

Spine: Low Back Assessment Clinical Pathway

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Version 1

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This clinical decision-making tool will help guide clinicians with appropriate procedures for patient management, investigations, and referrals.

Definitions:

- **Mechanical back pain (MBP):** arises from the spinal structures including bone, ligaments, discs, joints, nerves, and meninges. MBP is experienced in the lumbar region, buttocks, coccyx, or over the greater trochanters. MBP may also extend to include the groin, genitals, and upper thigh region as a result of referred pain. MBP fluctuates with activity and is produced by movement/positions and is relieved by rest or change in posture. Leg pain is radicular pain felt below the gluteal fold resulting from irritation of one or more nerve roots, particularly of the sciatic or femoral nerves.
- **Non-mechanical back pain (NMBP):** associated with symptoms or signs of serious medical (e.g., inflammatory arthritis, neoplasm) or psychological conditions.

Timelines:

- **Acute:** < 6 weeks (sequential days)
- **Sub-Acute:** ≥ 6 weeks to < 3 months (sequential days)
- **Chronic:** ≥ 3 months (sequential days)
- **Recurrent:** at least 2 episodes in the past 12 months

SECTION 1. OVERVIEW

This tool has been developed for point-of-care providers (e.g., primary care, allied health) who are managing patients with low back conditions. This tool will help guide assessment, screening, history-taking, physical examination, diagnosis, and treatment. It will provide evidence-based, goal-oriented management while identifying triggers for investigations and referrals. We acknowledge that this tool is not comprehensive but serves as a helpful clinical decision-making tool for managing low back conditions.

When using this tool:

- Sound clinical judgement should be used in conjunction with this tool as a guide;
- Consult the **CONSULT & IMAGING DECISION AID TOOL** ([Section 3](#)) when ordering imaging or laboratory tests
- Referral to a surgeon is only indicated if patient desires and is medically appropriate or fit for surgery

STEP 1: Initial Assessment: Perform Steps 1a-1e

1a: Perform **FOCUSED HISTORY-TAKING** ([Section 4](#))

1b: Identify **RED FLAGS** ([Section 7A](#))

1c: Identify **YELLOW** and **PSYCHOSOCIAL FLAGS** ([Section 7B](#))

1d: Assess likely recovery outcomes ([Section 8](#))

1e: Perform **PHYSICAL EXAMINATION** ([Section 6](#))

STEP 2: Triage

Were **red** or **yellow** flags identified in STEP 1?

NO

Proceed to STEP 3

YES



Yellow Flags require further investigations, co-management, and other clinical support tools. ([Section 7B](#))



Red Flags require immediate referral.

([Section 7A](#))



STEP 3: Consult & Imaging Decision-Making

Confirm appropriateness indications for surgical consults and imaging using the **CONSULT & IMAGING DECISION AID TOOL** ([Section 3](#))

STEP 4: Clinical Decision-Making

Identify referral patterns, timelines, and appropriate treatment measures using the **CLINICAL DECISION-MAKING TOOL** ([Section 2](#); [Section 10](#)).

STEP 5: Initial Management

Educate the patient ([Section 9A](#)) and determine pain pattern.

Mechanical Back Pain

Pain that fluctuates with activity, is produced by movement or positions, and is relieved by rest or change in posture.

Pattern 1 ([Section 9B](#)) **Pattern 3** ([Section 9D](#))

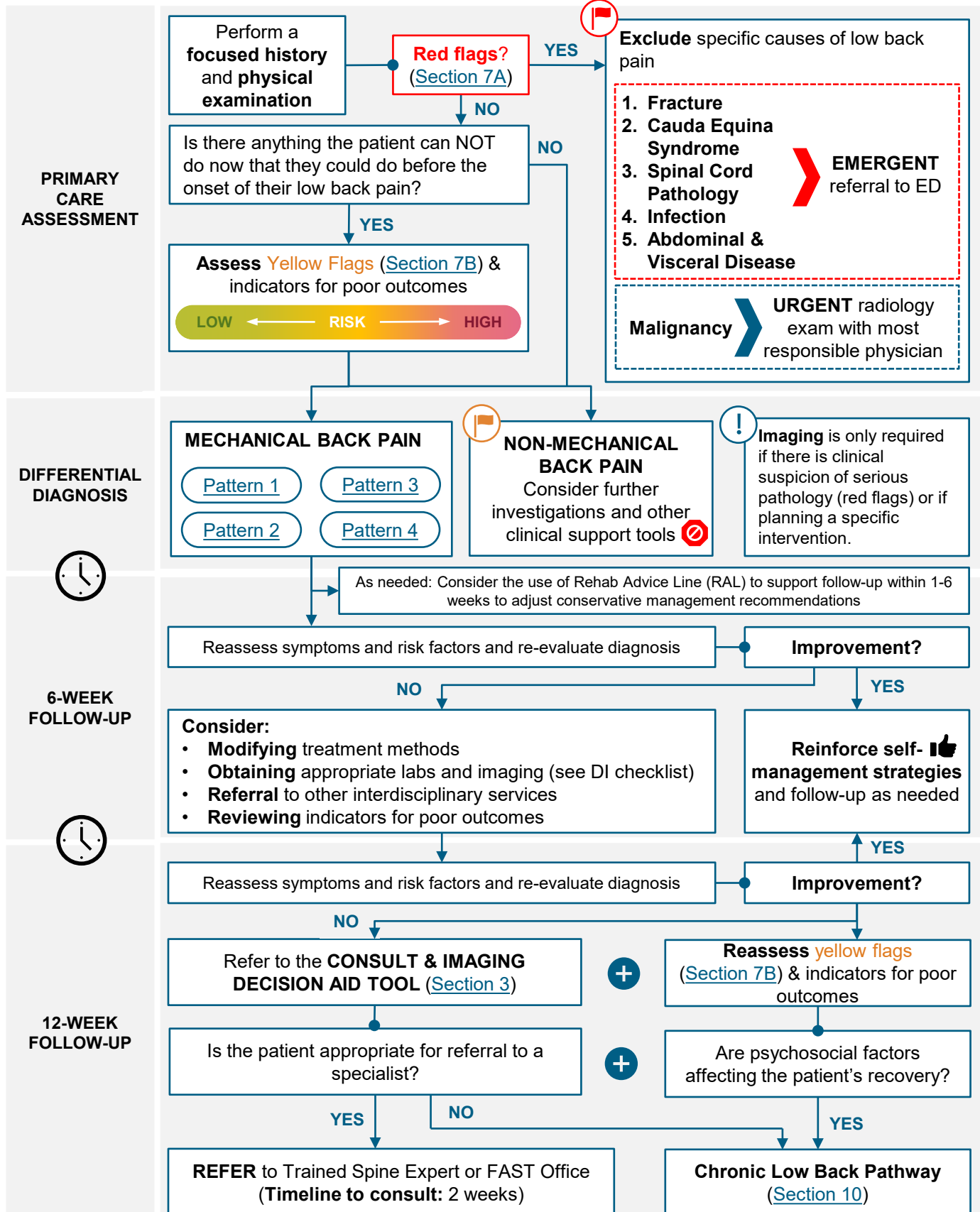
Pattern 2 ([Section 9C](#)) **Pattern 4** ([Section 9E](#))

