

# Elbow: The Top Tips and Tricks I Learned in My Career

**Edward J Harvey** MD,CM MSc FRCSC FAAOS FIOTA

Professor | **McGill University**  
Head of Surgery and Interventional Sciences Program | **MUHC-RI**



McGill

# Disclosures- no pertinent

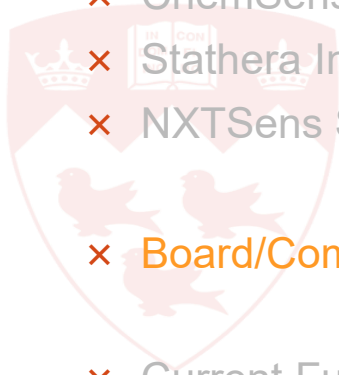
- × Co-Editor in Chief | Canadian Journal of Surgery, OTA Patient Portal
- × Editorial Board | OTA International, J Ortho Trauma
- × Partnerships | Google

## Corporate Ownership

- × NXTSens Inc. | Co-Founder CEO
- × MY01 Inc. | Co-Founder CMO
- × Cananose Inc. | Co-Founder CMO
- × ChemSense Tech Inc. | Co-Founder CEO
- × Stathera Inc. | Co-Founder
- × NXTSens Starter Inc. | Co-Founder CEO

- × Board/Committee Member | Orthopedic Trauma Association, SICOT

- × Current Funding | US DOD, CIHR, CDN DND, NRFR



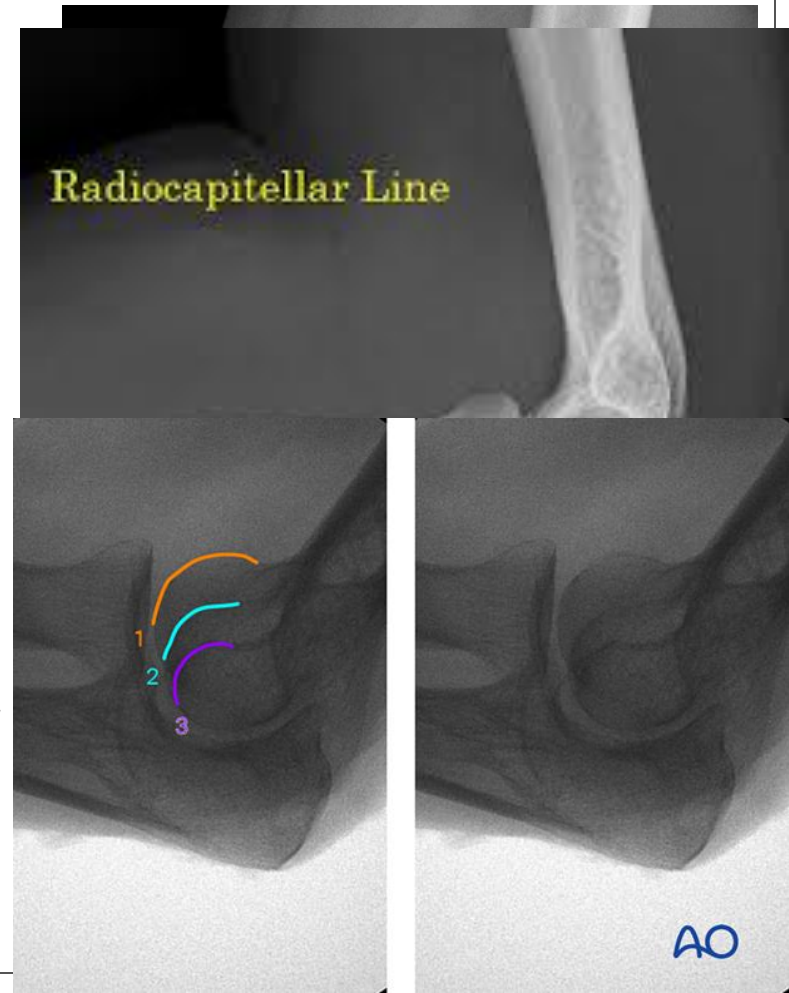
McGill

# Why the Elbow Is Humbling

- ✗ Complex anatomy in a small space
- ✗ High functional demands (stability + mobility)
- ✗ Unforgiving: stiffness, instability, and neurovascular complications are easy to miss or create

