

# SCGH HIP FRACTURE CLINICAL GUIDELINE

The aim of the Hip Fracture Clinical Guideline is to ensure best practice in the care of elderly hip fracture patients.

The guideline was developed collaboratively with the Departments of Geriatric Medicine, Orthopaedic Surgery, Emergency Medicine, Anaesthetics, Haematology and Allied Health. Wherever possible recommendations are based on the latest clinical practice guidelines, otherwise consensus has been reached by the authors following review of relevant literature.



## **IMPORTANT**

**ALL recommendations apply only in the absence of contraindications**

If you are uncertain, PLEASE discuss with a senior member of your team

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## MULTIDISCIPLINARY CARE

All hip fracture patients are admitted under the joint care of Orthopaedic Surgery and Geriatric Medicine. The Geriatrician will assume governance for medical decisions and the Orthopaedic Surgeon will assume governance for those decisions relating to surgical management. At all times a collaborative approach will prevail to ensure the best outcome for each individual patient.

The aim is to:

- Optimise patients' peri operative clinical condition
- Ensure prompt surgical fixation (operate within 24 hours of admission)
- Deliver early rehabilitation

All hip fracture patients will be cared for by a multidisciplinary team:

- They will be reviewed by a member of the Ortho-Geriatric team within 48 hours of admission and regularly post-operatively
- They will have nursing care according to the Hip Fracture Clinical Pathway
- They will be reviewed by the ward pharmacist on the first working day post admission
- They will be reviewed by a physiotherapist within 24 hours postoperatively
- They will have access to occupational therapy, social work, dietitian and speech pathology as required.

## COGNITIVE ASSESSMENT

All hip fracture patients should have a cognitive assessment on admission. The AMT4 and Clock Drawing Test are to be performed as part of the Nursing Admission Assessment. If either or both are abnormal a medical review should be conducted to assess for delirium and / or dementia. (See Cognitive Impairment Pathway, SCGH and Cognitive Impairment Medical Review Form)

## NUTRITION ASSESSMENT

All hip fracture patients are to have nutrition assessment completed as part of the Nursing Admission Assessment. If the Malnutrition Screening Tool (MST) score is  $\geq 3$  a nutritional supplement is to be prescribed in the patient's medication chart.

## GOALS OF CARE

All hip fracture patients should have a "Goals of Care" discussion preoperatively. This should include discussion on resuscitation status and limitations of treatment. This is to be documented on the Goals of Patient Care Form.

## REPORTING TO THE CORONER

All deaths resulting from a fall must be reported to the Coroner's Court on 9425 2900 before a death certificate can be issued. Following discussion of the case with the coroner you will be instructed whether or not a death certificate can be written.

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## PAIN MANAGEMENT

***Elderly patients are very susceptible to the side effects of narcotic analgesia (e.g. sedation, delirium, constipation etc) and the following basic prescribing principles should apply.***

### Regional Analgesia

- **Femoral Nerve Block**
  - All hip fracture patients are to receive a femoral nerve block under ultrasound guidance in the Emergency Department prior to transfer to the ward.
- **Femoral Nerve Catheter**
  - This is the preferred method of pre-operative analgesia for patients who may have a delay to theatre and the femoral nerve block is no longer effective
  - To arrange this contact the duty anaesthetist on extension 71242 in hours and the on call anaesthetic registrar on pager 4823 after hours (after hours there may be insufficient staff available to perform the procedure)

### Oral Analgesia

- Start with the lowest dose possible (START LOW)
- Do not escalate dosage rapidly (GO SLOW)
- ALL patients should also be charted for regular paracetamol (1 gram TDS – QID)
- Avoid polypharmacy
  - prescribe **only one type of opioid**,
  - If possible use the **same** drug for both long acting background analgesia and short acting prn analgesia for breakthrough pain.
- Avoid Codeine (Panadeine Forte), Morphine, Buprenorphine, Methadone, Gabapentinoids, NSAIDs and Tramadol.