Non-mechanical Back Pain

- Pain pattern is not identified, and pain is possibly associated with signs or symptoms of serious medical conditions; pain disorders, or psychological conditions ([Section 2](#)).



SECTION 2: ACUTE/SUB-ACUTE LOW BACK PATHWAY



SECTION 3. CONSULT & IMAGING DECISION AID TOOL



No routine imaging of patients with low back pain regardless of the duration of symptoms unless: (a) there are clinical reasons to suspect serious underlying pathology (i.e., **red flags), or (b) imaging is necessary for the planning and/or execution of a particular evidenced-based therapeutic intervention on a specific spinal condition.**

Unless the image has a direct bearing on the treatment decision it is not required. Spinal “abnormalities” in asymptomatic individuals are common and increase with age. For those with back dominant symptoms (i.e., axial back pain) there is an extremely high false positive rate; most of the findings have no correlation with the clinical picture. For most low back complaints obtaining spinal imaging does not improve patient care but can lead to inappropriate interventions and may have a detrimental impact on patient outcomes.

[Choosing Wisely Canada: Spine Recommendations](#)



In most instances, in the absence of **red flags** or progressive motor loss, surgery is only indicated if patient has complied with and failed ≥ 6 months non-surgical measures. Psychosocial factors that may be impacting recovery should be addressed prior to surgical consult. If available, consider referral to a trained spine expert, physiatrist, or sports medicine physician, prior to surgical consult.

Reason for FAST / Surgical Referral		Essential Investigations			Other Information
		Radiograph	CT Scan	MRI	
Patterns 1 & 2	Back Pain* (without referred pain or neuro symptoms)	Upright/standing thoracic and/or lumbar spine x-ray	N/A	MRI may be considered for patients with pain refractile to exhaustive medical (including rehab) therapy with pain suggestive of discogenic origin	<ul style="list-style-type: none"> Oblique and flexion/extension x-rays are not recommended. *If available, non-surgical specialist assessment should be considered prior to surgical referral (such as a trained spine expert, physiatrist, or sports medicine physician).
	Spinal Deformity	Scoliosis: AP/lateral x-ray (must be completed in an AHS facility)	N/A	If neurological symptoms (claudication, radiculopathy, myelopathy), MRI is strongly recommended	<ul style="list-style-type: none"> For insufficiency fractures - Consider referral to a specialist only if insufficiency fracture with pain not responsive to medical therapy or with progressive deformity.
Patterns 3 & 4	Lumbar Radiculopathy	For patients > 50 years old: Standing/upright AP and lateral x-ray of relevant region	Not required* unless mandated by your local FAST office.	Not required* unless mandated by your local FAST office.	<ul style="list-style-type: none"> Oblique and flexion/extension x-rays are not recommended. CT scans are not recommended for diagnosis of nerve root or cauda equina compression.
	Neurogenic Claudication				

* MRI *may be required* prior to referral to some clinics (consider gadolinium-enhanced scans for patients who have had previous spinal surgery). CT myelogram should be considered for patients unable to undergo an MRI.

SECTION 4. HISTORY-TAKING

DEMOGRAPHICS

Age: _____ Sex: _____ Gender: _____ Occupation: _____ Smoking History: _____

Q 1. What is the current problem or primary concern with your back?

Q 2. How did your injury occur? Is this a low back injury that you suffered at work?

Q 3. When did your problems start? (Specify date and determine if: **Acute:** < 6 weeks; **Sub-acute:** ≥ 6 weeks to <3 months; **Chronic:** ≥ 3 months; **Recurrent:** at least 2 episodes in the past 12 months)

Q 4. Have you had similar episodes previously (e.g., have you had this type of pain before)?

Q 5. Have you ever had surgery on your low back? (Which surgeries? When?)

Q 6. What diagnostic imaging/lab tests have you had for your low back condition?

Q 7a. What medications have you had for your low back condition and were they effective?

Q 7b. What medications are you currently on?

Q 8. What treatments have you had, or healthcare providers have you seen, for your low back condition? Were they effective? When did you last attend treatment with that healthcare practitioner?

Q 9. Do you have any medical conditions? Which ones?

Q 10. Have you had any new unexpected accidents with your bowel or bladder function, or any difficulties going to the bathroom since **this** episode of your low back condition started?

