The Pennine Acute Hospitals NHS
NHS Trust

PENNINE ACUTE NHS TRUST

FRACTURED NECK OF FEMUR - JUNIOR DOCTORS HANDBOOK

New Edition!

New Analgesia Guidance!

July 2016

Introduction - Standards of Care

The "Blue Book" - *The Care of Patients with Fragility Fracture* - published by the British Orthopaedic Association (BOA) and British Geriatric Society (BGS) describes good practice in caring for patients with fragility fractures. This is a good read and can be downloaded freely at:

http://www.fractures.com/pdf/BOA-BGS-Blue-Book.pdf

This recommends the following standards:

- All patients with hip fracture should be admitted to an orthopaedic ward within 4 hours of hospital admission.
- Patients who are medically fit should have surgery within 48 hours and within normal working hours.
    - In order to qualify for the Best Practice Tariff, patients who are medically fit should have surgery within 36 hours.)
- All patients presenting with a fragility fracture should be managed on an orthopaedic ward with routine access to orthogeriatric medical support from the time of admission.
- All patients presenting with fragility fracture should be assessed to determine their need for therapy to prevent future osteoporotic fractures.
- All patients with a fragility fracture following a fall should be offered multidisciplinary assessments and intervention to prevent future falls.

These standards are monitored for every patient admitted as part of the National Hip Fracture Database (NHFD).

Useful numbers:

NMGH

Ortho FY2/CT daytime bleep:	4123
Ortho FY2/CT evening bleep:	4123
Ward I5:	42552
Theatre phase 1:	42063
Fracture Clinic:	42617

ROH

Ortho SHO bleep	7421
Trauma nurse bleep	7700
Ward T7 (front desk)	75825
Ward T7 (TASU)	75856
Trauma room	75372
Theatre 3	78815
Theatre 7	78824

Notes

Anaesthetic office

42280

Anaesthetic office

78828 or 78385

Preoperative Guidelines

All patients with a confirmed or suspected fractured neck of femur should be admitted using the fractured neck of femur clerking document

It is very important that history taking is detailed, particularly the circumstances that led to the fracture. Patients must receive a thorough examination of all systems – not just a look at the affected leg!

All patients require the following investigations on admission:

Blood Tests

- FBC
- U&Es
- LFTs
- Bone profile
- Clotting
- Glucose
- Group and save and antibody screen
    - Cross match only necessary for those highly likely to need blood. If unsure, ask a senior orthopaedic surgeon, ortho-geriatrician or anaesthetist.

Other

- **Urinalysis**
- **CXR** – To look for evidence of LRTI/cardiac failure and to assess cardiac size. This is also an important investigation in those who have had or may have a malignancy.
- **ECG** – Looking in particular for:
    - Ischaemia
    - Bradyarrhythmias
    - Tachyarrhythmias

Results of investigations should be chased and documented on the results flow chart in the clerking document.

Abnormalities should be managed as per guidelines below or discussed with the anaesthetic, medical or orthogeriatric team.

Notes

Analgesia

A multi-modal strategy, employing several analgesics, each working by a different mechanism is recommended to produce adequate analgesia without intolerable side effects. The following analgesics can be considered unless contraindicated (allergies etc.):

- Paracetamol
- Oxycontin/Oxynorm (or alternative opioid if the patient has this already prescribed at presentation)

Laxatives should be co-prescribed in those receiving opiates to prevent constipation. Please also remember to prescribe appropriate anti-emetics.

NSAIDs are effective analgesics but their use is limited in older adults because of side effects and interactions. Potential side effects include gastrointestinal haemorrhage, renal failure, cardiac failure, hypertension and confusion. **They should be avoided in this population**.

In patients with renal failure, opiates accumulate and smaller doses at more prolonged intervals should be prescribed to prevent toxicity. Oxycontin and Oxynorm may be preferable to morphine in those with renal failure.

Changes in pharmacodynamics and pharmacokinetics occur with age often resulting in increased drug plasma concentrations and prolonged duration of action. In older people, if opiates are necessary, the initial dose should be small with close observation and reassessment before titrating.

A flow chart developed by Dr Gibson (Consultant Geriatrician) is shown on the next page to help you initiate therapy.

Also: please make sure that in the post-operative period analgesia is prescribed early enough (7 or 8am) so that it will have had a chance to have taken effect by the time the physiotherapy team start working with the patient!

If pain post-operatively is intractable and unresponsive to the analgesia suggested above, consider whether there is something amiss with either the wound or the fixation. Pain should settle relatively quickly post-operatively.

Notes

Analgesia Flow Chart

Stop medications containing both Paracetamol and another drug e.g. codeine

Prescribe Paracetamol 1g QDS

Prescribe Oxycontin 10mg BD
(Oxycontin 5mg BD if very frail e.g. <50Kg)
and
Oxynorm 5mg 4 hourly PRN
Review continued need at 48-72 hours post-op
UNLESS ...
Patient is already on stronger opiate
(e.g. Morphine, Fentanyl Patch)

Prescribe laxatives!!

