

# Provincial Clinical Knowledge Topic

## *Low Back Pain, 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 <a href="#">Acknowledgements</a>

## 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.

## Goals of Management

1. Assess hemodynamic stability and initiate support with IV fluids, blood products, and vasoactive medications as indicated
  - Recognize that hemodynamically unstable patients are unlikely to have a spinal / musculoskeletal cause for their back pain and initiate investigations for other potential causes as appropriate (e.g. – bedside US to assess for AAA)
2. In patients suspected of having a spinal or musculoskeletal cause of low back pain, initiate a diagnostic approach centered around the clinical ‘red flags’ that may indicate an emergent or serious cause (see Clinical Assessment Tools, below)
  - In patients exhibiting ‘red flags’ consider arranging diagnostic imaging on an urgent or emergent basis
  - In patients who do not exhibit these red flags, imaging - particularly plain film radiography - is generally considered to be extremely low yield and should play a very limited role
3. Initiate management of pain
  - Attempt whenever possible to maximize non-opioid analgesia prior to initiating therapy with opioids
  - When initiating opioid therapy, titrate to the lowest dose which effectively controls pain and plan to eliminate opioids from treatment at earliest reasonable time
  - In patients already receiving long-acting opioids for management of low back pain, consider increasing the dose of these agents by 20-25% and/or adding short-acting agents to the treatment regimen
4. Establish a longitudinal follow up plan for pain management +/- involvement of other healthcare providers (e.g. physiotherapy, chiropractic, spinal surgery)

## Clinical Decision Support

### Clinical Assessment Tools

**Table 1. ‘Red Flags’ suggesting emergent or urgent underlying cause of spinal back pain**<sup>1,2,3,4</sup>

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#### Compression Fracture

- Significant trauma
- Older age (especially greater than 70 years of age)
- Prolonged corticosteroid use
- Presence of contusion or abrasion

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#### Malignancy\*\*

- Prior history of malignancy
- Age greater than 50y
- Unexplained weight loss
- Failure to improve with conservative management longer than 1 month

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#### Infection

- Fever or chills
- Recent bacterial infection (e.g. urinary tract infection [UTI])
- IV drug abuse
- Immunocompromise

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#### Cauda Equina Syndrome

- Saddle anesthesia / paraesthesia
- New urinary retention without other cause
- New or progressive leg weakness
- Decreased rectal tone / new fecal incontinence
- Loss of ankle reflexes

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#### Disc Herniation

- Severe, progressive motor deficits

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*Note: The presence of a ‘red flag’ does not necessarily mandate imaging or other testing, but the absence of red flags makes it unlikely that testing will produce a clinically important result*

*\*\*Prior history of malignancy significantly increases the likelihood of a spinal malignancy (Positive Likelihood Ratio > 30); other risk factors for malignancy are weak predictors and only alter the probability of disease significantly when more than one are present*

## Initial Decision Making

### 1. In the unstable patient

- **Be aware these patients are unlikely to have spinal causes for low back pain.** Perform history, physical examination, and investigations with this in mind
- Initiate hemodynamic support, targeting adequate end organ perfusion (volume resuscitation, vasoactive medications)
  - Consider adopting a permissive approach to hypotension in patients with suspected ruptured abdominal aortic aneurysm (AAA) and preserved CNS / CVS perfusion
- Initiate investigations to rule out underlying causes based on clinical picture, for example: bedside US, point-of-care pregnancy testing, laboratory testing, formal radiological testing
- Initiate IV antibiotics if infection suspected based on clinical picture
- Consider emergent empirical surgical consultation if hemorrhage clinically suspected

### 2. In the stable patient:

- Remain aware of non-spinal causes for back pain and perform an appropriate history, examination, and tailored investigations as needed
- Assess for the presence of any 'red flags' which may indicate an emergent or urgent cause for spinal low back pain (Table 1)
  - Consider imaging on an urgent or emergent basis for patients exhibiting red flags (*\*\*NB – the presence of a 'red flag' does not necessarily mandate imaging or other testing, but the absence of red flags makes it unlikely that testing will produce a clinically important result*)
  - In patients with confirmed emergent diagnosis, arrange immediate consultation and treatment focused to the specific cause
- Assess for indicators of systemic inflammatory causes for spinal MSK back pain (e.g. ankylosing spondylitis) and initiate investigations as appropriate
  - Patients with history, exam, and investigations indicative of systemic inflammatory disorder should be considered for specialty referral
- Initiate symptomatic management
  - For non-emergent causes of spinal back pain, attempt to maximize non-opioid analgesia whenever possible
  - If opioid analgesia is necessary in non-emergent low back pain, utilize lowest possible dose and duration of treatment which still achieves adequate analgesia

