RHCYP Orthopaedics - Information for FYs

Welcome to RHCYP and to the Edinburgh Children's Orthopaedic (ECO) team. We hope you will find your time with us educational and enjoyable. We will do all we can to encourage you to be part of the surgical team and provide you with as much orthopaedic experience as possible. The following pages have been put together to try and help you settle in and work out how things run.

Geography – see Appendix 1

We meet at 8am sharp in a **seminar room near to Kildrummy** ward (level 3). If you're looking at doors to Kildrummy, head left and there's a set of double doors marked 'FD60S' further down the main corridor. We're in the room on the right once you're through these doors.

Orthopaedic patients are usually housed on **Dunvegan** (level 3). Elective and emergency in-patients will be processed through **Crichton**, the surgical admissions unit (level 1). The patients go to theatre from there, and will then return there or to Dunvegan post op.

Theatres are on level 1. Miss Baird and Mr Messner's theatre list is on Mondays, Mr Gaston and Miss Pollet's is on a Thursday, both in theatre 33. Emergency surgery 'CEPOD' is usually in theatre 31 which runs 24/7.

Clinics take place predominantly at RHCYP in OPD 8 (ground floor). In addition Mr Messner does a clinic every 1st,3rd and 5th Wednesday pm at St Johns in OPD 2 and Mr Ahmed and Ms Brown run a fracture clinic there every Monday afternoon.

Our **Offices** are on level 2 and the **Emergency Department** is on the ground floor.

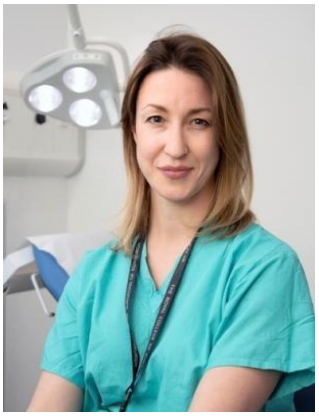
People

Your first port of call will often be the registrars: **Mr Monu Jabbal, Major Kirsty Milne** & **Major Josh McIntyre**



The consultants based here: **Mr Mark Gaston, Mr Juergen Messner, Miss Emily Baird** & **Miss Virginie Pollet**






In addition, Mr Kinley, Mr Simpson, Mr Ahmed and Ms Brown are consultants who contribute to the on call, CEPOD cover and fracture clinics.




Other members of the team include:
Stacey Watson and **Sarah Wyper,** secretaries ext 50623

Stacey Watson

Sarah Wyper

Derek Neill Ortho Technician Theatre / IP / OPD page 9279
Fraser Adams Ortho Technician ED / Fracture clinic
Sarah Paterson, Extended Scope Physio, lead for clubfoot clinic
Lauren Fraser, Extended Scope Physio, lead for neonatal DDH
Harriet Bascombe, Extended Scope Physio, lead for clubfoot and DDH at SJH

Lauren Fraser Derek Neill Sarah Paterson

Please wear your name badge and introduce yourself to everyone.

Clinical

Patient Safety

This underlies everything we do and relies upon team work. If at any time you see or hear something which you consider to be unsafe it is very important you feel able to talk to the other members of the team about it. We will always welcome suggestions for improving safety.
It is important to remember that RHCYP is a children's hospital and has some different practices to adult hospitals. We have a reputation for being available and helpful to the nursing staff, other medical teams and juniors which ensures patient safety.

Please ensure your own **hand-washing** practice is 100%.

The **WHO surgical checklist** is used for every case at RHCYP. Pre-list briefings occur at 8.30/8.45 for elective cases in the anaesthetic room, and it is a chance for you to introduce yourself and familiarise with the theatre team.

Ward rounds. Please always wear your name badge prominently on ward rounds and ensure you introduce yourself to patients/family, the nurse and FY meeting us on the wards. Before leaving a ward we practice "Read back" which means we ask the nurse and/or FY to summarise their understanding of the plan for each patient. It is really helpful and reduces communication errors. Do not check wounds on the ward round. The registrars will arrange this if required. As a rule, we avoid exposing wounds on the ward at all.

Please familiarise yourself with the **PET team** system for getting help with acutely ill kids. This team will respond urgently to help with children who are running into serious/worrying problems. It is the RHCYP equivalent of the resus team but we prefer to intervene before arrest occurs. Know the number (**2222**).

FY Duties

As FY doctor you are the front line in looking after our patients on the ward, and all the consultants would like you to feel able to seek help from any of the team members listed below whenever you need to.

Patients' notes must be written in 7 days a week, ideally typed in Clinical Notes on TRAK straight after the ward round. A typed note in TRAK mustalso be made on admission and documenting any intervention or discussion with the patient/family or other specialties. Regarding **neurovascular status**, it is insufficient to simply document 'NVI'. The gold standard is to document the motor and sensory function of all the applicable nerves pertaining to the specific injury e.g. supracondylar fractures should have the motor and sensory function of the median nerve/AIN, radial nerve/PIN and ulnar nerve documented in full. There is a short code on TRAK to formulate a framework for this in the clinical notes - \aenvi (need to press spacebar after)Radial, ulnar and median nerves intact (motor and sensory). Anterior interosseous nerve intact. Radial pulse present. Good peripheral perfusion.

