

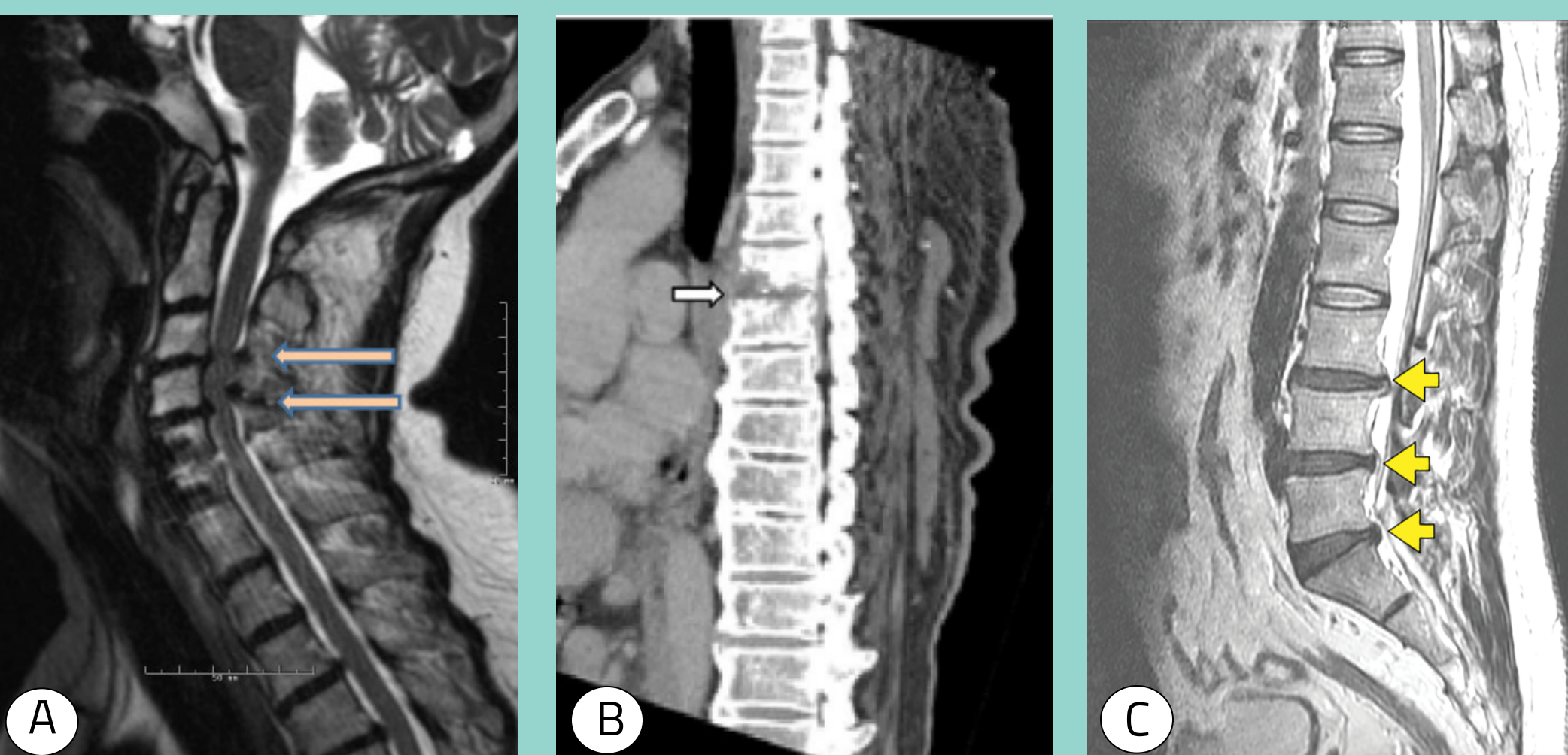
# Spondylosis: An Aging Spine

## Introduction

If osteoarthritis affects the spine, it is classified as spondylosis. Spondylosis is a degenerative disease that has potential to harm normal spinal structures and functions.<sup>1</sup> It commonly affects the vertebral discs and facet joints of any of the three regions of the spine. Depending on the severity and location of the spondylosis, it can severely affect a person's way of living. Spondylosis can be more prevalent depending on a person's sex. For example, spondylosis and lower back pain were found more in women than men.<sup>2</sup> Spondylosis is common in many people and can present with various signs and symptoms. Often, people between the ages of 20 and 50 report having symptoms. However, more than 80% of people over the age 40 were diagnosed with spondylosis on X-ray images.<sup>3</sup> Many people that are diagnosed with spondylosis on a radiograph do not present any symptoms. Spondylosis is a serious disease and can greatly impact an individual. It is important to understand the types, signs and symptoms, causes, diagnosis, and treatment options.

