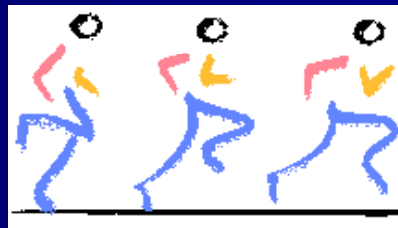


Doctors
Demystify



Elbow Stiffness

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Shriners Hospital 2008

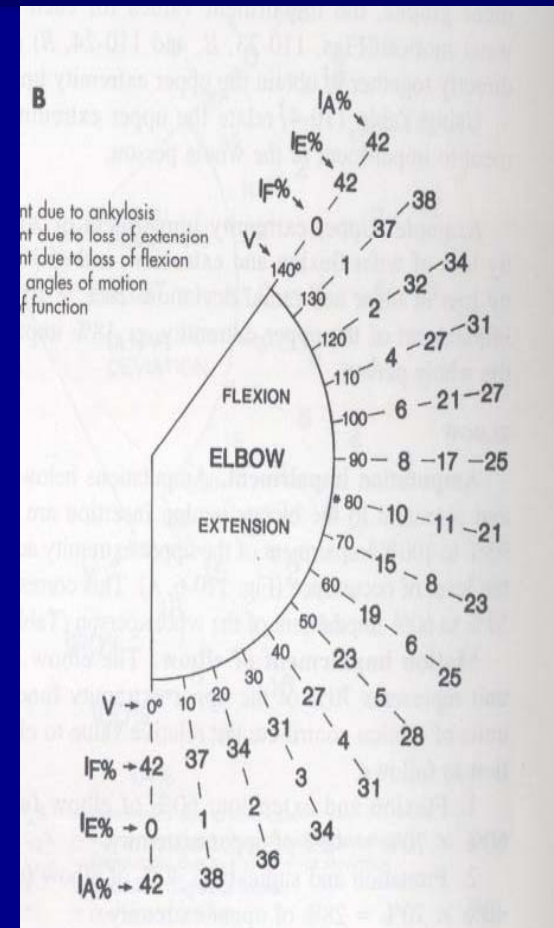
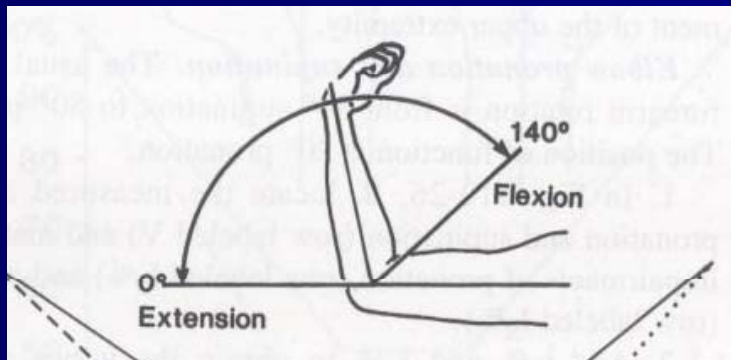


Background

- Importance of elbow motion
 - Elbow = 70% upper extremity motion
 - Flex-Ext = 42%
 - Pron-Sup = 28%

