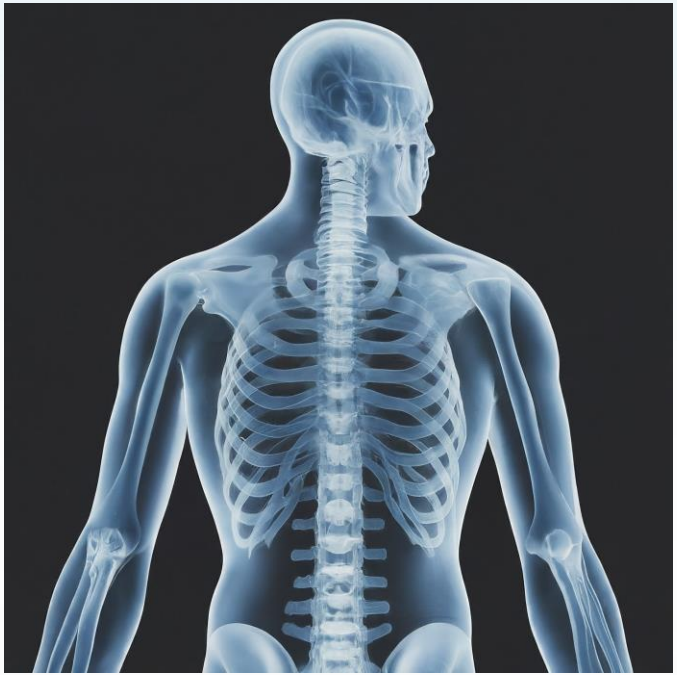
ROTHMAN ORTHOPAEDICS

MIDWESTERN UNIVERSITY 1900



Length of Stay:

Comparing interhospital patient length of stay following spinal procedures

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Disclosures

The authors declare there is no conflict of interest

Background

- Escalating healthcare costs have lead to the development of new techniques to reduce the length of hospital stay after elective procedures
- **Spinal surgery had adopted strategies to decrease the LoS**
  - Minimally invasive surgical techniques
  - Multidisciplinary discharge teams
  - Discharging same day when appropriate
- **Led to the development of specialized orthopedic hospitals with staff trained and familiar with orthopedic procedures and post-op protocols such as Ambulatory Surgery Centers**

Aim of Study

Purpose

To determine whether specialized orthopedic hospitals make good on their promise of reducing LoS and costs, as well as compare them to different health care institution models such as tertiary care hospitals, community hospitals, and hybrid community hospitals.

Hypothesis

Specialized orthopedic hospitals should have a statistically significant improvement to LoS due to the staff's added familiarity with the procedures and postop care.

Methodology

Study Design

Retrospective cohort study leveraging a comprehensive single-institution EMR .
All surgeries were performed by fellowship-trained spine surgeons.

Patient Population

Any patient above 18 who underwent one or two level lumbar fusion surgery between 2017 and 2022.
Surgery performed in setting of trauma, infection, neoplasm were excluded

Data Gathered

- Patient info
  - Age, sex, BMI, CCI, diabetes, smoking status
- Surgical features
  - Levels, cut to close time
- Surgical outcomes
  - LoS, revisions, 1 year complications, readmission

Results: Demographics

Table 1: Patient demographics and surgical characteristics based on a matched 1:1 comparison of the Teriaty-Care Hospital (TCH) to the Orthopaedic Specialty Hospital (OSH)

Variable	TCH (n=184)	OSH (n=184)	P Value
Age	61.0 ± 11.2	60.4 ± 10.9	0.654
Sex			1.000
Female	95 (51.6)	94 (51.1)	
Male	89 (48.4)	90 (48.9)	
Race			0.674
White	141 (76.6)	148 (80.4)	
Black	12 (6.5)	10 (5.4)	
Other	31 (16.8)	26 (14.1)	
BMI	29.5 ± 6.34	30.0 ± 5.35	0.135
Smoking Status			0.139
Non-Smoker	134 (72.8%)	148 (80.4)	
Former Smoker	28 (15.2%)	24 (13.0)	
Current Smoker	22 (12.0%)	12 (6.5)	
Diabetes	20 (10.9)	20 (10.9)	1.000
CCI	2.37 ± 1.15	2.30 ± 1.11	0.638
Type of Procedure			0.913
ALIF + PLDF	2 (1.09)	2 (1.09)	
PLDF	153 (83.2)	156 (84.8)	
TLIF/PLDF	29 (15.8)	26 (14.1)	
Number of Levels Fused	1.48 ± 0.73	1.52 ± 0.84	0.938
Number of Levels Decompressed	1.70 ± 0.96	1.51 ± 0.86	**0.021**

