

Guide to management of pre-operative abnormalities in patients with a fragility femur fracture

General Principles

- Medical optimisation should begin as soon as a patient with a fragility femur fracture is admitted, aiming for surgery within 36 hours. **Delaying surgery leads to higher morbidity / mortality risks that will often outweigh any benefits of a longer pre-op optimisation period.**
- **Minor abnormalities** need not necessarily delay surgery, as optimisation and surgery can proceed simultaneously.
- **Major abnormalities** may delay surgery and require a higher level of early intervention, including advice as appropriate from, for example, an anaesthetist (trauma anaesthetist or on-call night registrar), orthogeriatric consultant, medical registrar, cardiac outreach team, critical care outreach team, or diabetes specialist nurse. Such advice should be sought as soon as possible after admission.
- Unless specialist monitoring is required (CCU, stroke unit, renal unit), patients with a fragility femur fracture should be admitted to the hip fracture ward for medical optimisation.
- Patients who fall in hospital and sustain a fragility femur fracture should be transferred pre-operatively to the hip fracture ward.

	Minor abnormality	Major abnormality	Actions
Blood pressure	<ul style="list-style-type: none"> • Systolic BP > 180mmHg • Diastolic BP > 110mmHg 	<ul style="list-style-type: none"> • Systolic BP < 90mmHg 	<ul style="list-style-type: none"> • Look for cause • Start 500ml Hartmann's solution IV stat; reassess after 30 minutes • Advice: Anaesthetist, Orthogeriatrician, Medical Registrar
Heart rate and rhythm	<ul style="list-style-type: none"> • Sinus bradycardia \geq 45/min or sinus tachycardia > 120/min with otherwise normal ECG • Pulse 101-120/min with atrial fibrillation or flutter 	<ul style="list-style-type: none"> • Pulse < 45/min or complete heart block • Pulse > 120/min with atrial fibrillation / flutter or other ECG problem 	<ul style="list-style-type: none"> • Review medication (beta blockers?) • May need pacemaker • Advice: Anaesthetist, Cardiac Outreach Team, Medical Registrar
Ischaemic heart disease	Stable angina \pm chronic ischaemic ECG changes	<ul style="list-style-type: none"> • Evidence of new MI • Unstable angina 	<ul style="list-style-type: none"> • Treat as per trust protocols; • Advice: Anaesthetist, Orthogeriatrician, Medical Registrar, Cardiac Outreach Team
Heart failure	History of previous heart failure, now treated	<ul style="list-style-type: none"> • Clinical signs of heart failure • Signs of failure on CXR <ul style="list-style-type: none"> – pulmonary oedema – pleural effusion without consolidation 	<ul style="list-style-type: none"> • Give O₂, IV furosemide • Caution with IV fluids • May need CCU or SDU post-op • Advice: Cardiac Outreach Team, Orthogeriatrician, Medical registrar, Anaesthetist.
Respiratory failure	<ul style="list-style-type: none"> • SaO₂ \geq 90% and/or • pO₂ \geq 8kPa and/or • pCO₂ 6.2 – 7.3 kPa 	<ul style="list-style-type: none"> • SaO₂ < 90% and/or • pO₂ < 8kPa and/or • pCO₂ \geq 7.4kPa 	<ul style="list-style-type: none"> • Take arterial blood gases • Give O₂ (24% or 28% if history of COPD) • Repeat arterial blood gases • Advice: Orthogeriatrician, Medical Registrar, Anaesthetist

Surgery should proceed without delay but in addition:

- Initiate appropriate treatment for above conditions
- Correct fluid resuscitation is particularly important
- Optimise analgesia and continue usual medication unless contra-indicated
- Discuss with surgeon and anaesthetist at 8am trauma meeting

If the patient is not fit:

- Inform the Trauma Nurse (tel. #6243)
- Document why surgery should be delayed
- Document a plan for optimisation
- Write your contact details in the notes

Cardiac murmurs and echocardiography

- Older people with a fragility femur fracture do not require routine echocardiography prior to surgery.
- History and physical examination is important and ideally the need for echocardiography should be confirmed by an experienced physician (consultant or registrar).
- Check for a previous echocardiogram – there is unlikely to be a significant change if one has been done in the last two years.
- Echocardiography should be performed immediately prior to surgery if aortic stenosis is suspected, ie a systolic murmur radiating to the neck.
- A diagnosis of aortic stenosis should not delay surgery; patients may require additional invasive monitoring and a period of management on HDU or SDU post-operatively.

