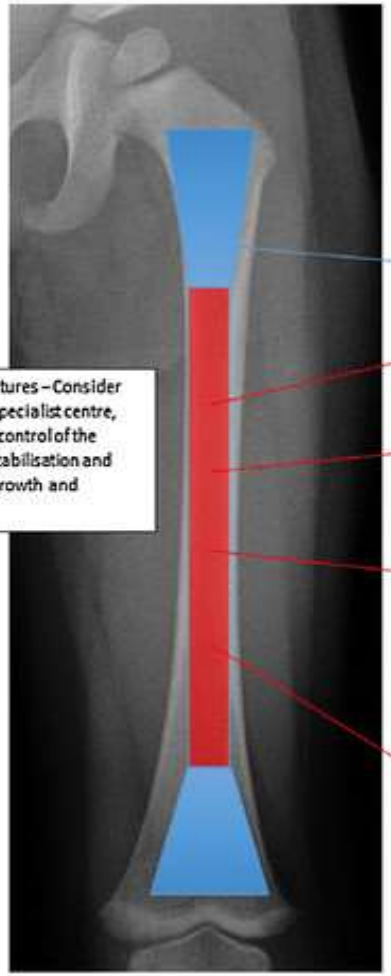
SNS COLLEGE OF PHYSIOTHERAPY
Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Coimbatore– 641035

COURSE NAME: CLINICAL ORTHO

SUBJECT CODE: 6281

TOPIC: OPERATIVE PRINCIPALS

Management algorithm for paediatric diaphyseal femoral fractures



Pathological fractures – Consider discussion with specialist centre, pain relief, local control of the lesion, skeletal stabilisation and preservation of growth and alignment

Guided by socioeconomic considerations and surgical experience

For more proximal/distal fractures consider internal/external fixation

<6 months old → Pavlik harness in first instance or short interval of traction initially

6 months to 5 years → Skin traction only; Skin traction followed by Spica; Spica casting only

5- 12 years → Elastic nailing; For very comminuted or unstable fractures consider plating/ex-fix; Rare indications for non-surgical treatment

>12 years
- <50kg → Elastic Nailing if axially stable
- <50kg → Elastic Nailing +/- ex fix or ex-fix or MIPPO plate if comminuted or axially unstable
- >50kg → Consider MIPPO plating or IMN

For polytrauma consider ex-fix if open/highly comminuted

Consider nailing if age/fracture appropriate

Consider NAI in all femoral fractures

SHOULDER DISLOCATION

HOPI

Fall on the out stretch hand with rotation

Posterior dislocation (due to internal rotation)

Anterior dislocation (due to external rotation of ABDucted arm)

Signs

✓Absent of normal contour of shoulder
✓Bryan sign – anterior axillary fold looks elongated
✓Callaway's sign – axillary girth get increased
✓Duga's sign – inability to touch opposite shoulder by affected hand
✓Hamilton's ruler test – a ruler can touch lateral epicondyle and acromion process at the same time

X-ray

✓AP view in internal and external rotation
✓Axillary view

Approach

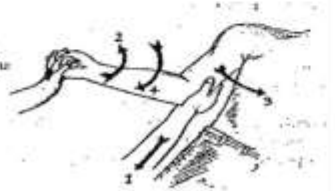
REDUCTION METHODS

A. Hippocratic method

1.The patient lies supine.
2.The physician's foot is placed in the patient's axilla against the chest wall while leaning backward.
3.Slow, steady and gentle longitudinal traction is applied to the affected arm in 30-40° abduction for about one minute.
4.The foot acts as a counterforce and as a lever to push the humeral head laterally while the physician pulls the head toward the patient's foot along the surface of the glenoid, effectively adducting the affected arm.
5.Put patient on arm sling

B. Kocher method

T – Traction in line of humerus
E – External Rotation of humerus
A – Adduction of arm
M – Medial rotation



Complications:

•Shoulder stiffness
•Axillary nerve damage
•Traumatic OA
•Recurrent dislocations
•Unreduced dislocation