Consent
We also ask that you are familiar with the law on consent for children, but you will not be asked to gain consent for surgical procedures. Please visit
http://www.gmc-uk.org/guidance/news_consultation/children_andyoung_people.asp
and download the "0-18 years: Guidance for all doctors" PDF to get up to date.

Discharges

These can be an administrative headache but are very necessary. The Immediate Discharge Letter (IDL) is an important means of communication with GPs and for hospital follow up. Please write these as fully as you can and ensure you record the diagnosis and procedures accurately. The post op plans should be detailed in the 'Op Note' section of Trak but if you are in any doubt about these please ask a more senior team member for clarification.

Learning opportunities

We recognise that many of you have different career ambitions that might not include surgery, but we feel that your post will more fulfilling if you take any opportunity to join us in theatre or clinic or for additional teaching. Please feel free to discuss any opportunities for clinical experience or teaching that you would like to take part in.

We would like all FY doctors who spend time in orthopaedics to leave with the following skills:

Skill	**Whom to best to approach**
Application of a leg or arm cast	Derek Neill in OPD / theatre Ortho ST in ED Fraser in Fracture clinic / ED
Splitting a cast	Derek Neill/ Ortho ST
Understanding traction for femoral fractures	Ortho ST
Understanding the management of bone or joint infection	STs/Consultants See Appendix 3
Understanding the management of a limping child	STs/Consultants
Recognising compartment syndrome and performing a neurovascular examination	STs/Consultants See Appendix 4
Basic suturing skills	STs/Consultants
Examining a baby for developmental dysplasia (DDH)	Lauren Daniel/ Sarah Paterson

DDH and Clubfoot
These are core paeds ortho topics and we benefit from a physio-led service for their non-operative management. Please prioritise the 'Baby Hip' clinic (Thurs am) and the 'CTEV casting' clinic (Wed am), to gain an understanding of the crucial early management of these conditions.

Neuro-muscular
Mr Gaston and Miss Pollet's elective clinics are very interesting to attend, to gain an understanding of the management of a child with cerebral palsy or other neuromuscular conditions.

Quality Improvement / Audit
It is hoped that you complete a QI / audit project whilst here. These can be presented at our Dept meeting and/or the Hospital Grand Round.

Meetings

You should ensure that you have a formal meeting with your assigned Educational Supervisor within the first two weeks of your surgical rotation. You will not be reminded to arrange this - your training is your responsibility. Early planning however is the best way to ensure you get as much out of working with us as you can.

At the **Tuesday morning trauma meeting**, the weekend's trauma cases will be reviewed in addition to cases from the preceding week. Post op elective cases from the preceding week, and pre-op cases for Monday/Thursday of that week will also be presented.

After the daily trauma meeting there is an **8.15 CEPOD meeting** in Theatre Recovery where the order of the emergency cases is decided.

We run a quarterly **Dept Governance** and **Radiology MDT** meetings – ask the registrars for details if you would like to join us.

Resources

Departmental information can be found at www.children.nhslothian.scot and www.edinburghorthopaedics.org

We have Fracture Guidelines (appendix 5) which you can refer to, and a website exists to help GPs refer patients to our service. It has patient and GP info sheets and guidance on limping child referral etc. www.refhelp.scot.nhs.uk> referral guidelines > musculoskeletal >children's orthopaedics.

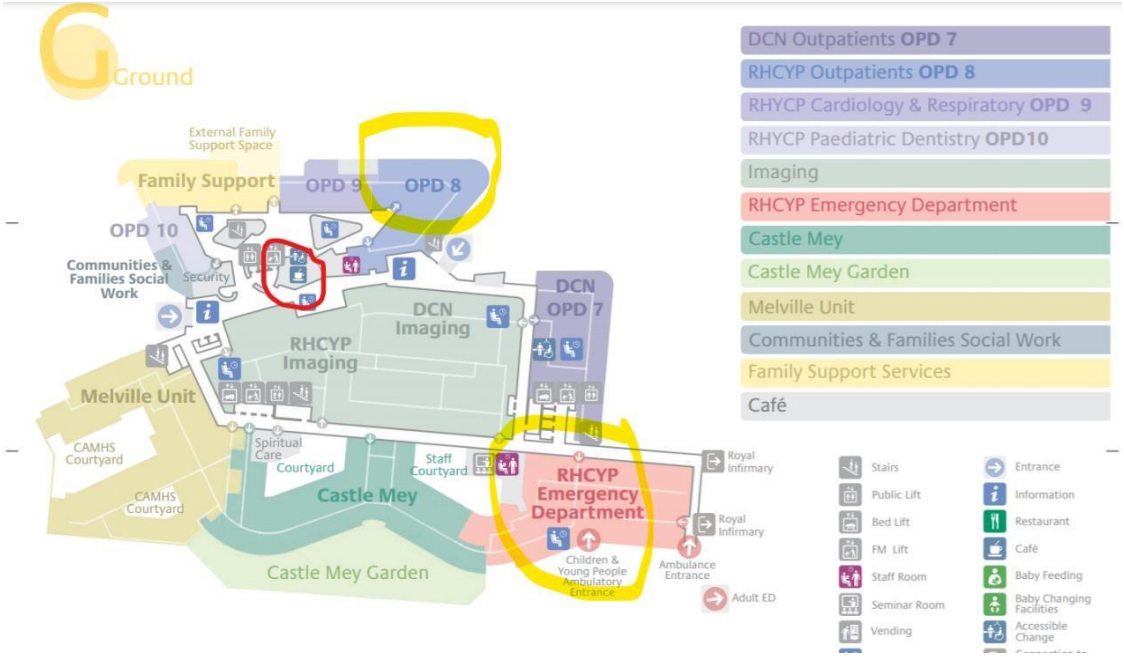
www.orthobullets.com has an excellent paediatrics section and is good for anatomy refreshment
Books: A basic book like MacRae's is useful for paediatric trauma.

