

A 76-year-old female with BMI of 29 is brought to your office by her daughter complaining of low back pain. The pain starts in the lumbar region and radiates to the buttocks and thigh. The pain is worse with walking and better when the patient flexes forward. On physical exam, pedal pulses are intact and symmetrical.

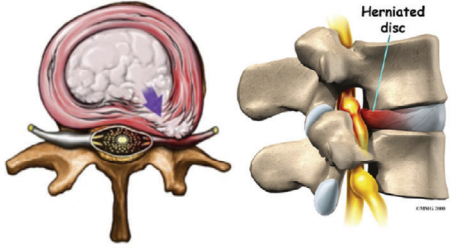
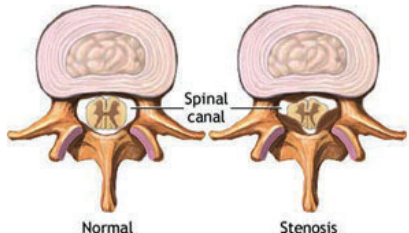
What is the the most likely diagnosis?

- A. Peripheral artery disease
- B. Spinal stenosis
- C. Polymyalgia rheumatica
- D. Thoracic disc herniation
- E. Lumbar disc herniation

- Caused by narrowing of the spinal canal with compression of the nerve roots.
- Since it most commonly results from osteophytes due to osteoarthritis, it is more common in patients over 65.
- Patients most commonly complain of low back pain that radiates to the buttocks and thighs.
- It is worse with standing and walking.
- There is improvement with lumbar flexion and sitting because this ↑ the space in the lumbar spinal canal.

Peripheral artery disease	Spinal stenosis
Leg pain exacerbated by walking	
Claudication (Vascular)	Pseudoclaudication (Neurogenic)
Pedal pulses absent	Pedal pulses present
“Shopping cart sign” _____	“Shopping cart sign” _____
Walking uphill → ↑metabolic demand → ↑pain	Walking downhill → ↑lordosis → ↑pain



Disc herniation		Spinal stenosis
flexion (sitting)	Worse with	extension (standing)
extension (standing)	Better with	flexion (sitting)
Usually <50 years	Age	Usually >50 years
Sudden	Onset	Insidious
		<p>Spinal stenosis is a narrowing of the spinal canal</p> 
Diagram		Normal Stenosis

Which of the following is correct regarding the spinal stenosis?

- A. Worse with flexion and sitting
- B. Better with extension and standing
- C. Usually over the age of 50
- D. Sudden onset

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What is the most accurate diagnostic test?

- A. Doppler study of the lower extremities
- B. X-ray
- C. Erythrocyte sedimentation rate
- D. MRI

Initial test of choice	Most accurate diagnostic test

For long-term back pain, you should recommend

- A. weight loss
- B. three sets of epidural injections
- C. long-term bed rest
- D. non-steroidal anti-inflammatory drugs

- It is always in the best interest of the patient and practitioner to use non-invasive, cost effective techniques with the lowest possible adverse effect.

A 43-year-old female presents to clinic complaining of pain all over her body for the past six months. History reveals that patient has also been chronically fatigued and unable to sleep. Physical examination reveals tenderness to 11 tender points along the body including the base of the skull on the right side, over the trapezius muscle on the left, over the right gluteal region, the right greater trochanter, and the medial aspect of the left knee.

The most likely diagnosis is

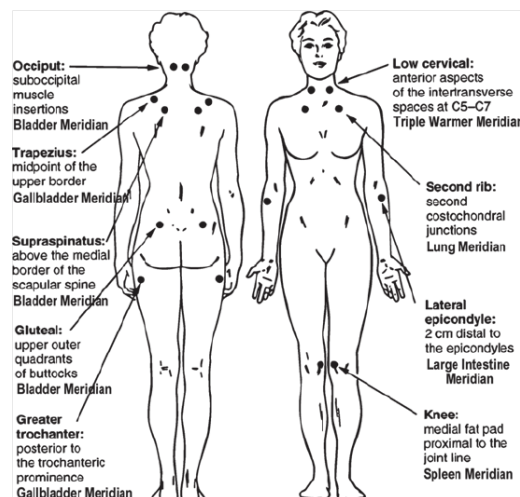
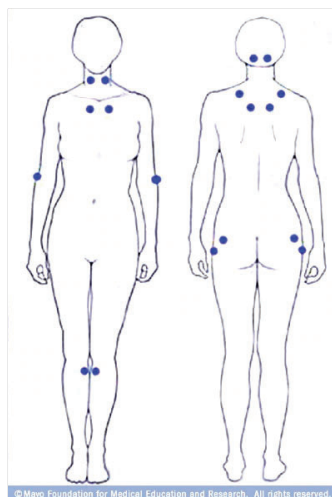
- A. Fibromyalgia
- B. Polymyalgia rheumatica
- C. Ankylosing spondylitis
- D. Rheumatoid arthritis
- E. Tendinitis

