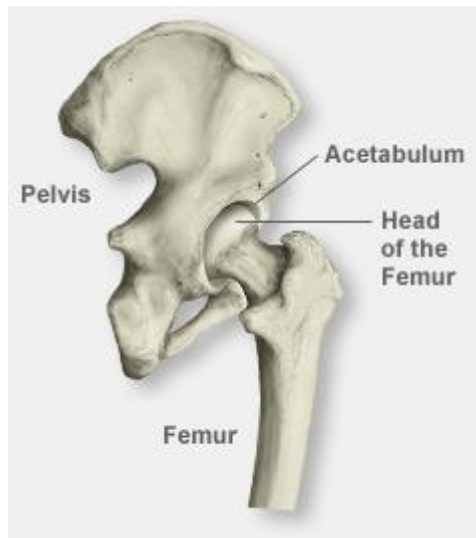


Guidelines to compliment the Integrated Care Pathway for Hip Fracture



Irish
Gerontological
Society

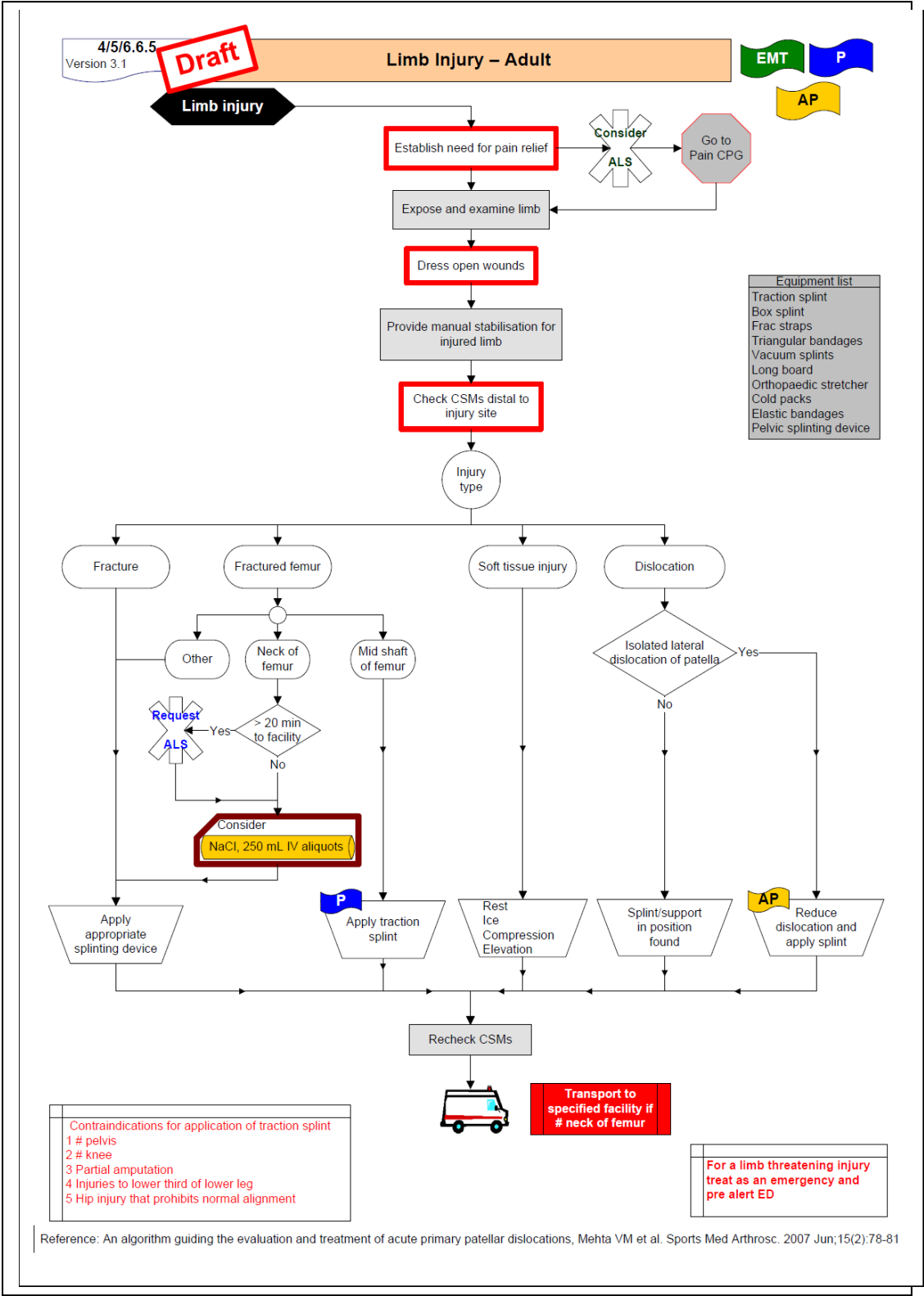


THE IRISH
INSTITUTE OF
TRAUMA AND
ORTHOAEDIC
SURGERY

Contents

- Pre-hospital care
- ED Management
- Blue Book Standards for hip fracture care
- Analgesia/ Pain
- Supplementary oxygen/ hypoxaemia
- Anaesthesia/ Fasting
- Consent/ Mental capacity
- Delirium
- Falls & fractures
- Role of Occupational therapist

Pre-hospital care



HIPS- Acronym for pre-hospital management

H - Hydrate the patient if required, dehydration increase confusion and complicates patient assessment. There is some evidence that poorly addressed dehydration in the initial period of injury and prior to surgery may contribute to increased mortality in the early days

I - Immobilisation of the fracture using simple means such as padding and triangular bandages and where necessary in association with Vacuum mattresses is all that is required. In addition prevention of chilling is also a key initiative.

P - Pain management that is sub-optimal increases mortality and morbidity. In a number of studies effective pre-hospital pain management has been shown to be in the order of 50%. We need to put more emphasis on the role of analgesia for these patients. NSAID medications are relatively contra-indicated.

