



One-Bed-One-Team - Does an Integrated General Hospital Inpatient Model Improve care Outcomes and Productivity: An Observational Study

Y. F. LAI^{1,2,3,4*}, S. Q. LEE⁵, Y. TAN¹, Z. Y. LAU⁶, J. PHUA⁶, S. M. KHOO⁶, S. P. K. GOLLAMUDI⁶, C. W. LIM¹ AND Y. W. LIM^{6,7}

¹MOH Office for Healthcare Transformation, Singapore, ²Department of Pharmacy, Alexandra Hospital, Singapore, ³Department of Pharmacy, National University of Singapore, Singapore, ⁴School of Public Health, University of Illinois, Chicago, United States, ⁵Division of Policy Research and Evaluation, Ministry of Health, Singapore, ⁶Alexandra Hospital, National University Health System, Singapore, ⁷Department of Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore.

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INTRODUCTION

With the increasing complexity of healthcare problems worldwide, the demand for better-coordinated care delivery is on the rise^{1,2}. However, current hospital-based practices remain largely disease-centric and specialist-driven^{3,4}, resulting in fragmented care. This leads to the need for integrated care, which involves coordination of health and social services to facilitate seamless and holistic management⁵. **Figure 1** shows the shift to the person-centric, Integrated Care Model (One-Bed-One-Team) whereby patients are managed from one location by a multidisciplinary team across the entire care continuum through integration of acute and subacute inpatient care within the same ward.

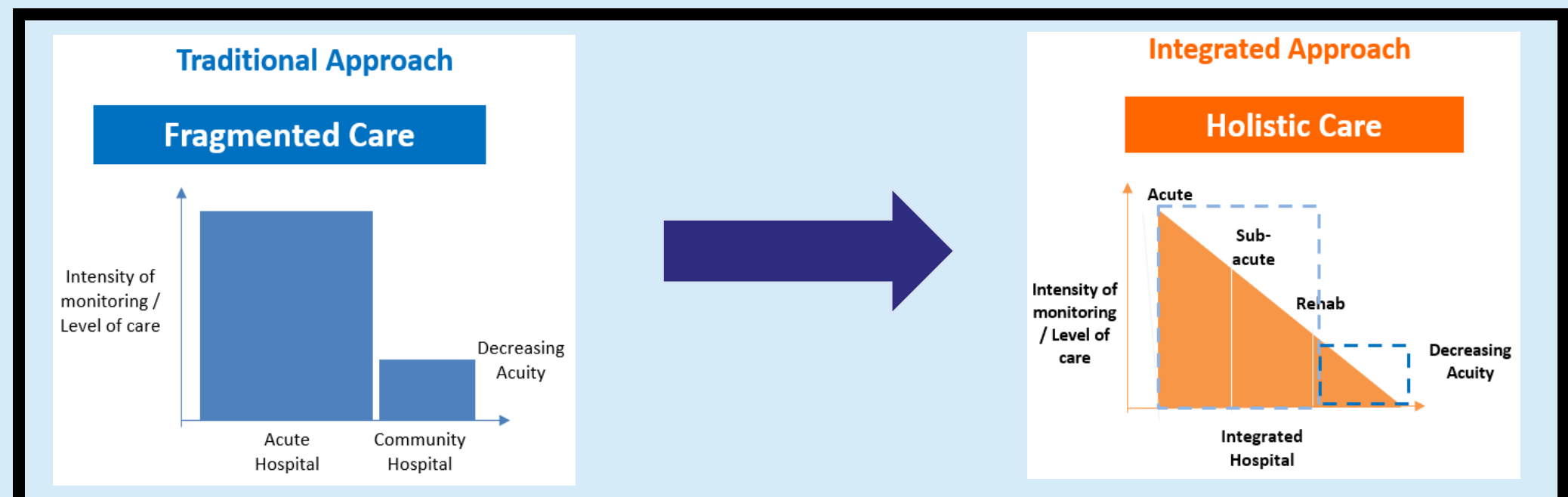


Figure 1. Transition from Traditional Approach to Integrated Approach

AIM

This study aimed to evaluate the effectiveness and feasibility of an integrated general hospital (IGH) inpatient care model, to determine its prospects to become a mainstream care model that tackles the evolving complex healthcare needs of patients.