## Order Set: Low Back Pain, Adult – Emergency

### Order Set Components

**Order Set Keywords:** back pain; cauda equina; sciatica

**Order Set Requirements:** Allergies

**Risk Assessment / Scoring Tools / Screening:** see [Clinical Decision Support](#) section

### Goals of Care Designation

- Goals of Care Designation: \_\_\_\_\_

### Diet / Nutrition

- NPO  
 NPO – May Have Sips, May Take Meds  
 Clear Fluids  
 Regular Diet  
 Other Diet : \_\_\_\_\_

### Patient Care

- Vital Signs: These orders need to be re-evaluated when the patient stabilizes or by two hours, whichever occurs first.
- as per [provincial guideline](#)
  - every \_\_\_\_\_ hourly
  - every \_\_\_\_\_ minute(s)
  - Continuous cardiac monitoring

### Other Measurements:

- Pain score and documentation using a 10-point Visual Analogue Scale (VAS) score  
 Bladder scan post void residual volume

### Intravenous Therapy

- Intravenous Cannula – Insert: Initiate IV  
 IV Peripheral Saline Flush/Lock: Saline Lock

#### IV bolus or rapid infusion

- 0.9% sodium chloride infusion \_\_\_\_\_ mL as fast as possible

#### Maintenance IV Solutions

- 0.9% sodium chloride infusion at \_\_\_\_\_ mL/hour  
 Other: \_\_\_\_\_ at \_\_\_\_\_ mL/hour

## Lab Investigations

**\*\*In the absence of red flags or suspicion of non-MSK cause for back pain, laboratory tests are generally not indicated.**

### Hematology

- Complete Blood Count (CBC)
- INR

### Transfusion Medicine

- Type and Screen

### Chemistry

- Electrolytes (Na, K, Cl, CO<sub>2</sub>)
- Glucose random level
- Creatinine
- Urea
- C-reactive protein (*if inflammatory disease or infection is suspected*)
- ALT
- Alkaline phosphatase
- Bilirubin
- Lipase

### Microbiology

- Blood cultures (*if infection is suspected*)

### Urine Tests

- Urine dipstick testing
- Pregnancy Test, Urine
- Urinalysis Random
- Urine Culture & Sensitivity

## Diagnostic Investigations

**\*\*DO NOT order diagnostic imaging test, including X-ray, CT, and MRI for acute low back pain without red flags. Only order imaging to clarify anatomy where the results will direct treatment**

### Standard X-Rays

**\*\*AP and lateral views when compression or other fracture is suspected. Oblique view x-rays are not recommended in acute trauma.**

- X-ray Thoracic Spine, 1-3 Views
- X-ray Lumbar Spine, 1-3 Views
- X-ray Sacrum
- X-ray SI joints

### Computed Tomography

**\*\*Spinal CT imaging may be indicated when:**

- Red flags present and MRI is contraindicated
  - Primary bone tumors are suspected (*detect or characterize*)
  - Trauma (*rule out or characterize fracture, evaluate for healing*)
- CT Lumbar Spine

- CT Thoracic Spine
- CT Angio Abdomen & Pelvis (*if abdominal aortic aneurysm suspected*)
- CT Angio Chest Abdomen Pelvis (*if aortic dissection suspected*)

### **Magnetic Resonance Imaging**

Consider emergent spinal MR imaging in the presence of 'red flags' suggesting possible Cauda Equina Syndrome, infection, or neoplasm – see [Table 1](#)

- MR Lumbar Spine
- MR Thoracic Spine
- X-ray Orbits, R/O Metallic Foreign Body (if prior history of metal shrapnel)

### **Other**

- Electrocardiogram - 12 lead
- Electrocardiogram - 15 lead

### **Medications**

**\*\* Pharmacologic interventions have demonstrated limited effectiveness in randomized trials of patients with acute musculoskeletal low back pain. Most of these cases are self-limited regardless of the intervention selected. Non-pharmacologic therapies (see 'Patient Education / Discharge Instructions', below) should be emphasized over pharmacologic therapies in the outpatient management of musculoskeletal low back pain**