- A chronic pain disorder whose diagnosis requires tender points above and below the waist on both left and right sides of the body.
- It is often coincident with chronic fatigue, insomnia, depression, and anxiety.

Fibromyalgia is characterized by:

- A. Chronic widespread pain and tenderness
- B. An elevated sedimentation rate
- C. A rapid resolution with antibiotics
- D. Bilateral median neuropathies at the wrist (CTS)

- _____ is characterized by diffuse tenderness and pain.
- The specific diagnostic criterion is the presence in 11 or more of 18 characteristic tender points.



To diagnose fibromyalgia, widespread musculoskeletal pain must be present over a period of at least _____ months.

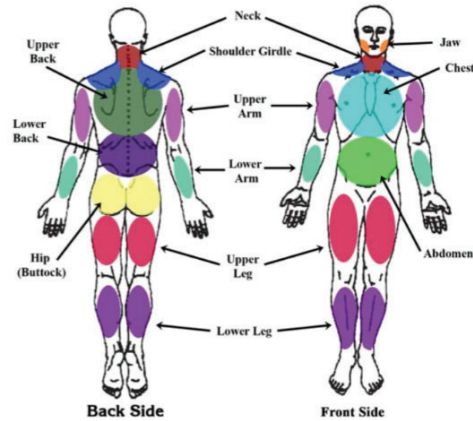
- A. 2
- B. 3
- C. 6
- D. 9

- The definition also includes at least _____ positive tender points out of 18 locations.

New Fibromyalgia Criteria (*American College of Rheumatology, 2010*)

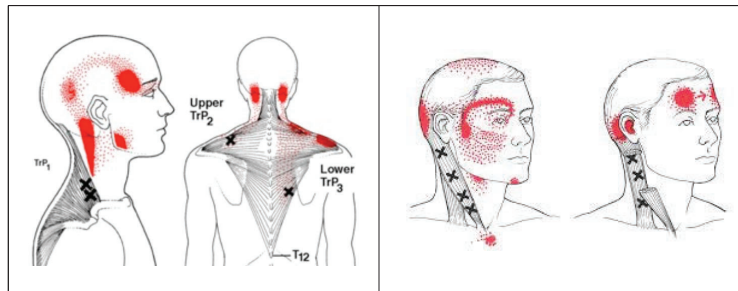
Determining Your Widespread Pain Index (WPI)

The WPI Index score from Part 1 is between 0 and 19.



Myofascial pain syndrome is characterized by:

- A. Widespread tenderness
- B. Tender points
- C. Trigger points
- D. No change in muscle tension



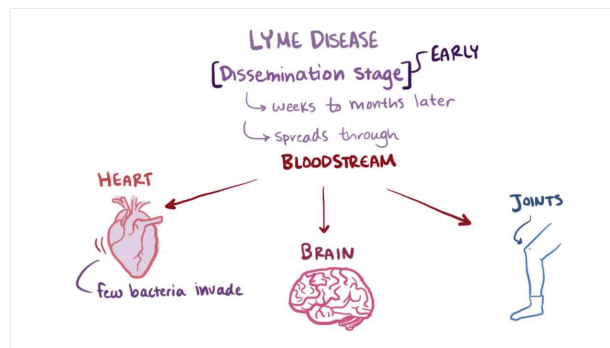
- Trigger points can develop due to a variety of factors, including direct or indirect trauma, overuse, or stress.
- A trigger point is an area of tautness, which on compression can cause local or referred manifestations. Trigger points can refer symptoms to more remote regions.
- In contrast, palpation of a tender point causes local discomfort without referred pain.

Tender points	Trigger points
No Referred pain	Referred pain

Which of the following organisms has been identified as the cause of Lyme disease?

