



ACI NSW Agency
for Clinical
Innovation

THE ORTHOGERIATRIC MODEL OF CARE:

Clinical Practice Guide 2010

ACKNOWLEDGEMENTS

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THE ACI ORTHOGERIATRIC MODEL OF CARE DOCUMENTS INCLUDE:

Summary of Evidence

Clinical Guide

Orthogeriatric Liaison Services: Recommendations for Service Planning for Orthogeriatric Care in NSW

This document provides a **Clinical Practice Guide** based on the **Orthogeriatric Model of Care: Summary of Evidence 2010** developed by members of the ACI Aged Health Network Orthogeriatric Group.

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FOREWARD

The purpose of this document is to provide a clear, practical guide to the care of frail older orthopaedic patients. As in all areas of clinical practice, the scientific evidence is imperfect and incomplete.

Therefore, the Agency for Clinical Innovation (ACI) Orthogeriatric Collaborative Group, which is a multidisciplinary group of NSW clinicians who are experienced in and dedicated to the care of these patients, has attempted to synthesise the available literature across the disciplines, including existing guidelines. We have also included examples of documents currently in use in orthopaedic units in NSW. We hope that the resulting guide is practical and easily applicable to practice in NSW hospitals, whether or not there is an orthogeriatric service in place.

We hope this will be a useful resource for a variety of clinical staff members and trainees. We do not aim for this guide to be prescriptive, as in many cases the recommendations represent the opinions of one or more experienced clinicians when no clinical trial evidence is available to guide treatment. We have included many examples of assessment tools and documents that have been validated in studies, or developed locally and found to be useful. We would hope that anyone using this guide would choose which of these resources would work best with the staffing and system in place locally. The published references used to compile this guide are provided in detail in the companion document entitled "The Summary of Evidence".

We welcome feedback regarding ways in which we can continue to improve this resource.



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1 PREOPERATIVE CARE

All patients should have a comprehensive medical and nursing admission assessment focussing on their premorbid function, cognition, comorbidities and risks. Other essential sources of medical and social information will be family/carers, GPs, aged care facility staff and other community service providers. Possible appropriate discharge destinations should be considered, even during the initial assessment. Older/frail patients presenting with a hip or other fracture should be admitted to an acute surgical ward within four hours.

1.1 TIMING OF SURGERY

- Patients medically fit for surgery should be operated on within 48 hours of admission
- Operation times should aim to be during standard daytime working hours.

1.2 ANTIBIOTIC PROPHYLAXIS

Patients undergoing orthopaedic surgery should receive antibiotic prophylaxis to reduce the incidence of deep and superficial wounds, respiratory and urinary tract infections.

1.3 VENOUS THROMBOEMBOLISM PROPHYLAXIS

If there is a delay in surgery, venous thromboembolism prophylaxis should commence preoperatively. This may include pharmacological treatment (forms of heparin) or mechanical devices (anti-embolic stockings or foot/calf pumps).

1.4 FLUID AND ELECTROLYTE BALANCE

Clinical and laboratory assessment of fluid and electrolyte balance needs to be attended to in the emergency department, so any imbalances are corrected promptly.

1.5 OXYGEN THERAPY

Patients' oxygen saturation should be checked on admission to hospital to establish a baseline, monitored for at least 48 hours after surgery and then as required.

1.6 ANAESTHETIC MANAGEMENT

- Regional/spinal anaesthesia is recommended for patients undergoing surgery to reduce complications providing no contraindications exist:
- Regional anaesthesia is associated with lower rate of venothromboembolism (VTE).
- Patients are able to mobilise earlier after a regional anaesthesia compared to a general anaesthesia. Beware of heightened fall risk in patients with cognitive impairment.
- Regional anaesthesia may decrease delirium postoperatively.

1.7 PREOPERATIVE TRACTION

There is insufficient evidence to support the routine use of either skin or skeletal traction prior to hip fracture surgery.

1.8 PAIN RELIEF

Pain can be **severe and ongoing** before and after orthopaedic surgery. Older patients may not be given sufficient analgesia.

A pain regime should

- **commence** in the emergency department
- be **regular** rather than PRN
- **continue** post-discharge
- be **documented** in the clinical notes
- be **communicated** to the community, particularly the GP, to continue optimal pain management.

1.9 DELIRIUM PREVENTION

Delirium is a transient mental disorder characterised by impaired cognitive function and reduced ability to focus, sustain or shift attention. It is often overlooked or misdiagnosed. The greatest risk factor is pre-existing cognitive impairment, but delirium can be prevented in many cases (see Section 2.17).

In addition to the above care, preoperative assessment should include

- **Baseline cognitive state** (e.g. co-morbidities and family/carer information)
- **Communication and care cues information** from the family (see Appendix J: Communication and Care Cues form).

2 POSTOPERATIVE MANAGEMENT

HIP FRACTURE SURGERY

Hip fractures are classified broadly as intracapsular, which includes the neck or head of the femur, or extracapsular, which are intertrochanteric or subtrochanteric. The choice of surgical management will depend on a number of factors: type and severity of the fracture, bone quality, health and pre-morbid functional status of the patient, and the surgeon's preference.

Subcapital fractures can lead to disruption of the blood supply to the femoral head, and will often be repaired with a hemiarthroplasty. Damage to the acetabular cup (pelvic part of the hip joint), is an indication for a total hip arthroplasty. Intertrochanteric fractures are treated with various forms of open reduction and internal fixation, depending on the type and location of fracture.

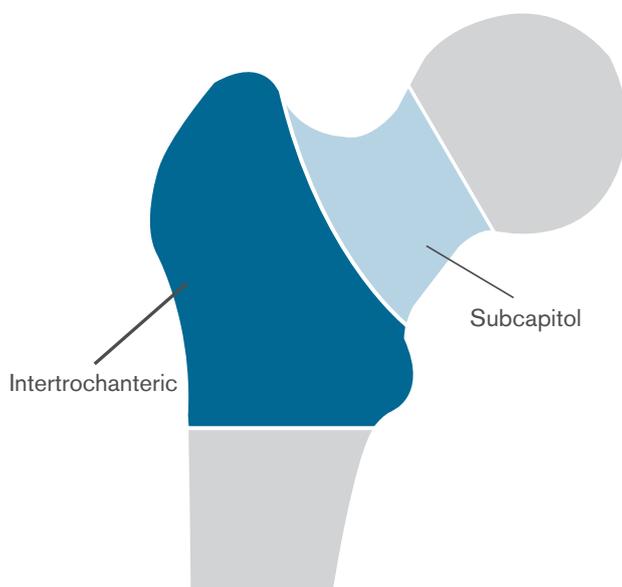


Figure 2.1 Drawing of femur showing the subcapital and intertrochanteric areas

2.1 POSTOPERATIVE PAIN RELIEF

Effective pain management will enhance patient comfort, assist in early mobility and rehabilitation and reduce length of stay by reducing postoperative complications. Use of **routine** paracetamol, with the addition of low dose opioid analgesia and additional doses charted PRN for breakthrough pain can effectively manage pain.

Pain levels should be routinely assessed and documented

- Pain scores may be helpful in managing the pain in some patients.
- Untreated pain has been shown to increase the risk of delirium.
- Cognitively impaired patients are more likely to be undertreated for acute pain.
- Patients who cannot voice discomfort must be assumed to still require regular analgesia.
- Staff should be educated about non-verbal signs of pain in patients with dementia and/or delirium e.g. agitation, confusion, withdrawal.
- Low doses of oxycodone may be preferred over tramadol, due to the potentially dangerous interactions, particularly with SSRIs.

All NSAIDs, including the COX-II inhibitors, have a high risk of GIT bleed and blood pressure, electrolyte and renal function complications in frail, older patients. If they must be used, a proton pump inhibitor should be added.

Providing a combination of two or more analgesic medications with differing analgesic mechanisms is considered best practise.