**A suitable ORAL ANALGESIC regime for the elderly is:**

Targin (oxycodone 5mg / naloxone 2.5mg) BD plus Oxycodone 2.5 – 5 mg 2 hourly prn

For the very frail elderly consider :

Targin (oxycodone 2.5mg / naloxone 12.5mg) BD plus Oxycodone 2.5 2 hourly prn

(patients will need to be prescribe regular aperients with this regime as described below)

*Opioid tolerant patients may require higher doses of analgesia peri-operatively. It is best to initially continue their usual analgesic regime and prescribe higher doses of breakthrough analgesia. The Acute Pain Service should be consulted for patients with complex analgesic requirements such as those with chronic pain on complex analgesic regimes.*

**ALL NEW PERI-OPERATIVE ANALGESIC PRESCRIPTIONS SHOULD HAVE A REVIEW AND CEASE DATE DOCUMENTED ON THE MEDICATION CHART (EG : “for 2 weeks and then cease”)**

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## BOWEL MANAGEMENT

All patients that are prescribed narcotic analgesia must have regular aperients prescribed.

The recommended prescribing regime is :

- Coloxyl with Senna 2 nocte
- Lactulose 20mls nocte
- Two suppositories (1 glycerin and 1 bisacodyl) 3rd daily if bowels not open

Ensure patients have their bowels open at least every 3<sup>rd</sup> day

## BLADDER MANAGEMENT

Hip fracture patients are **NOT** to receive indwelling urinary catheters (IDCs) unless clinically indicated (eg bladder stretch injury, monitoring urinary output)

Pre and post operatively patients are to have 4 – 6 hourly bladder scans and intermittent catheterisation (IMCs) as required. (See Nursing Guideline 25 and 44)

A bladder scan is to be performed in the operating theatre at the end of the procedure. If the volume is >500ml an IMC is to be performed in theatre.

## PROPHYLACTIC ANTIBIOTICS

RMO to chart preoperatively :

- Mupirocin 2% Nasal Ointment, smear applied to nares pre-op and then BD for 48 hours post-op (Total 5 doses)

Anaesthetist to chart in OT :

- Cephazolin 2gm IV at induction

For patients with immediate hypersensitivity to penicillins:

- Vancomycin 15mg/kg IV at induction

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## PERIOPERATIVE BLOOD PRESSURE MANAGEMENT

Hip fracture patients are at risk of perioperative hypotension due to dehydration, blood loss and spinal anaesthesia. Antihypertensive medications should be withheld preoperatively (with the exception of those prescribed for other indications eg: beta blockers for rate control or in the patient with coronary artery disease) and restarted post-op when clinically indicated.

## PERIOPERATIVE FLUID MANAGEMENT

Elderly patients often have poor fluid intake and hence low urine output prior to admission. Many elderly patients have poor cardiac function making them very susceptible to developing acute pulmonary oedema if given aggressive intravenous fluid therapy perioperatively.

Urine output of 15-20ml/hr may be acceptable in the frail elderly and maintenance fluids of 80-100mls/hr may be more appropriate.

When reviewing the 'hypotensive' or 'low urine output' patient postoperatively each case needs to be reviewed on an individual basis. If the patient usually has a low blood pressure, is clinically well or asymptomatic, is not dehydrated and does not have deteriorating renal function they are unlikely to require aggressive fluid resuscitation.

## OXYGEN THERAPY

Oxygen saturations should be measured on all patients with hip fractures both on admission and routinely on the ward. Low saturations on room air should be a trigger to search for any treatable pathology (infection, LVF, PE, atelectasis).

Oxygen should be considered as a drug and thus should be prescribed if required. Oxygen should be prescribed as per the following guideline.

[https://www.thoracic.org.au/journal-publishing/command/download\\_file/id/34/filename/TSANZ-Acute-Oxygen-Guidelines-2016-web.pdf](https://www.thoracic.org.au/journal-publishing/command/download_file/id/34/filename/TSANZ-Acute-Oxygen-Guidelines-2016-web.pdf)

Please Note:

- For patients at risk of hypercapnaeic respiratory failure **O2 sats on RA of  $\geq 88\%$  are often acceptable and oxygen therapy should be titrated to a target range of 88-92%.**

**In an emergency oxygen therapy should never be withheld from patients.**

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## VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS

All patients must have the VTE Risk Assessment completed on the medication chart.

All patients are to have VTE prophylaxis in the form of:

- **limited period of immobilisation**
  - patients are to have surgery as soon as possible after presentation to hospital or sustaining a hip fracture while in hospital (unless clinically contraindicated)
  - patients are to be mobilised as soon as possible after surgery and at least once a day thereafter (assuming the patient's clinical condition and goals of care allow)
- **mechanical prophylaxis**
  - patients are to have graduated compression stocking applied preoperatively and worn throughout their hospital stay (unless clinically contraindicated)
  - Intermittent pneumatic compression (**IPC**) devices are contraindicated in hip fracture patients due to their prolonged period of immobilisation prior to presentation
- **pharmacological prophylaxis**
  - LMWH (enoxaparin) should be prescribed and administered according to the "standard" VTE prophylaxis guidelines (unless clinically contraindicated)
  - daily administration of enoxaparin should be timed for 2000h (8pm).
  - patients who are not operated on immediately should, unless contraindicated, have their usual 20:00 Enoxaparin the night before surgery.

