Hip 'Fragility' Fracture Management

Reference #: FSH-ORTH-GUI-0002

Scope

Site	Service/Department/Unit	Disciplines
Fiona Stanley Hospital	Hospital Wide	Medical , Nursing and Midwifery

1. Introduction

Hip Fracture Management Guideline describes the medical and nursing management of older patients with fragilty hip fractures.

2. Guideline

2.1 Patient pathway

Hip Fracture patients over the age of 65 are admitted to FSH under the joint care of Orthopaedic Surgery and Geriatric Medicine. The Geriatrician will assume governance for the medical decisions and the Orthopaedic Surgeon will assume governance for those decisions relating to surgical management. (In the Aboriginal and Torres Strait Islanders population the age is reduced to over 55 years).

The Geriatric Medical team will also manage any patients with a fragility hip fracture needing medical management referred by the orthopaedics teams.

At all times a collaborative approach will prevail to ensure the best outcome for each individual patient. The aim is to optimise patients' perioperative medical condition, ensure prompt surgical fixation (when required) and deliver early rehabilitation.

All Hip Fracture patients will be cared for by a multidisciplinary team, incorporating the following principles:

The information provided in this document is based on its relevance to Fiona Stanley Fremantle Hospital Group (FSFHG) only. Due to differences in context, scope of practice and differences in service delivery, FSFHG does not make claim to its relevance or appropriateness for use within other organisations/sites.

- Patients will be reviewed by the Trauma / Orthogeriatric Clinical Nurse Specialist (CNS) during the admission.
- Patients will have nursing care according to the Hip Fracture Clinical Pathway.
- All patients will be reviewed by Geriatric Medicine.
- Unstable patients will be reviewed pre-operatively.
  - The aim is that all patients are reviewed within 24 hours of admission and regularly post-operatively.
- Patients will be reviewed by the ward pharmacist on the first working day post admission.
- Patients will be reviewed by a physiotherapist within 24 hours post-operatively.
- Patients will have access to Occupational therapy, Social Work, Dietetics and Speech Pathology as required.

2.2. Team Roles and Responsibilities

Emergency Department

Early surgery promotes improved outcomes; ideally operating on the day of injury. The priority after any necessary immediate resuscitation should be x-ray confirmation of the diagnosis and referral to the Orthopaedic Registrar and multidisciplinary team.

- The Emergency Department (ED) physician identifies hip fracture.
- The neck of femur (NOF) page is to be sent out to the team once the hip fracture is confirmed on X-ray.
- Acute Hip Fracture Clinical Pathway is commenced, including:
  - IV access and appropriate fluid resuscitation
  - Oral analgesia Pre-operative blood tests (CPOE "Orthogeriatric" Admit order set)
  - X-rays of pelvis (AP) and affected hip (lateral) template ball and Chest X-ray (In same visit).
  - ECG
  - Urinary catheterisation for all patients' hospital policy.
  - Pain assessment tool be completed within 30 minutes of admission to ED. Use PAINAID for patients with cognitive impairment
  - Ultrasound guided Femoral nerve block:

1)Femoral nerve block with 20ml 0.375% Ropivacaine with 4mg Dexamethasone Ultrasound Guided (note 0.375% represents 3.75mg/ml and is made by diluting 0.75% Ropivacaine with an equal volume of 0.9% saline)

***or* 2)Fascia Iliac Block** with 20-30ml 0.375% Ropivacaine with 4mg dexamethasone up to a max of 3mg/kg of Ropivacaine administered by landmark technique.'

Femoral Nerve or fascia iliac Block should be administered by an Emergency Department Medical Officer or Orthopaedic Resident who has been appropriately trained

The patient should have intravenous access in situ and resuscitation equipment available prior to insertion of the block.

- A falls assessment must be completed prior to discharge from the Emergency Department and the Emergency Department Falls Pathway activated.
- Patient is then admitted to the orthopaedic ward (4A).

