



Applications in Degenerative Conditions

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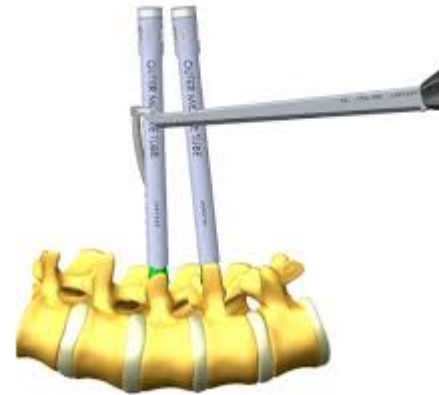
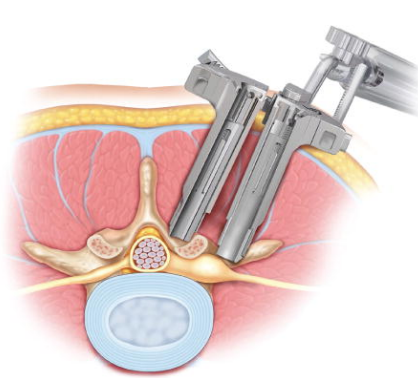
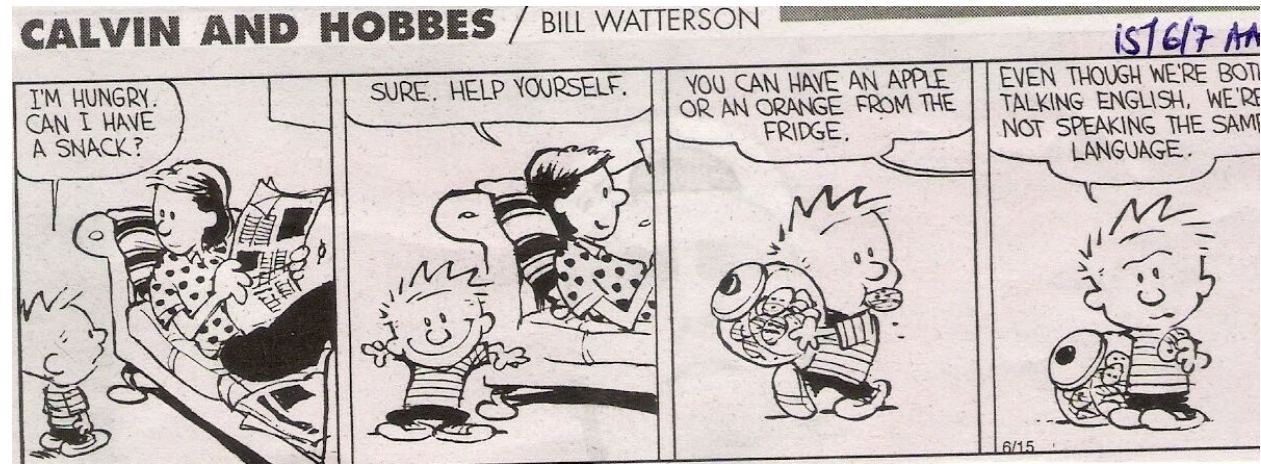
Disclosures

Consulting – Aesculap Spine

I know what the O-Arm looks like

I'm not really sure of the O-Arm's purpose

Let's get on the same page...



Let's get on the same page...

Rational decision making in a wide scenario of different minimally invasive lumbar interbody fusion approaches and devices

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- Endoscopic?
- Mini-open ALIF?
- LLF?
- ATP?

Minimally Invasive Spine Surgery



minimally invasive spine surgery



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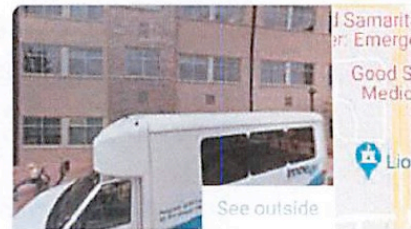
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Minimally Invasive Spine Surgery – How Does It Work?

In general, the goal of minimally invasive spine (MIS) surgery is to stabilize the vertebral bones and spinal joints and/or relieve pressure being applied to the ...



Minimally Invasive Spine I

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Medical office in



minimally invasive spine surgery



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Types of Minimally Invasive Spine Surgery - MedStar

Different types of minimally invasive spinal surgery mainly involve smaller incisions that minimize damage to the surrounding muscles or spine ligaments.

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Minimally Invasive Surgery at Denver Spine Surgeons in ...

The Denver Spine Surgeons minimally invasive philosophy is centered around more conservative indications for fusions, non-fusion surgical options when ...

