

KitNewCare Case Study: Avoidance of repeated glucose testing in patients with continuous glucose monitoring devices

Site: Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain.

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Why did you start?

Problem Description

In the haemodialysis unit, routine practice includes performing capillary glucose measurements in all diabetic patients at the start of each session, regardless of whether patients are already using continuous glucose monitoring devices.

This results in unnecessary use of disposable glucose strip tests and consumables including gloves and needles used by nurses to carry out the tests.

Continuous glucose monitoring systems provide real-time and continuous data on glucose levels, reducing the need for repeated point-in-time measurements. However, existing protocols have not been adapted to reflect this change in clinical capability

Specific Aims

The aim of this study was to reduce the environmental impact associated with glucose monitoring in haemodialysis patients by avoiding unnecessary capillary glucose testing in those using continuous glucose monitoring devices.

What did you do?

Context

The intervention was implemented in the haemodialysis unit of a university hospital participating in the KitNewCare project. The unit routinely manages patients with diabetes who require regular glucose monitoring as part of their care.

A subset of patients already using continuous glucose monitoring devices, providing an opportunity to assess whether routine capillary testing can be reduced.

Intervention

Training was given to staff to explain why the change was being introduced and update to workflow to check and record glucose levels using patient CGM devices.

Seven haemodialysis patients using CGM devices were identified for implementation of the optimised approach. The change to practice was explained to these patients and reassurance given that duplicate measurements are not clinically necessary.

Previously, capillary glucose measurements were performed routinely at the start of each dialysis session. Following optimisation, testing was limited to cases where clinically indicated, with reliance on CGM data for routine monitoring.

This change reduced the use of disposable glucose test strips as well as gloves and syringes which were previously being used for testing, while maintaining access to continuous glucose information for clinical decision-making.

Measures

Patient outcomes:

Patient records were reviewed during the trial period to monitor for any adverse events.

Environmental sustainability:

Patients with existing continuous glucose monitors were identified. Across a one week period the number of glucose test strips used for these patients was monitored and recorded in patient records.

Economic sustainability:

Financial outcomes were estimated based on the unit cost of consumables associated with glucose testing, including test strips, gloves, and 5 mL syringes. Direct local procurement data was not available; therefore, proxy values were used.

Social sustainability:

Social impact was assessed using the KitNewCare modelling framework, including estimates of forced labour medium risk hours.

What did you find?

Results

Patient outcomes:

No adverse events were reported following the change in practice. The reduction in capillary glucose testing did not result in loss of glycaemic control in patients using continuous glucose monitoring devices.

Environmental sustainability:

The estimated carbon footprint per test is 0.088 kgCO₂e, incorporating all components. This consists of glucose test strips (0.023 kgCO₂e), gloves (0.043 kgCO₂e), and a 5 mL syringe (0.022 kgCO₂e), with gloves representing the largest contribution.

Based on three haemodialysis sessions per week (156 tests annually), discontinuation of testing would result in an estimated saving of 13.73 kgCO₂e per patient per year. For the seven patients affected, this equates to a total annual saving of 96.11 kgCO₂e.

Associated water deprivation savings associated with glucose test strips were 9.54 m³ per year across the study population, equivalent to approximately 1.36 m³ per patient per year.

Economic sustainability:

The lowest available cost of a strip test was €0.1848 per test strip when procured in bulk, with additional consumable costs of €0.05 for gloves (one pair) and €0.03 for a 5 mL syringe, giving a total cost of €0.2648 per test. Across 156 haemodialysis sessions per patient annually, discontinuation of testing results in a saving of €41.31 per patient per year. For the seven patients affected, this corresponds to a total annual saving of €289.17.

Social sustainability:

The intervention resulted in a reduction of an estimated 7.35 forced labour medium risk hours, associated with decreased demand for raw materials used in the production of glucose test strips, particularly silver.

For staff there is a modest reduction in workload from the discontinuation of unnecessary glucose testing. From a patient comfort perspective, patients undergo less testing.

What does it mean?

Summary

Avoiding repeated glucose testing in haemodialysis patients using continuous glucose monitoring reduced unnecessary use of disposable test strips without affecting patient safety or clinical care.

The intervention demonstrates how aligning clinical practice with available monitoring technologies can improve sustainability without compromising patient outcomes, particularly in settings where routine practices have not yet adapted to technological advances.

This approach can be applied to other kidney centres and healthcare settings where patients have monitoring devices. Higher savings would be observed in centres and settings with more patients using continuous monitoring devices.