## Types

Spondylosis can affect the cervical (A), thoracic (B), and lumbar (C) regions of the spine. Cervical and lumbar spondylosis are the more common than thoracic spondylosis. Thoracic spondylosis is found to be asymmetric in most patients. On the other hand, lumbar spondylosis can be the most severe type because it often affects multiple vertebrae.<sup>1</sup> Because the lumbar region carries most of the body's weight, it is often the most painful type of spondylosis. If it affects more than one region or more than one level of the vertebrae, it is termed multilevel spondylosis.<sup>3</sup> The location and severity of spondylosis affects each patient differently.



Each picture (A) Cervical (B) Thoracic (C) Lumbar demonstrates spondylosis in an MRI scan with arrows indicating the location.

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## Signs and Symptoms

Typically, people between ages 20 and 50 reported to have symptoms of spondylosis.<sup>3</sup> Normally, symptoms only last a brief time and can be triggered with sudden movements. Symptoms that are more severe to watch out for include:<sup>4</sup>

- Weakness in arms or legs
- Numbness or tingling in arms, hands, legs, or feet
- Popping or grinding sensation of spine when moving
- Poor or loss of coordination
- Difficulty walking
- Headaches
- Loss of motion or pain with rotating head
- Pain or spasms in muscles
- Stiffness in muscles or joints
- Loss of bladder or bowel control

## Causes

The most common causes include:

- **Age**
  - Natural compression due to gravity
  - Wear and tear from friction or movement
- **Lifestyle**
  - Smoking decreases water in spinal discs further restricting movement<sup>5</sup>
  - Obesity increases stress and pressure on disc spaces<sup>6</sup>
  - Low activity levels or lack of resistance training weakens discs
  - Persistent and improper posture potentially damages nerves
- **Genetics**
  - Prior family history poses an increase risk for individuals<sup>5</sup>