Plan: CMR of shoulder joint with Velpeau's strapping x 3/52 followed by physiotherapy

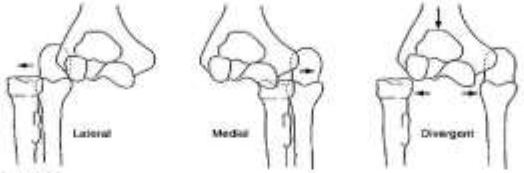
Manage

ELBOW DISLOCATION

HOPI

Fall on outstretched hand with elbow slightly flexed

TYPES



Signs

✓Short forearm with 3 bony points relation disturbed (also in # of epicondyles)
✓Triceps tendon stands prominent(bow stringing)

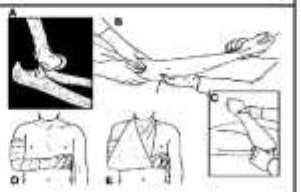
X-ray

✓AP view – greater superimposed of distal humerus with proximal ulna
✓Lateral – coronoid process lies posterior to condyles

Approach

REDUCTION METHODS

Dislocation reducing the dislocation by traction and pressure flexing the elbow fully as a test of reduction immobilizing the limb in an above-elbow plaster slab (margin shown by dotted line) and a sling.



Complications:

•Nerve injury (M>U>R)
•Brachial artery injury
•Myositis ossifican
•Recurrent dislocations
•Osteochondral fracture
•Unreduced dislocation
•Fractures of associated structures (epicondyles, radius head, coronoid process, olecranon)

Plan: CMR with above elbow POP x 3/52 followed by physiotherapy

Manage

HIP DISLOCATION

CLASSIFICATION:

•Posterior 70%
•Anterior 10-15%
•Central

HOPI

Usually occurs in an MVA as a result of dash board injury

Signs

✓Posterior dislocation shows: **FLEXION, ADDUCTION, INTERNAL ROTATION** deformity with shortening of limb, abnormal gluteal bony mass of head of femur

X-ray (AP and Lateral view)

✓femoral head out of acetabulum
✓Lesser trochanter less prominent
✓Broken Shenton's line
✓ASIS shifted upward
✓Associated fractures

Approach

REDUCTION METHODS (POSTERIOR DISLOCATION)

SHOULD BE DONE ASAP TO REDUCE THE CHANCE OF AVN OF HEAD

A. Bigelow method

FLEX
ABDUCT
EXTERNAL ROTATION
EXTENSION
NEUTRAL ROTATION

B. Allis method

1.The patient is supine
2.Affected hip and knee are flexed in 90 degree
3.In neutral rotation of hip, an upward traction is applied along the axis of femur and the same counter traction is given by holding the pelvis.

C. Stimsons' gravity method

The patient is laid prone with the lower limb hanging over the other end of the table
Femoral head is pushed down into the acetabulum and at the same time the traction is applied downward along the axis of femur

Complications:

•Sciatic nerve injury
•Vascular injury
•Irreducible dislocation
•Recurrent dislocation
•Associated fractures
•AVN (15%)
•Secondary OA
•Myositis ossificans

Early

Late

Plan: CMR with fixed skin traction on Thomas splint or POP hip spika x 4-6/52 then partial weight bearing on crutches x 8/52

