RAPID RESEARCH

@physicaltherapyresearch

June 2023

Inside This Week:

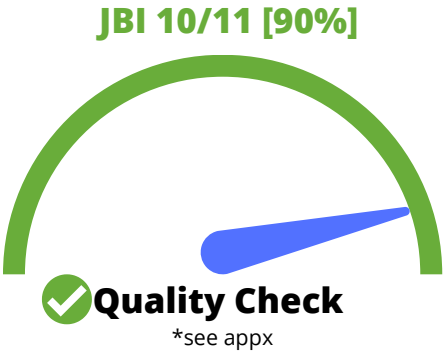
Spinal Stenosis

- Mechanisms of Spinal Stenosis Formation
- Spinal Stenosis Diagnostic Rules
- Epidural Injections for Spinal Stenosis

MECHANISMS OF SPINAL STENOSIS FORMATION

JUNE 2023

Click for Full Text (Byvaltsev et al. 2022)



This systematic review analyzed the literature to best describe molecular and genetic mechanisms that cause Spinal Stenosis (SS).

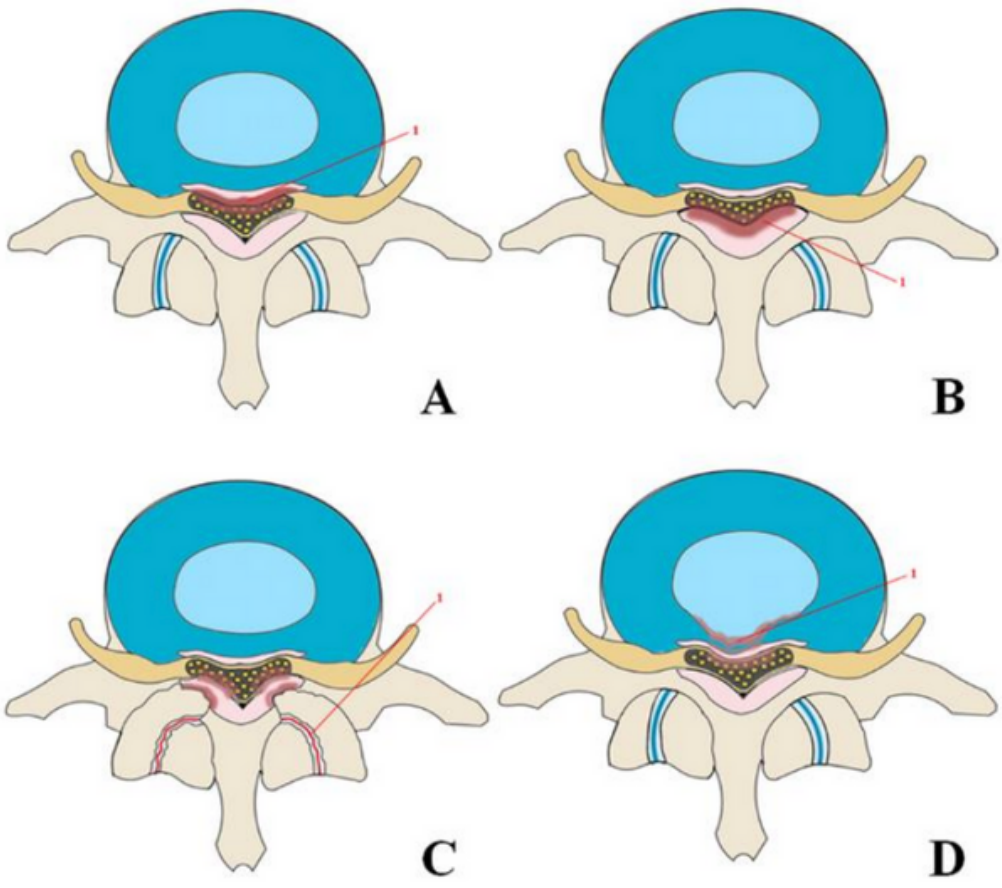


Figure 3. Mechanisms leading to spinal canal stenosis: (**A**)—ossification of the posterior longitudinal ligament spinal stenosis; (**B**)—ossification of the ligamentum flavum; (**C**)—osteoarthritis and hypertrophy of the facet joints leading to stenosis of the spinal canal; (**D**)—herniated disc.