Daily review:

1. Pain control
2. PRN use of Oxynorm
3. Regular dose of Oxycontin
4. Need to change or discontinue analgesia at 48-72 hours post-op

Updated Section

If the patient is unable to swallow

Ask why!

Seek advice!

Think about regional nerve blockade!

Review daily

Delirium?

Other side effects?

Effectiveness?

Analgesia: What standards are specifically sought by NICE?

The patient's pain should be assessed:

Standard 1

The patient's pain should be assessed

- ✓ Immediately upon presentation at hospital and
- ✓ Within 30 minutes of administering initial
- ✓ Hourly until settled on the ward and
- ✓ Regularly as part of routine nursing observations throughout admission

Standard 2

- ✓ Was immediate analgesia offered to patients presenting at hospital with suspected hip fracture?
- ✓ Did the person have a cognitive impairment (those with cognitive impairment are often disadvantaged in terms of receiving timely pain relief)?

Standard 3

- ✓ Was analgesia sufficient to allow movements necessary for investigations, and for nursing care and rehabilitation?

Standard 4

- ✓ Was Paracetamol offered every 6 hours preoperatively?

Standard 5

- ✓ If Paracetamol alone did not provide sufficient preoperative pain relief, were additional opioids offered/given?

Standard 6

- ✓ Is there evidence that adding nerve blocks was considered if Paracetamol and opioids did not provide sufficient preoperative pain relief, or to limit opioid dosage?

Notes

Intravenous Paracetamol in Adults: Preventing Toxicity

Background

Paracetamol is a commonly used analgesic which can be administered orally, intravenously or rectally. The usual recommended dose in adults is 1g every 4-6 hours and a maximum daily dose of 4g. IV Paracetamol is indicated for the short-term treatment of moderate pain, especially following surgery and for the short-term treatment of fever, when administration by the IV route is clinically justified by an urgent need to treat pain or hyperthermia and/or when other routes of administration are not possible.

Understanding the Problem

There is a narrow margin between the therapeutic and toxic doses of Paracetamol and over dosage can result in severe liver damage. The mechanism of toxicity is thought to be the production of a minor but highly reactive metabolite, NABQI, by isoenzymes in the liver and kidney. The amount of NABQI produced after normal doses of Paracetamol is usually completely detoxified by body stores of glutathione and excreted. In Paracetamol over dosage, stores of glutathione become depleted, allowing NABQI to accumulate and cause cell damage. Malnutrition, malabsorption and alcoholism can lead to glutathione deficiency, thus increasing the risk of toxicity associated with Paracetamol.

Caution must be used when IV Paracetamol is given to adults weighing less than 50kg, as the dose has to be adjusted according to body weight. The dose should also be reduced in patients with hepatocellular insufficiency, chronic alcoholism, chronic malnutrition, or dehydration.

Failure to reduce the dose appropriately may result in Paracetamol-induced liver toxicity. This could lead to hepatic failure and death.

Reducing the Risk

The recommended dose adjustments for IV Paracetamol in the BNF, detailed below, must be followed to reduce the risk of toxicity. All staff involved in the prescribing or administration of IV Paracetamol should ensure they are familiar with this information. Patients should be transferred to oral treatment as soon as possible.

Patients weighing less than 50kg

15 mg/kg every 4–6 hours, maximum daily dose of 60 mg/kg

- To administer doses less than 1g, remove any excess dose from the vial before administration to prevent the whole vial being inadvertently administered e.g. to give a 700mg dose remove 30ml (300mg) from a 1g/100ml vial and administer the remaining 70ml (700mg) over 15 minutes.

Patients with renal insufficiency

Increase dose interval to every 6 hours if the eGFR < 30 ml/minute

Patients with hepatocellular insufficiency, chronic alcoholism, chronic malnutrition, or dehydration, regardless of their weight*

Maximum daily dose of 3 g should not be exceeded

* IV Paracetamol is contraindicated in severe hepatocellular insufficiency

Note:

Although there is no specific advice on dose adjustments of oral Paracetamol in adults with low body weight etc. Similar reductions to those above should be considered. In cases of Paracetamol poisoning/toxicity consult

www.toxbase.org or contact the National Poisons Information Service on 0844 892 0111 for advice on risk assessment and management.

Reference:

CMFT Medication Safety Bulletin Issue No.2 17th February 2012. CMFT Pharmacy Department.

Antibiotic prophylaxis – Hemiarthroplasty only

Please prescribe using the up-to-date guidance on the intranet.

For those with drug allergies, consider liaising with the microbiologists.

Fluids

Those presenting with a fragility fracture are often hypovolaemic at presentation. All patients should be commenced on IV crystalloids unless they are in acute heart failure. Prescribe Hartmann's solution or normal saline with added potassium if hypokalaemic.

U&Es should be monitored on alternate days or daily if abnormal.

Thrombo-prophylaxis

Risk of significant PE is about 7% in patients following surgery for fractured neck of femur. There is considerable on-going debate about the most suitable treatment with no compelling evidence available.

Guidelines suggest:

- Enoxaparin 40mg daily or
- Enoxaparin 20mg if thin and frail or renal impairment (eGFR <30).