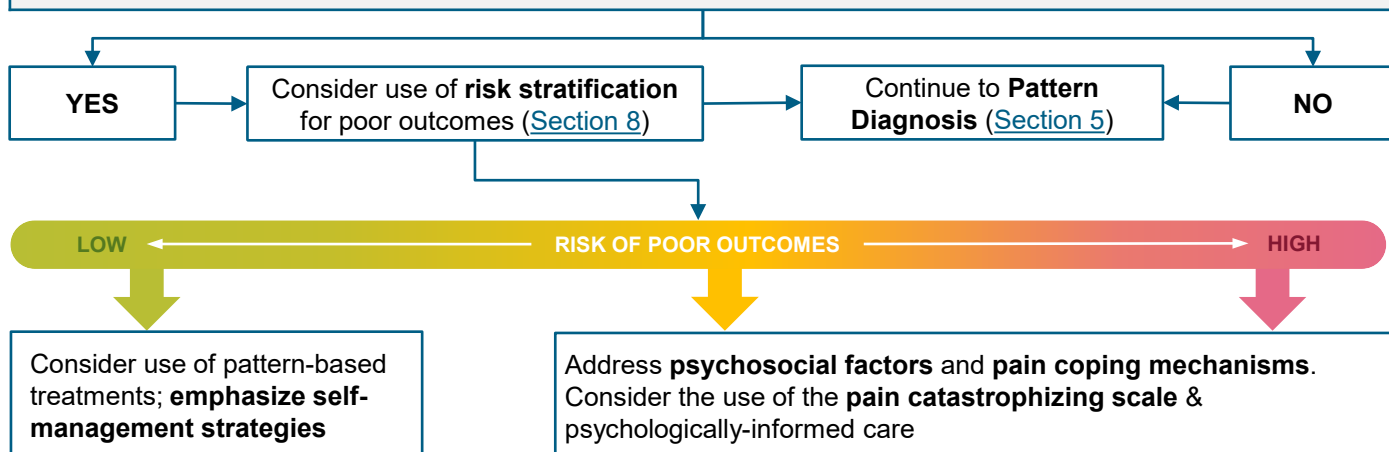
Q 11. Do you have numbness, weakness, tingling, or burning sensations in the leg(s)? In the saddle area?

Q 12. Knowing that you may experience recurring pain in your back, are you able to find relief with bending forward or backwards (e.g., is there ever a time or position you can get in where your pain is completely relieved?)

Red flag indications are based on responses to Q1-12. See **Screening: Red Flags** ([Section 7A](#))

Q 13. If age of onset <50 years old, are you experiencing morning stiffness in your back lasting >30 minutes after up and moving around?

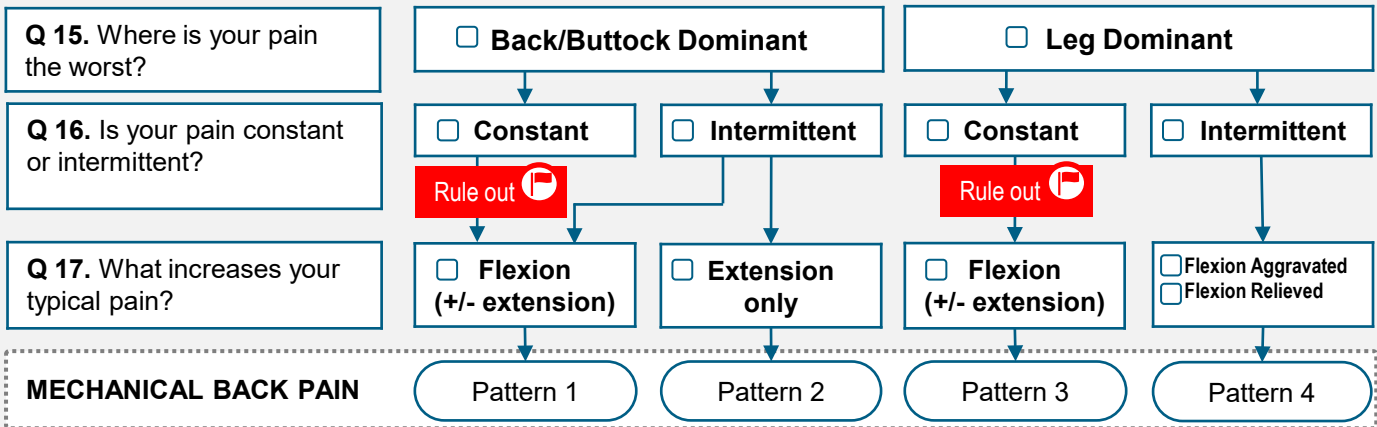
Q 14. Is there anything you **CANNOT** do now that you could do before the onset of your low back condition?







Yellow flag and **psychosocial** indications are based on responses to Q13-14. See **Screening: Yellow Flags/ Psychosocial Flags** ([Section 7B](#)).

SECTION 5. PATTERN DIAGNOSIS

PATTERN DIAGNOSIS



! If the pattern is **NOT** identified, the patient may have **NON-MECHANICAL BACK PAIN**
Consider further investigations and other clinical support tools

<p>PATTERN 1</p> 	<ul style="list-style-type: none"> • Pain is worst in the back, buttocks, upper thigh, or groin, and may radiate into the legs • Pain may be constant or intermittent • Pain is worse when sitting or bending forward and better when walking or standing • Pain may be eased by bending backwards • Normal neurological exam • Categorized as prone extension positive (PEP) or prone extension negative (PEN)*
<p>PATTERN 2</p> 	<ul style="list-style-type: none"> • Pain is worst in the back and buttocks, and may radiate into the legs • Pain is always intermittent • Pain is worse when bending backward and when standing or walking for extended periods • Pain may be eased by bending forward or sitting • Normal neurological exam
<p>PATTERN 3</p> 	<ul style="list-style-type: none"> • Pain is mainly in the legs, but back pain may also be present • Pain is constant and often worse when sitting or bending • Pain can be made worse by any movement or specific back positions in the acute stage • Pain may lessen in some rest positions • Positive neurological findings
<p>PATTERN 4</p> 	<ul style="list-style-type: none"> • Pain is worst in leg and can be described as heaviness or aching • Pain is always intermittent • Flexion aggravated (FA) <ul style="list-style-type: none"> - Pain aggravated with flexion - Pain improved or abolished with unloaded extension - Variable neurological findings • Flexion relieved (FR) (neurogenic claudication) <ul style="list-style-type: none"> - Pain is relieved by a change in position, proper rest, and usually by bending forward - Pain is worse when walking or bending backwards - Negative nerve root irritation tests

