

Glucometric Guardianship

SANJAY KALRA*, PRAMILA KALRA†, USHA AYYAGARI‡, DHEERAJ KAPOOR#, SHEHLA SHAIKH¥, S NALLAPERUMAL£, KALYAN KUMAR GANGOPADHYAY\$, VISHAL GALA§

*Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India

†Professor and Head, Dept. of Endocrinology, Ramaiah Medical College and Memorial Hospital, Bengaluru, Karnataka, India

‡Apollo Sugar Clinics, Chennai, Tamil Nadu, India

#Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute, Mumbai, Maharashtra, India

¥Saifee Hospital, Mumbai, Maharashtra, India

£BSS Hospital, Chennai, Tamil Nadu, India

\$Consultant, Dept. of Endocrinology, CK Birla Hospitals, Peerless Hospital, Kolkata, India

§Medical and Scientific Affairs, Roche Diabetes Care Pvt Ltd, Mumbai, India

ABSTRACT

It is a well-known fact that the knowledge of their current glucose readings empowers people with diabetes to evaluate and monitor the trends in glucose fluctuations and take informed decisions on adjusting their medicines, food intake, and physical activity. Glucose monitoring technology has undergone a technological evolution and has improved diabetes care in patients living with type 2 diabetes. This has also made the need to efficiently and effectively utilize blood glucose monitoring tools. Glucometric checklists offer a standardized approach to glucometric guardianship which is necessary to improve the process of drug choice and dose titration. The stepwise factors included in the glucometric guardianship checklist include procurement, distribution, pre-testing hygiene, testing, recording, action, disposal, quality control, and procedure safety. This article has reviewed the significance of glucometric guardianship and has also developed checklists for efficient glycemetic management.

Keywords: Type 2 diabetes, glucometric guardianship, checklist, glucose meters, glycemetic triad.

Introduction

Introduced in the late 1970s and regulatory clearance received for the first time in 1980, blood glucose monitoring (BGM) has revolutionized the self-care of people with diabetes. A knowledge of their current glucose readings empowers people with diabetes to assess and better understand their glucose patterns to adjust their food intake, activity and medications to achieve their glycemetic goals.¹

BGM is an essential part of case management in patients with diabetes. Having very high or very low blood glucose levels may affect cellular function and could be life-threatening, including direct health

care costs and reduced productivity; if not managed appropriately. It serves as a critical measure in individuals with ongoing diabetes management.²

The American Diabetes Association (ADA) 2017 reported that the total estimated cost of diagnosed diabetes in 2017 was \$327 billion;³ however, the direct cost of treating complications, including hospitalizations, emergency room visits and nondiabetes prescriptions, along with indirect costs related to lost/reduced productivity and human costs account for almost 73% of the total diabetes cost.⁴

The need to effectively and efficiently utilize BGM tools and resources to improve diabetes outcomes is indisputable. Continuous glucose monitoring is set to bring a fundamental change in the treatment of diabetes and patient engagement of those affected with this disease.⁵ Over the years, diabetes practice has become more and more algorithm-based and statistic oriented, which facilitates the patient-centric treatment approach.

Address for correspondence

Dr Sanjay Kalra

Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India; University Center for Research & Development, Chandigarh University, Mohali, Punjab, India

E-mail: brideknl@gmail.com

Gluco-centric screening and monitoring, added to this, have led to the neglect of a holistic medicine approach.⁶ Hence, in this review, we have reviewed the significance and value of glucometric guardianship. We have also attempted to design checklists to facilitate routine clinical practice and impact decision-making.

Glycemic Guardianship

Kalra et al proposed the concept of glycemic guardianship, which was defined as “activities carried out by the health care team and health care system to ensure optimal care of the person, or group of peoples, living with diabetes.” Glycemic guardianship is a novel concept that can be functional at the national/regional level as well as the individual level and is ideally considered in partnership with individuals living with diabetes. The World Health Organization’s Global Diabetes Compact (GDC) targets provide an umbrella for all activities related to glycemic guardianship.⁷

GDC emphasizes five targets comprising diagnosis of diabetes in 80% of individuals living with diabetes, achieving glucometric optimization in 80% of individuals diagnosed with diabetes, blood pressure control in 80% of individuals diagnosed with diabetes, ensuring statin prescription in 60% of individuals with diabetes who are 40 years or more in age, availability of affordable insulin, and blood glucose self-monitoring for all the people with type 1 diabetes. With the second-largest population of diabetes individuals living in India, the country’s health care system and providers must strive to screen, diagnose, manage and prevent diabetes and related complications. While the prevalence of diabetes has increased, so has the proportion of those living with undiagnosed diabetes, thereby diminishing or counterbalancing the advances in diabetes care and delivery.⁷

