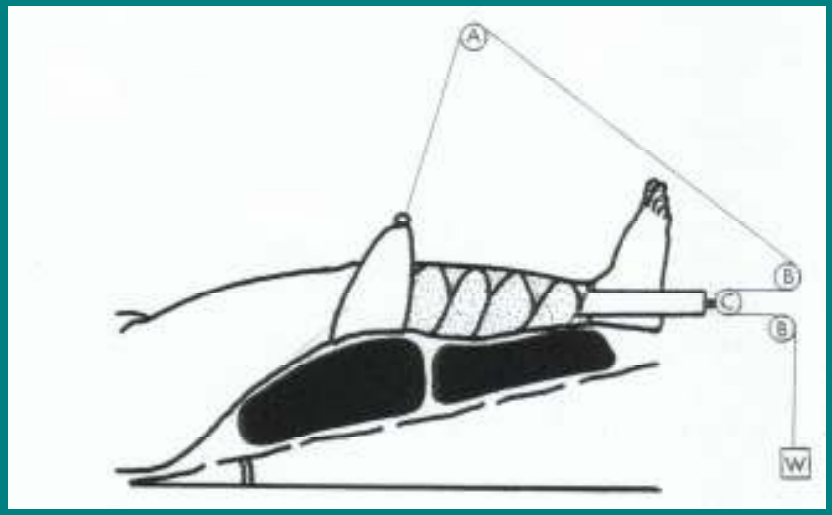
  monkey bar

  Jordan frame



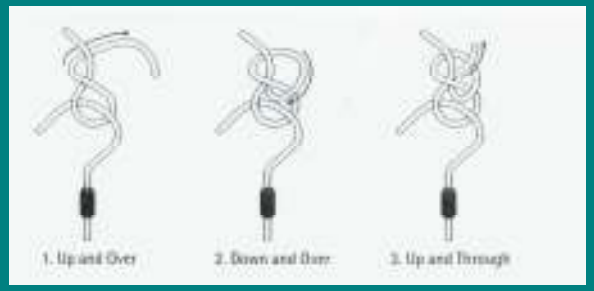
APPARATUS

- Weights
- Pulleys
- Traction Cord

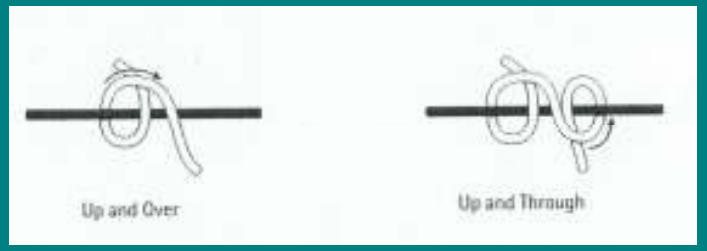


APPARATUS - Knots

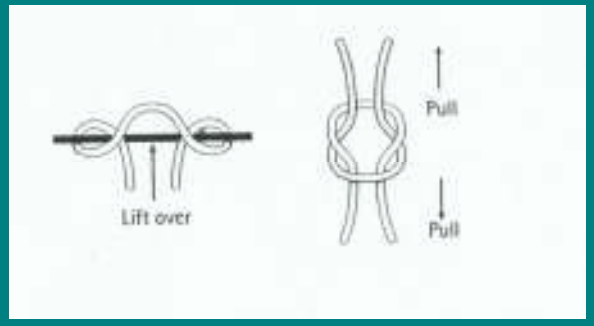
- Slip Knot



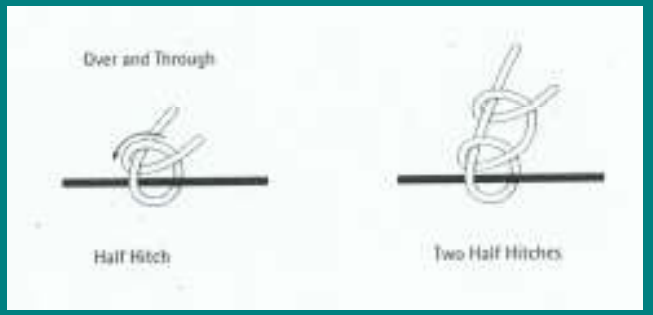
- Clove Hitch



- Reef Knot

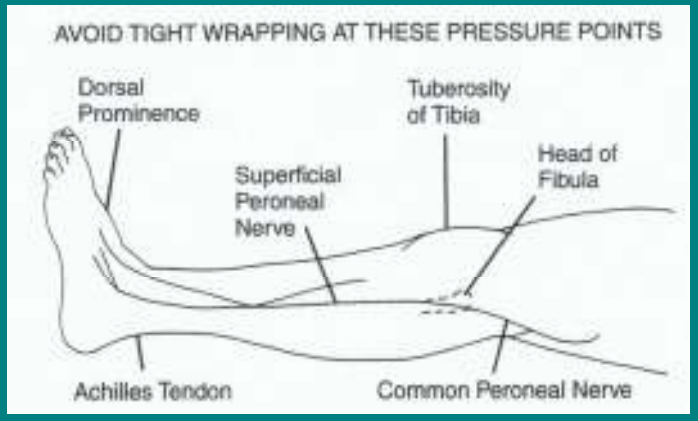


- Half Hitch



COMPLICATIONS – Skin Traction

- Allergic Reactions to zinc oxide adhesive
- Excoriation of the skin
- Pressure sores over bony prominences
- Nerve Palsy



COMPLICATIONS – Skeletal Traction

- Introduction of infection into the bone.
- Overdistraction of the bone fragments.
- Nerve damage.
- Breaking of the pins or wires.
- Incorrect placement of the pin or wire.
- Ligamentous damage.
- Damage to epiphyseal growth plates.
- Depressed scars.
- *patients in skeletal traction must have a nurse escort transferred within the hospital.*

ESSENTIAL PRINCIPLES OF TRACTION

- The grip or hold on the body must be adequate & secure.
- Provision must be made for countertraction.