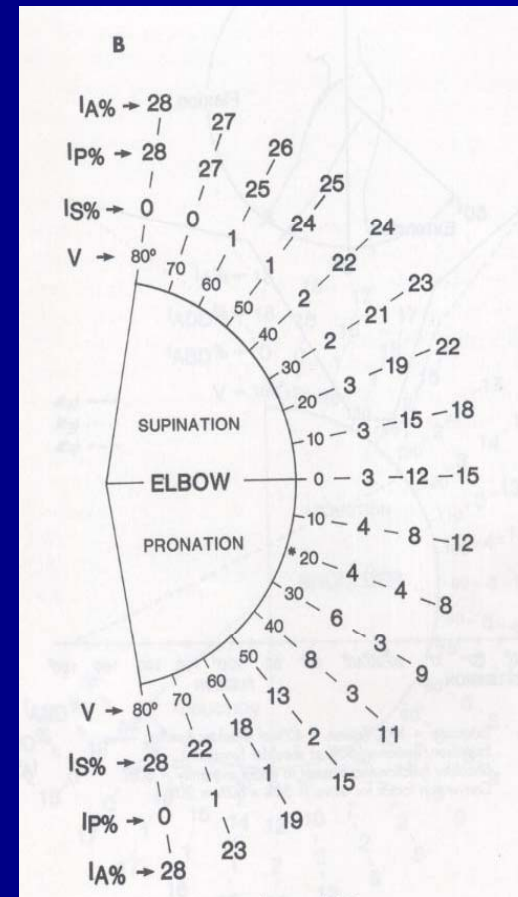
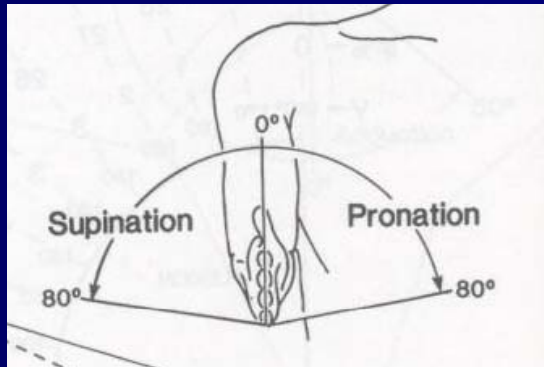
Flexion-extension

- Normal 0-140
 - AAOS 0-146
- Functional 30-130
(4% loss)
- Terminal Flex > Ext for ADLs



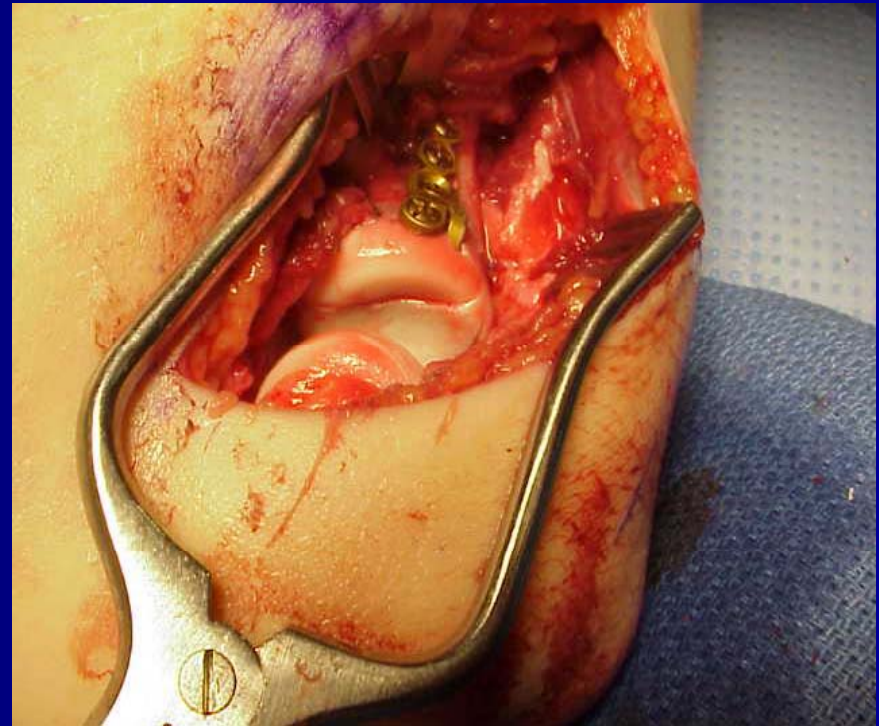
Pronation-Supination

- Normal 80-80
 - AAOS 71 pron/ 84 sup
- Functional 50-50 (3% loss)



Causes of Elbow Stiffness

- Post-traumatic
 - Burns
 - Fracture
- Post-surgical
 - Adhesions/ contracture
- Congenital
 - paralytic
- Acquired
 - Degenerative arthrosis
 - infection