- A. *Borrelia burgdorferi*
- B. *Streptococcus pyogenes*
- C. *Neisseria meningitidis*
- D. *Babesia microti*

- _____ is a tick-borne illness caused mostly by *B. burgdorferi* in the United States.
- The early stage of Lyme disease involves formation of erythema migrans, a characteristic skin lesion that develops within 2 weeks to a month of exposure.
- Later stages can involve neurological and cardiac symptoms along with persistent arthritis involving large joints such as the knee.



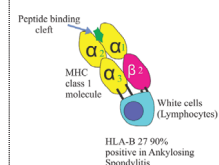
A 27 year old male with back pain that radiates to his thighs. The pain improves when he takes a warm shower.

- A. Gonococcal arthritis
- B. De Quervain's Tenosynovitis
- C. Ankylosing spondylitis
- D. Spinal stenosis

- _____ is commonly found in young males.
- It is an inflammatory arthritis affecting the spine and sacroiliac joints, causing eventual fusion ("bamboo spine" on radiograph).
- Due to its association with HLA-B27, patients may have family history of ankylosing spondylitis, psoriasis, reactive arthritis, or inflammatory bowel disease.
- AS patients may benefit from warm shower or light exercise, which helps with the pain and stiffness.

What does it mean if you are HLA-B27 positive?

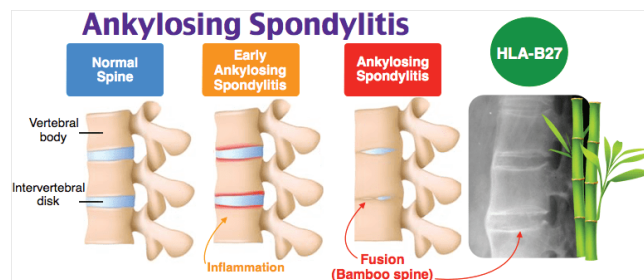
- A negative result means you don't have HLA-B27 in your blood. A positive result means HLA-B27 was found in your blood.
- You may have a higher-than-average risk of certain autoimmune diseases, such as ankylosing spondylitis and reactive arthritis.



A 20-year-old man presents to you for initial evaluation of low back pain and morning stiffness. He denies trauma to the area. On physical examination, there is decreased spinal mobility and decreased chest expansion. You make a diagnosis of:

- A. Spinal stenosis
- B. Reactive arthritis
- C. Ankylosing spondylitis
- D. Psoriatic arthritis

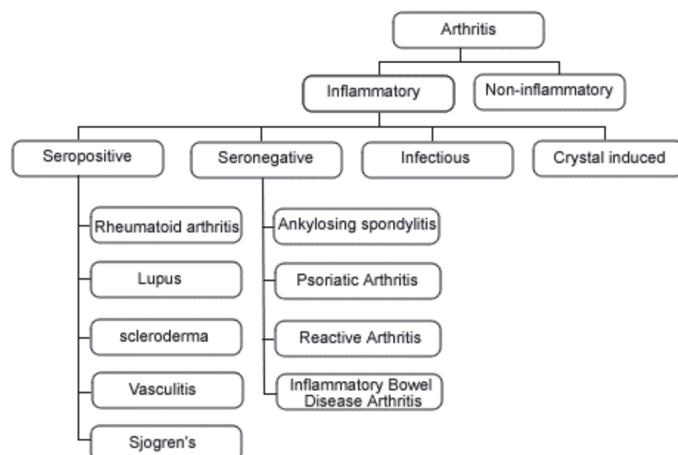
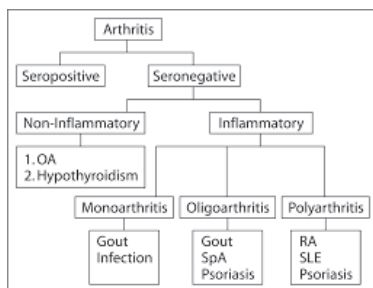
- _____ is three times more common in men than in women, usually presents in the late teens, and is associated with morning stiffness and aching pain in the lower back (at times affecting the buttocks).
- On physical examination, one can find tenderness to palpation over the sacroiliac joints and decreased spinal mobility.



Which of the following is NOT associated with HLA-B27 (+) serology?