With the Indian pharmaceutical industry being the world leader in manufacturing good quality drugs and devices, the easy availability of good quality and reasonably priced glucose monitoring devices and ancillaries has also been facilitated. With this, glucovigilance and personalized diabetes management have become integral to diabetes management and care.⁸

The Domains of Glucometric Guardianship

The benefits of glucometric guardianship are that it encompasses the physical and electronic infrastructure and further delineates the roles and responsibilities of various health care team members. The infrastructural

requirements of glucometric guardianship include hardware (glucose measuring devices and ancillary supplies) and software (data recording and analysis). Table 1 shows the domains of glucometric guardianship.

Procurement
<ul style="list-style-type: none"> • Glucometer • Ancillaries, i.e., lancets, strips, swabs • Indented by; at time of admission/later
Distribution
<ul style="list-style-type: none"> • Individual • Shared/number of beds
Pre-Testing Hygiene
<ul style="list-style-type: none"> • Glucometer battery • Sanitization; finger-tip sanitization
Testing
<ul style="list-style-type: none"> • Glucometer check • Procedure of pricking • Troubleshooting (e.g., poor circulation, lack of hygiene) • Frequency
Recording
<ul style="list-style-type: none"> • On paper • E-Enabled (Integrated personalized diabetes management)
Action
<ul style="list-style-type: none"> • Frequency of measurement • Change of insulin dose • Change in IV fluids • Escalation to senior medical staff
Disposal
<ul style="list-style-type: none"> • Plastics • Sharps • Blood-stained swabs
Quality Control
<ul style="list-style-type: none"> • Calibration • Audit
Procedure Safety
<ul style="list-style-type: none"> • What to do if there is needle stick injury/exposure to blood • How to check BG of HIV/HBsAg+ve patient

Box 1. Stepwise factors for glucometric guardianship checklist.

Table 1. Infrastructure of Glucometric Guardianship

Equipment	<ul style="list-style-type: none"> • Choice of the glucose monitoring device, e.g., Glucose meters vs. flash glucose monitoring device; glucose meters/FGMS model • Individual device or common device: e.g., prefer individual glucose meters if expected hospital stay of >2-3 days or if the expected number of glucometer pricks is >20 • Glucose sticks: available at bedside/central station • Lancets: available at bedside/central station • Alcohol swabs: available at bedside/central station • Meter calibration: needed/not needed: at what frequency
Roles and responsibilities	<ul style="list-style-type: none"> • Glucose monitoring: by- • Data entry: by- • Analysis: by- • Disposal of used ancillary supplies: by-, at- • Red flag range: e.g., call duty doctor if plasma glucose <70 mg/dL and >400 mg/dL; check urine/blood ketones if BG >400 mg/dL • Treatment/titration: by- • Meter calibration: by-
Patient-specific glucometric guardianship	<ul style="list-style-type: none"> • Frequency of monitoring • Site of prick; rotation of fingers • De-escalation of frequency of monitoring: e.g., if BG 100-200 mg/dL; <20% change in consecutive glucose values at the current frequency • Escalation of frequency of monitoring: e.g., if BG <100 or >200 mg/dL; >20% change in consecutive glucose values

The advantages of glucometric guardianship are given in Table 2 given below.

Glucometric Guardianship Checklist

“You can’t improve what you can’t measure accurately” is an adage illustrating the dilemma facing attempts to optimize glycemic control. Glucometric guardianship ensures appropriate measurement and monitoring of glucose levels to ensure alertness in glycemic management and agility in anticipating and identifying suboptimal glycemic parameters and responding to them.⁹ (Box 1)

In diabetes care, several well-developed algorithms are available for glycemic management in the inpatient and outpatient settings; however, they do not integrate the nuances of glucose monitoring. Thus, glucometric measurements act as a challenge as well as a facilitator to achieving optimal glucose control. Hence, a standardization of glucometrics and adopting a practice-based approach to glucometric guardianship is essential to improve the process of drug choice and dose titration.⁹

The objective of developing these checklists are: (i) to emphasize the need for accurate measurement,

Table 2. Advantages of Glucometric Guardianship

- Accurate determination of glucose control
- Avoidance of hypo-/hyperglycemia
- Prevention of complications
- Facilitation of audit
- Comparison and research

monitoring, of glucose levels to improve the management of diabetes; (ii) to facilitate the process of glucometric guardianship by outlining the steps and factors to consider when monitoring and analyzing blood glucose patterns in individuals with diabetes; (iii) standardize the process of glucose monitoring and ensure that health care providers have a systematic approach to managing blood glucose levels in different care settings.