	Minor abnormality	Major abnormality	Actions
Temperature	Temperature < 38.5°C regardless of site of infection	Temperature < 35°C Temperature > 38.5°C	<ul style="list-style-type: none"> Rewarm as per Trust policy Look for underlying cause Septic screen then treat as per Trust guidelines Advice: Consultant Microbiologist, Orthogeriatrician, Medical Registrar, Orthopaedic Surgeon
Warfarin	Any patient on warfarin should get Vitamin K 5mg IV stat as part of Fast-Track Protocol, no need to check INR first . Recheck INR 6 hours later or in time for 0800 trauma meeting. Repeat doses of Vitamin K until INR in range.		
	INR ≤ 1.5 is acceptable for spinal anaesthesia	INR > 1.5	<ul style="list-style-type: none"> Give repeat dose of Vitamin K 5mg IV Repeat INR after 6 hours If INR still > 1.5 consider FFP / Octaplex Advice: Haematologist, Consultant Anaesthetist
Clopidogrel	Stop clopidogrel on admission. Relative contra-indication to spinal anaesthesia (balance of risks). Proceed with surgery but be prepared to treat excessive intra-operative bleeding with platelets.		
DOACs (Apixaban, Rivaroxaban, Edoxaban, Dabigatran)	Stop DOAC on admission. Relative contra-indication to spinal anaesthesia (balance of risks), proceed under GA if possible No evidence of increased likelihood of excessive intra-operative bleeding if surgery proceeds without delay DOAC half-life is increased in patients with renal impairment. Dabigatran can be reversed using Idarucizumab (Praxbind)		
	≥ 24 hours since last dose	Recent DOAC dose with renal impairment	<ul style="list-style-type: none"> Consider delaying surgery Advice: Haematologist, Consultant Anaesthetist, Orthopaedic Surgeon
Electrolytes	Na ⁺ 121 – 128 or 151 – 155 mmol / l	Na ⁺ ≤ 120 mmol / l	<ul style="list-style-type: none"> Stop thiazide / loop diuretics Check urine osmolarity Consider fluid restriction Advice: Orthogeriatrician, Medical Registrar
		Na ⁺ > 155 mmol / l	<ul style="list-style-type: none"> Usually due to dehydration Slow correction with IV Normal Saline as per Trust guidelines
	K ⁺ 2.5 – 2.9 or 5.6 – 6.0 mmol / l	K ⁺ < 2.5 mmol / l	Refer to Trust hypokalaemia guidelines
		K ⁺ ≥ 6.1 mmol / l	Refer to Trust hyperkalaemia guidelines
Glucose	25 – 33 mmol / l	Glucose > 33 mmol / l	<ul style="list-style-type: none"> Consider stat dose S/C insulin Avoid aggressive sliding scale insulin Advice: Medical Registrar, Diabetes Nurse Specialist
Renal	<ul style="list-style-type: none"> CKD stage 1 – 3 AKI stage 1 – 2 	<ul style="list-style-type: none"> CKD stage 4 and 5 AKI stage 3 	<ul style="list-style-type: none"> Refer to Trust CKD and AKI guidelines Avoid nephrotoxic drugs Advice: Renal Registrar 0900-2200, Medical Registrar at other times
Anaemia	<ul style="list-style-type: none"> Hb 76 – 80 g / l Hb ≤ 75 g / l <ul style="list-style-type: none"> check haematinics then transfuse no delay to surgery consider using cell-saver in theatre 	Major active bleeding, eg peptic ulcer disease	<ul style="list-style-type: none"> Identify bleeding source Achieve haemodynamic stability prior to hip fracture surgery

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