Spine Guide

Learn about your spine, common spine problems, and the care you can expect.
THE SPINE PROGRAM IS A
MULTIDISCIPLINARY, INTEGRATED PRACTICE
that provides comprehensive spine care services, including surgical and non-surgical treatment of all spinal conditions.

Our staff includes specialists in physical and occupational therapy, physical medicine and rehabilitation, interventional and medical pain management, behavioral medicine, radiology, neurosurgery, and orthopedic surgery.

AS AN INTERDISCIPLINARY TEAM, WE PARTNER WITH YOU to assess your spine condition, weigh treatment options, and design a personalized treatment plan. We combine clinical excellence with research, education, and advocacy — and we strive always to provide healing with a human touch.
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Spine Basics

Knowing about your spine — its parts, how they’re put together, and what can go wrong — can help you understand your diagnosis and treatment options. It can also help you protect your spine in the future.

Your spine

Your spine is made up of vertebrae, discs, spinal cord and nerves, ligaments, and muscles.

Vertebrae

Your spine is a column of 33 bones (vertebrae) stacked up on top of each other. As shown below, the spinal column is divided into four regions, and the vertebrae within each region are numbered.

Cervical. This is your neck area. The cervical vertebrae are numbered from C1 to C7.

Thoracic. This is your upper- and mid-back, from your chest to your waist. The thoracic vertebrae attach to the ribs and are numbered from T1 to T12.

Lumbar. This is your lower back area. The lumbar vertebrae are numbered from L1 to L5.

Sacral. This region of your spine is your buttock and “tailbone” area. It includes the sacrum (5 vertebrae that are naturally fused to form a triangular-shaped bone) and the four very small coccygeal vertebrae below that.
Spine section showing vertebrae, discs, and facet joints:
side view

DISCS

The vertebrae are separated by discs that cushion the vertebrae and allow them to move properly. Each disc is a small, circular capsule with a tough outer wall (the annulus) and a softer core (the nucleus). In children, this core is gel-like, but with age, the core tends to harden and become less elastic.

Spine and facet joints:
view from the back

FACET JOINTS

Each vertebra has two pairs of facet joints. These joints link the vertebrae together at the back of your spine. They stabilize the spine and allow you to bend and twist. To help the joints glide smoothly against each other as you move, the joint surfaces are covered by cartilage and the whole joint is covered by a capsule containing fluid. This joint capsule is made of ligaments and other connective tissue.
Spinal cord and nerves

Besides supporting the weight of your body, the vertebrae also house and protect your **spinal cord**. The spinal cord is a network of nerves that extends from the base of your brain to your lower back. (The spinal cord passes through a tubular space — the **spinal canal** — formed by the ring-shaped openings of the vertebrae.) Smaller **spinal nerves** branch off of the spinal cord, exiting through smaller spaces between your vertebrae to reach all areas of your body.

Ligaments

The vertebrae are connected and supported by **ligaments**. The two main spinal ligaments run the length of the spinal column.
Common Problems

Back or neck pain is common. Most pain is temporary, but it can reoccur. It’s often caused by a strained muscle or sprained ligament — perhaps from an activity you’re not used to, such as yard work, moving furniture, or sitting for a long time.

Less often, pain comes from damage to part of your spine, or from a condition you were born with. The pain may accompany other symptoms such as stiffness, numbness, or weakness in your arms and legs. Spine problems can even affect your bowels and bladder. Some common problems are described in the following pages.

Who has back and neck pain?

Anyone can have back or neck pain. Still, some things increase your chance of having pain, for example:

- **Getting older.** The older you are, the more likely you are to have back or neck pain.

- **Poor physical fitness.** Lack of exercise and poor posture increase your risk of back pain.

- **Being overweight.** Extra weight puts extra stress on your spine.

- **Your job or your hobby.** A job or activity that requires you to lift, push, or pull can be risky. But desk work can also be hard on your back — especially if you don’t sit up straight or don’t get up very often.

- **Smoking.** Studies show that smokers have more back pain and spinal conditions than non-smokers do.

- **Previous injury.** An injury you had months or years ago may put you at risk for back problems later on.

- **Diseases.** Arthritis, osteoporosis, and other diseases can increase your chance of having back pain.