Exercise caution prescribing Enoxaparin in those with a platelet count of < 50. All patients should have a platelet count on the fifth day after initiation. If there is more than a one-third drop in platelets please discuss with haematology (such a drop may indicate a diagnosis of heparin induced thrombocytopenia though this is less likely with low molecular weight heparin than unfractionated heparin).

A spinal anaesthetic is contraindicated within 12 hours of a dose of Enoxaparin so an evening dose (ideally 6pm) allows a spinal any time during the following day's theatre list.

Please prescribe Enoxaparin and TED stockings on the drug card (if appropriate) after the relevant PAHNT assessments have been completed.

If a LMWH is contraindicated due to a previous adverse reaction, an alternative is Fondaparinux.

Notes

A-Z of immediate management, useful information and potential delays to surgery

Anaemia

Chronic mild anaemia should not delay surgery. If patients are anaemic (e.g. Hb <10g/dl), please check their haematinics. This should occur before any transfusion takes place.

Transfuse in the following situations:

- Hb <8g/dl - transfuse 2 units of blood (each over 3 hours). Consider 20mg oral Frusemide with each unit if there is evidence of fluid overload or a cardiac history.
- Hb 8-10g/dl with a history of ischaemic heart disease – consider the transfusion of 2 units of blood.

Note:

- Hb 8-10g/dl - and without a history of ischaemic heart disease - order 2 units of blood to be available in theatre

If anaemic with significant macrocytosis, check haematinics (ferritin, B_{12} and folate), LFTs (including GGT), TFTs and a manual blood film. Delay transfusion until discussed with ortho-geriatrician.

Anaesthetic Problems

The anaesthetist should be contacted regarding patients who have had:

- A history of difficult intubation:
    - Anyone who can't open their mouth
    - Restricted neck movements (e.g. ankylosing spondylitis) or an unstable neck (fractures or rheumatoid arthritis)
- Previous problems with general anaesthesia e.g.:
    - Malignant hyperpyrexia
    - Suxamethonium apnoea
    - Previous unplanned ICU admissions

Also, please inform the anaesthetist if you think a patient may need HDU or ICU care post-operatively. For instance: cardiac, respiratory, liver disease or multiple co morbidities.

Notes

Obtain the medical notes urgently for those who have had previous anaesthetic problems!

Or …

Who are complicated!

Antiplatelet agents

Clopidogrel should not be stopped in patients with previous coronary stents.

Please highlight all patients on Clopidogrel to a senior member of medical staff. The anaesthetic team should also be informed. If serious bleeding occurs, please discuss with the haematologist on-call. Platelet transfusion may be considered in the event of persistent bleeding that is not due to another identifiable cause.

Atrial Fibrillation (AF)

All patients with AF should have a ventricular rate of less than 100 pre-operatively.

Regular nursing observations should include the rate counted at the apex beat, and not peripherally.

Exclude or treat factors that may lead to new or rate-uncontrolled AF:

- Check potassium and magnesium levels and thyroid function tests.
- Remember: hypovolaemia, pain, sepsis, hypoxaemia.

For previously undiagnosed AF consider either:

- A beta-blocker such as Bisoprolol (provided there are no contraindications) or
- A rate limiting calcium channel blocker such as Diltiazem (provided there are no contraindications) or
- Digoxin

If unsure, discuss with an ortho-geriatrician or medical registrar on call.

For patients already on treatment for AF, consider exacerbating factors as above and then discuss increasing treatment with the ortho-geriatrician or medical registrar on call.

Notes

Bowels - constipation

Constipation is very common – transit time markedly slows due to immobility and the use of opioid analgesia.

The use of the Bristol Stool Chart should be mandatory. Treat constipation early and you will prevent episodes of urinary retention and delirium!

Remember that those who are constipated may have overflow diarrhoea. In all those with diarrhoea, remember that *per rectal* examination is a vital part of the assessment!

Catheters

Catheterisation should be avoided if possible: those that are catheterised are at greatly increased risk of urinary tract infections and delirium.

If a catheter has to be placed, plan to remove it as early as possible. If treatment of a catheter related urinary tract infection is required, follow PAHNT guidelines initially. Modifications to antibiotic therapy can be made when culture results are available or after consultation with the microbiologists.

Chest Infections

A chest infection can be a reason to delay surgery if particularly serious. Antibiotics should be started promptly (see Trust guidelines available on the intranet).

However, delaying surgery to allow a chest infection to improve can be futile. Infections tend to get worse rather than better in the presence of a fractured neck of femur due to relative hypo-inflation secondary to immobility.

Patients with a chest infection can usually have a spinal anaesthetic. Surgery should be performed as early as possible.

Please ask the physiotherapy team for help pre- and post-operatively. Humidified oxygen and saline nebulisers aid patients to expectorate and provide samples for microbiology.

Remember that blood cultures can help guide therapy!

Delirium

This affects up to 50% of those with fractured neck of femur. The summary of the NICE guidance is to be found at the end of this booklet. The web address for the full guideline is included.