Example of Pain Management Regimen

Paracetamol 1gram 3-4 times a day
Oxycodone 2.5 mg three times a day
Oxycodone 2.5mg to 5mg every four hours as needed for breakthrough pain.

2.2 ANTITHROMBOTIC PROPHYLAXIS

Promoting early mobility is a key to reducing VTE.

Assess for VTE risk and refer to NSW Health Venothromboembolism (VTE) Surgical and Medical Management posters and booklets 2008.

www.health.nsw.gov.au/policies/gl/2008/GL2008_014.html

Pharmaceutical Prophylaxis

The recommended anticoagulant prophylaxis medications and dosages, including the contraindications, are summarised in Table 2.1.

Table 2.1: Summary of anticoagulant prophylaxis recommendations for high risk patients from the NSW Health Venothromboembolism Surgical and Medical Management Guide.

Assess Patient Risk	Recommended Anticoagulant Prophylaxis
Hip or knee arthroplasty - if no contraindications to anticoagulant prophylaxis	Prescribe: <ul style="list-style-type: none"> • enoxaparin 40mg daily or • dalteparin 5000U daily or for orthopaedic surgery • fondaparinux 2.5mg daily (commence 6-8 hrs post-op) Duration 5-10 days EXCEPT 28-35 days for hip arthroplasty
Fracture Surgery - if no contraindications to anticoagulant prophylaxis	Prescribe: <ul style="list-style-type: none"> • enoxaparin 40mg daily or • dalteparin 5000U daily or • LDUH 5000 TDS for hip fracture surgery • fondaparinux 2.5mg daily (commence 6-8 hrs post-op) Duration 28-35 days
Contraindications to Anticoagulant Prophylaxis	
Active bleeding/high risk of bleeding e.g. haemophilia, thrombocytopenia (platelet count $<50 \times 10^9/L$), history of GI bleeding Severe hepatic disease (INR > 1.3) / adverse reaction to heparin On current anticoagulation Other e.g. very high falls risk and palliative management	
Renal impairment with LMWH – see manufacturer's product information and check information on dose variations in renal failure and new anticoagulants in: NSW Therapeutic Advisory Group Inc. (2010). Safe Use of Heparins and Oral Anticoagulants in Adults. NSW Department of Health. http://www.ciap.health.nsw.gov.au/nswtag/publications/posstats/Heparin_VTEupdated082010.pdf	

Mechanical Prophylaxis

Mechanical prophylaxis, such as compression stockings and intermittent compression devices, reduce the incidence of VTE in addition to pharmacological prophylaxis.

Sequential Compression Device/Intermittent Compression Device:

has been shown to reduce the rate of asymptomatic DVT. If a patient has a symptomatic or diagnosed DVT discontinuing use of mechanical device is recommended.

Graduated Compression Stockings (GCS):

should be applied when patient is admitted to hospital. There is little evidence to support their use in patients with a fracture. Contraindicated with fragile skin or vascular insufficiency, so GCS need to be routinely removed for skin inspections.

2.3 OXYGEN THERAPY

After surgery, oxygen saturation needs to be routinely monitored and oxygen therapy administered until adequate tissue oxygenation is maintained, aiming for $>95\%$ (for patients without known respiratory disease).

2.4 FLUID AND ELECTROLYTE BALANCE

Fluid and electrolyte status must be regularly assessed. Intake and output should be strictly documented on the fluid balance chart to enable prompt management and correction of fluid volume deficit or overload. Monitor blood results until electrolyte levels and renal function have returned to baseline level.

2.5 WEIGHT BEARING

Full weight bearing on the operated leg is recommended following hip fracture repair, however weight bearing status is determined by the orthopaedic surgeon.

Definitions:

Non Weight Bearing:	(NWB) Patient can hop on their unoperated leg. The operated leg is off the ground.
Partial Weight Bearing:	(PWB) The patient may apply 50% of their body weight through their operated leg maintaining a heel toe gait.
Touch Weight Bearing:	(TWB) The foot or toes may touch the floor (such as to maintain balance), but not support any weight. The weight of the leg on the floor while taking a step should be no more than 5% of the body weight.
Full Weight Bearing or Weight Bear as Tolerated:	(FWB or WBAT) The patient is allowed to put all pressure through the operated leg.

2.6 EARLY MOBILISATION

Patients should be encouraged to sit out of bed and begin mobilising the day after surgery, within 24 hours or as determined by the surgeon.

2.7 PHYSIOTHERAPY

Early assessment, treatment and documentation of progress and compliance with protected weight bearing are essential. Direct physiotherapist knowledge of the patient's mobility and ability to improve is crucial for rehabilitation referral.

2.8 HIP PRECAUTIONS

Following hemiarthroplasty or total hip arthroplasty, hip precautions may be prescribed by the surgeon. However, as the evidence to support these recommendations is limited, the use of precautions varies widely.

Common recommendations are:

- a) Do not cross legs.
- b) Do not twist the operated leg inwards or outwards.
- c) Do not bend the hip past 90 degrees.

2.9 CONSTIPATION

Monitoring and early interventions to prevent constipation are essential. Regular laxatives should be charted with/without stool softeners.

2.10 URINARY CATHETERISATION

Refer to local policy regarding management and insertion.

Prophylactic antibiotics should be considered to cover the insertion and removal of the catheter, particularly when a joint prosthesis is in situ. The indwelling catheter should be removed as early as possible, preferably 24 hours after surgery, ensuring that there is no faecal impaction, and ideally after patients have begun to mobilise.

Intermittent catheterisation is recommended over indwelling catheterisation.

2.11 BLOOD TRANSFUSION

Refer to local policy regarding blood transfusion.

Routine transfusion may not be required in asymptomatic patients with haemoglobin > 80g/L.

2.12 WOUND CARE

Surgical wounds heal by primary intention. To allow healing and prevent bacteria contamination:

- the surgical wound should be disturbed as little as possible
- intravenous antibiotic prophylaxis is started at induction of anaesthesia and continued according to surgeon's protocol, usually for a total of three doses
- the preferred antibiotic is often a first generation cephalosporin.

The aim of the surgical dressing is to:

- absorb blood or haemoserous exudates/ooze
- remain intact
- be waterproof to aid in hygiene and washing for patient.

Definitions of Wound Infections

Superficial Wound Infection:

Infection does not extend below deep fascia; if there is confirmed infection, antibiotics can be prescribed.

Deep Wound Infection:

Involves the deep fascia and sometimes the hardware or implant may need to be removed, followed by an extended period of intravenous antibiotics.

Wound Haematoma

Most wounds are expected to have some associated bruising. A small haematoma may resolve spontaneously, a large haematoma may require surgical drainage.

2.13 SURGICAL DRAINS

There is inadequate evidence to support drains after hip surgery.

2.14 PRESSURE AREA CARE

Refer to local policy and see following links:

NSW Department of Health link:

www.health.nsw.gov.au/policies/PD/2005/pdf/PD2005_257.pdf

Patient Education Brochure Link:

www.health.nsw.gov.au/quality/pdf/pressure_ulcers_brochure.pdf

All patients should be assessed and managed with a view to minimising the risk of pressure-related injury. Risk assessment tools should be used in conjunction with clinical judgement, not in isolation. Research suggests pressure-related injury occurs with exposure to a hard surface within as little as 30 minutes.

Alternating mattresses should be considered as a first line preventative strategy for elderly patients admitted with fractures.

The patient should be placed on such a mattress as early in the admission as practical, preferably in the emergency department.

2.15 NUTRITION

A large majority of hip fracture and older orthopaedic patients are already malnourished prior to being hospitalised and show a rapid decline in their nutritional status in the first 1-2 weeks after admission.

High energy protein preparations should commence 12 hours after surgery for hip fracture and other frail patients. A dietician should be consulted to review patients' nutritional needs and progress.