Outpatient Glucose Monitoring

Glucose control is an imperative and essential component of outpatient deviations in blood glucose level care in diabetes. Clinical scenarios with better glucose control have been shown to improve patient outcomes. Glycated hemoglobin (HbA1c) can be used

to assess the quality of outpatient glycemic control. Glucometrics has been shown to allow comparison of inpatient glycemic control among hospitals and patient care units and will allow institutions to evaluate the success of their quality improvement initiatives.¹⁰

The availability of point-of-care meters capable of storing glucose measurements from many patients eases, to some degree, the burden of data collection.¹¹

Inpatient Glucose Monitoring

Inpatient hyperglycemia and hypoglycemia are related to worse patient outcomes, such as additional wound infections, prolonged hospital stays and higher mortality rates, especially in ICU. In most cases, an inpatient target glucose range of 140-180 mg/dL may represent the optimal balance for avoiding complications associated with extraordinarily high- and low-glucose levels.¹²

Emergency/Casualty

Many patients reporting to emergency care could have hyperglycemia who may be undiagnosed. Uncontrolled hyperglycemia and iatrogenic hypoglycemia are associated with a broad range of adverse outcomes, with insulin commonly attributing to adverse drug events if the patient is a known case of diabetes on treatment. While insulin and hypoglycemia management protocols allow for managing patients in emergency care, there is a lack of glucometric standardization and limited resources acting as challenges in diabetes management.¹³

Checklists

Because of the challenges in managing outpatient, inpatient, and emergency patients, we have attempted to devise CHECKLISTS to test, monitor and analyze the blood glucose pattern in individuals with diabetes

Table 3. Checklist for Outpatients

Patient ID	Visit 1	Visit 2
Procurement: <ul style="list-style-type: none"> • if the patient using a glucometer (which brand) • of a meter (which brand if patient not using glucometer) • of ancillaries, i.e., lancets, strips, swabs (which brand) 	Procurement <ul style="list-style-type: none"> • Which brand of glucometer • Recommended brand of glucometer • Recommended brand of ancillaries • Comments, if any 	Cross check availability of <ul style="list-style-type: none"> • Glucometer • Ancillaries
Usage pattern and training: <ul style="list-style-type: none"> • Individual/shared/family Training of <ul style="list-style-type: none"> • How to use the glucometer • Testing: change of lancet after how many pricks • How to share readings with the HCP 	Individual <input type="checkbox"/> Shared <input type="checkbox"/> Family <input type="checkbox"/> <ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> Comments, if any	Cross-check usage pattern and technique
Pre-testing hygiene: <ul style="list-style-type: none"> • Time/Date of calibration • Glucometer battery • Sanitization <ul style="list-style-type: none"> a) Fingertip sanitization b) Glucometer Disinfection • Needle 	Pre-testing hygiene: <ul style="list-style-type: none"> • Time/Date • Glucometer battery working Y <input type="checkbox"/> N <input type="checkbox"/> • Sanitization Y <input type="checkbox"/> N <input type="checkbox"/> • Done Y <input type="checkbox"/> N <input type="checkbox"/> • Done Y <input type="checkbox"/> N <input type="checkbox"/> • Needle Checked Y <input type="checkbox"/> N <input type="checkbox"/> Comments, if any	<ul style="list-style-type: none"> • Time/Date • Glucometer battery working Y <input type="checkbox"/> N <input type="checkbox"/> • Sanitization Y <input type="checkbox"/> N <input type="checkbox"/> • Done Y <input type="checkbox"/> N <input type="checkbox"/> • Done Y <input type="checkbox"/> N <input type="checkbox"/> • Needle Checked Y <input type="checkbox"/> N <input type="checkbox"/> Comments, if any
Testing: <ul style="list-style-type: none"> • Glucometer check • Confirm glucose units (mg or mmol) • Procedure of pricking/intensity of lancet prick 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Checked – Y <input type="checkbox"/> N <input type="checkbox"/> 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Checked – Y <input type="checkbox"/> N <input type="checkbox"/>