Orthopaedic Department

- Completes medical admission form.
- Determines optimal procedure and obtains informed consent
- Discusses and documents goals of care with patients and/or their Next of Kin.
- Reviews and documents pre-operative tests results.
- Contacts the Anaesthetic and Orthogeriatric teams.
- Prescribes medications: Prophylactic regimes for thromboprophylaxis, pain management, bowel management and infection are commenced (Refer to sections 3.5 - 3.9)
  - Tranexamic acid 1 gram orally to be given 1 hour pre-operatively unless contraindicated (recent cardiac event).
  - Tranexamic acid 1 gram orally to be given 4 hours post-operatively unless contraindicated (e.g. recent cardiac event).
  - Pre – op drinks prescribed
- Patient should be prescribed the following for pain on diagnosis of a hip fracture:
  - Paracetamol orally 1g QID (500mg QID for patients < 50kg).
  - Oxycodone orally 2.5-5mg 4 hourly PRN (use lower doses if <50kg, unwell, frail patients).
  - Targin® (oxycodone/naloxone) 5/2.5mg BD (2.5 /1.25mg if particularly frail) should be prescribed on admission with review at day 3.
  - If patient does not tolerate oxycodone - Buprenorphine sublingual 200 micrograms 4hrly PRN.
  - Write a regular prescription for opioids used by the patient for chronic pain managment
  - Movicol® (macrogol powder) orally 1 sachet BD regularly and Coloxyl with Senna® (docusate with senna 50mg/8mg) 2 tablets BD
  - If the patient has uncontrolled pain more than 18 hours after their initial nerve block despite the analgesia prescribed above discuss with orthogeriatric Registrar (27757) or the NOF

anaesthetist (26411) about expected time to surgery and consideration of a repeat single shot Femoral Nerve Block.

Anaesthetics

Acceptable criteria for delaying surgery include:

- Hb <80g/L
- Na <120 or >150mmol/L
- K<2.8 or >6.0mmol/L
- Uncontrolled diabetes – ketotic and/or dehydrated
- Uncontrolled or acute onset LVF
- Correctable arrhythmia with ventricular rate >110bpm
- Chest infection with sepsis/hypoxia
- Reversible coagulopathy

Early management by anaesthetics and orthogeratrics and other specialities is recommended to prevent onset of these problems at presentation in the ED

The majority of these issues will be reversible and should not delay theatre.

Management of an undiagnosed murmur

Is not an acceptable reason to delay surgery in isolation. Anaesthetists should proceed as per severe aortic stenosis. A bed side echo (by an appropriately skilled anaesthetist) may provide reassurance. If aortic stenosis is suspected, a formal ECHO during the acute admission may be an appropriate course of action to assess severity, particularly if there is:

- Unexplained syncope or pre-syncope
- Slow rising pulse
- Absent 2nd heart sound
- Left ventricular hypertrophy on ECG without hypertension

Management of ICDs and pacemakers

- Best practice is to identify the specific type of device (single vs. dual chamber, AICD function), the underlying rhythm, current mode of operation and response to magnet.
- Devices should have been checked within the last 12 months – please arrange an urgent pacemaker check if one has not been documented in the last 12 months..

Management of inter-current ischaemia

- Mild troponin elevation only, with no chest pain or ECG changes – ideally treat with aspirin and proceed to surgery without delay.
- STEMI – consult cardiology immediately with likely Percutaneous coronary intervention and next day surgery. Cardiologist must be made aware of fractured NOF as this will influence the type of procedure.
- NSTEMI:
- Significant (i.e. chest pain, Unstable ECG changes, Troponin) – consult cardiology and proceed as advised.
- Insignificant (i.e. Troponin elevated with mild, stable ECG changes e.g. Inverted T waves/ST Segment depression) – if no arrhythmia, chest pain or failure, proceed to surgery without delay, ideally with aspirin.

- Consider bed side focused echo (by an appropriately skilled anaesthetist) if proceeding and no formal echo in place.

3.2.1 Post-operative care

- Patients with STEMI + arrhythmias to be admitted to Coronary Care Unit
- Patients requiring monitoring to be admitted to High Dependence Unit or Cardiology ward (Ward 4D).
- If in doubt, consult with cardiology before proceeding.

3.2.2 Dealing with peri mortem patients having a palliative procedure

- Address Goals of care with patient/ family/ surgeons
- Consider other non-operative palliative care options with the Multi- disciplinary Team (MDT).

3.2.3 Anaesthetic Choice

- Type of surgery should be considered in decisions around anaesthetic technique.
- DO NOT plan both GA (general anaesthetic) and spinal (avoid over-sedation in conjunction with a spinal).
- Peripheral blockade (Femoral Nerve Block or Fascia Iliaca Block) should be considered for both GA and neuraxial techniques.
- Spinal/ epidural should always be considered first (lower early mortality/DVT/cognitive dysfunction).
- For neuroaxial techniques, consider reducing hypotension by lateralising (use hyperbaric bupivacaine) and limit dose (<10mg if possible).
- The use of intrathecal opiates in this population is not supported

by strong evidence. The evidence that exists supports the use of minimal effective doses. In practice where intrathecal opioids are used, intrathecal fentanyl <15micograms is desirable.

