

## Surgical Treatment of Spinal Metastases 2000-2010: Effect of a Randomized Controlled Trial

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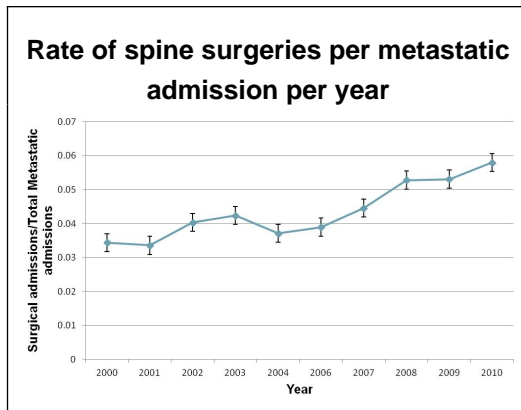


## Introduction

The breadth and rapidity by which randomized controlled trials (RCTs) alter neurosurgical practice patterns is unknown. Patchell et al.'s 2005 RCT showed significant benefit with surgical decompression in patients with spinal metastasis (SpM). We examined trends in spinal surgery for patients with SpM, before and after the publication of the RCT.

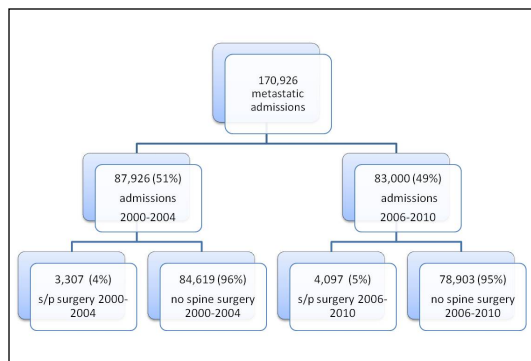
## Methods

The Nationwide Inpatient Sample (NIS) was used to identify a 20% stratified sample of SpM admissions to US non-federal hospitals from 2000-2010, over two successive 5-year periods excluding 2005, when the RCT was published. Multivariate analysis assessed the effect of patient and hospital characteristics on the adjusted odds of surgery in pre-versus post-RCT groups.



## Results

7,404 admissions met study criteria. More surgeries were performed for SpM in the post-RCT group (55%) versus the pre-RCT group (45%) ( $p<.0001$ , OR 1.3, 95% CI=1.27-1.39), while fewer patients were diagnosed with SpM in the post- (49%) versus pre- (51%) RCT group ( $p<.0001$ ). Adjusted odds for surgery were higher in the post versus pre RCT group for patients with 1 or more comorbidities or myelopathy, visceral metastasis, and lower income. Pulmonary, venous thromboembolism, renal, urinary complications, and decubitus ulcers were more likely in the post-RCT group; however, in-hospital mortality decreased ( $p=.02$ ). Teaching hospitals ( $p=.02$ ) and hospitals in the Western US ( $p=.01$ ) showed increased surgical rates post-RCT as well.



### Admission characteristics and surgery

#### Post RCT

	Odds Ratio (95% CI)
Comorbidities	
0	reference
1	<b>1.6 (1.4-1.8)</b>
2	<b>1.6 (1.4-1.8)</b>
≥3	<b>2.7 (2.4-3.1)</b>
Visceral Metastasis	<b>1.5 (1.3-1.6)</b>
Myelopathy	<b>1.3 (1.1-1.4)</b>
Median ZIP income	
1 <sup>st</sup> quartile	<b>2.4 (2.1-2.7)</b>
2 <sup>nd</sup> quartile	<b>1.7 (1.5-1.9)</b>
3 <sup>rd</sup> quartile	<b>1.7 (1.5-1.9)</b>
4 <sup>th</sup> quartile	reference
Teaching status	
Teaching	<b>1.5 (1.3-1.7)</b>
Non-teaching	Reference
Hospital region	
Northeast	.94 (.83-1.1)
Midwest	.92 (.81-1.0)
South	Reference
West	<b>1.4 (1.3-1.6)</b>

## Conclusions

Surgery for SpM increased after the publication of the Patchell et al. RCT, despite fewer patients being diagnosed with metastatic disease. Patients with more comorbidities, lower socioeconomic status, more extensive metastatic burden, and more severe neurologic compromise underwent surgery after the RCT, with more associated surgical complications but less in-hospital mortality. The results of the RCT were adopted both quickly and widely, with broader adoption in the Western US.

## Learning Objectives

By the conclusion of this session participants should be able to:

1) Describe how a randomized clinical trial (RCT) has influenced the practice of spine surgery for metastatic disease in the United States.

2) Discuss in small groups how these RCT results influenced trends in patient selection for surgery and how these trends compare to the RCT's original inclusion/exclusion criteria.

3) Identify institutional and geographic factors that may affect surgical decision-making for patients with spinal metastasis.

## References

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