- A. Reiter's syndrome (reactive arthritis)
- B. Ankylosing spondylitis
- C. Psoriatic arthritis
- D. Osteoarthritis

- All of the choices above except osteoarthritis are associated with HLA-B27 (+) serology.
- They are called seronegative arthropathies. Other HLA-B27 (+) diseases include enteropathic arthropathy and pauciarticular juvenile rheumatoid arthritis.



Which joint/area of the body is affected first in ankylosing spondylitis (AS)?

- A. Lumbar spine
- B. Sacroiliac joint
- C. Cervical spine
- D. Thoracic spine

- In Ankylosing Spondylitis (AS), the typical order of progression is that the _____ is affected first, followed by the lumbar spine, thoracic spine, and lastly cervical spine.
- This is a distal to proximal progression.

Which of the following is NOT true about ankylosing spondylitis (AS)?

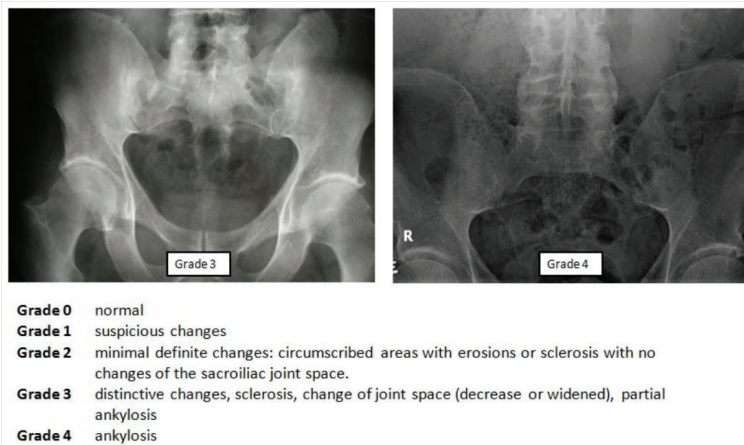
- A. Onset is usually late adolescence or early adulthood
- B. It is three times more common in men than in women
- C. It can be associated with HLA-B27
- D. The sacroiliac joint is usually not involved

- In ankylosing spondylitis, the _____ is usually the first joint to be involved, and both sides are affected. It can be associated with HLA-B27.
- It is much more common in men than in women, and the onset is usually late adolescence to early adulthood.

Which of the following is NOT a common disease complication of ankylosing spondylitis (AS)?

- A. Iritis/uveitis
- B. Inflammatory bowel disease
- C. Osteoporosis
- D. Dementia

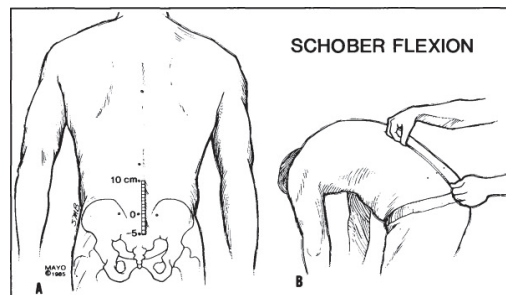
- Common potential complications of ankylosing spondylitis (AS) include iritis or uveitis, inflammatory bowel disease, aortic insufficiency and aortic root dilatation, osteoporosis, and spine fracture.
- Dementia is not a common complication of AS.



The Wright-Schober test is used in which of the following conditions?

- A. Ankylosing spondylitis (AS)
- B. Systemic lupus erythematosus
- C. Reiter's syndrome
- D. Dermatomyositis

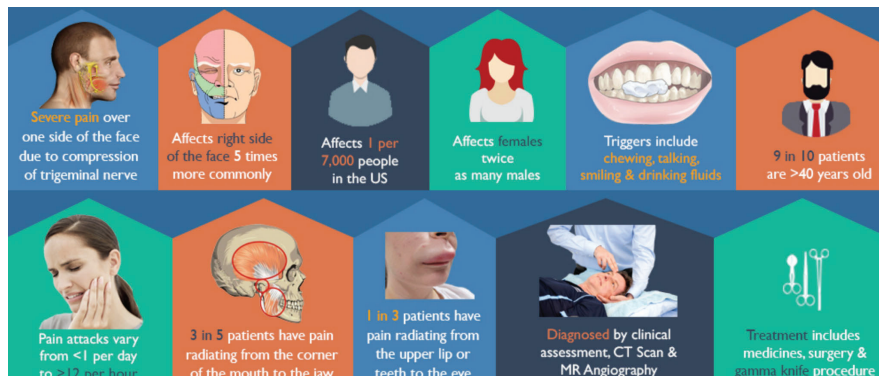
- The _____ test is used to measure the ability to flex the lower back in a patient with AS.
- AS is a chronic inflammatory condition of the spine and sacroiliac joint that leads to osseous formation in the spine.
- The test is conducted with the examiner identifying the fifth lumbar vertebrae (L5), marking 5 cm below this point, and another point 10 cm above L5. The examiner instructs the patient to attempt to touch his or her toes. Lumbar flexion should increase the distance between the two points by more than 5 cm. If the distance between the two points does not increase by 5 cm, flexion is limited and the test is considered positive.



