

Provincial Clinical Knowledge Topic

Hip Fracture, Adult – Emergency

V 1.0

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Revision History

Version	Date of Revision	Description of Revision	Revised By
1.0	March 2017	Topic completed and disseminated	See Acknowledgements

Important Information Before You Begin

The recommendations contained in this knowledge topic have been provincially adjudicated and are based on best practice and available evidence. Clinicians applying these recommendations should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care. This knowledge topic will be reviewed periodically and updated as best practice evidence and practice change.

The information in this topic strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards and align with Quality and Safety initiatives and accreditation requirements such as the Required Organizational Practices. Some examples of these initiatives or groups are: Health Quality Council Alberta (HQCA), Choosing Wisely campaign, Safer Healthcare Now campaign etc.

Within this knowledge topic PICO-D questions or key clinical questions that have been used to guide research using the **P**opulation/**P**roblem, **I**ntervention, **C**omparison, **O**utcome, **D**esign format.

Rationale

Nationally in 2005 the Minister of Health and Long Term Care committed to achieving a 48-hour surgical repair target for hip fracture patients.¹ In 2008 an Orthopedic Expert Panel was convened to help organization develop and implement a strategy to optimize the flow of these patients from the Emergency Department (ED) to surgery, decreasing wait times, with a goal of reaching a 48-hour 90th percentile target.² Delays in surgical repair leads to increases in morbidity and mortality, and less successful post-op rehabilitation^{2,3,4,5,6,7} with the odds of a patient dying within the first year nearly doubling for patients with operative delays greater than 48 hours.^{2,7}

While hip fracture prevention programs are being undertaken our elderly population continues to grow significantly. In 2011 those aged 65 and older constituted 14% of the Canadian population; by 2031 that number will be 22%. Currently 2% are 85 and older, by 2031 it is expected to be 4%.⁸

While most hip fractures are attributable to falls, numerous factors place patients at increased risk. Key demographic variables include: increasing age, female, Caucasian, and low socio-economic status. A number of systemic diseases also contribute including osteoporosis, stroke, diabetes, stroke, and others. Medications, past medical history, nutrition, body habitus, and life style also contribute. Individually or in combination these factors lead to muscle weakness, balance problems, hypotension, reduced mobility, dementia or decreased visual acuity contributing to falls.^{9,10,11}

According to Alberta data provided by the Bone and Joint Strategic Clinical Network there has been a steady increase in hip fracture admissions across the province in keeping with a growing and aging population. There were 2354 in 2011-12, 2515 in 2012-13, and 2708 in 2013-14 with a clear expectation that this trend will continue. The table below shows a breakdown by zone and also shows the frequency of patients requiring transfer from their presenting site to an Orthopedic surgical site within the zone or from outside the zone. With the goal of surgery within 48 hours of injury time ranges from transferring to receiving site are also included.

Table1. Alberta Hip Fracture Data

Zone	Fiscal Year	Hip Fracture Patients	Transfer within zone	Transfer from other zone	Transfer site to Surgery site (range in median days)
South	2011-12	251	65	1	0.24 – 0.34
	2012-13	280	84	6	0.28 – 0.42
	2013-14	295	81	0	0.29 – 0.43
Calgary	2011-12	763	106	6	0.32 – 0.44
	2012-13	791	125	6	0.31 – 0.48
	2013-14	905	142	12	0.3 – 0.38
Central	2011-12	287	173	1	0.83 – 0.95
	2012-13	251	126	0	0.84 – 0.9
	2013-14	262	101	0	0.74 – 0.91
Edmonton	2011-12	928	293	176	0.94 – 1.09
	2012-13	1069	312	181	0.96 – 1.39
	2013-14	1131	317	182	1.12 – 1.37
North	2011-12	125	65	0	0.14 – 0.35
	2012-13	124	55	0	0.35 – 0.48
	2013-14	115	51	0	0.36 – 0.49

Reference: Data provided by Data Integration and Management Resources (DIMR) to the Bone and Joint Strategic Clinical Network, 2014.

The timely and appropriate assessment of patients with suspected hip fractures in the emergency department, including effective pain control, identification and management of co-morbidities, and early transfer to an Orthopedic receiving hospital are important goals for the care of these patients. The following evidence informed Emergency Medicine knowledge in collaboration with our Orthopedic colleagues will help support the delivery of high quality, patient centered emergency care.

Goals of Management

1. ABC: Protect airway, prevent aspiration, support ventilation, volume resuscitate as needed
2. Rule out other associated injuries that may accompany a hip injury
3. Consider the possibility of syncope or other medical etiology leading to the hip fracture
4. Provide appropriate pain control to provide comfort during the initial workup and stabilization
5. Arrange for timely clarifying imaging for patients with clinical evidence of hip fracture but not confirmed on standard imaging
6. Identify active co-morbidities requiring concurrent management during fracture care and recovery to communicate with Orthopedics
7. Coordinate with Orthopedic colleagues to try to ensure surgical repair within 36 to 48 hours of the injury
8. Mitigate delirium risk whenever possible and be alert to early identification and management if it develops

Nursing Assessment and Documentation

This section contains specific considerations related to this topic. Standard assessment and documentation practices should still be followed.

1. Triage Assessment/Documentation
 - Canadian Emergency Department Information Systems (CEDIS) complaints:
 - Lower extremity injury¹²
 - Canadian Triage and Acuity Scale (CTAS) Modifiers:
 - Pain modifier most discriminatory, obvious deformity as a level 3 special modifier if pain only mild¹²
2. Initial Assessment/Documentation
 - Presenting History: Time of injury and mechanism of injury. If not witnessed try to identify when they were last seen prior to the injury (extended time down is a risk for rhabdomyolysis)?
 - Past History: Previous fractures, history of bone hypodensity, history of malignancy, diabetes, chronic cardiac or respiratory disease
 - Social History: Pre injury housing (e.g. own home, senior's living, care facility, etc.) and functional status (e.g. independent living, requires assistance, bed bound, etc.) and use of community services (e.g. home care, palliative care, meals on wheels, etc.)
 - Pre-Operative Risk Factors for Delirium ([PICO 1](#))
 - Taking psychotropic or narcotic agents
 - Cognitive impairment / dementia
 - Depression
 - Increased number of co-morbidities
 - Hip fracture +/- inadequately controlled pain

- Living in a long term care facility
- Functional impairment
- Visual and hearing impairment
- Systems review:
 - Neurology:
 - The Confusion Assessment Method (CAM) Diagnostic Algorithm (see [Appendix A](#))
Does the patient exhibit:
 1. Acute onset and fluctuating course of confusion
 2. Inattention
 If the answer is yes to both do they exhibit either:
 3. Disorganized thinking
 4. Altered level of consciousness
 If the answer to 3 or 4 is yes, then the patient likely is exhibiting delirium
 - Extremities: leg shortening, external rotation, pulses, sensation
 - Other: recent falls
- 3. Scoring Tools/Scales (see [Appendix A](#) and [Appendix B](#))
 - CAM Diagnostic Algorithm
 - Pain Scales

Physician Assessment and Documentation

This section contains specific considerations related to this topic. Standard assessment and documentation practices should still be followed.

1. History of Present Illness
 - Time of injury and mechanism of injury; if a fall then determine whether it was a trip or there was some neurologic/consciousness alteration that precipitated the fall
2. Past History
 - Previous fractures, history of bone hypodensity, history of malignancy, diabetes, chronic cardiac or respiratory disease, other significant past medical history
3. Pre-Operative Risk Factors for Delirium ([PICO 1](#))
 - Taking psychotropic or narcotic agents
 - Cognitive impairment / dementia
 - Depression
 - Increased number of co-morbidities
 - Hip fracture +/- inadequately controlled pain
 - Living in a long term care facility
 - Functional impairment
 - Visual and hearing impairment

4. Social History
 - Pre injury housing (e.g. own home, senior's living, care facility, etc.) and functional status (e.g. independent living, requires assistance, bed bound, etc.) and use of community services (e.g. home care, palliative care, meals on wheels, etc.)
5. Physical Examination
 - Focused exam to determine presence or absence of hip fracture signs such as: leg shortening, external rotation, pulses and sensation.
 - General exam looking for additional signs of trauma, respiratory difficulty, or surgical risk factors
6. Scoring Tools / Risk Scores (see [Appendix A](#))
 - CAM Diagnostic Algorithm

Initial Decision Making

1. Is the patient unstable with their suspected hip fracture (hemodynamically or with severe respiratory distress or altered level of consciousness)?
 - Considerations:
 - Look for further trauma to the head, chest, abdomen or pelvis requiring immediate stabilization and diagnostic confirmation. If no evidence of further trauma look for a medical cause requiring stabilizing interventions.
2. Is the patient hemodynamically stable with no change to their pre-injury cognitive function?
 - Considerations:
 - Focus on providing adequate analgesia and get the appropriate diagnostic and preoperative imaging.
 - Once a hip fracture is confirmed contact the Orthopedic service to arrange for admission or transfer to a hip fracture centre with the goal of surgical repair within 36 to 48 hours of the injury.
 - Assess cognitive function, risk stratify patient for delirium, and mitigate risk by providing adequate pain control, avoiding over sedation, maintaining hydration, and helping patient maintain time and place orientation.
3. Is there an alternate diagnosis consider?
 - Considerations:
 - Hip dislocation, pelvic fracture, contusion, malignancy, abscess, etc.

