Traction
Then and Now

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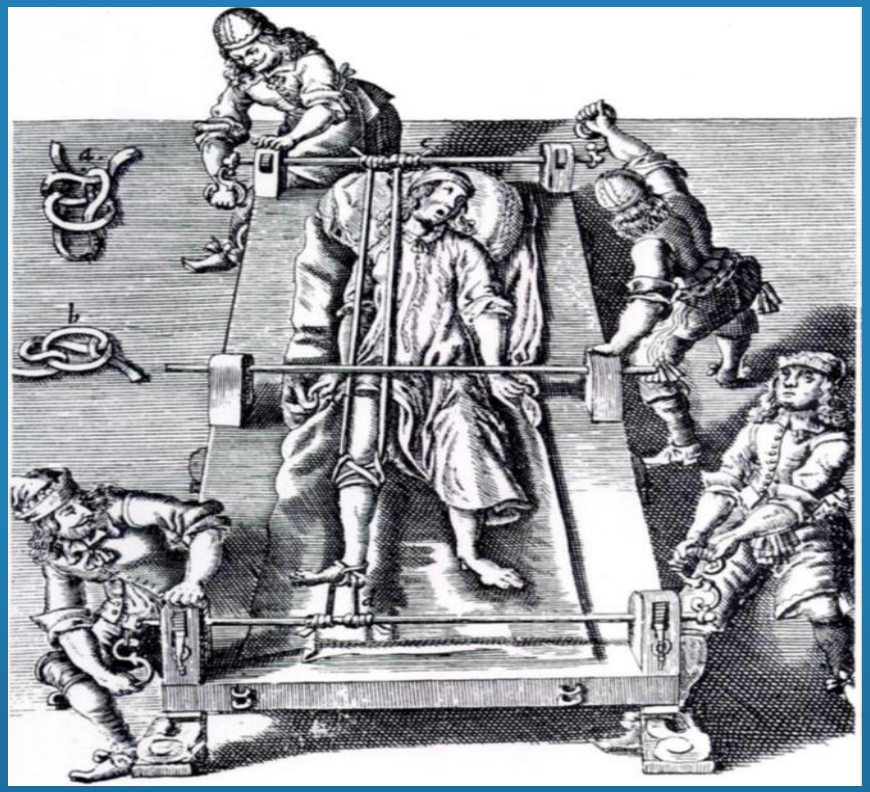
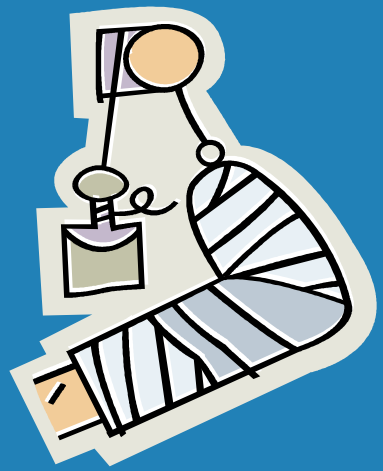


Traction

- Application of a pulling force to an injured or diseased part of the body or an extremity while a countertraction pulls in the opposite direction
- Requires the use of ropes, weights and pulleys as a means of counteracting the natural tension in the tissues
- Countertraction is usually the patient's body



Once the preeminent treatment option, but has been replaced by ORIF as the treatment of choice

BUT not always and not in developing countries

Our Orthopaedic History

Orthopaedics

derived from Greek words for "correct" or "straight" ("orthos") and "child" ("paidion)

