

EFFICACY OF CARDIAC REHABILITATION IN REDUCING HOSPITAL READMISSIONS: A RETROSPECTIVE COHORT STUDY

Neha Shibu, David Rankin, Mohammad Asghari-Jafarabad

BACKGROUND

Cardiovascular disease poses a significant health and economic burden for Australians. (1) Cardiac rehabilitation programs have been found to improve clinical outcomes following cardiovascular disease-related hospitalisations and reduce subsequent readmissions. (2) Cabrini Health offers a range of post-discharge services including cardiac rehabilitation services to improve health outcomes and prevent readmission.

AIM

- To identify the uptake of cardiac rehabilitation at Cabrini Health
- To study whether participation in cardiac rehabilitation reduces subsequent hospital readmissions

METHODOLOGY

A retrospective cohort study of 17,093 cardiac-related hospital encounters at Cabrini Health between July 2019 and November 2022. Study data was obtained from the patient administration Patient Administration System (PAS). Each of these encounters was followed up for participation in inpatient or outpatient cardiac rehabilitation at Cabrini Health. Subsequent readmissions were also noted for these patients.

REFERENCES

(1) Australian Institute of Health and Welfare. Heart, stroke and vascular disease: Australian facts [Internet]. Canberra: Australian Institute of Health and Welfare; 2023 [cited 2023 June 7]. Available from: <https://www.aihw.gov.au/reports/heart-stroke-vascular-diseases/hsvd-facts>.
(2) Labroschiano C, Air T, Tavella R, Beltrame JF, Ranasinghe I. Readmissions following hospitalisations for cardiovascular disease: a scoping review of the Australian literature. Australian Health Review. 2020;44(1):93-105.

RESULTS

BASELINE CHARACTERISTICS

- Of the 17,093 encounters, 1,337 (7.82%) had cardiac rehabilitation follow-up (RFU) post-discharge
- RFU participants had a higher age, higher Charlson score, and longer initial length of stay compared to no RFU group.

Table 1: Baseline patient characteristics

	No RFU (n=15,755)	RFU (n = 1,337)	P-value
Age (years) [Mean (SD)]	72.4 (14.1)	80.5 (11.5)	<0.001 T
Sex [n (%)]			0.745 F
F	6683 (42.4)	561 (42.0)	
M	9072 (57.6)	776 (58.0)	
Principal diagnosis [n (%)]			<0.001 F
Cardiac arrhythmias	4892 (31.1)	207 (15.5)	
Heart failure	976 (6.2)	322 (24.1)	
Ischaemic heart disease	2798 (17.8)	357 (26.7)	
Other cardiac disorders	1983 (12.6)	128 (9.6)	
Syncope, collapse, and chest pain	2704 (17.2)	131 (9.8)	
Valvular and structural heart disease	1323 (8.4)	130 (9.7)	
Vascular disease	1079 (6.9)	62 (4.6)	
Admission class [n (%)]			<0.001 F
Emergency	4568 (29.0)	556 (41.6)	
Other	64 (0.4)	23 (1.7)	
Planned	9882 (62.7)	579 (43.3)	
Urgent	1241 (7.9)	179 (13.4)	
Discharge type [n (%)]			<0.001 F
Home	14899 (94.6)	885 (66.2)	
Nursing Home	421 (2.7)	39 (2.9)	
Other	13 (0.1)	0 (0.0)	
Statistical Discharge	58 (0.4)	290 (21.7)	
Transfer	364 (2.3)	123 (9.2)	
Stay type [n (%)]			<0.001 F
Overnight	11882 (75.4)	1266 (94.7)	
Same day	3873 (24.6)	71 (5.3)	
Charlson Comorbidity Index [Mean (SD)]	3.1 (1.6)	4.1 (1.6)	<0.001 T
Initial length of day [Median (P25-P75)]	1.0 (1.0-3.0)	6.0 (2.0-11.0)	<0.001 MW

READMISSION PARAMETERS

- There was no significant difference in the number of readmissions across the two groups.
- The median number of days from discharge to acute readmission was 70.0 days in the no RFU group compared to 128.5 days in the RFU group.
- Median length of stay of readmission was 4.0 days in the RFU group compared to 1.0 days in the no RFU group.

Table 2: Association between RFU and readmission parameters

	No RFU (n=15,755)	RFU (n = 1,337)	P-value
Number of readmissions [n (%)]	4664 (29.6)	412 (30.8)	0.352 F
Type of readmission [n (%)]			<0.001 F
ON	3611 (77.4)	372 (90.3)	
SD	1053 (22.6)	40 (9.7)	
Days between discharge and readmission [Median (P25-P75)]	70.0 (20.0-245.0)	128.5 (46.0-357.5)	<0.001 MW
Length of stay of readmission [Median (P25-P75)]	1.0 (1.0-5.0)	4.0 (1.0-10.0)	<0.001 MW

TOTAL NUMBER OF SESSIONS AND READMISSIONS

- The median number of RFU session was 6 sessions.
- 35.1% of those with total RFU less than 6 sessions were readmitted and 27.1% of the group with total RFU more than 6 sessions were readmitted (p-value = 0.002).

Table 3: Association between total number of RFU sessions and readmission parameters

	Total RFU < 6 sessions (n=618, 46.2%)	Total RFU > 6 sessions (n=719, 53.8)	P-value
Number of readmissions [n (%)]	217 (35.1)	195 (27.1)	0.002F
Type of readmission [n (%)]			0.405F
ON	193 (88.9)	179 (91.8)	
SD	24 (11.1)	16 (8.2)	
Days between discharge and readmission [Median (P25-P75)]	139.0 (43.0-400.0)	115.0 (50.0-329.0)	0.469 MW
Length of stay of readmission [Median (P25-P75)]	3.0 (1.0-8.0)	6.0 (1.0-11.0)	<0.001 MW

CONCLUSION

In conclusion, this study found that participation in cardiac rehabilitation post-discharge did not reduce total number of subsequent readmissions at Cabrini Health. However, participation in cardiac rehabilitation was associated with a significantly delayed time to readmission. Cardiac rehabilitation programs were also significantly underutilised at Cabrini Health.