Pelvic & Acetabular fracture management guidelines

# MANAGEMENT IN A&E

 **Trauma Team management**

* ATLS principles
* Haemostatic resuscitation for the haemodynamically unstable patient (PRBC + FFP + Platelets + Ca+2) + Tranexamic Acid + avoid hypothermia.
* Pelvic binder, if not applied already
* **DO NOT** test for pelvic mechanical stability
* **DO NOT** log roll patient until pelvis is cleared
* All patients suffering high-energy trauma must have examination of the perineum and genitalia plus a rectal examination and the findings recorded in the medical records.

**Most haemodynamically unstable pelvic injuries will stabilize with the standard approach of pelvic binder + haemostatic resuscitation. Cases that continue to bleed are expected to be rare**

### PELVIC BINDERS

* All suspected pelvic fractures, or patients with blunt trauma and a systolic blood pressure < 110 mmHg, should have a pelvic binder applied as part of their initial resuscitation; ideally pre-hospital.
* You **SHOULD NOT** wait for imaging.
* **Greater Trochanters**: The pelvic binder should be applied centered over the greater trochanters. If a binder is not available then a sheet can be wrapped and tied around the pelvis and the knees/ankles.
* **No external fixator in A&E**: There is **NO INDICATION** for application of an emergency pelvic external fixator in the Emergency Department.
* **Lateral compression fractures**: binders are relatively **SAFE** to be applied in all pelvic fractures, including lateral compression. This is an emergency haemorrhage control measure, and you won’t identify the type of fracture before proper imaging. In addition, the force and displacement caused by the injury is much more than what a binder can do.
* The binder should **not be on for more than 24 hours** and an AP Pelvic x-ray taken on loosening or removal. The pelvic binder stabilises pelvic vessels and allows clotting. It should not be kept on for more than 24 hours because of the risk of tissue necrosis. Gross instability on removal should prompt urgent transfer to QEUH for surgical stabilisation (ex-fix or definitive fixation).

### OUT OF BINDER RADIOGRAPHS

All trauma patients who had a trauma CT with a pelvic binder on, and no pelvic fractures identified on the CT, must have a pelvic X-ray after removal of the binder, and before leaving the A&E (as a pelvic binder can anatomically reduce an open book fracture).

### URINARY CATHETER & UROLOGICAL INJURIES

* ALL pelvic fractures should have **urinary drainage established before transfer to the orthopaedic ward / ITU / HDU**. This is by means of a urinary catheter, or supra-pubic catheter when indicated.
* Assess for external signs of urethral injury before attempting catheter insertion (blood at urethral meatus, scrotal/ perineal haematoma, perineal wound).
* A **single, gentle attempt at catheterization, by an experienced doctor**, is permissible, even if the clinical or CT findings suggest urethral injury.
* **In adults, a 16F soft, silicone catheter should be used.**
* The procedure and the presence of clear or blood stained urine must be recorded in the medical records.
* If the catheter drains blood stained urine, a catheter cystogram must be performed.
* If the catheter does not pass, or drains only blood, do NOT inflate the balloon, withdraw the catheter and perform a retrograde urethrogram.
* Please refer any urogenital injury to the urology team on call ASAP

### POLYTRAUMA PATIENTS & MAJOR TRAUMA

Patients with multiple injuries should be referred and transferred as appropriate to the West of Scotland Major Trauma Centre, based at QEUH. The referral for transfer should be made directly to the Major Trauma Team, via the Major Trauma Coordinator on QEUH Dect phone 82149 / 82150. The Major Trauma Consultant on call can be contacted directly on Dect phone 83909.

### SPECIFIC INJURIES

**Vertical Shear Pelvic Injury** In addition to the pelvic binder, skeletal traction using a distal femoral traction pin is recommended. Apply skin traction while awaiting application of skeletal traction.

**Open Pelvic Fracture**  Wounds in the perineum, vagina or rectum require transfer to theatre for debridement and diversion of faeces with a defunctioning colostomy in an upper abdominal quadrant. Basic principles of care of open fractures apply, with antibiotic prophylaxis for infection and pelvic stabilisation by external fixation. Early diagnosis of an open pelvic injury is essential, as mortality due to sepsis increases from approximately 15-20% to 50%+ if diverting colostomy not performed within 48 hours. It is mandatory to involve the on call general surgical, plastic surgery, and/or gynaecologist oncall as soon as the diagnosis is made.