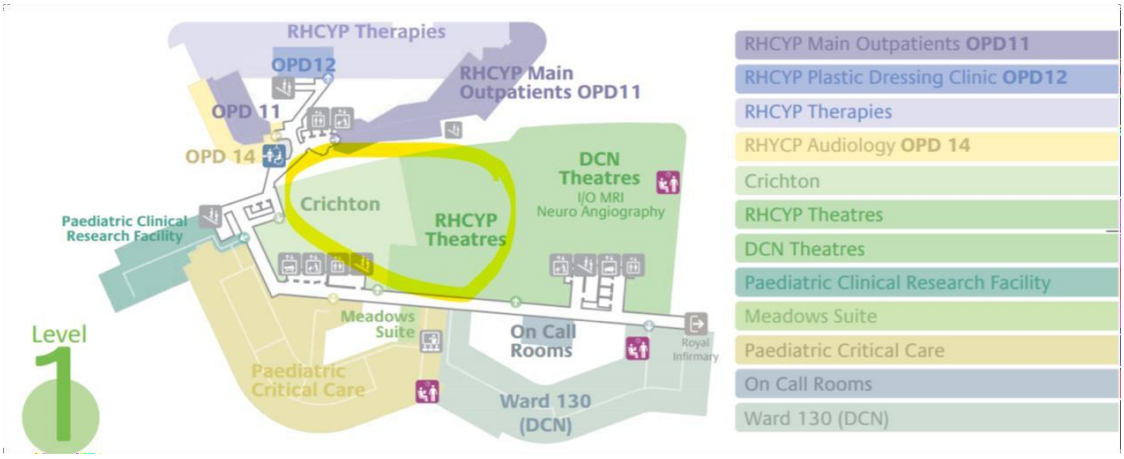
We hope you enjoy your time here, and we welcome any feedback you have

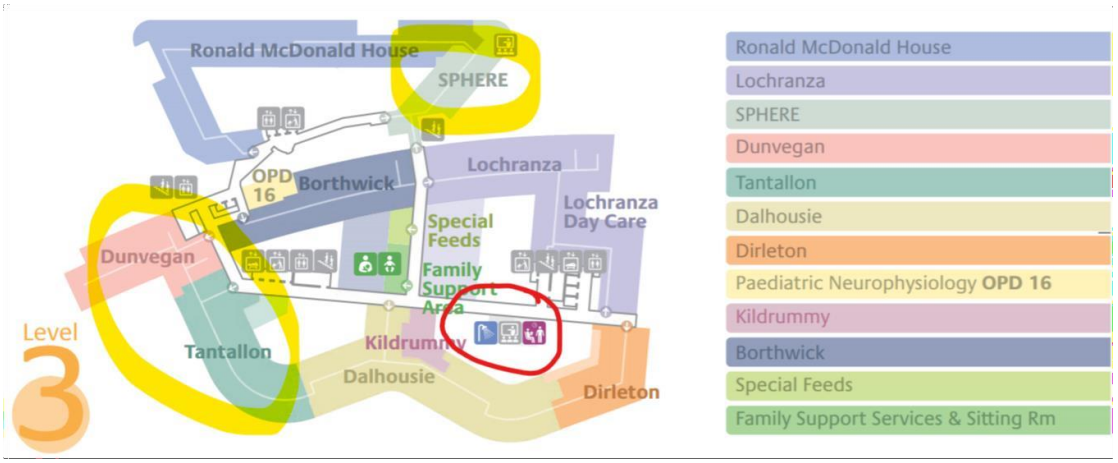
Miss Baird, Miss Pollet, Mr Gaston, Mr Messner

Appendices

1: Maps






Ronald McDonald House
SPHERE
OPD 16
Borthwick
Lochranza
Lochranza Day Care
Special Feeds
Family Support Area
Dunvegan
Tantallon
Kildrummy
Dalhousie
Dirleton
Level 3
Ronald McDonald House
Lochranza
SPHERE
Dunvegan
Tantallon
Dalhousie
Dirleton
Paediatric Neurophysiology OPD 16
Kildrummy
Borthwick
Special Feeds
Family Support Services & Sitting Rm