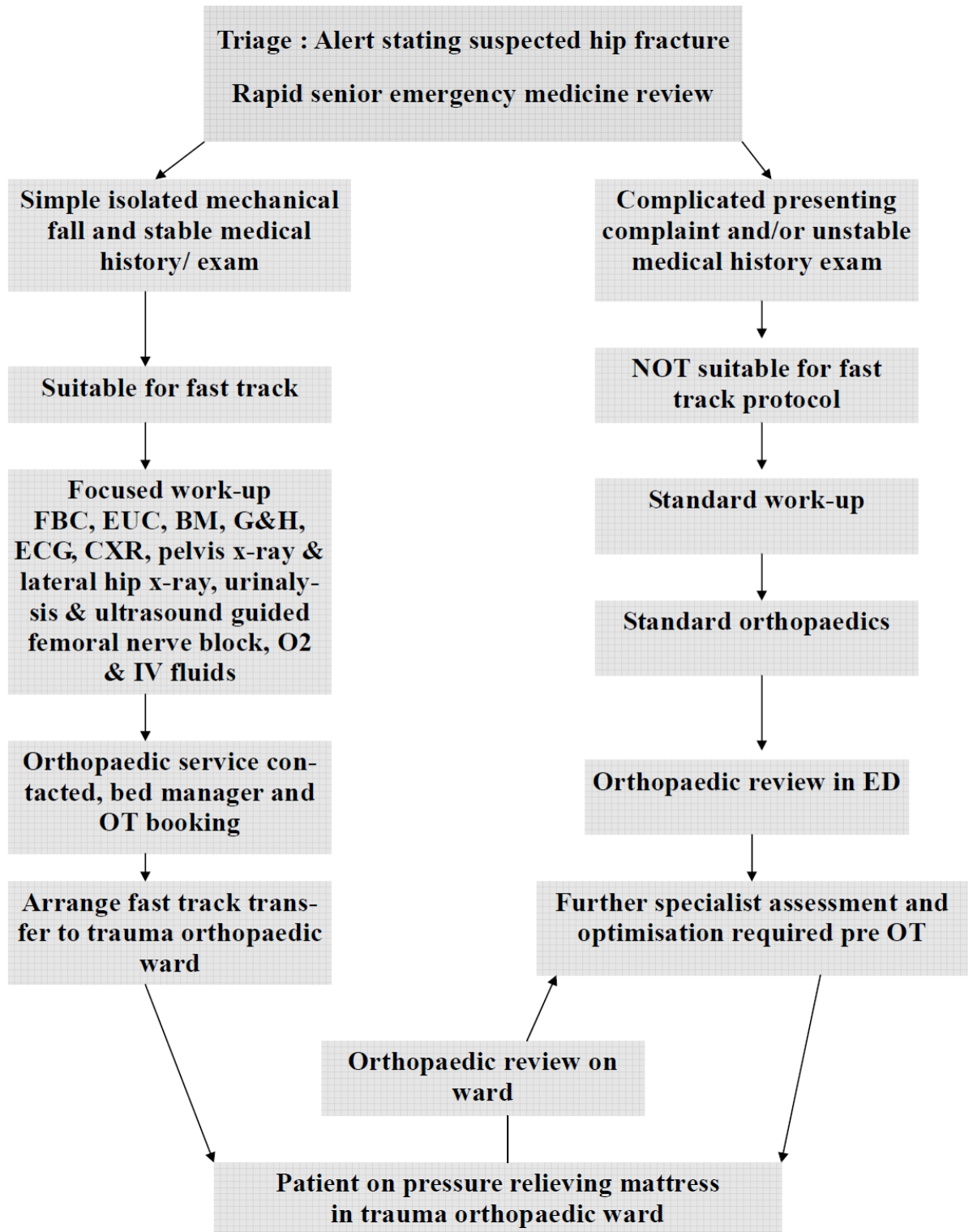
S - Specific facilities that can offer prompt intervention to repair the fractures offer these patients the best level of care. Transporting patients to an ED that cannot offer surgical management necessitates a secondary transfer and delays care. This is not to the benefit of the patient and places a demand on the Ambulance Service to provide secondary transport, possibly delaying definitive care further.



National Ambulance Service 2014

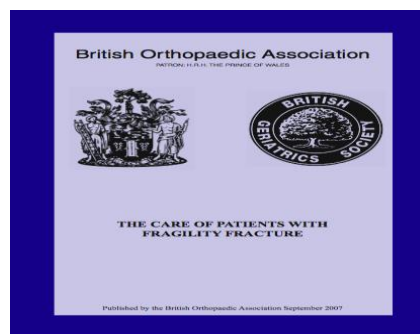
Emergency Department Management

Suspected proximal femur (hip) fracture pathway for emergency departments



British Orthopaedic Association/ British Geriatric Association Blue Book Standards

- 1) All patients with hip fractures should be admitted to an acute orthopaedic ward within 4 hours of presentation.
- 2) All patients who are medically fit should have surgery within 48 hours of admission, and within normal working hours.
- 3) All patients with hip fractures should be assessed and cared for with a view to minimising their risk of developing a pressure ulcer.
- 4) All patients presenting with a fragility fracture should be managed on an orthopaedic ward with routine access to acute orthogeriatric medical support from time of admission.
- 5) All patients presenting with fragility fractures should be assessed to determine their need for antiresorptive therapy to prevent future osteoporotic fractures.
- 6) All patients presenting with a fragility fracture following a fall should be offered multidisciplinary assessment and intervention to prevent future falls.



www.boa.ac.uk/

Pre-operative management

1) Analgesia/ Pain

Older patients with hip fractures are at high risk of undermanaged acute pain after surgery which can result in impeded mobility; functional impairment and prolonged hospital stay (Morrison et al, 2003 & American Geriatrics Society, 2009)

Types of pain:

Nociceptive pain has two subtypes:

- 1) Somatic pain involves skin and musculoskeletal structures and tends to be well localised. Typically characterised as aching, sharp or throbbing pain which is intensified by movement. E.g. Osteoarthritis, fractures.
- 2) Visceral pain involves injury to or inflammation of organs and GI tract. Typically characterised by deep, dull aches or cramping. It tends to be poorly localised and frequently radiates to surrounding structures. E.g. Constipation.

Neuropathic pain: is associated with injury of disease of the peripheral or central nervous system.

- Consider femoral nerve block pre-operatively
- Prescribe paracetamol 1g PO/ IV QDS regular for baseline pain relief.
- Incrementally increase analgesia as required.
- Do not routinely prescribe compound preparations containing codeine.
- AVOID ALL NSAIDS AND COX2 INHIBITORS
- If you are prescribing opioid analgesia consider charting regular laxatives also
- Monitor the need for analgesia daily.
- Use pain assessment scales
- Record a pain score.

Always prescribe using the generic name of the drug and review the need for medication daily.

Maher AB, Meehan AJ, Hertz k, et al. Acute nursing care of the older adult with fragility hip fracture: an international perspective (part 1). International Journal of Orthopaedic & Trauma Nursing. 2012; 16 (4): 177-194

Maher AB, Meehan AJ, Hertz k, et al. Acute nursing care of the older adult with fragility hip fracture: an international perspective (part 2). International Journal of Orthopaedic & Trauma Nursing. 2013; 17 (1): 4-18

Examples of pain assessment scales:

- Pain Map
- Numeric rating scale (graphic and verbal)
- The pain thermometer
- Abbey pain scale (for patients with dementia)
- PAINAD (pain assessment in advanced dementia)

Appendix 3. Pain map

'Where is your pain?' Please mark where you feel pain on the drawings below.'

The assessment of pain in older people | 9

Appendix 4. Examples of pain scales

4A. Numeric rating scale

The Numeric Graphic Rating Scale (NGRS)

Reproduced with permission from Professor Lynne Turner Stokes, Geriatric Substance Abuse Editor, Royal College of Physicians, London.