- There must be minimal friction between cords & pulleys.
- The line & magnitude of the pull must be maintained.
- There must be frequent checks of the apparatus to ensure ;
  - traction set-up is functioning as planned
  - Patient is not suffering injury from traction treatment.

CARE OF TRACTION APPARATUS

- Check system every shift & after any procedure performed – check the line of pull.
- Keep clean & dust free.
- Ensure all Balkan beam clamps are tight & traction cord running thru' pulley smoothly.
- Cords attached with secure knots e.g. clove hitch or two half hitches.
- Ends of cords should be short & single length used.
- Weights hanging freely.
- Traction equipment compatible with bed being used.
- Do not hang weights directly over patient without safety cord attached.
- Ensure countertraction maintained.

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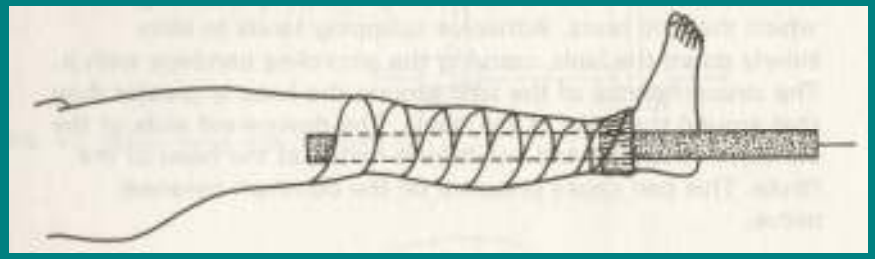
Simple Skin Traction (Bucks)



- Running Traction
- balanced skin traction (pull balanced between weights & patient's body weight