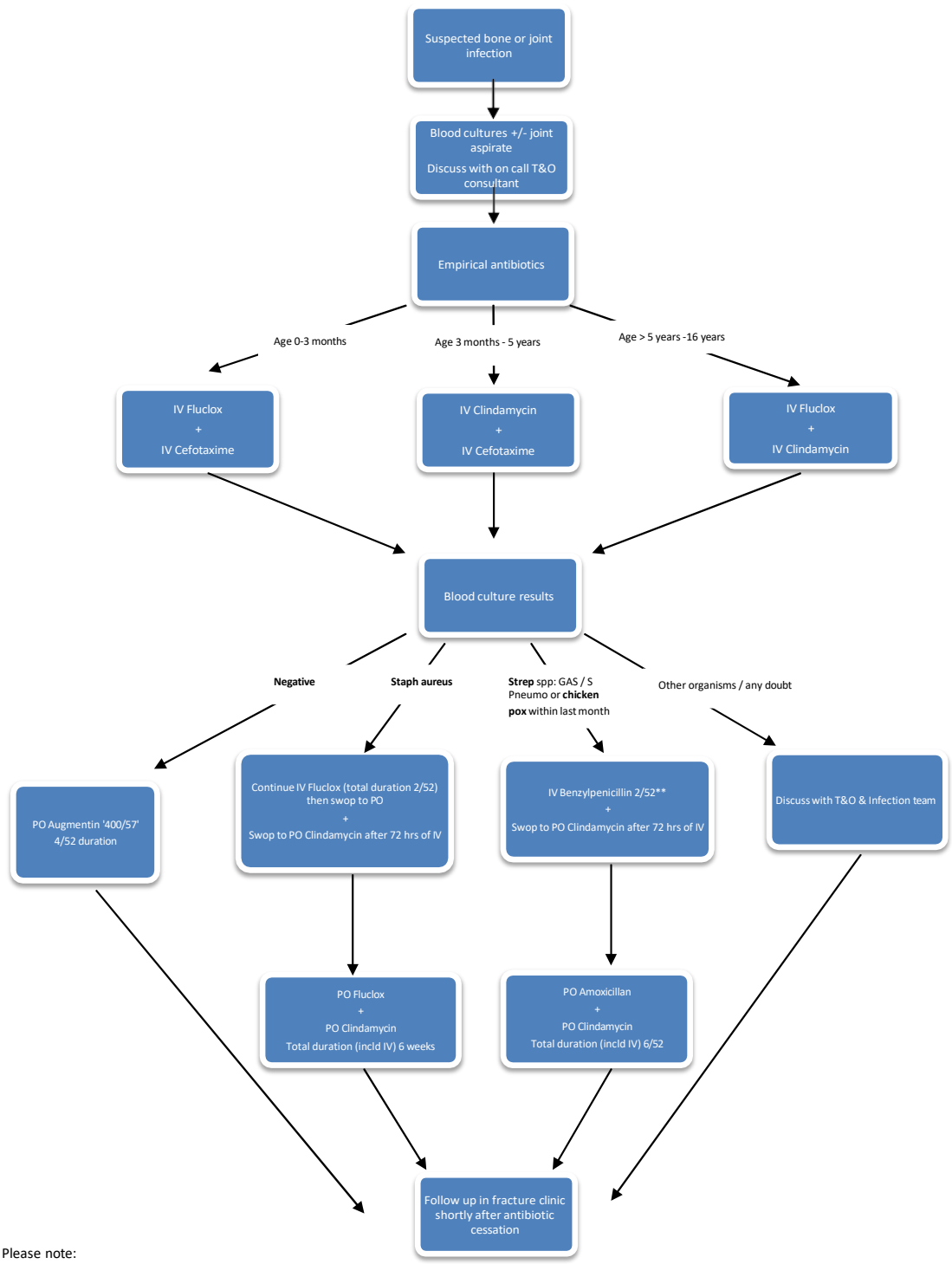

Health Records
Child Life & Health
Helipad Support
Restricted access
Little France School
Clinical Management Office
Restaurant
Terrace
Terrace
Level 4
Child Life & Health
Little France School
Clinical Management Office
Helipad Support
Restaurant
Health Records
Stairs
Public Lift
Bed Lift
FM Lift
Staff Room
Seminar Room
Entrance
Information
Restaurant
Café
Vending
Waiting Room
Parent Shower Room
Baby Feeding
Baby Changing Facilities
Accessible Change
Connection to Royal Infirmary

2: Timetable

	am	pm
Monday	**Trauma meeting** **Baird/ Messner theatre** **Gaston elective clinic**	**Baird / Messner theatre** **Brown/ Ahmed SJH fracture clinic** **Gaston Gait Lab AAH / Teams**
Tuesday	**Trauma meeting** **CEPOD / Teaching**	**Baird / McKinley fracture clinic** **Messner elective clinic** **Derek's K wire clinic**
Wednesday	**Trauma meeting** **Clubfoot clinic**	**Messner RCHYP / SJH clinic**
Thursday	**Trauma meeting** **Gaston /Pollet theatre** **Baird / DDH clinic**	**Gaston / Pollet theatre**
Friday	**Trauma meeting** **Simpson/ Pollet fracture clinic** **Gaston elective clinic**	**Pollet elective clinic**

Updated Aug 2024

Orthopaedic Department Guidance based on NHS Lothian Antimicrobial Guidelines in Children (Oct 2013)



Please note:

