

INCREASING THE PERCENTAGE OF CORRECT MANAGEMENT OF HYPOGLYCEMIA INCIDENTS IN MEDICAL WARDS AT KAJANG HOSPITAL



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1. SELECTION OF OPPORTUNITIES FOR IMPROVEMENT

1.1 INTRODUCTION

Hypoglycemia is associated with increased morbidity and mortality. The risk of inpatient death increased threefold for every 0.56 mmol/L decrease in the lowest blood glucose value below 3.9 mmol/L. Hypoglycemia also results in increased length of hospital stay resulting in increased cost to the healthcare system.

1.2 PROBLEM IDENTIFICATION

	S	M	A	R	T	SCORE
Low percentage of correct management of hypoglycemia incidents in Medical Wards	50	44	50	46	48	238
Wastage of diabetes medication in poor compliance patient in Hospital Kajang	42	10	36	15	40	143
Poor understanding of antidiabetic medication among discharged patients.	34	34	36	18	42	164

GROUP MEMBERS: 10 SCORE: 1 TO 5

1.3 REASON FOR SELECTION

- Seriousness**
Low percentage of correct management of hypoglycemia incidents can cause reactive hypoglycemia and extravasation of blood vessel (BV) which lead to prolonged hospitalisation, increase the risk of morbidity and mortality and treatment cost.
- Incorrect treatment**
• 28% reactive hypoglycemia found in hypoglycemia cases following complex carbohydrate intake³.
- Incorrect monitoring time**
• Hypoglycemia can cause neuronal damage in the brain within 15 minutes to 1 hour⁵.
- Delays in the treatment can subsequently cause impaired cognitive function⁶, increased risk of dementia and functional brain failure².
- Measurable**
The percentage of correct management of hypoglycemia incidents can be measured through the patient's medical record.
- Appropriateness**
Appropriate management of hypoglycemia incidents can prevent complications and improve the quality of care as per our core responsibilities.
- Remediable**
This problem is remediable with the active involvement of a multidisciplinary team approach.
- Timeliness**
This study can be completed within a short period.

1.4 PROBLEM STATEMENT

PROBLEM NONE (0%) of the hypoglycemia incidents (N=19) in medical ward were managed correctly according to the *Practical Guide to Inpatient Glycemic Care 2020*.