2.16 DELIRIUM AND DEMENTIA

Apart from instigating the above strategies - please see your own local policy/guidelines/protocols for the management of delirium. See Appendices D, E, F, G, & H for cognitive assessment instruments and Appendix I for a delirium diagnosis tool (CAM).

Health Department Links:

www.health.vic.gov.au/acute-agedcare

www.health.nsw.gov.au/policies/gl/2007/pdf/GL2007_025.pdf

www.health.gov.au/internet/main/publishing.nsf/content/ageing-dementia-resource-guide.htm

Early identification and involvement of a geriatric medical team can reduce incidence, duration and severity of postoperative delirium.

Prevention and Management of Delirium

All relevant non-pharmacological measures should be implemented before medications are trialled to avoid possible adverse effects and interactions.

Multi-component Strategies

- Offer reassurance to the patient and reorient to time and place
- Involve and educate patient, family/carers where possible
- Lights on during the day and off at night
- Clocks and calendars in sight to assist with orientation
- Normalise sleep patterns
- Ensure good communication e.g. interpreters, vision/hearing aids
- Provide meaningful, reassuring conversation and activities
- Involve the geriatric clinical nurse consultant, if available.

Pain can be a common trigger in the delirious postoperative patient. It is imperative to ensure that pain is appropriately managed prior to any pharmacological intervention for behaviours related to delirium.

Pharmacological Treatment of Delirium

Antipsychotic medication should only be used as a last resort, due to limited efficacy and risk of adverse events. The preferred agents are:

Medication	Route	Dose (mg) can be repeated after 1-2 hrs	Maximum dose before senior referral
Haloperidol*	IM/PO	0.25 - 0.5 mg	1 mg
Risperidone	PO	0.5 mg	1 mg
Quetiapine	PO	25 mg	50mg
Olanzapine	IM	2.5 - 5 mg	10mg

*Must have Benztropine 1-2 mg orally or IV/IM available in case of a dystonic reaction

These medications can be charted as needed for agitation in patients at high risk for delirium, with a statement in the order such as **'after pain has been assessed and treated'**. Contact the consultant geriatrician or senior medical officer if medication is not effective in reducing delirium symptoms.

These medications may be charted at these doses on the PRN chart for patients at high risk for delirium, to prevent the patients receiving higher doses. Benzodiazepines should be avoided, except in the case of benzodiazepine or alcohol withdrawal.

Physical and mechanical restraints MUST NOT BE USED as they can lead to increased distress, agitation and injury.

2.17 FALLS PREVENTION

All patients admitted following a fall should be assessed for the cause and offered interventions for personal and environmental risk factors to prevent further falls. Patients with a fracture have an increased chance of falling and fracturing especially in the first three months.

A Falls Risk Assessment Tool should be regularly used and recorded with results highlighted at patient handover sessions. Cognitive impairment is an important risk factor. Interventions needed to provide access to multi-factorial fall prevention programs may include:

- **Orientation, reassurance and supervision:** to sustain optimum cognition and safety
- **Toileting schedule:** as required
- **Mobility and environmental aids:** with physiotherapy and occupational therapy assessment and advice
- **Physical activity:** to improve strength, balance and function, although in the very frail patients, attempting increased exercise may lead to more falls
- **Single Focus Lenses:** for patients with multifocal glasses, the provision of single focus lenses for use outside have been found to decrease the incidence of falls
- **Medication review:** medications should be reviewed for appropriateness and potential interactions
- **Hip Protectors:** There is evidence to show that hip protectors reduce fractures in a health care facility; however compliance in wearing hip protectors is poor due to patients finding them uncomfortable.

Fall Injury Among Older People – Management Policy to Reduce
www.health.nsw.gov.au/policies/PD/2005/pdf/PD2005_353.pdf

Falls Prevention Strategies: NSW Falls Prevention Program,
Clinical Excellence Commission

[www.safetyandquality.gov.au/internet/safety/publishing.hsf/
content/FallsGuidelines-2008download](http://www.safetyandquality.gov.au/internet/safety/publishing.hsf/content/FallsGuidelines-2008download)

www.cec.health.nsw.gov.au/moreinfo/falls.html

2.18 OSTEOPOROSIS ASSESSMENT

Patients admitted to hospital with fragility fractures or older patients who have presented for an elective joint replacement but who are at risk of falling require assessment for osteoporosis.

- Vitamin D deficiency is commonly undiagnosed.
- The 25-hydroxy vitamin D, corrected calcium, phosphate and thyroid function levels should be checked for all patients.
- Calcium and vitamin D need to be replete in patients prior to commencing osteoporosis treatment.
- Vitamin D enhances calcium absorption.
- Calcium and vitamin D combined have been shown to significantly reduce non-vertebral fractures by 26% and hip fractures by 35% in the frail person with a diagnosis of osteoporosis.
- Dietary intake of 1,300mg calcium per day is recommended for postmenopausal women.
- Replacement of vitamin D for levels <75 nmol/Lm, along with calcium supplementation, is recommended.

Bisphosphonates have been associated with a considerable reduction in the risk of vertebral, hip and non-vertebral fractures in postmenopausal osteoporotic women, however to commence bisphosphonate treatment in hospital may not always be possible.

- because the vitamin D level has not been normalised
- there is concern from the treating surgeon regarding bone healing
- major dental work is planned.

In these cases the recommendation to commence treatment should be conveyed to the patient's GP or a referral made to a falls and fracture, osteoporosis or endocrine clinic. See Appendix K for an example of a letter to GPs to provide recommendations for further treatment of osteoporosis in patients with hip fracture.

3 REHABILITATION / DISCHARGE PLANNING

Rehabilitation should be provided in a multidisciplinary setting for all patients expected to go home or to a low level care facility. Patients with very poor mobility, functional impairments and multiple comorbidities should be referred to a rehabilitation unit with consultation from a geriatrician.

3.1 ASSESSMENT

Assessment should include

- Premorbid function and mobility needs
- Social support – residence, level of support in residence, current community supports and access to residence including the number of steps
- Relevant clinical conditions – refer to 'old' medical files
- Cognitive and mental state – pre-existing and current cognitive and mental state
- Postoperative weight-bearing status
- Rehabilitation goals and needs of the patient.

Patients from a high level care facility such as a nursing home or with a discharge plan for placement in a high level facility should receive slow stream rehabilitation in this facility. Such frail patients will not be able to tolerate or benefit from a more intensive rehabilitation regime. Patients should be discharged back to the high level care facility in a timely manner once deemed medically fit including:

- Oral intake has resumed
- Indwelling catheter has been removed and urinary output confirmed
- Oxygen saturation has returned to baseline
- Bowels have opened during the hospital stay
- Any medical issues likely to lead to rapid readmission have been stabilised.

3.2 MULTIDISCIPLINARY REHABILITATION

In addition to medical and nursing staff, the team ideally includes the following members:

Physiotherapist

It is important for the physiotherapist in the rehabilitation setting to receive a clear handover from the acute ward physiotherapist regarding progress to date and goals of therapy.

Occupational Therapist

- Will assess patients' ability to care for themselves and manage daily activities
- Where required will undertake a home assessment to determine any hazards within the home
- Where required will prescribe equipment to assist in daily living tasks after discharge
- Will initiate falls prevention education.

Social Worker

- Will review and liaise with community services and explore social support and history
- Will facilitate and coordinate higher level care transition if necessary.

Speech Pathologist

- If necessary will assess for swallowing and speech issues

Dietitian

- Should be a routine referral for all patients over the age of 70.

Pharmacist

- Will communicate with staff regarding prescribing issues during the hospital stay and patient/carer education regarding new medications prior to discharge.

3.3 DISCHARGE PLANNING

Early social work/discharge planner intervention, even preoperatively, can facilitate discharge planning.