A 34-year-old woman with multiple sclerosis presents to your office with facial pain. The pain is described as stabbing, electric pain, is unilateral over the jaw, and is intermittent. What is the most likely diagnosis?

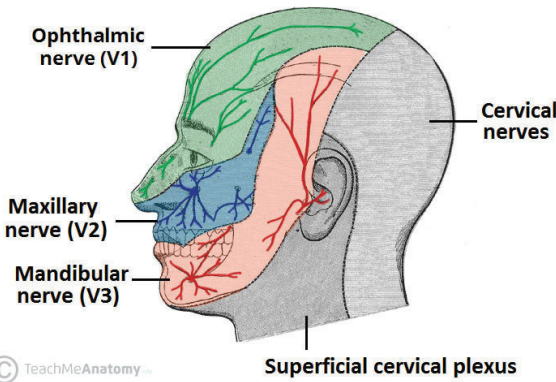
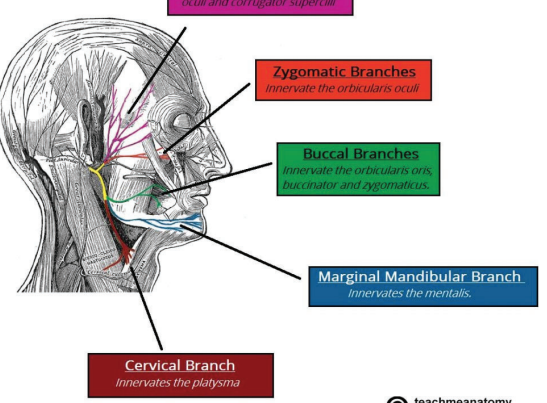
- A. Occipital neuralgia
- B. Trigeminal neuralgia
- C. Osteonecrosis of jaw
- D. Osteomyelitis

- The trigeminal nerve supplies sensation over the jaw.
- _____ causes neuropathic pain, is more common in women, multiple sclerosis patients, and is described as a sharp, electric pain.
- It is usually unilateral and intermittent.



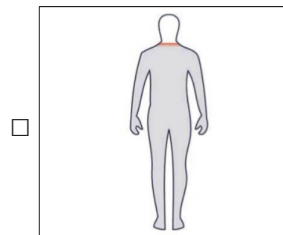
Which one of the following is not a branch of the facial nerve (cranial nerve VII)?

- A. Temporal branch
- B. Zygomatic branch
- C. Mandibular nerve branch
- D. Marginal mandibular branch

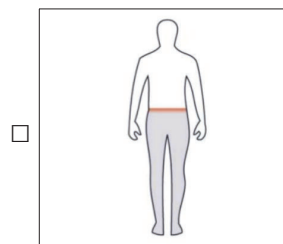
Cranial nerve V (Trigeminal)	Cranial nerve VII (Facial)
 <p>Ophthalmic nerve (V1)</p> <p>Maxillary nerve (V2)</p> <p>Mandibular nerve (V3)</p> <p>Cervical nerves</p> <p>Superficial cervical plexus</p> <p>© TeachMeAnatomy</p>	 <p>Temporal Branches Innervate the frontalis, orbicularis oculi and corrugator supercilii</p> <p>Zygomatic Branches Innervate the orbicularis oculi</p> <p>Buccal Branches Innervate the orbicularis oris, buccinator and zygomaticus</p> <p>Marginal Mandibular Branch Innervates the mentalis</p> <p>Cervical Branch Innervates the platysma</p> <p>© teachmeanatomy</p>
<ul style="list-style-type: none"> • Motor + Sensory. Sensory from face and mouth; Motor to muscles of mastication (chewing) 	<ul style="list-style-type: none"> • Motor + Sensory. Serves the muscles of facial expression, lacrimal glands, and salivary glands

Match each spinal cord injury to the correct diagram.