4B. Verbal descriptor rating scale (5 points)

'How severe is your pain today?'

None
 Mild
 Moderate
 Severe
 Very severe

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4C. Verbal numerical rating scale

'On a scale of 0 to 10, please tell me how severe your pain is today.'

4D Pain Thermometer

Reproduced with permission from Professor Ross Hirst, University of Leeds.

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The Abbey Pain Scale

For measurement of pain in people with dementia who cannot verbalize

How to use scale: While observing the resident, score questions 1 to 6.

Name of resident: _____
 Name and designation of person completing the scale: _____
 Date: _____ Time: _____ at _____ hrs.

Latent pain relief given was _____

Q1. Vocalization
 eg whimpering, groaning, crying
 Absent 0 Mild 1 Moderate 2 Severe 3

Q2. Facial expression
 eg looking tense, frowning, grimacing, looking frightened
 Absent 0 Mild 1 Moderate 2 Severe 3

Q3. Change in body language
 eg fidgeting, rocking, squaring part of body withdrawn
 Absent 0 Mild 1 Moderate 2 Severe 3

Q4. Behavioural change
 eg increased confusion, refusing to eat, alteration in usual patterns
 Absent 0 Mild 1 Moderate 2 Severe 3

Q5. Physiological change
 eg abnormal pulse, pulse or blood pressure outside normal limits, perspiring, flushing of skin
 Absent 0 Mild 1 Moderate 2 Severe 3

Q6. Physical changes
 eg skin tears, pressure areas, ulcers, contractures, previous injuries
 Absent 0 Mild 1 Moderate 2 Severe 3

Add scores for Q1 to Q6 and record here: _____ Total pain score _____

Now tick the box that matches the total pain score

0-2 No pain 3-7 Mild 8-11 Moderate 12-14 Severe

Finally tick the box which matches the type of pain

Chronic Acute Acute on chronic

Abbey L, De Witt A, Hirst R, Robinson A, Sims L, Parker D, Lacey M. The Abbey Pain Scale. Formed by the JAG & AGS Medical Research Foundation 1988 (pdf).
 (This document may be reproduced with this reference reference.)

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Pain Assessment in Advanced Dementia Scale (PAINAD)

Instructions: Observe the patient for five minutes before scoring his or her behaviors. Score the behaviors according to the following chart. Behaviors of each item are recorded on the following page. The patient can be observed under different conditions (e.g., at rest, during a stressful activity, during caregiving), after the administration of pain medications.

Behavior	0	1	2	Score
Respiration	Normal	Occasional labored breathing	Many labored breathings	
Independent of vocalization	Independent of vocalization	Short period of hyper-respiration	Long period of hyper-respiration	
Negative vocalization	None	Occasional moan or groan	Regularly moaned	
Facial expression	Smiling or happy expression	Low level squint with a negative or discomforting quality	Low level frowning or squint	
Body language	Flaccid	Tense	Rigid	
Comprehensibility	No need for correction	Intermittent pointing or fidgeting	Pointing or fidgeting away	
		Contracted or restrained by voice or touch	Contracted, or resistance	
				TOTAL SCORE

(Woolson et al., 2005)

Scoring:
 The total score ranges from 0-10 points. A possible interpretation of this scores is: 1-3=mild pain, 4-6=moderate pain, 7-10=severe pain. These ratings are based on a standard 0-10 scale of pain, but have not been substantiated in the literature for this tool.

Source:
 Warden V, Hurley AC, Walker L. Development and psychometric evaluation of the Pain Assessment in Advanced Dementia (PAINAD) scale. J Am Med Assoc. 2005;293:1319-14.

Concise guidance to good practice. A series of evidence based guidelines for clinical practice. Number 8. The assessment of pain in older adults. (2007) Royal College of Physicians, British Geriatric Society & The British Pain Society

Supplementary oxygen

Hypoxemia. Arterial hypoxemia in elderly bedridden patients after hip fracture is a common phenomenon. It has been associated with the development of the acute confusional state. This has been corroborated in the literature.

Decreased postoperative oxygen saturation (< 90%) has been associated to be a significant risk factor for postoperative confusion and death within 4 months post hip fracture surgery.

Prior to anaesthesia induction a decreased preoperative SpO₂ was identified as a risk factor for in-hospital complications. It has been illustrated that over 50% of patients can have a significant decrease in SpO₂ in the time period between the arrival time in the operating room and the orthopaedic ward.

As many as 20% of patients monitored in the operating room almost 20% of the patients, who were monitored at arrival in the operating room, had an SpO₂ level less than 90%.

Traumatized elderly patients are at an increased risk for the development of clinically significant hypoxemia soon after being bedridden because of an increased mismatching of ventilation to perfusion in the lungs, and that this situation in most cases can be prevented by oxygen treatment. It is therefore advocated that early, and continuously administered supplemental oxygen in these patients for at least 6 hours after anaesthesia, at night for 48 hours post-op to maintain O₂ sats > 90% (> 88% if COPD) and for as long as is required. O₂ saturations should be monitored routinely and continued for as long as the tendency to hypoxaemia exists.

Patients who are on inhalers should be prescribed nebulisers in the perioperative period.

- Björkelund K, Hommel A, Thorngren K, Lundberg D, Larson S. The Influence of Perioperative Care and Treatment on the 4-Month Outcome in Elderly Patients with Hip Fracture AANA Journal February 2011 Vol. 79, No. 1 51-61 Haljamae H, Stefaansson T, Wickström I. Preanesthetic evaluation of the female geriatric patient with hip fracture. Acta Anaesthesiol Scand. 1982;26(4):393-402.*
- Krasheninnikoff M, Ellitsgaard N, Rude C, Moller JT. Hypoxaemia after osteosynthesis of hip fractures. Int Orthop. 1993;17(1):27-29.*
- Marcantonio ER, Goldman L, Orav EJ, Cook EF, Lee TH. The association of intraoperative factors with the development of postoperative delirium. Am J Med. 1998;105(5):380-384.*
- Berggren D, Gustafson Y, Eriksson B, et al. Postoperative confusion after anesthesia in elderly patients with femoral neck fractures. Anesth Analg. 1987;66(6):497-504.*
- Clayer M, Bruckner J. Occult hypoxia after femoral neck fracture and elective hip surgery. Clin Orthop Relat Res. 2000;(370):265-271.*
- Hole A, Terjesen T, Breivik H. Epidural versus general anaesthesia for total hip arthroplasty in elderly patients. Acta Anaesthesiol Scand. 1980;24(4):279-287.*
- Lynne-Davies P. Influence of age on the respiratory system. Geriatrics. 1977;32(8):57-60.*

Anaesthesia and Fasting

Patients requiring anaesthesia after unplanned admission are at higher risk of medical errors and peri-operative complications

1. There should be protocol-driven, fast-track admission of patients with hip fractures through the emergency department.
2. Patients with hip fractures require multidisciplinary care, led by orthogeriatricians.
3. Surgery is the best analgesic for hip fractures.
4. Surgical repair of hip fractures should occur within 48 hours of hospital admission.
5. Surgery and anaesthesia must be undertaken by appropriately experienced surgeons and anaesthetists.
6. There must be high-quality communication between clinicians and allied health professionals.
7. Early mobilisation is a key part of the management of patients with hip fractures.
8. Pre-operative management should include consideration of planning for discharge from hospital.
9. Measures should be taken to prevent secondary falls.
10. Continuous audit and targeted research is required in order to inform and improve the management of patients with hip fracture.