Order Set: Hip Fracture, Adult – Emergency

Order Set Components

Order Set Keywords: fractured hip, delirium, transfer, femoral nerve block

Order Set Requirements: Allergies

Risk Assessment / Scoring Tools / Screening: see [Appendix A, B and C](#)

Goals of Care Designation

- Utilize appropriate goal of care
 - Important for this group of patients as many are elderly and other may have terminal diseases such as cirrhosis or GI malignancy. Use of the appropriate Goal of Care designations will help ensure investigations and management are consistent with the patients' preferences.

Precautions and Safety

- Consider need for soft restraints for patients with dementia and restlessness

Activity

- Bedrest

Diet / Nutrition

- NPO
- NPO – May Have Sips, May Take Meds
- NPO – May Have Ice Chips
- Clear Fluids
- Regular Diet
- Other Diet : _____

Patient Care Orders

- Vital Signs: Vital Signs to include: respiratory rate (RR), pulse rate (P), blood pressure (BP), temperature (T), and oxygen saturation (O2 Sat)
 - as per [provincial guideline](#)
 - manual or automatic
 - every _____ hourly
 - every _____ minute(s)
- Neurological Vital Signs: These orders need to be re-evaluated when the patient stabilizes or by two hours, whichever occurs first. Neurological Vital Signs to include Glasgow Coma Scale (GCS), and pupillary size and reaction to light with reassessments:
 - as per [provincial guideline](#)
 - every _____ hourly
 - every _____ minute(s)
 - Note: The physician should be notified if a patient's GCS decreases by 2 points.
- Distal neurovascular assessment of the affected limb and regular monitoring as per local standards,
 - as per local standards
 - every __ hourly
 - every __ minute(s)

- Pain score and documentation using a 10-point Visual Analogue Scale (VAS) score or Faces Pain Scale (see [Appendix B](#) Pain Scales)
- Measure and record output (+/- input) [1,2,4] hourly
- Foley catheter as per physician order ([PICO 2](#))
- Application of the CAM Diagnostic Algorithm ([PICO 3](#))
- Avoid delirium triggers such as dehydration, over sedation or disorientation where possible (provide necessary IV fluids, hearing aids, glasses, and awareness of time and location wherever possible) ([PICO 4](#))
- Repositioning protocol based on Braden Risk Score (see [Appendix C](#))
- Pressure Ulcer Prevention Strategies if Braden Score is 18 or less.

Respiratory Care

- O₂ Therapy - Titrate to Saturation, Maintain: O₂ Saturation greater than or equal to 92% or patient baseline
- O₂ Therapy: _____ Lpm via _____ (*specify device*) to maintain oxygen saturation greater than or equal to _____%, unless otherwise specified
 - Oxygen Saturation options reserved for patients with specific concerns such as Chronic Obstructive Pulmonary Disease (COPD). If Oxygen Saturation is already adequate, no supplemental oxygen is required.
- Notify physician if oxygen flow required to be increased by greater than 2 LPM to maintain the same level of oxygenation or if there is a progressive increase in the work of breathing

Intravenous Orders

- Intravenous Cannula – Insert
- Saline Lock
- IV Bolus:
 - sodium chloride 0.9% bolus _____ mL over _____ minutes(s)
 - lactated ringers bolus _____ mL over _____ minutes(s)
- IV Maintenance:
 - sodium chloride 0.9% infusion at _____ mL/hour, reassess after _____ hours
 - lactated ringers infusion at _____ mL/hour, reassess after _____ hours

Lab Investigations

Hematology

- Complete Blood Count (CBC)
- PT INR ([PICO 5](#))

Transfusion Medicine

- Type and screen (*if at the surgical receiving site*)

Chemistry

- Electrolytes (Na, K, Cl, CO₂)
- Glucose
- Creatinine

Other Labs *(based on presentation needs of the patient)*

Transfusion Medicine

- Crossmatch _____ Unit(s) on standby / to infuse

Chemistry

- Urea
- Magnesium (Mg) [\(PICO 6\)](#)
- Calcium (Ca)
- Troponin

Blood Gases

- Blood Gas Venous
- Blood Gas Arterial

Urine Tests

- Urinalysis
- Pregnancy Test, Urine
- Urine Culture

Diagnostic Investigations

Standard X-Rays

- Chest X-ray, 1 Projection: (anterior-posterior)
- Pelvis X-ray, 1 Projection: (anterior-posterior)
- Hip X-ray, 2 Projections (anterior-posterior and lateral)
 - Right hip
 - Left hip
- Femur X-ray, Unilateral (anterior-posterior and lateral) if prior injury or surgery
 - Right Femur
 - Left Femur

Advanced Imaging *(decision to be made through discussion with Radiologist)* [\(PICO 7\)](#)

- CT Pelvis: Additional Info to DI Tech: CT Hips
 - o Indications: in patients with clinically suspected hip fracture but non diagnostic plain films or plain films suggestive of acetabular fracture, CT can be used to help clarify
- MR Pelvis Enhanced (Magnetic Resonance Imaging [MRI] Hip): Additional Info to DI Tech: MR Iliac
 - o Indications: in patients with clinically suspected hip fracture but non diagnostic plain films MRI is the most sensitive test to identify an occult fracture

Other *(for all patients over 50 years of age)*

- Electrocardiogram (ECG) – 12 Lead

Medications

Narcotic Analgesics^{13,14} Based on the Numeric Rating Scale for Pain (where 0 is no pain and 10 is worst possible pain) consider the following medications for pain control: [\(PICO 8, 9\)](#)

***For “susceptible patients” defined as elderly, frail, low body mass, systemically unwell, or on medications known to cause sedation or lower blood pressure we recommend decreasing narcotic dosing by 50%.*

Note: dose reductions, due to risk of opioid-induced sedation and respiratory depression are required for the elderly and obese patients with poor respiratory reserve. HYDROmorphine is preferred in renal failure as it does not accumulate like morphine metabolites do.

For Susceptible Patients:

Morphine

To achieve a pain score of LESS than 4/10 in accord with patient request give:

- morphine 1.25 to 2.5 mg IV once

OR

- morphine 1.25 to 2.5 mg IV every 10 minutes (contact physician or nurse practitioner if pain not controlled after administration of 7.5 mg total)

AND THEN to maintain a pain score of LESS than 4/10 in accord with patient request give:

- morphine 1.25 to 2.5 mg IV/SUBCUTANEOUSLY every 2 hours PRN

OR

HYDROmorphine

To achieve a pain score of LESS than 4/10 in accord with patient request give:

- HYDROmorphine 0.25 to 0.5 mg IV once

OR

- HYDROmorphine 0.25 to 0.5 mg IV every 10 minutes (contact physician or nurse practitioner if pain not controlled after administration of 1.5 mg total)

AND THEN to maintain a pain score of LESS than 4/10 in accord with patient request give:

- HYDROmorphine 0.25 to 0.5 mg IV/SUBCUTANEOUSLY every 2 hours PRN

OR

fentaNYL

To achieve a pain score of LESS than 4/10 in accord with patient request give:

- fentaNYL 25 mcg IV once

OR

- fentaNYL 25 mcg every 10 minutes IV (contact physician or nurse practitioner if pain not controlled after administration of 100 micrograms total)

For Previously Well Patients:

Morphine

To achieve a pain score of LESS than 4/10 in accord with patient request give:

- morphine 2.5 to 5 mg IV once

OR

- morphine 2.5 to 5 mg IV every 10 minutes (contact physician or nurse practitioner if pain not controlled after administration of 15 mg total)

AND THEN to maintain a pain score of LESS than 4/10 in accord with patient request give:

- morphine 2.5 to 5 mg IV/SUBCUTANEOUSLY every 2 hours PRN

OR

HYDRORomphone

To achieve a pain score of LESS than 4/10 in accord with patient request give:

- HYDRORomphone 0.5 to 1 mg IV once

OR

- HYDRORomphone 0.5 to 1 mg IV every 10 minutes (contact physician or nurse practitioner if pain not controlled after administration of 3 mg total)

AND THEN to maintain a pain score of LESS than 4/10 in accord with patient request give:

- HYDRORomphone 0.5 to 1 mg IV/SUBCUTANEOUSLY every 2 hours PRN

OR

fentaNYL

To achieve a pain score of LESS than 4/10 in accord with patient request give:

- fentaNYL 25 to 50 mcg IV once

OR

- fentanyl 25 to 50 mcg every 10 minutes IV (contact physician or nurse practitioner if pain not controlled after administration of 150 micrograms total)

Nerve Block

- Femoral nerve block 5 ml BUPivacaine 0.5% ([PICO 10, 11](#))

Antinauseants ([PICO 12](#))

- ondansetron tab 8 mg PO every 8 hours PRN for nausea/vomiting

OR

- ondansetron DISINTEGRATING tablet 4 to 8 mg sublingual every 8 hours PRN (*should be considered primarily for actively vomiting patients without IV access*)

OR

- metoclopramide 5 mg IV every 6 hours PRN

Manage Anticoagulation Medications (*for patients at high risk for clotting [mechanical heart valve or VTE] in last 3 months discuss with surgeon*)

- Hold direct oral anticoagulants (e.g. dabigatran, rivaroxaban, apixaban)

- Hold warfarin, administer 5 mg Vitamin K PO **OR**;

if surgery expected within 12 hours and requested by the accepting Surgeon, administer 5 mg Vitamin K IV once (*recommend dilute in 50 mL of NS or D5W and run over 10 to 30 minutes*)

- Last warfarin dose – Date: _____ Time: _____

Relevant Guidelines, Procedures, Protocols and Clinical Knowledge Topics

Procedures - Physician

- Ultrasound guided femoral nerve block

Guidelines

- [Provincial Hip Fracture Care Pathway Toolkit](#)