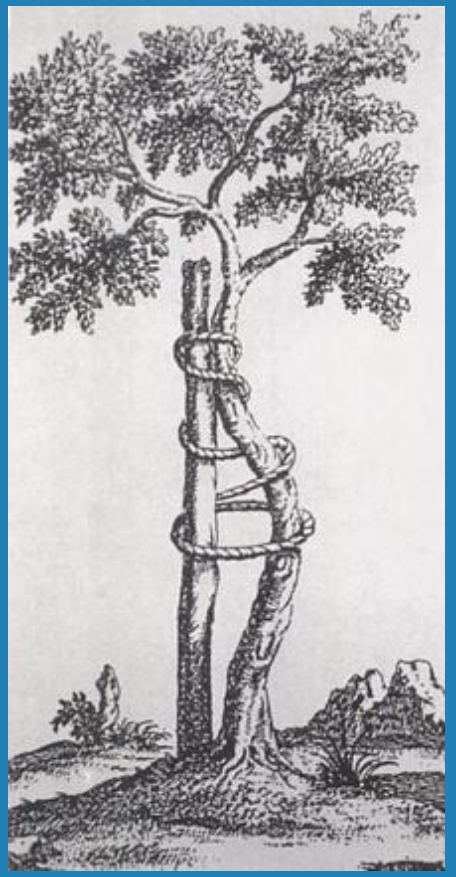
Nicholas Andry 1741

Orthopaedia: or the Art of Correcting and Preventing Deformities in Children

Jean-Andre Venel 1780 “father of orthopaedics”

He established

the first orthopaedic institute in the first hospital dedicated to the treatment of children's skeletal deformities



My Hero – Agnes Hunt

Founded with Robert Jones first UK orthopaedic hospital

'…, we decided that as the doctors all advocated fresh air, we would build a shed in the garden and I should sleep there with the bad cripples and only children who could walk should go upstairs…..'.

The instruments of the “Bonesetter……”

Changing ideas have shaped the discovery and evolution of orthopaedic technology

Advances -use of computers as instruments in the navigational guidance the use of robotics

Cordless drills and improvements in the design of saws

Yet some of the old instruments remain:

- Plaster of Paris bandages
- Liston’s bonecutter
- Gigli’s saw, Macewan’s osteotomes

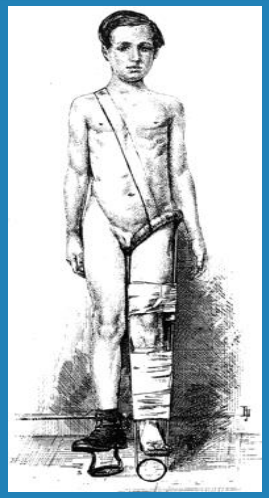
The Thomas Splint

But all evolve…….

The Thomas Splint 1865

Hugh Owen Thomas (1834–1891)

- A calliper splint for TB



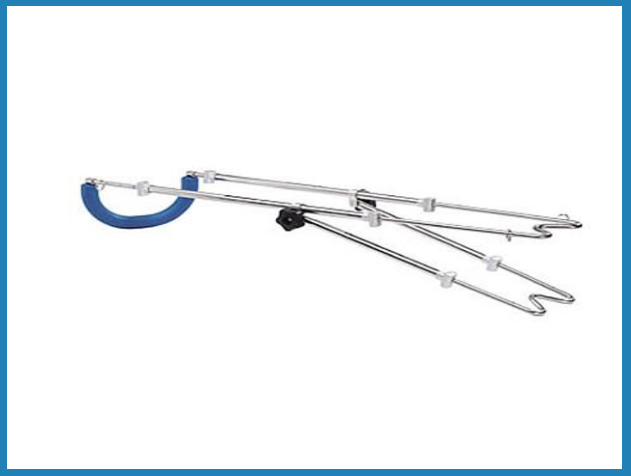
Sir Robert Jones (1857 –1933)

- Introduces military orthopaedic hospitals during WW1
- Adapts Thomas splint for femoral shaft fractures
- Mortality rates dropped

from 80% to nearly 12%

FIG. 14.—Adjusting improved splint on a litter patient, Broussey, France, April 20, 1918

The Thomas Splint Today



Temporary or as definitive management

Adapted into Emergency management

initial reduction of femur fractures prior to OR skeletal traction

Evolution

http://www.bbc.co.uk/guides/zs3wpv4

A Tour of Traction

Evolution
Place in orthopaedics

Methods.
Indications / Complications

TRACTION

TYPE OF TRACTION :