KEY FINDINGS

62 studies included:

The 5 Main Mechanisms of SS:

1. Ossification of the posterior longitudinal ligament (OPLL)
2. Hypertrophy & ossification of the Ligamentum Flavum (HLF/OLF)
3. Facet joint (FJ) osteoarthritis
4. Herniation of the intervertebral disc (IVD).
5. Achondroplasia.

FJ, OPLL, & HLF/OLFLF/OLF associated with an over-abundance of transforming growth factor beta and genes.

OPLL associated with increased bone morphogenetic protein 2.

FJ osteoarthritis associated with Wnt/β-catenin signaling and genes.

MAIN TAKEAWAYS

Prevalence of degenerative diseases leading to spinal stenosis is increasing due to an increase in the life expectancy of the population.

There are a number of contributing factors involved with the formation of Spinal Stenosis.

Although most publications lack data on a direct relationship between the mutation and SS formation, it is clear that genetics has a direct impact on the formation.

SPINAL STENOSIS DIAGNOSTIC RULES

JUNE 2023

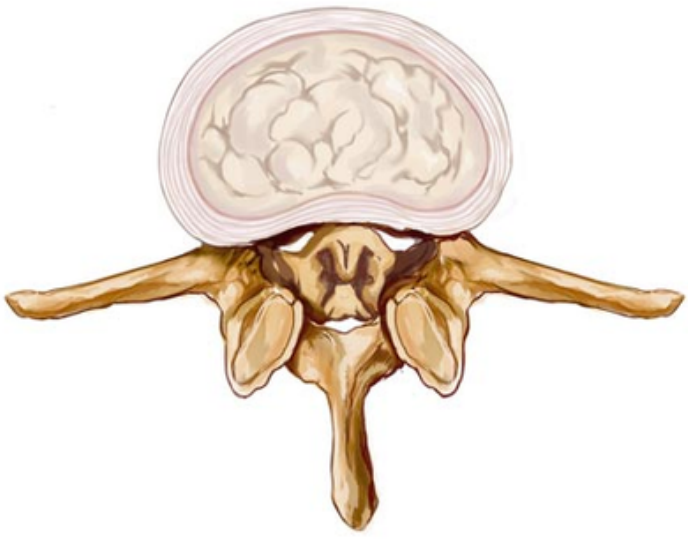
Click for Full Text (Peterson et al. 2017)

JBI 10/11 [90%]

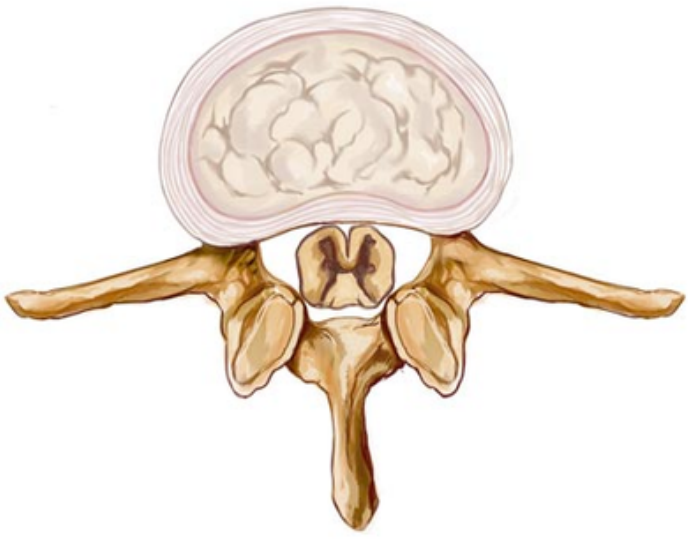
Quality Check

*see appx

This systematic review developed best evidence Clinical Diagnostic Rules (CDR] for the identification of the most common disorders in the lumbar spine.



Stenosis



Normal

KEY FINDINGS

64 studies were included

Clinical Decision Rule for Spinal Stenosis:

Use the Cook rule; at least 3/5 positive test findings from:

- Patient history: age more than 48 years
- Bilateral symptoms
- Leg pain more than back pain
- Pain during walking/standing
- Pain relief upon sitting

Also include:

Improved walking tolerance with the spine in flexion

Patient history report of relief by forward bending.