* Patients who experience pain reduction within ten repetitions of prone passive extension movements are considered **Pattern 1 prone extension positive (PEP)**. They demonstrate a clear directional preference. Consider providing advice to follow-up with Rehab Advice Line (RAL) at 1-833-379-0563 if patient does not improve over 1-2 weeks with PEP exercises ([Section 9B](#)).

Conversely, **Pattern 1 prone extension negative (PEN)** patients do not experience this pain reduction with prone passive extension movements.

SECTION 6. PHYSICAL EXAMINATION

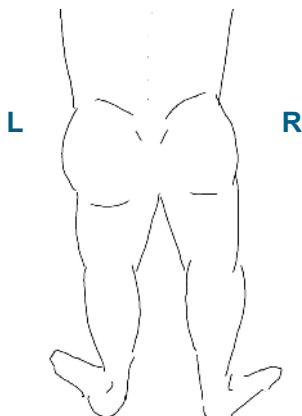
STEP 1. OBSERVE: a) deformities; b) posture; c) asymmetries (e.g., side-to-side, upper vs lower extremity)

STEP 2. EXAMINE:

		Additional Findings:	Abnormal	
			L	R
Gait	<ul style="list-style-type: none"> • Heel walking (L4-L5) • Toe walking (S1) 		<input type="checkbox"/>	<input type="checkbox"/>
Standing	<ul style="list-style-type: none"> • Active movement testing into flexion (touch toes) • Active movement testing into extension (bend backwards) • Active movement testing into rotation and side-flexion • Trendelenburg test (L5) • Double-legged squat (Functional testing) • Muscle tone 		<input type="checkbox"/>	<input type="checkbox"/>
Sitting	<ul style="list-style-type: none"> • Patellar reflex (L3-L4) • Hip flexion power (L2) • Seated knee extension power (L3) • Ankle dorsiflexion power (L4-L5) • Great toe extension power (L5) • Great toe flexion power (S1) • Plantar response • Clonus • Slump test (Active sitting knee extension) 		<input type="checkbox"/>	<input type="checkbox"/>
Lying	<p><i>Supine:</i></p> <ul style="list-style-type: none"> • Passive straight leg raise (SLR) and crossover SLR • Active and passive movement testing into hip internal and external rotation <p><i>Prone:</i></p> <ul style="list-style-type: none"> • Femoral nerve stretch test (Prone Knee Bend) (L3-L4) • Ankle (Achilles) reflex (S1) • Saddle sensation testing (S2- S4) (if indicated) 		<input type="checkbox"/>	<input type="checkbox"/>

STEP 3. PALPATE FOR : a) vertebral point tenderness; b) soft-tissue tenderness

STEP 4. Indicate point(s) of maximal tenderness on diagram with "X" and shade in referral pattern



SECTION 7A. SCREENING RED FLAGS



RED FLAGS

May a) require additional resources to help manage the patient if not already being managed or b) need referral to alternative pathway measures

DIFFERENTIAL DIAGNOSIS	INDICATIONS	REFERRAL	ESSENTIAL INVESTIGATIONS
Fracture	<ul style="list-style-type: none"> Recent history of high-energy trauma (fall from height or MVA) Sharp, stabbing pain aggravated by movement or pressure Recent history of mild or moderate trauma AND any of: Age >70 years old, osteoporosis, or prolonged corticosteroid use 	Same day urgent referral to emergency department	X-ray CT Bone Scan
Cauda Equina Syndrome	<ul style="list-style-type: none"> Numbness, weakness, tingling, or burning sensations in the saddle area Unexpected accidents with bowel or bladder function, or difficulties going to the bathroom Bilateral/alternating radiculopathy; progressive bilateral foot or leg weakness 	Same day urgent referral to emergency department	MRI
Spinal Cord Pathology (Myelopathy)	<ul style="list-style-type: none"> Altered loss of sensation Global progressive motor loss Accentuated deep tendon reflexes Gait disturbance Clonus Reduced fine motor control & balance 	If rapid progression*: Same day urgent referral to emergency department	MRI
Infection	<ul style="list-style-type: none"> Constant or progressive pain unrelated to activity or not relieved with rest Swelling unrelated to trauma Systemically unwell, fever Obvious wound History of infection (e.g., discitis, osteomyelitis, epidural abscess, paraspinal abscess) History of drug abuse Immunosuppression (e.g., HIV) 	Same day urgent referral to emergency department	MRI
Abdominal & Visceral Disease (e.g., pancreatitis, aortic aneurysm)	<ul style="list-style-type: none"> Abdominal pain radiating to the back Sudden onset of pain in absence of aggravating features (i.e., pain not aggravated by spinal movement) Faint or fainting spells 	Same day urgent referral to emergency department	Based on presentation
Malignancy	<ul style="list-style-type: none"> History of cancer Night sweats Unexplained/unintentional/sudden weight loss Unexplained deformity or mass Unrelenting pain that is unrelated to activity and not relieved with rest Acute onset with no identifiable cause 	Urgent radiology investigation by most responsible physician	CT MRI

*If progression of symptoms is not rapid, may consider an urgent referral to FAST/spine surgeon.

SECTION 7B. SCREENING YELLOW & PSYCHOSOCIAL FLAGS



YELLOW FLAGS

May a) require additional resources to help manage the patient if not already being managed or b) need referral to alternative pathway measures.