Disposition Planning

1. Considerations for admission ([PICO 13, 14](#))
 - Radiologic indications of hip fracture require admission for surgical repair unless otherwise stipulated in the Goals of Care.
 - A majority of hospitals across the province have no Orthopedic surgical services and as a result need to transfer these patients for admission. To improve efficiency, safety, and consistency a provincial standardized approach has been developed. (see [Appendix D](#)) is Clinical Transfer Information Form. In addition a set of holding orders has been developed for those patients awaiting transfer to the receiving institution (see [Appendix E](#)). As part of the transfer process it is important for the referring physician to confirm with the accepting Orthopedic surgeon anticipated time to surgery to determine whether to continue NPO or to maintain the patient's caloric intake until a designated time.
2. Considerations for discharge
 - Rarely patients who are bed bound and in a long term care setting, especially if their Goals of Care are comfort measures only, may reject or their family may reject surgical care and in those cases may go back to their originating facility.
3. Patient education / discharge instructions
 - There are no emergency department discharge instructions as these patients are almost universally admitted.
 - A "Patient waiting on Call" information sheet is available for those patients being held at their presenting institution awaiting transfer (see [Appendix F](#))

Rural Considerations

The major challenges and considerations from a rural perspective are:

1. The need to transfer these patients to an Orthopedic center. This requires speaking with an accepting Orthopedic Surgeon and then working with them and AHS to determine the timing of transfer, the location of transfer, the most appropriate means of transport, and finding the space and clarifying the necessary holding orders for those transfers that will be delayed.
2. Arrangements can be made by calling
 - RAAPID NORTH: 1-780-735-0400 OR 1-800-282-9911 or;
 - RAAPID SOUTH: 1-403-944-4488 OR 1-800-661-1700
 - The RAAPID nursing staff can coordinate consulting services, and transport services, and emergency departments providers from the receiving hospital all on the same line to ensure transfer arrangements are made with maximum efficiency
3. A number of laboratory tests are not readily available in rural hospitals without having to send samples out to a central lab. As such only those lab tests locally available and important to support the initial emergency assessment and stabilization should be drawn there.

Patient Experience and Expectations

Based on a meeting with 8 patient advisors in Calgary January 25, 2015, we received the following feedback and general recommendations regarding approaches to communication, care and patient expectations in the emergency department (ED):

1. They hoped we would be able to improve care consistency among ED providers.

Patient quote: "Every time I presented to the emergency department with the same condition (atrial fibrillation), each doctor provided a different treatment approach."

2. They were supporters of care pathways, checklists, protocols, etc. wherever appropriate.

Patient quote: "I am a strong supporter of care pathways as whenever I/my family member receive treatment using a pathway the care seems clearer and more consistent"

3. While none of the patients liked long waits, they could accept them better if there was clearer communication and reassessments as required.

Patient quote: "Nobody likes to wait and I understand that sicker patients take priority, however, there needs to be improved communication and reassessments for those patients who are waiting"

4. They pointed out the importance of having a patient advocate accompany a sick person, but also allowing the advocate to be with the patient at decision critical points (e.g. initial assessment, treatment decision making, receiving bad news, etc.) was considered paramount.

Patient quote: "When I accompany my family member to the ED I am often not permitted to join them when they are moved into a treatment space. I am often told this is 'policy'."

5. They believe that improving follow up, especially for patients being discharged from the ED and being referred to a specialist is important. This was recognized as a key safety risk for patients; having to rely on faxed referrals and a call back from the consultant's office can lead to dangerous delays or failed connections to the detriment of the patient's health and well-being.

Patient quote: “The current health care system is poorly coordinated with lots of gaps and delays, especially with referrals from one physician to another.”

Preparation for Analytics

1. Key Outcomes

- Clinical Outcomes
 - Time from injury to hip fracture surgery less than 48 hours
 - Time from injury to hip fracture surgery less than 36 hours
 - Pain was managed and maintained at a VAS score of less than or equal to 4 without an altered level of consciousness
 - Measures to decrease the incidence of delirium, including adequate food and hydration, avoiding restraints and early transfer to a quiet environment were undertaken
- Process Outcomes
 - Consistent nurse and physician adherence to the transfer process and pathway
 - The CAM score was utilized to identify delirium early
- Patient Experience
 - Felt their pain was recognized and managed early and appropriately
 - Were provided a clear explanation of their injury, the need for transfer to a surgical site, and the steps along the way

2. Data Elements for Capture

- Patient demographics
- CEDIS presenting complaint and CTAS score
- ED time markers (triage to physician, physician to consult and then to admission or physician to discharge) and outcome markers (identified as Clinical Decision Unit (CDU) patient, consulted for admission, admitted to ICU or ward, died)
- ED hip fracture diagnoses
- Site and zone identifiers
- Date, time and dose of analgesic ordering
- Date and time of Orthopaedic consultation
- Date and time of transfer request and time of departure from transferring site
- Date and time of arrival at and admission to receiving hospital
- Date and time of CT or MRI to confirm/diagnose hip fracture
- Delirium (based on a standard definition) incidence and where identified (transferring site/ED, ED in Surgical receiving hospital, or after admission to the ward)
- Date and time of CT or MRI to confirm/diagnose hip fracture
- Date and time of hip fracture surgical repair
- Date and time of discharge from hospital postoperatively
- Discharge destination (rehabilitation, sub-acute, home of origin, long term care)

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Clinical Questions & Recommendations

Clinical Questions help us to ask pertinent information about the knowledge topic in order to facilitate finding an evidence based answer that will guide decision making. Working groups have the option of identifying 2-3 key clinical questions. The questions chosen will then be prioritized using a Likert scale and evidence search strategy determined. Clinical questions may be formulated based on the PICO format as supported by Sackett¹ and Guyatt² in their User's Guide to the Medical Literature to define the clinical question. PICO-D format identifies the patient problem or population (P), intervention (I), comparison (C) and outcome(s) (O).

1. Sackett D, Richardson WS, Rosenberg W, Haynes RB. How to practice and teach evidence based medicine. 2nd ed. Churchill Livingstone; 1997.
2. Guyatt GH, Oxman AD, Vist GE, et al; for the GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008; 336(7650):924-926.

GRADE Methodology - Used to address quality of evidence and strength of recommendations of answers to the clinical questions. Whenever possible answers are identified from recent high quality guidelines or high quality systematic reviews and recommendations provided are based on GRADE definitions. Where guidelines or systematic reviews are not available to answer certain questions rapid reviews are undertaken and/or a consensus approach used to try to answer clinically relevant questions. **Only where the evidence is supportive and the benefits clearly outweigh the harm is a “we recommend” strength of recommendation applied.**

Table 1. GRADE Quality of Evidence¹

High GRADE A	We have high confidence that the true effect lies close to that of the estimate of the effect.
Moderate GRADE B	We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low GRADE C	Our confidence in the effect estimate is low: The true effect may be substantially different from the estimate of the effect.
Very low GRADE D	We have very low confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

Table 2. GRADE Strength of Recommendations¹

Strong GRADE 1	Strong recommendation, with desirable effects clearly outweighing undesirable effects/burdens (or vice versa). Wording of Recommendation: We recommend in favor of / We recommend against....
Weak GRADE 2	Weak recommendation, with desirable effects closely balanced with undesirable effects. Wording of Recommendation: We suggest in favor of / We suggest against
Insufficient evidence or no consensus	Wording of Recommendation: There is insufficient evidence or the confidence in the effect estimates is so low that the panel is unable to make a recommendation regarding....

1. Guyatt GH, Oxman AD, Vist GE, et al; for the GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008; 336(7650):924-926.

PICO Question 1: *In patients brought to the emergency department are there preoperative risk factors for developing delirium?*

Population: Emergency Department patients presenting with a hip fracture

Intervention: Factors that put patients at risk for delirium

Comparison: Factors that put patients at low risk for delirium

Outcomes: Identifying patients at risk for delirium

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: Delirium is a common complication in patients presenting with hip fractures with cognitive impairment, older age, functional impairment, sensory impairment, depression, preoperative psychotropic drug use, psychopathological symptoms, living in a long term care institution, and greater comorbidities were all associated with a higher risk of developing post-operative delirium.^{1,2}

Quality of Evidence: Moderate, GRADE B. We are moderately confident in the effect estimate

Strength of Recommendation: Strong, GRADE 1

References:

1. Dasgupta M, Dumbrell AC. Preoperative risk assessment for delirium after noncardiac surgery: a systematic review. *J Am Geriatr Soc* 2006;54(10):1578-89.
2. NICE. Delirium: prevention, diagnosis and management, 2010. <https://www.nice.org.uk/guidance/qs63/resources/delirium-in-adults-2098785962437> (accessed 17/06/2016).

PICO Question 2: *In patients brought to the emergency department with a hip fracture is there an alternative to the routine use of an indwelling foley catheter to manage urination?*

Population: Patients brought to the emergency department with hip fracture

Intervention: Indwelling foley catheter

Comparison: No indwelling foley catheter

Outcomes: Prevention of urinary tract infections, atonic bladder

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: We recommend that indwelling catheters should be avoided if possible to decrease the risk of UTI. Intermittent catheterization maybe a viable alternative to indwelling catheters if catheterization is required. Despite this finding it is recognized that from a nursing care perspective and the need to prevent soiled linens and skin breakdown a limited time with an indwelling catheter may be necessary.

The SIGN 2009 guidelines could not find any quality evidence for the use of urinary catheterization in hip fracture patients and should be avoided except in cases of urinary incontinence, a long journey, there is concern of urinary retention or when monitoring renal/cardiac function. Additionally, the 2010 Bone & Joint Health network guidelines also recommend avoiding indwelling catheters due to a high incidence of UTI.