**Associated Femoral / lower limb / open fractures**

Should be discussed with pelvic team ASAP regarding order / timing of fracture fixation / management.

Generally long bone / open fracture management should take priority and pelvic fixation can be managed at a second sitting. The only type of pelvic fractures that need dealt with urgently are open #s, APC3 (>2.5cm symphyseal diastasis) & vertical shear fractures, which are generally associated with significant haemodynamic instability and/or are open.

### ACETABULAR FRACTURES

**Resuscitation**– According to ATLS Protocol.

**Imaging:**

* Acetabular fractures can present as part of polytrauma (usually diagnosed on Trauma CT) or isolated injury to the hip region.
* If diagnosed on plain film, further imaging with CT is required.
* One should look for signs of hip dislocation, joint incongruity, associated femoral head or neck fracture and neurological injury.

**Hip dislocation** (native joint)

* Should be reduced urgently. Attempted reduction can be undertaken in resus but if unsuccessful or unstable should be done in theatre, under anaesthesia. If associated with an acetabular fracture and unstable **skeletal femoral traction** should be applied. Occasionally an anti-rotation boot is also required if the joint is still unstable after application of skeletal traction. It is mandatory to perform a detailed neurological and vascular assessment of the limb(s) before and after reduction of a dislocation.
* A further CT of the hip/pelvis should be performed after reduction to assess congruity of reduction, size and displacement of acetabular fractures and check for retained bony fragments.
* If the hip is irreducible, remains highly unstable or a new neurological deficit develops after reduction, urgent advice should be sought from one of the pelvic and acetabular surgeons.

# INPATIENT MANAGEMENT

### ASSESSMENT

This should include

* Completion of detailed secondary survey.
* Detailed lower limb neurological assessment.
* Perineal and digital rectal examination, to assess neurology and rule out open pelvic injury. This can be performed in the supine position. You don’t need to feel the prostate
* Vaginal exam (by Obs&Gyn) in cases with high suspicion of open pelvic injury.
* Inspection for skin lesions around the pelvis.
* Urological assessment is part of the emergency work up, and a catheter (urethral / supra-pubic) should be inserted **before** transfer to the ward.

### RADIOLOGICAL INVESTIGATIONS

* All patients should undergo fine cut CT scans (2-3mm slice thickness) of the whole pelvis with 3D Reconstructions.
* Further xrays (postop +/- preop) may also be required:

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| --- | --- |
| Pelvic fracture  | AP + Inlet and Outlet views pelvis  |
|  |  |
| Acetabular fracture  | AP pelvis + Judet oblique views pelvis  |

### INPATIENT CARE

This should include:

* Adequate analgesia, but **no NSAIDS**
* Skeletal traction where appropriate: see below
* VTE prophylaxis: start Enoxaparin 40 mg o.d. within 24 hours of admission unless there is a contraindication, *see below*.

Always check with other teams involved (e.g General Surgery if concomitant abdominal injury, neurosurgery if concomitant head injury....etc) before starting VTE prophylaxis

* Start **bowel management** to prevent constipation ASAP. Senna + Movical
* Omeprazole or Lansoprazole PO

### VTE PROPHYLAXIS

* Start within 24 hours of injury or restoration of haemodynamic stability
* 40mg Enoxaparin OD, unless contraindicated, for a total of 6 weeks. (20mg if <50kg)
* If chemical prophylaxis is contraindicated, use intermittent calf compression, if there is no contraindication (e.g. leg injury)
* Contraindications to LMWH:
	+ Persistent haemodynamic instability
	+ Head injury with acute intracranial haemorrhage
	+ Spinal injury with unstable vertebral injury requiring stabilization (check with spinal team)
	+ Active peptic ulcer or recent GI haemorrhage
	+ Other sources of active bleeding
	+ Allergy to heparin
* With other acute injuries that have potential for major haemorrhage (e.g. splenic rupture, aortic dissection), check with the appropriate specialty before commencing LMWH.
* In patients with delayed surgery, more than 5 days, a Duplex Ultrasound scan should be considered to rule out DVT pre-operatively. If there is a DVT, arrange for insertion of IVC filter pre-operatively. This should be removed at 4-6 weeks postoperatively.