Notes

Diabetes Mellitus

Diabetic patients who usually take insulin should be listed first on the operating list. They usually need a sliding scale of insulin started on the morning of surgery.

Diabetic patients on oral hypo-glycaemics only do not usually need a sliding scale. They should be listed as early as possible on the operating list. Their diabetic medications should be omitted on the day of surgery. Blood sugar should be measured 1-2 hourly and if it rises above 11, a sliding scale should be considered.

Diet-controlled diabetics virtually never need a sliding scale. Their blood sugar should be monitored.

Please refer to the PAHNT guideline available on the intranet for further details.

Diuretics

Older people are often on diuretics. Many are hypovolaemic at admission and at risk of becoming more dehydrated as a result of preoperative starving.

If there is no evidence of acute heart failure, diuretics should be written up on the drug chart but a decision made to either omit them or give them during the peri-operative period. If unsure, please discuss with one of the ortho-geriatricians.

Echocardiograms

Echocardiograms are rarely required pre-operatively in patients with a fractured neck of femur. There are two situations where an anaesthetist may wish for an echocardiogram preoperatively:

- *If severe aortic stenosis* is suspected. Severe AS is a contraindication for spinal anaesthesia. AS gives rise to an ejection systolic murmur that radiates to the carotids. Signs of severity include:
    - Slow rising pulse
    - Quiet/absent second heart sound
    - History of exertion angina/syncope
- *If LV dysfunction is suspected*.
    - This is not necessary for *every* patient with heart failure. Mainly, it will be necessary for breathless patients where there is diagnostic uncertainty.
    - If unsure, discuss with the ortho-geriatrician or anaesthetist.

Notes

Those with a pansystolic murmur do not require an echocardiogram *unless* there are signs of heart failure!

Those with a pansystolic murmur do not need an echocardiogram preoperatively.

Falls

The most important question is: why did they fall in the first place? The clerking proforma is designed to help you answer this question.

It is important to search thoroughly for a cause even in those who report a slip or a trip – many of those who suffer syncopal episodes will deny "blacking out".

Think about the following:

Symptoms at the time of the event?

- Loss of consciousness
- Pale, sweaty, light-headed
- Chest pain, palpitations
- Incontinence
- Tongue biting
- Fitting
- Vertigo

Provocation of the event?

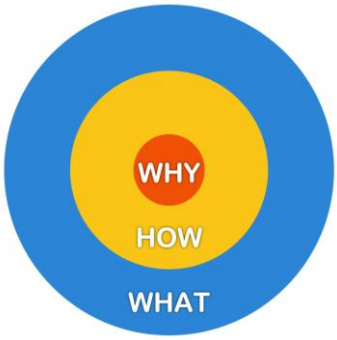
- Postural change
- After a meal
- Head movement
- New drug therapy: anti-hypertensives, diuretics, benzodiazepines, neuroleptics, antidepressants ….

A thorough examination and medication review are required. The basic investigations required are detailed in the clerking proforma.

After the fracture has been dealt with, additional examination components are required:

- Lying and standing blood pressure
- Gait
- Balance

Notes



Nutrition

All patients should have the MUST score completed on arrival. Malnutrition is very common in those who present with a fractured neck of femur.

Malnutrition results in poor energy levels, apathy and poor wound healing. When you see patients, look at their ability to eat and food intake in conjunction with the MUST score.

If you are worried, involve the dieticians early! They will be able to guide you with regard to nutritional supplementation and the issues surrounding re-feeding.

Oxygen

Oxygen should be given as required to patients as required and titrated according to their oxygen saturations.

In patients with COPD, the potential for CO_2 retention should be considered.

Further prescribing advice is available on the Trust intranet.

Pacemakers

All patients with a pacemaker have routine annual checks. A pacemaker check preoperatively is only required if the pacemaker appears to be malfunctioning or has not been checked within the preceding 12 months.

The surgeon should be made aware of patients with pacemakers as this will influence diathermy choice.

Physiotherapy

Patients are normally seen pre-operatively to confirm social history e.g. normal level of mobility, use of any walking aids, if they have a house with stairs, and any history of falls. The chest is assessed and the physiotherapist may make suggestions to help optimise the patient for surgery.

The normal post-operative physiotherapy interventions are explained to patients and circulation and maintenance exercises of unaffected limbs are taught.

On day 1, post-op patients are then seen with the aim to sit out of bed and mobilise if medically fit to do so. Please ensure that the weight bearing status is documented in the notes so that the physiotherapy team know how they can proceed.

Notes

Details of the type of pacemaker and the results of the most recent check are required.

For an ICD, the cardiac technicians need to be available while the patient is in theatre.

On day 2 post-op patients are mobilised with the appropriate walking aids.

Each following day, mobility is progressed until the patient is independent with a walking aid or referred to rehabilitation or intermediate care for further mobility practice.

A stair assessment may also be required before discharge home.

Please ensure patients have adequate analgesia so that they can effectively progress with the physiotherapy team.

Platelets

Platelets can clump which can give a misleadingly low result. It's worth repeating the sample and asking the laboratory to do a blood film if this is a possibility.