DIFFERENTIAL DIAGNOSIS	INDICATIONS	COLLABORATIVE MANAGEMENT
Inflammatory arthropathy	<ul style="list-style-type: none"> If age of onset <50 years old, and experiencing morning stiffness in the back lasting >30 minutes after up and moving around e.g., rheumatoid spondylitis, ankylosing spondylitis, psoriatic spondylitis, reactive spondyloarthropathy 	Rheumatologist



PSYCHOSOCIAL FLAGS

May a) require additional resources to help manage the patient if not already being managed; b) need referral to alternative pathway measures; and c) should be assessed for risk of poor recovery outcomes (e.g., fear, pain avoidance, low mood, job dissatisfaction, ongoing litigation). Consider using the ©Keele STarT Back risk stratification tool ([Section 8](#)).

INDICATIONS	COLLABORATIVE MANAGEMENT
<ul style="list-style-type: none"> Receiving active treatment at chronic pain clinic (e.g., low back condition part of a generalized pain condition) 	Pain management specialist
<ul style="list-style-type: none"> Receiving active treatment for a neurological or neuromuscular condition (e.g., stroke, multiple sclerosis, meningeal irritation, transverse myelitis) 	Neurology/ neurosurgeon
<ul style="list-style-type: none"> Receiving active treatment for a medical condition such as diabetes, renal disease, respiratory disease, or ischemic heart disease 	General internal specialist
<ul style="list-style-type: none"> Low back condition is a part of a work-related incident (Workers' Compensation Board related) 	Workers' Compensation Board case manager
<ul style="list-style-type: none"> Biopsychosocial factors (e.g., depression, anxiety, stress, low mood, withdrawal from social interaction, lack of support) Inappropriate attitudes, beliefs, behaviours about back pain (e.g., kinesiophobia, fear of re-injury) Inability to cope with low back condition Poor occupational factors (e.g., heavy work, unsociable hours, low job satisfaction) 	Psychologically-informed active care



SECTION 8: RISK STRATIFICATION

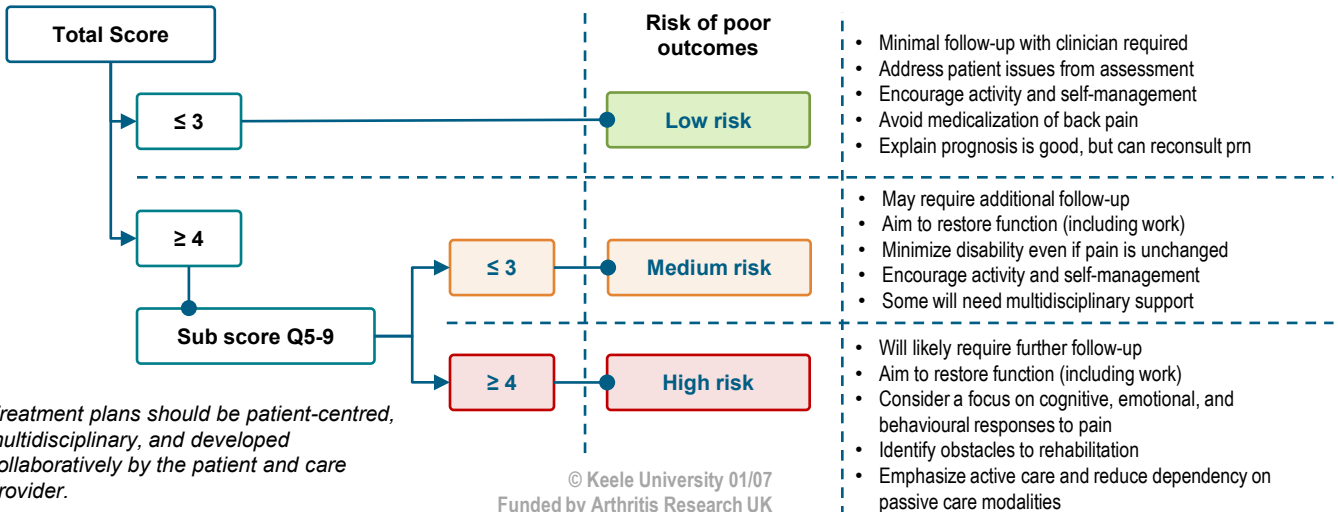
The © Keele STaRT Back Screening Tool

This tool characterizes patients by risk of persistent symptoms (low, medium, or high) which assesses likely recovery outcomes and allows the clinician to tailor interventions appropriately

Thinking about the last 2 weeks, "X" your response to the following questions:	Disagree (0)	Agree (1)			
1. My back pain has spread down my leg(s) at some time in the last 2 weeks					
2. I have had pain in the shoulder or neck at some point in the last 2 weeks					
3. I have only walked short distances because of my back pain					
4. In the last 2 weeks, I have dressed more slowly than usual because of back pain					
5. It's not really safe for a person with a condition like mine to be physically active					
6. Worrying thoughts have been going through my mind a lot of the time					
7. I feel that my back pain is terrible and it's never going to get any better					
8. In general, I have not enjoyed all the things I used to enjoy					
9. Overall, how bothersome has your back pain been in the last 2 weeks ?					
	Not at all	Slightly	Moderately	Very much	Extremely
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	0	0	0	1	1

TOTAL score (sum all 9): _____ SUB score (sum of Q5-9): _____

SCORING SYSTEM

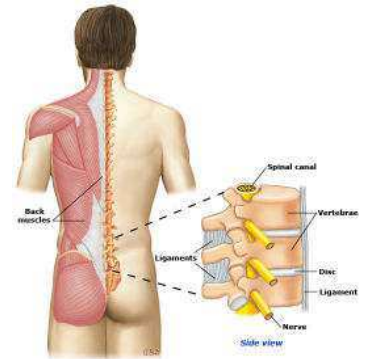


SECTION 9A. INITIAL MANAGEMENT – PATIENT EDUCATION

What is back pain?