## POST-OPERATIVE MOBILISATION

Patients are to be operated on with the aim of allowing them to fully weight bear (without restriction) in the immediate postoperative period.

Patients on a morning theatre list are to be mobilised that afternoon (ie Day 0 post-op)

Patients on an afternoon theatre list are to be mobilised early the next morning (ie Day 1 post op)

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## ANTIPLATELET MANAGEMENT

- Clearly document indication for the antiplatelet therapy
- In general, surgery should **NOT BE DELAYED** in hip fracture patients taking antiplatelet therapy.

## ASPIRIN THERAPY FOR INDICATIONS OTHER THAN VASCULAR STENTS

- Aspirin therapy should be maintained throughout admission unless a contraindication arises (e.g. GI bleeding).

## ANTIPLATELET MEDICATION (CLOPIDOGREL / TICAGRELOR / PRASUGREL ) FOR INDICATIONS OTHER THAN VASCULAR STENTS

- **DO NOT** cease any dual aspirin therapy
- Withhold further dose pre-operatively. If the patient has had a recent atherothrombotic event (esp < 1 month) the treating physician / surgeon should be contacted prior to any alteration of antiplatelet therapy. Discuss with haematology about “safe for theatre” times.
- If the patient is at high risk of an ischaemic event or there is a contraindication to recommencing their antiplatelet therapy post-op consider covering with aspirin therapy (if no contraindication exists)
- Recommence 24 - 48 hours post-op if no surgical contraindication exists.

## ANTIPLATELET MEDICATION (ASPRIN / CLOPIDOGREL / TICAGRELOR / PRASUGREL ) IN PATIENTS WITH VASCULAR STENTS

- Aspirin should be continued throughout in **ALL** patients with a history of vascular stents
- If possible document:
  - 1) date of stent insertion
  - 2) type of stent inserted
  - 3) anatomical location of stent
  - 4) any specific recommendations from the interventionalist at time of procedure.
- If the patient has a history of stent insertion within the last 12 months (or any other concerns), the treating physician / surgeon should be contacted prior to any alteration of antiplatelet therapy. Discuss with haematology about “safe for theatre” times.



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## WARFARIN REVERSAL AND BRIDGING ANTICOAGULATION

- **WITHHOLD** further doses of warfarin
- Clearly document
  - indication for warfarin
  - usual dose of warfarin
  - date / time of last dose
- Take INR
- Prescribe **BRIDGING ANTICOAGULATION** if indicated as below
- Speak to cardiologist /on call haematologist for specific advice if the patient has a mechanical heart valve

## WARFARIN REVERSAL

### If going straight to theatre give:

- Vit K 5 mg IV (unless mechanical heart valve).
- Prothrombinex (25 units/kg) and repeat INR 15 minutes post dose.
- Call haematology for advice if INR > 1.5.

### If going to theatre next day give:

- Vit K 5 mg IV now (unless mechanical heart valve)
- Repeat INR in am
  - if INR >1.5 give Prothrombinex 25 units/kg prior to theatre and repeat INR 15 minutes post dose.
  - Call haematology for advice if INR > 1.5

## Notes

Vitamin K when given IV has an onset of action within 6-8 hours.

Prothrombinex contains small amounts of heparin and its use to reverse warfarin should be carefully considered in patients with a history of heparin-induced thrombocytopenia. Discuss with haematology

# SCGH HIP FRACTURE CLINICAL GUIDELINE

## BRIDGING ANTICOAGULATION

Consider bridging anticoagulation with therapeutic dose LMWH while INR <2 for the following patients:

### 1. AF and

- CHADS2 5 or 6
- Rheumatic valvular disease
- Recent CVA / TIA (<3 months)

**Patients with AF who have a CHADS2 score of  $\leq 4$  and who have not had a stroke or TIA in last three months should not receive bridging (Bridge trial)**

### 2. VTE (DVT/ PE)

- Recent VTE < 3 months.
  - Consider IVC filter if VTE within 1 month. Please discuss with haematology.
  - Prophylactic dose LMWH is usually sufficient in patients with VTE >3 months prior
- Recurrent VTE despite therapeutic anticoagulation
- Consider in severe thrombophilia. Discuss with haematology. N.B. heterozygosity for prothrombin gene mutation **or** factor V Leiden is **NOT** a severe thrombophilia.