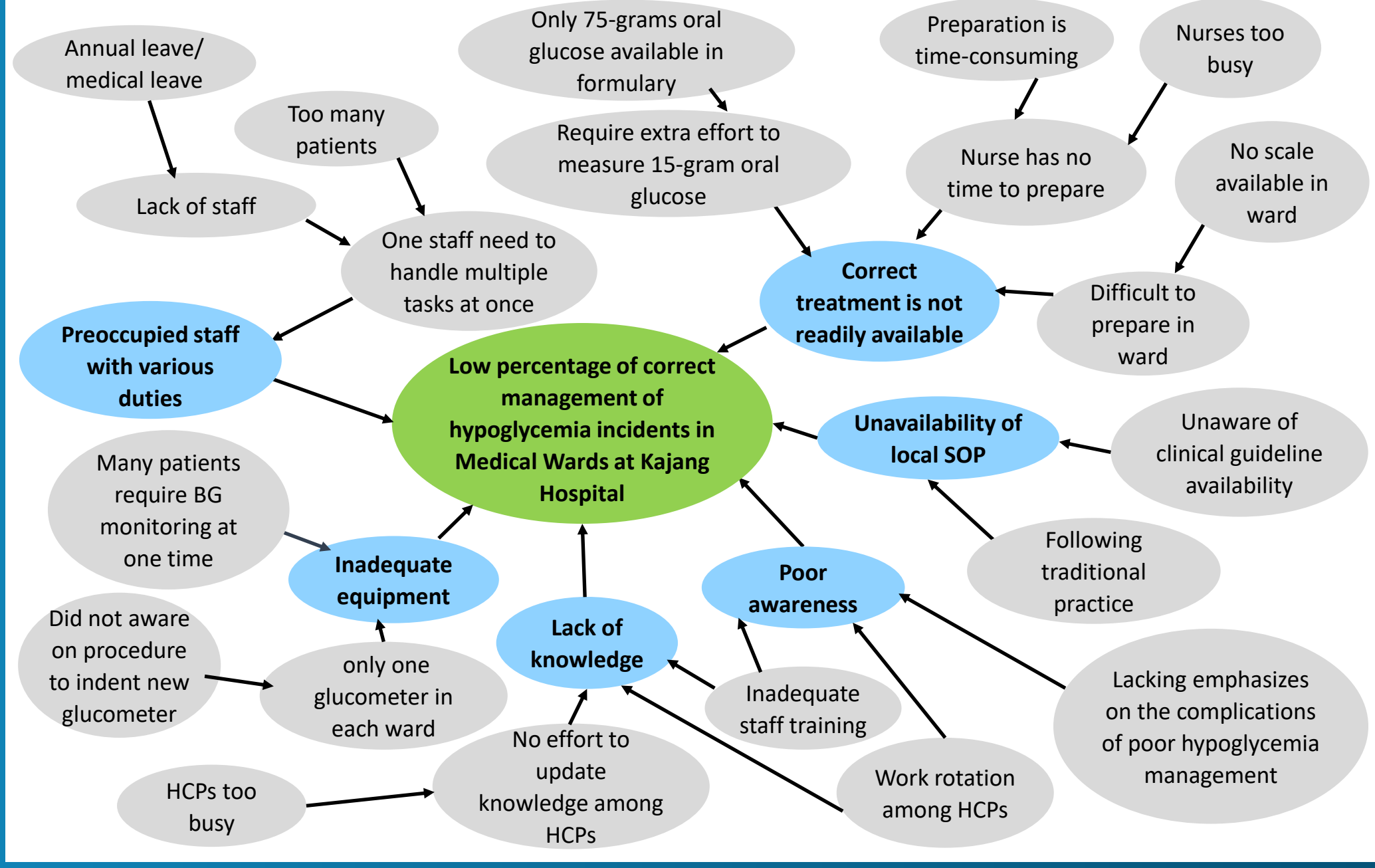
EFFECT ONE of the three patients who developed reactive hypoglycemia following incorrect management of hypoglycemia passed away*.

CAUSE Correct treatment is not readily available, unavailability of local Standard Operating Procedure (SOP), staff being preoccupied with various duties and inadequate equipment.