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Table 3. Checklist for Outpatients		
Patient ID	Visit 1	Visit 2
<ul style="list-style-type: none"> • Troubleshooting frequency 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, specify the reason Comments if any 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, specify the reason Comments, if any
Frequency (Appendices 1 and 2)		
Recording:		
<ul style="list-style-type: none"> • Cross-checking glucometer data with the CBG log • E-enabled [Integrated personalized diabetes management (IPDM)] • On paper 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Y <input type="checkbox"/> N <input type="checkbox"/> • Y <input type="checkbox"/> N <input type="checkbox"/> 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Y <input type="checkbox"/> N <input type="checkbox"/> • Y <input type="checkbox"/> N <input type="checkbox"/>
Action:		
<ul style="list-style-type: none"> • Change in diet/physical activity • Change in OAD • Change in insulin dose 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, Specify • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, Which OAD? • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y Specify 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, Specify. • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, which OAD? • Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y Specify
Storage of strips	Storage done as per instruction Y <input type="checkbox"/> N <input type="checkbox"/>	<ul style="list-style-type: none"> • Cross-check storage and disposal
Disposal: (home/hospital)	Disposal: Home (Y) or Hospital (Y)	
<ul style="list-style-type: none"> • Plastics • Sharps • Blood-stained swabs 	<ul style="list-style-type: none"> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> • Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	

Appendix 1: Glucose Monitoring Log (Outpatients)

Date/Time	BB	AB	BL	AL	BD	AD	3 am	Comments

Week:Date Onwards

Date/Time	BB	AB	BL	AL	BD	AD	3 am	Comments

BB, BL, BD: Before Breakfast, Lunch, Dinner
 AB, AL, AD: After Breakfast, Lunch, Dinner

Appendix 2: Diet Log (Outpatients)	
Day/Time	Diet log/changes in diet/activity/illness next to the blood glucose levels
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

BB, BL, BD: Before Breakfast, Lunch, Dinner
 AB, AL, AD: After Breakfast, Lunch, Dinner

Table 4. Checklist for Ward Patients		
Ward ID	Audit No. 1	Audit No. 2 onwards
Procurement: <ul style="list-style-type: none"> of meter (which brand?) of ancillaries, i.e., lancets, strips, swabs (e.g., which brand) 	<ul style="list-style-type: none"> Recommended brand of glucometer Recommended brand of ancillaries Comments, if any 	CMEs and CNEs should be conducted regularly (monthly or quarterly). This should be accompanied/ followed by audits at frequent intervals. These audits are targeted at ward nurses/diabetes educators. It is expected that these health care providers will disseminate the right knowledge to all patients admitted to their ward as well as their caregivers.
Usage pattern: <ul style="list-style-type: none"> Individual shared/beds 	<ul style="list-style-type: none"> Individual <input type="checkbox"/> Shared <input type="checkbox"/> 	
Pre-testing practices: <ul style="list-style-type: none"> Glucometer battery Sanitization <ul style="list-style-type: none"> a) Fingertip sanitization b) Glucometer disinfection Setting intensity of lancet prick 	<ul style="list-style-type: none"> Glucometer battery working – Y <input type="checkbox"/> N <input type="checkbox"/> Sanitization <ul style="list-style-type: none"> Done Y <input type="checkbox"/> N <input type="checkbox"/> Done Y <input type="checkbox"/> N <input type="checkbox"/> Done as per skin thickness over the fingertip comments, if any 	
Testing: <ul style="list-style-type: none"> Glucometer check Confirm glucose units (mg or mmol) Procedure of pricking <ul style="list-style-type: none"> Loading the lancet Rotating site of finger prick Troubleshooting (poor circulation, lack of hygiene) Check from the hand where the IV line is going on <ul style="list-style-type: none"> Check from the limb in which no dextrose infusion going on Care of finger prick site after checking glucose 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Checked- Y <input type="checkbox"/> N <input type="checkbox"/> Checked- Y <input type="checkbox"/> N <input type="checkbox"/> Checked- Y <input type="checkbox"/> N <input type="checkbox"/> Checked- Y <input type="checkbox"/> N <input type="checkbox"/> Comments, if any Checked- Y <input type="checkbox"/> N <input type="checkbox"/> Checked- Y <input type="checkbox"/> N <input type="checkbox"/> 	
Log (Appendix 3)		
Recording and analysis: <ul style="list-style-type: none"> On paper 	<ul style="list-style-type: none"> Y <input type="checkbox"/> N <input type="checkbox"/> 	