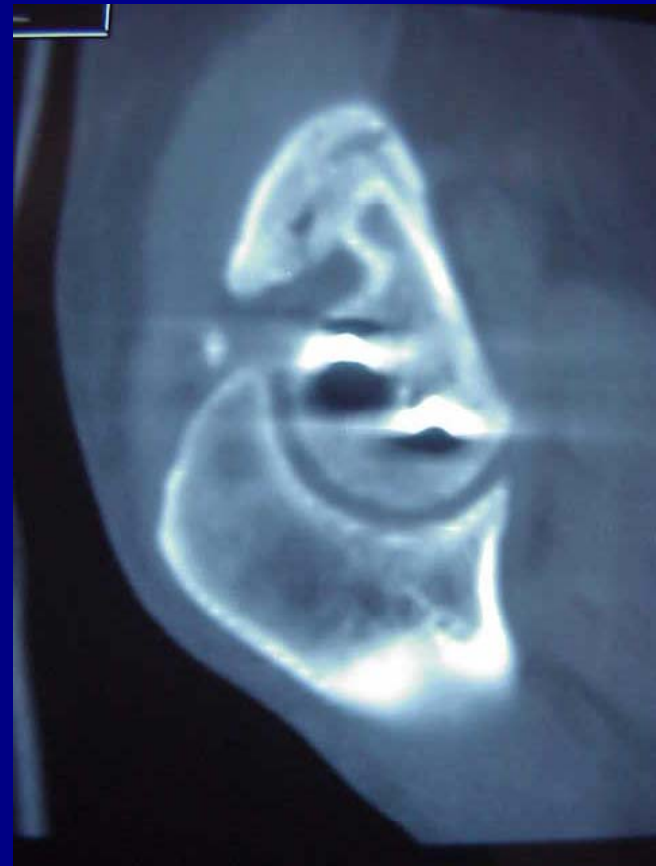


Morrey Classification

- Extrinsic (extra-articular)
 - Skin, subcutaneous tissue
 - Capsule (posterior/anterior)
 - Collateral ligament contracture
 - Myostatic contracture (post/ant)
 - Heterotopic ossification

- Intrinsic (intra-articular)
 - Articular deformity
 - Articular adhesions
 - Osteophytes
 - Fibrosis
 - Loose bodies

- Mixed



Evaluation

■ History

- Perceived deficits in motion
 - Pron/sup deficits: radiocapitellar pathology
 - Flex/ext deficits: ulnohumeral pathology
 - Ankylosis: heterotopic bone
- Painful or pain free deficits
 - Post traumatic stiffness is usually not painful
 - Pain implies arthrosis, impingement, entrapment neuropathy