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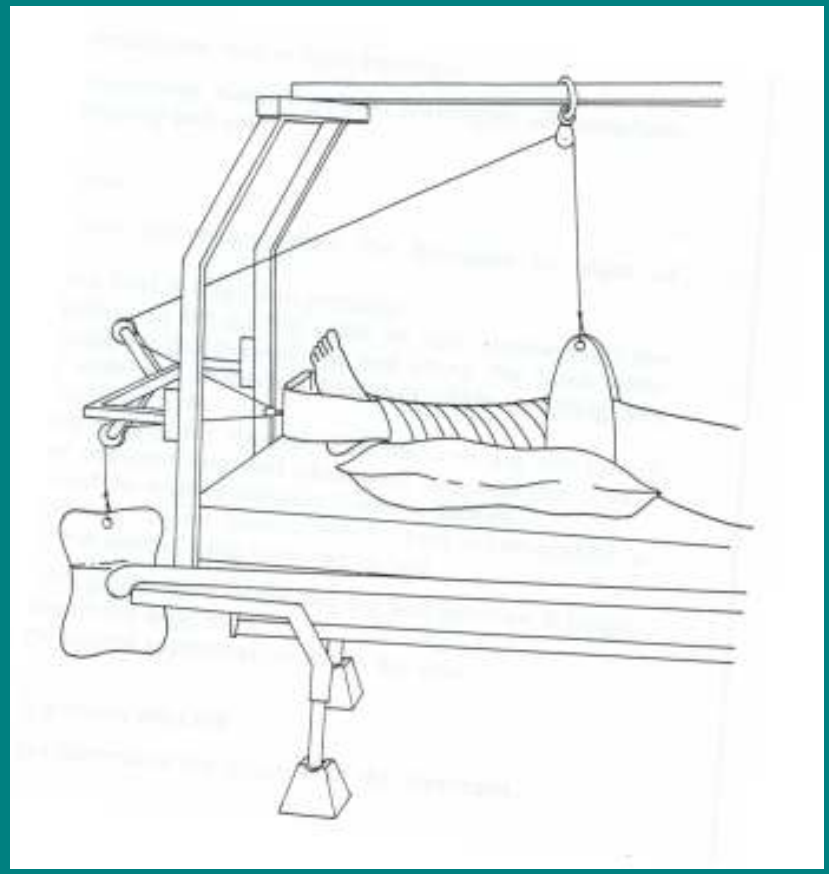
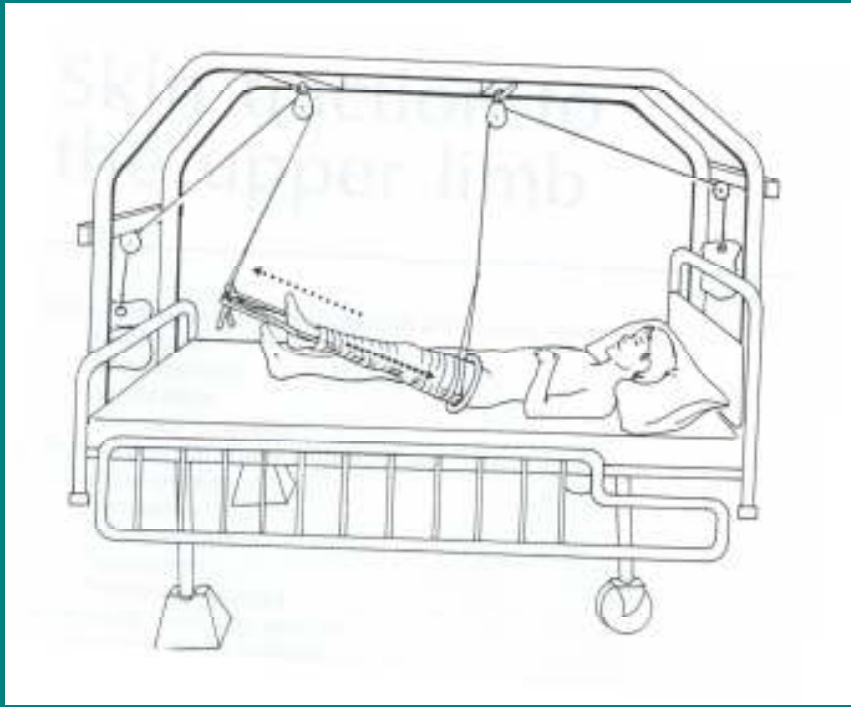
Hamilton Russell Traction

- - two directional, balanced

  lower limb traction.