### 3. Mechanical Heart Valve

- Bridging therapy is recommended for patients with MHVs other than those with a bileaflet aortic valve and no other risk factors (Keeling, *et al* 2011, BCSH guidelines).

## WHAT TO PRESCRIBE

Treatment dose LMWH (bd 1mg/kg dosing regime if normal renal function). Consider UFH bridging in patients with CrCl<30ml/min

In patients who are receiving pre-operative treatment dose LMWH the last dose should be at least 24 h before surgery.

Patients who do not require bridging anticoagulation should be prescribed prophylactic dose LMWH. This is to commence when the INR< 2 and charted at 2000hrs. It should be commenced preoperatively unless contraindicated.

## POSTOPERATIVE MANAGEMENT

Postoperative bridging (i.e. treatment dose LMWH) is not restarted until 48 hours after surgery and the surgeons are happy to do so. Thromboprophylaxis should be given in the interim.

Recommencement of warfarin postoperatively may occur as soon as it is clinically safe to do so. Generally the patient's usual dose of warfarin should be recommenced. LMWH can be ceased when the INR>2.

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## DIRECT ORAL ANTICOAGULANT (DOAC) MANAGEMENT

1. **WITHHOLD** further doses of DOAC
2. Document
  - DOAC name, dose, time of last dose
  - Indication for DOAC
3. Request
  - Baseline coagulation tests: PT, aPTT, Thrombin Time
    - Give vitamin K 10mg IV if any concern regarding poor Vitamin K intake (malnutrition) or malabsorption and/or PT abnormal
  - Baseline drug level if DOAC within 72 hours (within 1 week if renal impairment). This can be done on the coagulation sample
  - Creatinine clearance, LFT

NOTE : Abnormal results on coagulation tests are unexpected with apixaban. If abnormal look for other causes. Thrombin time is very sensitive for dabigatran. An abnormal TT is expected even if very low levels of drug present. If normal this excludes a significant amount of dabigatran. An abnormal result does not indicate clinically significant amounts of drug are present.

4. Determine safe time for surgery

<p>Drug Level &lt; 30 ng/ml <b>AND</b> Coag tests are NORMAL <b>AND</b> Last DOAC dose &gt; 24 hours ago <b>THEN</b> <b>Surgery is safe from DOAC perspective</b> <i>(If drug level is not in keeping with the clinical scenario (eg: time of last dose or renal function) review history and repeat drug level to confirm)</i></p>	<p>Drug Level &gt; 30 ng/ml <b>OR</b> Coag tests ABNORMAL <b>THEN</b> Determine DOAC clearance time (Refer to table below - WATAG Guidelines) <b>THEN</b> <b>Surgery is safe from a DOAC perspective when sufficient clearance time has lapsed</b></p>
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	Rivaroxaban (Xarelto®)	Apixaban (Eliquis®)	Dabigatran (Pradaxa®)
Common dose	20 mg daily	5mg bd	150mg bd
Creatinine Clearance ≥50mL/min	Last dose 48-72 hrs before surgery	Last dose 48-72 hrs before surgery	Last dose 48-72 hrs before surgery
Creatinine Clearance 30-49mL/min	Last dose 72 hrs before surgery	Last dose 72 hrs before surgery	Last dose 96 hrs before surgery

Please repeat drug level at induction as part of quality and safety exercise

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If surgery is expected to be delayed >48 hours due to DOAC the risks and benefits of delay must be discussed. The on call haematologist may be contacted for further advice.

## POSTOPERATIVE RESUMPTION OF DOAC

If bleeding is absent, resume DOAC 48-72 hours following hip fracture surgery. Prescribe prophylactic dose LMWH postoperatively while DOAC is being withheld.

For patients at high risk of thrombosis/thromboembolism an earlier reduced dose may be suitable (e.g. on the evening following surgery). Specialist haematologist advice is recommended,

## WHEN TO CALL HAEMATOLOGY

- Haemostatic products required, eg patient bleeding or surgery is not deferrable
- Coagulation results difficult to interpret, or requesting and interpreting drug specific levels
- Significant renal dysfunction
- If epidural or spinal anaesthesia being considered. In general neuroaxial anaesthesia is contraindicated unless anticoagulant effect can be excluded.
- If surgery is expected to be delayed >48 hours due to DOAC clearance time
- If drug level is not in keeping with clinical scenario (eg : time of last dosage or renal function)
- Other significant haematological concerns

NB: A specific reversal agent Idarucizumab is now available for Dabigatran. This is only for use in life threatening bleeding (e.g. multi trauma, intracerebral haemorrhage) or when urgent lifesaving surgery is required. This must be authorised by the on call haematologist and will not be authorised in situations where surgery can be safely delayed.