1. Manual traction
2. Skin traction
3. Skeletal traction
4. Traction by gravity

SKIN TRACTION

Advantages

- Easy to apply
- No hazard of bone infection or epiphyseal plate injury

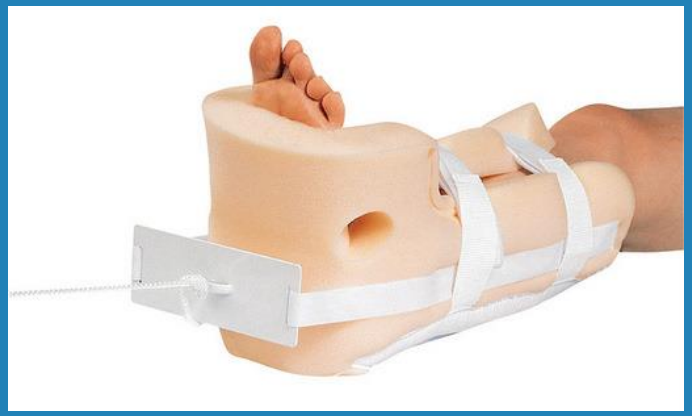
Disadvantages

Limited force not to exceed 3kilos

More common for paediatric patients

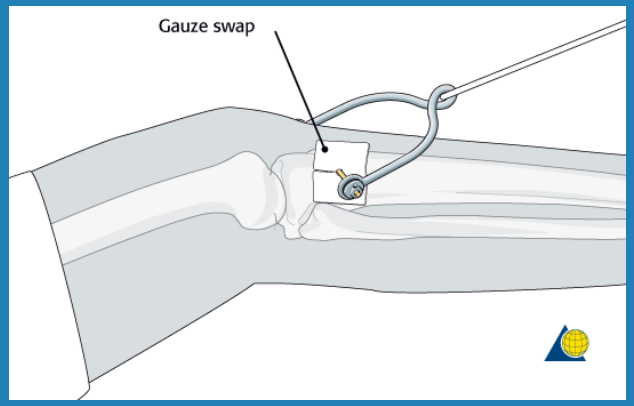
Can cause soft tissue problems especially in elderly or rheumatoid patients

Foam TRACTION



SKELETAL TRACTION

May pull up to 20% of body weight for the lower extremity
Requires local anaesthesia for pin insertion if patient is awake
Preferred method of temporary management till ORIF



SKELETAL TRACTION

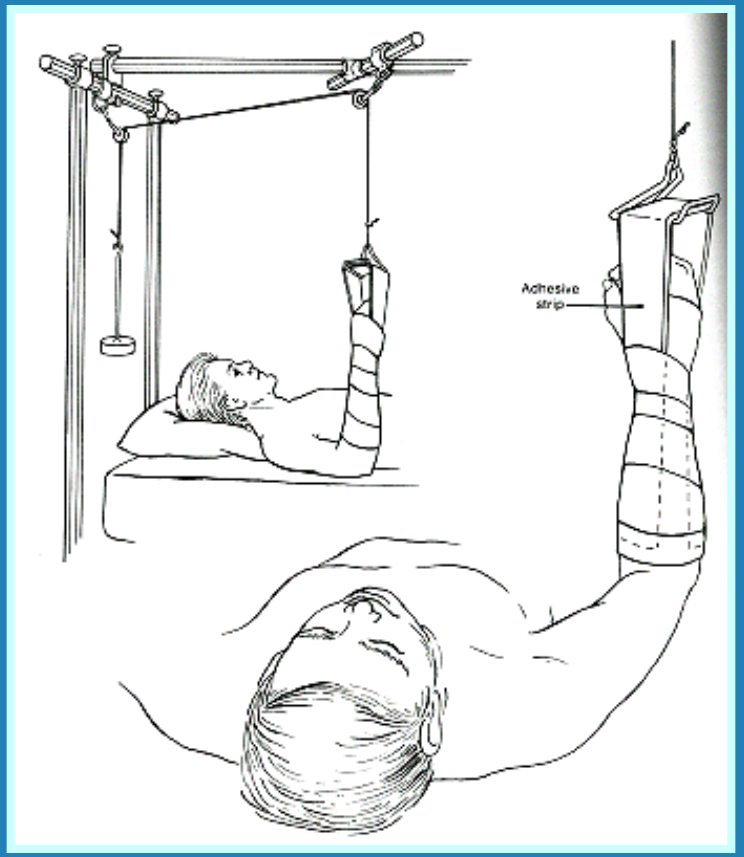
- Infection
- Over distraction of the bone fragments
- Nerve damage: excessive traction forces
- Breaking of the pins or wire