- **Family history and genetics.** Some conditions run in families.

Although your spine care team will provide a thorough assessment, it’s not always possible to pinpoint the source of symptoms. Studies show many cases of back pain have no identifiable cause.
**Abnormal curvature**

Your spine’s natural curves help balance your body. If the curves become too pronounced — or if your spine develops a twist or an extra curve — it puts extra pressure on the vertebrae and discs. This can cause instability, pain, and bulging or herniated discs. Abnormal curvatures include those shown below.

- **Scoliosis (in red)**
  - A side-to-side curve in your back

- **Kyphosis (in red)**
  - Increased curve ("hump") in your upper back

- **Lordosis (in red)**
  - Increased curve in your lower back ("swayback")

*(normal curvature shown in blue)*
Fractures
Like any bones, your vertebrae can crack or break. Reasons for a spine fracture include an injury, repeated stress, or a condition like osteoporosis, which can make bones weak and brittle.

Degenerated disc
Degenerative disc disease (DDD) is a catch-all term to describe changes — usually thinning, hardening, and drying out — in your spinal discs. Disc degeneration can result from normal aging or wear-and-tear, but it’s sometimes begun or sped up by injury, disease, or unusual stress. Degenerated discs can irritate the spinal nerves and cause instability. They can be painful.

Bulging disc
If the outer wall of a spinal disc weakens, it may push out (bulge) toward the nerves. This can cause painful nerve irritation.

Herniated disc (also called ruptured disc)
If the outer wall of a spinal disc tears (ruptures), the soft material inside the disc can squeeze out and press on nearby nerves. This can cause pain, numbness, or weakness in your legs or back.

Instability
Spinal instability is when adjoining vertebrae slip back and forth, or have permanently shifted out of position. This instability can be caused by a damaged spinal disc, a bone injury, arthritis in the facet joints, or just something you were born with. The slippage can irritate the bone, disc, spinal cord, and nerves.

Stenosis
Stenosis is a narrowing of the spinal canal. Stenosis can press on the spinal cord and nerves and cause pain and other symptoms. Stenosis can be caused by enlarged ligaments, facets, or other abnormal bone growth such as bone spurs.

Nerve problems
All of the conditions described above can irritate or press on ("pinch") the spinal cord or nerves. This can cause pain, numbness, weakness, and other problems throughout your body. Common examples are lumbar radiculopathy or sciatica (nerve problems in your lower spine, causing leg pain) and cervical radiculopathy (nerve problems in your neck, causing arm pain).
Spine treatment isn’t one size fits all. At the Spine Program, we work closely with you and with each other to understand your condition and create a treatment plan that matches your needs and lifestyle.

Your spine care team

The Spine Program includes people from different specialties working together to help diagnose and treat you. Here are a few of the people who may be on your spine care team:

- **Nurses, Nurse Practitioners, Physician Assistants.** These experts can help assess your condition and coordinate your care. Working with the rest of your team, they can also directly provide much of the care you’ll receive at the Program.

- **Doctors.** Your team may include doctors specializing in physical medicine and rehabilitation, radiology, interventional and medical pain management, or behavioral medicine. If surgery looks like it may be an option for you, your team will include a neurosurgeon or orthopedic surgeon. Your spine team will also consult with your primary care doctor as needed.

- **Physical therapists.** The treatment of spine and pain conditions often includes physical and occupational therapists. These experts help create individualized programs to improve or restore strength, flexibility, movement, and function.
Team-based approach

At the Spine Program, our experts work as a team on each phase and aspect of your care. Here’s what you can expect:

- **An initial assessment.** When you first come to the Spine Program, a provider will work with you (and with your primary care provider as needed) to understand your previous care and your reasons for coming. The provider will consult with others at the Spine Program to evaluate your case and assemble a team suited to your needs.

- **Interdisciplinary care.** We may recommend that you see more than one provider at the Spine Program. There are several reasons for this. First, we may need a range of medical perspectives to build a complete picture of your problem and treatment options. Second, you may need to see different providers at different stages of your care. Or, your care may require more than one type of treatment at a time — and thus more than one specialist.

- **Care management.** A nurse or other provider will coordinate all your care at the Spine Program. Thanks to this coordination, everyone on your spine care team — including you — will have the full story of your problem. They’ll also know the treatment plan you’ve agreed to, and be able to do their part efficiently and effectively.