Low back pain can be caused by problems with the muscles, ligaments, discs, bones (vertebrae), or nerves. Often, back pain is caused by strains or sprains involving the muscles or ligaments. These problems can rarely be seen on imaging tests, such as x-rays, MRI or CT scans.

Occasionally, back pain can also be a result of irritation to the nerves as they exit the spine. In these cases, numbness, weakness, tingling, or pain may be felt in different parts of the leg. A healthcare provider can help determine if an imaging test is required.

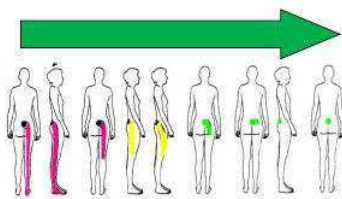


Centralization and Peripheralization of Back Pain

Pain originating from the back can sometimes travel up and down the leg. Pain that spreads further down the legs is described as peripheralization. Pain that recedes towards the back to a smaller, more local, area, is described as centralization. This is caused by a change in the stress and strain on the joints, soft tissues, and nerves as they exit the spine.

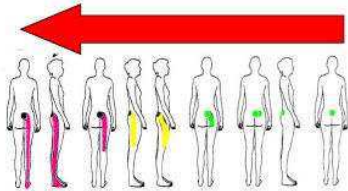
Centralization

Centralization of pain that occurs with specific positions or movements is **desirable**. This indicates there is reduced stress and strain on the joints, soft tissues, and nerves of the back. Use these positions or movements that centralize pain to help get better.



Peripheralization

Peripheralization of pain that occurs during certain positions or movements is **NOT desirable**. This indicates there is increased stress and strain on the joints, soft tissues, and nerves of the back. Avoid activities that cause peripheralization of symptoms.



In the beginning, some back pain is normal with exercise as long as pain is receding out of the leg or the area of back pain is getting smaller, this is a good prognostic sign (centralization). Stop any exercise that makes the pain travel further down the leg.

General Recommendations

1. Ease back into daily activities:

- Patients may need to take it easy for the first day or two, however, getting back to normal daily life and activities as soon as possible is important.
- Include gentle physical activity such as walking or swimming.

2. Avoid or change activities that cause pain

such as too much bending, sitting, heavy lifting, or reaching.

3. Pay attention to body mechanics and posture.

Take extra care when lifting and stand or sit tall with shoulders back and stomach pulled in to support the back.

4. Reduce stress.

Take 10-15 minutes to sit quietly and breathe deeply. Try to focus only on breathing. If thoughts return, refocus one's attention on breathing.

5. Get support

when needed. Be honest with one's doctor about how the pain affects daily living. Let people know when help is needed.

For all patients: Provide information on nature of pain; encourage continuation of activities; recommend a general exercise program such as walking, swimming, or biking; and emphasize active-based rehabilitation over passive treatments such as acupuncture, manual therapy, and spinal injections.

SECTION 9B. INITIAL MANAGEMENT – PAIN PATTERN 1

REST POSITIONS

Patients experience pain with bending forwards and may prefer to rest or bend backwards. Try each position to offload the back and use the one which provides the most relief. Progress to exercises when tolerated. Try: 1) putting one foot up on a footstool switching feet every 5 to 15 minutes; 2) sitting with a firm foam **Lumbar Roll** at about waist level between the spine and the chair; 3) a **Nighttime Roll**; or 4) other rest positions such as **Supine Lie**.

Lumbar Roll (Sitting)

- Use a straight-backed chair and place lumbar roll to support the centre of the back.



Supine Lie

- Lie on back, knees and head resting on pillow.



Lumbar Roll (Nighttime)

- Use lumbar night roll under waist when sleeping on your side to support your low back.

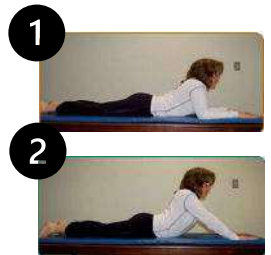


PRONE EXTENSION-POSITIVE (PEP) EXERCISES

Consider for patients who experience pain reduction within ten repetitions of **Prone Lying Passive Extensions**. Estimating pain relief should wait until after the first five push-ups. PEP patients may report initial discomfort but experience relief once the first set is completed.

Repeated Prone Lying Passive Extension

- Lie on stomach and relax back muscles. Place hands in front of shoulders and prop up onto elbows (pose 1). Do not let the hips come off the floor. Hold this position while taking a few deep breaths and relax. Repeat 10 times.
- If pain prevents one from propping on the elbows, don't proceed. Instead rest for a day or two and try again. If the pain worsens, stop exercise immediately.
- Begin with pose 1 and progress to pose 2 (elbows straight) when pain-free and able.



PRONE EXTENSION-NEGATIVE (PEN) EXERCISES

Consider for patients who fail to improve within ten repetitions of **Prone Lying Passive Extension**. **Prone Lying Passive Extension** is a negative experience, and one has neither an obvious directional preference nor a straight path to pain control. Begin with prescribing scheduled rest periods (see above). Progress to the “Z” Lie and **Prone Lie**. With increased mobility, treatment progresses to **Repeated Prone Lying Passive Extension**.

“Z” Lie

- Lie on back, head supported by a pillow; put your feet up on a chair with knees bent at more than 90° angle (may support buttocks with pillow).



Prone Lie

- Lie on stomach and use three pillows to support hips.
- Gradually remove the # of pillows under hips until able to lay flat on stomach.



FUNCTIONAL RECOMMENDATIONS

- Avoid sitting for long periods. Include short walks and standing breaks.
- When lifting something from the ground, squat down to pick it up, rather than bending down through the back.
- Long-term bed rest is not recommended and can hinder recovery.