- **There is no substitute for thorough and regular clinical review**
- Consider central venous access (0-3 months) or long saphenous /PICC line (3 months+) in theatre within 24 hours
- If tissue/aspirate cultures are positive, IV treatment is required for minimum of 48-72 hours, and continue until patient apyrexial and CRP normalised
- Antibiotic regime may vary depending on sensitivities from the culture results
- Consider Kingella Kingae in <5 year olds
- If allergy to Penicillin, use Clindamycin in conjunction with other agents as discussed with infection team
- Prescribe the maximum dose for the child's weight
- T&O ST to enter patient in infection audit database and review cases at MMQI

** If child well, consider changing to IV Ceftriaxone o.d.

Miss Baird, Mr Gaston, Dr Jones, Dr Kalima 29.07.19

4: Neurovascular examination

Assessment of Neurological Status in Upper Limb Injuries

Nerve	Median	Radial	Ulnar	AIN (Anterior Interosseous)
Paediatric fractures associated with neurological deficit[1]:	Supracondylar (4%) Radius & Ulna	Supracondylar (4-6%) Humeral Shaft	Supracondylar (2%) Radius & Ulna	Supracondylar (5%) Radius & Ulna (Diaphyseal)
Motor Assessment	 Finger flexion	 Extension of wrist & MCP joint	 Small muscles of hand (finger abduction & adduction)	 Thumb flexion at IP joint & flexion of index finger at DIP joint
Sensory Assessment				N/A

Documentation of Neurological Status should <u>ALWAYS</u> include which nerves have been examined.

eg. **Neurovascularly Intact** (*Radial* ✓ *Ulnar* ✓ *Median* ✓ *AIN* ✓)

1. Babal et al. Nerve Injuries Associated with Paediatric Supracondylar Humeral Fractures: A Meta-Analysis. Journal of Paediatric Orthopaedics 2010
2. Davidson AW. Rock-Paper-Scissors. Injury, *International Journal of Care of Injured*. 2003; 34:61-63

Review date: Dec2015

5: Fracture guidelines

The following guidelines provide indicative treatment plans in the immediate management for common paediatric fractures. These are not definitive or comprehensive and any doubt should result in request / referral for opinion to orthopaedics in the normal way. **All junior and nurse practitioner ED staff should discuss any case they are not sure about with senior A&E medical staff prior to referral.**

For any patients having a cast removed at home the information leaflet with QR code should be given to the family

Daily morning trauma meeting review referral (RHCYP Trauma Meeting Review List)
If any concerns regarding fractures that do not require immediate orthopaedic management then please place on Trauma Meeting Review list on TRAK. Patients added to the list for trauma meeting review should have a plan made by the treating clinician in ED.

Following Orthopaedic Consultant review if any changes are required to this plan then the orthopaedic team will contact the family. Please ensure that contact details on TRAK are correct prior to discharge from ED

OVER-ARCHING PRINCIPLES
ALL INJURIES SHOULD BE EXAMINED TO ASSESS NEUROVASCULAR STATUS, AND EXCLUDE COMPARTMENT SYNDROME.
Orthopaedic consultants must urgently review:
- A child with a suspicion of septic arthritis or musculoskeletal infection
- A child with suspicion of a tumour
It is important to remember to <u>always</u> consider **NAI**. *"If you can't cruise, you can't bruise."* Any fracture in a non-ambulatory child needs referral to the child protection team.

Clavicle fracture
Immediate treatment: Provide a collar and cuff for comfort and discharge from ED
Prep the family to begin gentle ROM from 1 week onwards
Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given

Shoulder dislocation
Immediate treatment: Reduce
Provide a collar and cuff for comfort and discharge from ED
Advise to begin gentle ROM from 2 weeks onwards
Follow up treatment: Refer to physiotherapy (community)
No associated fracture: No routine orthopaedic follow up – only if concerns – contact details to be given
Associated fracture: Fracture clinic at 2 weeks post injury with xray on arrival

Proximal humerus fracture
Immediate treatment: Provide a collar and cuff and discharge from ED
Advise to begin gentle ROM from 2 weeks onwards
Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given.
If any concerns in fractures with significant displacement or physeal injury add to Trauma Meeting Review list on TRAK

Midshaft humerus fracture

Minimally displaced / stable

Immediate treatment: Provide a collar and cuff for comfort and discharge from ED

Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given

Displaced / unstable

Immediate treatment: Apply a well fitting high above elbow backslab / softcast if appropriate and discharge from A&E

Follow up treatment: Fracture clinic at 1 week post injury with xray on arrival to assess displacement and NV status
If stable: discharge from clinic. Back slab / softcast off at home at 3 weeks and advise to begin gentle ROM
If unstable/any concerns: discuss with orthopaedic consultant

Supracondylar fracture of humerus

Gartland I (undisplaced)

Immediate treatment: Apply a well-fitting above elbow backslab or soft cast with flexion to 90 degrees and discharge from ED

Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given
Prep the family that they will remove the backslab or soft cast themselves at 3 weeks and to avoid high energy activities (e.g. trampolines) up to 2 months post injury.