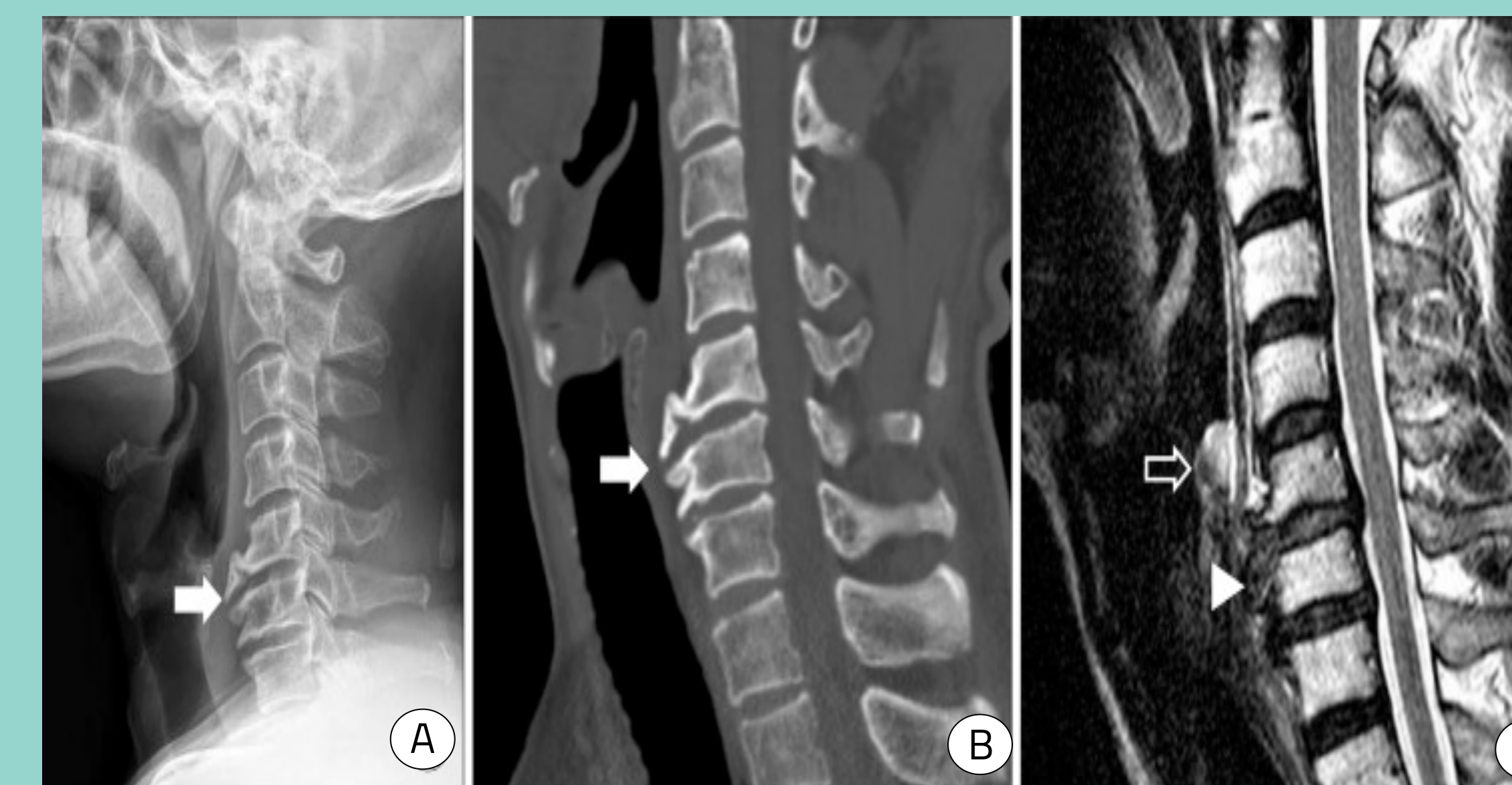
## Effects

The most common effects of spondylosis include:

- **Abnormalities**
  - Results in accelerated degeneration of spinal discs and nerve roots
  - Increases the likelihood of developing deformities such as bone spurs
- **Spinal narrowing**
  - Smaller opening leads to potential pinching of nerve roots<sup>1</sup>
  - Increased pressure from less available space causes numbness in the arms and shoulders if cervical spondylosis is present<sup>1</sup>



Bone spurs and osteophytes. *AXIS* <http://www.axis-hospital-croatia.com/all-conditions-list/bone-spurs-and-osteophytes/>. Accessed January 13, 2021.



Seo JW, Park JW, Jang JC, Lee SM. Anterior cervical osteophytes causing dysphagia and paradoxical vocal cord motion leading to dyspnea and dysphonia. *Annals of Rehabilitation Medicine*. 2013;37(5):717-720. [https://www.researchgate.net/figure/Large-anterior-osteophytes-arrow-of-the-C5-and-C6-vertebra-bodies-are-demonstrated-in\\_fig1\\_258530933](https://www.researchgate.net/figure/Large-anterior-osteophytes-arrow-of-the-C5-and-C6-vertebra-bodies-are-demonstrated-in_fig1_258530933). Accessed January 13, 2021.

## Diagnosis

In order to properly diagnose spondylosis, imaging is a key aspect on finding the location and severity of it. The major modalities of imaging that diagnose spondylosis include X-rays, CT, and MRI.<sup>7</sup> The image above shows cervical osteophytes caused by spondylosis utilizing each modality: (A) X-ray (B) CT and (C) MRI. Normally, an X-ray is ordered of the spine to discover and evaluate any abnormalities. It can show the presence of bone spurs, thickening of facet joints, and narrowing of intervertebral disc space. CT scans are utilized for a more detailed image and additional views of the spine. The CT scan can diagnose if there is a narrowing of the spinal canal. An MRI scan is preferred when diagnosing spondylosis because they show the greatest detail; however, they are the most expensive.<sup>3</sup> MRI scans are used to visualize the vertebrae, the facet joints, the nerves, and ligaments of the spine. MRI is the best imaging modality for diagnosing compression of any nerves within the spine from spondylosis. Also, this modality can show the presence of a herniated disc and the severity of it due to spondylosis. Fluoroscopy exams, such as myelograms can be used to identify the severity of spondylosis. During a myelogram, contrast is injected in the spinal canal to visualize if there is compression or narrowing. There are multiple modalities that contribute to diagnosing spondylosis; therefore, radiology is an important aspect.