The extended use of indwelling urinary catheters in hospitalized or postoperative patients have been shown to increase the likelihood of UTI, potentially increasing hospital length of stay (Sedor 1999, Schumm 2008; Wald 2005). A non-randomized trial found intermittent catheters has been shown to reduce the occurrence of UTI and decrease hospital stays compared to indwelling catheters in postoperative elderly patients with hip fractures (Johansson 2002). A randomized controlled trial found that post-operative elderly patient receiving intermittent catheterization returned to satisfactory voiding sooner than patients with indwelling catheters (Skelly 1992). No differences were found in UTI rates between the two groups.

Quality of Evidence: Moderate, GRADE B. We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.

Strength of Recommendation: GRADE 1, Strong.

References:

1. Johansson I, Athlin E, Frykholm L, Bolinder H, Larsson G. Intermittent versus indwelling catheters for older patients with hip fractures. *Journal of Clinical Nursing* 2002; 11:651-656.
2. Sedor J, Mulholland SG. Hospital-acquired urinary tract infections associated with the indwelling catheter. *Urol Clin North Am* 1999; 26(4):821-8.
3. Schumm K, Lam TBI. Types of Urethral catheters for management of short-term voiding problems in hospitalized adults: a short version Cochrane review. *Neurourology and Urodynamics* 2008; 27:738-46.
4. Scottish Intercollegiate Guideline Network. Management of hip fracture in older people, a national clinical guideline. 2009. Available at <http://www.sign.ac.uk/pdf/sign111.pdf>, Accessed March 2015.
5. Skelly JM, Guyatt GH, Kalbfleisch R, et al. Management of urinary retention after surgical repair of hip fracture. *CMAJ* 1992; 146: 1185-1189.
6. Waddell J, McMullan, Lo N, O'Connor M, Sheppard L, Mensour M, Palda V, McGlasson R. Improving time to surgery-emergency room, preoperative and immediate postoperative clinical practice guidelines for the management of hip fracture patients. Bone & Joint Health Network 2010. Available at http://boneandjointcanada.com/wp-content/uploads/2014/05/ER-Pre-op-Clinical-Practice-Guidelines-20101101_Final.pdf, Accessed March 2015
7. Wald H, Epstein A, Kramer A. Extended use of indwelling urinary catheters in postoperative hip fracture patients. *Med Care* 2005; 43(10):1009-17.

PICO Question 3: *In patients brought to the emergency department with a suspected hip fracture can the Confusion Assessment Method (CAM) be effectively utilized by emergency nurses to identify patient exhibiting delirium?*

Population: Patients brought to the emergency department with hip fracture

Intervention: Confusion Assessment Method (CAM)

Comparison: Standard nursing care

Outcomes: Identification of patients exhibiting delirium

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: We suggest that nurses can implement the CAM on elderly patients presenting to the ED with hip fracture recognizing the potential for decreased sensitivity to detect delirium when administered by non physicians. There is some evidence to suggest that alternate versions of the CAM, including the CAM-ICU or the bCAM when administered with delirium triage screen, may be appropriately administered by nursing staff.

A systematic review was completed assessing screening tools for delirium in the ED (LaMantia 2014). The review included 22 articles, of which 7 different screening instruments were used, including: the CAM, CAM-ICU, CAM-ED, the organic brain syndrome scale, diagnostic and statistical manual criteria, the delirium rating scale, and the NEECHAM confusion scale. The review found only one instrument (the CAM) was validated for use on elderly patients presenting to the ED. There is some evidence to suggest that the sensitivity of the CAM tool decreases when administered by non-physicians (Monette 2001). An additional study validated the use of the CAM-ICU tool, which found modest sensitivity, but high specificity (Han 2014). The study suggests that the CAM-ICU can be performed by physicians and non-physicians in the ED including nursing staff. Another study implemented a two-step screening process which can be implemented by physicians and non-physicians (Han 2013). The first step includes the delirium triage screen, in which altered level of consciousness is measured using the Richmond agitation sedation scale and asking patients to spell lunch backwards. Patients who are scored as positive for potential delirium than receive a modified CAM, referred to as the brief CAM (bCAM). This method was found to be highly sensitive and specific for detecting delirium in elderly ED patients.

Quality of Evidence: Low, Grade C. Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect. Evidence is based on non-randomized controlled trials.

Strength of Recommendation: GRADE 2, Weak

References:

1. Han JH, Wilson A, Vasilevskis EE, Shintani A, Schnelle JF, Dittus RS, Graves AJ, Storrow AB, Shuster J, Ely EW. Diagnosing delirium in older emergency department patients: Validity and reliability of the delirium triage screen and the brief confusion assessment method. *Ann of Emerg Med* 2013; 62(5): 457-465.

2. Jan JH, Wilson A, Graves AJ, Shintani A, Schnelle JF, Dittus RS, Powers JS, Vernon J, Storrow AB, Ely EW. Validation of the confusion assessment method for the intensive care unit in older emergency department patients.
3. LaMantia MA, Messina FC, Hobgood CD, Miller DK. Screening for delirium in the emergency department: A systematic review. *Ann Emerg Med* 2014; 63:551-560.
4. Monette J, Galbaud du Fort, G, Fung SH, Massoud F, Moride Y, Arsenault L, Afilalo M. Evaluation of the confusion assessment method (CAM) as a screening tool for delirium in the emergency room. *General Hospital Psychiatry* 2001; 23: 20-25.

PICO Question 4: *In elderly patients who are in pain and out of their environment in the emergency department are there effective measures to decrease the risk of delirium?*

Population: Elderly patients with hip fracture in the emergency department

Intervention: Preventative interventions

Comparison: Standard ED care

Outcomes: Incidence of delirium

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: We suggest that adequate pain relief but avoidance of excessive sedation, geriatric consultation, maintenance of hydration, and strategies targeted at orientation can mitigate delirium risk in these patients.

The 2009 SIGN guidelines state that effective pain relief for postoperative patients is associated with reduced occurrence of delirium. The 2010 Bone & Joint guidelines states that hip fracture patients are at a high risk for delirium before and after surgery. Intervention protocols for delirium should be established and implemented for patients presenting to the ED including a review of risk factors, assessing symptoms of delirium using a screening tool such as the Confusion assessment method, assess and manage underlying causes and effective pain management, and various prevention strategies targeted at orientation, early mobilization, non-pharmacological approaches to reduce psychoactive drug use, sleep hygiene, adaptive equipment for visual and hearing impairment, and early intervention for volume depletion. The guidelines recommend that geriatric consultation may reduce the occurrence and severity of delirium undergoing surgery for hip fracture. Medication should be considered for some patients. Rehabilitation through mobilization should be started within 24 hours after surgery

A Cochrane review was conducted on interventions for preventing delirium in hospitalized patients (Siddiqi 2007). The review identified one randomized trial examining patients with hip fractures (Marcantonio 2001). Hospitalized patients were randomized to receive pro-active geriatric consultation, or usual care. The geriatric consultation included daily visits by a geriatrician during the patient's hospital stay who provided patients recommendations based on a structured protocol. Geriatric consultation significantly reduced delirium compared to usual care.

Another non-randomized study (Bjorkelund 2010) developed a multi-factorial program to reduce the occurrence of dementia in patients undergoing surgery for hip fracture; including supplemental oxygen, IV fluid supplementation and extra nutrition, increased monitoring of vital physiological parameters, adequate pain relief, avoid delay in patient transfer, screen for delirium via daily testing with the OBS scale, avoiding polypharmacia, and provide a perioperative/anesthetic period. The occurrence of delirium was decreased in patients who underwent the program.

Quality of Evidence: Moderate, GRADE B. We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.

Strength of Recommendation: GRADE 2, Weak

References:

1. Bjorkelund KB, Hommel A, Thorngren KG, Gustafson L, Larsson S, Lundberg D. Reducing delirium in elderly patients with hip fracture: a multi-factorial intervention study. *Acta Anaesthesiol Scand* 2010; 54:678-688.
2. Marcantonio ER, Flacker JM, Wright RJ, Resnick NM. Reducing Delirium after hip fracture: A randomized trial. *J Am Geriatr Soc* 2001; 49:516-522.
3. Scottish Intercollegiate Guideline Network. Management of hip fracture in older people, a national clinical guideline. 2009. Available at <http://www.sign.ac.uk/pdf/sign111.pdf>, Accessed March 2015.
4. Siddiqi N, Holt R, Britton AM, Holmes J. Interventions for preventing delirium in hospitalised patients. *Cochrane Database of Systematic Reviews* 2007, Issue 2. Art. No.: CD005563. DOI: 10.1002/14651858.CD005563.pub2.

PICO Question 5: In surgical patients with a hip fracture is routine vs selective, based on a history of suspicious bleeding risk, preoperative ordering of PTT and INR indicated?

Population: Surgical patients with a hip fracture

Intervention: Routine preoperative ordering of PTT and INR

Comparison: Selective preoperative ordering of PTT and INR based on a history of suspicious bleeding risk

Outcomes: Prevention of surgical complications

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: There is insufficient evidence to recommend the routine measurement of PTT and INR preoperatively. Chee et al on behalf of the British committee for Standards in Haematology made several recommendations in 2008 based on a systematic review of the literature. These included: 1. A bleeding history including detail of family history, previous excessive post-traumatic or postsurgical bleeding and use of anti-thrombotic drugs

should be taken in all patients preoperatively and prior to invasive procedures. (Grade C, Level IV); 2. Indiscriminate coagulation screening prior to surgery or other invasive procedures to predict postoperative bleeding in unselected patients is not recommended. (Grade B, Level III); and 3. If the bleeding history is negative, no further coagulation testing is indicated. (Grade C, Level IV). Fowler and Perry in their 2014 review supported the need for pre operative haemostasis testing only if there is a history of or anticipated risk of peri operative bleeding.