# Imaging Tips: Don't Miss What's Hiding

- ✗ The anterior fat pad sign vs. posterior fat pad sign
- ✗ Radiocapitellar line – always check it
- ✗ CT for all complex fractures before the OR
- ✗ MRI for subtle ligamentous injuries?
- ✗ *Always get an elbow series (CT), not just an AP/lateral*



# Radial Head Fractures: Pearls

- ✗ Mason classification – and its limitations
- ✗ Don't operate
- ✗ When to fix vs. replace vs. excise (excision alone can be dangerous)
- ✗ Assessing the Essex-Lopresti injury – don't miss it!
- ✗ *"Test the IOM and DRUJ before closing"*



# The Terrible Triad: A Pattern That Demands Respect

- ✗ Posterior elbow dislocation + radial head + coronoid fracture

*(1) a concentric joint reduction on postreduction radiographs (symmetric joint space, ulnohumeral distance <4 mm on lateral radiographs),  
(2) a radial head fracture with no mechanical block  
(3) a smaller coronoid fracture  
(4) a stable arc of active motion to a minimum of 30° of extension to allow early ROM within the first 10 days*

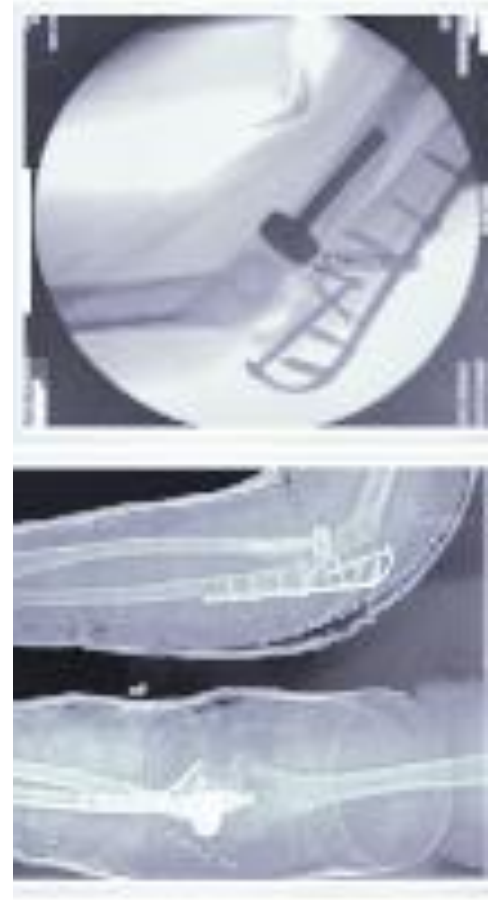
**Stable Reduction in Extension:** The elbow can be extended to at least 45° (or ideally fully) without redislocation or subluxation.

**Stability in Pronation/Supination:** The radial head and coronoid fixation remain secure during rotation.

**Stability Against Valgus Stress:** The repaired lateral collateral ligament (LCL) and bony structures prevent widening

# The Terrible Tetrad: A Pattern That Demands More Respect

- ✗ Posterior elbow dislocation + radial head + coronoid fracture + olecranon fx
- ✗ Systematic approach: radial head, olecranon, coronoid, then LCL/MCL
- ✗ Stability check intraoperatively
- ✗ *PUDA restoration is important*