Tetraplegia (Quadriplegia) ■



Paraplegia ■



Tetraplegia	<ul style="list-style-type: none"> • Replaced the term _____ in 1992. • Impairment or loss of motor and/or sensory function in the cervical segments of the spinal cord due to damage of neural elements within the spinal canal. • Results in impairment of function in arms, trunk, legs, and pelvic organs. • Does not refer to peripheral nerve or brachial plexus injuries (i.e., refers only to UMN injuries).
Paraplegia	<ul style="list-style-type: none"> • Impairment or loss of motor and/or sensory function in thoracic, lumbar, or sacral (but NOT cervical) segments of the spinal cord. • Trunk, legs, and pelvic organs may be involved, but arm function is spared. • Also refers to cauda equina and conus medullaris injuries but not to LMN injuries outside the neural canal such as lumbosacral plexus lesions or peripheral nerve injury.

Match each item to the definition.

Dermatome ■

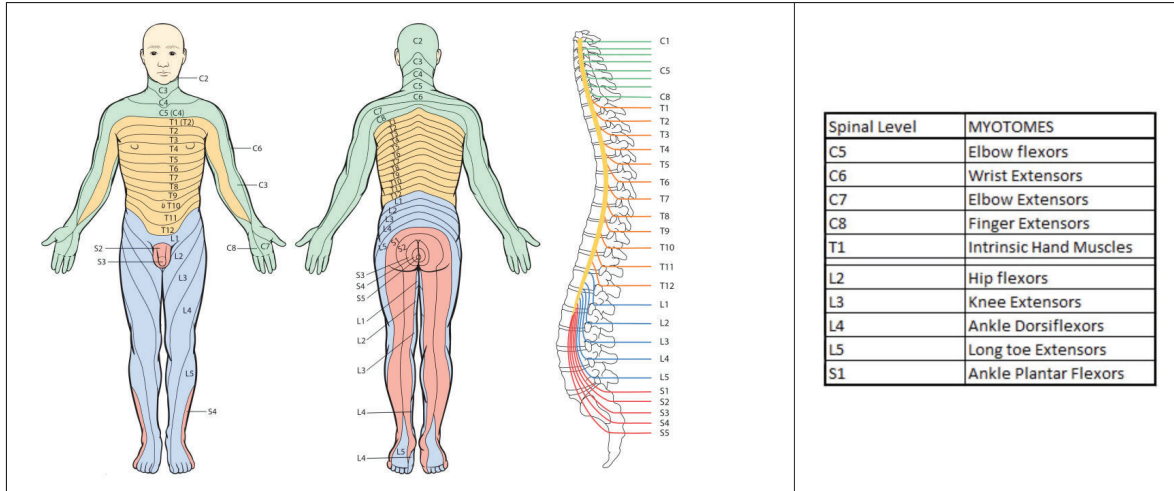


Collection of **muscle** fibers innervated by the **motor** axons within each segmental nerve (root)