.....
The Department of Health has suggested the following targets for patients with hip fracture [9]:

- (i) all patients should be admitted within 4 hours of arrival in the emergency department; and
- (ii) (ii) patients should be operated on by an experienced clinical team within 24 hours of a decision that the patient is fit for surgery.

In addition, the British Orthopaedic Association Standards for Trauma (BOAST) guidelines [10] stipulate that within 4 hours of hospital arrival, hip fracture patients should be admitted to an appropriate clinical ward area with nursing, orthogeriatric medicine and surgical expertise appropriate for this often frail patient group; further, that surgical fixation should not be delayed more than 48 hours from admission unless there are clear reversible medical conditions.

Protected trauma lists, separate from general emergency operating lists, improve the efficiency of trauma service provision. These should be provided daily, including weekends and bank holidays, and be staffed by appropriately experienced senior medical and theatre staff. Unless life or

limb-threatening trauma intervenes, the Working Party suggests that hip fracture surgery is prioritised within operating lists, overriding the particular subspecialist interest of the senior surgeon assigned to the list.

Multidisciplinary trauma meetings

Daily multidisciplinary trauma meetings, convened before the start of operating lists, offer excellent opportunities to communicate issues relating to recent admissions and to plan operative lists and equipment required for the day/next day, as well as providing regular teaching and feedback.

Approximately 70% of patients will be of ASA physical status 3–4 [6, 7]: 35% have one co-morbidity; 17% have two; and 7% have three or more [16]. The most common co-morbidities are cardiovascular disease (35%), respiratory disease (14%), cerebrovascular disease (13%), diabetes (9%), malignancy (8%) and treated renal disease (3%).

Benefits of early, intensive orthogeriatric input into management of patients with hip fracture.

- Early identification of patients at increased risk of peri-operative morbidity and mortality.
- Appropriate additional investigation, indicated by patients' co-morbidities.
- 'Pre-optimisation' of less fit patients before surgery.
- Early rehabilitation and discharge planning.
- Improved interdisciplinary communication between orthogeriatricians, surgeons and anaesthetists, reducing avoidable admission-to-operation delays.

Routine pre-operative investigations

Full blood count and urea and electrolyte analyses are required routinely before surgery. Coagulation studies and chest radiography are required only if clinically indicated.

It has been suggested that older patients require a higher blood transfusion trigger than is generally used for patients to the extent that pre-operative transfusion should be considered if Hb is < 9 g.dl⁻¹, or Hb is < 10 g.dl⁻¹ with a history of ischaemic heart disease. If Hb is 10–12 g.dl⁻¹, two units of blood should be crossmatched. If Hb is within normal limits, a grouped sample is sufficient. Revision surgery or periprosthetic fractures incur greater blood loss and require preoperative crossmatching.

Urea and electrolytes. Hypokalaemia is associated with new onset, rapid ventricular rate atrial fibrillation (AF) peri-operatively.

Electrocardiogram (ECG). This is required in all elderly patients with hip fracture.

Chest radiograph. Routine chest radiographs on admission are not necessary, but may be useful in patients with newly diagnosed heart failure.

Atrial fibrillation. All patients in AF should have a ventricular rate < 100/min). Factors that may lead to new or fast AF include hypokalaemia and hypomagnesaemia, hypovolaemia, sepsis, pain and hypoxaemia. If treatment of these is ineffective, acute ventricular rate control may be achieved using beta-blockers (metoprolol) or verapamil [22].

Anticoagulation.

A third of patients presenting with hip fracture take aspirin regularly. There is a risk of significant bleeding if aspirin is taken in combination with other thromboprophylactic medication. Aspirin may be withheld during inpatient stay, unless indicated for unstable angina or recent/frequent transient ischaemic attacks.

About 4% of patients take clopidogrel, which inhibits platelet function, and this should alert the anaesthetist to myocardial ischaemia or cardiac stents. Clopidogrel is generally not stopped on admission, especially in patients with drug-eluting coronary stents. Surgery should not be delayed, nor platelets administered prophylactically, but marginally greater blood loss should be expected. Novel antiplatelet therapies include prasugrel, eptifibatid, abciximab and tirofiban.

Warfarin is taken by approximately 5% of patients presenting with hip fracture. Hospital guidelines concerning the peri-operative management of patients taking warfarin should be followed; in general, the International Normalised Ratio (INR) should be < 2 for surgery and < 1.5 for neuraxial anaesthesia. Small amounts of vitamin K may be used to 'reverse' the effects of warfarin; supplemental peri-operative anticoagulation with heparins is usually indicated. Warfarin should be recommenced 24 h after surgery, although some departments recommence it later on the day of surgery.

AAGBI safety guideline: Pre-operative assessment and patient preparation. The role of the anaesthetist. The Association of Anaesthetists of Great Britain and Ireland. January 2010. www.aagbi.org

Gawande AA, Studdert DM, Orav EJ, Brennan TA, Zinner MJ. Risk factors for retained instruments and sponges after surgery. *New England Journal of Medicine* 2003; 348: 229-53.

Fasting guidelines for adults and children (RCN pre-operative fasting guidelines, 2005)

Adults

Pre-operative fasting in adults undergoing elective surgery –
'the 2-6 rule':

- '2' – Intake of water up to 2 hours before induction of anaesthesia.
- '6' – A minimum pre-operative fasting time of 6 hours for food (solids, milk and milk-containing drinks).
- The anaesthetic team should consider further interventions for patients at higher risk of regurgitation and aspiration.

Post-operative resumption of oral intake in healthy adults:

Patients should be encouraged to drink when ready, providing there are no contraindications.

Ensure all patients fasting for theatre have an IV cannula inserted and fluids charted.

Intake and output should be recorded on all patients pre-operatively and for at least 48 hours post-operatively.

Continue IV fluids on patients until they have resumed appropriate fluid intake.

Royal College of Nursing. *Perioperative fasting in adults and children. An RCN guideline for the multidisciplinary team.* London: RCN, 2005.

ASA physical status

ASA grade 1 A normal healthy patient: i.e. without any clinically important comorbidity and without a clinically significant past/present medical history.

ASA grade 2: A patient with mild systemic disease.

ASA grade 3: A patient with severe systemic disease.

ASA grade 4: A patient with severe systemic disease that is a constant threat to life.

ASA grade 5: A moribund patient who is not expected to survive without the operation.