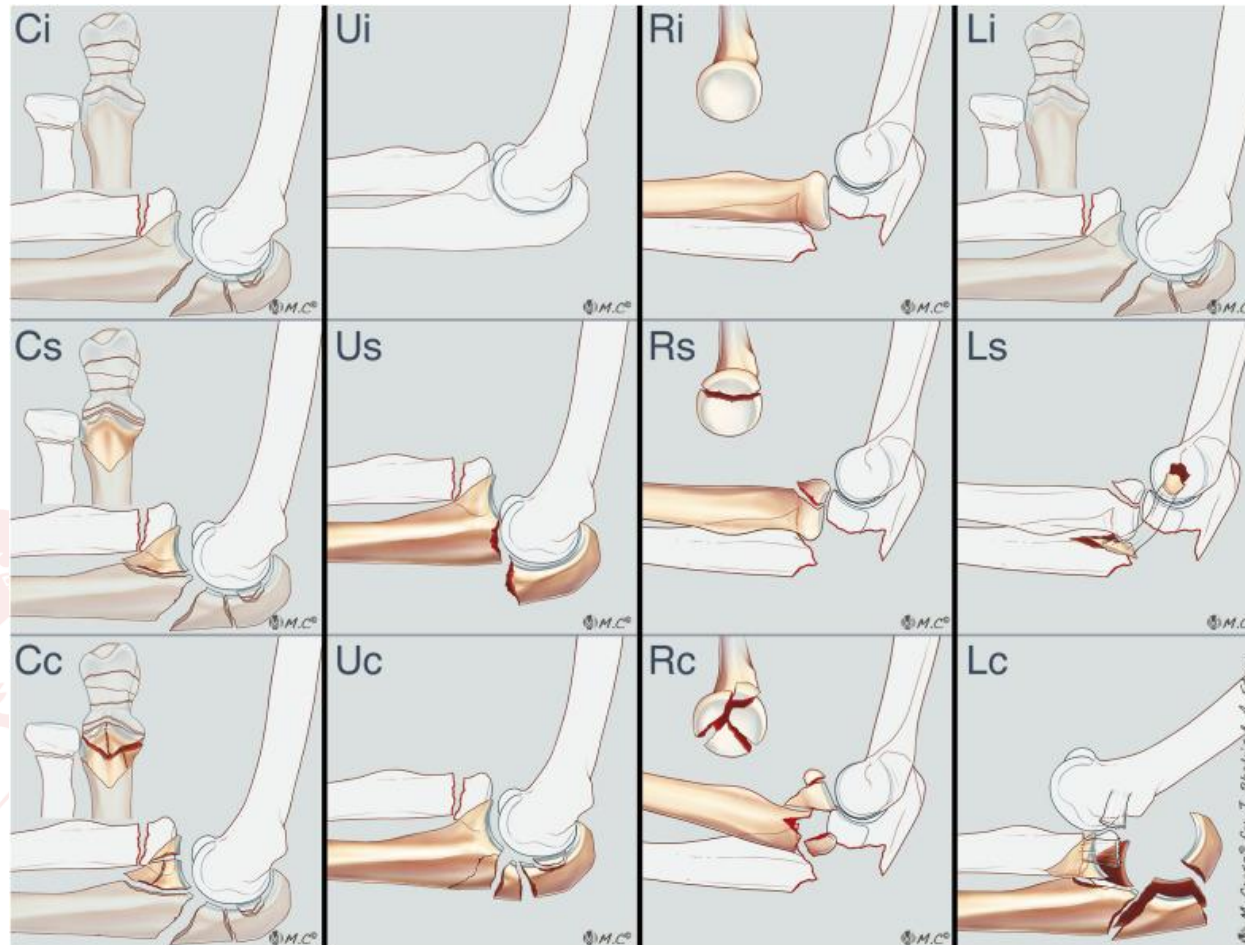


# CURL Classification

## What is this?

Reliability of the CURL classification for proximal ulna fracture-dislocations of the elbow

Humaid Ghori, BSc<sup>a</sup>, Rahul Bagga, MBBS, BSc (Hons)<sup>b</sup>, Anand Tatgar, MSc<sup>a</sup>, Andrew Stone, MBBS, BSc (Hons), FRCS (Tr & Orth)<sup>c,\*</sup>, Richard J. Murphy, MBChB, MA, DPhil, FRCS(Tr & Orth)<sup>b</sup>, Joideep Phadnis, MBChB, FRCS (Tr & Orth)<sup>a,b</sup>