- Recommended discharge plan should be documented within 48 hours postoperatively.
- The availability of rehabilitation, community and social support in the patient's local area should be assessed.
- Information regarding premorbid cognition, mobility and function and level of support is required. This information should be documented as early in the admission as possible and utilised for management and discharge planning.

Cognition should be assessed postoperatively, after any delirium has resolved, to establish the current level of cognitive function, using a formal screening test such as the MMSE or the RUDAS (Appendix H).

The Estimated Date of Discharge (EDD) should be communicated to all members of the health care team and be documented in the file, on the ward list of patients, and at the bedside.

- The patient and the next of kin must be informed of progress throughout the hospital stay to ensure they are prepared to assist in meeting the patient's needs
- The patient and the next of kin should also be aware of the discharge plan and estimated date
- Supported discharge with community services will facilitate a safe transition from hospital to the community and reduce the length of stay
- A Transitional Aged Care Package can provide 12 weeks of functional assistance as well as home-based physiotherapy twice weekly.

Effective communication between the hospital staff, the community medical practitioner, service providers and/or residential facility staff is essential to ensure continuity of appropriate care. A comprehensive discharge summary, as well as a phone call from the relevant team member, are the most effective means of liaison with the post-discharge health care team.

APPENDIX A: ORTHOGERIATRIC WARD ROUNDS

A structured and efficient ward round will promote best practice and improve communication between health care professionals.

Prior to discussing a patient, all team members should be introduced to the patient who should be actively involved in their treatment and encouraged to ask questions.

Frequency:	2- 3 times per week
Place:	Bedside – encourage patient involvement / paper round
Teams Members:	Including as many of the following as possible: Orthogeriatrician Orthogeriatrician Registrar JMO/ RMO Orthopaedic Registrar Senior Nurse Physiotherapist Social Worker Occupational Therapist Dietician/ Speech Pathologist
Aim:	Provide teaching/education Improve communication between health professionals Improve patient care through increased level of awareness by all health professionals Promote input from patient Promote teamwork
New Patients:	Gather history, liaise with GP and review past medical files
Include:	Reason for admission Surgery Comorbidities that may impact length of stay Complications - resolutions Observations Results from bloods/tests/x-rays available for discussion Discharge destination – identify responsible person for making booking aware Estimated Date of Discharge (EDD) Potential problems for not reaching EDD Consult to Allied Health or other team
Documentation:	Must be accurate Notes must be legible

APPENDIX B:

CASE CONFERENCING / DISCHARGE PLANNING MEETING

Aim:	To promote communication and coordination of care between the multidisciplinary teams and aid in the smooth transition from hospital back to the community.
Who should Attend:	<ul style="list-style-type: none"> • Orthogeriatric team • Orthopaedic JMO/ RMO • NUM/CNC or relevant senior nurse • Physiotherapist • Social Worker • Occupational Therapist • Dietician/Speech Pathologist
Nominate person to lead or chair meeting	
For each patient:	<ul style="list-style-type: none"> • Identify reason for admission and surgery (including dates) • Receive verbal report from all attendees about patient progress • Identify potential risk that will affect length of stay • Document destination (patient aware) • Establish Estimated Date of Discharge (EDD) • Develop and document an agreed discharge plan and necessary tasks e.g.- rehab referral/ contact • Establish coordination
Report from Case Conference:	<ul style="list-style-type: none"> • Summary documented for each patient in clinical notes • See following page for suggested template • Inform patient of discharge plan

APPENDIX C: JMO/ RMO GUIDES:

This document is an example of a treatment guide or pathway for junior doctors compiled from examples from St George, Westmead, Concord and St Vincent's hospitals in Sydney.

PREOPERATIVE MANAGEMENT:

Some of these investigations may have already been attended to in the emergency department. If so, all results still need to be checked.

INVESTIGATIONS

- Electrolytes
- Creatinine
- Haemoglobin
- Platelet Count
- INR (if needed)
- Vitamin D & Calcium level/ Thyroid function tests/ LFTs
- Group and Hold ordered
- Troponin (if probability or suspicion of myocardial event)
- CRP and Cultures – urine, blood, sputum, wounds, if clinical suspicion of infection ABG if O₂ saturations <90%
- CXR, hip and pelvis x-ray
- ECG
- Urinalysis

ASSESSMENT

1. Exclude other injuries (head/adjoining joints)
2. Cognitive assessment/delirium screening/document baseline cognition
3. Number of falls/syncope
4. Review fluid balance and, if needed, commence IV fluids
5. Analgesia: regular analgesia is charted
6. Neurovascular assessment

MEDICATION REVIEW

1. Chart medications and discuss with GP if any discrepancies or concerns
2. Discuss with Orthogeriatric Registrar or Senior Registrar if patient is on Warfarin or insulin
3. If patient Nil by Mouth, suggest withholding oral hypoglycaemics unless otherwise indicated.

FRACTURED NECK OF FEMUR CHECKLIST

(Including preoperative and postoperative care)

Adapted for Dr Ming Loh – Department of Aged Care, Westmead Hospital

PREOPERATIVE:

- | | |
|--------------------------------------|--|
| <input type="checkbox"/> ECG checked | <input type="checkbox"/> Chest X-ray Checked |
| <input type="checkbox"/> Consent | <input type="checkbox"/> Discussion with family about resuscitation status |

BLOOD / FLUID / ELECTROLYTES CHECKED:

- | | | | |
|---|-------------------------------------|--|---|
| <input type="checkbox"/> Electrolytes | <input type="checkbox"/> Creatinine | <input type="checkbox"/> Hb | <input type="checkbox"/> Platelet Count |
| <input type="checkbox"/> Group and Hold Ordered | | <input type="checkbox"/> INR if applicable | |
| <input type="checkbox"/> Vitamin D & Calcium Level / Thyroid Function tests/
LFTs ordered (PTH if calcium level is elevated) | | <input type="checkbox"/> Fluid Balance reviewed and intravenous therapy prescribed | |
| <input type="checkbox"/> IV access | | <input type="checkbox"/> Indwelling Catheter | |
| <input type="checkbox"/> Urinalysis checked | | <input type="checkbox"/> Analgesia charted regularly | |

GENERAL OBSERVATIONS – STABLE

- | | | |
|--|---|--|
| <input type="checkbox"/> BP and Pulse | <input type="checkbox"/> Temperature | <input type="checkbox"/> No sign of sepsis |
| <input type="checkbox"/> Oxygen saturations reviewed (> 93% on room air) | <input type="checkbox"/> Patient is not delirious (CAM) | |
| <input type="checkbox"/> Baseline cognition documented | <input type="checkbox"/> Secondary injuries excluded
(head/ adjoining joints/ internal bleeding) | |

REVIEW OF MEDICATIONS

- | | |
|---|--|
| <input type="checkbox"/> Antihypertensive | <input type="checkbox"/> Antiplatelet therapy |
| <input type="checkbox"/> Warfarin – does patient need FFP/ Vitamin K? | <input type="checkbox"/> Antiarrhythmics |
| <input type="checkbox"/> Antipsychotic / antiepileptic / Parkinson Treatment
(must be given, even while NBM) | <input type="checkbox"/> Oral Hypoglycaemic or Insulin therapy |

REVIEW OF MAJOR MEDICAL CONDITIONS

- | | |
|--|---|
| <input type="checkbox"/> Ischemic Heart Disease | <input type="checkbox"/> Recent AMI |
| <input type="checkbox"/> CCF | <input type="checkbox"/> LVEF = _____ % |
| <input type="checkbox"/> Valvular Heart Disease _____ requires antibiotic prophylaxis? _____ | |
| <input type="checkbox"/> Atrial Fibrillation – Current pulse rate = _____ | |
| <input type="checkbox"/> COPD – FEV1/ FVC = _____ requires Ventolin preop? _____ | |
| <input type="checkbox"/> CRF – baseline Creatinine _____ | |
| <input type="checkbox"/> Chronic Liver Disease – INR = _____ Albumin = _____ | |