ASA grade 6: A declared brain-dead patient whose organs are being removed for donor purposes.

Consent and mental capacity

Approximately 25% of patients with hip fracture have moderate or severe cognitive impairment, and a further 15–25% have mild cognitive impairment. In order for patients to consent to, or refuse, surgical repair of hip fracture, they must be able to do so voluntarily, based on a decision made on information about the procedure presented to them. The patient must have capacity to make a decision; that is, he / she must be able to understand the information, remember it and use it to reach a decision. In this age group, the ability to assimilate information and communicate decisions may be impaired by poor vision, hearing or speech, and steps should be taken to overcome these problems.

If the patient lacks capacity, then treatment may be provided according to the Mental Capacity Act 2005 [26] (MCA) (in Scotland, the Adults with Incapacity (Scotland) Act 2000). Essentially, it remains the (see table below) Reasons for delaying surgery for hip fracture that the Working Party considers acceptable and unacceptable.

Doctors' decision to administer treatment that is deemed to be both necessary and in the patient's best interests; doctors should be prepared to justify their decisions to treat/deny/withdraw treatment to the courts if necessary. Decisions must not be biased by reference to the patient's age. Doctors must consult relatives about treatment decisions, and should seek to ascertain whether the patient had previously written an advanced directive, or appointed a Lasting Power of Attorney. The Courts may be consulted if there is uncertainty about a patient's management or if there is dispute between clinical staff and relatives.

Rationing

Reasons for delaying surgery for hip fracture that the Working Party considers acceptable and unacceptable.

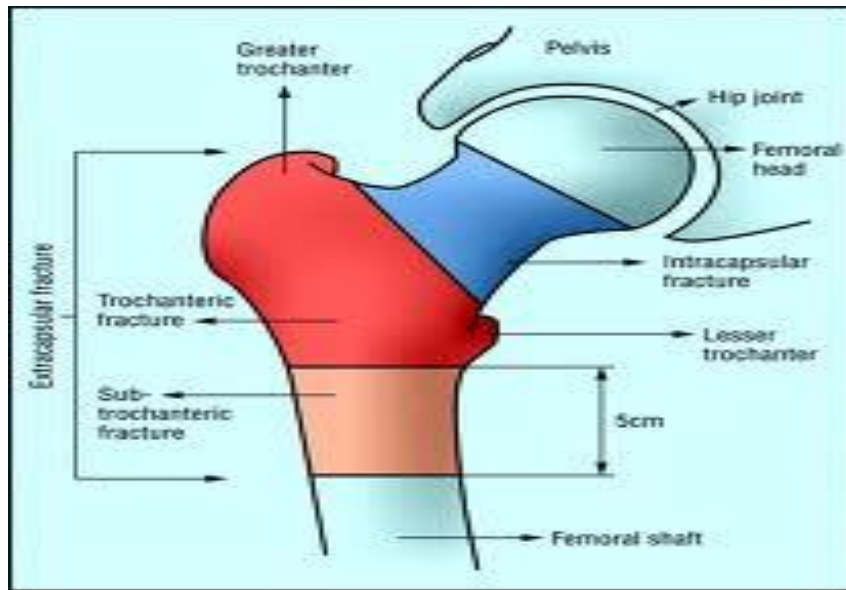
Acceptable

- Haemoglobin concentration < 8 g.dl)1.
- Plasma sodium concentration < 120 or > 150 mmol.l)1 and potassium concentration < 2.8 or > 6.0 mmol.l)1
- Uncontrolled diabetes.
- Uncontrolled or acute onset left ventricular failure.
- Correctable cardiac arrhythmia with a ventricular rate > 120 .min)1.
- Chest infection with sepsis.
- Reversible coagulopathy.

Unacceptable

- Lack of facilities or theatre space.
- Awaiting echocardiography.
- Unavailable surgical expertise.
- Minor electrolyte abnormalities.

Orthopaedic Management



Surgical considerations

A number of hip fracture classification systems exist. Generally, 50% of fractures are intracapsular, the remainder extracapsular.

Intracapsular fractures include subcapital, transcervical and basicervical fractures, and may be displaced or undisplaced. Blood loss from an intracapsular fracture at the time of injury is minimal because of the poor vascular supply at the fracture site and tamponade effected by the capsule.

Occasionally, undisplaced fractures may be treated conservatively, but there is a 30–50% risk of subsequent displacement. Current preference is for all undisplaced intracapsular fracture to be treated by internal fixation with multiple screws or a sliding hip screw. Untreated, disruption to the capsular blood supply of the head of the femur by a displaced intracapsular fracture can lead to avascular necrosis of the bone, resulting in a painful hip of limited function. Therefore, surgical treatment involves hemiarthroplasty; even then, intracapsular fracture is associated with longer-term arthritis, and increasingly, total hip arthroplasty is preferred for younger patients. Compared to uncemented arthroplasty, cemented arthroplasty improves hip function and is associated with lower residual pain postoperatively.

Extracapsular fractures

These include inter- and subtrochanteric fractures, and can be further divided into groups related to the degree of comminution. Blood loss from cancellous bone is greater, such that the total blood loss from an

extracapsular fracture may exceed one litre; the greater the degree of comminution and the larger the bone fragments, the greater the blood loss. In addition, greater periosteal disruption causes extracapsular fractures to be considerably more painful than an intracapsular fracture. Extracapsular fractures can be treated conservatively, healing after 6–8 weeks of traction and bed rest, but such management is associated with increased morbidity and mortality, and a considerably reduced chance of the patient returning home. Invariably, extracapsular fractures are fixed surgically, using either a sliding hip screw (intertrochanteric fractures) or less commonly, a proximal femoral intramedullary nail (subtrochanteric fractures).

Thromboprophylaxis

- Older patients with a hip fracture/ fragility fracture are at risk of thromboembolism and should be prescribed Enoxaparin 40mg SC nocte unless a contraindication exists.
- Although no dose adjustment is recommended in patients with moderate (creatinine clearance 30-50 mL/min) and mild (creatinine clearance 50-80 ml/min) renal impairment, all such patients should be observed for signs and symptoms of bleeding.
- Prescribe Enoxaparin 20 mg SC nocte in those with severe renal impairment (creatinine clearance < 30 ml/min).
- Observe those frail & thin/ low body weight (women < 45 kg, men < 47kg) for signs and symptoms of bleeding.
- Ensure anti-embolism stockings are applied to both lower limbs and measured correctly prior to application.
- Encourage patients to ambulate as much as possible, encourage dorsi-planter flexion and deep breathing exercises and should be encouraged constantly.

Transfusion thresholds

- For otherwise healthy patients over 65 years of age a transfusion trigger of 8g/dl is appropriate.
- If Hb is < 8g/dl or if patient is symptomatic transfuse 2 units (each unit over three to four hours).
- Consider Frusemide 20mgs with each unit if any signs and symptoms of fluid overload and those with a history of chronic/ decompensated heart failure or LVF.
- For otherwise healthy patients with additional risk factors of cardiac and cerebrovascular pathology, a higher trigger of 9g/dl is permitted.

