

INVESTIGATING FACTORS IMPACTING LENGTH OF STAY AND READMISSION: A CASE OF COMPLEX LIVER SURGERIES

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Introduction



Identifying factors that impact **length of stay (LOS)** and **readmission** after complex surgical procedures can be useful to decrease costs. Few studies evaluate the relationship of postoperative complications, comorbidities and facility factors with LOS and readmission for patients undergoing major liver resection

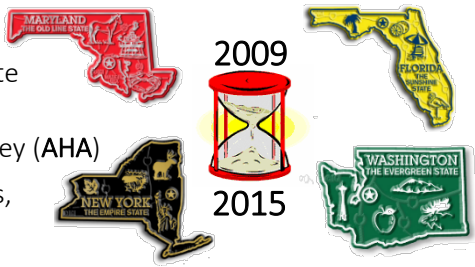
Objective

To address, predict and **decrease** readmissions and **control** LOS, it is essential to raise **awareness** to the critical elements of the care delivery environment including **hospital resources**, and **patient clinical profiles**



Methods

- We focused on patients who underwent **partial hepatectomy & lobectomy**
- Multivariate stepwise **linear** and **logistic regression** were used to model LOS and readmission. To analyze multiple components of health care delivery environment we **linked** :
 - Healthcare Cost and Utilization Project-State Inpatient Database (**HCUP-SID**)
 - American Hospital Association Annual Survey (**AHA**)
 - The merged dataset contained 65 variables, 46 **patient** and 19 **hospital** factors
- Univariate analysis** was performed to compare **patients** and **hospitals** in the **readmit** and **no readmit** groups



Using a 1:2 ratio the readmit and no readmit groups were matched for age, demographics, hospital type, comorbid disease and complications for a more comparative analysis

Results

- Among **286** hospitals, there were **10,375** patients, **1354 (11.34%)** had at least one readmission within 30 days following discharge from an index hospitalization
- LOS was modeled** with 65 variables, stepwise method eliminated 43 variables, with final model containing **22 variables**
- Readmission was modeled** with 65 variables, stepwise method eliminated 48 variables, with final model containing **17 variables**



LOS Model Top 3 Predictors	R ² * 0.58
	Betas
Postoperative Sepsis	10.3
Deep Vein Thrombosis	6.07
Preoperative weight loss	4.0

*Measure of goodness of fit of the model

In the matched cohort, as compared to patients not readmitted those who were readmitted **stayed longer, had higher number of procedures and chronic conditions, which were associated with higher costs**, and there wasn't any significant difference in facility factors (total admissions, surgical volume, full time physicians, residents and registered nurses)

Conclusion

Pre-existing conditions and postoperative complications impact **LOS** more as compared to **facility factors**. Prevention of post-operative complications may **decrease LOS**, while **patient disposition** is a major factor contributing to readmission. There is a need to carefully investigate patient factors to **improve the care delivery environment**

Readmission Model Top 3 Predictors	AUC* 0.55
	Odds Ratios
Patient Disposition at Discharge	
Transfer to short-term hospital	18.32
Other Facilities**	2.18
Home Health Care	1.9

Odds ratio for routine discharge is 1
 *Area Under the Curve; a measure of predictive accuracy
 **Skilled Nursing facility, Intermediate care Facility and other type of facility

Univariate Analysis	No Readmit	Readmits
	n = 2707	n = 1354
Length of Stay	8	10
No of Chronic Conditions	5	6
Procedures on Discharge	5	6
Total Cost	\$31000	\$36500
Total Gross Charges	\$93000	\$114000

*Mean values rounded to next digit, p<0.001
 **Comparisons of facility factors were not significant p>0.50
 Cost is calculated by Cost to Charge Ratios provided by HCUP SID