SECTION 9C. INITIAL MANAGEMENT – PAIN PATTERN 2

REST POSITIONS

Patients experience pain with bending backwards and prefer to bend forwards since flexing can reduce or even abolish the back pain; in no circumstance does flexion make one's typical pain worse. Progress to exercises when tolerated. Try each position to offload the back and use the one which provides the most relief.

Sitting Flexion

- Sit with feet flat on the floor, about hip-width apart.
- Bend forward to rest stomach on top of lap.
- First, let arms and head hang.
- If required, use hands on knees to push trunk upright.
- Repeat throughout the day.



"Z" Lie

- Lie on back, head supported by a pillow; put feet up on a chair with knees bent at more than 90° angle (may support buttocks with pillow).



Trunk Flexion Stretch (Sustained Flexion)

- Kneel on hands and knees.
- Tuck in chin and arch back.
- Slowly sit back on heels, dropping shoulders towards floor.
- If the knees hurt, place a pillow between you buttocks and heels to sit on.



EXERCISES

Single Leg Knee to Chest Stretch

- Lie on back, knees and head resting on pillows.
- Raise one knee to chest and place hand around knee to pull gently to chest
- Once you can do this comfortably, progress to **Double Knees to Chest**.



Double Knees to Chest Stretch

- Lie on back with knees bent and feet flat on floor.
- Raise one knee to chest and slowly raise the other to meet it (Use hands if necessary).
- Place hands around knees and pull gently to chest.
- Press back firmly against floor by flexing stomach muscles.



FUNCTIONAL RECOMMENDATIONS

- Avoid long periods of standing and take sitting rests throughout the day.
- Remain active and use the rest positions if back pain worsens.
- Long-term bed rest is not recommended and can hinder recovery.

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SECTION 9D. INITIAL MANAGEMENT – PAIN PATTERN 3

REST POSITIONS

Constant leg dominant pain is managed without movement and with scheduled rest. The patient with severe radicular pain may need to spend much of time, 30 minutes out of each hour, resting. Several positions can decrease the leg pain (even if back pain increases – see Centralization, Section 9A). The **“Z” Lie** is the best choice. The **Prone Lie** may also ease the leg pain. Try each position to offload the back and use the one which provides the most relief. Progress to exercises when tolerated.

“Z” Lie

- Lie on back, head supported by a pillow; put feet up on a chair with knees bent at more than 90° angle (may support buttocks with pillow).



Prone Lie

- Lie on stomach and use three pillows to support hips.
- Once you can lay flat, progress to **Prone Lie on Elbows**.



Lumbar Roll (Sitting)

- Use a straight-backed chair and place lumbar roll to support the centre the back.



Lumbar Roll (Nighttime)

- Use lumbar night roll under the waist when sleeping on one's side to support the back.



EXERCISES

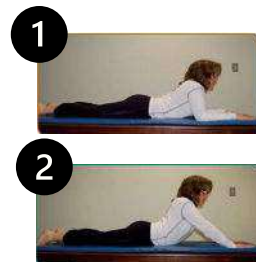
Cat / Cow (warm-up)

- Kneel on hands and knees.
- Arch back, letting head drop slightly.
- Keep abdomen and buttock muscles tightened.
- Do not force into end-ranges of motion.



Repeated Prone Lying Passive Extension

- Lie on stomach and relax back muscles. Place hands in front of shoulders and prop up onto elbows (pose 1). Do not let the hips come off the floor. Hold this position while taking a few deep breaths and relax. Repeat 10 times.
- If pain prevents one from propping on the elbows, don't proceed. Instead rest for a day or two and try again. If the pain worsens, stop exercise immediately.
- Begin with pose 1 and progress to pose 2 (elbows straight) when pain-free and able.



FUNCTIONAL RECOMMENDATIONS

- Change positions frequently from sitting to standing to walking.
- Schedule rest periods throughout the day (Find the rest position that best reduces leg pain).
- Long-term bed rest is not recommended and can hinder recovery.

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SECTION 9E. INITIAL MANAGEMENT – PAIN PATTERN 4

REST POSITIONS

Intermittent leg pain is managed without movement and with scheduled rest. Try each position to offload the back and use the one which provides the most relief. Progress to exercises when tolerated. Try 1) putting one foot up on a footstool switching feet every 5 to 15 minutes; 2) sitting with a firm foam **Lumbar Roll** at about waist level between the spine and the chair; 3) a **Nighttime Roll**; or 4) other rest positions.

Lumbar Roll (Sitting)

- Use a straight-backed chair and place lumbar roll to support the centre of the back.



Lumbar Roll (Nighttime)

- Use lumbar night roll under the waist when sleeping on one's side to support the back.



FLEXION AGGRAVATED (FA) EXERCISES

Prone passive extension tends to be a positive experience, but since the source of the pain is neurogenic rather than purely mechanical, use a gentle approach.

Prone Lie

- Lie on stomach and use three pillows to support hips.
- Once you can lay flat, progress to **Prone Lie on Elbows**.



Repeated Prone Lying Passive Extension

- Lie on stomach and relax back muscles. Place hands in front of shoulders and prop up onto elbows (pose 1). Do not let the hips come off the floor. Hold this position while taking a few deep breaths and relax. Repeat 10 times.
- If pain prevents one from propping on the elbows, don't proceed. Instead rest for a day or two and try again. If the pain worsens, stop exercise immediately.
- Begin with pose 1 and progress to pose 2 (elbows straight) when pain-free and able.



FLEXION RELIEVED (FR) EXERCISES (Refer to Pain Pattern 2 [Section 9C](#) for additional guidance)

The key to managing the symptoms of Pattern 4 flexion relieved (i.e., neurogenic claudication) is posture. Maintaining spinal flexion requires strong abdominal muscles so therapy is directed at improving core strength and function. A pelvic tilt is the foundational exercise.

