

May 22nd, 4:30 PM - 6:00 PM

# Comparison of Radiation Exposure During Thoracolumbar Fusion Using Fluoroscopic Guidance versus Anatomic Placement of Pedicle Screws

Natalie Egge

*University of Massachusetts Medical School*

Jeffrey Lange

*University of Massachusetts Medical School*

Christian P. DiPaola

*University of Massachusetts Medical School*

*See next page for additional authors*

Follow this and additional works at: [http://escholarship.umassmed.edu/cts\\_retreat](http://escholarship.umassmed.edu/cts_retreat)



Part of the [Orthopedics Commons](#)

---

Egge, Natalie; Lange, Jeffrey; DiPaola, Christian P.; Lapinsky, Anthony; Connolly, Patrick J.; and Eck, Jason C., "Comparison of Radiation Exposure During Thoracolumbar Fusion Using Fluoroscopic Guidance versus Anatomic Placement of Pedicle Screws" (2012). *UMass Center for Clinical and Translational Science Research Retreat*. 18.  
[http://escholarship.umassmed.edu/cts\\_retreat/2012/posters/18](http://escholarship.umassmed.edu/cts_retreat/2012/posters/18)

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact [Lisa.Palmer@umassmed.edu](mailto:Lisa.Palmer@umassmed.edu).

---

**Presenter Information**

Natalie Egge, Jeffrey Lange, Christian P. DiPaola, Anthony Lapinsky, Patrick J. Connolly, and Jason C. Eck

**Creative Commons License**

This work is licensed under a [Creative Commons Attribution-Noncommercial-Share Alike 3.0 License](https://creativecommons.org/licenses/by-nc-sa/3.0/).

## **COMPARISON OF RADIATION EXPOSURE DURING THORACOLUMBAR FUSION USING FLUOROSCOPIC GUIDANCE VERSUS ANATOMIC PLACEMENT OF PEDICLE SCREWS**

Natalie Egge MD; Jeffrey Lange MD; Christian DiPaola MD; Anthony Lapinsky MD; Patrick Connolly MD; Jason Eck DO, MS

University of Massachusetts Department of Orthopedic Surgery, Spine Division

Contact: [Natalie.Egge@umassmemorial.org](mailto:Natalie.Egge@umassmemorial.org)

### **Introduction:**

There are multiple accepted surgical techniques for placing thoracolumbar pedicle screws. Some surgeons use fluoroscopy to aid in placement of instrumentation, while others use fluoroscopy as confirmation of positioning after anatomic placement of screws. The purpose of this study is to evaluate the difference in radiation exposure imparted to the patient using a fluoroscopic-guided technique versus anatomic placement of screws.

### **Methods:**

A retrospective study evaluated 185 adult patients with non-percutaneous, posterior instrumented fusions over a four-year time period. For each patient, the fluoroscopy report was reviewed and the method of fluoroscopy utilization was ascertained from the patient's operative report. Average seconds per screw inserted for each method was compared using a student's t-test.

### **Results:**

82 patients underwent thoracolumbar fusion by an anatomic technique, with an average of 5.72 screws (range 2-26) placed. The mean fluoroscopy time was 11.85 seconds (median 6 sec.) and the average time for placement of a single screw was 2.65 seconds. 103 patients underwent fluoroscopic-guided surgery. An average of 5.1 screws (range 2-12) were placed and the mean fluoroscopy time was 83.26 seconds per operation. The average time for placement of a single screw was 17.08 seconds.

### **Conclusion:**

Patients undergoing thoracolumbar fusion using the fluoroscopic-guided technique have increased radiation exposure, reaching 6.5 times the amount imparted using an anatomic technique, which is statistically significant ( $p < 0.01$ ). Surgeons performing a large number of fluoroscopic-guided operations may have the potential to exceed annual radiation dose limits.