- Low threshold for arterial lines and defense of blood pressure.
- General anaesthesia should be Minimum Alveolar Concentration (MAC) sparing and Bispectral Index (BIS) guided.
- Beware "Triple Low"; hypotension, low MAC and low BIS.

Orthogeriatric Team

- The geriatric medicine assessment occurs during weekdays (working hours) in a joint care model.
- A consultant geriatrician will routinely visit the ward on weekends and public holidays. Consultant geriatrician is available 24/7 via helpdesk for advice.

Weekends/public holidays, a review from the on-call general medical service should be sought from HOOT medical registrar.

The Focus of the Initial Assessment should be:

- Medical optimisation for surgery.
- Ensuring a thorough medical history is documented, including cardiac/neurological case of falls and medication reconciliation and review.
- Clarifying premorbid physical and cognitive function.
- Determining if more specific investigations or referrals to other subspecialty teams are required pre-operatively (in consultation with orthopaedics/anaesthetics).
- Ensuring that family is aware of the management plan as appropriate**.**
- Discussing Goals of care if not completed by orthopaedic surgery/anaesthesia.
- Identifying a rehabilitation/discharge plan and discussing this with the patient and their family.

Timing of Surgery

- While surgery should proceed as soon as is practicable the service aims to operate within 36hrs of fracture. Fasting times should be minimised with pre-operative carbohydrate drinks prescribed.

3.3 Analgesia

3.3.1 Principles of Management

- Provision of adequate analgesia is critical for good functional outcomes.
- The aim is to ensure adequate relief without causing adverse effects of delirium or drowsiness

- Use the lowest possible effective doses for older patients and increase the doses carefully.

NSAIDS are not routinely prescribed for hip fracture patients.

- Celecoxib, and/or Pregabalin may be considered by orthogeriatric team.

3.3.2 Suggested Analgesia guideline

- Paracetamol orally 1g QID (500mg QID for patients < 50kg).
- Oxycodone IR orally 2.5-5mg 1 hourly PRN (for the first 24 hours)
- Oxycodone IR orally 2.5-5 mg 4 hourly PRN (subsequently)
- Second alternative: Buprenorphine sublingual 200micrograms 4 hourly PRN.

If the patient requires MORE analgesia than above postoperatively the following may be added :

- Targin (oxycodone/naloxone) orally 2.5/ 1.25mg to 5/2.5mg BD. (review at day 3)
- Ensure co-prescription of aperient (macrogol powder, docusate and senna) with opioid prescription.

- Naloxone subcutaneous 40 micrograms 1 hourly PRN (for itch in the first 24h post spinal anaesthesia)
- At least 2 antiemetics
  - Ondansetron orally/intravenous 4mg TDS/PRN
  - Droperidol intravenously 0.5mg TDS/PRN
- The orthogeriatric team will consider in selected patients :
  - Celecoxib orally 100mg BD (1 week)
  - Pregabalin orally 25mg to 75mg BD.

3.4 Anticoagulants and Antiplatelet Medications

3.4.2 Warfarin

- Refer to Anticoagulation Reversal Guidelines (Warfarin/Heparin)
- The indication for warfarin therapy should be clarified on admission, to help determine the need for other bridging anticoagulation (IV heparin or subcut enoxaparin) peri-operatively.
- Warfarin should be actively reversed pre-operatively to minimise time to surgery, rather than allowing INR to fall passively.
- Reversal with Prothrombinex® VF as per FSH Blood Transfusion Policy
- Manual: Prothrombinex information
- Successful reversal is INR ≤ 1.4.-immediately pre-op
- Patients with prostethic heart valves may require a degree of warfarin refersal and bridging anticoagulation. Consultation between the Orthogeriatric consultant and Cardiologist/ Cardiothoracic surgeon may need to be considered.

- For patients with recent thromboembolism, discussion with Ortho-geriatric consultant and / or Haematologist may be required
- All patients will be reviewed by Orthogeriatric team and an early discussion made about the appropriateness of recommencement of anticoagulation. Warfarin recommencement post-operatively may occur as soon as it is clinically safe to do so, or when the bleeding risk is considered minimal by the orthopaedic team. Generally regular doses of warfarin should be recommended.