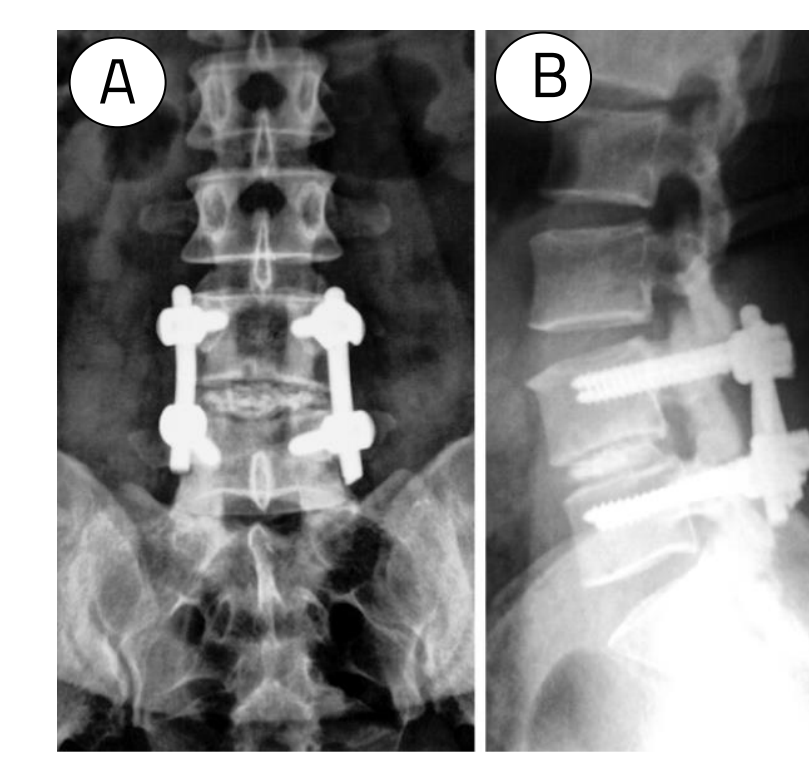
## Treatment

For most patients battling spondylosis, non-surgical options are more common and preferred.<sup>1</sup>

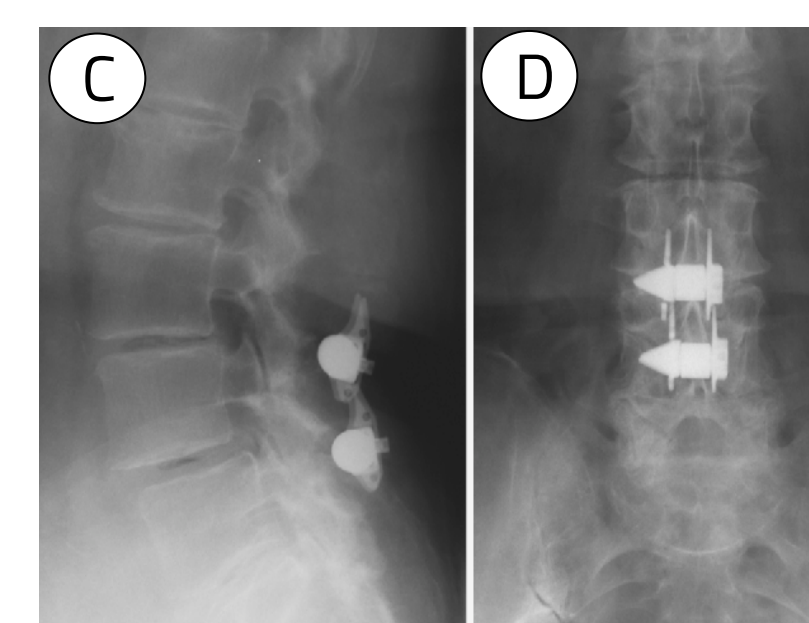
- **Medications:** commonly used are ibuprofen or non-steroidal anti-inflammatory medications (NSAID) to help reduce swelling and relieve pain
- **Physical Therapy:** therapy helps stabilize the spine and increase flexibility
- **Low Impact Exercise:** exercise, such as yoga, is found to be helpful to manage symptoms
- **Steroid Injection:** the steroid cortisone is often used to reduce swelling and relieve pain temporarily

If non-surgical options do not help reduce the side effects, surgery is an option. Indications for surgery options include bowel or bladder dysfunction, spinal stenosis, neurological dysfunctions, and unstable spine.<sup>8</sup> The surgical options consist of<sup>8</sup>

- **Decompression Techniques**
  - **Facetectomy:** removal of facet joint to reduce pressure
  - **Foraminotomy:** increasing the foramen opening, so nerves can exit without compression
  - **Laminectomy:** total removal of lamina
  - **Laminotomy:** partial removal of lamina
  - **Corpectomy:** removal of all or part of vertebral body
- **Stabilization Options**
  - **Dynamic Stabilization:** a device called a dynesys (X-rays (A) and (B)) is a spinal implant that helps maintain more spinal flexibility and range of motion
  - **Interspinous Process Decompression:** a device called an X-Stop (X-rays (C) and (D)) is utilized as a spinal implant, which keeps the spine from pinching the nerves and causing pain



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## Acknowledgements

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