**\*\* In cases warranting pharmacologic therapy, NSAIDs and muscle relaxants should be considered first line agents (no one agent has been demonstrated to be superior amongst these groups). Acetaminophen likely has limited effectiveness but has few side effects and is generally safe. Opioids should be considered only in patients who have failed therapy with these agents as well as non-pharmacologic therapies.**

### **Nonopiate Analgesia**

#### **Oral**

- acetaminophen tab 975 **or** 1000 mg PO once
- acetaminophen tab 325 to 1000 mg PO q4h PRN for pain (maximum 3000 mg/day)
- acetaminophen tab \_\_\_\_\_ mg PO \_\_\_\_\_

**\*\*Suggest 325 to 650 mg for mild to moderate pain, 975 to 1000 mg for moderate to severe pain**

- ibuprofen 400 mg PO once
- ibuprofen 200 to 400 mg PO q 6h PRN for pain (maximum 1200 mg/day)
- ibuprofen \_\_\_\_\_ mg PO \_\_\_\_\_

**\*\*Suggest 200 mg for mild to moderate pain, 400 mg for moderate to severe pain**

- cyclobenzaprine 5 to 10 mg PO once
- cyclobenzaprine 5 to 10 mg PO TID PRN for pain

**\*\*Suggest 5 mg for mild to moderate pain, 10 mg for moderate to severe pain**

#### **Parenteral**



**\*\*Recommend restricting ketorolac use to actively vomiting patients and using lowest effective dose**

- ketorolac 15 mg IV once
- ketorolac \_\_\_\_\_ mg IV \_\_\_\_\_

### Opiate Analgesia

**\*\*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%.**

- Contact physician or nurse practitioner for reassessment if pain not controlled after administration of maximum dosage.

#### Oral

- codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg 2 tabs PO once
- codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg 1 to 2 tabs PO every 4 hours PRN for pain
- codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg \_\_\_\_\_ tabs PO \_\_\_\_\_
  
- oxyCODONE 5 mg-acetaminophen 325 mg 2 tabs PO once
- oxyCODONE 5 mg-acetaminophen 325 mg 1 to 2 tabs PO every 4 hours PRN for pain
- oxyCODONE 5 mg-acetaminophen 325 mg \_\_\_\_\_ tabs PO \_\_\_\_\_
  
- HYDROmorphine 1 mg PO once
- HYDROmorphine 1 to 2 mg PO every 4 hours PRN for pain
- HYDROmorphine \_\_\_\_\_ mg PO \_\_\_\_\_

**\*\*Suggest 1 mg for moderate pain and 2 mg for severe pain**

#### Parenteral

- HYDROmorphine 1 mg IV once
  - HYDROmorphine 0.5 to 1 mg every 10 minutes PRN for pain (maximum 3 mg total)
  - HYDROmorphine \_\_\_\_\_ mg IV \_\_\_\_\_
- \*\*Suggest 0.5 mg for moderate pain and 1 mg for severe pain**
- morphine 5 mg IV once
  - morphine 2.5 to 5 mg IV every 10 minutes PRN for pain (maximum 15 mg total)
  - morphine \_\_\_\_\_ mg IV \_\_\_\_\_
- \*\*Suggest 2.5 mg for moderate pain and 5 mg for severe pain**
- fentaNYL 50 mcg IV once
  - fentaNYL 25 to 50 mcg IV every 5 minutes PRN for pain (maximum 200 mcg total)
  - fentaNYL \_\_\_\_\_ mcg IV \_\_\_\_\_
- \*\*Suggest 25 mcg for moderate pain and 50 mcg for severe pain**

### Antiemetics

**\*\*Avoid dimenhyDRINATE in patients 65 years of age or older due to increased risk of side effects including delirium. Suggest 25 mg for mild/moderate nausea, 50 mg for moderate/severe nausea**

- dimenhyDRINATE 50 mg PO once
- dimenhyDRINATE 25 to 50 mg PO q4h PRN for nausea/vomiting
- dimenhyDRINATE \_\_\_\_\_ mg PO \_\_\_\_\_
  
- dimenhyDRINATE 50 mg IV once
- dimenhyDRINATE 25 to 50 mg IV q4h PRN for nausea/vomiting
- dimenhyDRINATE \_\_\_\_\_ mg IV \_\_\_\_\_