M. Crespo for J. Phadnis & A. Stone

# Coronoid Fractures: The Underappreciated Key

- ✗ Regan-Morrey, Mayo, and O'Driscoll classifications?
- ✗ *A Type I coronoid fracture in the right context is NOT trivial*
- ✗ Anteromedial facet fractures – varus posteromedial instability (VPMRI) pattern
- ✗ Approach options:
  - ✗ lateral window vs. medial exposure

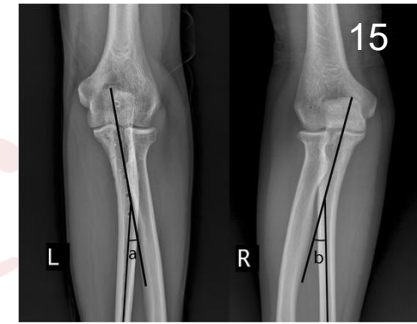


Tip Fracture

Anteromedial Fracture

Basal Fracture

# Olecranon Fractures: Simple Until They're Not



✗ Fixation options: ~~tension band wiring~~ vs. plate vs. Fibre wire

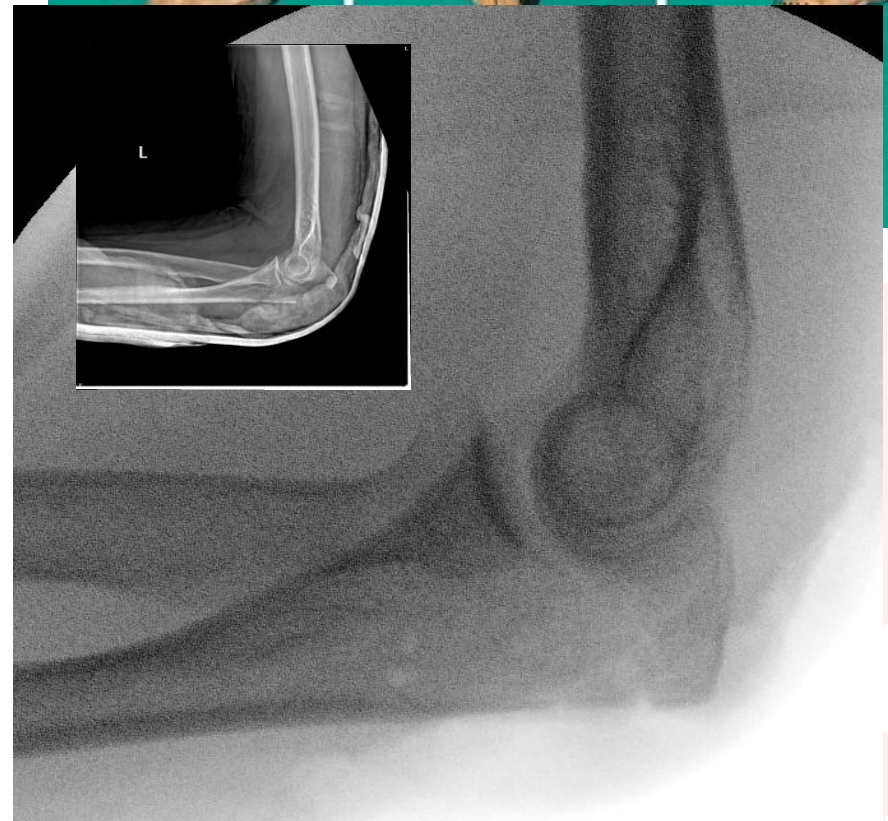
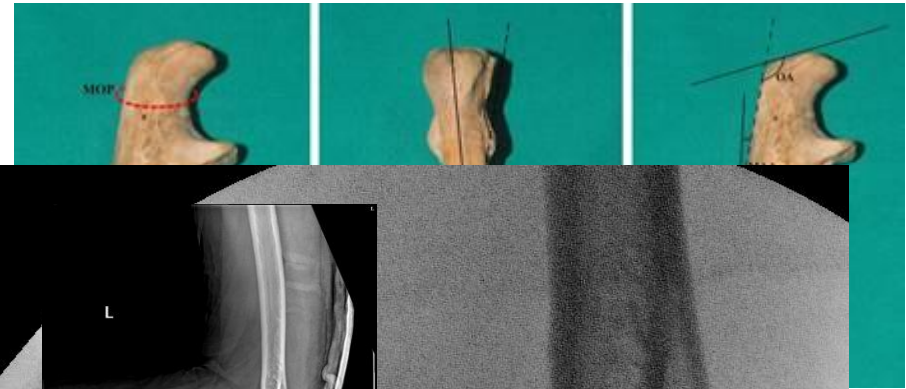
✗ PUDA – 5-6Deg@47mm