MAIN TAKEAWAYS

In some diagnostic categories we have sufficient evidence to suggest a CDR.

In others, we have only preliminary evidence that needs testing in future studies.

The use of single clinical tests appears to be less useful than clusters of tests which is more closely in line with clinical decision making.

Follow the Cook rule in diagnosing Spinal Stenosis.

EPIDURAL INJECTIONS FOR SPINAL STENOSIS

JUNE 2023

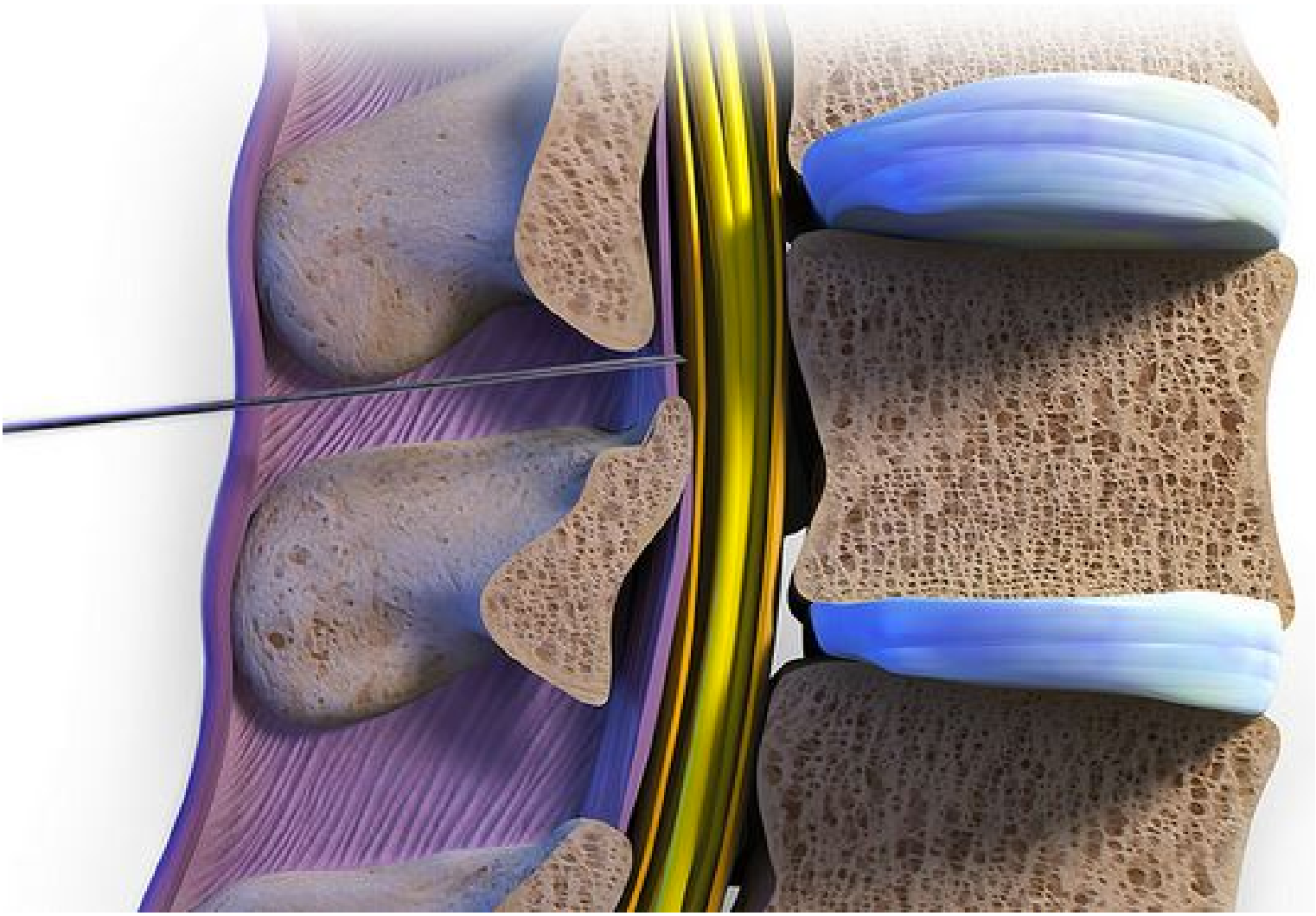
Click for Full Text (Manchikanti et al. 2016)

JBI 10/11 [90%]

Quality Check

*see appx

This systematic review assessed the efficacy of 3 categories of epidural injections for lumbar and spinal stenosis: performed with saline with steroids, local anesthetic alone, or steroids with local anesthetic and separate facts from opinions.