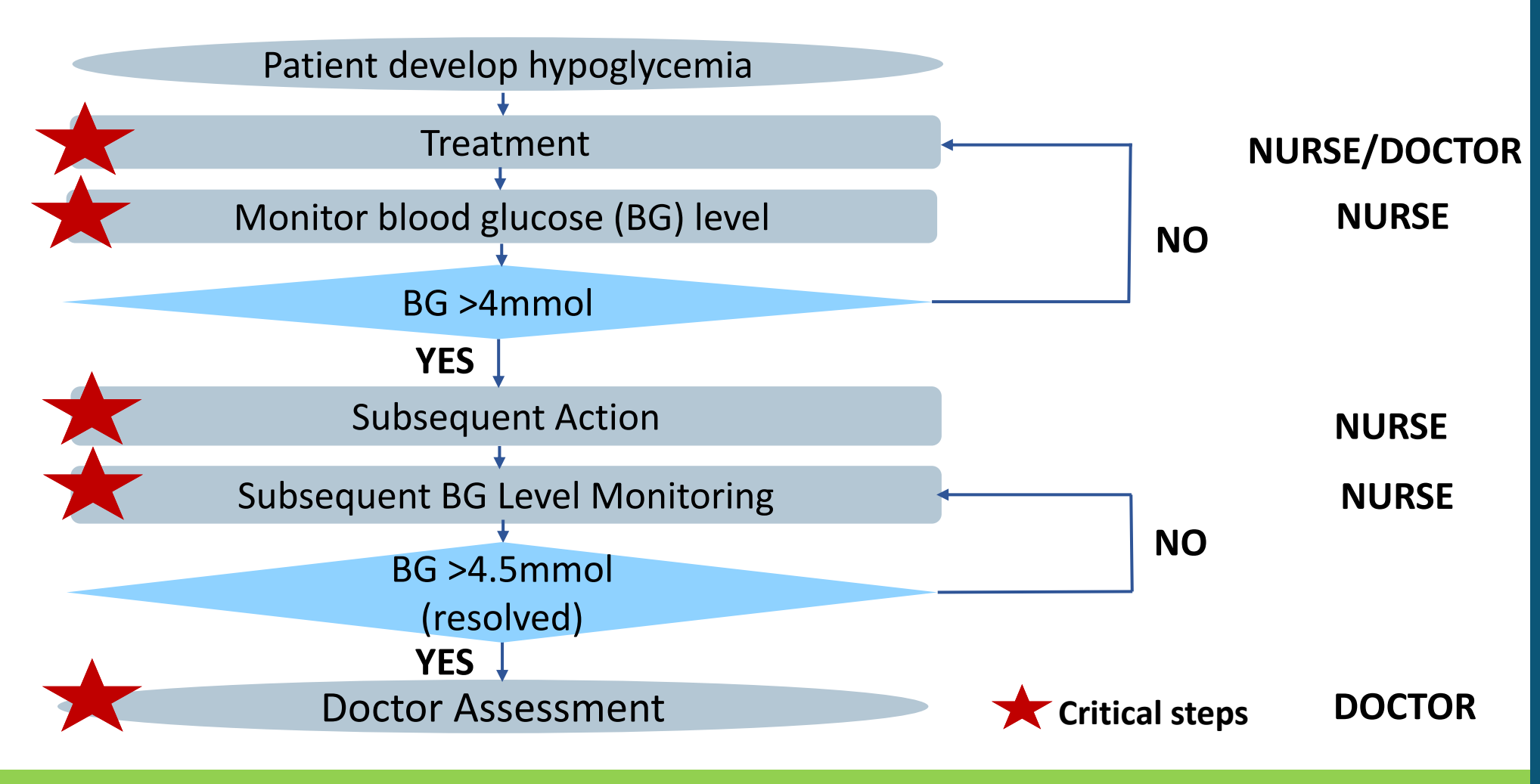
AIM To increase the percentage of correct management of hypoglycemia incidents in medical ward at Kajang Hospital.

1.5 TERMS AND DEFINITION

Term	Definition
Hypoglycemia Incidents	An episode when patients' blood glucose level fall ≤ 3.9 mmol/L regardless of whether symptoms of hypoglycemia are present ¹ .
Correct Management of Hypoglycemia incidents	Correct management of hypoglycemia incidents must fulfil 5 criteria as per guideline ¹ : 1. Treatment with 15-gram oral glucose 2. Monitoring BG level at 15 minutes after treatment 3. Subsequent action 4. Subsequent BG level monitoring 5. Assessment and modification of current medication
Reactive hypoglycemia	Recurrent hypoglycemia episode happens due to complex carbohydrate intake as a treatment following a hypoglycemia episode ² .