- **Communication.** You are the most important person on your spine care team. Throughout your treatment at the Spine Program, we’ll do our best to explain our processes and give you the information you need to make decisions and help care for yourself. We welcome your questions and suggestions — in fact, we depend on them to help us work well with you and your family.
Assessment and Treatment

This section describes the common techniques used for diagnosis and treatment of spinal conditions.

Assessment

To learn about you and your condition, your spine team will discuss your symptoms with you, examine you, and obtain relevant diagnostic tests. Over the course of your care, these evaluations and tests may be repeated as part of follow-up care, or as other clinicians become involved in your care. Here are some of the evaluations and tests your team may use.

Patient history

Your care team will ask questions as part of their assessment. Possible topics are listed below.

- **Pain and other symptoms, for example:** Where is your pain? How bad is it? How long have you had it? When did you first notice it? What makes it better, or worse? How is your life affected by your symptoms — have they changed your sleep habits, your work life, your recreation?

- **Previous medical care, for example:** What tests or treatments have you already had? What were the results? What medications do you take? Please bring prior imaging and medical records to your first appointment. The place where your studies were performed can help you obtain copies.

- **Lifestyle and daily habits, for example:** Do you smoke? Exercise? What kind of work do you do? How do you usually sleep, sit, stand?

- **Family history, for example:** Does anyone else in your family have back problems or chronic pain?

- **Overall physical and emotional health, for example:** Do you have any chronic conditions such as arthritis or osteoporosis? Have you had cancer, depression, or an infection? How would you rate your recent and current stress level? What do you do for fun and relaxation?
Physical exam
As part of a physical exam, your doctor will check your body and its movement. Below are some things your doctor may note.

• **Weakness:** Simple exercises can help test your strength.
• **Range of motion:** Your doctor may check your flexibility or watch you bend and twist.
• **Tenderness:** Your doctor may assess areas of soreness by touching parts of your body.
• **Sensation and sensitivity:** Your doctor may check to see that you can feel heat, cold, or a pin prick on parts of your body.
• **Reflexes and motor skills:** Your doctor may ask you to walk on your heels or toes, or do tests to check your body’s reactions.
• **Shape, tone, and position** of the spinal bones, muscles, and so on.

Laboratory tests
Sometimes back and neck symptoms can be caused — or made worse — by a systemic illness (an illness throughout your body, not just in your spine). To check for illness, your doctor may request a test of a sample of your blood or urine. In addition, if surgery or other interventions will be part of your treatment, routine laboratory tests are usually ordered first.

Imaging studies
There are several technologies that allow your spine team to take pictures of the inside of your body. Depending on what they need to see, they may suggest one of the imaging studies listed below.

• **X-ray:** Beams of low-dose radiation create pictures of tissues, bones, and organs on film.
• **MRI:** Magnetic Resonance Imaging (MRI) uses a magnetic field and radio waves to create images. MRI is very useful for evaluating details of soft-tissue structures, like nerves, in and around your spine.
• **CT scan:** Computed tomography (CT) uses a computer and x-rays to create cross-section views (“slices”) of areas of the body. It’s especially useful for highlighting abnormal tissue and clearly showing bone detail.
• **Bone density scan:** This scan uses x-ray or ultrasound to measure the amount of bone in a particular area. It can detect and assess osteoporosis (thinning bones).

Electrodiagnostic testing
The term “electrodiagnostic testing” covers a range of tests that measure electrical activity in nerves and muscles. Two common electrodiagnostic tests are the electromyogram (EMG) and the nerve conduction study (NCS). Results from these tests help your doctor assess nerve and muscle function and locate any damage.

Other procedures
Other procedures, such as spinal injections and discography, may be useful in evaluating sources of back pain that cannot be seen on other common imaging studies. Your care team will provide information on these procedures if needed.

PAIN IS NOT THE ONLY SYMPTOM WE CARE ABOUT....
Your medical assessment should cover a range of symptoms — not just pain — such as the following:

• Numbness, tingling, “pins and needles”
• Bowel or bladder problems
• Stress or emotional issues
• Fever, chills, sweating
• Weakness, slow reflexes
• Dizziness, headaches
• Sexual dysfunction
• Unusual weight gain or loss

Mention these or any other unusual changes or symptoms to your care team. Even if it seems unrelated to your spine or doesn’t bother you, it will help your providers get a more complete picture of your health.