POSTOPERATIVE MANAGEMENT

Review	Day 1	Day 2	Day 3	Concerns
Temperature				
BP				
SaO2 & RR				
Chest Auscultation				

DVT Prophylaxis:
LMWH (Fragmin/ Clexane) Charted

Graduated Compression Stockings Day 1 Day 2 Day 3

Sequential Compression Device Day 1 Day 2 Day 3

Not Delirious Day 1 Day 2 Day 3

Cannula Site Reviewed Day 1 Day 2 Day 3

Pressure Care: Waterlow: _____ Pressure Mattress _____

Fluid Balance: Intraop Blood Loss: _____

Pain Control Adequate: Pain Score: _____

<input type="checkbox"/> Paracetamol	<input type="checkbox"/> Patient comfortable
<input type="checkbox"/> Endone / Oxycontin	<input type="checkbox"/> Referral to Acute Pain Service
<input type="checkbox"/> Regular charted	<input type="checkbox"/> Antiemetics required
<input type="checkbox"/> PRN effective	

Bowel Management Opened
 Regular laxative charted

POSTOPERATIVE BLOOD RESULTS

Blood Test	Day 1	Day 2	Day 3
Haemoglobin			
Requires transfusion			
Na			
K			
Creatinine			
Albumin			

- Referral to dietician
- Referral to physiotherapist
- IDC out
- IVC and IVF ceased
- Antibiotics ceased
- Wound check

OSTEOPOROSIS MANAGEMENT

- Screening blood tests ordered: 25 – OH Vitamin D, Ca, TFT, LFT (PTH if calcium level is elevated)
- Vitamin D (Ostelin 1,000 IU/day) & Caltrate (1.2g/ day)
- Oral bisphosphonate, if already on and vitamin D level is > 75nmol/L and surgeon is agreeable to continuation acutely. If intolerant of oral bisphosphonate, refer to endocrinologist for an alternative.
- Referral to minimal trauma clinic for those community-dwelling newly started on bisphosphonate (in consultation with the orthopaedic surgeon)

APPENDIX D: MINI MENTAL STATE EXAMINATION (MMSE)

Folstein MF, Folstein SE, McHugh PR, "Mini Mental State" A Practical Method for Grading the Cognitive State of Patients for the Clinical J Psychiatric Res. 1975;12:189-198.

Mini-Mental State Examination	Surname _____ MRN _____
	Given names _____ Phone _____
	Address _____
	LMO _____ DOB ____/____/____ Sex F M

Diagnosis: _____ Dominant Hand: _____

Examiners Name & Designation: _____ Date: _____

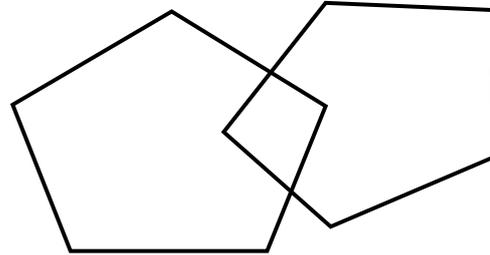
Diagnosis: _____ Dominant Hand: _____

Examiners Name & Designation: _____ Date: _____

		SCORE	MAX
ORIENTATION:	What is the: Day _____ Date _____ Month _____ Season _____ Year _____		5
	Where are we: Country _____ State _____ City _____ Hospital _____ Ward _____		5
	REGISTRATION: Ask the patient if you can test his/her memory. Then say, "I am going to say the name of 3 objects. After I have said then, I want you to repeat them. Remember what they are because I am going to ask you to name them again in a few minutes". Say clearly and slowly - approximately one second for each word. APPLE CHAIR PAPER The first repetition determines the score (0-3) but keep saying the words until he/she can repeat all three (up to 6 trials).		3
	ATTENTION & CALCULATION: Serial 7s- Start with 100 and subtract by 7s. Stop after 5 subtractions (93, 86, 79, 72, 65). Score total number of correct answers. ALTERNATIVELY: If the patient cannot or will not perform this task, spell WORLD backwards. 1 point for each letter in correct order D-L-R-O-W.		5
	RECALL: Recall the 3 previous words. Score 1 point for each word.		3
	LANGUAGE: Show the patient a wrist watch and ask him/her what it is. Repeat for a pencil Ask the patient to repeat this phrase after you. "No ifs, ands or buts" . One trial only. Follow a 3 stage command. "Take this paper in your right/left hand, fold in half and put it on the floor" . Use a blank paper. Score 1 point for each part correctly executed.		2
INSTRUCTION: Read and obey the command printed below: "Close your eyes". Score 1 point for if eyes close. CLOSE YOUR EYES	1		
WRITE A SENTENCE: Ask the patient to write a complete sentence. Do not dictate. It must be written spontaneously, contain a subject and a verb and make sense. Correct spelling, grammar and punctuation are not necessary. Write a sentence: _____ _____	1		

PRAXIS:

Copy the design below. All ten angles must be represented and two must intersect to form a four sided figure to score one point. Tremor and rotation are ignored.



1

TOTAL

30

ADMINISTRATION

1. Before assessment is commenced it is important to establish rapport with the patient and ensure that he/she is as relaxed and as comfortable as possible.
2. Establish the status of the patient's vision and hearing and whether glasses or hearing aids are usually worn.
3. Establish if the patient is right or left dominant. The 3-stage command requires the examiner to instruct the patient to take the paper with their non-dominant hand.
4. Enquire about the patient's educational level and prior vocational attainments.
5. It is essential the tester give his/her whole attention to the patient.
6. Test instructions must be given verbatim, in a clear and non harried manner.
7. Items must be given as per order on the printed sheet.
8. The tester should sit opposite the patient and make regular eye contact.
9. Encouragement should be given without any specific comment re successes or failures.

Assess patient's level of consciousness along a continuum

--	--	--	--

Alert

Drowsy

Stuporous

Coma

INTERPRETATION AND GENERAL COMMENT

The Mini Mental State Examination is essentially a screening tool for cognitive dysfunction. Maximum total score is 30. A score below the usual cut off (23/24) indicates a need for more complete evaluation.

This assessment tool does not diagnose dementia, cannot stand-alone and must be taken in concert with a full assessment of the patient's physical, mental, functional, social and economical status. However, clinical trials for Alzheimer's disease have indicated a score of 21 or greater correlates with mild dementia, 10-20 with moderate dementia and 9 or less with severe dementia (2).

It is important to recognise that, while the MMSE has good inter-rater reliability, its other "psychometric" properties are not known. Few studies have been done on the distribution of the MMSE scores on the "normal" population.

The examiner should be aware that neurological problems, eg those resulting in left or right inattention, neglect or specific language disorders may affect performance on the MMSE.

Unwarranted assumptions may be made in over-interpreting differences between scores obtained by an individual over time, as detailed test retest reliability statistics are not available, eg a lower score on retesting may represent a chance deviation rather than a "deterioration".

False positives are often found in the elderly and those with poor formal education, low socio-economic status and depression or migrant background. Caution should be exercised in using this tool with those whose English is poor. False negatives may be found in those who are highly educated, have very mild cognitive function or have a focal right hemisphere lesion.

Reference:

1. Folstein MF, Folstein SE, McHugh PR, "Mini Mental State" A Practical Method for Grading the Cognitive State of Patients for the Clinical J Psychiatric Res. 1975;12:189-198.
2. Ferris SH, Mackell JA, Mohs R et al. A multicenter evaluation of new treatment efficacy instruments for Alzheimer's disease clinical trials: Overview and general results. Alzheimer Dis Assoc Disord. 1997; 11 (suppl 2): S1-S12.

APPENDIX E: ABBREVIATED MENTAL TEST SCORE (AMTS)

Hodkinson, H. (1972). Evaluation of a mental test score for assessment of mental impairment the elderly
Age and Ageing 1, 233-238.