Manage

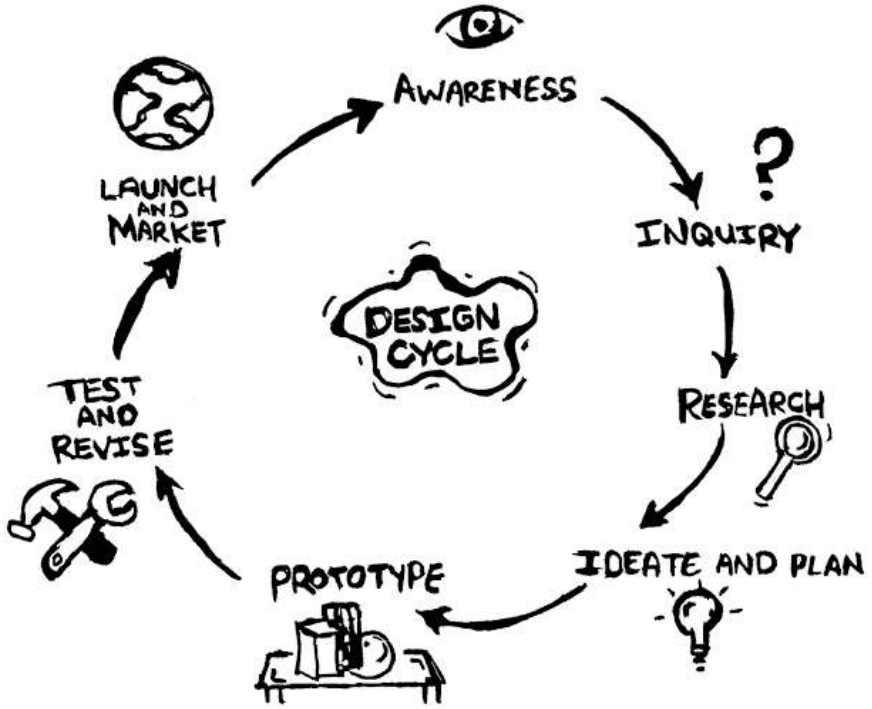
ORTHOPAEDICS ESSENTIALS
PART 6 DISLOCATIONS

Together In Delivering Excellence (T.I.D.E.)

Contributors: Dr. Thum, Goh, Poh, Shum, Justine, Shanthy, Huda, Mirnna, Lin, Phrindha, Fong, Ling Ying, Phoon, Quah