Gartland II

Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Will require further discussion with orthopaedic consultant regarding operative or non-operative management

Follow up treatment: If operative treatment: Derek's K wire clinic appointment 3 weeks post op for removal of wires
Fracture clinic at 4 weeks with xray on arrival. Can be discharged at this stage unless further concerns (e.g. posture, NV injury)
If non-operative treatment: Fracture clinic at 1 week with xray on arrival. Review in fracture clinic at 4 weeks with xray on arrival. Can be discharged at this stage unless further concerns (e.g. posture, NV injury)

Gartland III and IV

Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Admit to the ward for standard surgical management
Document a clear assessment of their NV.

Follow up treatment: Derek's K wire clinic appointment 3 weeks post op for removal of wires.
Fracture clinic at 4 weeks with xray on arrival. Further follow up dependent on status at that time, some need 6-12 months FU. (e.g. elbow posture, NV injury, risk of AVN).

Medial epicondyle fracture

Immediate treatment: Reduce any associated elbow dislocation and check that the medial epicondyle is not within the joint (if incarcerated ORIF will be required)
Apply a well-fitting above elbow backslab or soft cast

Follow up treatment: If displaced less than 1cm (most): No routine orthopaedic follow up – only if concerns – contact details to be given. Family to remove cast at 3 weeks and begin gentle ROM
If displaced >1cm: Discuss with orthopaedic registrar on call and fast patient. Will require further discussion with orthopaedic consultant regarding operative or non-operative management

Lateral condyle fracture
Send to xray for internal oblique view (out of cast) to assess true displacement

No intra-articular displacement
Immediate treatment: Apply a well-fitting above elbow backslab or soft cast and discharge from ED
Follow up treatment: Fracture clinic at <1 week for lateral and internal oblique xrays with cast off
If satisfactory: further fracture clinic reviews with lateral and internal oblique xrays at 2 weeks and 4 weeks with cast off and then until fracture union
If displacement: For fixation (see pathway below)

Intra-articular displacement
Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Admit to the ward for open reduction and screw fixation
Document a clear assessment of their NV status
Explain to family that screw will remain in situ
Follow up treatment: Fracture clinic at 4 weeks with cast off and lateral and internal oblique xrays
Follow up until fracture union, no routine screw removal

Isolated elbow dislocation
Immediate treatment: Reduce (check medial epicondyle not in joint)
Apply a well-fitting above elbow backslab or soft cast and discharge from ED
Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given.
Family to remove cast at 4 weeks and begin gentle ROM.

Olecranon fracture
Look for associated radial head dislocation

Minimally displaced with no radial head displacement
Immediate treatment:Apply a well-fitting above elbow backslab or soft cast and discharge from ED
Follow up treatment: Fracture clinic 1 week with xray on arrival to assess for displacement

Displaced
Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Consider reduction in ED under sedation
If unable to reduce admit to the ward for fixation
Document a clear assessment of their NV
Follow up treatment: To be decided by the consultant in charge of care

Radial neck fracture
Minimally displaced
Immediate treatment: Apply an above elbow backslab or softcast or C&C

Prep the family that they will need to remove the cast themselves at home at 4-6 weeks and begin gentle ROM
Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given

Displaced
Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Follow current protocol for manipulation under sedation in A&E
Use moulded back slab or softcast
Follow up treatment: Satisfactory reduction: Fracture clinic 1 week with xray on arrival to assess for loss of reduction
Not reduced: Admit to the ward for reduction +/- fixation
Document a clear NV assessment

Monteggia/Galleazi fracture dislocation
Beware of these dislocations with any forearm injury
Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Admit to the ward for reduction +/- fixation
Document a clear NV assessment
Follow up treatment: To be decided by the consultant in charge of care

Diaphyseal forearm fracture
Minimally displaced
Immediate treatment: Apply an above elbow back slab cast or softcast and discharge from ED
Repeat xray in cast to assess position
Prep the family that they will need to remove the cast themselves at home at 4-6 weeks and begin gentle ROM
Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given

Displaced
Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Follow current protocol for manipulation under sedation in ED
Use moulded back slab or softcast
Extend to above elbow after xray
Follow up treatment: Satisfactory reduction in child < 10 years of age: Prep the family that they will need to remove the cast themselves at home at 4 weeks and begin gentle ROM
Satisfactory reduction in child > 10 years of age: Fracture clinic 1 week with xray on arrival to assess for loss of reduction
Not reduced: Admit to the ward for reduction +/- TENs
Document a clear assessment of their NV

Distal radius fractures
Buckle / undisplaced
Immediate treatment: Apply a removable splint or softcast and discharge from ED
Prep the family to remove the splint or softcast at 4 weeks and begin gentle ROM exercises
Follow up treatment: No routine orthopaedic follow up – only if concerns – contact details to be given

Displaced

Immediate treatment: Refer to the orthopaedic registrar on call and fast patient
Follow current protocol for manipulation under sedation in ED
Use moulded back slab or softcast
Extend to above elbow after xray
Follow up treatment: Satisfactory reduction in child < 10 years of age : Prep the family that they will need to remove the cast themselves at home at 4 weeks and begin gentle ROM. No routine orthopaedic follow up – only if concerns – contact details to be given.
Satisfactory reduction in child > 10 years of age : Fracture clinic 1 week with xray on arrival to assess for loss of reduction
Not reduced: Admit to the ward for reduction +/- fixation
Document a clear assessment of their NV status

Scaphoid fractures
Suspected
Immediate treatment: Apply a thumb extension splint
Follow up treatment: ED review clinic 2 weeks for further assessment.