Upper Extremity Traction

- Can treat most fractures
- Requires bed rest
- Usually reserved for comatose or multiply injured patient or settings where surgery can not be done

Forearm Skin Traction

- Adhesive strip
- Useful for elevation in any injury
- Can treat difficult clavicle fractures with excellent cosmetic result
- Risk is skin loss

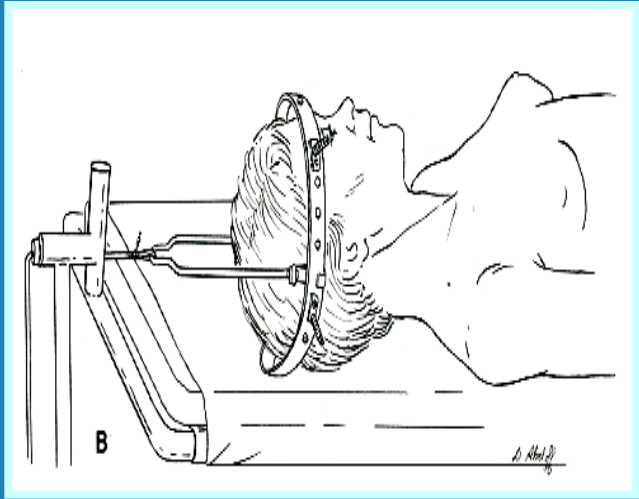


Dunlop's Traction

- Supracondylar and trans condylar fractures in children
- Used when closed reduction difficult or traumatic
- Forearm skin traction with weight on upper arm
- Elbow flexed 45 degrees

Halo Traction

- Unstable C spine #
- Pre Op



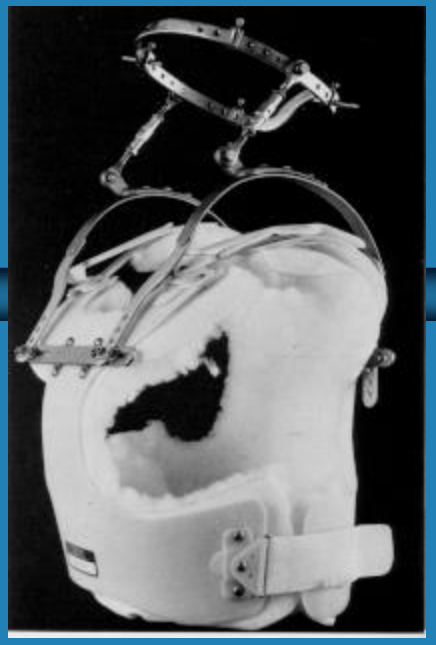
Preoperative Halo-Gravity Traction severe scoliosis

Halo Brace

- Adult and children
- C1-3 fractures – dens
- Application –Sedation-Orthotics/ surgeon