Always:

- Consider: is there a potential drug cause?
- Check: INR, APTTr, fibrinogen and U&E

However:

- Platelets >120
    - No action required. Surgery should proceed.
- Platelets 80-120
    - Surgery should not be delayed but platelet count should be followed up post-operatively as this may need investigating.
- Platelets 50-80
    - This will usually preclude spinal anaesthesia so the anaesthetist must be made aware.
    - The surgeon also needs to be made aware as platelet cover may be necessary.
    - Platelets may be required: please discuss this with the haematologist.
- Platelets <50
    - Discuss with haematologist with regard to platelet transfusion.

Potassium

- Potassium should be >3.5mmol/dl or the case may be cancelled.
- If potassium is <3.5mmol/dl replace with KCl in intravenous fluids and/or prescribe Sando-K two tablets TDS. orally.
- Check potassium daily until it comes back to normal.
- Consider why potassium is low and treat the cause.

Notes

Rehabilitation

A comprehensive assessment is crucial in order to plan rehabilitation. Thus, at presentation we need to define the:

- Orthopaedic injury and proposed treatment plan
- Medical problems (causative or co-existent)
- Psychiatric problems (both functional and organic)
- Home circumstances e.g.:
  - Type of house or care facility
  - Level of care required (if any)
  - Use of aids
- The patient's view of how they see the future

The clerking proforma will guide you through the type of information that needs to be sought.

A multi-disciplinary approach should be utilised to determine both the rehabilitation goals and the most appropriate setting for rehabilitation.

Renal impairment

A creatinine >200 may be a very significant elevation in a small elderly person. It may not prevent the patient going to theatre, but more information is necessary.

Think about the following:

- Review the old results – is the impairment acute, chronic or acute on chronic
- Is the patient in urinary retention?
- If yes: catheterise and think about what may have caused the urinary retention (UTI, constipation, drugs etc.) and treat as appropriate
- Is the patient clinically dehydrated? If yes, rehydrate orally and/or intravenously.
- Did the patient have a long lie and is rhabdomyolysis a possibility?
  - Check serum CK and urinary myoglobin. Ensure good hydration.
- Is the patient taking any nephrotoxic medication and can these be stopped?
  - If unsure, liaise with the ward pharmacist or ortho-geriatrician

Notes

A fluid balance chart should be commenced. Liaise with the ortho-geriatrician or medical registrar on-call if renal dysfunction is new.

Notes

Sodium

Patients with low sodium may have impaired control of sodium and water balance in their brain. This may lead to cerebral events (including fits, cerebral oedema and brain damage).

Slow onset or chronic hyponatraemia may be compensated and safe. Rapid correction can be unsafe.

If the patient has low sodium:

- Review old blood results (if available) and ascertain if hyponatraemia is acute or chronic.
- Consider the cause:
    - Stop inappropriate diuretics
    - Discuss with the pharmacist – are there any other culprit medications
- Check urine and serum osmolality, urine sodium, TFTs, LFTs and random cortisol
    - If patients are on diuretics, urinary sodium and osmolality are not helpful. If low sodium persists after stopping diuretics, then these investigations should be sent.
- Do not try and give large amounts of sodium
- Avoid IV dextrose
- Discuss with an ortho-geriatrician any patient who has sodium lower than 125-130mmol/l or anyone you are concerned about.

Some rules of thumb:

a) Na^+ 130 - 135mmol/L – don't worry, just monitor
b) Na^+ <130mmol/L investigate including a review of drugs
c) Na^+ >125mmol/l should not delay surgery

Urinary incontinence

Urinary incontinence is a huge problem and has a massive impact on quality of life.

Take a thorough history, review the medication chart and conduct an examination. Remember to dip the urine.

"Flag-up" patients with this serious problem to the ortho-geriatrician: continence assessment and management forms a vital part of the MDT's approach to rehabilitation!

Warfarin

- For a spinal anaesthetic to take place, the INR must be <1.5.
- If INR >1.5 check with orthopaedic surgeon whether they wish to proceed with surgery.

Warfarin should be reversed to prevent delay to surgery.

The indications for Warfarin treatment must be identified and patients stratified according to the risk of thrombo-embolic complications.

Stratifying risk:

Low Risk of Thromboembolism

- Uncomplicated AF
- Venous thromboembolism (VTE) >3/12 previously without high risk features

High Risk of Thromboembolism

- Within 3 months of VTE
- Thrombophilia
- Recurrent VTE +/- thrombophilia
- Previous arterial thromboembolism, especially within the preceding 3 months
- Caged ball heart valve replacement – any site
- Mitral valve replacement or >1 mechanical heart valve replacement
- Mechanical heart valve replacement or AF with co-existing cardiac conditions

Reversal of Warfarin

The following are guidelines (if in doubt call the on-call haematologist):

- INR < 3 Vitamin K IV 1mg
- INR 3-8 Vitamin K IV 2mg
- INR >8 Vitamin K IV 5mg

Check INR after 6 hours and repeat treatment as necessary.

- Use smaller doses of IV vitamin K to reduce likelihood of resistance when re-introducing anticoagulants post-operatively.