AMTS Abbreviated Mental Test Score	Surname _____ MRN _____
	Given names _____
	DOB ____ / ____ / ____ Sex F M
	AFFIX PATIENT LABEL HERE

	DATE	DATE
Each correct answer = 1 mark		
1. What is your age ?		
2. What is the time (to the nearest hour)?		
3. Address for recall at the end of the test – this should be repeated by the patient to ensure it has been heard correctly – 42 West Street		
4. What is the year ?		
5. What is the name of this hospital ?		
6. Can you recognise two people here (Dr, Nurse, carer etc)		
7. What is your date of birth ?		
8. What is the year of the 1st World War (1914 &/or 1918)?		
9. What is the name of the present Prime Minister ?		
10. Please count backwards from 20 - 1		
Remember to ask for the address stated in Q3.	TOTAL	

Equal to or less than 7 = possible cognitive impairment

Comments

Date: _____ **Signature & Designation of Assessor:** _____

APPENDIX F: SIX ITEM SCREENER (SIS)

Callahan, C.M. Univerzagt, F.W. Hui, S.L. Perkins, A. J. Hendrie, H.C (2002). Six-Item Screener to identify cognitive impairment among potential subjects for clinical research. *Medical Care*. 40(9), 771-781

	SCORE	MAX
<p>1. SAY TO YOUR PATIENT</p> <p>"I am going to name 3 objects remember what they are because I am going to ask you to name them again in a few minutes".</p> <p>"Please say the 3 items after me". (Say clearly & slowly – 1 second for each word)</p> <p style="text-align: center;">APPLE TABLE PAPER</p> <p>Keep giving trials for the 3 words until the patient has said all 3 (up to 6 trials)</p>		
<p>2. THEN ASK THE PATIENT TO NAME THE CURRENT</p> <ul style="list-style-type: none"> – DAY – MONTH – YEAR <p>Give 1 point for each correct answer</p>		3
<p>3. SAY – "NOW WHAT WERE THE 3 OBJECTS I ASKED YOU TO REMEMBER?"</p> <p>Give 1 point for each correct answer</p>		3
TOTAL		6

≤ 4 = cognitive impairment - further investigation needed

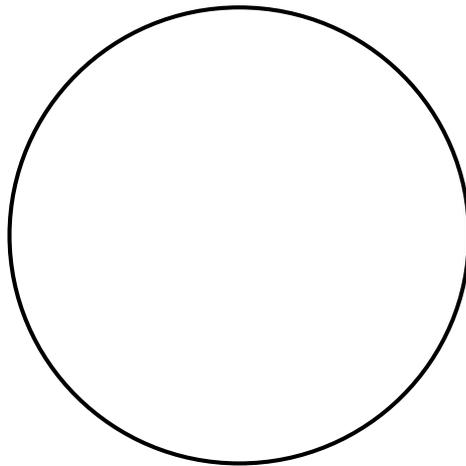
APPENDIX G: MINI-COG

Borson, S. Scanlan, J. Brush, M. Vitaliano, P. Domlakh A. (2000). The mini-cog :a cognitive vital signs measure of dementia screening in multi-lingual elderly, *International Journal Geriatric Psychiatry*,15(11), 1021-1027.

	SCORE	MAX
<p>1. SAY TO YOUR PATIENT ‘I AM GOING TO NAME 3 OBJECTS</p> <p>After I have said them I want you to repeat them. Remember what they are because I am going to ask you to name them again in a few minutes!</p> <p>‘Please say the 3 items for me’. (Say clearly & slowly – 1 second for each word)</p> <p style="text-align: center;">APPLE TABLE PAPER</p> <p>Keep giving trials for the 3 words until the patient has said all 3 (up to 6 trials)</p>		
<p>2. SAY – NOW WHAT WERE THE 3 OBJECTS I ASKED YOU TO REMEMBER?”</p> <p>Give 1 point for each correct answer</p> <p>≤ 3 = impairment - needs further investigation</p>		3

3. CLOCK-DRAWING TEST

Say to the subject: “Put the numbers on the clock and set the hands at ten minutes past eleven



Normal []

Abnormal []

All numbers present in correct sequence & position and hands readably displayed the requested time

APPENDIX H: ROWLAND UNIVERSAL DEMENTIA ASSESSMENT SCALE (RUDAS)

Storey J, Rowland J, Basic D, Conforti D & Dickson H [2004] *International Psychogeriatrics*, (16(1):13-31

www.health.qld.gov.au/northside/html/rudas.asp

Liverpool Hospital RUDAS Rowland Universal Dementia Assessment Scale

Affix ID Label Here	MRN	
Surname	Given Names	
Address	Suburb	Postcode
Date of Birth	Sex	AMO
Hospital Name	Ward	

Date: / /

ITEM

MEMORY

MAX
SCORE

INSTRUCTIONS

I want you to imagine that we are going shopping. Here is a list of grocery items. I would like you to remember the following items which we need to get from the shop. When we get to the shop in about 5 mins. time I will ask you what it is that we have to buy. You must remember the list for me. **Tea, Cooking Oil, Eggs, Soap.** Please repeat this list for me.

(Ask person to repeat the list 3 times. If person did not repeat all four words, repeat the list until the person has learned them and can repeat them, or, up to a maximum of five times.)

Visuospatial Orientation

I am going to ask you to identify/show me different parts of the body. (Correct = 1).
Once the person correctly answers 5 parts of this question, do not continue as the maximum score is 5.

- (1) show me your right foot
- (2) show me your left hand
- (3) with your right hand touch your left shoulder
- (4) with your left hand touch your right ear
- (5) which is (indicate/point to) my left knee
- (6) which is (indicate/point to) my right elbow
- (7) with your right hand indicate/point to my left eye
- (8) with your left hand indicate/point to my left foot

/5

Praxis

I am going to show you an action/exercise with my hands. I want you to watch me and copy what I do. Copy me when I do this . . . *(One hand in fist, the other palm down on table - alternate simultaneously).* Now do it with me: Now I would like you to keep doing this action at this pace until I tell you to stop – approximately 10 seconds. *(Demonstrate at moderate walking pace).*

Score as:

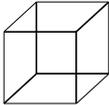
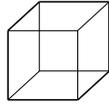
- | | |
|------------------------|--|
| Normal = 2 | (very few if any errors; self-corrected, progressively better; good maintenance; only very slight lack of synchrony between hands) |
| Partially Adequate = 1 | (noticeable errors with some attempt to self-correct; some attempt at maintenance; poor synchrony) |
| Failed = 0 | (cannot do the task; no maintenance; no attempt whatsoever) |

/2

Visuoconstructional Drawing

Please draw this picture exactly as it looks to you (Show cube on back of page). (Yes = 1)

Score as:

(1) Has person drawn a picture based on a square?		1
(2) Do all internal lines appear in person's drawing?		1
(3) Do all external lines appear in person's drawing?		1
		/3

Judgment

You are standing on the side of a busy street. There is no pedestrian crossing and no traffic lights. Tell me what you would do to get across to the other side of the road **safely**.
(If person gives incomplete response that does not address both parts of answer, use prompt: "Is there anything else you would do?") Record exactly what patient says and circle all parts of response which were prompted.

Score as:

Did person indicate that they would look for traffic?	(YES = 2; YES PROMPTED = 1; NO = 0)	2
Did person make any additional safety proposals?	(YES = 2; YES PROMPTED = 1; NO = 0)	2
		/4

Memory Recall

(Recall) We have just arrived at the shop. Can you remember the list of groceries we need to buy?

	Tea	2
	Cooking Oil	2
	Eggs	2
	Soap	2

(Prompt: If person cannot recall any of the list, say "The first one was 'tea'." (Score 2 points each for any item recalled which was not prompted – use only 'tea' as a prompt.))