Definite
Immediate treatment: Apply a below elbow softcast
Follow up treatment: Fracture clinic review 6 weeks with removal of cast on arrival and scaphoid xrays to assess for non-union. Follow up until union.

Pelvic ring fractures
Immediate treatment:Inform consultant on call asap - ATLS management
Pelvic binder stabilises the pelvic ring and promotes clot formation and pain relief.
Open book pelvis injury may require external fixation.
Most other pelvic injuries can be managed non-operatively
Follow up treatmentas per treating consultant

Apophyseal traction injuries (ASIS, AIIS, ischial)
Immediate treatment:If significant displacement discuss with ortho on call team
Otherwise rest and analgesia
Follow up treatment: No specific follow up required. Refer to physio

Slippedupper/capital femoral epiphysis
Immediate treatment:Admit the patient for screw fixation irrespective of stability
Keep the patient strictly non-weightbearing and on bedrest
In severe slips CT scan will facilitate decision making, avoid frog leg pelvis viewsin patients unable to weightbear (acute unstable) and where AP pelvis view already confirms diagnosis.
Consider decompression of capsule if unstable – expeditious treatment of unstable cases less than 24 hours if possible. Always pin the other side as already in theatre.
Treatment options:
1. Pinning in situ (+ contralateral side)
2. In situ - cuneiform osteotomy (open reduction) where in situ pinning is technically impossible due to severity of slip
Follow up treatment: To be decided by consultant in charge of care

High AVN risk in unstable SUFE patients

Paediatric femoral neck fractures

Immediate treatment	Admit and fast for urgent surgical treatment (especially Delbet I-III) Discuss directly with consultant on call Femoral nerve block for pain relief
Follow up treatment	As per treating consultant - high AVN risk in Delbet I-II

Closed femoral shaft fractures

Immediate treatment:	Application of Thomas splint and admit to the ward < 6 months Pavlik Harness can be fitted < 12 months (< 12 kg) Gallows traction +/- convert to hip spica < 5 years: suspended Thomas splint to avoid excessive shortening and control spasm. Possible hip spica application at 5-7 days after discussion with parents (some prefer traction treatment over hip spica) >5 years: treat with operative stabilisation with TENs / other internal fixation >11 years or >50 kg: intramedullary fixation / ORIF/ submuscular plating
Follow up treatment:	Dependant on the procedure undertaken – D/W consultant

Closed distal femoral fractures

Immediate treatment:	2 types: 1. Low energy fragility fractures in neuromuscular syndromes 2. High energy sports related fractures in very active kids Type 1 can very often treated with a well moulded long leg cast unless significant displacement Type 2 needs admission to the ward and fasting for surgery Consider operative stabilisation with internal fixation
Follow up treatment:	Dependant on the procedure undertaken – D/W consultant

Patellar sleeve avulsions

Immediate treatment:	Consider surgical management if significant displacement Do not confuse with distal patellar apophysitis Discuss with ortho team if concerns If suspected but not evidenced on radiograph arrange for urgent MRI
Follow up treatment:	Dependant on the procedure undertaken – D/W consultant

Tibial spine avulsions

Immediate treatment:	Type I: Cylinder cast with knee in extension. Fracture clinic FU Consider intervention if significant displacement – In A&E if possible Haematoma evacuation (large needle) and cylinder cast in knee extension can help reduce tibial spine
Follow up treatment:	Dependant on the procedure undertaken – D/W consultant

Patellar dislocations

Immediate treatment:	Relocation under sedation Knee brace for comfort to be worn for one day only If evidence of hemarthrosis on plain radiograph arrange for outpatient MRI Physio follow up for quads strengthening exercises

Follow up treatment:	If MRI arranged for follow up in fracture clinic after scan completed, otherwise discharge to physio

Toddlers' fractures

Immediate treatment:	Apply a softcast Discharge from ED with instructions about softcast removal at 3 weeks, weight bear as tolerated. Advise parents toddler will limp
Follow up treatment:	None

Proximal tibial physeal fractures (incd SH4 tibial tuberosity fractures)

Immediate treatment:	If undisplaced for above knee backslab/split cast Consider admission for monitoring of swelling / compartment syndrome overnight If displaced admission to the ward and fast Consider operative stabilisation with internal fixation asap Significant risk of compartment syndrome and vascular injury
Follow up treatment:	Dependant on the procedure undertaken – D/W consultant Valgus deformity can occur (Cozen phenomenon) which usually resolves spontaneously

Tibial midshaft fractures

General consideration	Tibial shaft fractures with intact fibula have increased risk of varus malunion and delayed union
Minimally displaced	
Immediate treatment:	Apply a well moulded above knee cast, if significant swelling for split cast and strict elevation on ward, for completion and discharge when comfortable Non weight bearing – ask physio to assess and provide a Zimmer frame or crutches
Follow up treatment:	Fracture clinic: X-ray at 1 week - time in cast / conversion to below knee and FU dependent on patient age / fracture – discuss with consultant.
Displaced	
Immediate treatment:	Discuss with consultant If soft tissues amenable consider applying a moulded above knee soft cast and follow up as above. If too unstable to treat in plaster, the preferred treatment is internal fixation. If mild deformity persisting, accept cast and consider wedging in clinic at follow up. If soft tissues <u>not</u> amenable, then admit for internal fixation, TENS, ORIF or external fixation – discuss with consultant
Follow up treatment:	1/52 with check xray – consider wedging if necessary – further follow up case specific

