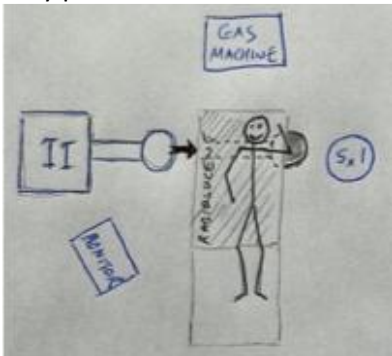


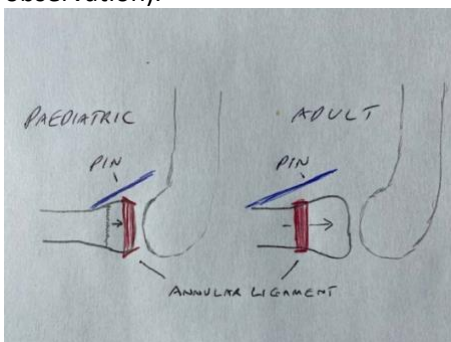
09 Paediatric Upper Limb Part 2 – Elbow

PRO TIPS

- “Knowledge Disperses Fear” (Motto of No. 1 Parachute Parachute School, RAF Brize Norton) – To manage these problems it is essential know
 - The normal anatomy of the paediatric elbow.
 - Acceptable levels of malalignment.
 - Complications
- The statement that ‘they all do well’ is not / cannot be true. Different thresholds for intervention have different levels of risk vs benefit (personal and resource). If you are going to implement a strategy you need to be able to quote, how many people you will be condemning to a sub optimal outcome it will NOT be 0%.
- Obsessively check and document neurologic and vascular status. Document what you find, if no function is demonstrated record as such. Do not assume restriction secondary to pain or non-compliance.
- Supracondylar set up (in conjunction with technique described by Reynolds + Jackson, Concept of treatment in supracondylar humeral fractures, Injury 2005). Elbow hanging off edge of table allows easy placement of lateral wires with shoulder externally rotated. (other set ups + techniques are available!)



- Traction for supracondylar humerus fractures is poorly covered in available review resources. You should be aware of the technique advocated by Dwyer et al (Elevated, straight-arm traction for supracondylar fractures of the humerus in children, BJJ 2005). NB 32% cubitus varus deformity if guidelines not strictly followed.
- The paediatric and adult annular ligaments are different, so is the relationship with the PIN (personal observation).



- Beware of a supracondylar with an AIN palsy. There is a high probability of the brachial artery being caught in the fracture site and so is at risk when reducing and k-wiring.
- If you need to open supracondylar fractures, in my opinion a medial proximal longitudinal incision extending across the antecubital fossa allows for direct visualisation of the NV bundle (often through the damaged brachialis), proximal and distal mobilisation of the NV bundle (often necessary to lift the bundle off the proximal bone end), vascular reconstruction and can be extended into a full-length fasciotomy.

UK ISCP TRAUMA + ORTHOPAEDIC SYLLABUS

Knowledge

0 = No experience expected / 1= Has observed or knows of / 2= Can manage with assistance / 3 = Can manage whole but may need assistance / 4= Able to manage without assistance including potential common complications

Green text = Oxford Trauma Service suggestions

Topic	CORE	ST3-ST8	>ST8
CBD slides / Radiopaedia https://radiopaedia.org/?lang=gb			
Anatomy			
Clinical and functional anatomy with pathological and operative relevance	3	4	4
Surgical approaches to the limbs and axial skeleton	2	4	4
Operative			
Management of closed peri-articular fractures	2	4	4

Technical

0 = No experience expected / 1= Has observed or knows of / 2= Can manage with assistance / 3 = Can manage whole but may need assistance / 4= Able to manage without assistance including potential common complications

Green text = Oxford Trauma Service suggestions

Topic	CORE	ST3-ST8	>ST8
Procedure slides			
Supracondylar elbow fracture MUA +/- percutaneous wires	0	4	4
Supracondylar elbow fracture open reduction	0	4	4
Lateral condyle fracture ORIF	0	4	4
Medial condyle / epicondyle fracture MUA / percutaneous wire / ORIF	0	4	4
Closed reduction and intramedullary fixation of humeral shaft fracture	1	3	4
Closed reduction and percutaneous pinning of supracondylar fracture of the humerus	1	4	4
Open reduction of supracondylar fracture of the humerus	1	4	4
Open reduction and internal fixation of displaced lateral condyle fracture of the humerus	1	3	4
Open reduction and internal fixation of fractures of the medial epicondyle	1	3	4

Please find below, resources that cover the syllabus objectives.