Notes

Please also consider the following:

For low thrombotic risk:

- Give low molecular weight heparin (LMWH) prophylaxis dose
- Restart normal maintenance dose of Warfarin once haemostasis satisfactory
- Continue LMWH prophylaxis dose until INR therapeutic

For high thrombotic risk (especially those with a mechanical heart valve)

- Consult haematologist regarding the choice of either unfractionated or low molecular weight heparin. Again, monitor platelets and watch for more than a one-third fall. If this occurs, discuss with the haematology team.

Rapid Reversal of Warfarin

For rapid reversal of Warfarin in emergency situations, consider using Beriplex in addition to 10mg of Vitamin K.

This works within 30 minutes of administration and the effects last 6-8 hours by which time vitamin K should have taken effect. This will need to be discussed with the on-call haematologist.

As a rough guide, administration is usually as follows:

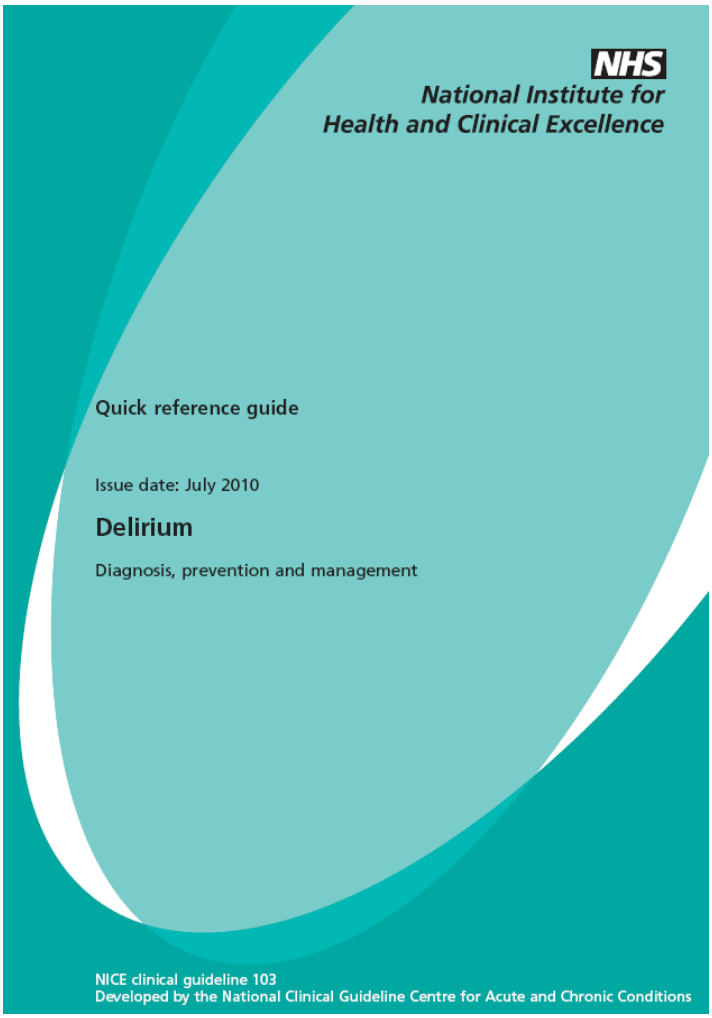
- INR 2-3.9 give 25 units/kg
- INR 4-6 give 35 units/kg
- INR >6 give 50 units/kg

A more detailed table is available that allows finer dose estimations: please discuss with haematology.

The maximum dose should not exceed 5000 units.

If you have any suggestions for additional topics or corrections, please e-mail Dr Raj Parikh Consultant Geriatrician at: Raj.Parikh@pat.nhs.uk

Notes



Think delirium

Be aware that people in hospital or long-term care may be at risk of delirium. Delirium can have serious consequences (such as increased risk of dementia and/or death) and may increase the length of stay of people already in hospital and their risk of new admission to long-term care.

Available at:

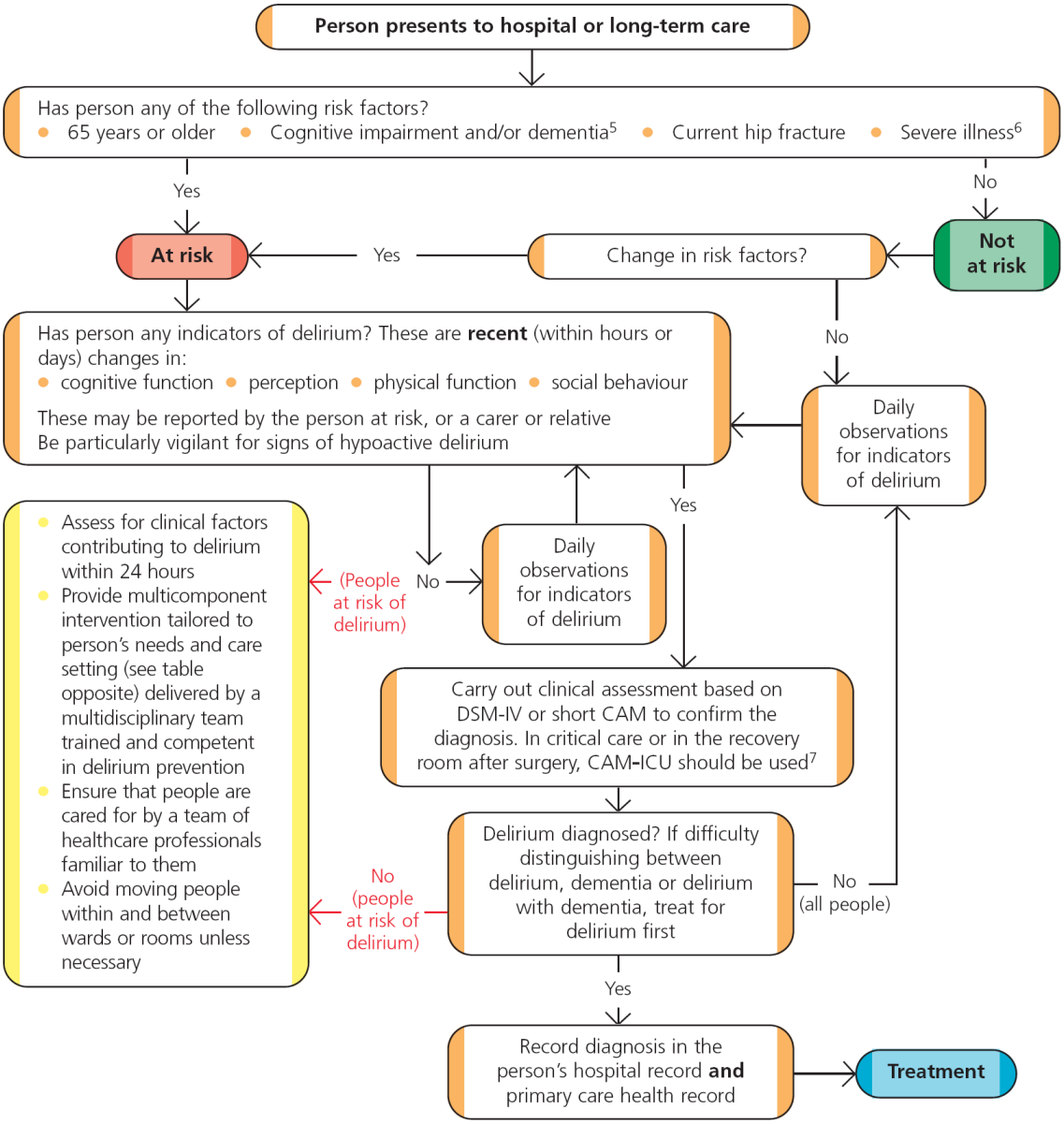
http://guidance.nice.org.uk/CG103/QuickRefGuide/pdf/English

Interventions to prevent delirium

Clinical factor	Preventive intervention
Cognitive impairment or disorientation	• Provide appropriate lighting and clear signage. A clock (consider providing a 24-hour clock in critical care) and a calendar should also be easily visible to the person at risk. • Reorientate the person by explaining where they are, who they are, and what your role is. • Introduce cognitively stimulating activities (for example, reminiscence). • Facilitate regular visits from family and friends.
Dehydration or constipation	• Encourage the person to drink. Consider offering subcutaneous or intravenous fluids if necessary. • Seek advice if necessary when managing fluid balance in people with comorbidities (for example, heart failure or chronic kidney disease).
Hypoxia	• Assess for hypoxia and optimise oxygen saturation if necessary.
Immobility or limited mobility	• Encourage the person to: – mobilise soon after surgery – walk (provide walking aids if needed – these should be accessible at all times). • Encourage all people, including those unable to walk, to carry out active range-of-motion exercises.
Infection	• Look for and treat infection. • Avoid unnecessary catheterisation. • Implement infection control procedures in line with 'Infection control' (NICE clinical guideline 2).
Multiple medications	• Carry out a medication review for people taking multiple drugs, taking into account both the type and number of medications.
Pain	• Assess for pain. Look for non-verbal signs of pain, particularly in people with communication difficulties. • Start and review appropriate pain management in any person in whom pain is identified or suspected.
Poor nutrition	• Follow the advice given on nutrition in 'Nutrition support in adults' (NICE clinical guideline 32). • If the person has dentures, ensure they fit properly.
Sensory impairment	• Resolve any reversible cause of the impairment (such as impacted ear wax). • Ensure working hearing and visual aids are available to and used by people who need them.
Sleep disturbance	• Avoid nursing or medical procedures during sleeping hours, if possible. • Schedule medication rounds to avoid disturbing sleep. • Reduce noise to a minimum during sleep periods[4].