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Table 4. Checklist for Ward Patients		
Ward ID	Audit No. 1	Audit No. 2 onwards
<ul style="list-style-type: none"> E-enabled (Integrated personalized diabetes management [IPDM]) Escalation matrix in place 	<ul style="list-style-type: none"> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> 	
Action: <ul style="list-style-type: none"> Change in diet Change in frequency and timing of glucose testing Change in OAD/ insulin type. Change in insulin dose Use of dextrose or any other IV fluids 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, Specify Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, Specify Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y, Which OAD? Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y Specify 	
Storage (e.g., strips) Disposal: hospital <ul style="list-style-type: none"> Plastics Sharps Blood-stained swabs 	<ul style="list-style-type: none"> Storage Done as per instruction Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	

Appendix 3: Glucose Monitoring and Insulin and/or OAD Log (Ward patients)

Day/Time		Fasting	AB	BL	AL	BD	AD	3 am	Comments (eg any change in diet, physical activity, illness, antibiotics)
Date	Blood Glucose								
	Insulin Dose								
Date	Blood Glucose								
	Insulin Dose								
Date	Blood Glucose								
	Insulin Dose								
Date	Blood Glucose								
	Insulin Dose								
Date	Blood Glucose								
	Insulin Dose								
Date	Blood Glucose								
	Insulin Dose								

BB, BL, BD: Before Breakfast, Lunch, Dinner
 AB, AL, AD: After Breakfast, Lunch, Dinner

Table 5. Checklist for Emergency/Casualty Patients

	Audit 1	Audit 2
<p>Procurement:</p> <ul style="list-style-type: none"> Type of glucometer- glucose oxidase or glucosedehydrogenase (which brand) of, ancillaries i.e., lancets, strips, (which brand) 	<p>Procurement</p> <ul style="list-style-type: none"> Recommended brand of glucometer Recommended brand of ancillaries <p>Comments, if any</p>	<p>CMEs and CNEs should be conducted regularly (monthly or quarterly). This should be accompanied/ followed by audits at frequent intervals.</p>
<p>Usage pattern:</p> <ul style="list-style-type: none"> Individual bed Shared beds 	<ul style="list-style-type: none"> Individual <input type="checkbox"/> Shared <input type="checkbox"/> 	<p>These audits are targeted at emergency nurses. It is expected that they will follow good glucometric practices.</p>
<p>Pre-testing practices</p> <ul style="list-style-type: none"> Glucometer battery Sanitization <ul style="list-style-type: none"> a) Fingertip sanitization b) Glucometer disinfection Check from the hand where the IV line is going on Check from the limb in which no dextrose infusion going on 	<ul style="list-style-type: none"> Glucometer battery working – Y <input type="checkbox"/> N <input type="checkbox"/> Sanitization Y <input type="checkbox"/> N <input type="checkbox"/> <ul style="list-style-type: none"> Done Y <input type="checkbox"/> N <input type="checkbox"/> Done Y <input type="checkbox"/> N <input type="checkbox"/> Needle Checked Y <input type="checkbox"/> N <input type="checkbox"/> <p>Comments, if any</p>	<p>They should be able to refer the patient as well as their caregivers to the right health care provider upon discharge.</p>
<p>Testing:</p> <ul style="list-style-type: none"> Glucometer check Confirm glucose units (mg or mmol) <p>Procedure of pricking</p> <ul style="list-style-type: none"> Care of finger prick site after checking glucose Rotating site of finger prick Troubleshooting (poor circulation, lack of hygiene) 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Checked – Y <input type="checkbox"/> N <input type="checkbox"/> Checked – Y <input type="checkbox"/> N <input type="checkbox"/> Checked – Y <input type="checkbox"/> N <input type="checkbox"/> <p>Comments, if any</p>	
<p>Log (Appendix 4)</p>		
<p>Recording:</p> <ul style="list-style-type: none"> E-enabled matrix/hospital information system 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	
<p>Action:</p> <ul style="list-style-type: none"> Change in insulin dose/insulin type Last insulin dose and time before discharge Escalation/De-escalation matrix 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> <ul style="list-style-type: none"> If, Y Specify dose & type, Last insulin dose..... time before discharge..... Specify 	
<p>Storage of strips disposal: hospital</p> <ul style="list-style-type: none"> Plastics Sharps Blood-stained swabs 	<ul style="list-style-type: none"> Storage done as per instruction – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	