METHOD

The study was conducted in 3 hospitals in Singapore – (AH), (NUH), and (NTFGH). A cross-sectional quantitative study was conducted amongst patients admitted under the IGH model, and 2 control groups – patients receiving usual care in public hospitals, with and without a co-located community hospital (CH). The IGH model managed patients from one location with a multidisciplinary team, performing needs-based care transition utilizing acuity tagging to match the intensity of care to illness acuity. Patient demographics and baseline characteristics were summarised through descriptive statistics. The primary outcome measure were the average length of stay (ALOS) and 30- and 60-days readmission rates, which compared between the matched intervention group and two groups of usual care controls. Differences in ALOS between intervention and control were calculated in number of days and compared through T-test for each of the following categories: (1) absence of care transition; (2) heterogeneous care transition and (3) presence of care transition. Differences were compared using one-way ANOVA. The secondary outcome measures included productivity and cost measures, specifically discharge rates to step-down care services/acuity transition rates, hospitalization costs and service utilization, with the same categories.

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RESULTS

Analysis on primary outcome measures shows that the readmission rates of IGH patients were marginally higher than those of patients under usual care but were not statistically or clinically significant.

Figure 2 shows the ALOS comparison between IGH patients and controls. Among patients without acuity transition, the IGH acute care episodes (AH ALOS) was 0.7 days shorter than patients under usual care in hospitals without CH co-location while patients with acuity transition in IGH but no CH transfer in controls was 2 days shorter, but subacute care episodes (CH ALOS) was 4.8 days longer. Among patients with acuity transition in IGH and CH transfers in controls, the IGH AH ALOS was 10.2 and 6.4 days shorter and the CH ALOS was 26.9 and 15.8 days shorter compared with those of patients under usual care in hospitals without CH co-location and with CH co-location.

	IGH (Intervention)	NUH (Usual care without co-located CH)	NTFGH (Usual care with co-located CH)
Overall cost comparisons			
No. of matched episodes	1182		
Cost per episode (% difference)	\$5249	\$5315 (+1%)	\$4075 (-22%)
Among patients without acuity transition			
No. of matched episodes	619		
Cost per episode (% difference)	\$3247	\$4340 (+34%)	\$3515 (+8%)
Among patients with acuity transition in IGH but no CH transfer in controls			
No. of matched episodes	595		
Cost per episode (% difference)	\$7307	\$5370 (-27%)	\$4509 (-38%)
Among patients with acuity transition in IGH and CH transfer in controls			
No. of matched episodes	68 (vs NUH) 112 (vs NTFGH)	68	112
Cost per episode (% difference)	\$9907 (vs NUH) \$12891 (vs NTFGH)	\$25958 (+162%)	\$19785 (+53%)

Productivity comparisons			
	IGH	NUH	NTFGH
Daily treatment fee			
L1	\$111		
L2	\$135	\$280	\$256
L3	\$169		
ALOS			
Acute hospital/L3	3.2	5.4	5.2
Community hospital/L1.L2	4.8	-	-
Overall cost			
L3 cost	\$540.80 (3.2days x \$169)	\$1512 (5.4days x \$280)	\$1331.20 (5.2days x \$256)
L1/L2 cost	\$590.40 (4.8days x \$123)	-	-
Total cost (% difference)	\$1131.20	\$1512 (+33.7%)	\$1331.20 (+17.7%)

Table 1. Cost and Productivity analyses between intervention and usual care

Table 1 shows the cost and productivity analyses categorized by acuity transition. Cost categories included medication, investigation, treatment services, consumables and consultation fees accounting for approximately 30% of total costs. Amongst all episodes, IGH and NUH's costs were comparable (1%), whereas NTFGH's cost was significantly lower (22%). Among patients without acuity transition, the IGH cost per episode was 8% lower than that for usual care at NTFGH and 34% lower than that at NUH. Among patients with acuity transition in IGH but no CH transfer in controls, the IGH overall cost per episode was 38% higher than that for usual care at NTFGH and 27% higher than that at NUH.

In our study, we found that the IGH inpatient model resulted in an overall shorter ALOS. This could be due to several differentiating elements of the IGH model. Firstly, having one care team (**Figure 3**) to overlook a patient's entire care continuum in the hospital instead of having multiple specialists was proven more efficient without the need for case handovers and duplicative investigations. Secondly, the IGH model reduced administrative hassle and transfer delays by managing patients from one location without the need to move patients physically across institutions, resulting in timely and frictionless care transition. Lastly, a seamless acuity transition process allowed regular adjustment of patient acuity when a patient's condition improved or deteriorated during the care episode, contributing to a smooth continuity of care. Our study found that for the same diagnosis code, much lesser patients in usual care underwent care transition compared with those under IGH care. This mechanism is seldom meaningfully practiced for vast majority of patients due to barriers in transfer, complex transfer application and documentation and operational and financial frameworks at CHs.

