

# Cord compression

Cord compression is a race against the clock: get an MRI within hours, start dexamethasone (a strong steroid to shrink swelling), and either cut the pressure off with surgery or blast it with radiation—all in under 24 hours—or the person may never walk again.

## THE ONE-LINE TRUTH

Something (tumor, infection pocket, blood clot, ruptured cushion, or broken bone) is squeezing the spinal cord inside its bony tunnel, cutting off the nerve signals that run your legs, bladder, and feeling below that squeeze point.

## The chain — how it unfolds

1. A mass (tumor, abscess, blood clot, herniated disc, or fractured bone) grows or swells inside the tight bony tunnel of the spinal canal and starts pressing on the spinal cord. — why: The spinal canal is a fixed, narrow space with no room to stretch, so any new mass immediately starts squeezing the soft nerve tissue of the cord, like a hand closing around a garden hose.
2. The squeeze compresses the tiny blood vessels (capillaries and venules) that feed oxygen and glucose to the spinal cord nerve cells, causing starved blood flow (ischemia) (not enough blood flow). — why: The nerve cells in the cord have a very high energy need and no backup oxygen supply, so even a few hours of reduced blood flow starts killing them, especially in the center of the cord where blood flow is weakest.
3. The blood-starved (ischemic) nerve cells swell and release inflammatory chemicals, which triggers more swelling (vasogenic swelling (edema)) in the tissue around the injury, further increasing pressure inside the canal. — why: This creates a vicious cycle: the original squeeze causes starved blood flow (ischemia), starved blood flow causes swelling, and the swelling makes the squeeze worse, accelerating nerve cell death.
4. The descending motor tracts (the nerve highways carrying movement commands from the brain down to the legs) are cut off, so electrical signals cannot reach the leg muscles, causing weakness (paresis) or complete paralysis (plegia) in both legs below the level of compression. — why: Motor signals travel down specific lanes in the cord (the corticospinal tracts), and when those lanes are squeezed shut, the brain's commands never reach the muscles—like cutting a power line.

5. The ascending sensory tracts (the highways carrying touch, pain, temperature, and position sense from the body up to the brain) are also blocked, causing numbness, tingling, or a sharp change in feeling at the level of the squeeze (a sensory level). — why: Sensory signals traveling up the cord hit the compression and stop, so everything below that point goes numb or feels wrong—patients often describe a tight band around the chest or belly at the exact level where the cord is squeezed.
6. The autonomic nerve fibers that control the bladder detrusor muscle (the muscle that squeezes to empty the bladder) and the urethral sphincter (the valve that holds urine in) are disrupted, causing urinary retention (cannot pee) or incontinence (leaking), and the same happens to the bowel. — why: Bladder and bowel control depend on coordinated signals traveling up and down the cord; when the cord is compressed, those signals are cut off, so the bladder cannot empty on command or the sphincter cannot hold, and stool may leak too.
7. The saddle area (the skin around the bottom, genitals, and inner thighs—shaped like the area that touches a horse saddle) loses feeling (saddle anesthesia), which is a red-flag sign of severe compression low in the spine (cauda equina syndrome) or a very low cord injury. — why: The nerves that serve this area exit the very bottom of the spinal canal, so if they are squeezed, the first clue is often numbness in this saddle distribution, along with bladder and bowel trouble.
8. Reflexes below the injury become exaggerated (hyperreflexia, brisk knee and ankle jerks, positive Babinski sign with the big toe going up instead of down) because the upper motor neuron brake signals from the brain are cut off, leaving the spinal reflex arcs firing without control. In the first hours, muscles may be flaccid (floppy) instead, a phase called spinal shock. — why: Normally the brain sends inhibitory signals down the cord to calm reflexes; when the cord is compressed, those brake signals stop, so reflexes overshoot—or in the very early phase, the whole reflex system shuts down temporarily (spinal shock) before the overactive reflexes (hyperreflexia) kicks in.

## Spot it — what you see, and why

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- Back pain that gets worse when lying down or at night: The tumor or swelling is pressing directly on the spinal cord or the nerves coming off it, and when you lie flat, gravity no longer pulls the pressure away — the squeeze stays constant and pain signals fire more strongly.
- Numbness or tingling in the legs, feet, or around the groin and buttocks: The compressed spinal cord or nerve roots can no longer carry normal touch and position signals up to the brain, so you feel pins-and-needles or lose sensation in the areas those nerves serve.