If assessment shows a problem in your spine, it doesn’t necessarily mean that you won’t get better. Many people with arthritis, disc degeneration, and other problems can live with little or no pain when treated effectively.
Treatment options

Your care may include one or more of the treatments described below.

Education and activity

Your care team can teach you what you can do on your own to relieve pain, regain strength, and increase flexibility. For example, they may advise you on proper body mechanics (how to sit, sleep, lift, and so on) or how to use ice and heat to ease inflammation. Much of this important education can help you prevent spine pain in the future — as well as treat it today.

Oral medication (pills)

Your doctor may prescribe medication to reduce inflammation, relax muscles, and ease pain. Take the medication exactly as your doctor or pharmacist advises — and let your doctor know about other medications, herbs, or supplements you take.

Physical therapy

Physical therapy encompasses a variety of treatments to promote healing, relieve pain, build strength and flexibility, and help prevent future injuries. For example, your physical therapist may create and supervise a program of exercises and make suggestions to help improve body mechanics (how to sit, sleep, lift, and move). Other physical therapies include spinal manipulation (applying force to a spinal joint) and traction.

Traction

Traction is a non-surgical method for decompressing the vertebrae. It’s done either manually by a specially trained provider, or mechanically with braces or devices that gently elongate the spine.

Spinal injection

Your doctor may recommend a spinal injection to treat inflammation or ease pain. An injection can deliver medication directly to the source of your symptoms. Common injections include:

- **Epidural steroid (cortisone) injections.** Injections near specific nerves or directly into the epidural space (the area around the nerves within the spinal canal) can help diagnose and treat pain.
- **Facet joint injections and nerve branch blocks.** Injections in or near the facet joints can treat arthritic joint pain.
- **Sacroiliac (SI) joint injections.** Injections at the SI joint, where the spine and pelvis join, can diagnose and treat pain in that area.
- **Trigger point injections.** Injections into tight, irritated muscle areas (trigger points) may help the muscle relax and ease pain.
Other non-surgical procedures

Other procedures — such as neurotomy and radiofrequency ablation — use heat, cold, chemicals, or radiofrequency energy to destroy nerves near a problem joint. This relieves symptoms by preventing pain signals from traveling to the brain.

Additional treatments for chronic pain include spinal pumps and stimulators that are implanted under the skin. A pump can put medication directly into the spinal fluid at just the right place in your spine. A spinal stimulator delivers a small electric pulse on the surface of the spinal cord to help mask pain.

Surgery

Most spine problems can be treated without surgery. In some cases, however, your spine care team may suggest surgery as a good option for relieving your symptoms. Surgical options include those listed below.

- **Microdiscectomy**: Removing part of a damaged spinal disc through a small surgical incision, using microscopically enhanced techniques.

- **Laminotomy, laminectomy (decompression)**: Removing bone, ligament, and spurs which cause spinal stenosis. These procedures relieve pressure on a nerve or the spinal cord.

- **Spinal fusion**: Joining (fusing) two vertebrae so that there’s no movement between them.

- **Anterior Cervical Discectomy and Fusion (ACDF)**: Removing a disc in the neck (cervical) region of your spine and fusing the vertebrae above and below it.

- **Vertebroplasty**: Injecting a special cement into a collapsed vertebra to support the damaged bone and help with pain.

- **Kyphoplasty**: Injecting a special balloon and cement into a collapsed vertebra, similar to vertebroplasty. The balloon is inflated inside the vertebra to restore the original height of the bone, and the cement helps preserve this shape after the balloon is removed.

- **Total disc replacement (arthroplasty)**: Removing an entire damaged spinal disc and replacing it with an artificial disc to help preserve motion between two vertebrae.
My spine care team:


My appointments:

Date: ___________________________ Time: ___________________________
Provider: _______________________

Date: ___________________________ Time: ___________________________
Provider: _______________________

Date: ___________________________ Time: ___________________________
Provider: _______________________

Date: ___________________________ Time: ___________________________
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To find these and other resources, go to:
intermountainhealthcare.org