Values given as mean, ± SD, or N (%); Bold values indicate statistical significance ($p<0.05$); TCH, Tetiary-Care Hospital; OSH, Orthopaedic Specialty Hospital; BMI, Body Mass Index; CCI, Charlson Comorbidity Index; LOS, Length of Stay; OR, Operating Room; A/PLDF, Anterior lumbar interbody fusion with a Posterior Lumbar Decompression and Fusion; PLDF, Posterior Lumbar Decompression and Fusion; TLIF, Transforaminal Lumbar Interbody Fusion. 1:1 match based on patient demographics (Age, BMI, CCI) and surgical characteristics (type of procedure and number of levels fused).

Results: Surgical Outcomes

Table 2: Comparing Surgical Outcomes based on a matched 1:1 comparison of the Teriaty-Care Hospital (TCH) to the Orthopaedic Specialty Hospital (OSH)

Variable		TCH (n=184)	OSH (n=184)	P Value
Cut to Close (minutes)		171 ± (82.0)	159 ± (46.4)	0.372
OR Time (minutes)		242 ± (80.6)	214 ± (91.9)	0.068
LOS		3.03 ± 2.77	1.65 ± 0.68	**<0.001**
90 Day Readmission		12 (6.5)	0 (0.00)	**0.001**
1 Year Revisions		20 (10.9)	12 (6.5)	0.195
Discharge Disposition				**0.001**
	Home	173 (94.0)	184 (100.0)	
	IPR	7 (3.8)	0 (0.0)	
	SNF	4 (2.2)	0 (0.0)	

Values given as mean, or N (%); Bold values indicate statistical significance (p<0.05); INR, Inpatient Rehab; SNF, Skilled Nursing Facility.

Statistically significant decreases in Length of Stay and 90 day readmissions

Conclusion

- **Hypothesis is supported**
  - Length of stay was decreased in specialized hospital for 1- to 2- level elective lumbar fusions
  - No differences in revisions and complications indicating expedited recover did not compromise surgical quality of surgical care

- **Significance to orthopedics**
  - Patients may be better suited for specialized orthopedic hospitals for less complex elective spinal procedures
  - One place that surgeons can reduce costs is forming protocols to route patients hospital based on their procedure to save costs without compromising quality of care

THANK YOU!

Any Questions?

References

1. Shichman I, Roof M, Askew N, Nherera L, Rozell JC, Seyler TM, et al. Projections and Epidemiology of Primary Hip and Knee Arthroplasty in Medicare Patients to 2040-2060. JBJS Open Access 2023;8:e22.00112. https://doi.org/10.2106/JBJS.OA.22.00112.
2. Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of Primary and Revision Hip and Knee Arthroplasty in the United States from 2005 to 2030. JBJS 2007;89:780. https://doi.org/10.2106/JBJS.F.00222.
3. Ritter MA. The Anatomical Graduated Component total knee replacement: a long-term evaluation with 20-year survival analysis. J Bone Joint Surg Br 2009;91:745–9. https://doi.org/10.1302/0301-620X.91B6.21854.
4. Bozic KJ, Kurtz SM, Lau E, Ong K, Chiu V, Vail TP, et al. The epidemiology of revision total knee arthroplasty in the United States. Clin Orthop 2010;468:45–51. https://doi.org/10.1007/s11999-009-0945-0.
5. Delanois RE, Mistry JB, Gwam CU, Mohamed NS, Choksi US, Mont MA. Current Epidemiology of Revision Total Knee Arthroplasty in the United States. J Arthroplasty 2017;32:2663–8. https://doi.org/10.1016/j.arth.2017.03.066.
6. Schwabe MT, Hannon CP. The Evolution, Current Indications and Outcomes of Cementless Total Knee Arthroplasty. J Clin Med 2022;11:6608. https://doi.org/10.3390/jcm11226608.
7. McCormick BP, Rigor P, Trent SM, Lee JW, Tefera E, Mistretta KL, et al. Short-Term Outcomes Following Cemented Versus Cementless Robotic-Assisted Total Knee Arthroplasty. Cureus n.d.;14:e30667. https://doi.org/10.7759/cureus.30667.