Delirium

Definition: An acute reversible diffuse neuronal dysfunction usually due to a toxic -metabolic derangement, characterized by inattention, disorientation, misperceptions, agitation and/or somnolence, hallucinations, acute memory disturbances and paranoid ideation.

Can be evident in as many as 62% of hip fracture patients.

“Confusion” is a symptom and not a diagnosis

Causes of Delirium

PRISME

- P: Pain, poor nutrition
- R: Retention, restraints
- I: Infection, immobility
- S: Sleep disturbances, sensory deficits
- M: Metabolic imbalances, mental status, medications
- E: Environmental

Assessment of Delirium

- Full clinical examination.
- Full bloods.
- CXR
- MSU
- MMSE
- Review medications
- Get collateral history from family/ carers.

NB: Avoid sedative medications where possible, however if patient is extremely agitated, commence an anxiolytic benzodiazepine at the lowest possible dose and for the shortest amount of time. Eg. Lorazepam 0.5mg (in the elderly half the adult dose).

Falls & Fracture Risk

Definition: A fall is often defined as “inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest on furniture, wall or other objects” (W.H.O.)

- Risk factors for falling can be loosely classified under three main headings:
 - Intrinsic
 - Extrinsic
 - Environmental

Intrinsic Factors	Extrinsic Factors	Environmental Factors
<ul style="list-style-type: none"> ▪ Muscle weakness ▪ History of falls ▪ Gait and balance deficits ▪ Visual deficit ▪ Arthritis ▪ Depression ▪ Cognitive impairment ▪ Increasing age ▪ Urinary incontinence ▪ Orthostatic or postprandial hypotension ▪ Dizziness 	<ul style="list-style-type: none"> ▪ Use of assistive devices ▪ Impaired activities of daily living ▪ Medication <ul style="list-style-type: none"> ○ Psychotropic drugs ○ Polypharmacy ○ Antiarrhythmic medications ○ Digoxin ○ Diuretics 	<ul style="list-style-type: none"> ▪ Poor lighting ▪ Insufficient space ▪ Chair and bed heights ▪ Poor hand rail facilities ▪ Inappropriate use of bed rails ▪ Inappropriate seating and cushions ▪ Lack of correct footwear ▪ Inadequate clothing poor ward layout ▪ Staffing levels

<ul style="list-style-type: none"> ▪ Hearing impairment ▪ Limited activity ▪ Fear of falling 		
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Falls assessment:

Number of falls in the past twelve months.

Explained fall or unexplained fall.

Fracture assessment:

Fracture risk factors

Previous fracture

Parent fractured hip

Current smoking

Alcohol 3 or more units/day

Rheumatoid arthritis

Glucocorticoids (yes if patient on glucocorticoids > 3 months)

Always consider secondary causes

Occupational Therapy Hip Fracture Care

**Appendix and evidence completed by: Lynch, Paula, O' Donoghue, Niamh,
O Broin, Ruairi, Swanton, Tracy (2013).**

St. Vincent's University Hospital , Elm Park , Dublin 4 .

Hip fracture refers to a fracture occurring in the area between the edge of the femoral head and 5 centimetres below the lesser trochanter. Hip fracture is a major public health issue due to an ever-increasing ageing population.

National Clinical Guideline Centre. (2011). The management of hip fracture in adults. Methods Evidence & Guidance. National Clinical Guideline Centre at The Royal College of Physicians. UK.

Every year, in Ireland, approx. 3000 people are hospitalised with a hip fracture.

**Ahern, Dr. E., (2013). Irish Hip Fracture Database: Better, Safer Care, IHFD
2013. Irish Gerontological Society.**

A randomized trial carried out by Halbert et al (2007) demonstrated the benefit of multi-disciplinary rehabilitation; showing a 16% reduction in the pooled outcome combining death or admission to a nursing home. This result supports the routine provision of organized care for patients following hip fracture, as is current practice for patients after stroke.

[Halbert J](#), [Crotty M](#), [Whitehead C](#), [Cameron I](#), [Kurrle S](#), [Graham S](#), [Handoll H](#), [Finnegan T](#), [Jones T](#), [Foley A](#), [Shanahan M](#); [Hip Fracture Rehabilitation Trial Collaborative Group](#) (2007). **Multi-disciplinary rehabilitation after hip fracture is associated with improved outcome: A systematic review. US National Library of Medicine. PMID: 17724548 [PubMed - indexed for MEDLINE.**

Clinical pathways involving intensive OT and/or PT exercises and early mobilization, early supported discharge, high-frequency OT/PT, and additional OT combined with PT were associated with improved functional recovery during acute care.

Chudyk, A., Jutai, J., Petrella, R., Speechley, M (2009). Systematic Review of Hip Fracture Rehabilitation Practices in the Elderly. Arch Phys Med Rehabil 2009;90:246-62.

Occupational therapy recognizes that service users have a wide range and diversity of goals, specific to their own situation. Part of the remit of the hospital- based occupational therapist, therefore, includes signposting and referral to community teams, in recognition that not all needs may be addressed within the hospital environment.

College of Occupational Therapists (2012). College of Occupational Therapy for Adults Undergoing Total Hip Replacement. Practice Guideline. COT.

In addition to the Care Pathway (Beaumont Hospital Occupational Therapy Department) evidence suggests that the role of Occupational Therapy in this clinical area lies in the following five areas listed below:

1. Standardised Home Hazard assessment and intervention
2. Cognitive impairment
3. Falls Evidence ** please refer to HSE Strategy to Prevent Falls and Fractures in Ireland's Ageing Population
4. Education/ Hip Precautions Education
5. Activities of Daily Living

1) Standardised Home Hazard assessment and intervention

Falls and fractured hips in the elderly have often been attributed to home environmental factors.

Clemson, L., Roland, M. & Cumming R. (1992). Occupational Therapy Assessment of Potential Hazards in the Homes of Elderly People: an Inter-rater Reliability Study. Australian Occupational Therapy Journal. 39 (3) pages 23 -26.

In a randomized controlled trial, Cumming et al, 1999, explored whether occupational therapist home visits targeted at environmental hazards reduce the risk of falls. This study concluded that

a home visit by an occupational therapist can prevent falls among older people who are at increased risk of falling.

Occupational therapy home assessment can assist the patient in preparing for discharge.

Management of Hip Fracture in Older People. Scottish Intercollegiate Guidelines Network (SIGN). Clinical Guideline 111, June 2009.

Collaboration between the occupational therapist and service user is imperative when considering and assessing the home situation.

College of Occupational Therapists (2012). Occupational therapy for adults undergoing total hip replacement. Practice guideline. London: College of Occupational Therapists Ltd.

Cumming et al (1999) also concluded in his study that home visits by occupational therapists may also lead to changes in behaviour that enable older people to live more safely in both the home and the external environment.