2.3 PROCESS OF CARE



3. PROCESS OF GATHERING INFORMATION

Study Design	QA/QI Study	Sampling technique	Universal Sampling
Study Period	Verification Jan – Feb 23	Cycle 1 Mar – Jul 23	Cycle 2 Aug – Dec 23
Inclusion Criteria	Conscious Patient		
Exclusion Criteria	Critically ill, Ventilated patients, Patient on Insulin Infusion		
Data Collection Tools	Hypoglycemic Management Audit Form:	Healthcare Provider Survey Form:	

4. ANALYSIS AND INTERPRETATION

4.1 MAIN FINDINGS FROM VERIFICATION

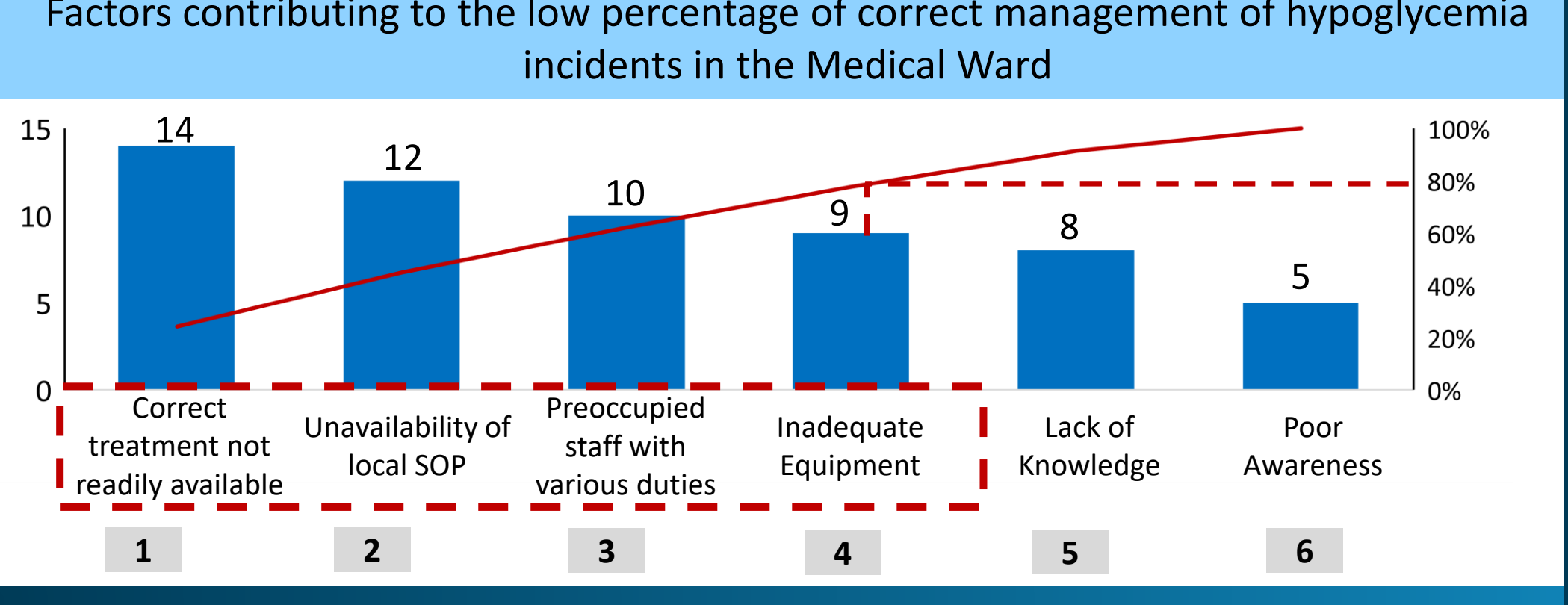
NONE (N=34) of the management of hypoglycemia incidents in Medical Ward were correct	0% Correct immediate treatment with 15-gram oral glucose
	6% Monitoring BG level at 15 minutes treatment was given
	29% Correct subsequent action per guideline
	71% Correct subsequent BG level monitoring per guideline
	38% Correct assessment and modification of current medication

*Refer definition of correct management of hypoglycemia incidents: MUST FULFILL ALL FIVE CRITERIAS