/8

Language

I am going to time you for one minute. In that one minute, I would like you to tell me the names of as many different animals as you can. We'll see how many different animals you can name in one minute. *(Repeat instructions if necessary)*. Maximum score for this item is 8. If person names 8 new animals in less than one minute there is no need to continue.

1. _____	5. _____
2. _____	6. _____
3. _____	7. _____
4. _____	8. _____

TOTAL SCORE /30

APPENDIX I: CONFUSION ASSESSMENT METHOD (CAM)

Inouye, S. K., van Dyck, C. H., Alessi, C. A., Balkin, S., Siegel, A. P., & Horwitz, R. I. (1990). Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Annals of Internal Medicine*, 113(12): 941-48

CAM Confusion Assessment Method	Surname _____ MRN _____
	Given names _____
	DOB ____ / ____ / ____ Sex F M
	AFFIX PATIENT LABEL HERE

CONFUSION ASSESSMENT METHOD (CAM) (Inouye et al. 1990)

Consider the diagnosis of delirium if features 1 and 2 **and either** feature 3 or 4 are present

<p>1. Acute and fluctuating course</p> <p>Is there evidence of an acute change in mental status from the patient's baseline? Did the (abnormal) behaviour fluctuate during the day, that is, come and go, or increase and decrease in severity?</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> Uncertain (please specify)</p>	<p>3. Disorganised thinking</p> <p>Was the patient's thinking disorganised or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from one subject to another?</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> Uncertain (please specify)</p>
<p>2. Inattention.</p> <p>Did the patient have difficulty focussing attention during the interview, e.g. being easily distractible, or having difficulty keeping track of what was being said?</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> Uncertain (please specify)</p>	<p>4. Altered level of consciousness</p> <p>Overall, how would you rate this patient's level of consciousness?</p> <p><input type="checkbox"/> Alert (normal)</p> <p><input type="checkbox"/> Altered</p> <ul style="list-style-type: none"> • Vigilant (hyperalert, easily startled, overly sensitive to stimuli) • Lethargic (drowsy but easily aroused) • Stupor (difficult to arouse) • Coma (unrousable) • Uncertain

- Delirium symptoms present
- Delirium symptoms NOT present
- N/A

Date: _____

Signature of assessor & designation: _____

Medical Officer's signature: _____

APPENDIX J: COMMUNICATION AND CARE CUES FORM (CCC)

<p>Nursing Notes for Communication and Care Cues</p> <p>NORTHERN SYDNEY CENTRAL COAST NSW HEALTH</p>	Surname _____ MRN _____
	Given names _____
	DOB ____ / ____ / ____ Sex F M
	AFFIX PATIENT LABEL HERE

We realise that as a carer (spouse, partner, relative or friend) there may be important information that you would like us to know so that we can provide better care. Please can you **EXPLAIN** the significant things?

1. Does the patient have any **communication difficulties** (eg can't say what they may want to, can't understand etc)

2. How does the patient normally **move about** (eg by themselves, with walking stick or walking frame, holding on to the furniture etc)

3. Does the patient wear any **artificial aids** (eg dentures, hearing aid, glasses, limbs etc)?

4. What are the usual **hygiene habits** (eg showering/bathing, shaving, toileting, continence, denture management etc)?

5. Are there any **special food or drink** requirements or likes/dislikes (eg allergies, consistency, religious, milk/sugar etc)?:

6. What are the usual **sleeping habits** (eg bed time, waking time, pillows, blankets, position, night caps, settling routines etc)?

Does the patient SMOKE

YES [] NO []

Does the patient drink alcohol regularly

YES [] NO []

Please could you bring in some comforting personal items (eg toiletries, photos, rug, clothing, books, music etc) so that we can reassure and orientate your relative.

Preferred Name:

Where born :

Time lived in Aust:

Language Spoken at Home:

English ability:

Names of Adult **Family** Members (spouse, brothers, sisters, etc):

Names of **Children**:

Names of **Grandchildren**:

Names of **Other Special People or Pets**:

Cultural or Religious Practices:

Past Major **Occupation**:

Past **Hobbies or Interests**:

Occasions of Importance:

Other **special Issues and/or important habits**
(likes, dislikes, rituals, ways of doing things etc):

Name & relationship of person completing form

APPENDIX K: POST DISCHARGE GP LETTER

This letter can be sent to the local doctor with the discharge summary of patients with hip fractures. The recommendations regarding referral to an endocrinologist should be modified based on the local availability of services. If the patient will not be followed up in an outpatient clinic after discharge, another means of checking with the GP should be in place, such as an osteoporosis liaison service

Dear Dr _____

Re: Osteoporosis Treatment

I am writing to you regarding osteoporosis treatment in your patient who is being discharged after a hip fracture. In light of recent evidence, the following are my recommendations for **osteoporosis treatment post hip fracture** which should be individualised based on your knowledge of your patient:

1. Treatment with bisphosphonates in combination with calcium and vitamin D is recommended in the majority of patients after an osteoporotic (low trauma) hip fracture.
2. Serum 25-OH vitamin D levels should be normalised (> 75 nmol/L) prior to commencing a bisphosphonate. If the level was low in hospital and vitamin D replacement was commenced, the level should still be checked to confirm that the patient's serum 25-OH vitamin D level has been normalised. Please keep in mind that untreated hypocalcaemia is a contraindication for all bisphosphonates.
3. If there are no contraindications to taking oral bisphosphonates, such as symptomatic oesophagitis or gastritis, an oral bisphosphonate such as risedronate (Actonel) or alendronate (Fosamax), should be commenced after the fracture along with ongoing vitamin D (1000 IU) and calcium supplementation (1200mg).
4. If the patient has not tolerated an oral bisphosphonate in the past, or for some other reason is not suitable for oral treatment, the patient should be referred to our endocrine clinic for treatment with IV zoledronic acid (Aclasta).
5. If the patient has been taking a bisphosphonate prior to sustaining a hip fracture, this may have been ceased acutely at the request of the surgeon. Continuation/recommencement should be considered on an individual basis taking into account factors such as overall prognosis, functional and medical status and quality of life goals. In some patients, review by a bone specialist may be indicated.
6. Dental procedures, especially significant ones, such as dental extractions should be performed prior to commencing a bisphosphonate.

The background for these recommendations is an article published in the New England Journal of Medicine by Lyles et al. (357:2007), which presents the results of the HORIZON (Health Outcomes and Reduced Incidence with Zoledronic Acid Once Yearly) trial. This paper describes a randomised, controlled trial of 1065 hip fracture patients who could not tolerate or would not take oral bisphosphonates and who did not have bone mineral density measurements as an entry criterion, comparing an annual infusion of zoledronic acid 5 mg to placebo. The authors demonstrated a statistically significant reduction in vertebral fractures, non-vertebral fractures and mortality in the treated group. The sample was followed for a mean period of 1.9 years. Patients were checked for vitamin D deficiency and treated with calcium, vitamin D and any other osteoporosis treatments their treating doctors prescribed.

While this is a large, well-designed study, there are certain issues that need to be taken into consideration when applying the results of this company-sponsored trial to our patients: the patients in the trial were not as old (mean age of 74 years) or as frail (bedbound patients were excluded) as many of our patients. The decision to treat a patient post hip fracture still needs to be individualised by the medical practitioner who is most familiar with all aspects of the patient, such as comorbidity (which may be associated with a limited life expectancy) or the need for invasive dental work. While it is unlikely another such trial will be undertaken, we will probably continue to learn more in the future about the risks and benefits of treating hip fracture patients with bisphosphonates.

I would be happy to discuss this issue with you further, if I can be of any assistance.

Yours sincerely,

THE OTHOGERIATRIC MODEL OF CARE 2010 (cont'd)

Please also refer to the Summary of Evidence 2010 for further information.