# SCGH HIP FRACTURE CLINICAL GUIDELINE

## PATIENT BLOOD MANAGEMENT

Patient Blood Management for hip fracture patients involves:

1. Iron Therapy
2. Tranexamic Acid Therapy
3. RBC Transfusion Therapy

## IRON THERAPY

Anaemia (Hb < 130g/L males , Hb < 120g/L females) is prevalent in the hip fracture population. Hip fracture surgery commonly results in a fall in haemoglobin level, triggering the need for allogenic blood transfusion. The frequency and volume of allogenic blood transfusion following hip fracture surgery may be reduced by perioperative intravenous iron infusion.

Following consensus between orthopaedic surgery, anaesthetics and geriatric medicine, ***all hip fracture patients, will receive an intravenous infusion of 500 mg Iron Polymaltose (Ferrosig) intra-operatively unless a contraindication exists (see below)***

Contraindications to iron therapy :

- Iron overload syndromes (haemochromatosis, haemoglobinopathies)
- Patients requiring recurrent transfusions ( eg: myelodysplasia)
- Polycythemia rubra vera

## TRANEXAMIC ACID (TXA) THERAPY

There is moderate quality evidence that TXA reduces post-operative anaemia and the need for postoperative blood transfusion in hip fracture surgery, but its safety profile in this patient population is not well documented. Furthermore there is a paucity of data regarding the optimum therapeutic regime in this setting. Following a literature review and consensus between orthopaedic surgery, anaesthetics and geriatric medicine all hip fracture patients will receive **a single bolus of 15mg/kg IV TXA given at induction**. Patients **WILL NOT** receive subsequent doses.

Contraindications to TXA therapy :

- active intravascular clotting
- history of venous thromboembolic disease (DVT, PE)
- active coronary artery or cerebrovascular disease (event within the last 12 months)
- history of vascular stents
- history of retinal vein or artery occlusion
- congenital or acquired coagulation abnormality
- Patients on anticoagulants.
- active malignancy
- active genitourinary bleeding
- mechanical heart valves
- acquired defective colour vision
- subarachnoid haemorrhage
- Patients with hypersensitivity to TXA

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## TRANSFUSION THERAPY

Red blood Cell (RBC) transfusion should not be dictated by haemoglobin alone but based on assessment of the patient's clinical status, comorbidities, intraoperative losses and risk of ongoing bleeding. Elderly patients with multiple co-morbidities tend not to tolerate anaemia well.

**Preoperative:** Group and Screen all patients

Hb < 90g/l – Notify Anaesthetics/Orthogeriatrics. (A significant preoperative anaemia should trigger a search for an underlying cause.)

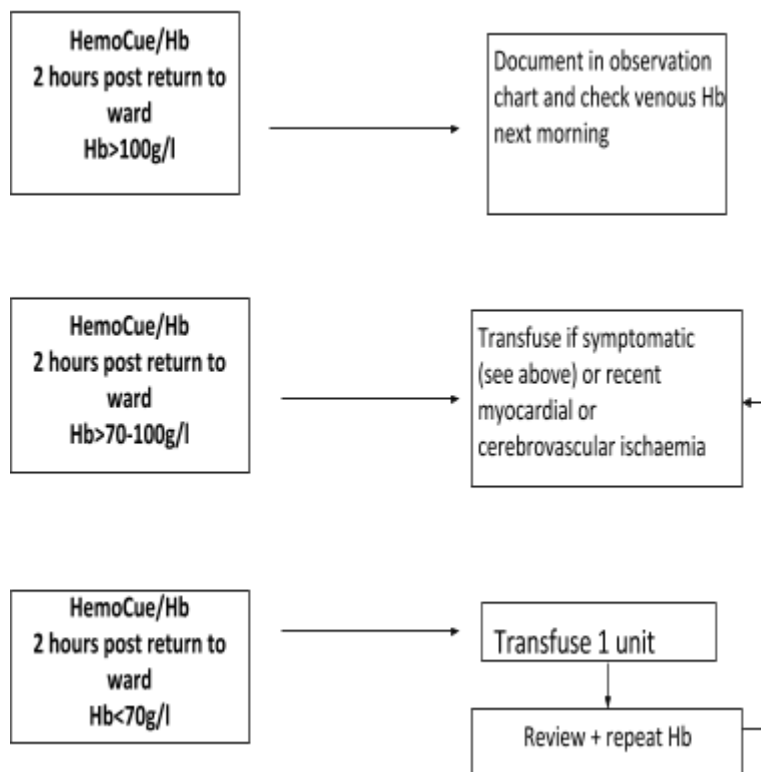
**Postoperative:** A Haemacue should be performed within two hours of the patient returning to the ward.