Pelvic Tilt

- Lie on the floor with knees bent and feet planted firmly on the floor.
- Push belly button towards the floor, rotating the pelvis forward.
- Keep abdomen and buttock muscles tightened.



Sitting or Forward Flexion

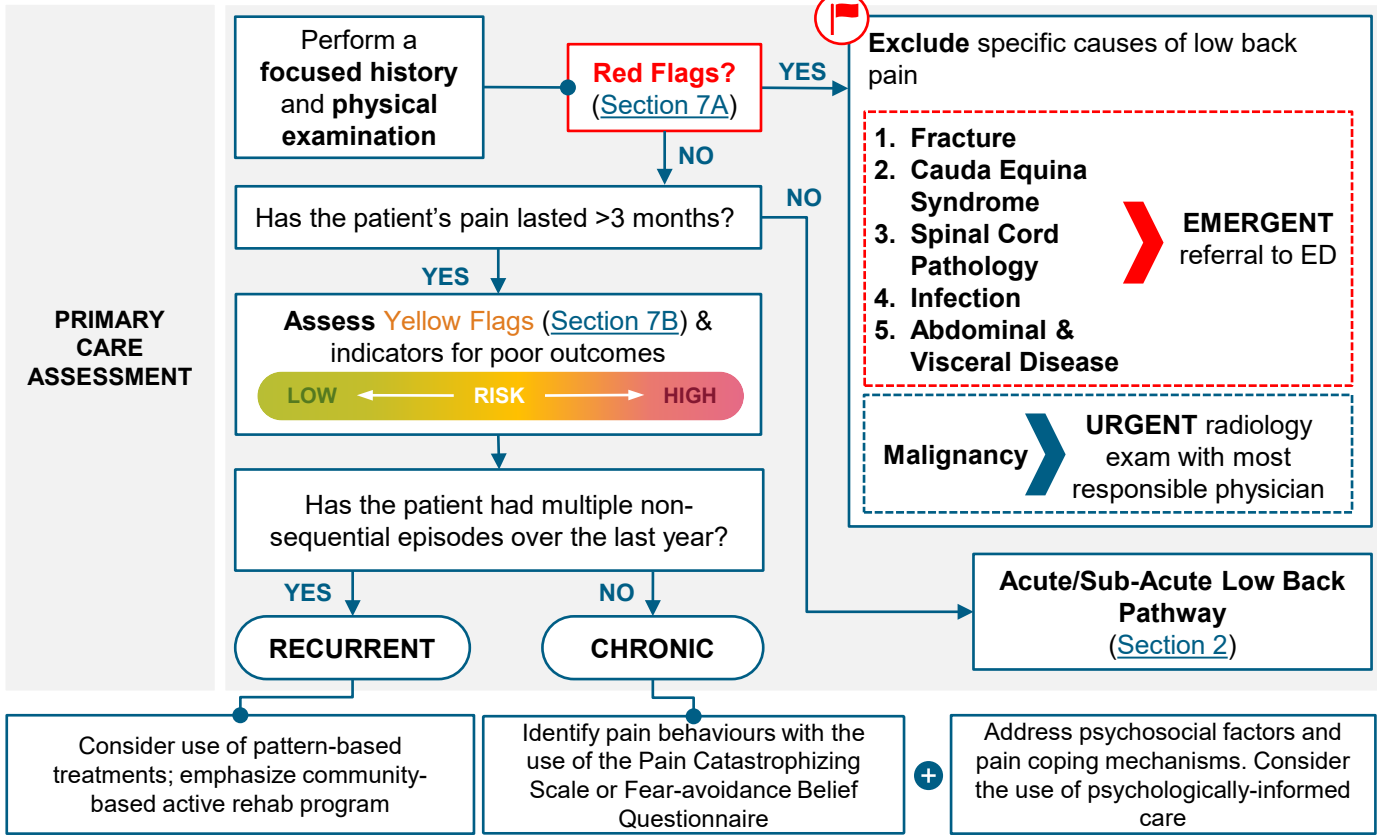
- When pain occurs, rest in seated or forward flexion.
- If in forward flexion, lean forward to rest stomach on lap, allowing arms and head to hang near feet.



FUNCTIONAL RECOMMENDATIONS

- Change positions frequently from sitting to standing to walking.
- Schedule rest periods throughout the day (Find the rest position that best reduces leg pain).
- Long-term bed rest is not recommended and can hinder recovery.





KEY EDUCATION

- Low back conditions may not be related to the extent of damage in the back (e.g., hurt does not necessarily mean harm).
- Low back conditions are rarely caused by serious health problems.
- Most often we are unable to determine a specific pain generator. A functional-based rehabilitation plan can still be used to effectively manage the condition.
- Early return to work, even on modified duties promotes better outcomes.
- Staying active is important Carry on with normal activities as much as possible.

EXERCISE

- Emphasize active-based rehabilitation over passive treatments such as acupuncture, electrical modalities, manual therapy, and spinal injections.
- Determine what the patient prefers for activity and recommend a general exercise program such as walking, swimming, or biking. Gradually increase duration and difficulty.
- General exercise programs working toward overall health goals and well-being.

KEY OUTCOME MEASURES

- Measure function as opposed to pain as an outcome. Consider the use of the Oswestry Disability Index or Roland-Morris Disability Questionnaire to evaluate disability and change over time.

ANALGESIC OPTIONS

- Acetaminophen, NSAIDs, analgesic antidepressants if indicated.

REFERRAL OPTIONS

- Community-based or home rehabilitation program (exercise-based, movement-based therapy, judicious use of manual therapy).
- Community-based cognitive behavioural therapy program.
- Multidisciplinary chronic pain program.
- Injection therapies in carefully selected patients (e.g., epidural steroid, therapeutic facet joint, sacroiliac joint corticosteroid).
- Surgery and specialist consults in carefully selected patients (e.g., instability, spinal deformity).