### SKELETAL TRACTION

* This is indicated in displaced acetabular fractures associated with hip instability and vertical shear pelvic fractures.
* To be applied in the **distal femur using a Denham pin**, unless there is an associated femur fracture.
* Total skeletal traction weight is 10% of body weight.
* Weights, Stirrups, Pulleys and cords are in Store on Ward 10C.
* If not enough weights available then use 3L bags of Saline.
* Apply skin traction while awaiting application of skeletal traction.

### PRE-OPERATIVE WORK UP

Work up should include the following:

* Up to date FBC, U&E, clotting profile
* Cross match 4 units PRBC
* Appropriate radiographs (see above)
* Documented neurological and urological assessment.
* Prophylactic antibiotics(Cefuroxime 1.5g) and Tranexamic acid (1g) at induction.

### REFERRAL TO PELVIC TEAM & SHARED CARE

* This is recommended as soon as possible
* For external referrals, the patient must be referred to the on call Orthopaedic Registrar at QEUH via Dect phone 82735 or 0141 452 2735. The minimum data set for telephone referral is:
* Patient name & CHI
* Referring unit & contact details
* Mechanism & date of injury
* Neurovascular status
* Open or closed injury
* Haemodynamic status and products given
* Other injuries & current management
* For both internal and external referrals, the patient should be added to the T&O QEUH Bluespier trauma whiteboard and the Pelvic surgeon first on for the Wednesday Pelvic theatre list that week should be informed.
* The ‘Pelvic Fracture Referral Form’ should be completed **in full** and emailed to Pelvic.Trauma@ggc.scot.nhs.uk including the **patient surname and CHI in the email subject heading.**
* **This form must be completed in full by the Orthopaedic Consultant/Registrar/SHO of the referring team, not the FY doctor on the ward. An additional copy should be filed at the front of the notes.**
* Should urgent advice from the pelvic team be required, please ask theOrthopaedic Registrar at QEUH for the most appropriate surgeon to contact directly (Mr Kelly, Mr Campton, Mr Marsh or Miss Gill – the first on surgeon for the weekly dedicated Pelvic list).
* If there is a delay of >24hr between referral and management advice, please contact the Orthopaedic Registrar at QEUH (82735 or 0141 452 2735) or the Orthopaedic Trauma ANP (82737 or 0141 452 2737).

As the On call Orthopaedic trauma team has dedicated time to look after the acute aspects of the injuries, the patient remains under a joined care between the admitting team, and the pelvic team. The admitting team will look after the associated injuries. For patient convenience, the pelvic team may offer to take over the outpatient care of other injuries from 6wks point if there were no active issues regarding fractures or soft tissues and wounds.

### POST-OPERATIVE CARE PLAN

Unless specified in the post op note, the plan will include:

* Start VTE prophylaxis the next morning, unless contra-indicated and continue for 6 weeks
* No NSAIDS
* Continue bowel management to prevent constipation ASAP. Senna + Movical
* Omeprazole or Lansoprazole PO
* Check x-rays +/- CT as specified in the post op notes
* Weight bearing status usually TWB on affected side for 6-8 weeks, but specified in op note
* Clinic follow up (Monday pm #OPC QEUH) at 6, 12, 26, 52 wks with related X-rays on arrival
* Modified Merle d'Aubigné outcome score (on sgortho shared drive under P&A) to be completed at each clinic visit.
* Routine postoperative bloods: FBC, U&Es next morning.

# TRANSFER OF PATIENTS FOR PELVIC SURGERY AT QEUH

Patients requiring operative intervention for pelvic injuries will require transfer to QEUH.

For **multiply injured patients**, the patients should be referred urgently to the Major Trauma Team (see page 2), with ED > ED or inpatient > inpatient transfer as decided appropriate by the MT Team.

Patients with **isolated but high energy isolated pelvic fractures** should be referred as per the instructions of page 5 of this document, but will likely be transferred to Ward 1C (Major Trauma ward).

Patients with **isolated low energy isolated pelvic fractures** should be referred as per the instructions of page 5 of this document, and will likely be transferred to an inpatient Orthopaedic bed in QEUH.