Validation of a risk stratification tool for a Hospital Outreach Medication Review (HOMR) program

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Introduction

- Hospital Readmissions are a growing problem, with rates as high as 20% and representing 17% of hospital repayments in the US.[1]
- The pharmacist led Hospital Outreach Medication Review (HOMR) program has been shown to reduce hospital readmissions by 25%.[2]
- It has been suggested that the optimal time for review is 7-10 days post-discharge, however, this target is poorly met.[3]

Aim

- To develop and validate a risk-assessment tool to identify patients at “low-risk” of readmission in which a telephone-based review would be a safe and effective alternative to the traditional home-based review.

Method

- The risk tool was derived from the Society of Hospital Pharmacists of Australia standards of practice for clinical pharmacy services stratification instrument.[4]
- A prospective arm (the Risk-assessed cohort) were recruited from HOMR referrals between January to May 2017 and were stratified as “High-risk” (score>10) or “Low-risk” (score ≤ 10).
- Those deemed low-risk received a telephone review and those deemed high-risk received the traditional home-based review.
- This Risk-Assessed cohort was compared to retrospectively collected data from participants referred between May and October 2016 (the “Baseline Cohort”).

Data collection and outcome variables

- Baseline Characteristics: Type II diabetes Mellitus (T2DM), ischaemic heart disease (IHD), congestive cardiac failure (CCF) and chronic kidney disease (CKD), Charlson score (CCS), and date of readmission.
- Primary Outcome: 30-day readmission rates between Risk-Assessed Cohort and Baseline Cohort.
- Secondary Outcomes: 60-day and 90-day readmission rates, cost-effective analysis between risk-assessed and baseline cohort and patient satisfaction (Table 1).

Table 1: Characteristics of the Baseline cohort (standard care) compared with the new Risk-assessed cohort

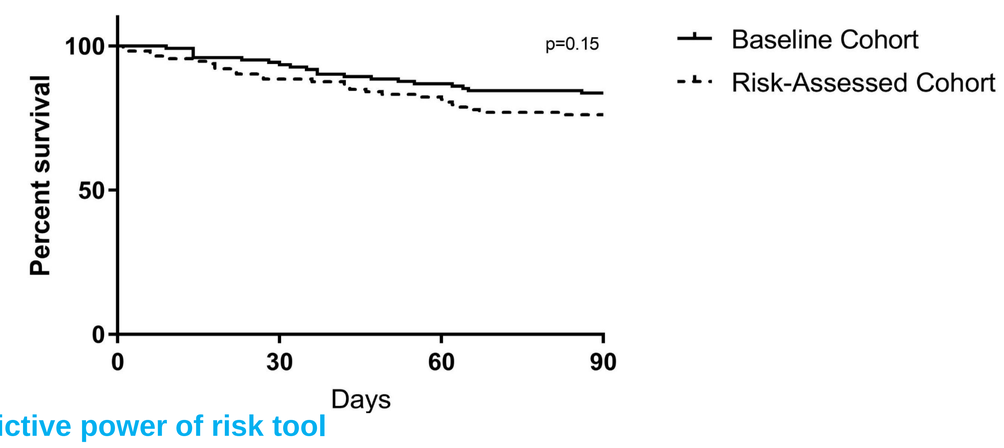
	Baseline Cohort (n=122)	Risk-Assessed Cohort (n=113)	p-value
Age (years)	75.5±12.2	73.5±12.4	0.22
Male (%)	60 (49)	61 (54)	0.51
Risk Score	9 IQR [7-12]	12 IQR [9-13]	**<0.01**
Charlson Score	6 IQR [5-7]	7 IQR [5-8]	**0.03**
CCF (%)	31 (25)	29 (26)	1.00
IHD (%)	41 (34)	40 (35)	0.79
T2DM (%)	57 (47)	52 (46)	1.00
CKD (%)	13 (11)	29 (26)	**<0.01**
30 Day Readmission (%)	8 (7)	13 (12)	0.25
60 Day Readmission (%)	16 (13)	20 (18)	0.37
90 Day Readmission (%)	20 (16)	27 (24)	0.19

Results

1.Study population

- 235 patients were included in the final analysis; 113 patients in the Baseline Cohort and 122 in the Risk-Assessed Cohort.
- There was no significant difference between the new model (Risk-assessed) versus standard care (Baseline cohort) in 30, 60 and 90 day readmissions and time to readmission (Figure 1).

Figure 1: Kaplan-Meier curves depicting time to readmission comparing the Baseline Cohort and the new Risk-Assessed model.



2. Predictive power of risk tool

- There was a statistically significant difference in 60 and 90 day readmissions between those deemed High-risk compared to those deemed Low-risk (24% vs 8%; p=0.04 & 29% vs 11%; p=0.02 respectively) with a trend towards significance at 30 days.
- Logistic regression identified the risk score as the only independent predictor of hospital readmissions (β: 0.17, SE: 0.08, OR: 1.18, p=0.04).

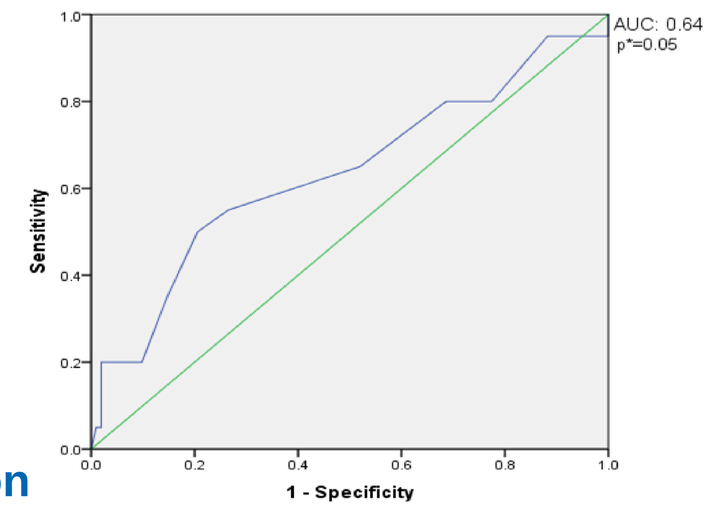
Table 2: Logistic regression analysis of variables predicting 90-day hospital readmission.

	Univariate			Multivariate		
Variable	IRR	SE	p-value	IRR	SE	p-value
Risk Score	1.17	0.07	0.03	1.18	0.08	**0.04**
Charlson Score	1.20	0.11	0.10	1.12	0.12	0.31
IHD	2.55	0.51	0.07	2.79	0.55	0.06

3. Cost effective analysis and patient satisfaction

- Extrapolated against the number of referrals and current proportion of those being phone reviewed, this results in a direct cost saving of $10,457.98 per year.
- 100% of responders were satisfied with the HOMR with no significant difference in those who received a telephone review versus a home review.

Figure 2:Receiver Operating curve for risk score and 90-day hospital readmission.



Conclusion

- Risk score was able to identify those at highest risk of readmission at 60 and 90 days with a trend towards significance at 30 days.
- When utilising the risk score, a telephone based medication review in low risk patients was deemed a safe alternative to the traditional home medication review with a significant reduction in cost and personnel time.
- This new risk tool may be of interest to policy makers to identify those at most risk of hospital readmission as well as alternative modes of review for post-discharge interventions.

- References

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