2.4 MODEL OF GOOD CARE

No	Process	Criteria	Standard	Verification (N=34)	Cycle 1 (N=54)	Cycle 2 (N=47)
1	Treatment	a) Nurse informs doctor	100%	100%	100%	100%
		b) Doctor Prescribe 15g oral glucose	100%	0%	30%	72%
		c) Nurse serve 15g oral glucose	100%	0%	30%	72%
2	Monitor BG level	d) Nurse check BG level at 15 minutes and document in patient investigation chart	100%	6%	40%	70%
		e) Nurse serve • 20g slow-acting carbohydrate through oral feeding/ Nasogastric (NG) feeding OR • Injection Dextrose 5% if patient NBM/No NG tube	100%	29%	22%	62%
4	Subsequent BG Level Monitoring	f) Nurse monitor BG level at intervals; • Hourly if BG level <4.5mmol/L OR • 6 Hourly if BG level >4.5mmol/L	100%	71%	89%	100%
		g) Doctor assesses and modify current medication regimen as per guideline	100%	38%	87%	96%

4.2 PARETO CHART



5. STRATEGIES FOR CHANGE

5.1 CYCLE 1

5.1.1) INNOVATION OF GlucoMist
*Refer to contributing factor no. 1

Innovation of a 15g oral glucose pre-pack as floor stock in the wards by Pharmacy Department.

BEFORE 35% hypoglycemia incidents treated with complex carbohydrate: delayed treatment for patient AND increase risk of reactive hypoglycemia

AFTER 50% hypoglycemia incidents treated with Dextrose 50% injection : Painful experience for patient and increase risk of BV extravasation

BEFORE Hypoglycemia incidents can be managed correctly and easily with GlucoMist

AFTER Hypoglycemia incidents can be managed correctly and easily with GlucoMist

Time taken to treat patient: 12 minutes/patient (Average) vs Time taken to treat patient: < 1 minute/patient

5.1.2) DEVELOPMENT OF LOCAL SOP : HypoAct
*Refer to contributing factor no. 2, 5 & 6

Development of local SOP called **HypoAct** adapted from Practical Guide to Inpatient Glycemic Care

BEFORE ONLY 29% of subsequent action and ONLY 38% of doctor assessment and modification of medication regimen of hypoglycemia incidents were correct.

AFTER 21% of HCPs claimed reason of their compliance failure is due to unavailability of local SOP and 14% claimed lack of knowledge

Time taken to develop: 13 March, 4 April & 6 April 2023 (92%)

5.1.3) REPOSITIONING ROLE OF NURSES
*Refer to contributing factor no. 3

BEFORE ONE nurse acts as a runner for WHOLE WARD BG monitoring

AFTER EACH CUBICLE NURSE do BG monitoring for their own cubicle

monitoring = 1.25 hrs – 1.5 hrs /session vs monitoring = 10mins – 15mins /session

5.1.4) ADDITIONAL GLUCOMETER
*Refer to contributing factor no. 4

BEFORE ONE glucometer ONLY

AFTER Add TWO new glucometers

1 glucometer every 44 vs 1 glucometer every 14 – 16

5.2 CYCLE 2

FINDINGS FROM CYCLE 1 ONLY 14% of the management of hypoglycemia incidents in Medical Ward were correct

Factors contributing to the low percentage of correct management of hypoglycemia incidents in the Medical Ward After Cycle 1

35.2% New HCPs not aware on the remedials

42.6% Did not come to CMEs held

5.2.1) ROUTINE DIABETES GRAND ROUND

AIM : To ensure correct information reach every level of HCPs through real-case scenario

Every two weeks on Friday morning – bedside teaching on the benefit of GlucoMist and how to use HypoAct in managing hypoglycemia incidents to doctors, pharmacists and nurses

Continuous education in the ward by Diabetic Educator (DE) Nurse to ensure the information reached every nurse

5.2.2) HYPOACT AND GLUCOMIXT OFFICIAL LAUNCHING

AIM : To expand awareness among all HCPs in the hospital regarding the QA/QI study and new innovations while gaining top management support

Official launching by Hospital Director during World Diabetes Day (WDD 2023)