The 2003 NICE guidelines on the use of routine preoperative tests for elective surgery did suggest that haemostasis testing should be considered for patients with comorbid cardiovascular disease, renal dysfunction, or over 80 years of age.

The Provincial Hematology Network Co-Chaired by Dr Tony Morris and Wendy Corbierre recommended that we remove PTT from our order sets because PTT is neither sensitive nor specific for global clotting factor deficiencies such as can occur with liver failure, consumptive coagulopathy or massive hemorrhage. In this context the PT-INR is somewhat more sensitive due to its dependence on FVII levels which have the shortest half-life of all the clotting factors. A fibrinogen level would be a more useful second line test than a PTT in most circumstances, as fibrinogen is often more quickly depleted than other factors. However fibrinogen levels are not available at most smaller centres and patients suspected of having a global clotting factor deficiency need to be transferred to larger centre anyway.

In summary, the PTT provides no clinical advantage outside the two following scenarios:

- a) Heparin monitoring (or assessment of some of the novel oral anticoagulants)
- b) Within the context of a comprehensive hemostasis investigation

Quality of Evidence: Low, GRADE C. Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect. Evidence is based on non-randomized controlled trials.

Strength of Recommendation: There is insufficient evidence to recommend routine hematology testing.

References:

1. Fowler A, Perry DJ. Laboratory monitoring of haemostasis Anaesthesia 2015, 70 (Suppl. 1), 68–72.
2. Chee YL, Crawford JC, Watson H, Greaves M. Guidelines on the assessment of bleeding risk prior to surgery or invasive procedures. British Journal of Haematology 2008; 140: 496–504.
3. NICE. Preoperative tests: The use of routine preoperative tests for elective surgery, 2003. <http://www.nice.org.uk/guidance/cg3> (accessed 18/09/2014).

PICO Question 6: *In surgical patients with a hip fracture what are the indications for ordering calcium, magnesium, albumin, TSH or B12?*

Population: Surgical patients with a hip fracture

Intervention: Measurement of blood calcium, magnesium, albumin, TSH or B12 levels

Comparison: No measurement of blood calcium, magnesium, albumin, TSH or B12 levels

Outcomes: Prevention of surgical complications

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: There is insufficient evidence and lack of consensus to make a recommendation regarding the indications for ordering calcium, magnesium, albumin, TSH, or B12 in hip fracture patients presenting to the ED. No studies, reviews, or guidelines could be identified.

Quality of Evidence: Very Low, GRADE D. We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

Strength of Recommendation: There is insufficient evidence.

PICO Question 7: *In patients with clinically suspicious hip fractures but non diagnostic plain films is MRI or CT superior to make a definitive diagnosis?*

Population: Patients with clinically suspicious hip fractures but non diagnostic plain films

Intervention: MRI

Comparison: CT scan

Outcomes: Definitive diagnosis of hip fracture

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: It is suggested that in accordance with the NICE 2011 guidelines recommendation, physicians should offer an MRI if patient presents with a suspicious hip fractures but had a negative x-ray. If a MRI is not available within 24 hours or is contraindicated, CT is recommended. The SIGN 2009 guidelines state that MRI is the investigation of choice when there is doubt regarding the diagnosis of a hip fracture. If MRI is not available, then a radioisotope bone scan or a repeat of plain radiographs (24-48 hrs later) should be ordered.

Quality of Evidence: Very Low, GRADE D. We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

Strength of Recommendation: Weak, GRADE 2

References:

1. National Institute for Health and Care Excellence. Hip fracture: the management of hip fracture in adults. 2011. Available at <http://www.nice.org.uk/guidance/cg124/resources/guidance-hip-fracture-pdf>, Accessed March 2015.
2. Scottish Intercollegiate Guideline Network. Management of hip fracture in older people, A national clinical guideline. 2009. Available at <http://www.sign.ac.uk/pdf/sign111.pdf>, Accessed March 2015.

PICO Question 8: *In patients brought to the emergency department with a suspected hip fracture are intravenous narcotics titrated to patient pain response safe and effective?*

Population: Patients brought to the emergency department with a suspected hip fracture

Intervention: Intravenous narcotics titrated to patient pain response

Comparison: Standard care

Outcomes: Prevention of complications (safety), pain control (effectiveness)

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: It is suggested that intravenous narcotics are safe for acute pain in the emergency department and routinely underutilized. A systematic review provides dosing recommendations of 0.1 mg/kg q 10-15 mins. prn or hydromorphone 0.015 mg/kg q 10-15 mins to target a pain score of $\leq 4/10$ in consultation with the patient.¹ In elderly patients (> 65 years) hydromorphone 0.5 mg and repeated in 15 mins prn led to comparable pain control and decreased opioid dosing than usual care.² In adult ED patients aged 21-64 a hydromorphone protocol of 1 mg IV plus 1 mg IV 15 mins later was safe and more effective controlling pain than standard care.³

The 2009 SIGN guidelines recommend that pain relief should be given as quickly as possible using intravenous opiate titrated for effect.⁴ The 2011 NICE guidelines recommend that patients should be offered paracetamol for pain relief. Additional opioids should be offered if paracetamol does not provide adequate pain relief.⁵

Quality of Evidence: Low, GRADE C. Our confidence in the effect is limited: The true effect may be substantially different from the estimate of effect.

Strength of Recommendation: Weak, GRADE 2

References:

1. Patanwala AE, Keim SM, Erstad BL. Intravenous opioids for severe acute pain in the emergency department. *Ann of Pharmacol* 2010;44:1800-09.
2. Chang AK, Bijur PE, Davitt M, Gallagher EJ. Randomized clinical trial of an intravenous hydromorphone titration protocol versus usual care for management of acute pain in older emergency department patients. *Drugs Aging* 2013;30:747-54.
3. Chang AK, Bijur PE, Davitt M, Gallagher EJ. Randomized clinical trial comparing the safety and efficacy of a hydromorphone titration protocol to usual management of adult emergency

- department patients with acute severe pain. *Ann Emerg Med* 2011;58(4):352-9.
4. Scottish Intercollegiate Guideline Network. Management of hip fracture in older people, a national clinical guideline. 2009. Available at <http://www.sign.ac.uk/pdf/sign111.pdf>, Accessed March 2015.
 5. National Institute for Health and Care Excellence. Hip fracture: the management of hip fracture in adults. 2011. Available at <http://www.nice.org.uk/guidance/cq124/resources/guidance-hip-fracture-pdf>, Accessed March 2015.

PICO Question 9: *In patients brought to the emergency department with a suspected hip fracture are intravenous narcotics titrated to patient pain more effective than subcutaneous narcotics given in a fixed dose and fixed dosing schedule?*

Population: Patients brought to the emergency department with a suspected hip fracture

Intervention: Intravenous narcotics titrated to patient pain response

Comparison: Subcutaneous narcotics given using a fixed dosing schedule

Outcomes: Pain control (effectiveness)

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: It is recommended that intravenous opioids have a more rapid onset and are easier to titrate than subcutaneous or intramuscular for acute severe pain.¹ The Canadian, US and UK consensus guidelines for management of severe pain in the ED recommend the intravenous over subcutaneous or intramuscular route for rapid and safe pain control.^{2,3,4}

Quality of Evidence: Low, Grade C. Our confidence in the effect is limited: The true effect may be substantially different from the estimate of effect.

Strength of Recommendation: Weak, GRADE 2

References:

1. McQuay H. Opioids in pain management. *Lancet* 1999;2229-32.
2. Ducharme J. Emergency pain management: A Canadian Association of Emergency Physicians consensus document. *J Emerg Med* 1994;12:855–66.
3. Acute pain management guideline panel : *Acute pain management: Operative or medical procedures and trauma: Clinical practice guideline*. Washington DC: US Department of Health and Human Services, 1992.
4. Kelly AM. A process approach to improving pain management in the emergency department: development and evaluation. *J Accid Emerg Med* 2000;17:185–187.

PICO Question 10: *In emergency department patients with a hip fracture is a femoral nerve block more effective than narcotics in controlling pain?*

Population: Patients in the emergency department with a hip fracture

Intervention: Femoral nerve block

Comparison: Opioid analgesics

Outcomes: Pain control (effectiveness)

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: We suggest that femoral nerve block may be more effective in inducing pain relief, and reducing the amount of additional analgesics required to maintain pain relief. Current evidence suggests that patients undergoing femoral nerve block do not experience additional side effects than treatment with opioids alone. Only two randomized controlled trials are available, one of which was non-blinded and in children. The other study provided femoral nerve block in adjunction with opioid treatment.

The 2011 NICE guidelines recommend that physicians should consider adding nerve blocks if paracetamol and opioids do not provide adequate pain relief, or as a way to reduce opioid use.

A randomized blinded, controlled study was identified which compared ultrasound-guided three-in-one femoral nerve block in adjunct with parenteral opioids vs. parenteral opioids alone to reduce pain in adult (≥ 55 yrs) presenting to the ED with hip fractures (Beaudoin 2013). The study found that femoral nerve block was more effective in reducing pain and decreased the amount of rescue analgesia compared to opioids with no additional side effects. A systematic review on the effectiveness of nerve blocks for pain management of femoral fractures in children presenting to the ED (Black 2013) identified one non-blinded randomized study which compared the effectiveness of anatomically-guided fascia iliaca compartment nerve block vs. morphine to reduce pain. The study found patients receiving compartment nerve block had reduced likelihood of analgesia failure, required fewer additional analgesics, longer median duration of analgesia, and lower CHEOPS (Children's Hospital of Eastern Ontario Pain Scale) scores (Wathen 2007).