Transfuse the anaemic patient if:

- they have symptoms that may be attributable to anaemia (hypoxia, shortness of breath, hypotension, hypovolemia, (pre)syncope symptoms, tachycardia, delirium etc.)
- they are actively bleeding
- recent myocardial or cerebrovascular ischaemia (aim for Hb >100)

Patients should only receive a Single Unit Transfusion followed by medical assessment +/- repeat formal lab Hb before consideration of a further unit

## TRANSFUSION PROTOCOL



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## DELIRIUM ASSESSMENT AND MANAGEMENT

Hip Fracture patients are at high risk of postoperative delirium. The aetiology is usually multifactorial. Although some factors are irreversible (pre-existing cognitive impairment, new environment and post-anaesthetic) potentially reversible causes should always be looked for and treated accordingly:

- Pain
- Constipation
- Urinary retention
- Dehydration / Poor nutritional intake
- Hypoxia
- Hypotension
- Electrolyte abnormality
- Occult sepsis (eg UTI, RTI )
- Medication toxicity (anticholinergics, sedatives / opioids)
- Consider alcohol or benzodiazepine withdrawal – if this is suspected refer to AWS guidelines

Non-pharmacological measure should always be first line management

- Maintain low level sensory stimulation: soft sound and lighting
- Single room if possible
- Staff calmly to engage, distract and supervise the patient
- Avoid confrontation e.g. walk away, defer interventions or offer food and drink to diffuse tension
- Consider 1:1 companion
- Encourage family to stay and assist

If the patient poses a risk to themselves or others and non-pharmacological measures are not sufficient the following can be prescribed:

**Risperidone** 0.25 – 0.5 mg PO 4 hourly PRN (maximum 2 mg in 24 hours)

For patients with an extrapyramidal syndrome (eg: Parkinson's Disease) prescribe

**Quetiapine** 12.5 – 25 mg 4 hourly PO PRN (maximum 100 mg in 24 hours)

If very agitated and Risperidone/Quetiapine (as above) not adequate, add:

**Olanzapine** 2.5 – 5mg 4 hourly PO or IM (maximum 7.5mg in 24 hours)

- Always use oral before parental whenever possible.
- Avoid benzodiazepines as they may worsen delirium and cause falls
- **Remember to treat the underlying cause of the delirium**

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## OSTEOPOROSIS ASSESSMENT AND MANAGEMENT

All patients admitted with a minimal trauma fracture should be investigated for underlying osteoporosis.

Serum Calcium and Vitamin D levels should be ordered on all minimal trauma fracture patients on admission.

Ensure the patient has adequate dietary calcium intake (1000-1300 mg per day).

If inadequate consider calcium supplementation with 600mg daily to bd

Ensure the patient has a Vitamin D level > 50 nmol/L.

If Vitamin D deficient prescribe supplementation as detailed below:

- Mild deficiency (30-49 nmol/L) : cholecalciferol 1000 - 2000 IU/day
- Moderate to severe deficiency (<30 nmol/L) : 3000-5000 IU/day for 6-12 weeks, followed by maintenance dose of 1,000-2,000 IU per day

Further osteoporosis treatment will be initiated in consultation with the Orthogeriatric team. Patients identified as requiring outpatient follow-up regarding their bone health need an eReferral to Fragile Bone Clinic.

## FALLS RISK ASSESSMENT

All patients admitted with a fall and fracture should have a falls assessment.

This should include an assessment regarding:

- Circumstances of the presenting fall
- Falls history
- Medication review to minimise polypharmacy and eliminate high risk medications
- Heart rate and rhythm (History and ECG review)
- Postural hypotension (History and BP review)

Patients identified by the Orthogeriatric team as requiring outpatient follow-up regarding their falls risk need an eReferral to Falls Clinic



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