*\*\*PO administration or slow infusion via IVPB are preferred for metoclopramide to reduce the risk of akathisia. Suggest 5 mg for mild/moderate nausea or if CrCl less than 40mL/min; 10 mg for moderate/severe nausea, and CrCl over 40mL/min*

- metoclopramide 10 mg PO once
- metoclopramide 5 to 10 mg PO q6h PRN for nausea/vomiting
- metoclopramide \_\_\_\_\_ mg PO \_\_\_\_\_
  
- metoclopramide 10 mg IVPB once
- metoclopramide 5 to 10 mg IVPB q6h PRN for nausea/vomiting
- metoclopramide \_\_\_\_\_ mg IVPB \_\_\_\_\_

*\*\*4 mg starting dose recommended for IV ondansetron*

- ondansetron 4 mg IV once
- ondansetron 4 mg IV to be repeated once 30 minutes after first dose PRN for nausea/vomiting
- ondansetron 4 mg IV q8h PRN for nausea/vomiting
- ondansetron \_\_\_\_\_ mg IV \_\_\_\_\_
  
- ondansetron tab 8 mg PO q8h PRN for nausea/vomiting
- ondansetron tab \_\_\_\_\_ mg PO \_\_\_\_\_

*\*\*Due to high cost, recommend reserving ondansetron DISINTEGRATING tab for actively vomiting patients without an IV*

- ondansetron DISINTEGRATING tab 8 mg PO q8h PRN for nausea/vomiting
- ondansetron DISINTEGRATING tab \_\_\_\_\_ mg PO \_\_\_\_\_

## Consults

**\*\*Refer patient with red flags indicating a high likelihood of serious underlying pathology for immediate evaluation and treatment to an appropriate resource depending on what is available in your region. The presence of Cauda Equina Syndrome is considered to be a surgical emergency.**

- Consult Spinal Surgery
- Consult Rheumatology
- Consult Other: \_\_\_\_\_

## Disposition Planning

1. Considerations for admission
  - Serious / emergent cause of back pain identified on imaging or strongly suspected on clinical grounds:
    - Infection
    - Cauda Equina Syndrome
    - Neoplasm with neurological compromise
    - Vascular emergency (e.g. aortic dissection, ruptured AAA)
  - Inability to manage adequately in usual home environment due to:
    - Severe pain resulting in significant functional impairment
    - Inadequate social / community supports and unable to arrange home care in a timely fashion
2. Considerations for discharge
  - Serious / emergent causes of back pain ruled out
  - Pain control adequate for patient to manage in an outpatient setting, taking into account their social circumstances and any relevant underlying comorbidities
3. Outpatient analgesia<sup>5</sup>
  - Pharmacologic interventions have demonstrated limited effectiveness in randomized trials of patients with acute musculoskeletal low back pain. Most of these cases will be self-limited regardless of the intervention selected. Therefore, non-pharmacologic therapies (see 'Patient Education', below) should be emphasized over pharmacologic therapies in the outpatient management of musculoskeletal low back pain
  - In cases warranting pharmacologic therapy, NSAIDs and muscle relaxants should be considered first line agents (no one agent has been demonstrated to be superior amongst these groups). Acetaminophen likely has limited effectiveness but has few side effects and is generally safe. Opioids should be considered only in patients who have failed therapy with these agents as well as non-pharmacologic therapies.
  - Similarly, patients with chronic low back pain should first be treated with non-pharmacologic therapies. NSAIDs are the preferred pharmacologic agent for chronic low back pain, with tramadol and duloxetine the preferred second-line agents. Opioids should only be considered if these treatments have failed and only after a careful examination of the risks and benefits of treatment have been considered. Opioids have demonstrated only a modest analgesic benefit of questionable clinical significance in therapeutic trials of chronic low back pain.
4. Outpatient follow-up
  - Patients whose symptoms are not resolving should:
    - Follow-up with primary physician in one week if pain is severe and has not subsided
    - Follow-up with primary physician within six weeks if not substantially recovered
    - Seek emergent reassessment if red flags subsequently develop at a later time
  - Patients with findings suggestive of a systemic inflammatory cause for spinal low back pain should be considered for referral directly to a rheumatologist
  - Consider referring patients with non-specific low back pain to a spinal care specialist such as a physical therapist, osteopathic physician, or physician who specializes in

musculoskeletal medicine for individualized advice (see below for specific advice on discharge from ED)

