30-day Readmission Rates After Cardiac Surgery: A Single-Center Quality Improvement Study

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RESEARCH QUESTION

- Are there significant demographic differences between patients aged 18-90 who were readmitted within 30 days after discharge from cardiac surgery, and are there any specific systemic changes that can be made to potentially decrease rates of readmission?
- We predict that follow up with a provider within 30 days of discharge will have a significant negative correlation with readmission.

INTRODUCTION

Readmission after cardiac surgery is common across the nation and associated with significant morbidity and healthcare-associated cost to the patient and the hospital. We explored the potential risk factors associated with increased likelihood of readmission in a single-center review with the hope of modifying current hospital practices to decrease readmission rates in the future.

MATERIALS/METHODS

- Using administrative data, we identified patients readmitted to the same institution within 30 days of cardiac surgery over a 36-month period (n = 61). Time-matched patients meeting the same inclusion criteria were the control group (n = 487).
- Cardiac surgery included valve replacement surgery, aortic surgery, coronary artery bypass grafting, or any combination of these procedures.
- Comorbidities were grouped based on systemic characteristics and included if not corrected by surgery
- We performed a standardized review of readmitted patients' medical records to evaluate timing and potential risk factors for readmission including comorbidities, emergent status, type of procedure, and whether they had followed up with a physician prior to readmission.
- We evaluated timing of readmission by procedure and tested for univariate associations between characteristics of readmitted patients and non-readmitted patients in our clinical registry.
- Patient demographics and perioperative comorbidities were evaluated by univariate analyses.
- Logistic regression analysis identified independent risk factors for readmission.

DEFINITIONS

- "CABG alone" includes patients who underwent single, double, triple, or quadruple bypass without an additional procedure
- "Valve alone" includes patients who underwent primary repair or replacement of the tricuspid, pulmonic, mitral, or aortic valve (both open and minimally invasive) without an additional procedure
- "Aortic alone" includes patients who underwent thoracic aortic aneurysm repair without an additional procedure
- "Combination" includes patients who underwent any combination of the above procedures

FIGURES

Procedure Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CABG alone	209	38.1	38.1	38.1
	Valve alone	220	40.1	40.1	78.3
	Aortic alone	19	3.5	3.5	81.8
	Combination	100	18.2	18.2	100.0
	Total	548	100	100.0	

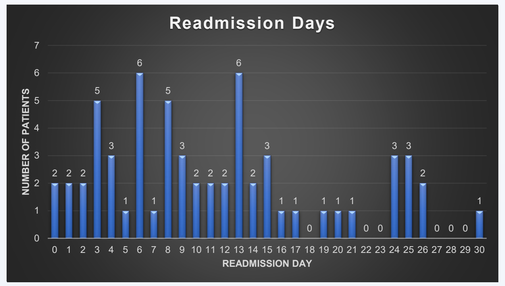
Emergent Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elective	299	54.5	54.6	54.6
	Urgent	178	32.4	32.5	87.0
	Emergent	71	12.9	13.0	100.0
	Total	548	99.8	100.0	

- Demographic data of included patients
- In the pool of 548 included patients, 38.1% underwent a CABG, 40.1% underwent a valve procedure alone, 3.5% underwent an aortic procedure alone, and 18.2% underwent a combination of procedures
- 54.5% of included procedures were considered elective, 32.4% considered urgent, and 13.0% considered emergent

CONCLUSIONS

Ensuring early follow-up within 30 days for high-risk patient groups is a promising target for decreasing readmission rates in this population following cardiac surgery.



- The average number of days between discharge and readmission. Discharge day is considered day "0". The mean was 11.3 days and 72.1% of patients were readmitted within the first 14 days after discharge

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.272	.101		2.685	.007
	Age	-.002	.001	-.059	-1.394	.164
	Sex	.030	.027	.047	1.121	.263
	Procedure Type	.016	.012	.056	1.333	.183
	Emergent Status	-.006	.019	-.012	-.292	.770
	Follow Up	-.233	.041	-.238	-5.731	<.001
	Cardiac Comorbidity	-.052	.079	-.158	-.649	.516
	Renal Comorbidity	-.023	.081	-.033	-.289	.773
	Pulmonary Comorbidity	-.106	.077	-.216	-1.381	.168
	Metabolic Comorbidity	-.072	.079	-.212	-.919	.358
	Total Comorbidity	.095	.077	.518	1.226	.221

a. Dependent Variable: Readmission Status

- Dependent Variable: Readmission Status. There were no statistically significant differences between the readmission and nonreadmission groups besides the follow up status ($p < 0.001$).

DISCUSSION

- Confirms initial hypothesis that prompt follow up after discharge significantly reduces the likelihood of readmission within 30 days
- Previous studies have shown similar findings, particularly if follow up was within the first 14 days after discharge
- Additionally, previous studies have shown that contact with a provider even over phone call significantly reduced readmission
- Many factors that could influence patient ability to comply with provider follow up (socioeconomic, medical literacy, physician scheduling, etc)
- Overall, study highlights importance of provider follow up to reduce 30-day readmission rates
  - Results will help inform discharge guidelines at this institution
  - Limitations in ability for this study to assess impact of specific comorbidities on risk of readmission

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