Cumming, R., Thomas, M., Szonyi, G., Salkeld, G., O'Neill, E., Westbury C. & Frampton, G. (1999). Home Visits by an Occupational Therapist for assessment and modification of environmental hazards: A Randomised Control Trial. *Journal of America Geriatrics Society*. 47, pages 1397 - 1402.

Hagsten et al (2004) completed a randomised controlled trial which investigated whether occupational therapy is of value for hip fracture patients. This RCT highlighted the importance of home assessment concluding that falls preventative changes were needed in 90% of the home visits. Home visits during the hospital stay also indicated high need for technical aids and adaptation of the home.

Hagsten, B., Svensson. O., & Gardulf, A. (2004). Early individualised postoperative occupational therapy training in 100 patients improves ADL after hip fracture. A randomized trial. *Acta Orthopaedica Scandinavia*. 75 (2) p. 177-183.

A randomised controlled trial examining the outcomes of medical and occupational therapy assessment found significant reduction in falls among the intervention group at 12 month follow up. The occupational therapy intervention consisted of one home visit focused on identification of environmental hazards, minor environmental modifications were completed, minor assistive technology was supplied and referral made for social services occupational therapy for more structural home modifications. This study highlighted the home visit among elderly as an excellent occasion for patient education and fall prevention.

Close, J., Ellis M., Hooper, R., Glucksman E., Jackson, S., Swift, C.(1999) Prevention of falls in elderly trial (PROFET): a randomised controlled trial. *The Lancet*, 353, p. 93-97.

The opportunity to provide a home visit, which may be the preferred option, may not always be possible due to resource limitations. Drummond et al (2012) identified that home visits were not routinely carried out by occupational therapists and were 'sporadic' and usually associated with specific service user needs such as frailty, history of falls and co-morbidities.

Drummond A, Coole, C, Brewin, C. & Sinclair E. (2012). Hip precautions following primary total hip replacement: a national survey of current occupational therapy practice. *British Journal of Occupational Therapy*. 75 (4) p. 164-170.

2) Cognition

Cognitive status is a key individual factor to be identified, and is highlighted within both the NICE and SIGN hip fracture guidelines.

College of Occupational Therapists (2012). College of Occupational Therapy for Adults Undergoing Total Hip Replacement. Practice Guideline. COT.

It is recommended that cognitive status is taken into account during pre-operative and post-operative intervention due to its potential for impact on recovery.

Wong J, Wong S, Brooks E (2002) A study of hospital recovery pattern of acutely confused older patients following hip surgery. *Journal of Orthopaedic Nursing*, 6(2), 68–78.

Of particular note for occupational therapists is that the ability to learn about hip precautions and the use of adaptive behaviours and equipment may be affected by cognitive status.

Wang X, Emery LJ (2002) Cognitive status after hip replacement. *Physical & Occupational Therapy in Geriatrics*, 21(1), 51–64.

Cognitive impairment is seen in between 35% and 61% of hip fracture patients. This rate is believed to be as much as three to six times higher for hip fracture patients than other hospitalized older patients.

Wong J, Wong S, Brooks E (2002) A study of hospital recovery pattern of acutely confused older patients following hip surgery. *Journal of Orthopaedic Nursing*, 6(2), 68–78.

People with hip fracture should have their cognitive status assessed, measured and recorded from admission using a validated tool.

National Clinical Guideline Centre. (2011). The management of hip fracture in adults. Methods Evidence & Guidance.

National Clinical Guideline Centre at The Royal College of Physicians. UK.

The key to the reliable identification of cognitive impairment is to integrate three components: observation of the patient; a collateral account from a carer; and the results of standardized tests, including AMTS, MMSE.

Young, J., Meagher, D., MacLulich, A. (2011). Cognitive assessment of older people. British Medical Journal (BMJ) 2011;343:d5042.

Differentiating delirium from depression or dementia requires astute clinical assessment skills and an awareness of the distinguishing clinical features of each condition.

Maher, A., Meehan, A., Hertz, K., Hommel, A., MacDonald, V., O'Sullivan, M., Specht, K., Taylor, A (2012). Acute nursing care of the older adult with fragility hip fracture: An international perspective. International Journal of Orthopaedic and Trauma Nursing (2012) 16, 177–194 Elsevier.

Sanders et al, in the BMJ refer to post-operative delirium lasting up to 11.8 days on average without pharmacological treatment.

Sanders, R., Pandharipande, P., Davidson, A., Daqing M., Maze, M (2011). Anticipating and managing postoperative delirium and cognitive decline in adults BMJ 2011;343:d4331.

There is limited evidence in the occupational therapy literature regarding which standardised assessments to use, and at which point post operatively. As the literature suggests, numerous forms of cognitive disturbance may occur post hip surgery. It is therefore advisable that occupational therapists use their clinical reasoning skills in conjunction with close co-operation with the multi-disciplinary team to establish the form of cognitive disturbance, and when and how to assess said disturbance.

It is recommended that further research be carried out in relation to which standardised assessments are completed, and at what point post operatively.

3) Falls Evidence: Please refer to HSE Strategy to Prevent Falls and Fractures in Ireland's Ageing Population (2008)

4) Education/ Hip Precautions Education

Education has a key role to play following hip fracture. Both the NICE Clinical Guidelines for Hip Fracture (2011) and SIGN Guidelines for the Management of Hip Fractures in Older

People (2009) stress the importance of providing education and support to both patients and their families following hip fracture.

National Clinical Guideline Centre (2011) ‘Hip fracture: the management of hip fracture in adults’, (NICE clinical guideline 124).

Scottish Intercollegiate Guidelines Network (SIGN) (2009) Management of Hip Fractures in Older People: A national clinical guideline.

The manifold benefits of education include resumption of roles and occupations; reducing length of stay and readmission rates (Mooney & Ireson, 2009), reduced anxiety and patient empowerment (Spalding, 2005).

Spalding , N. (2005). Reducing anxiety by pre operative education: make the future familiar, Occupational Therapy International, 10 (4), 278–293.

Mooney, M. and Ireson, C. (Eds) (2009) Occupational therapy in orthopaedics and trauma, Chichester: John Wiley and Sons.

Recent NICE accredited practice guidelines published by the College of Occupational Therapists highlight the central role education has to play (www.nice.org.uk/accreditation). Advice regarding joint positioning, hip precaution education (where indicated), education around compensatory strategies required for ADL function and falls prevention education are all recommended.

College of Occupational Therapists (2012) Occupational therapy for adults undergoing total hip replacement, London: COT.

The compensatory approach, one of the most commonly used approaches in Occupational Therapy following a fracture, enables a person to maximise functional independence in spite of temporary disability. Education has a key role in facilitating this (COT, 2012; Mooney&Ireson, 2009).

College of Occupational Therapists (2012) Occupational therapy for adults undergoing total hip replacement, London: COT.

