



# Singapore Healthcare Management 2016

# Inpatient Glucose Management (IGM) Programme in the Asian Healthcare Setting



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## Introduction

Suboptimal glycaemic control in inpatients is an established marker of adverse outcomes. However, it often receives inadequate attention and variable treatment, especially in non-critically ill patients. The Inpatient Glucose Management (IGM) programme improves glycaemic control in European and North American countries but there is paucity of data on IGM programme from Asia. Thus, IGM programme was implemented in certain medical wards in Singapore General Hospital (SGH) to gather pilot data.

## Objective

The IGM team plans to take on a proactive role in managing the glucose level in inpatient stay. The diabetic patients are able to receive personalised interventions on a timely basis and bring their blood glucose level back to the normal range. This would result in enhanced patient safety during their stay in SGH.

Pilot data will be collected during the inpatient stay.

## Methodology

### Generation of Daily Patient List

- A list of Internal Medicine (IM) inpatients with suboptimal glycaemic control yesterday (defined by  $\geq 3$  point-of-care capillary blood glucose (CBG) readings  $< 4$  mmol/L and/or  $> 10$  mmol/L within 24 hours), will be generated and sent to the IGM team on a daily basis.

### Daily IGM Team Ward Round

- The IGM team comprising of endocrinologists, pharmacists and diabetes nurse educators will receive the daily list
- The team will review these patients and develop an early medication action plan reference by for primary care team
- Patient was reviewed by the IGM team until discharge

### Documentation and Monitoring

- Document the recommendations in the case notes for review by primary team
- Follow up on the outcomes of the recommendations on the following day
- Monitor CBG control every 2 – 3 days until patient discharged from the IGM service
- Extract and analyse the data on a weekly basis by an administrative team; IGM team updated bi-weekly to assess the impact of the IGM programme

## Conclusion

IGM programme improved inpatient diabetes, resulting in improved glycaemic control. With rising disease burden in Asia, this could be one effective strategy for inpatient diabetes.

## Result

### Analysis

One year running data was collected for intervention and control group

### Exclusion criteria

- Recommendations by IGM team were not taken
- The patients with length of stay greater than 14 days

### Results

	Pre intervention	Intervention
Sample size	764 (100%)	319 (100%)
LOS $\leq 14$	559 (73.2%)	257 (80.6%)

	Pre Intervention n = 559	Intervention n = 257	P value (2 tailed t-test with unequal variance)
Mean Age	71.2 $\pm$ 14.2	71.8 $\pm$ 12.3	0.774
Cohort mean glucose (mmol/L)	10.6 $\pm$ 3.2	10.2 $\pm$ 3.1	0.001
Cohort mean glucose/ pt-stay (MDG)	11.1 $\pm$ 2.9	10.3 $\pm$ 2.6	0.000

	Pre Intervention n = 559	Intervention n = 257	Chi sq value	P value
% total CBG readings within 4-10mmol/L	47.0%	52.3%	35.368	$< 0.01$
% total CBG readings within 4-14mmol/L	79.2%	83.0%	25.321	$< 0.01$
% total CBG readings $> 10$ mmol/L	51.8%	47.0%	28.484	$< 0.01$
% total CBG readings $> 14$ mmol/L	20.3%	16.8%	23.468	$< 0.01$
% total CBG readings $> 18$ mmol/L	6.1%	4.9%	7.801	$< 0.01$
% Pt days with hypoglycemia ( $\leq 2.8$ mmol/L)	0.7%	0.2%	4.988	$0.01 < p < 0.05$
% Pt days with hypoglycemia ( $\leq 3.9$ mmol/L)	3.5%	1.7%	15.769	$< 0.01$

- 257 patients in the intervention group and 559 patients in the control group with mean age of  $71.8 \pm 12.3$  and  $71.2 \pm 14.2$  years old respectively
- The intervention group has significant lower patient days of mean patient-day glucose (MDG) than the control group ( $10.3 \pm 2.6$  vs  $11.1 \pm 2.9$  mmol/L with  $p < 0.001$ )
- The intervention group has significantly higher proportion of CBG readings which are within the target range of 4 – 14 mmol/L than the control group (83.0% vs 79.2% with  $p < 0.001$ ).
- The intervention group has significant lower proportion of total CBG  $> 14$ mmol/L than the control group (16.8 % vs. 20.3% with  $p < 0.01$ )
- Significant reduction in patients' days with hypoglycaemia (CBG  $\leq 3.9$ mmol/L) in intervention group compared to control group (1.7% vs. 3.5% with  $p < 0.01$ )
- Better glucose management (target range of 4 – 14 mmol/L) was achieved after IGM programme
- Early intervention from the IGM team enhances patient safety



The IGM team