Myotome ■

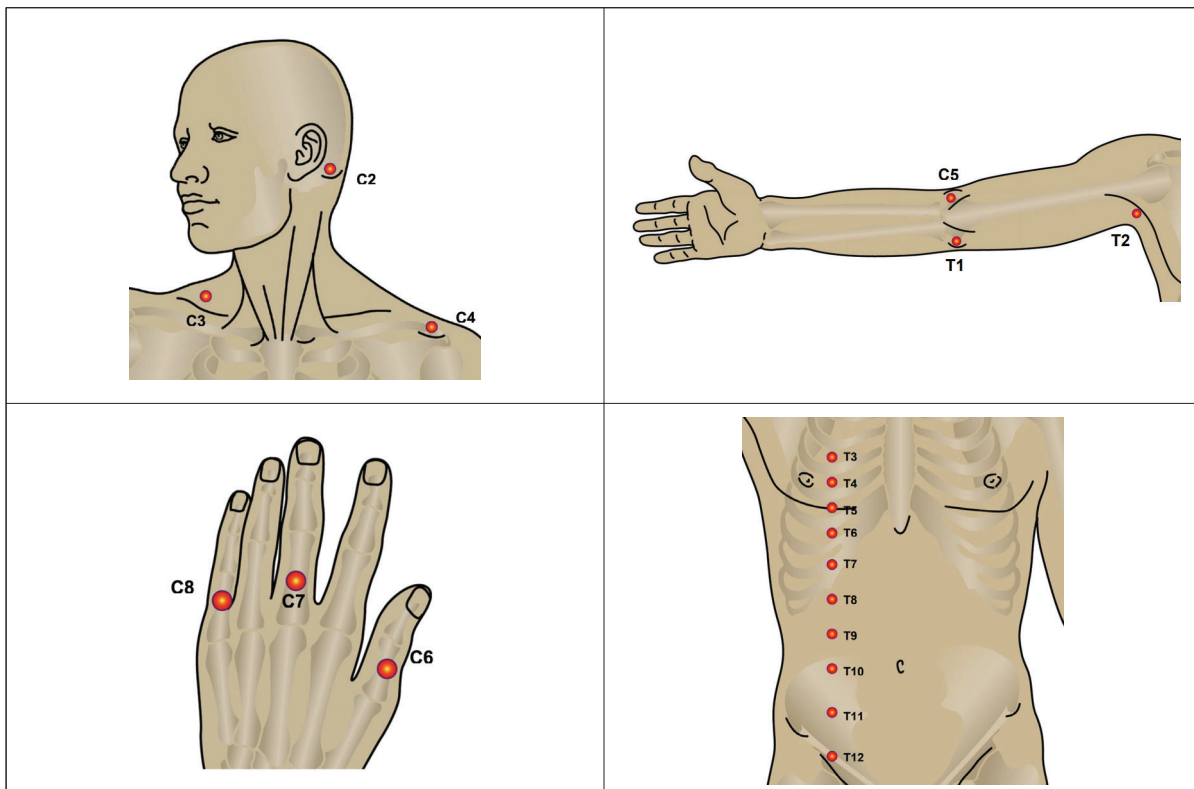


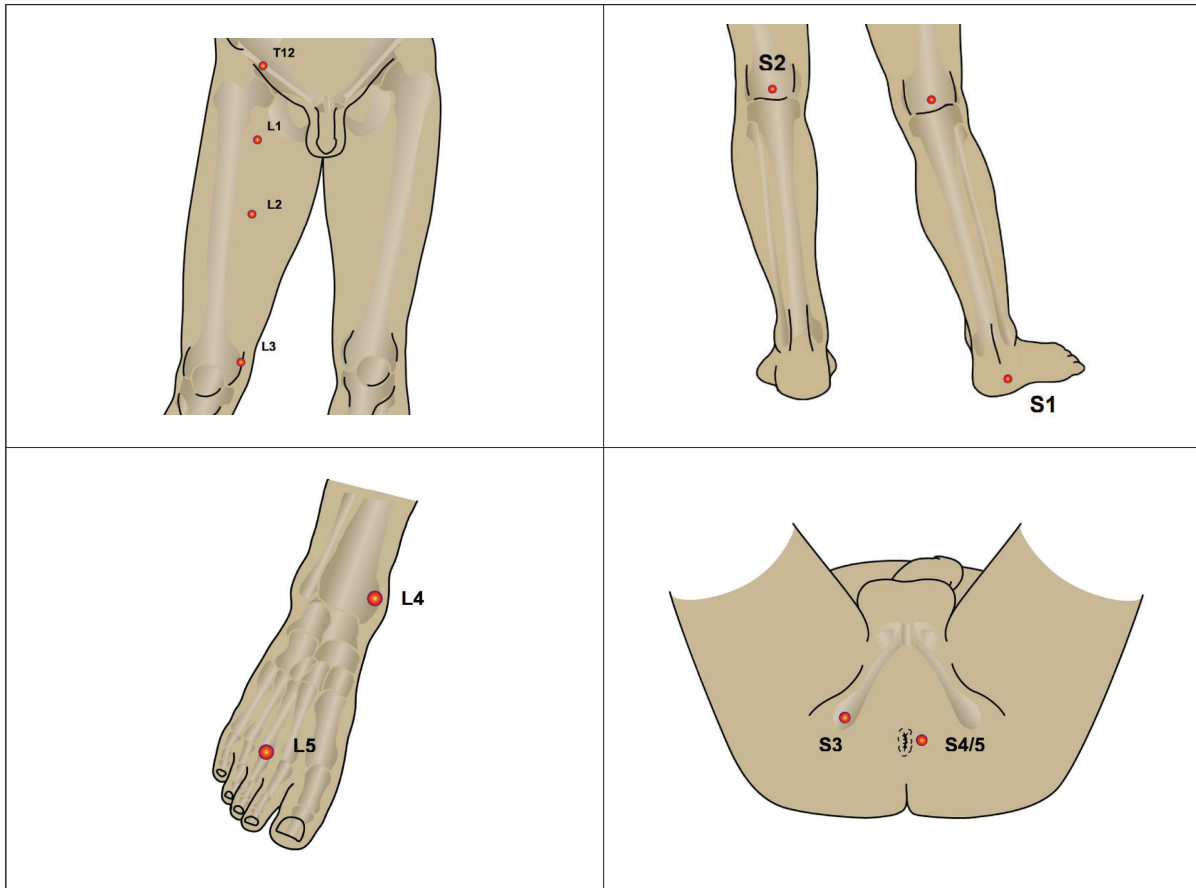
Area of **skin** innervated by the **sensory** axons within each segmental nerve (root)