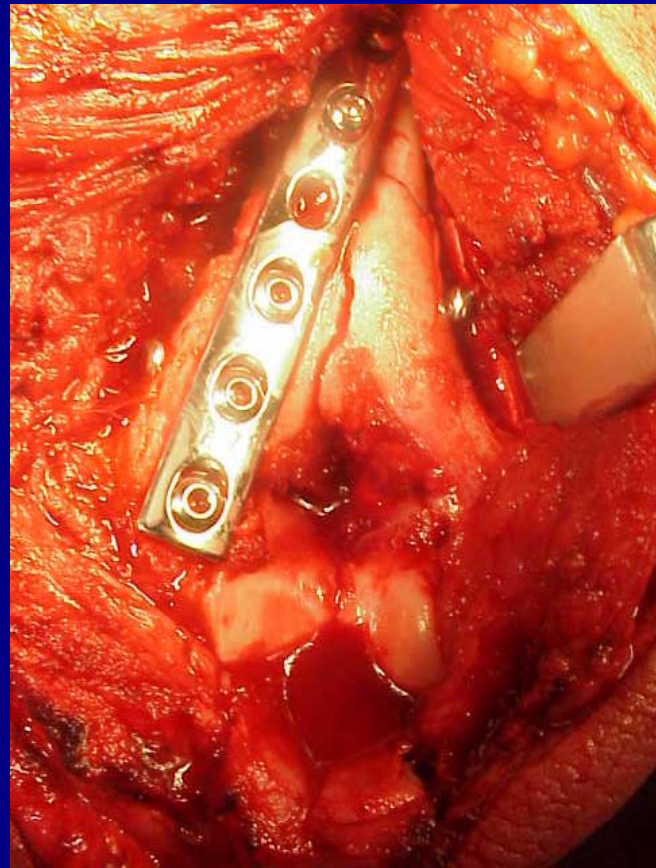
Evaluation

■ Physical Exam

- Inspect skin: scars, fibrosis, adherence to the joint (may indicate need for flap)
- ROM: active and passive endpoint should be noted (hard endpoint- bony impingement, soft- soft tissue constraint)
- Neuro exam: ulnar and median nerve may show signs of entrapment in scar or callus

Evaluation

- Radiographs
 - AP/lat/oblique
 - DJD
 - Impinging hardware
 - Heterotopic bone
 - CT Scan
 - Joint deformity/ LB
 - Heterotopic bone
 - MRI
 - Ligament integrity



Treatment

- Nonoperative
 - Prevention via early motion
 - Decrease inflammation (NSAIDs, steroids)
 - Heat prior to therapy, ice afterwards
 - Modalities (iontophoresis, US, massage, e-stim)
 - Correct muscle imbalances with strengthening



Treatment

- Acute

- Gradual patient controlled stretching

- Splinting

- Dynamic hinged- useful for flexion deficits but poorly tolerated

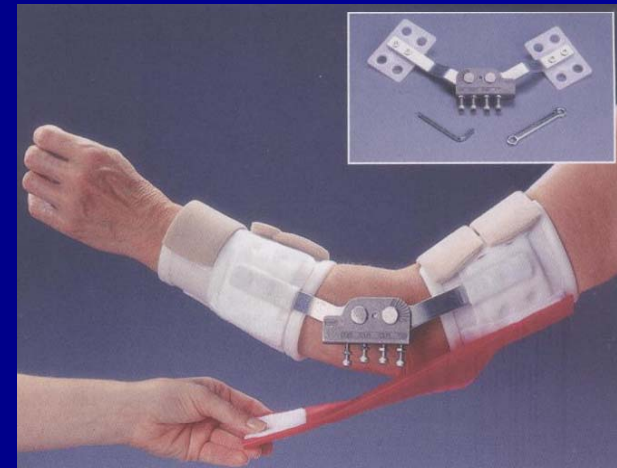
- Static splints- adjustable for flex/ext deficits and better tolerated (turnbuckle splints)

- Night splints in alternating directions

- CPM- limited role

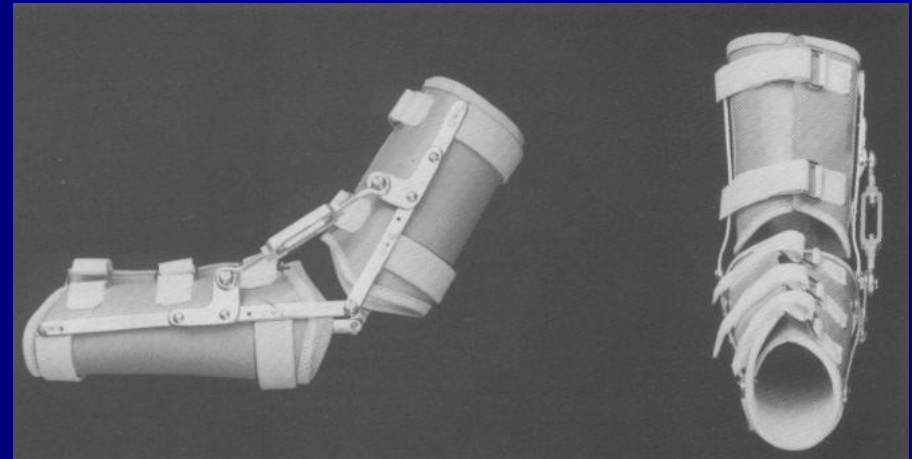
Dynamic

- Constant force
- Does not allow relaxation- spasm of antagonistic muscle
- Poorly tolerated