Complications

- Pin loosening
- Pin Infection
- Falls risk
- Functional decline



LOWER EXTREMITY TRACTION

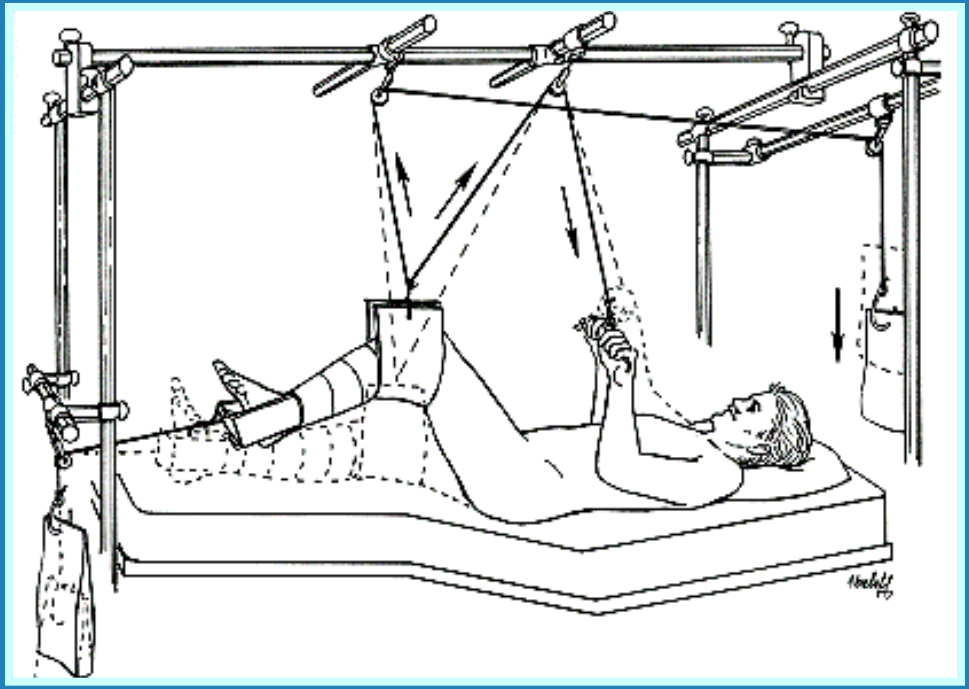
- Can be used to treat most lower extremity fractures of the long bones
- **Requires bed rest**
- Used when surgery can not be done for one reason or another
- Uses skin and skeletal traction

Buck's Traction

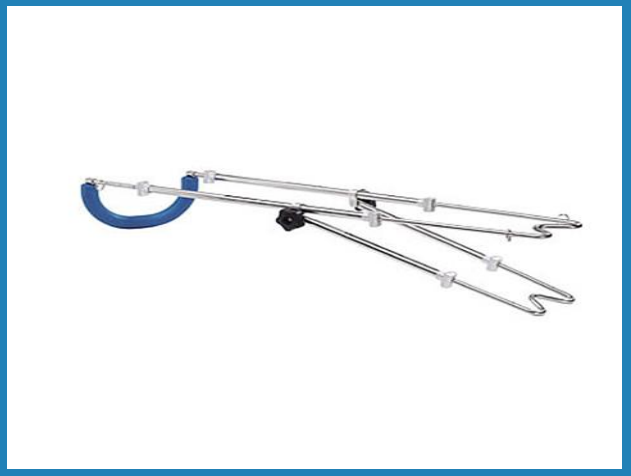
- Used preoperatively for femoral fractures
- Not used to obtain or hold reduction

Split Russell's Traction

- Buck's with sling
- May be used in more distal femur fx in children
- Can be modified to hip and knee exerciser