International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) - Key Sensory Points

*Source: asia-spinalinjury.org





Sensory information that covers the area of skin over middle finger (dermatome) is subserved by afferent fibers from which dorsal root?

- A. C5
- B. C6
- C. C7
- D. C8

Sensory information that covers the area of skin over the nipple line is subserved by afferent fibers from which dorsal root?

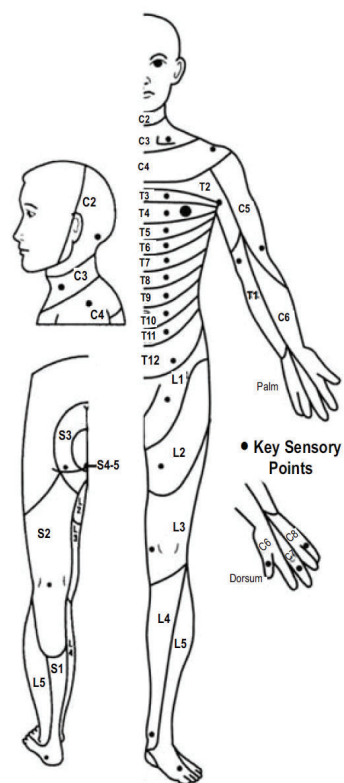
- A. C7
- B. T4
- C. T10
- D. S1

A dermatome is an area of skin that is mainly supplied by a single spinal nerve. What is the T10 dermatome?

- A. Supraclavicular fossa
- B. Nipple line
- C. Umbilicus line
- D. Ischial tuberosity

ASIA Key Sensory Levels

- C2: Occipital protuberance
 C3: Supraclavicular fossa
 C4: Superior acromioclavicular (AC) joint
 C5: Lateral side of the antecubital fossa
 C6: Thumb—dorsal surface, proximal phalanx
 C7: Middle finger—dorsal surface, proximal phalanx
 C8: Little finger—dorsal surface, proximal phalanx
 T1: Medial (ulnar) side of antecubital epicondyle
 T2: Apex of axilla
 T3: Third intercostal space (ICS) at mid-clavicular line
 T4: Nipple line—fourth ICS at mid-clavicular line
 T5: Fifth ICS—midway between T6 and T8
 T6: Xiphoid—sixth ICS (at mid-clavicular line)
 T7: Seventh ICS—at mid-clavicular line
 T8: Eighth ICS—midway between T6 and T10
 T9: Ninth ICS—midway between T8 and T10 (at mid-clavicular line)
 T10: Tenth ICS—at umbilicus (at mid-clavicular line)
 T11: Eleventh ICS—at mid-clavicular line
 T12: Inguinal ligament at midpoint
 L1: Half the distance between T12 and L2
 L2: Mid-anterior thigh
 L3: Medial femoral condyle
 L4: Medial malleolus
 L5: Dorsum of foot at third metatarsophalangeal (MTP) joint
 S1: Lateral heel
 S2: Popliteal fossa in the midline
 S3: Ischial tuberosity
 S4-5: Perianal area (taken as one level)



Source: American Spinal Injury Association