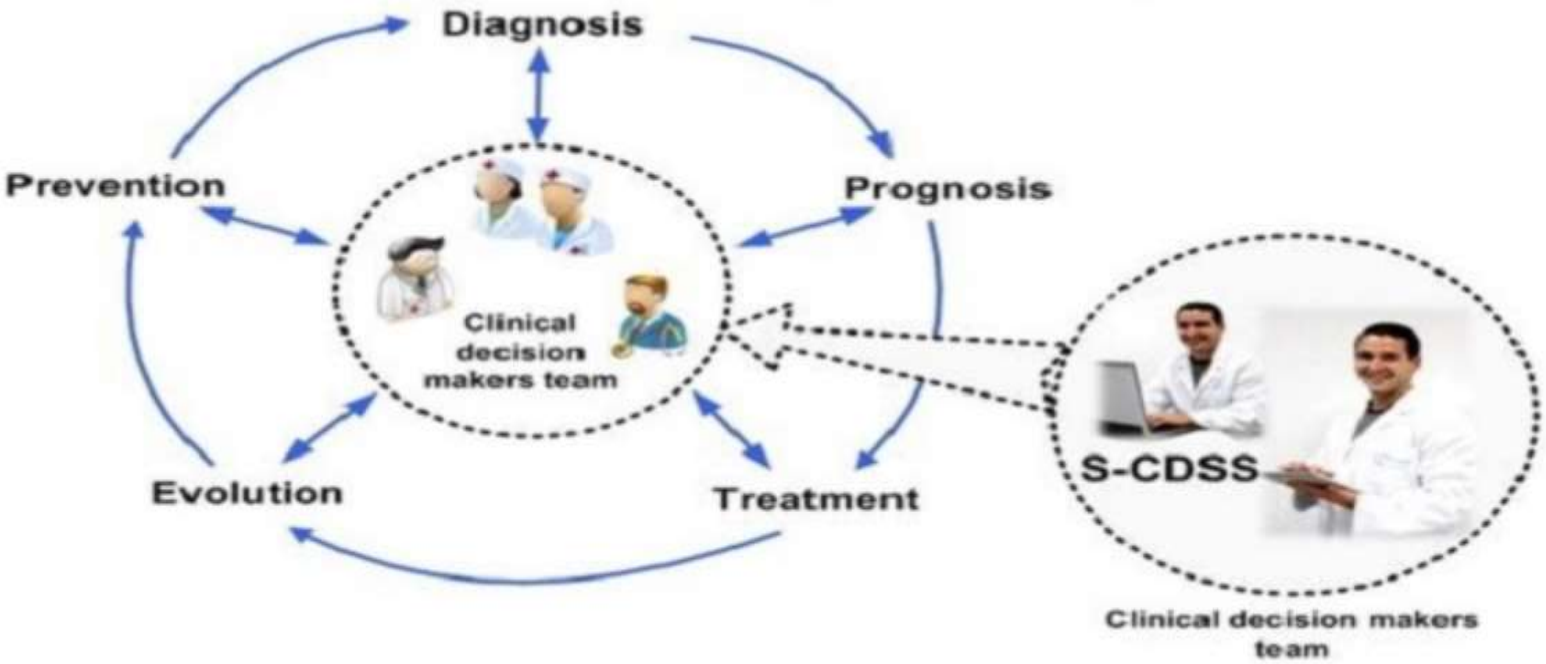
Design Thinking Cycle in Practice

- Capture feedback from healing and function
- Adjust protocols



Emerging Tools

- Clinical scoring and decision support
- Imaging tools to improve accuracy



AO Principles

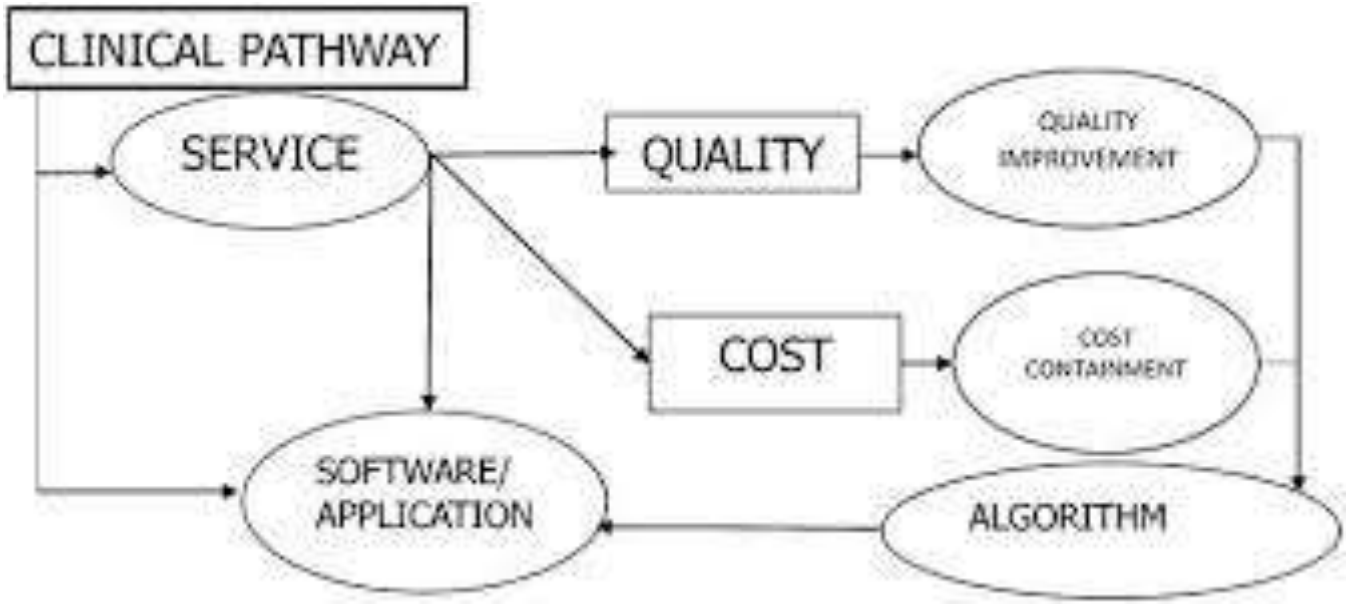
- The four AO principles of fracture fixation are:-
  1. Fracture reduction to restore anatomical relationships.
  2. Fracture fixation providing absolute or relative stability as the “personality” of fracture, patient and injury requires.
  3. Preservation of blood supply to soft tissues and bone.
  4. Early and safe mobilization of the injured part and the patient as a whole.

