



# Characteristics of Patients Undergoing Emergent Spinal MRIs that Predict Urgent Neurosurgical Intervention

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## Introduction

The use of advanced radiology in the U.S. emergency setting has increased over the years causing dramatic increases in healthcare costs and overall emergency department length of stay without associated equal increases in patient outcomes. Back and neck pain are frequent causes of emergency room visits and commonly lead to radiographic evaluation, although the real purpose of emergent imaging is to identify the patients that require urgent neurosurgical intervention. This study aims to determine which presentations most commonly lead to urgent neurosurgical intervention and should prompt urgent spinal MRI as part of the emergency room evaluation.

## Methods

A retrospective chart review was performed for all patients undergoing spinal MRIs ordered by emergency room physicians during a three month period at Interim LSU Hospital, a Level 1 Trauma Center in New Orleans, Louisiana. Patient data was collected and analyzed by presenting symptoms, duration of symptoms, physical exam findings, and disposition: emergent, urgent, or outpatient surgery vs. no neurosurgical intervention.

## Results

Our study population consisted of 35 patients that underwent a total of 45 emergent MRIs. Three patients (8.6%) were admitted and underwent surgery. Emergency surgery was performed on one patient with an epidural abscess. Two patients underwent urgent surgery for post-operative recurrent lumbar disc and metastatic disease with compression. Five patients (14.3%) were referred for outpatient surgery. The majority of outpatient surgery referrals (80%) were for chronic cervical myelopathy. Ten patients (28.6%) had documented weakness on exam, and six of these were in the intervention group. A majority of patients (82.9%) presented with axial and neck pain.

## Conclusions

The results of this study demonstrate that urgent neurosurgical MRI is indicated in situations where acute processes causing spinal cord or nerve root compression is suspected. Chronic measurable deficits and pathologies can usually be evaluated with outpatient imaging. Additionally, this study supports that axial neck and back pain alone are not reliable indicators for urgent interventions. Further evaluation of data is necessary to distinguish what characteristics have the highest predictive value in urgent neurosurgical intervention to determine a reliable and cost-effective protocol for emergency department spinal MRI.

## Learning Objectives

To determine the percentage of MRI scans ordered at our institution lead to urgent neurosurgical intervention; To use that information to develop a protocol for physicians to determine which patients require emergent advanced radiologic evaluation.

## References

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