Quality of Evidence: Moderate, GRADE B. We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different. Only two randomized trials identified, one of which provided nerve blocks in adjunction with opioid treatment.

Strength of Recommendation: GRADE 2, Weak

References:

1. Beaudoin FL, Haran JP, Liebmann O. A comparison of ultrasound-guided three-in-one femoral nerve block versus parenteral opioids alone for analgesia in emergency department patients with hip fractures: A randomized controlled trial. *Academic Emergency Medicine* 2013; 20(6):584-591.

2. Black KJL, Bevan CA, Murphy NG, Howard JJ. Nerve blocks for initial pain management of femoral fractures in children. *Cochrane Database of Systematic Reviews* 2013, Issue 12. Art. No.: CD009587. DOI: 10.1002/14651858.CD009587.pub2.
3. National Institute for Health and Care Excellence. Hip fracture: the management of hip fracture in adults. 2011. <http://www.nice.org.uk/guidance/cg124/resources/guidance-hip-fracture-pdf>, Accessed March 2015.
4. Wathen JE, Gao D, Merritt G, Georgopoulos G, Battan FK. A randomized controlled trial comparing a fascia iliaca compartment nerve block to a traditional systemic analgesic for femur fractures in a pediatric emergency department. *Ann Emerg Med* 2007; 50:162-171.

PICO Question 11: In emergency department patients with a hip fracture are emergency physicians fast and effective in performing an ultrasound guided femoral nerve block?

Population: Patients in the emergency department with a hip fracture

Intervention: Ultrasound guided femoral nerve block performed by emergency physician

Comparison: Ultrasound trained pain control specialists

Outcomes: Pain control (effectiveness)

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: It is suggested that trained emergency physicians can safely and effectively perform femoral nerve within 8 minutes and can improve pain relief and decrease the dosing requirements for rescue analgesia.^{1,2} Beaudoin 2013 suggests that since many emergency physicians are familiar with ultrasound guided procedures, ultrasound guided nerve block would be an easy procedure that can be completed by emergency doctors. Haines 2012 found that after brief training, emergency physicians were easily able to complete ultrasound-guided fascia iliaca compartment block.^{2,3}

The 2011 NICE guidelines recommend that nerve blocks should be administered by trained personnel, but does not clarify whom those personnel should be.⁴

Quality of Evidence: Very Low, GRADE D. We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect. Limited studies assessing the effectiveness and efficiency of physicians to perform ultrasound guided nerve block was available.

Strength of Recommendation: GRADE 2, Weak.

References:

1. Beaudoin FL, Nagdev A, Merchant RC, Becker BM. Ultrasound-guided femoral nerve blocks in elderly patients with hip fractures. *Am. J. Emerg. Med.* 2010;28(1):76-81.
2. Beaudoin FL, Haran JP, Liebmann O. A comparison of ultrasound-guided three-in-one femoral nerve block versus parenteral opioids alone for analgesia in emergency department

patients with hip fractures: A randomized controlled trial. *Academic Emergency Medicine* 2013; 20(6):584-591.

3. Haines L, Dickman E, Ayvazyan S, Pearl M, Wu S, Rosenblum D, Likourezos A. Ultrasound-guided fascia iliaca compartment block for hip fractures in the emergency department. *The journal of emergency medicine* 2012; 43(4): 692-697.
4. National Institute for Health and Care Excellence. Hip fracture: the management of hip fracture in adults. 2011. <http://www.nice.org.uk/guidance/cg124/resources/guidance-hip-fracture-pdf>, Accessed March 2015.

PICO Question 12: *In elderly patients (with clinically suspicious hip fractures) should dimenhydrinate be avoided?*

Population: Elderly patients with clinically suspicious hip fractures

Intervention: Dimenhydrinate

Comparison: No dimenhydrinate

Outcomes: Excessive drowsiness, increased frequency of delirium,

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: We suggest that antihistamines be used with caution in elderly patients due to the increased risk of delirium, especially in susceptible populations. Marcantonio reported an odds ratio of 1.8, 0.7-4.5. for delirium risk among post operative surgical patients. Agostini reported an increased risk of delirium among hospitalized medical patients, 70 years of age and older receiving diphenhydramine (relative risk [RR], 1.7; 95% CI, 1.3-2.3), with a dose-response relationship demonstrated for most adverse outcomes. Rothberg et al in 2013 reported an increase in hospital-acquired delirium (adjusted odds ratio of 1.22, 95% CI = 1.09-1.36) among 225,028 patients aged 65 and older admitted to one of 374 US hospitals between September 2003 and June 2005.

Quality of Evidence: Moderate, GRADE B. We are moderately confident in the effect estimate.

Strength of Recommendation: GRADE 2, Weak.

References:

1. Rothberg MB, Herzig SJ, Pekow PS, Avrunin J, Lagu T, Lindenauer. Association between sedating medications and delirium in older inpatients. *J Am Geriatr Soc* 2013;61:923–930,
2. Clegg A, Young JB. Which medications to avoid in people at risk of delirium: a systematic review. *Age and Ageing* 2011;40:23-29.
3. Agostini J, Leo-Summers LS, Inouye SK. Cognitive and other adverse effects of diphenhydramine use in hospitalized older patients. *Arch Intern Med* 2001;161:2091-97.
4. Marcantonio ER, Juarez G, Goldman L, Mangione CM, Ludwig LE, Lind L, Katz N, Cook EF, Orav EJ, Lee TH. The relationship of postoperative delirium with psychoactive medications. *JAMA* 1994;272(19):1518-22.

PICO Question 13: *In elderly patients being admitted from the emergency department does early transfer to the ward decrease the incidence of delirium compared to those held in the emergency department?*

Population: Elderly patients admitted as inpatient from the emergency department

Intervention: Early transfer to ward

Comparison: Held in emergency department, delayed transfer to ward

Outcomes: Incidence of delirium

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: The 2009 SIGN guidelines state that while there is no evidence to suggest that fast tracking improves patient outcomes.

Quality of Evidence: Very Low, Grade D. We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

Strength of Recommendation: There is insufficient evidence and lack of consensus to make a recommendation regarding whether early transfer to the ward decreases the incidence of delirium.

References:

1. Scottish Intercollegiate Guideline Network. Management of hip fracture in older people, a national clinical guideline. 2009. Available at <http://www.sign.ac.uk/pdf/sign111.pdf>, Accessed March 2015.

PICO Question 14: *In patients brought to the emergency department with a hip fracture what is the optimal time for surgical repair support safe and speedy recovery?*

Population: Patients brought to the emergency department with hip fracture

Intervention: Surgical repair of hip fracture

Comparison: Timing of surgical repair

Outcomes: Prevention of complications, morbidity, mortality, safety

Design: Systematic reviews and clinical trials

Search Strategy: Cochrane library, Medline, and Pubmed for systematic reviews and clinical trials. Guidelines were checked.

Clinical Recommendation: We suggest that surgery take place as soon as possible (within 24-48 hrs) after the patient presents to the hospital with hip fracture. There is some evidence to suggest that early surgeries reduce the risk of mortality among non-randomized trials.

NICE guidelines recommend that surgery should be performed the day of or the day after admission. No source of the evidence for that recommendation was provided. The SIGN guidelines states, that patients should receive surgery as soon as possible, within safe

operating hours (including weekends), after presenting to the hospital with hip fracture. Short delays in surgery can be justified to correct conditions such as hypo- and hyperkalaemia, cardiac failure, diabetes, or significant anaemia. While a few studies found no evidence that early surgery reduces mortality in patients with hip fracture (Grimes 2002, Majumdar 2006). A systematic review, however, which included 16 non-randomized trials found that delaying surgery to more than 24-72 hours from the time of admission increased the risk of mortality within 30 days by 44% (95% CI, 33-55%) and one year mortality by 33% (95% CI, 22-44%) (Shiga 2008). An additional systematic review (which did not conduct an extensive literature search, as well as no meta-analysis) suggested that early surgery for hip fracture reduced length of stay in hospital, and may reduce mortality (Khan 2009). Another review (Moja 2012) conducted a meta-analysis of 35 studies found early hip surgery reduced the odds of mortality (OR=0.74, 95% CI, 0.67-0.81).

Studies published since then have also reported improved health outcomes (Sircar 2007) and reduced mortality (Carretta 2011, Uzoigwe 2013) among patients with hip fracture receiving early surgery. Librero 2012 found however, that age of the patient, as well as the occurrence of additional comorbidities were associated with mortality, not the timing of the surgery.

Early surgery is associated with reduced length of stay (Orosz 2004, Bergeron 2006, Siegmeth 2005) and reduced pain (Orosz 2004). Another non-randomized study found that patients with delayed surgery were less likely to return to independent living within 4 months after surgery (Al-Ani 2008) reduced hospital stay and potentially reduced mortality.

Quality of Evidence: Low, Grade C. Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect. None of the included studies are randomized controlled studies.

Strength of Recommendation: Grade 2, Weak.

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Appendix A - The Confusion Assessment Method (CAM) Diagnostic Algorithm

The Confusion Assessment Method (CAM) Diagnostic Algorithm:

<http://insite.albertahealthservices.ca/8927.asp>

Feature 1: *Acute Onset and Fluctuating Course* This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions:

Is there evidence of an acute change in mental status from the patient's baseline AND did the (abnormal) behavior fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?

YES =2 NO=0

Feature 2: *Inattention* This feature is shown by a positive response to the following question: Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?