- Refer workers with low back pain beyond six weeks to a comprehensive return-to-work rehabilitation program. For occupationally-related subacute low back pain (duration four to eight weeks), intensive interdisciplinary rehabilitation is moderately effective.
5. Patient education / discharge advice<sup>6-14</sup>
- **Routine activity vs bed rest:** remaining active improves pain control and functional status for acute non-specific low back pain but has minimal to no effect in sciatica (moderate evidence)
  - **Exercise therapy:** No benefit in acute low back pain (moderate evidence). Improves functional status and pain control in chronic low back pain (strong evidence). Prevents recurrences of acute low back pain (moderate evidence). Exercise programs initiated after acute treatment help to reduce the frequency of low back pain recurrences and increase the time to relapse (moderate evidence).
  - **Superficial heat or cold:** Superficial heat modestly improves short term pain scores in acute low back pain (moderate evidence). Cold therapy has not been adequately studied. Conflicting evidence exists regarding superiority of heat vs. cold.
  - **Chiropractic therapy:** Combined chiropractic therapy provides a modest reduction in short- to medium-term pain and disability of questionable clinical significance for patients with acute low back pain. Current evidence can neither support nor refute the superiority of combined chiropractic therapy over other treatments for acute or chronic low back pain. Spinal manipulation therapy (SMT) alone has failed to show improvements in pain or disability in low quality studies of acute low back pain, while high quality studies suggest SMT has a significant but clinically unimportant effect on short-term pain relief in chronic low back pain.
  - **Massage:** Improves short term pain control in acute low back pain and both pain and disability in chronic low back pain, but the magnitude of improvement is of questionable clinical significance (low quality evidence).
  - **Acupuncture:** Role in acute low back pain is unclear. May be a useful adjunct to other therapies in chronic low back pain (low quality evidence).
  - Patient Care Handouts from My Health Alberta:
    - [Low Back Pain: Exercises](#)
    - [Back Pain: Care Instructions](#)
    - [Getting Back to Normal After Low Back Pain: Care Instructions](#)
  - Patient Handout Acute Low Back Pain from TOP
    - [What You Should Know About Your Acute Low Back Pain](#)
  - Patient Handout from Choosing Wisely
    - [Treating lower back pain: How much bed rest is too much?](#)
    - [Imaging tests for lower back pain: When you need them—and when you don't.](#)

## Rural Considerations

1. Consider RAAPID consultation to nearest Emergency Department for consideration of advanced imaging (e.g. CT or MR) in cases with red flags

## Analytics

### 1. Key Outcomes

- Clinical
  - Reduced proportion of patients requiring admission
  - Reduced need for opiate analgesia
  - Reduced use of imaging (particularly plain radiography) for low back pain without 'red flag' features
  - Reduced rates of unplanned return to ED for low back pain within 72hr of discharge
- Process
  - Reduced time to imaging for patients diagnosed with an emergent cause for spinal low back pain
- Patient Experience
  - Received early, appropriate treatment for low back pain with adequate symptomatic relief
  - Received appropriate and accurate discharge education (if applicable)

### 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 (consulted for admission, admitted to ICU or OR or ward, died)
- ED diagnoses for non-specific low back pain, sciatica, compression fracture, spinal infection, spinal malignancy, cauda equina syndrome using ICD-10
- Site and Zone identifiers
- Use of imaging (GR, CT, MR)
- Use of opiates, NSAIDs, acetaminophen
- Discharge destination (home, home care, family physician)
- Discharge medications (opiates, other headache therapies)

### 3. Proposed Reports

- Number (%) of ED patients triaged as low back pain
- Number (%) of ED patients (by site/zone/hospital type or location [e.g. inner city]) for whom this order set is applied
- Number (%) of ED patients (by site/zone/hospital type or location [e.g. inner city]) for whom imaging was completed (GR, CT, MR)
- Number (%) of ED low back pain patients (by site/zone/hospital type or location [e.g. inner city]) treated with opiates, NSAIDs, acetaminophen, other)
- Number (%) of ED low back pain patients (by site/zone/hospital type or location [e.g. inner city]) admitted from the ED to ward / OR / ICU
- ED Length of stay for admitted and discharged patients with headache
- 72-hour 'unplanned' ED return visits for low back pain and % of those which were admitted or had an emergent/ urgent diagnosis discovered on repeat visit

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