The Thomas Splint Today



Temporary or as definitive fracture management

Adapted into Emergency management

initial reduction of femur fractures prior to OR skeletal traction

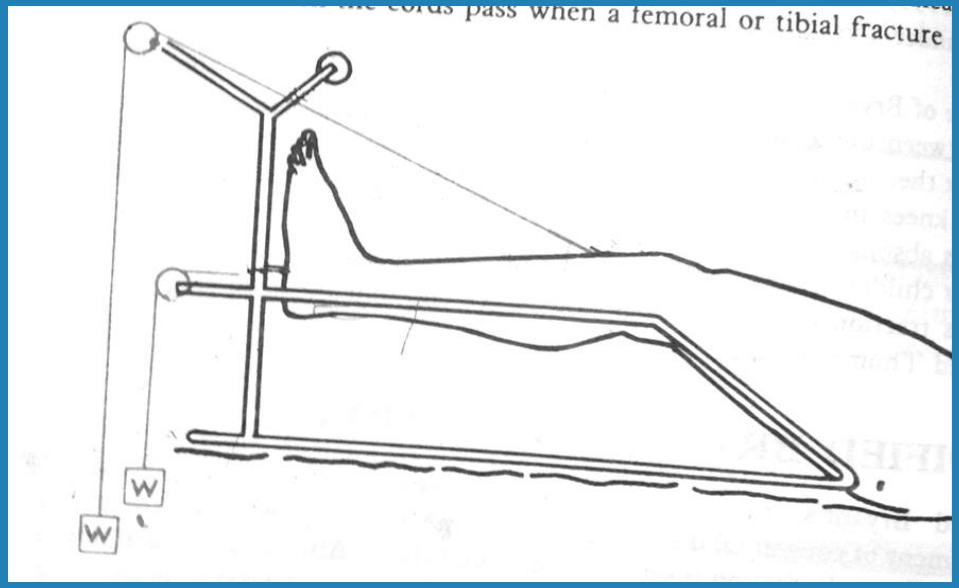
Distal Femoral Traction

Method of choice for acetabular and proximal femur fractures

SLIDING TRACTION WITH BOHLER BROWN SPLINT:

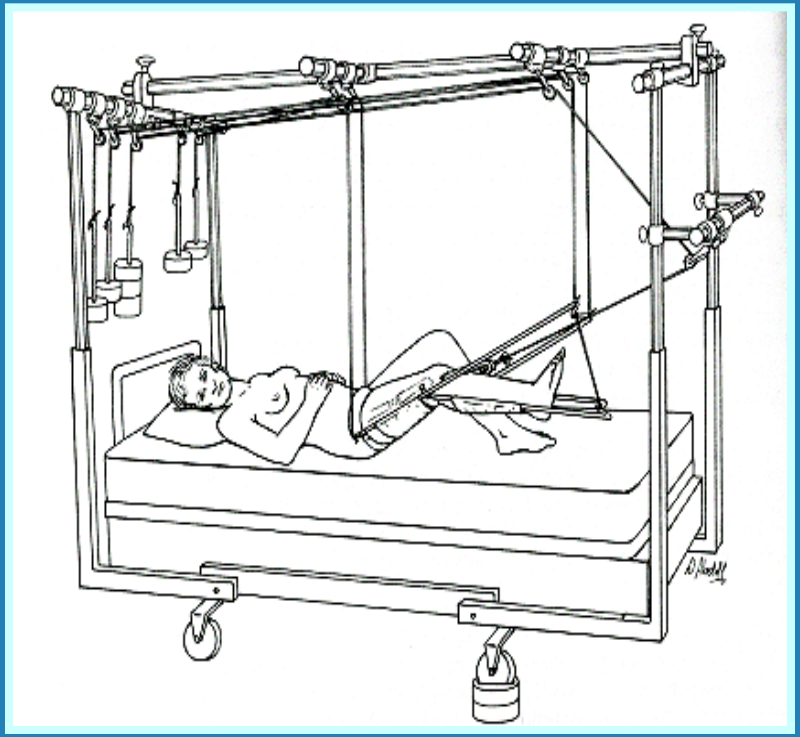
Used for the fracture of tibia or femur.

Skeletal traction is usually applied, but skin traction can be given b/k.



Balanced Suspension with Pearson Attachment (on Thomas splint)

- Enables elevation of limb to correct angular malalignment
- Counterweighted support system
- Four suspension points allow angular and rotational control



Slings and Springs

Not true traction

Holds the leg in suspension with no true counter traction.