3.4.3 Direct Oral Anticoagulants (DOAC)

- Factor Xa inhibitors (such as Rivaroxaban and apixaban) cannot be easily reversed. Refer to FSH NOACS Guidelines for the Pre-operative and Pre-intervention Management of Medications and discuss with Orthogeriatric team how to proceed.

3.4.4 Aspirin

- Surgery should not be delayed. Aspirin therapy indicated for defined pathology (i.e. not nonspecific prophylaxis) should be maintained throughout admission unless a contraindication arises (e.g. active bleeding)

3.4.5 Antiplatelet Medication

- Indication for dual/other antiplatelet medication needs to be confirmed before decision to withhold treatment. Single antiplatelet medication should not delay surgery.Discussion between the Orthopaedic, Anaesthetics and/or Orthogeriatric teams is required, particularly if the patient has a recent stroke or cardiac event/intervention. Discussion of risk/benefit of early surgery for patients on dual antiplatelet medication will be required before proceeding to surgery.

3.4.6 Antihypertensive Medication

- All antihypertensive medications are to be withheld pre-operatively with the exception of beta blockers. If systolic blood pressure >150mmHg pre operatively discuss with Anaesthetist and/ or orthogeriatrics

3.5 Delirium Management

Delirium Screen tools:

- 4AT to be completed on admission, as well as post operatively on day 1and 2. Cease if normal or continue daily if abnormal post operatively.
- Daily Orthogeriatric team review will address delirium management

Refer to: Dementia and cognitive screening tool

3.6 Anaemia Management

- General measures should be undertaken to prevent or reduce blood loss, such as warfarin reversal for over-anticoagulation, or platelet transfusion for thrombocytopenia.
- Clinical triggers for blood transfusion include:
  - Symptoms of anaemia (such as Cardiac chest pain)
  - Congestive cardiac failure, unexplained tachycardia
  - Hypotension, pre-syncope/syncope and delirium
  - Haemodynamic compromise attributable to significant blood loss.
- Haemoglobin should be assessed pre-operatively, in PACU and on day 1

3.6.2 Recommended Transfusion guidelines

Transfusion should not be based on haemoglobin alone but on a consideration of the clinical picture including impending surgery if pre-operative. Post-operative hypotension is most commonly caused by anaemia/hypovolaemia and this needs to be actively excluded in post operative hypotensive patients. Consider transfusion if;

- Pre-operative Hb < 100 g/L → if symptomatic, Transfuse packed red blood cells (1 unit, then reassess),
- Post-operative Hb < 90 g/L, if symptomatic, Transfuse packed red cells (1 Unit then reassess)
- Transfuse 1 unit packed red cells if there is presence of obvious clinical triggers above.

3.6.3 Iron Infusions

- Functional iron deficiency is almost ubiquitous in the fractured neck of femur patient population.
- As such, all patients will receive intraoperative Iron Polymaltose as per the guideline based on bodyweight unless there is a contraindication.
- Contraindications to Iron infusion in this setting are; documented adverse reaction to intravenous iron, active infection with current systemic symptoms, ACE inhibitor given on day of surgery, documented haemachromatosis or iron overload

Dosing

- <50kg – 500mg Iron Polymaltose over 15 minutes
- >50kg 1000mg Iron Polymaltose over 15 minutes

3.7 Bladder & Bowel Management

Bladder Management

- Patients with hip fractures are at increased risk of urinary retention. This can lead to bladder stretch injury and predispose to urinary tract infection (UTI).

- Urinary retention ± UTI can increase the risk of delirium in older patients.
- Remove indwelling catheter on Day 1 post-operative at 0600hr following suppositories at 0500hr (Nurse initiated).
- Monitor bladder as per bladder assessment policies

Bowel Management

- Patients with hip fractures are at increased risk of constipation due to immobility and adverse effects of opiate analgesia.
- Constipation can increase the risk of delirium and bowel obstruction in older patients.
- Regular bowel chart should be commenced on admission and managed as per the Adult Bowel Management policy.
- All patients must receive PR suppositories at 0500hr prior to removal of IDC at 0600hr.
- Suggested Bowel Regime to be prescribed for all patients:
  - Coloxyl & Senna orally 2 tablets BD
  - Macrogol powder orally 1 sachet BD
  - Bisacodyl/Glycerine suppository or enema if bowels not opened for 3 days.