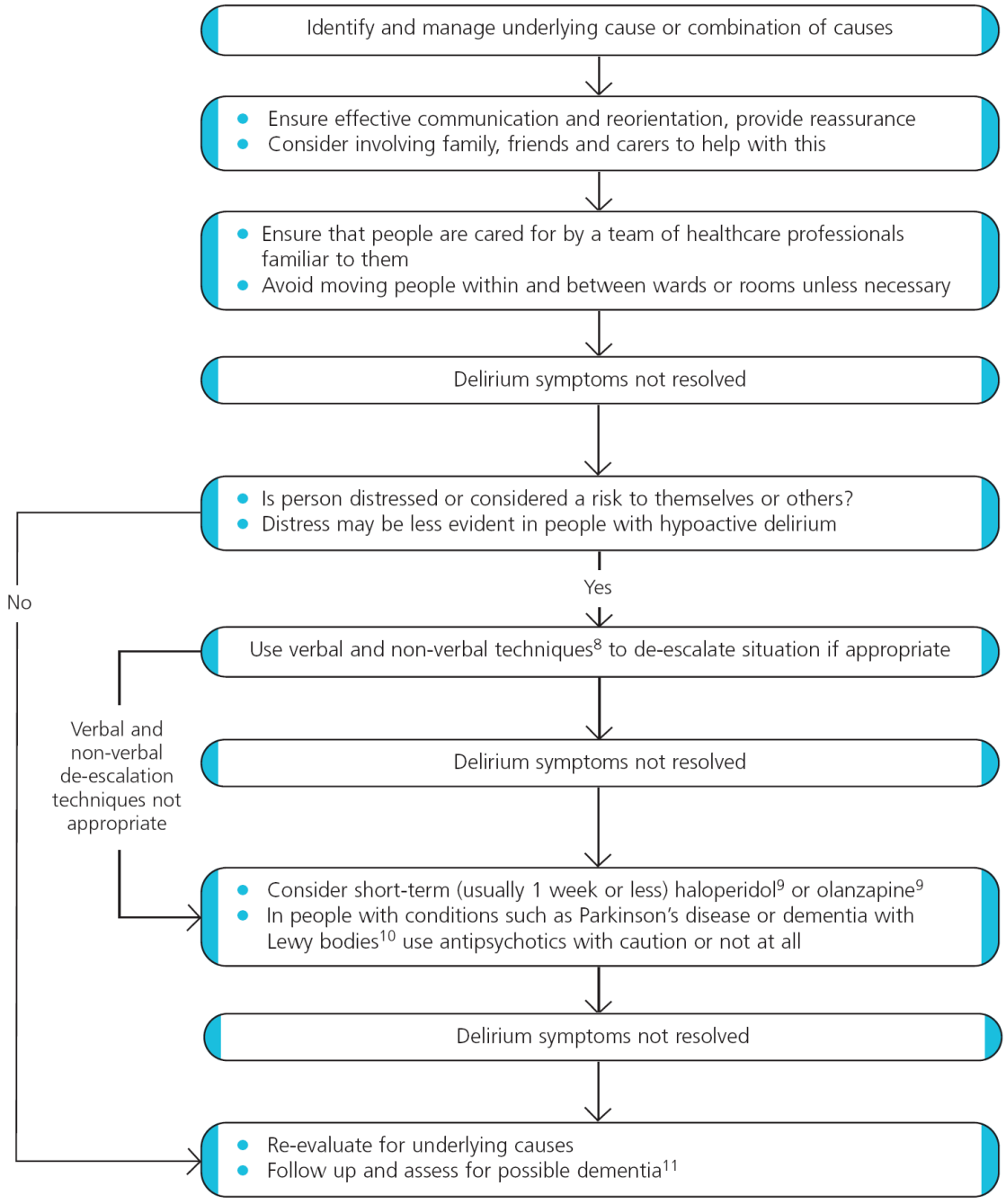
[4] See 'Parkinson's disease' (NICE clinical guideline 35) for information about sleep hygiene.

Preventing and diagnosing delirium



[5] If cognitive impairment is suspected, confirm using a standardised and validated cognitive impairment measure. If dementia is suspected, refer to 'Dementia: supporting people with dementia and their carers in health and social care' (NICE clinical guideline 42).
[6] For further information on recognising and responding to acute illness in adults in hospital see 'Acutely ill patients in hospital' (NICE clinical guideline 50).
[7] A healthcare professional trained and competent in the diagnosis of delirium should carry out this assessment.

Treating delirium



[8] See 'Violence' (NICE clinical guideline 25).
[9] Haloperidol and olanzapine do not have UK marketing authorisation for this indication.
[10] For more information on the use of antipsychotics for these conditions, see 'Parkinson's disease' (NICE clinical guideline 35) and 'Dementia' (NICE clinical guideline 42).
[11] For more information on dementia see 'Dementia' (NICE clinical guideline 42).

Consent Process

Patients need to have a capacity assessment to ensure they can consent for surgery.

Please consider, can they:

- understand the information given to them that is relevant to the decision
- retain that information long enough to be able to make the decision
- use or weigh up the information as part of the decision-making process
- communicate their decision – this could be by talking or using sign language and includes simple muscle movements such as blinking an eye or squeezing a hand

For more information please see the capacity toolkit on GMC website. Link:

http://www.gmc-uk.org/Mental_Capacity_flowchart/