Patient Engagement

- Shared decision making
- Education for rehabilitation

Quality Improvement

- Use decision data to refine care pathways

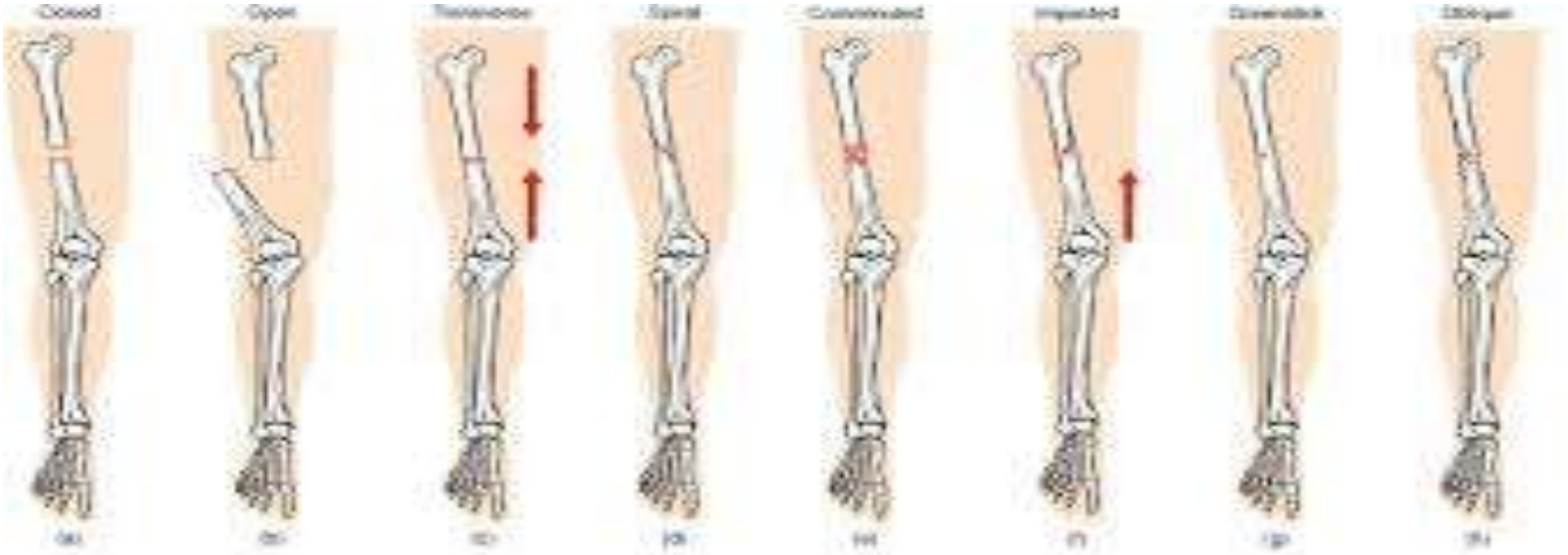


Measuring Success

- Time to union
- Functional scores

Common Errors & Prevention

- Inadequate reduction
- Poor fixation choice



Integrating Design Thinking with Clinical Pathways

Summary


General Orthopedics
In-office and nonsurgical solutions for injuries and joint pain.
Orthopedic Surgery
90 years of combined experience, including minimally-invasive techniques that reduce pain, and scarring while improving outcome.
Hand/Upper Extremity
Diagnosis and treatment of injuries and conditions affecting the hand to shoulder.
Sports Medicine
Expert care and treatment for athletes and active individuals, helping them recover from sports-related injuries. Walk-in injury care available.
Physical Therapy
Post-operative care with our in-network team to improve mobility, restore function, and monitor recovery.