- **Alternating mattresses** should be considered as a first line preventative strategy for elderly patients admitted with fractures.
- **High energy protein** preparations should commence 12 hours after surgery for hip fracture and other frail patients.
- Early identification and involvement of a **geriatric medical team** can reduce incidence, duration and severity of postoperative delirium.
- All relevant nonpharmacological measures should be implemented to **prevent & treat delirium** before medications are commenced, in order to avoid possible adverse effects and interactions.
- The preferred agents are antipsychotic medications, such as low dose haloperidol (0.5–1mg no more than every 8 hours) or risperidone (0.5mg up to bd), as needed for agitation, **after pain has been assessed and treated**.
- Patients admitted to hospital with fragility fractures, or older patients who have presented for an elective joint replacement but who are at risk of falling, require **assessment for osteoporosis**.
- **Replacement of vitamin D** for levels <75 nmol/L, along with calcium supplementation should commence, and if vitamin D-replete, commencement of bisphosphonates should be considered.

- Patients who were admitted from Nursing Home level care should be discharged back to their facility as soon as medically fit and in a timely manner, including:
- Oral intake has resumed
 - Indwelling catheter has been removed and urinary output confirmed
 - Oxygen saturation has returned to baseline
 - Bowels have opened during the hospital stay
 - Any medical issues likely to lead to rapid readmission have been stabilised.

It is best for these patients to receive slow stream rehabilitation in the own facility.

APPENDIX L:



THE OTHOGERIATRIC MODEL OF CARE 2010 QUICK REFERENCE GUIDE

Please also refer to the Summary of Evidence 2010 for further information.

ASSESSMENT FOR REHABILITATION

- Premorbid function and mobility
- Social support – residence, level of support in residence, current community supports, access to residence, including the number of steps.
- Relevant clinical conditions – refer to 'old' medical files
- Mental State – pre-existing cognition
- Postoperative weight-bearing status
- Rehabilitation goals and needs of patient

Rehabilitation for community or hostel-dwelling patients should be provided in a multidisciplinary setting.

* Cognition should be assessed postoperatively, after any delirium has resolved to establish the current level of cognitive function, using a formal screening test, such as the MMSE or RUDAS.

* The Estimated Date of Discharge (EDD) should be communicated to all members of the health team and documented during multidisciplinary case conferences, in the file, on the ward list of patients, and possibly at the bedside. The patient and the next of kin should also be aware of the discharge plan.

All patients admitted following a fall should be assessed and offered interventions to prevent further falls.

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THE ORTHOGERIATRIC MODEL OF CARE 2010

Please also refer to the Summary of Evidence 2010 for further information.

PREOPERATIVE CARE OF ACUTE ORTHOGERIATRIC PATIENT

- All patients should have a **comprehensive medical and nursing admission**.
- Patients with a hip or other fracture be **admitted to an acute surgical ward within four (4) hours**.
- Patients medically fit for surgery should be **operated on within 48 hours** of admission, during standard daytime working hours if possible.
- **Antibiotic prophylaxis** at the time of induction and continued for 48 hours is recommended.
- If there is a delay in surgery, DVT prophylaxis should **commence preoperatively** with mechanical devices (anti-embolic stockings or foot/ calf pumps) and/or a form of subcutaneous heparin.
- Clinical assessment of **fluid balance** is required. Routine preoperative **blood tests** should include: FBC, EUC, LFTs, Calcium, Magnesium, Phosphate, Coagulation studies, Group and Hold, 25-OH Vitamin D, as well as an ECG and chest x-ray, in addition to x-rays of any areas which may have been injured.
- Patients should be assessed for **cognitive impairment** and delirium pre and post operatively.
- Patient's **oxygen saturation** should be checked on admission to hospital monitored for at least 48hrs after surgery and then as required.
- **Regional anaesthesia** is associated with lower rate of VTE, earlier mobilisation and lower rates of delirium compared to a general anaesthesia.
- A **pain regime** should commence in the emergency department, with consideration of a femoral nerve block if possible.

POSTOPERATIVE MANAGEMENT

Pain control should be routinely assessed and documented. Pain scores may be helpful in managing the pain in some patients. Avoid NSAIDs.

Example of Pain Management Regimen

Paracetamol 1 gram 3-4 times a day routinely.
Oxycodone 2.5 mg three times a day routinely.
Oxycodone 2.5mg to 5mg every 4 hours as needed for breakthrough pain.

KEY MESSAGES

- Increasing older population
- Between June 2005-2006 in NSW, 3,332 people >65 yrs were admitted with a fracture of the neck of femur
- Older people have increased risks for medical complications
- Orthogeriatric Model of Care has been shown to reduce medical complications by 21%, mortality by 3% and readmission within 6 months by 20%
- In a survey in 2009 only 3 out of 28 NSW hospitals had best practice models of orthogeriatric care
- Up to 50% of people admitted with a minimal trauma fracture will be re-admitted with a further fracture
- Those with a further fracture will have an average length of stay in hospital of 22 days.

- Continuation of **DVT Prophylaxis**: Mechanical prophylaxis, such as compression stockings and intermittent compression devices reduce the incidence of VTE in addition to pharmacological prophylaxis.
- Monitor **fluid and electrolyte status** regularly on the fluid balance chart to enable prompt management.
- Patients are encouraged to **sit out of bed** and begin mobilising the day after surgery, within 24 hours or as determined by the surgeon.
- Early intervention to **prevent constipation** is essential. Regular laxatives should be charted with/ without stool softeners.
- The **indwelling catheter should be removed** as early as possible, preferably 24 hours after surgery, ensuring that there is no faecal impaction.
- **Routine transfusion** in asymptomatic patients with haemoglobin levels > 80g/L may not be required.
- The **surgical wound** should be disturbed as little as possible.

GLOSSARY

ABG	Arterial Blood Gas	IM	Intramuscular
ACI	Agency for Clinical Innovation	JMO	Junior Medical Officer
AHS	Area Health Service	IDC	Indwelling Catheter
AMTS	Abbreviated Mental Test Score	IU	International Units
BP	Blood Pressure	IV	Intravenous
BMD	Bone Mineral Density	IVC	Intravenous Cannula
BMI	Body Mass Index	IVF	Intravenous Fluids
Ca	Calcium	LDUH	Low Dose Unfractionated Heparin
CAM	Confusion Assessment Method	LFTs	Liver Function Tests
CCF	Congestive Cardiac Failure	LMWH	Low Molecular Weight Heparin
CNC	Clinical Nurse Consultant	LVEF	Left Ventricular Ejection Fraction
COPD	Chronic Obstructive Pulmonary Disease	MMSE	Mini Mental State Examination
CRF	Chronic Renal Failure	MNA	Mini Nutritional Assessment
CRP	C-Reactive Protein	NBM	Nil By Mouth
CT	Computed Tomography	NSAIDs	Non Steroidal Anti-Inflammatory Drugs
ECG	Electrocardiogram	NUM	Nursing Unit Manager
EUC	Electrolytes Urea Creatinine	O ₂	Oxygen
DEXA/DXA	Dual-Energy X-ray Absorptiometry	PTH	Parathyroid Hormone
DVT	Deep Venous Thrombosis	PRN	Pro Re Nata – as needed but not more often than 4th hourly
EDD	Estimated Date of Discharge	QT	Represents the duration of activation and recovery of the ventricular muscle measured during an ECG
ESPEN	European Society of Parental and Enteral Nutrition	RMO	Resident Medical Officer
FBC	Full Blood Count	TFTs	Thyroid Function Tests
FEV	Forced Expiratory Volume	SERMs	Selective Oestrogen Receptor Modulators
FFP	Fresh Frozen Plasma	SIGN	Scottish Intercollegiate Guidelines Network
FVC	Forced Vital Capacity	SIS	Six Item Screener
GCS	Graduated Compression Stockings	WHO	World Health Organisation
GP	General Practitioner	VTE	Venothromboembolism
Hb	Haemoglobin		
HRT	Hormone Replacement therapy		
INR	International Normalised Ratio – blood clotting test		

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