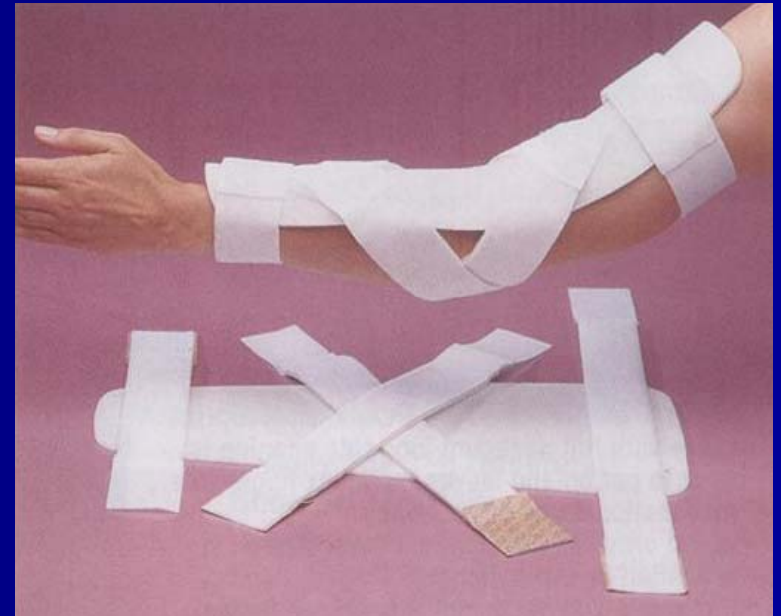
Static Adjustable

- "Turnbuckle"
- Static stretch
- Adjustable angle
- Better tolerated



Static

- Uses principle of stress relaxation
- Force diminishes as joint stretches (relaxation)
- Similar to serial casting



Treatment

- Surgical intervention can be considered as early as 3-6 months from the time of injury once the early phase of soft tissue healing has resolved

Operative Management

- Bony block- arthrosis, heterotopic bone
- Soft tissue contracture
- Intra-articular pathology

Bony block

- Excision of osteophytes
- Clearance of olecranon and coronoid fossae
- Resection of radial head
- Outerbridge ulnohumeral arthroplasty



