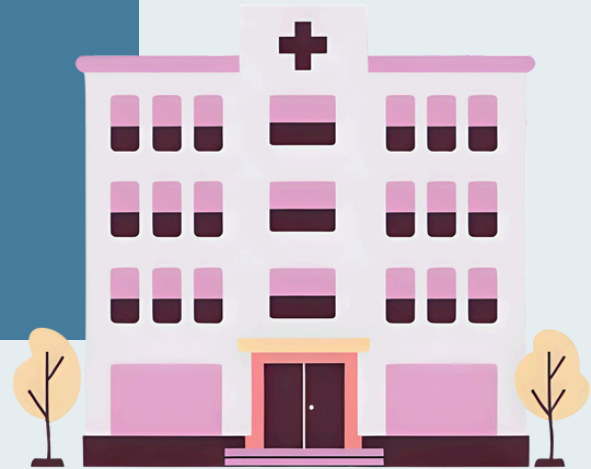


REVOLUTIONIZING DIABETES CARE: DOES IMPLEMENTATION OF CONTINUOUS GLUCOSE MONITORING IN HOSPITAL SETTINGS ENHANCES PATIENT OUTCOMES IN ITU ?

By Lola Olanipekun



INTRODUCTION

Diabetes affects **4.6 million** people in the UK, 90% with type 2, and an estimated **1.3 million** remain undiagnosed. It is a major cause of amputations, strokes, heart attacks, and heart failure. Around half of diabetic patients will require surgery, often needing Tight Glycemic Control (TGC) through variable or continuous insulin infusions (V/CRII). TGC reduces infections, mortality, and hospital stays but poses risks like hypoglycemia and electrolyte imbalance, requiring close monitoring. Traditional glucose monitoring (fingersticks or blood draws) can sometimes be inaccurate and impractical. **Continuous Glucose Monitoring (CGM)** offers real-time readings, fewer blood draws, and better safety through trend detection and precise insulin control

METHODOLOGY

Accuracy and Feasibility of Real-time Continuous Glucose Monitoring in Critically Ill Patients After Abdominal Surgery and Solid Organ Transplantation – Hagerf et al. 2024

- Accuracy of CGM: Mean absolute relative difference (MARD) – 9.4%
- **92.8%** of CGM values In zone A (clinically safe) – Clarke surveillance error grid
- **6.1%** of CGM Values in **Zone B**
- **1.2%** of CGM values in **zone C**
- **Median** time in range **78%**
- **<1% hypo** events using CGM

Feasibility and Performance of Continuous Glucose Monitoring to Guide Computerized Insulin Infusion Therapy in Cardiovascular Intensive Care Unit– Ang et al., 2024

- Accuracy of CGM: MARD between CGM and POC–BG values was **13.2%**, and the **median** was **9.8%**.
- **99.7%** of CGM–POC pairs fell within the clinically acceptable **Zones A and B** of the Clarke Error Grid.
- **Nursing Convenience: 93%** of nurses found CGM more convenient than POC–BG testing.
- **Patient Satisfaction: 93%** of patients rated the CGM–guided care process as good or very good.

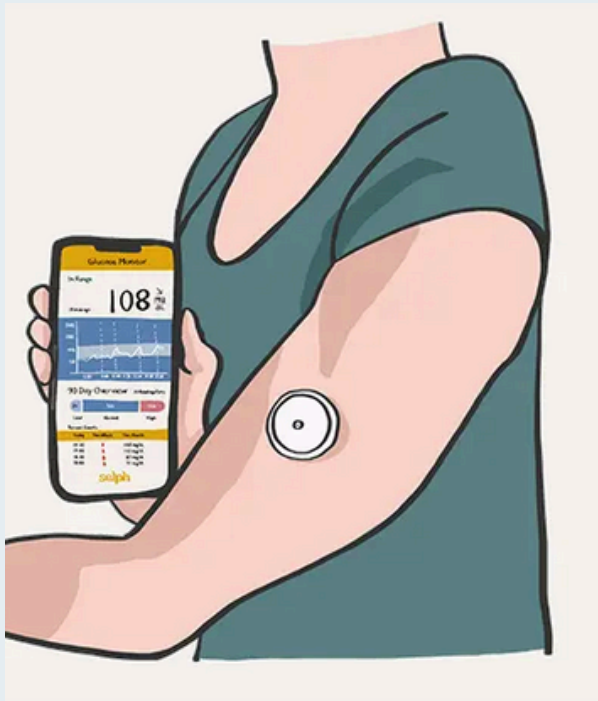
Continuous peri-operative glucose monitoring in noncardiac surgery – Putuz et al., 2024

- **Significant variability** was observed across different surgical procedures and patient groups;
- Accuracy of CGM: MARD between CGM and traditional methods was – **9.2%**
- CGM detected **hypoglycemic events 30% more often** than traditional testing , and **hyperglycemia was detected 25% of the time earlier**
- Strong correlation between stable glucose levels and reduced infection rates, shorter hospital stays
- Adverse Events: Device-related adverse events were uncommon and typically mild.
- Device Dysfunction: Approximately **9.21% of devices experienced issues** such as accidental removal or sensor/reader malfunctions, 8% experienced signal loss

ANALYSIS

These studies demonstrate that continuous glucose monitoring (CGM) is feasible, accurate, and clinically useful in ICU and peri-operative settings. Across trials, CGM showed consistent accuracy when compared with conventional glucose monitoring methods such as capillary blood glucose (CBG) and point-of-care blood glucose (POC–BG). Reported mean absolute relative difference (MARD) values of 10–12% (Hagerf et al., 2024; Ang et al., 2024) indicate sufficient reliability to support clinical decision-making in glucose control.

Analytical approaches varied across studies. Ang et al. (2024) found a 99.7% concordance between CGM and traditional methods ($p<0.05$). Putzu et al. (2024) highlighted CGM’s role in maintaining postoperative normoglycemia and reducing intraoperative hypoglycemia, while Hagerf et al. (2024) showed more stable glucose trends with CGM compared to standard methods. Despite these benefits, all studies noted limitations, particularly lag times during hemodynamic instability or rapid glucose changes, which reduce reliability in critical conditions such as severe sepsis or diabetic ketoacidosis. In such cases, confirmatory POC testing remains essential. Ang et al. (2024) also reported a 93% satisfaction rate among patients and staff, indicating strong acceptance. In summary, CGM offers meaningful advantages in addition traditional monitoring by providing real-time data, reducing fingersticks, and improving workflow. However, further large-scale randomized controlled trials are needed to establish its role in insulin delivery protocols and patient outcomes.



CONCLUSION

The use of Continuous Glucose Monitoring (CGM) in postoperative care has shown promising benefits and received positive feedback from both patients and staff. Unlike traditional finger-prick or blood sampling, CGM offers a less disruptive method by providing real-time, continuous glucose data, supporting better clinical decision-making. Initially used in the community for Type 1 Diabetes (T1DM), CGM was introduced into hospital settings in the U.S. during the COVID-19 pandemic to reduce patient contact. Since then, the technology has advanced, improving sensor accuracy and enabling better integration into clinical environments (Shaw et al., 2024). Although still relatively new in hospitals, more large-scale studies are needed to develop clear, evidence-based guidelines for safe implementation. Education for staff and patients will be essential, alongside cost-benefit evaluations. For now, combining CGM with traditional blood glucose testing may offer a balanced approach to postoperative glycemic control while further research and development continue.