KEY FINDINGS

12 studies included;

Sodium Chloride or Bupivacaine with Steroid:
Lack of efficacy was found at all follow-up points.

Lidocaine vs Lidocaine with Steroid:
Significant effectiveness from baseline to long-term (6mo+) follow-up periods in both.

Similar effectiveness for both on pain and function at 3 months and 12 months.

MAIN TAKEAWAYS

Epidural steroids with sodium chloride solution or Bupivacaine may not be effective.

Both Lidocaine alone or Lidocaine with steroid have shown significant evidence of efficacy both in radiculopathy and spinal stenosis.

GIVE US YOUR FEEDBACK!

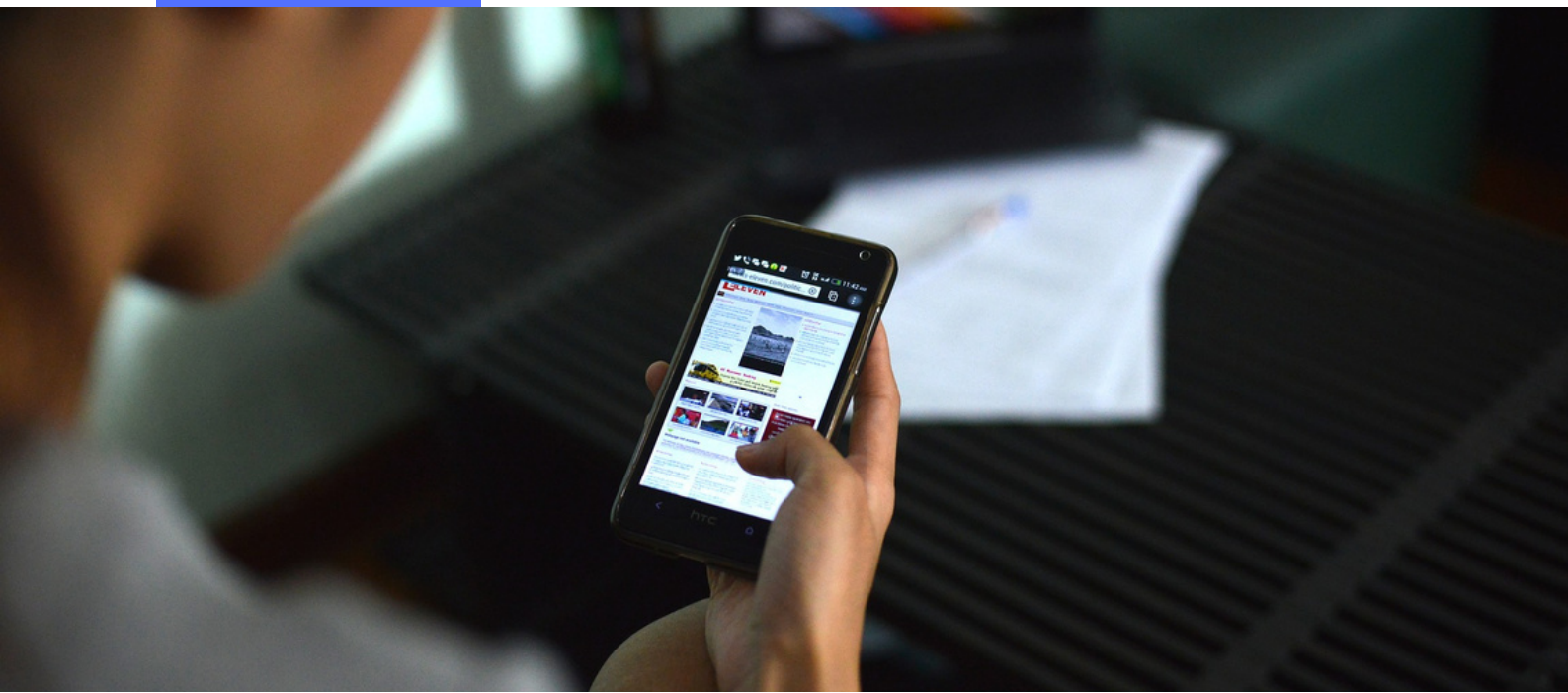
MEMBERS

We are on a mission to make research more accessible, easier to interpret, and quicker to implement.