CENTER for



SPINE & ORTHOPEDICS

Uninstrumented Spinal Fusion

■ 1997 Volvo Award Winner in Clinical Studies

Degenerative Lumbar Spondylolisthesis With Spinal Stenosis: A Prospective, Randomized Study Comparing Decompressive Laminectomy and Arthrodesis With and Without Spinal Instrumentation

Jeffrey S. Fischgrund, MD,* Michael Mackay, MD,* Harry N. Herkowitz, MD,* Richard Brower, MD, David M. Montgomery, MD,* and Lawrence T. Kurz, MD*

Degenerative Lumbar Spondylolisthesis With Spinal Stenosis

A Prospective Long-Term Study Comparing Fusion and Pseudarthrosis

Martin B. Kornblum, MD,* Jeffrey S. Fischgrund, MD,† Harry N. Herkowitz, MD,† David A. Abraham, MD,‡ David L. Berkower, DO,§ and Jeff S. Ditkoff||

Instrumented **Non**-fusion

Five-year Results of a Randomized Controlled Trial for Lumbar Artificial Discs in Single-level Degenerative Disc Disease

James J. Yue, MD,^{*} Rolando Garcia, MD, MPH,[†] Scott Blumenthal, MD,[‡] Dom Coric, MD,[§]
Vikas V. Patel, MD,[¶] Dzung H. Dinh, MD,^{||} Glenn R. Buttermann, MD,^{**#} Harel Deutsch, MD,^{††}
Larry E. Miller, PhD,^{‡‡} Elizabeth J. Persaud, PhD,^{§§} and Nicole C. Ferko, MSc^{§§}

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Assumptions Of MIS Spine Surgery

The MIS TLIF

- Less Blood Loss
- Lower Infection Rate
- Shorter Hospital Stay
- Quicker Return To Work
- Less Morbidity and Mortality
- Lower Cost

MIS TLIF – PUB MED

[Static Versus Expandable Devices Provide Similar Clinical Outcomes Following Minimally Invasive](#)

1. [Transforaminal Lumbar Interbody Fusion.](#)

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PMID: 32015740

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2. [interbody fusion in adult spinal deformity.](#)

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J Orthop Surg Res. 2020 Jan 15;15(1):13. doi: 10.1186/s13018-020-1545-7.
PMID: 31941529 [Free PMC Article](#)

[The Impact of Comorbidity Burden on Postoperative PROMIS Physical Function Following Minimally Invasive](#)

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[Postoperative Outcomes Based on American Society of Anesthesiologists Score After Minimally Invasive](#)

5. [Transforaminal Lumbar Interbody Fusion.](#)

Yoo JS, Parrish JM, Jenkins NW, Khechen B, Haws BE, Narain AS, Hrynewycz NM, Brundage TS, Singh K.
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6. [fusion and conventional transforaminal lumbar interbody fusion for the treatment of lumbar isthmic spondylolisthesis.](#)

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PMID: 31908941 [Free PMC Article](#)

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Claus CF, Lytle E, Tong D, Bahoura M, Garmo L, Yoon E, Jasinski J, Kaufmann A, Richards B, Soo TM.
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PMID: 31651845 [Free PMC Article](#)

Minimally Invasive versus Open Spine Surgery: What Does the Best Evidence Tell Us?

McClelland S 3rd¹, Goldstein JA¹.

Author information

CONCLUSION: The highest levels of evidence do not support MIS over open surgery for cervical or lumbar disc herniation. However, MIS TLIF demonstrates advantages along with higher revision/readmission rates. Regardless of patient indication, MIS exposes the surgeon to significantly more radiation; it is unclear how this impacts patients. These results should optimize informed decision-making regarding MIS versus open spine surgery, particularly in the current advertising climate greatly favoring MIS.

- Reduced 2-year societal cost
- Fewer medical costs
- Reduced time to return to work
- Improved short-term ODI scores

Relationship between surgeon volume and outcomes in spine surgery: a dose-response meta-analysis

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Contributions: (I) Conception and design: HZ Li, Z Lin, HD Lu, ZZ Li, ZY Yang; (II) Administrative support: None; (III) Provision of study materials or patients: None; (IV) Collection and assembly of data: All authors; (V) Data analysis and interpretation: All authors; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

*These authors contributed equally to this work.