3.8 Other Management Priorities

Antibiotic Prophylaxis

Cefazolin 2g at the time of induction intra-operatively, MRSA positive patients to have Teicoplanin in addition to cephazolin. (refer to Surgical Antibiotic Prophylaxis Guideline Orthopaedic Surgery, Surgical Antibiotic Prophylaxis Guideline Orthopaedic Surgery: Open Fractures

Thromboprophylaxis

- Refer to VTE Risk Assessment Guideline.
- The rate of radiological proven deep vein thrombosis (DVT) in this population is as high as 45%. The large majority of DVTs are asymptomatic and fewer still progress to symptomatic pulmonary embolism (PE). Estimates of the incidence of fatal PE vary from <1-7%.

A wide variety of both physical and pharmacological methods have been shown to reduce radiologically proven DVT. Significant reduction in the more clinically relevant endpoints of symptomatic DVT and PE is more difficult.

- The best balance of risk and benefit, based upon currently available evidence appears to be treatment with some chemoprophylaxis, application of physical methods and early mobilisation.
- In the absence of contraindications, LMWH (enoxaparin) should be prescribed and administered according to the FSH VTE prophylaxis guidelines.

- Appropriate doses are enoxaparin subcut 40mg daily post op, (OR 20mg daily if weight less than 40kg or renal-impaired with eGFR less than or equal to 30ml/min).
- The daily administration of enoxaparin should be given at 0600hr day 1 post surgery for all patients
- Mechanical prophylaxis- calf pumps on both legs until patient mobile
- Enoxaparin may be continued for 35 days post operatively unless contraindicated.
- If the patient is unable to be managed on enoxaparin post discharge (compared with no thromboprophylaxis):
    - Aspirin should be continued for 28 days post operatively unless contraindicated. Patients discharged home from FSH will require this to be included in their discharge medication.

Fluid Management

- Document fluid intake and output for all patients during the intraoperative period on a fluid balance chart
- Urine output of 15-20 mL/hr may be adequate for some older patients. Patients with "low" urine output should be reviewed by the Orthogeriatric team or Medical Registrar to determine the level of fluid resuscitation required

Caution: Older patients are susceptible to fluid overload

- Patients should be encouraged to maintain adequate oral fluid intake if possible

Nutrition

- The Malnutrition Screening Tool (MST) must be completed on admission to acute ward. The patient may be referred to a Dietitian if indicated.
- Nutritional supplements should be commenced as per dietician guidance.
- Pt with MST score of greater than 2 should be placed on a high energy high protein diet.

- All Hip Fracture patients receive pre-operative drinks at 1700hr on the day before surgery and 0600hr on the day of surgery

Pressure Injury Prevention

- The skin integrity bundle must be completed within 2 hours of the treating team admitting the patient
- Preventative strategies should be implemented according to pressure care nursing practice. Refer to relevant FSFHG

Pressure Injury Prevention and Management policies

Fall prevention and Management

- All patients will have a Falls Risk Assessment and Management plan (FRAMP) commenced on admission to ward.

3.9 Osteoporosis Management

Principles of Management

- All patients presenting with a minimal trauma hip fracture should be assessed to determine their need for calcium/vitamin D supplementation and specific anti- resorptive therapy.
- The following blood tests are advised:
- Full blood picture (FBP), Renal function (U&E), Liver function (LFT), Thyroid function (TFT), Calcium and 25-hydroxyvitamin D [25(OH)D].
- Additional investigations for secondary causes of osteoporosis may be required for selected patients.
- The need for Bone Mineral Densitometry or Fasting Metabolic Bone Studies will be advised by the Orthogeriatric team.
- Suggested Treatment Regime
    - 25(OH)D < 50nmol/L
      Colecalciferol 50micrograms daily
    - 25(OH)D < 40 nmol/L:
    - Colecalciferol 50 micrograms tds for 2 weeks, then 50 micrograms daily.
    - Caltrate® 600mg daily may be prescribed in the absence of hypercalcaemia if dietary calcium intake < 1200 mg/day (3 servings of dairy products, with at least one being calcium-fortified).
    - Anti-resorptive therapy will be commenced / considered for older patients with minimal trauma fractures of the hip, wrist or vertebral body. The decision and choice of therapy (such as bisphosphonate or denosumab) will be advised by the Orthogeriatric team.

3.10 Multidisciplinary Rehabilitation

Geriatrician-led multidisciplinary rehabilitation begins in the acute ward from the first post-operative day:

- Early mobilisation is encouraged and the physiotherapist may perform an initial mobility assessment Day 0 post-operative. Nursing staff to stand patient on day 0, physiotherapist to mobilise patient from day 1
- The nursing staff and allied health professionals will initiate assessment and discharge planning upon admission to the acute ward.
- Other allied health members including the speech pathologists, dieticians and pharmacists may also participate in the rehabilitation/discharge process as required.