✗ (Chapleau J, Balg F, Harvey EJ, Ménard J, Vaclair F, Laflamme GY, Hebert-Davies J, Rouleau DM. Impact of olecranon fracture malunion: Study on the importance of PUDA (Proximal Ulna Dorsal Angulation). Injury. 2016)

✗ Tension band fails

✗ Hardware prominence – set expectations with patients

✗ *Pre-contour your plate; the olecranon is not flat*



# Elbow Dislocations: Simple Is Not So Simple

## × Simple vs. complex dislocation

- × J Shoulder Elbow Surg . 2008 Mar-Apr;17(2):276-80. Epub 2007 Dec 26. Residual subluxation of the elbow after dislocation or fracture-dislocation: treatment with active elbow exercises and avoidance of varus stress. Andrew D Duckworth , David Ring, Anna Kulijdian, Michael D McKee

Does not become concentric

## × When to operate on a "simple" dislocation

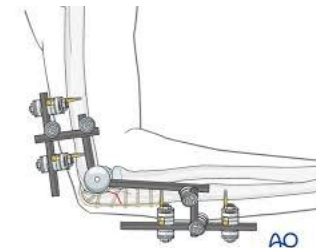
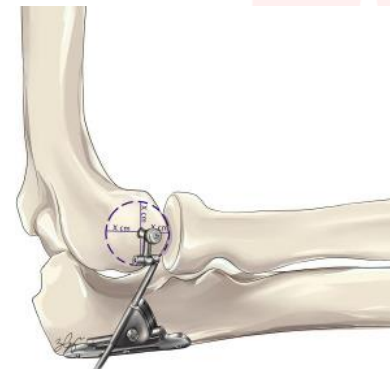
- × J Shoulder Elbow Surg. 2008 Mar-Apr;17(2):281-6. Epub 2008 Feb 20. Unstable elbow dislocations. Andrew D Duckworth , David Ring, Anna Kulijdian, Michael D McKee

## × Hinged external fixation

## × Hinged internal fixation

- × *Early protected motion is the key to avoiding stiffness? Can tolerate 2 weeks in cast (4)*

External Fixator?



# Stiffness: The Enemy After Every Elbow Case

- ✗ Prevention starts intraoperatively - stability
- ✗ NSAIDs / radiation for HO prophylaxis – who gets it?
  - ✗ NSAIDS first release
  - ✗ Radiation rarely used
  - ✗ Operate when ROM is severely limited
- ✗ Splinting vs. early motion protocols
  - ✗ Casts / Transfixion for 2 weeks not an issue
- ✗ Hinged braces?
- ✗ Botox?
  
- ✗ *If a patient loses motion at 6 weeks, act early – don't wait - CRPS*

# Complications: Own Them and Learn From Them

- ✗ Stiffness, hardware failure, nonunion, infection
- ✗ Heterotopic ossification – recognition and management
- ✗ *Complications are your best teacher if you're honest about them*

# Top 10 Take-Home Tips

- ✗ Know the anatomy cold
- ✗ CT scan all complex fractures
- ✗ Fix the coronoid or tighten the capsule- almost always
- ✗ Test I.O.Membrane/DRUJ after radial head work
- ✗ Systematic approach to terrible triad/tetrad
- ✗ Ulna/olecranon is not a slam dunk
- ✗ Watch your nerves - no loops
- ✗ In pediatrics, get a comparison view / arthrogram
- ✗ Have a backup plan in the OR
- ✗ Complications are data - review them honestly

Thanks



McGill