Distal tibial fractures

Immediate treatment:	Apply a moulded below knee cast or backslab / split cast if significant swelling Mild equinus position of foot is acceptable and prevents recurvatum alignment in sagittal plane (ankle stiffness is rarely a problem in children and teenagers) Nonweight bearing 6 weeks – ask physio to assess provide a Zimmer frame or crutches

If high communition (unstable fracture) consider ORIF or external fixation (d/w consultant on call)

Follow up treatment: Fracture clinic: X-ray at 1 week - time in cast FU dependent on patient age / fracture – discuss with consultant.

Salter Harris 2 distal tibial fractures

Immediate treatment: Apply a well moulded below knee soft cast or if swollen a below knee backslab. Manipulation under sedation if displaced – as per A&E protocol.
Non weight bearing with zimmer or crutches (physio input)

Follow up treatment: Fracture clinic: X-ray at 1 week - time in cast FU dependent on patient age / fracture – discuss with consultant.Arrange long term fracture clinic follow up XR for potential of growth arrest – min 6 months.

Adolescent transitional fractures of the ankle (Triplane and Tillaux)

Immediate treatment: Undisplaced fractures should be managed as per SHII fractures above
For displaced fractures, manipulation under sedation as per A&E protocol. Often the ankle should be internally rotated for reduction and an above knee cast applied (split cast if significant swelling) to control rotation. A repeat check Xray required to ensure good positioning - If the fracture gap is deemed unacceptable, admit the patient for operative intervention. A CT scan should beconsidered to guide screw placement.

Follow up treatment: If conservative – treat as per protocol above. If operative, consultant to determine follow up plan

Distal fibular fractures

Immediate treatment: Apply a moonboot if possible or removable below knee soft cast
Weight bear as able – ask physio to provide crutches if required
Prep the family that they will remove the boot or soft cast themselves at home in 4 weeks

Follow up treatment: No routine acute orthopaedic follow up – only if concerns – contact details to be given. Follow up SHIII and IVs

Foot fractures (excluding Lisfranc)

Immediate treatment: Apply a moonboot if possible or removable below knee soft cast
Prep the family to remove the cast themselves at 4 weeks
Weight bear as able

Follow up treatment: No routine acute orthopaedic follow up – only if concerns – contact details to be given.

Calcaneal fractures

Immediate treatment Elevation and NWB backslab / cast
Rule out any other injuries further proximal including axial skeleton
Consider admission for elevation and analgesia

Follow up treatment 6/52 NWB follow up in clinic with x-ray on arrival

Lisfranc injuries

Immediate treatment: Suspect in significant midfoot swelling and plantar hematoma
Arrange for urgent CT to assess Lisfranc joints

Below knee cast and NWB until treatment decision
Ligamentous separation or Lisfranc fracture dislocation may need fixation – discuss with consultant
Bony Lisfranc with minimal displacement for NWB cast 6/52

Follow up treatment: As per treating consultant

OPEN FRACTURES

Immediate treatment: Follow the BOAST guidelines including early antibiotics and photography of the wound to facilitate decision-making. Wounds should NOT be washed out in ED.
Discuss all cases with the on call orthopaedic consultant urgently
A decision regarding surgical debridement, stabilisation and definitive coverage should be made in consultation with a plastic surgeon - Joint Consultant Ortho-Plastic decision making will minimise morbidity and limit unnecessary trips to theatre.
Techniques to minimise duration and complexity of treatment will be considered. This may include some of the following options (soft tissue and bone reconstruction ladder):
1. Tension free skin closure achievable and stable fracture configuration: cast treatment with or without windowing (i.e. Gustilo I and II fractures) - see closed tibia shaft recommendations
2. Primary closure achievable due to bone loss - squaring off of bone ends and acute shortening. Circular external fixation allows staged proximal lengthening or ORIF with lengthening in the future (if desirable)
3. Immediate soft tissue cover achievable with plastics involvement (local flap or free flap) - ORIF
4. Immediate soft tissue cover not achievable due to contamination or extent of defect: external fixation following debridement and negative pressure dressing until soft tissue cover by plastics as second stage, then either conversion to internal fixation or continuation with external (circular) fixation
5. early amputation (rarely indicated in children)

Follow up treatment: Determined by the consultant in charge of care

FURTHER GENERAL CONSIDERATIONS:

- If considering surgery for a suspected or confirmed COVID patient, this should be discussed with a consultant prior to admitting a patient. It may be appropriate to discharge the patient and perform delayed surgery in some cases
- Use absorable sutures (vicryl rapide) where at all possible
- If placing a backslab or softcast, ensure the parents know how it would be removed at home and direct them to the information leaflet and online videos on “how to remove your child’s cast”
- Use splint or boot in preference whenever appropriate/possible
- If placing a backslab or softcast, always ensure it is sturdy enough to last the duration of treatment
- Do not place a full POP without confirming with a senior team member that this is required