Mooney, M. and Ireson, C. (Eds) (2009) Occupational therapy in orthopaedics and trauma, Chichester: John Wiley and Sons.

Education and advice also have a role to play in reducing patient anxiety and in patient empowerment. According to Spalding (2003), if patients know what to expect they will feel less anxious and be better able to cope.

Spalding , N. (2003). Reducing anxiety by pre operative education: make the future familiar, Occupational Therapy International, 10 (4), 278–293.

In addition to patient anxiety, Chow (2001) found that significant numbers of carers/ family members also experience stress (91.3%). By involving family/ carers in education sessions post surgery, Chow (2001) found that it assisted in not only maximising patient independence but also in reducing carer stress.

Chow W.H. (2001) An investigation of carers’ burden: before and after a total hip replacement, British Journal of Occupational Therapy, 64(10), 503– 508.

Hip Precautions following a total hip replacement or hemiarthroplasty involves education restricting certain movements and activities in an effort to prevent or reduce likelihood of hip dislocation (Restrepo et al, 2011). More recently these precautions have been challenged due to limited literature supporting their practical use (COT, 2012; Stewart and McMillan, 2011).

Surgical approach, surgeon skill, cognitive capacity and hospital volume have been reported as having greater importance in dislocation rates (Restrepo et al, 2011; Steward and McMillan, 2011). In a randomised prospective study of 256 patients in the U.S., Peak et al (2005) found that reducing restrictions placed on patients post operatively resulted in increased patient satisfaction and quicker return to baseline function. With no consensus thus achieved COT (2012) and Drummond et al (2012) recommend that Occupational Therapists are actively involved in debates regarding continued use of hip precautions with the surgical team and MDT colleagues.

5) Activities of Daily Living

In relation to post operative Hip Fracture care, Occupational Therapy post operative training in activities of daily living should be commenced as soon as possible following surgery . (Kumar and Redford 1984 , Thorngren 1998), Byers and Parker 1992, Stewart and Mc Millan 1998) .

The initial Occupational Therapy emphasis being on activities of daily living (ADL). Examples of what should be included in this ADL practice includes: functional transfers, washing , dressing and toileting practice . *Management of hip fracture in older people . (SIGN*

Guidelines (2011).

A study by Swanson et al (1998) looked to explore if *frequency and intensity* of Occupational Therapy intervention had an impact on hip fracture outcomes .

Swanson's study concludes that during the acute inpatient setting intensive daily Occupational Therapy was associated with higher mean functional levels, reduced lengths of stay in hospital. Additionally those patients who receive more than 5 sessions a week was linked to a predictor of early ambulation and in turn an ability to return home sooner.

Swanson CE, Day GA, Yelland CE, et al. The management of elderly patients with femoral fractures – a randomised controlled trial of early intervention vs. standard care. Med J Aust 1998; 169: 515-8.

Huusko TM et al (2000) added additionally that intensive OT along with PT and postoperative geriatrician care in acute settings resulted in a more favourable discharge destination and reduced lengths of stay even among patients' with a mild to moderate dementia.

Huusko TM, Karppi P, Avikainen V, Kautiainen H, Sulkava R. Randomised clinically controlled trial of intensive geriatric rehabilitation in patients with hip fracture: subgroup analysis of patients with dementia. Br Med J 2000; 321: 1107-11

Following on from this study a later study by Jones et al (2002) added that there were significant FIM and FAM increased scores for patients' who received intensive Occupational therapy as part of their post operative hip fracture care . Intensive occupational therapy was defined as 1 hour per day by 5 days a week .

Jones GR, Miller TA, Petrella RJ. Evaluation of rehabilitation outcomes in older patients with hip fractures. Am J Phys Med Rehabil 2002; 81:489-97

Hagsten et al (2004) in their study of 100 patients outlined the type of Occupational Therapy re- training used in used postoperatively with patients following hip fractures . They used two outcome measures a Klein – Bell (1982) ADL scale, looking specifically at patients’ abilities in dressing, toilet visits, mobility and bathing/hygiene . Patients in this study self reported using a modified Disability Rating Index (DRI) looking specifically at ADL activities, indoor and outdoor instrumental activities of daily living (IADL) .

The OT intervention concentrated on daily individual training for 45- 60 minutes looking at patient’s ability to get out of bed, their ability to get to the bathroom and finally their ability to perform morning activities and dress.

This study found that OT training speed up patients’ recovery regarding key ADL areas such as dressing, toilet visits and bathing/ hygiene . In addition they found this study that OT intervention, educating and facilitating on the ward practice in the use of technical aids/ adaptive equipment has a clinical effect in the early phases of rehabilitation.

Hagsten B, Svensson O , Gardulf A. Early individualised postoperative occupational therapy training in 100 patients improves ADL after hip fracture . A randomised trial. Acta Orthop Scand 2004;2: 177-183

Hagsten et al (2006) in a study found that at a 2 month follow up post discharge, patients’ who had received Occupational Therapy intervention had regained their pre- fracture Health related quality of life (HRQL) and self reported ability to complete activities of daily living and instrumental activities of daily living .

They concluded that individualised occupational therapy training improves the ability to perform instrumental activities of daily living and would appear to speed up the recovery in HRQL areas.

Hagsten B, Svensson O , Gardulf A. Health- related quality of life and self reported ability concerning ADL and IADL after hip fracture . A randomised trial. Acta Orthop Scand 2006 ;77 (1): 114-119

From an out patient setting perspective Tinetti et al (1997) reported that patients who had undergone a 12 week PT exercise and OT program focusing on ADLs had significant improvements in balance, strength and ambulation 6 months after commencing the intervention.

Tinetti ME, baker DI, Gottschalk M, et al . Systematic home- based physical and functional therapy for older persons after hip fracture . Arch Phys Med Rehabil 1997; 78: 1237- 47.

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[Drummond A](#), [Coole C](#), [Brewin C](#), [Sinclair E](#) (2012) Hip precautions following primary total hip replacement; a national survey of current occupational therapy practice, [British Journal of Occupational Therapy](#) 01/2012; 74(4):164-70.

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Jones GR, Miller TA, Petrella RJ. Evaluation of rehabilitation outcomes in older patients with hip fractures. Am J Phys Med Rehabil 2002; 81:489-97

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Scottish Intercollegiate Guidelines Network (SIGN) (2009) Management of Hip Fractures in Older People: A national clinical guideline.

Spalding , N. (2003). Reducing anxiety by pre operative education: make the future familiar, *Occupational Therapy International*, 10 (4), 278–293.

Stewart, L.S.P., McMillan, I.R. (2011) How necessary are hip restrictions for avoiding dislocation following hemiarthroplasty or total hip arthroplasty in older patients with a hip fracture? *British Journal of Occupational Therapy*, 74(3), 110–118.

Swanson CE, Day GA, Yelland CE, et al. The management of elderly patients with femoral fractures – a randomised controlled trial of early intervention vs. standard care. *Med J Aust* 1998; 169: 515-8.

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