Games, Talk, Interactive booth, Interesting Prize

2. KEY MEASURES FOR IMPROVEMENT

2.1 STUDY OBJECTIVES

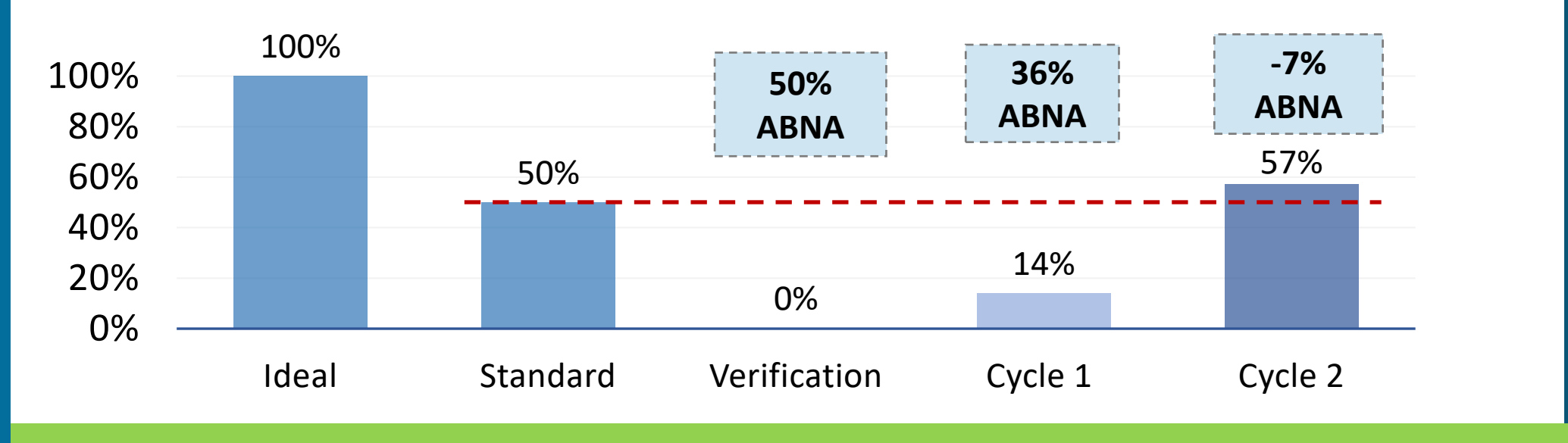
- General Objective**
To increase the percentage of correct management of hypoglycemia incidents in the Medical Ward at Kajang Hospital
- Specific Objectives**
- To determine the percentage of correct management of hypoglycemia incidents in the Medical Ward
 - To identify the factors contributing to the problem.
 - To develop remedial measures.
 - To evaluate the effectiveness of the remedial measure.

2.2 INDICATOR AND STANDARD

INDICATOR:	Percentage of correct management of hypoglycemia incidents in Medical Ward	STANDARD:	50%
FORMULA:	$\frac{\text{Total number of correct management of hypoglycemia incidents in Medical Ward}}{\text{Total number of hypoglycemia incidents in Medical Ward}} \times 100\%$		
		41% (Coats, 2013)	44% (Adarju, 2009)
		*With the consensus of Endocrinologist	

6. EFFECT OF CHANGE

6.1 ACHIEVABLE BENEFIT NOT ACHIEVED (ABNA)



8. LESSON LEARNT

This study warrants patient safety in preventing reactive hypoglycemia in future. It also improves productivity by providing prompt access to correct treatment as well as reducing healthcare costs.

9. NEXT STEP

- Raise the standard set to improve service quality.
- Share the strategies with other facilities within JKNS.
- Community outreach – Educating healthcare provider in nursing home and providing them with GlucoMist
- Annual hypoglycemic audit for sustainability.
- Create HypoKit utilizing GlucoMist and HypoAct for the patient to bring home as a rescue kit during any hypoglycemia incident.