Restoring rom gradually to an irritable hip, by abducting the affected leg

Rests the hip joint in a flexed position whilst allowing active movement - perthes

Mobilisation while a patient is non-weight bearing following femoral and tibial osteotomy.

Birth to Six Months DDH

Pavilk harness (1944)

- Experienced staff*
- Very successful
- Allows free movement within confines of restraints

Gallows TRACTION

Children <12 months (and not walking) or weighing 10 to 16kgs.
Indications

fractured shaft of femur

to stretch the soft tissues pre-operatively for DDH

Ultrasound-guided gradual reduction using FACT flexion and abduction continuous traction- DDH

Traction Splint

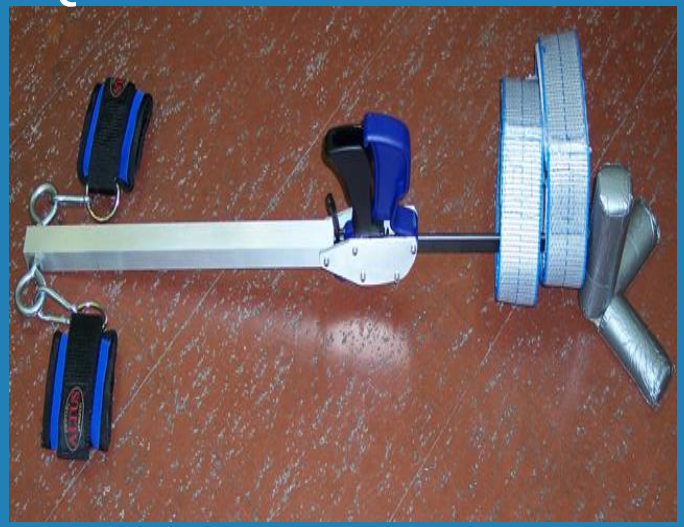
Hare traction splint

http://www.splints.com/pages_products/pivot_trac_splint.html

Sager Traction Splint

http://www.eo.com.sg/image/Consumable/Sager-splint.jpg

Quick Action Traction



Quick Action Traction Splint

Dynamic External Fixation

Value of traction today…

- Safe and dependable way of treating fractures for more than 100 years
- Bone reduced and held by soft tissue
- Less risk infection at fracture site
- No devascularization
- Allows more joint mobility than plaster

Disadvantages

Costly in terms of hospital stay

Hazards of prolonged bed rest

- VTE
- Decubiti
- Pneumonia
- Delirium
- Functional decline

- Requires meticulous nursing care

Orthopaedic Care in Developing Countries

Most injured patients worldwide have no access to an orthopaedic surgeon

Trauma and Infections common

Minimal resources
Simple Techniques- Great Benefit

Casts / Splints / Traction

Orthopaedic Ward 1970s UK

Orthopaedic Ward Manilla 2015

Questions?

Useful Links

- RCN Taction guidelines

http://www.rcn.org.uk/__data/assets/pdf_file/0004/608971/RCNguidance_traction_WEB_2.pdf

- RCN competence framework for orthopaedic and trauma Practitioners

https://www.rcn.org.uk/__data/assets/pdf_file/0010/476047/004316.pdf

- Paediatrics

NSW Traction

http://www.schn.health.nsw.gov.au/_policies/pdf/2014-9099.pdf

Vic NV assessment

http://www.rch.org.au/rchcpg/hospital_clinical_guideline_index/Neurovascular_observations/

DDH

VIC RCH http://www.rch.org.au/kidsinfo/fact_sheets/Pavlik_Harness_for_DDH/

International Hip dysplasia institute http://hipdysplasia.org/

Traction handbook Zimmer

http://www.zimmer.com/content/dam/zimmer-web/documents/en-US/pdf/medical-professionals/surgical-and-operating-room-solutions/zimmer-traction-handbook.pdf

U Tube have extensive lists of traction videos