YES=2 NO=0

Feature 3: *Disorganized thinking* This feature is shown by a positive response to the following question:

Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

YES=1 NO=0

Feature 4: *Altered Level of consciousness* This feature is shown by any answer other than "alert" to the following question:

Overall, how would you rate this patient's level of consciousness? (alert [normal]), vigilant [hyperalert], lethargic [drowsy, easily aroused], stupor [difficult to arouse], or coma [unarousable])

ALERT=0 NOT ALERT=1

The diagnosis of delirium by CAM requires the presence of features 1 and 2 and either 3 or 4. (SCORE greater than or equal to 5)

Appendix B - Pain Scales

Numerical Rating Scale (NRS)

The Numerical Rating Scale (NRS) is a self-reporting tool that is useful when assessing procedural, acute and chronic pain.

Patients must be capable of counting up to 10 (most commonly used scale is the 10-point) and understand the concepts of classification and seriation. They must also have sufficient language comprehension & production, and understanding of emotional states.

Ask the patient to assign a number to his/her pain with 10 representing no pain and 10 representing the worst pain ever.

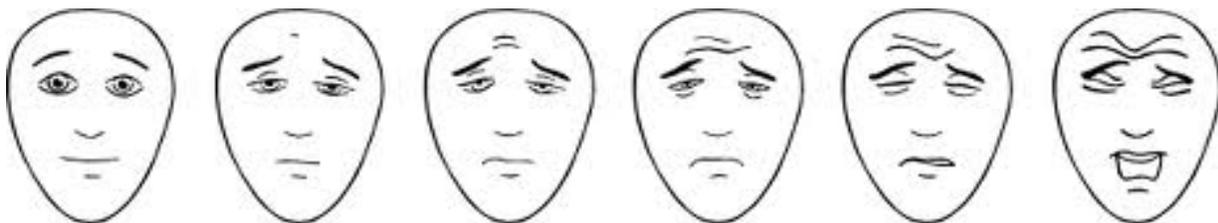
“If 0 is no pain or hurt and 10 is the worst pain imaginable, how much pain or hurt are you having now”

Faces Pain Scale – Revised

The Faces Pain Scale – revised (FPS-R) is a self-report tool that is useful when assessing procedural, acute and chronic pain.

Ask the patient to indicate which face indicates how much hurt or pain they are feeling. Do not use words like ‘happy’ and ‘sad’. This scale is intended to measure how the patient feels inside, not how their face looks.

“These faces show how much someone is hurting. This face {point to left-most face} shows no pain. The faces more and more pain {point to each from left to right} up to this one {point to right-most face} – it shows very much pain. Point to the face that shows how you hurt {right now}”



Score the chosen face 0, 2, 4, 6, 8, 10 counting left to right so 0 =no pain and 10 = very much pain.

Appendix C - Repositioning Protocol/Braden Risk Score

Braden Risk Score Assessment Tool, Alberta Health Services
<http://insite.albertahealthservices.ca/frm-10144.pdf>

Prevention protocols linked to Braden risk scores are as follows:

- At risk: score of 15 to 18
 - Frequent repositioning turning; use a written schedule
 - Maximize patient's mobility
 - Protect patient's heels
 - Use a pressure-reducing support surface if patient is bedbound or chairbound
- Moderate risk: score of 13 to 14
 - Same as above, but provide foam wedges for 30-degree lateral position
- High risk: score of 10 to 12
 - Same as above, but add the following:
 - Increase the turning frequency
 - Do small shifts of position
- Very high risk: score of 9 or below
 - Same as above, but use a pressure-relieving surface
 - Manage moisture, nutrition, and friction/shear

Appendix D - Clinical Transfer Information Form

<http://insite.albertahealthservices.ca/frm-09277-sample.pdf>

		Affix patient label within this box	
Inter-Facility Patient Transfer To request Inter-Facility Transfer, please use iRequest or call 1.877.661.6710 Provincially Form faxed to receiving facility if requested/required? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Transfer Information			
Physician order for IFT <input type="checkbox"/> Yes <input type="checkbox"/> No		Date of transfer	
Patient ID band on? <input type="checkbox"/> Yes <input type="checkbox"/> No		Primary language	Interpreter required? <input type="checkbox"/> Yes <input type="checkbox"/> No
Legal status <input type="checkbox"/> N/A <input type="checkbox"/> Voluntary <input type="checkbox"/> Formal, Form #		<input type="checkbox"/> 1 <input type="checkbox"/> 6 <input type="checkbox"/> 10 Other _____ <input type="checkbox"/> Forensic	
Notification of transfer Patient aware <input type="checkbox"/> Yes <input type="checkbox"/> No Family <input type="checkbox"/> Yes <input type="checkbox"/> No Family physician <input type="checkbox"/> Yes <input type="checkbox"/> No Receiving physician <input type="checkbox"/> Yes <input type="checkbox"/> No Physician's Name _____ Personal Directive* <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Goals of Care order* <input type="checkbox"/> Yes <input type="checkbox"/> No Goals of Care Designation R _____ M _____ C _____ *Where these exist, an original must accompany the patient		<input type="checkbox"/> Next of kin <input type="checkbox"/> Caregiver <input type="checkbox"/> Guardian <input type="checkbox"/> Substitute decision maker Name _____ Relationship _____ Phone _____ Family Physician _____ Phone _____ <input type="checkbox"/> Unknown Living arrangements <input type="checkbox"/> Independently <input type="checkbox"/> Residential facility <input type="checkbox"/> In-home support	
Sending Practitioner		Phone	Position
Facility		Unit	Phone
Principal diagnosis/problem		Reason for transfer	
Medical history/Co-morbidities			
Allergies <input type="checkbox"/> None known <input type="checkbox"/> Yes (attach COPY of Allergies)		Alerts <input type="checkbox"/> none <input type="checkbox"/> Bariatric (Note abdominal width in cm) _____ <input type="checkbox"/> Falls risk _____ <input type="checkbox"/> VRE <input type="checkbox"/> MRSA <input type="checkbox"/> Infectious precautions <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Contact <input type="checkbox"/> Contact/droplet <input type="checkbox"/> Airborne <input type="checkbox"/> Recently out of country <input type="checkbox"/> Pressure ulcer risk (Bradley Scale) _____ <input type="checkbox"/> Skin condition <input type="checkbox"/> Smoker <input type="checkbox"/> Skin integrity <input type="checkbox"/> Other _____	
Medications <input type="checkbox"/> None <input type="checkbox"/> Med Reconciliation Form <input type="checkbox"/> Yes (attach current Medication Administration Record)		<input type="checkbox"/> Diabetic _____ (insulin scale attached) <input type="checkbox"/> Deaf <input type="checkbox"/> Blind <input type="checkbox"/> Mute	
Height (cm)	Weight (kg)	<input type="checkbox"/> Actual <input type="checkbox"/> Stated <input type="checkbox"/> Not Available	
Baseline CPS score _____ (from Bathing/Dressing MDS 2.0 Inter RAI)	Functional Status Mental Status _____ A _____ O _____ Feeding _____ Transfer _____ Ambulation _____	Indep <input type="checkbox"/> Asst <input type="checkbox"/> Depend <input type="checkbox"/>	Alerts and Swallowing Fasting <input type="checkbox"/> Yes <input type="checkbox"/> No Diet _____ Restrictions _____ Safe swallow strategies Medication <input type="checkbox"/> Crushed <input type="checkbox"/> Whole Enteral feeding <input type="checkbox"/> NG <input type="checkbox"/> PEG Regime and food sent <input type="checkbox"/> Yes <input type="checkbox"/> No
Mental/cognitive/behaviour <input type="checkbox"/> No issues <input type="checkbox"/> Cognitive impairment <input type="checkbox"/> Post-traumatic amnesia <input type="checkbox"/> Verbal aggression <input type="checkbox"/> Physical aggression <input type="checkbox"/> Sleep disturbance <input type="checkbox"/> Resistant to care <input type="checkbox"/> Acquired brain injury		<input type="checkbox"/> GCS _____ <input type="checkbox"/> Delirium <input type="checkbox"/> Dementia <input type="checkbox"/> Depression <input type="checkbox"/> Wanderer <input type="checkbox"/> Harm to self <input type="checkbox"/> Harm to others <input type="checkbox"/> Elopement risk <input type="checkbox"/> Other _____	
Restraints <input type="checkbox"/> Not applicable <input type="checkbox"/> Chemical _____ <input type="checkbox"/> Physical _____		Continence <input type="checkbox"/> No issues <input type="checkbox"/> Fecal incontinence <input type="checkbox"/> Urinary incontinence <input type="checkbox"/> Intermittent catheter <input type="checkbox"/> Indwelling catheter Date inserted _____ <input type="checkbox"/> Stoma/colostomy	
09277(Rev.2015-10)	Original - Accompanies Patient	Canary - Patient Chart	Page 1 of 2