TRACTION MADE EASY!
Fixed Thomas Traction



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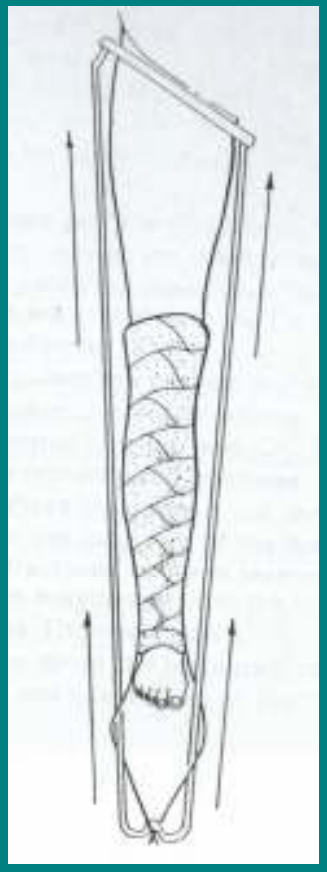
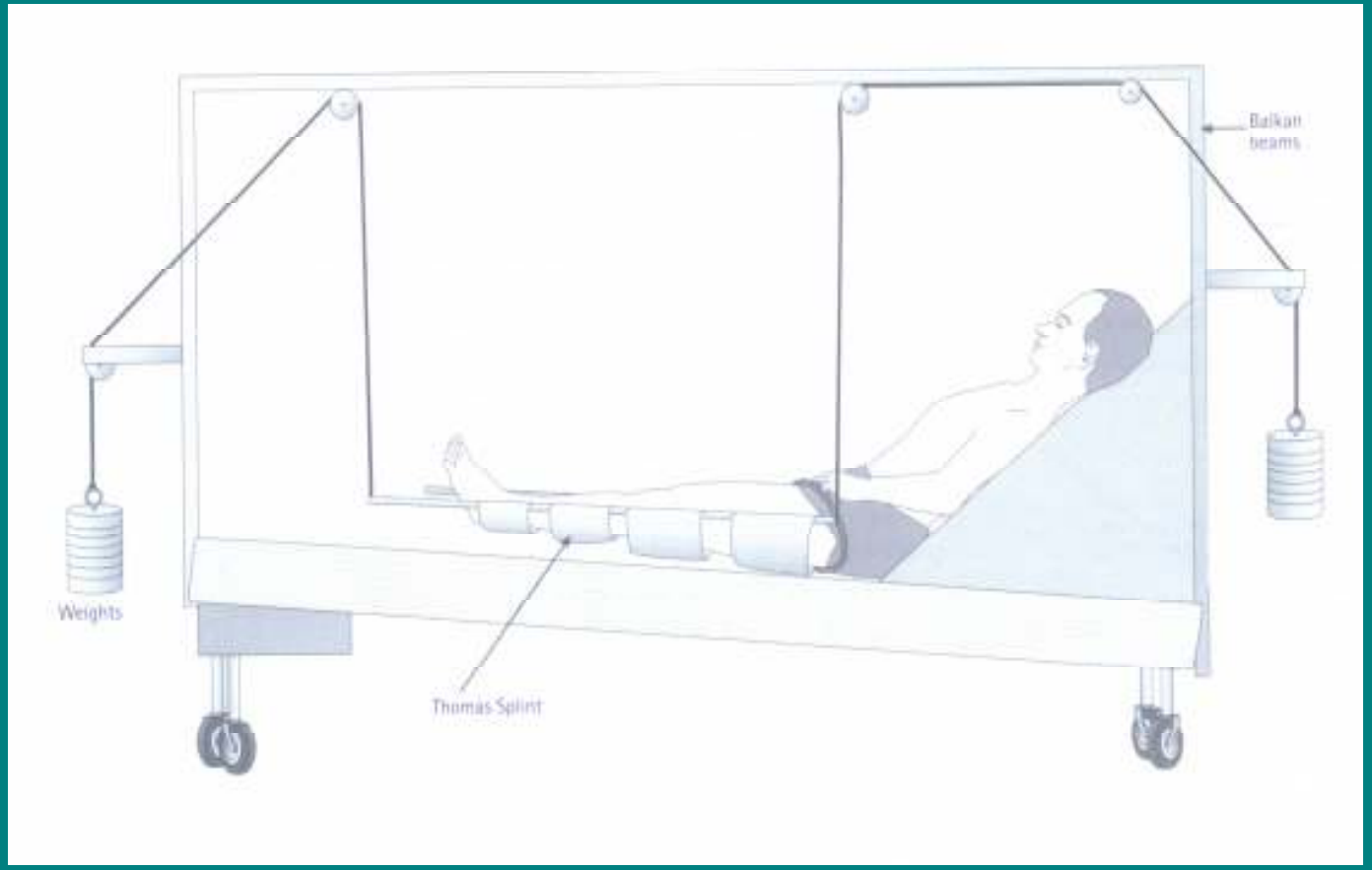


TRACTION MADE EASY!
Resting Thomas Splint



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