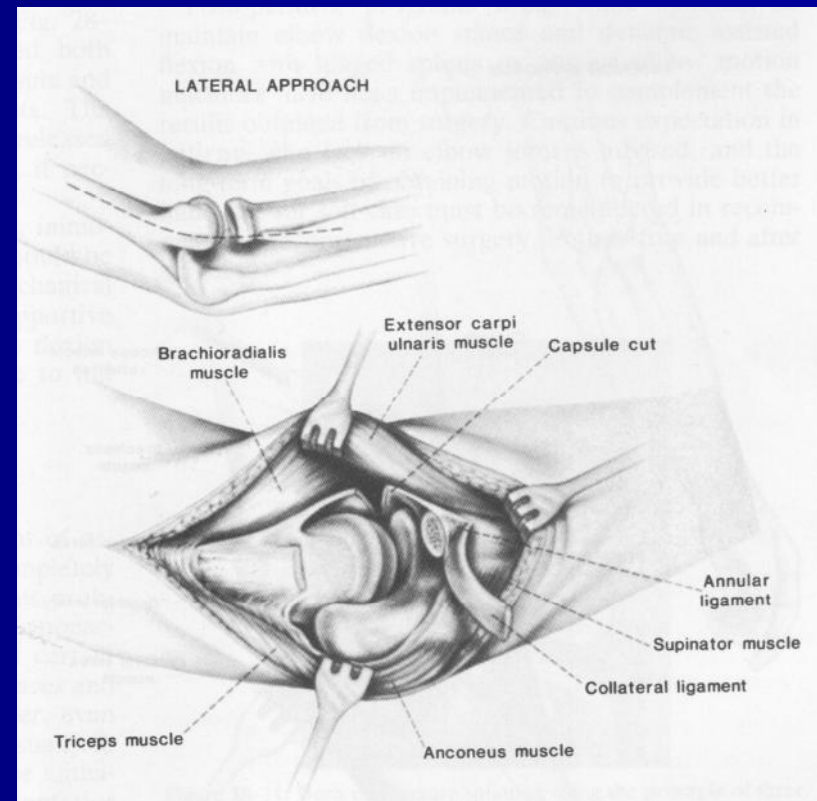
Bony block

- Heterotopic Ossification

- Risk factors: direct trauma with intramuscular bleeding, thermal injury, head injury, forceful MUA
- Tx: excision of mature bone followed by indomethacin or radiation within 48-72 hours

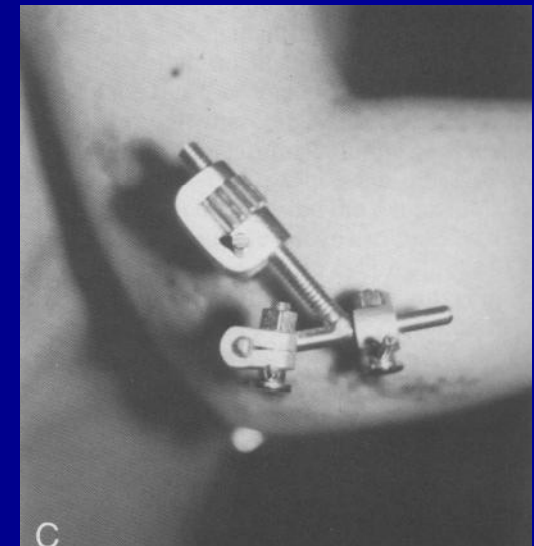
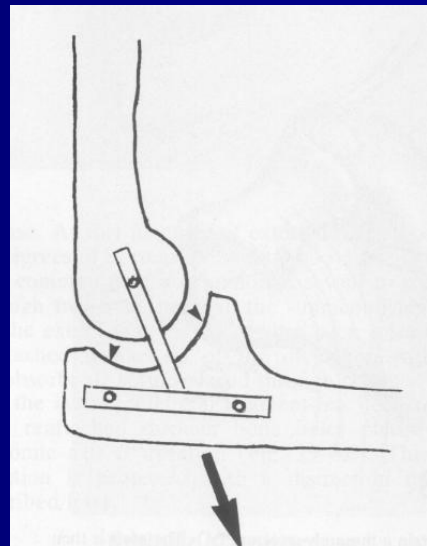
Soft tissue contracture

- Release of anterior capsule and brachialis
- Release of collateral ligaments
- Release posterior capsule and elevation of triceps



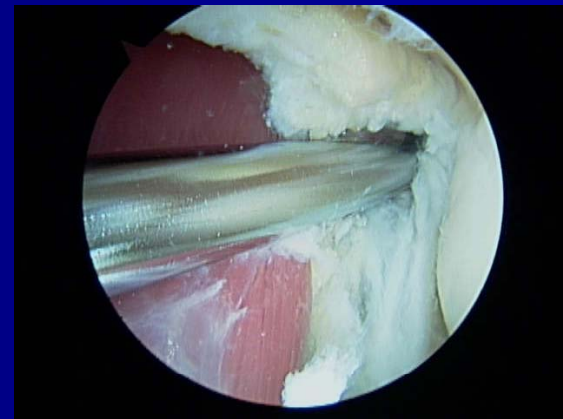
Intra-articular pathology

- Distraction arthroplasty
 - Loss >50% articular surface
 - Malunion with incongruity of the articular surface



Intra-articular Pathology

- Arthroscopic loose body removal
- Spur excision
- Capsular release
- MUA



Arthroscopy

■ Pros

- Same indications as open release
- Less invasive with less blood loss minimizing HO
- Earlier ROM

■ Cons

- Technically challenging
- Higher complication rate in stiff elbows

Salvage Options

- Total Elbow Replacement
 - Pts >60
 - Low demand
 - Results RA>DJD



Thank You