DISCUSSION SLIDES

OTA Resident Lectures – [Paediatric Supracondylar Humerus Fractures](#)

RECOMMENDED KNOWLEDGE REVIEW RESOURCES

ANATOMY

- AO Surgery Reference – [Surgical + Developmental Anatomy](#)

SUPRACONDYLAR + T CONDYLAR DISTAL HUMERUS FRACTURES

- Rockwood + Green Chapter 13p: Supracondylar Fractures of the Distal Humerus p479-527
- Rockwood + Green Chapter 14p: T-Condylar Fractures of the Distal Humerus p528-548
- BOA Standards for Trauma – [Supracondylar Fractures in the Humerus in Children](#)
- JBJS Clinical Summary – [Supracondylar Fractures](#)
- Orthobullets – [Supracondylar Humerus Fractures](#)
- VuMedi – [Supracondylar Humeral Fractures](#) (15mins)

CONDYLAR + EPICONDYLAR DISTAL HUMERUS FRACTURES

- Rockwood + Green Chapter 16p: Lateral Condylar and Capitellar Fractures of the Distal Humerus p602-630
- Rockwood + Green Chapter 17p: Distal Humeral Physeal, Medial Condyle, Lateral Epicondylar, and Other Uncommon Elbow Fractures p631-660
- Orthobullets – [Lateral Condylar Fractures](#)
- Orthobullets – [Medial Epicondyle](#)
- Orthobullets – [Distal Humerus Physeal Separation](#)
- VuMedi – [Lateral Mass + Medial Epicondyle Fractures](#) (10mins)

ELBOW DISLOCATIONS + PULLED ELBOW

- Rockwood + Green Chapter 15p: Dislocations of the Elbow and Medial Epicondylar Humerus Fractures p549-601
- Orthobullets – [Elbow Dislocation](#)
- Orthobullets – [Pulled Elbow](#)

COMPLICATIONS

- Orthobullets – [Pulled Elbow](#)
- VuMedi - [Complications of Pediatric Upper Extremity Fractures](#) (12mins)

- VuMedi – [Staying Out of Trouble in Paediatric Upper Extremity Trauma](#) (17mins)

SCORING / CLASSIFICATION SYSTEMS

- [AO/OTA](#)

RECOMMENDED TECHNICAL REVIEW RESOURCES

EVALUATION OF THE INJURED PAEDIATRIC ELBOW

- Rockwood + Green Chapter 12p: Evaluation of the Injured Pediatric Elbow p463-478
- AO Surgery Reference – [Examination](#)

SUPRACONDYLAR + T CONDYLAR DISTAL HUMERUS FRACTURES

- AO Surgery Reference – [Distal Humerus](#)
- Reynolds – Concept of treatment in supracondylar humeral fractures, Injury 2005
- Dwyer – Elevated, straight-arm traction for supracondylar fractures of the humerus in children, BJJ 2005
- VuMedi – [Supracondylar Humerus Closed Reduction and Pinning](#) (15mins)
- VuMedi – [Open Reduction of Supracondylar Humerus Fracture](#) (10mins)

CONDYLAR + EPICONDYLAR DISTAL HUMERUS FRACTURES

- AO Surgery Reference – [Distal Humerus](#)
- May – Open Reduction and Internal Fixation of Pediatric Medial Epicondylar Humeral Fractures in the Prone Position, Ess Sx Tech JBJS 2021

SMITH + NEPHEW

- [Trauma Education](#)
- [EVOS small](#)

STRYKER

- Surgeon Education – [Link](#)
- Video Library – [Link](#)
- Trauma + Extremity Products – [Link](#)

DEPUY SYNTHES

- [Educational Material](#)
- [J+J Technical Guides](#)

GUIDES + PROTOCOLS

MELBOURNE PAEDIATRIC FRACTURE GUIDELINES

- [Guidelines](#)
NB you will need to select the sections from the top banner - Emergency Department, Fracture Clinic, Education, Family Resources

NICE (NATIONAL INSTITUTE FOR CLINICAL EXCELLENCE)

- [Trauma \(QS166\)](#)
- [Fractures \(non-complex\): assessment and management \(NG38\)](#)