Appendix 4: Frequency of Monitoring and Insulin Log (Emergency/Casualty patients)

Date:							
Type of Insulin.....							
Day/Time	8 am	8:15 am	8:30 am	8:45 am	9:45 am	11:00 am	
GCS							
Plasma Glucose							
IV Infusion							
Oral Intake							
Insulin							

Date:

Table 6. Checklist for ICU Patients

Patient - Name	Audit 1	Audit 2
Procurement: <ul style="list-style-type: none"> Type of glucometer- glucose oxidase or glucose dehydrogenase (which brand) of ancillaries, i.e., lancets, strips, (which brand) 	Procurement <ul style="list-style-type: none"> Recommended brand of glucometer Recommended brand of ancillaries Comments, if any 	<p>CMEs and CNEs should be conducted regularly (monthly or quarterly). This should be accompanied/ followed by audits at frequent intervals.</p> <p>This audit is targeted at ICU nurses. It is expected that they will follow good glucometric practices. They should be able to refer the patient as well as their caregivers to the right healthcare provider upon discharge.</p>
Usage pattern of glucometer: (tick any) <ul style="list-style-type: none"> Individual or Shared 	<ul style="list-style-type: none"> Individual <input type="checkbox"/> Shared <input type="checkbox"/> 	
Pre-testing practices: <ul style="list-style-type: none"> Glucometer battery (check after how much time) Sanitization; <ul style="list-style-type: none"> a) Fingertip sanitization b) Glucometer disinfection Check from the hand where the IV line is going on Check from the limb in which no dextrose infusion going on 	<ul style="list-style-type: none"> Glucometer battery working – Y <input type="checkbox"/> N <input type="checkbox"/> Sanitization Done Y <input type="checkbox"/> N <input type="checkbox"/> Done Y <input type="checkbox"/> N <input type="checkbox"/> Checked Y <input type="checkbox"/> N <input type="checkbox"/> Comments, if any 	
Testing: <ul style="list-style-type: none"> Glucometer check Confirm glucose units (mg or mmol) 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	
Procedure of pricking <ul style="list-style-type: none"> Care of finger prick site after checking glucose Rotating site of finger prick Troubleshooting (poor circulation, lack of hygiene) 	<ul style="list-style-type: none"> Checked – Y <input type="checkbox"/> N <input type="checkbox"/> Checked – Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> 	
	Comments if any	
Log (Appendix 5)		
Recording: <ul style="list-style-type: none"> E-enabled system (Hospital information system) On paper (Structured Reports) 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	

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Table 6. Checklist for ICU Patients

Patient - Name	Audit 1	Audit 2
Action: <ul style="list-style-type: none"> Change in insulin dose/type Escalation/De-escalation rules 	<ul style="list-style-type: none"> Done – Y <input type="checkbox"/> N <input type="checkbox"/> If Y Specify dose & type Y <input type="checkbox"/> N <input type="checkbox"/> Comments, if any 	
Storage (e.g., of strips) Disposal: hospital <ul style="list-style-type: none"> Plastics Sharps Blood-stained swabs 	<ul style="list-style-type: none"> Storage Done as per instruction Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> Done – Y <input type="checkbox"/> N <input type="checkbox"/> 	

Appendix 5: Frequency of Monitoring and Insulin and/or OAD Log (ICU Patients)

Day/Time	Fasting	2 hours after breakfast	BL	2 hours after lunch	BD	2 hours after dinner	3 am	Random	
		BG/Insulin rate						Time	Glucose value
Monday									
Tuesday									
Wednesday									

Week:....Date Onwards

Day/Time	8 am	10 am	Noon	2 pm	4 pm	6 pm	8 pm	Random	
		BG/Insulin rate							
Monday									
Tuesday									
Wednesday									

Week:....Date Onwards

presenting to the health care systems at different levels of point-of-care. Tables 3-6 and Appendices 1-5 describe the checklist and logs for outpatients, ward patients, Emergency/Casualty and ICU patients.

Conclusion

Glucometric guardianship aims to ensure optimal glycemic management. It is a process of allowing appropriate assessment, monitoring, and analysis of glucose levels regularly. The aim of glucometric guardianship is to (i) enable alertness in glycemic management; (ii) agility in anticipating and detecting suboptimal glycemic parameters, and (iii) response to

glycemic variability. These checklists will enable health care providers to enhance glycemic management, anticipate and identify suboptimal glycemic parameters, and respond effectively to glycemic variability.

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