Affix patient label within this box

Inter-Facility Patient Transfer

Personal Items	Facility	Patient	Family	Attached copy of (check all that apply)	
<input type="checkbox"/> Clothing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Physician letter	<input type="checkbox"/> Allied health letter
<input type="checkbox"/> Glasses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Cognitive assessment tool	<input type="checkbox"/> Nursing notes
<input type="checkbox"/> Dentures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Observation chart	<input type="checkbox"/> Fluid balance chart
<input type="checkbox"/> Hearing Aid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Medication record	<input type="checkbox"/> Wound chart
<input type="checkbox"/> Medications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> IV orders	<input type="checkbox"/> Assessment of Behavioural risk
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> *Involuntary treatment order	<input type="checkbox"/> Care Plan
Equipment				<input type="checkbox"/> Investigation results	
List valuables				<input type="checkbox"/> X-rays	<input type="checkbox"/> ECG
				<input type="checkbox"/> Pathology report	
				Other _____	
				*When checked, a copy must accompany the patient	
Observations at TIME of transfer:				Intravascular access	Insertion
Date		Time		<input type="checkbox"/> No access	Site
T	P	R	B/P	SpO ₂	Date
				Peripheral venous line (1)	
				Peripheral venous line (2)	
				Central Line	
				Other	
				IV Fluids (type, rate, meds)	
Signature				Date	Time
Sending Facility to complete when booked					
Transport Provider Service			Pick-up Date		Pick-up Time
Destination Facility/Site					
Transport staff to complete at time of pick-up				Event # _____	
Was handover provided to Transport staff				<input type="checkbox"/> Yes <input type="checkbox"/> No	
Were personal items received				<input type="checkbox"/> Yes <input type="checkbox"/> No	
Was the transport physician consulted				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
				Transport Staff (print)	
				Signature	
Receiving Facility to complete at time of accepting patient					
Handover provided to receiving facility by				<input type="checkbox"/> Receiving staff <input type="checkbox"/> Transport Provider	
Personal items received				<input type="checkbox"/> Yes <input type="checkbox"/> No	
Receiving Facility		Unit	Phone (for all hours)		Position
Practitioner Name		Practitioner Signature		Date	Time
Return Trip (if applicable) - completed by NEW Sending Facility (WAS Receiving Facility) at booking					
Communication back to sending facility (send white copy BACK with Transport staff on return trip)					
<input type="checkbox"/> No change in patient condition <input type="checkbox"/> Changes in patient status-see attached documentation					
Transport Provider Service		<input type="checkbox"/> as above		Pick-up Date	Pick-up Time
Documents Attached on Return		Baseline	Functional status	Indep	Asst
<input type="checkbox"/> Goals of Care		<input type="checkbox"/> Original Med Record	Mental Status ___ A ___ O	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Prescription		<input type="checkbox"/> Discharge plan	Feeding	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Discharge Diagnosis		<input type="checkbox"/> Completed labs/test/x-rays	Bathing/Dressing	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sending cognition if changed			Transfer	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sending skill condition if changed			Ambulation	<input type="checkbox"/>	<input type="checkbox"/>
Practitioner Name		Practitioner Signature		Date	Time
Transport Staff to complete upon pick up for Return trip				Event # _____	
Handover provided to Transport staff				<input type="checkbox"/> Yes <input type="checkbox"/> No	
Personal items received				<input type="checkbox"/> Yes <input type="checkbox"/> No	
Transport physician/OLMC consulted				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
				Next of Kin notified	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Facility notified of return	
				<input type="checkbox"/> Were previous personal items sent back?	
Receiving Transport Staff (print)				Signature	
				Date	

Appendix E - Rural Hip Fracture Holding/Transfer Orders

Transfer / Holding Hip Fracture Adult Orders

Last Revised: December 2016

Wt ____kg	Allergies	<input type="checkbox"/> Up to date in Electronic System
Estimated date of fracture (yyyy-Mon-dd)		Time (hh:mm)
Orthopedic Surgeon Arrangements		
<input checked="" type="checkbox"/> Plan for return transfer to referring facility 48 hours following surgery		
<input checked="" type="checkbox"/> Before transferring patient , confirm with Admitting Hospital that patient has been accepted and completion of Emergency Department Hip Fracture Orders		
Intravenous Orders		
<input type="checkbox"/> IV Maintenance: 0.9% NaCl infusion at _____mL/hour, reassess after ___ hours		
<input type="checkbox"/> IV Maintenance: Ringers Lactate infusion at _____mL/hour, reassess after ___ hours		
<input type="checkbox"/> IV Maintenance: Dextrose 5% NaCl (D5NS) infusion at _____mL/hour, reassess after ___ hours		
Manage Anticoagulation Medications if currently taking		
<input checked="" type="checkbox"/> Hold direct oral anticoagulants (e.g. dabigatran, rivaroxaban, apixaban)		
<input checked="" type="checkbox"/> Hold warfarin, administer 5 mg Vitamin K PO once		
OR , if surgery expected within 12 hours and requested by the accepting Surgeon, administer 5 mg Vitamin K IV once (<i>recommend dilute in 50 mL of NS or D5W and run over 10 to 30 minutes</i>) [if not already given]		
Last warfarin dose – Date: _____ Time: _____		
Preoperative Anticoagulation Requirements		
<i>To be discussed with the accepting surgeon:</i>		
<i>* May be important if surgery to be delayed or patient at high risk for clotting [mechanical heart valve or VTE in last 3 months]</i>		
Medications		
Nonopiate Analgesia - Oral		
<input checked="" type="checkbox"/> acetaminophen 650 mg PO/PR qid (maximum dose 3 g/day from all sources)		
Opiate Analgesia - Parenteral		
<i>We recommend decreasing narcotic dosing by 50% for “susceptible patients” defined as elderly, frail, low body mass, systemically unwell, or on medications known to cause sedation or lower blood pressure.</i>		
<input type="checkbox"/> morphine 1.25 to 2.5 IV/subcutaneously q2h PRN		
OR		
<input type="checkbox"/> HYDROmorphine 0.25 to 0.5 mg IV/subcutaneously q2h PRN		
Nerve Block		
<input type="checkbox"/> femoral nerve block 5 mL BUPivacaine 0.5%		
Antiemetics (<i>avoid dimenhydrinate</i>)		
<input type="checkbox"/> ondansetron 4 mg IV/PO/sublingually q8h PRN (<i>sublingual should be reserved for actively vomiting patients without IV access</i>)		
<input type="checkbox"/> metoclopramide 5 mg IV q6h PRN		

Patient Care Orders

- Bedrest - turn every 2 hours and provide skincare
- Pressure Ulcer Prevention Strategies if Braden Score is 18 or less

Diet / Nutrition

If transfer to be delayed, discuss Diet/NPO time with accepting Surgeon to ensure best possible nutritional status prior to surgery. See Enhanced Recovery After Surgery [ERAS] Guidelines

- NPO: May take meds; NPO from – Date: _____ Time: _____
- Other Diet: _____

Monitoring

- Vital signs: respiratory rate, pulse, blood pressure, temperature, oxygen saturation
 - as per local standards manual automatic
 - every 4 hour(s) manual automatic
- Neurological Vital Signs: Glasgow Coma Scale (GCS)
 - as per local standards
 - every 4 hour(s)
 - every _____ minutes
 - Notify physician if patient’s GCS decreases by two or more points

Intake and Output

- Urinary Catheter, Inserted – Date: _____ Time: _____

Respiratory Care

- O₂ Therapy – Titrate to Saturation greater than or equal to 92% or patient baseline
- Notify physician if O₂ Therapy increased by greater than 2 LPM to maintain the same level of oxygenation or if there is a progressive increase in work of breathing

Delirium Mitigation and Assessment

Ensure adequate pain relief without over sedation, maintenance of adequate hydration/nutrition, and encourage family member/caregiver to help keep patient oriented to time and place to help decrease delirium risk.

- Confusion Assessment Method (CAM) q8h AND if change in patient’s clinical status

If CAM is positive, discuss with physician regarding Delirium Management

For a diagnosis of delirium these two must be present	→ Was the onset acute and/or does behaviour fluctuate?	Yes or No
	→ Is there evidence of inattention? <i>(difficulty focusing, attention, shifting and keeping track)</i>	Yes or No
and at least one of these	→ Is there evidence of disorganized thinking? <i>(incoherent, rambling, illogical flow of ideas)</i>	Yes or No
	→ Is there altered level of consciousness? <i>(hypoactive or hyperactive)</i>	Yes or No
Management of delirium in older persons should always be individualized		Score /4

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Send the following documents with patient:

- Completed Clinical Transfer Information Form (09277)
- A letter from the Referring Physician
- Copies of completed Rural ED Hip Fracture Orders, referring hospital ED Record, EMS Record, Nurse’s Notes, Medication Records and Lab reports
- Personal Directive, guardianship papers and transfer record from Continuing Care (where applicable)

Appendix F - When You Are On Call For Surgery

health information

When You are On Call for Surgery

What does being on call mean?

When you are on call for surgery, it means that you are on a list waiting for a block of time for your operation. Sometimes the wait can be longer than expected.

Why would I be on call?

You can be on call for a few reasons:

- there are others who also need urgent or unplanned surgery
- your surgery does not have to be done right away
- you may be too sick for surgery right now, but will have it as soon as you are stable

Can my surgery still be postponed?

Being on call and/or being postponed when you have been on call can be very frustrating. You and your family are stressed, tired, and you are hungry.

Sometimes, even though you have been on call for a while, the surgery may be postponed until the next day. This can happen because it is no longer safe for the surgeon to do any more surgery (for example, the surgeon has been operating for most of the day).

We know that the wait can be very trying. We would like nothing better than for you not to have to wait. We will do everything we can to make sure that you and your family know when you are going for surgery or if the surgery time is changing.

When can I eat or drink?

When you are on call, you will be NPO. This means that you cannot have anything to eat or drink before your surgery. If your surgery is postponed, an order will be left for you to have something to eat and drink. Please try to eat and drink if you are allowed, as you will usually feel much better with something in your stomach.

This material is for information purposes only. It should not be used in place of medical advice, instruction and/or treatment. If you have questions, speak with your doctor or appropriate healthcare provider.

Acknowledgements

We would like to acknowledge the contributions of the clinicians who participated in the development of this topic. Your expertise and time spent are appreciated.

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<i>Topic Lead</i>			
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<i>Working Group Members</i>			
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For questions or feedback related to this knowledge topic please contact Clinical Knowledge Topics by emailing ClinicalKnowledgeTopics@albertahealthservices.ca