Help us by giving 1 minute of your time to leave feedback for us.

We would greatly appreciate any feedback you have, as it helps us continually improve!

Leave Review



JBI Critical Appraisal Checklist for systematic reviews and research syntheses

Author: Byvaltsev et al. Year: 2022

		Yes	No	Unclear	Not applicable
1.	Is the review question clearly and explicitly stated?	+	☐	☐	☐
2.	Were the inclusion criteria appropriate for the review question?	+	☐	☐	☐
3.	Was the search strategy appropriate?	+	☐	☐	☐
4.	Were the sources and resources used to search for studies adequate?	+	☐	☐	☐
5.	Were the criteria for appraising studies appropriate?	+	☐	☐	☐
6.	Was critical appraisal conducted by two or more reviewers independently?	+	☐	☐	☐
7.	Were there methods to minimize errors in data extraction?	+	☐	☐	☐
8.	Were the methods used to combine studies appropriate?	+	☐	☐	☐
9.	Was the likelihood of publication bias assessed?	☐	X	☐	☐
10.	Were recommendations for policy and/or practice supported by the reported data?	+	☐	☐	☐
11.	Were the specific directives for new research appropriate?	+	☐	☐	☐

Overall appraisal: 10/11 (90%)

LIMITATIONS:

Most publications lack data on a direct relationship between mutation and stenosis formation.

Indications of the studies differed depending on the populations.

Analyzed only the most common mechanisms of OPLL formation.

JBI Critical Appraisal Checklist for systematic reviews and research syntheses

Author: Peterson et al. Year: 2017

		Yes	No	Unclear	Not applicable
1.	Is the review question clearly and explicitly stated?	+	☐	☐	☐
2.	Were the inclusion criteria appropriate for the review question?	+	☐	☐	☐
3.	Was the search strategy appropriate?	+	☐	☐	☐
4.	Were the sources and resources used to search for studies adequate?	+	☐	☐	☐
5.	Were the criteria for appraising studies appropriate?	+	☐	☐	☐
6.	Was critical appraisal conducted by two or more reviewers independently?	+	☐	☐	☐
7.	Were there methods to minimize errors in data extraction?	+	☐	☐	☐
8.	Were the methods used to combine studies appropriate?	+	☐	☐	☐
9.	Was the likelihood of publication bias assessed?	☐	X	☐	☐
10.	Were recommendations for policy and/or practice supported by the reported data?	+	☐	☐	☐
11.	Were the specific directives for new research appropriate?	+	☐	☐	☐

Overall appraisal: 10/11 (90%)

LIMITATIONS:

Vast majority of patients, most likely not representative of those that present for treatment in primary care.

Almost all patients were preselected having a referral to specialist centers for specific diagnostic evaluation making them likely to have the target disorder in question.

JBI Critical Appraisal Checklist for systematic reviews and research syntheses

Author: Manchikanti et al. Year: 2016

		Yes	No	Unclear	Not applicable
1.	Is the review question clearly and explicitly stated?	+	☐	☐	☐
2.	Were the inclusion criteria appropriate for the review question?	+	☐	☐	☐
3.	Was the search strategy appropriate?	+	☐	☐	☐
4.	Were the sources and resources used to search for studies adequate?	+	☐	☐	☐
5.	Were the criteria for appraising studies appropriate?	+	☐	☐	☐
6.	Was critical appraisal conducted by two or more reviewers independently?	+	☐	☐	☐
7.	Were there methods to minimize errors in data extraction?	+	☐	☐	☐
8.	Were the methods used to combine studies appropriate?	+	☐	☐	☐
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10.	Were recommendations for policy and/or practice supported by the reported data?	+	☐	☐	☐
11.	Were the specific directives for new research appropriate?	+	☐	☐	☐

Overall appraisal: 10/11 (90%)

LIMITATIONS:

The review was restricted to the data available with at least 3 months of followup, which excluded some studies.

The inclusion criteria were restricted to English language studies