- Patients who are suitable candidates for inpatient rehabilitation will be referred to a subacute care facility by the 2nd post-operative day, in order to maximise their chances of returning to their previous domicile.
- The destination for subacute care will be determined by the address/district of the domicile and will be advised accordingly by the Orthogeriatric team.
- Patients who are previously from a residential care facility will be assessed by the Orthogeriatric team and will be considered for inpatient rehabilitation on an individual basis.
- The Orthogeriatric team may also assist in the review of patients for medical stability and coordination of care before discharge to their residential facilities.

3. Compliance/Performance Monitoring

Compliance against this document will be evaluated by the orthopaedic, geriatric, anaesthetic and nursing teams with routine incident clinical review processes.

Clinical pathway variance analysis reports are used to monitor compliance with this guideline.

4. Related Policy Documents

Surgical Antibiotic Prophylaxis Guideline
FSFHG Guidelines for the Pre-operative and Pre-intervention Management of Medications
Anticoagulation Reversal Guidelines (Warfarin/Heparin) Prothrombinex guidelines
NOACS Guidelines (Draft)
FSH Osteoporosis Management Guideline – replace with WADEP document

4.1 Related documents

Acute Neck of Femur Clinicl Pathway
Delirium and cognative impairment screening tool

5. Related standards

NSQHS standards v2

- Clinical Governance

6. Bibliography

1. Australian and New Zealand Society for Geriatric Medicine. Position Statement 5. Orthogeriatric care. Revised 2010.
2. Mak JCS et al (2010). Evidence-based guidelines for the management of hip fractures in older persons: an update. MJA 192(1) 37-41.
3. NICE Clinical Guideline (2011). The management of hip fracture in adults.
4. Scottish Intercollegiate Guidelines Network (2009). Management of hip fracture in older people

5. British Orthopaedic Association (2007). The care of patients with fragility fracture.
6. Nowson CA et al (2012). Vitamin D and health in adults in Australia and New Zealand: a position statement. MJA 196(11) 1-7.
7. Ebeling PR et al (2013). Building healthy bones throughout life: an evidence- informed strategy to prevent osteoporosis in Australia. MJA Vol 2(Supp 1) 1-9.
8. Tran HA et al (2013). An update of consensus guidelines for warfarin reversal. MJA 198(4) 1-7.
9. Australian Red Cross Blood Service - Warfarin Reversal Concensus Guidelines 2004.
10. Fletcher AK, Rigby AS, Heyes FL. Three-in-one femoral nerve block as analgesia for fractured neck of femur in the emergency department: a randomized, controlled trial. Ann Emerg Med 2003; 41: 227-233.
11. Skelly JM, Guyatt GH, Kalbfleisch R, et al. Management of urinary retention after surgical repair of hip fracture. CMAJ 1992; 146: 1185-1189.
12. Oldmeadow LB, Edwards ER, Kimmel LA, et al. No rest for the wounded: early ambulation after hip surgery accelerates recovery. ANZ J Surg 2006; 76: 607-611.
13. Vidan M, Serra JA, Moreno C, et al. Efficacy of a comprehensive geriatric intervention in older patients hospitalized for hip fracture: J Am Geriatr Soc 2005; 53: 1476-1482.
14. Association of Anaesthetists of Great Britain and Ireland (AAGBI) Guideline
15. Browning RM, Alakeson N, O'Loughlin EJ. Anaesth Intensive Care. Efficacy and safety of ultra rapid iron polymaltose infusion during general anaesthesia. 2017 May;45(3):320-325

7. Authorisation

EXECUTIVE SPONSOR: Medical Co Director Service 3					
Version	**Date Issued**	**Compiled/Revised By**	**Committee/Consumer Group Consulted**	**Endorsed By**	**Revision due**
1	12/2014	Senior Project Officer FSH Clinical Commissioning	Drugs and Therapeutics Committee	Policy Committee	12/2017
2	07/2015	Clinical Nurse Specialist Trauma / Ortho–Geri	Drugs and Therapeutics Committee	Policy Committee	07/2018
3	04/2017	Medical CoDirector Service 3	Drugs and Therapeutics Committee	Director Clinical Services	09/2017
4	07/2019	Medical CoDirector Service 3	Drugs and Therapeutics Committee	FSFHG Policy Committee	07/2022