- Weakness in one or both legs: The motor signals traveling down the spinal cord from the brain to the leg muscles are blocked or slowed by the compression, so the muscles cannot contract as strongly — like a kinked garden hose cutting water flow.
- Trouble walking or clumsiness, stumbling more than usual: Because the legs are weak and the spinal cord is not sending clear position signals, the brain cannot coordinate balance and smooth movement — your legs do not know exactly where they are in space.
- Loss of bladder control (cannot hold urine) or bowel control (cannot hold stool): The nerves at the lower end of the spinal cord control the sphincter muscles that hold urine and stool in; when those nerves are squeezed, the brain loses the ability to keep those gates shut.
- A tight band-like feeling around the chest or belly: The spinal cord carries sensation signals from the torso, and when it is compressed the nerves misfire — the brain reads this confused signal as a squeezing or wrapping sensation even though nothing is actually wrapped around you.

## Red flags — act now

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- New inability to hold urine or stool, or not feeling the urge to go
- Sudden weakness in both legs or legs giving out when trying to stand
- Numbness spreading into the groin, buttocks, or inner thighs (saddle area)
- Back pain that wakes you from sleep or does not get better with rest
- Loss of balance or falling more often, especially if it started suddenly

## Treat it — in this order

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1. Dexamethasone 10 mg IV immediately, then 4 mg IV every 6 hours → Dexamethasone is a powerful steroid that shrinks swelling (edema) in the tissue around the compressed spinal cord. The swelling itself squeezes nerve fibers and blocks blood flow, so shrinking it takes pressure off the cord and lets oxygen and signals get through again. Patients often regain some leg strength and sensation within 12 to 24 hours.
2. Urgent MRI of the entire spine (cervical, thoracic, lumbar) with and without contrast within 4 hours → MRI shows exactly what is compressing the cord (tumor, abscess, a pooled collection of blood (hematoma), disc herniation, fractured bone), where it is (which vertebral level), and how bad the squeeze is. Imaging the whole spine catches skip lesions (cancer or infection at multiple levels) that you would miss if you only scanned the painful spot. Knowing the cause and location lets the surgical and radiation teams plan the right procedure.

3. Emergency neurosurgery or orthopedic spine consult (page immediately, do not wait for morning rounds) → Surgical decompression within 24 hours removes the mass, bone fragments, blood clot, or bulging disc pressing on the cord, and it may also stabilize a broken or crumbling vertebra with rods and screws. Releasing the pressure stops ongoing nerve death and gives the spinal cord a chance to heal. Studies show that surgery within 24 hours of losing leg strength improves the odds of walking again.
4. Radiation therapy (10 to 14 daily treatments or a single high dose) if the tumor is radiosensitive or the patient cannot tolerate surgery → Radiation shrinks tumors that are sensitive to X-rays (lymphoma, multiple myeloma, small cell lung cancer, prostate cancer, breast cancer), which gradually releases the squeeze on the cord over 1 to 3 weeks. For patients too sick for surgery or with cancer in bones that would crumble if cut, radiation is the main treatment. It also kills microscopic cancer cells left behind after surgery.
5. Indwelling Foley catheter or intermittent straight catheterization every 4 to 6 hours → When spinal cord compression damages the sacral nerves, the bladder cannot empty on its own and urine backs up into the kidneys, causing hydronephrosis (kidney swelling) and infection. A catheter drains the bladder completely, protecting kidney function and preventing urinary tract infections and bladder rupture while you treat the cord compression.

## Your top priorities at the bedside

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1. Perform and document a complete neurologic exam every 2 hours: motor strength in all four limbs using the 0-to-5 scale, sensory level with light touch and pinprick, rectal tone if trained, and reflexes — why: The spinal cord has no extra space; even small increases in pressure cut off blood flow and cause starved blood flow (ischemia) (oxygen starvation) leading to neuron death within hours; serial exams catch deterioration early so the team can rush to surgery or radiation before damage becomes permanent
2. Administer dexamethasone 10 mg IV immediately as ordered, then continue 4 mg IV every 6 hours on time without delay — why: Dexamethasone (a powerful steroid) shrinks vasogenic swelling (edema) (fluid swelling around the injury) which is often worse than the tumor or abscess itself; reducing swelling restores some cord blood flow and buys time for definitive treatment; delays in steroid dosing allow preventable neuron death
3. Insert a Foley catheter using sterile technique and monitor urine output hourly; if bladder retention is present measure post-void residual before placing the catheter — why: Cord compression blocks autonomic nerves (automatic body control nerves) to the bladder causing retention (inability to empty); a full bladder stretches and damages bladder muscle permanently within 24 hours and increases infection risk; immediate drainage protects future bladder function