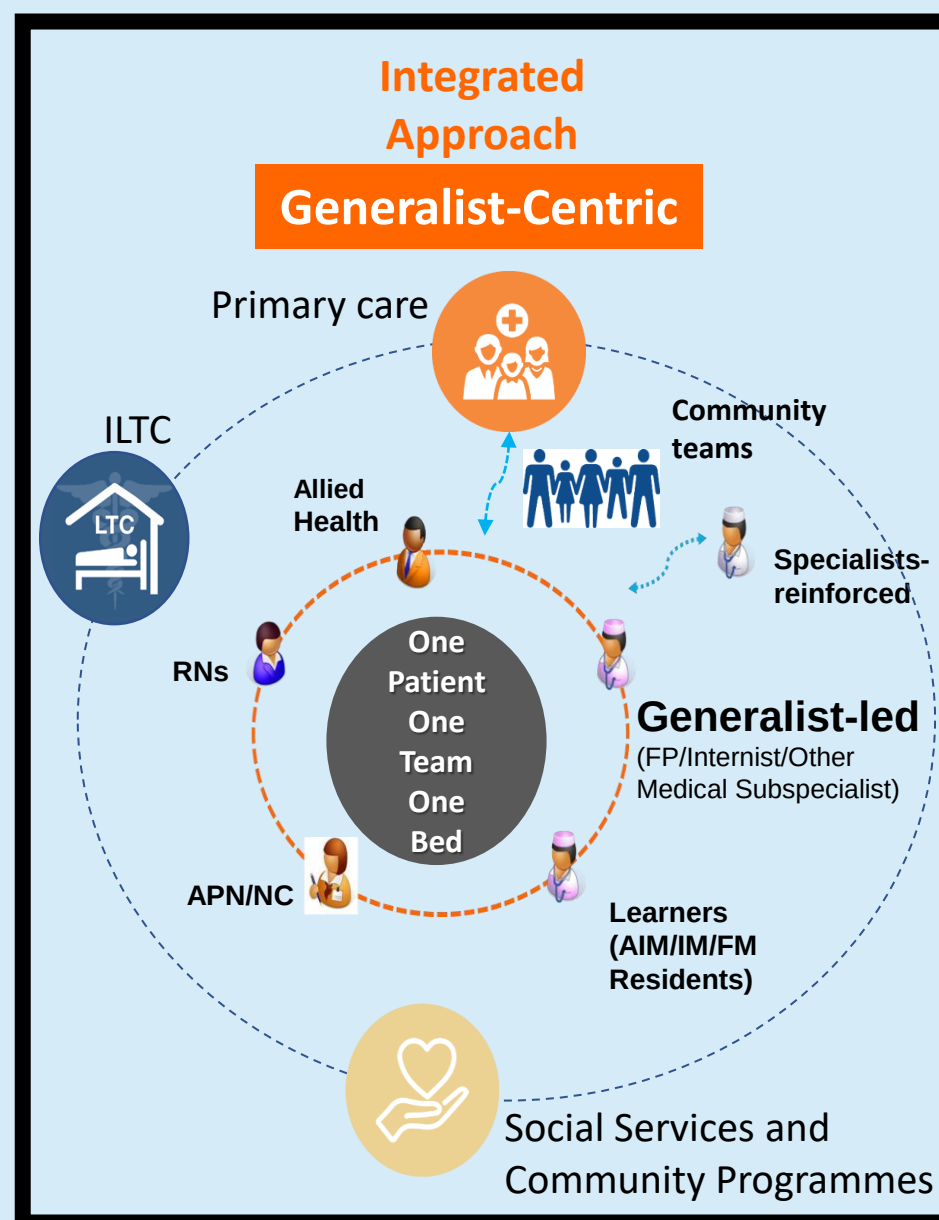


Figure 3. Summary of collaborators within the One-Bed-One-Team Model

CONCLUSIONS

The IGH care model has shown promising results in shortening the average length of stay of inpatients by providing a holistic and coordinated management of their illnesses through a one-bed-one-team approach. The IGH model has the potential to allow for highly efficient care transition and resource optimisation without compromising on the quality of patient care by accurately and dynamically tagging a patient's trajectory of illness to appropriate acuity levels. Thus, general medicine patients who require acuity transition, which is the majority of inpatient load, should be the patient segment that the IGH model focuses on to become a mainstream care model that tackles the evolving complex healthcare needs of patients.

CONTACT INFORMATION

The corresponding author can be reached at yifeng.lai@mohht.com.sg

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