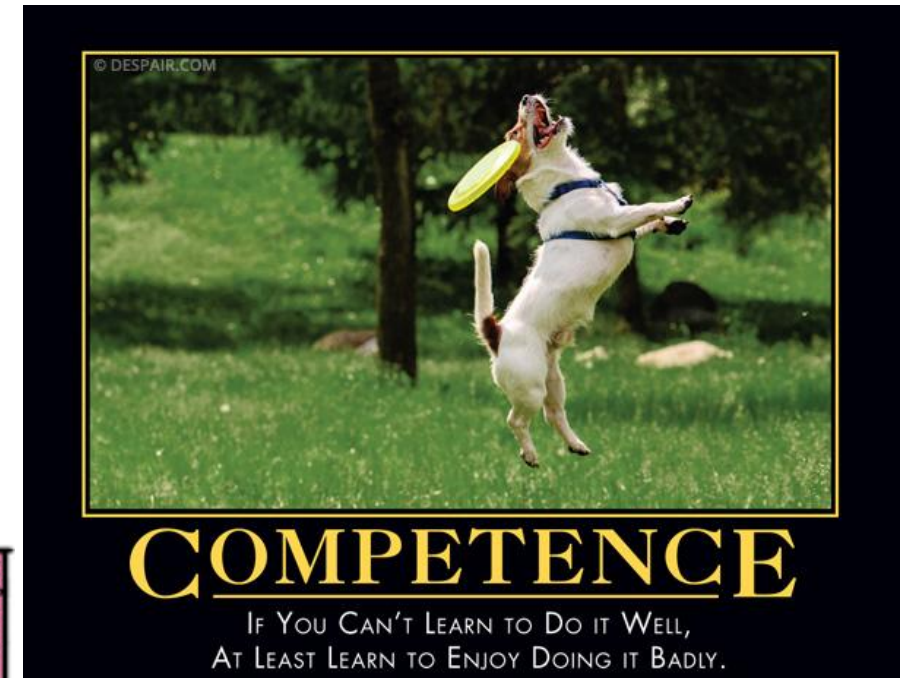
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Email: johnniehuading@163.com.

- Lower Morbidity and Mortality
- Shorter Length of Stay
- Less Readmissions
- Lower Costs

The Known Problems

1. The Learning Curve
2. Radiation Exposure



Learning Curve

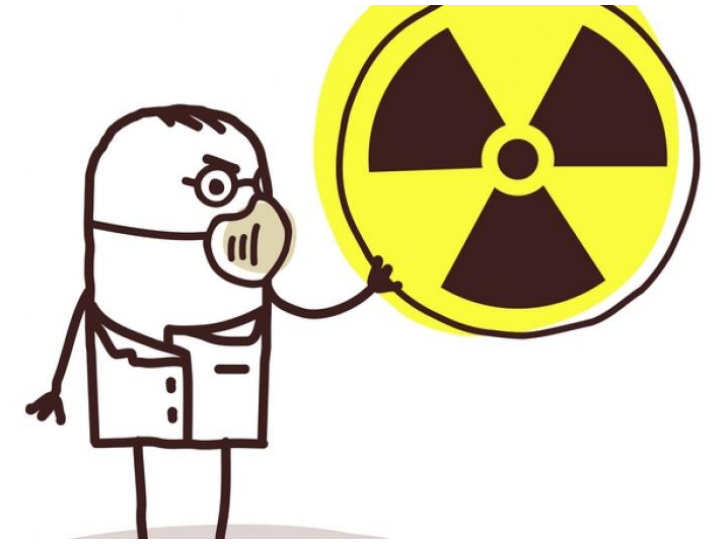
- Steep Learning Curve
- 10-44 cases for MIS TLIF

Solution: Increased training during residency/fellowship with MIS Surgery



Radiation Exposure

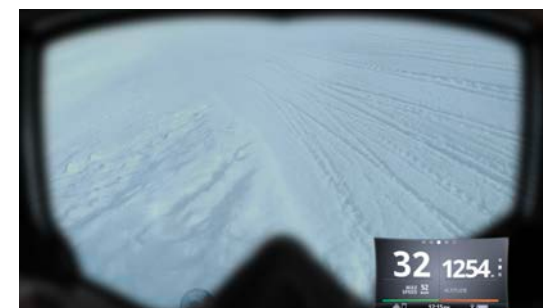
Excessive amount of flouroscopy could be detrimental to the surgeron



Solution: Navigation



We now even have augmented reality in the OR.



Training Programs + Navigation =
Not knowing anatomy or how to
perform a procedure without the
latest technology



Solution: Robots



MIS is here to stay....



Pep talk for Non-MIS surgeons

1. Robots and Navigation are cool.
2. Nothing hurts results more than follow up.
3. If patients leave the hospital after breakfast instead of after lunch it means less rounding!
4. Radiation might be good for population control
5. More Surgery = More Money = Better Car + Nicer House
(so who cares about revisions)

Thank You

