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Improving Capillary Blood Glucose Monitoring in Respiratory Inpatients Receiving High-Dose Systemic Corticosteroids: A Quality Improvement Study

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Abstract

Introduction

Systemic corticosteroids can cause hyperglycemia, making appropriate inpatient capillary blood glucose (CBG) monitoring important. This quality improvement project aimed to increase adherence to Joint British Diabetes Societies for Inpatient Care (JBDS-IP) monitoring recommendations from 28.1% to at least 70% within six weeks on two respiratory wards.

Materials and methods

A prospective quality improvement project was conducted at Ulster Hospital, Northern Ireland, from September to October 2026. Guideline-appropriate CBG monitoring was assessed using eligible patient-days. Two sequential Plan-Do-Study-Act (PDSA) cycles introduced ward-based nursing education, followed by a prompt for doctors to document once-daily or four-times-daily (QDS) monitoring requirements in the electronic medical review plan. Outcome, process, and balancing measures were analyzed descriptively.

Results

Across 224 eligible patient-days, guideline-appropriate CBG monitoring increased from 16/57 (28.1%) at baseline to 65/89 (73.0%) following Cycle 1 and 70/78 (89.7%) following Cycle 2. Complete QDS monitoring among patients with pre-existing diabetes increased from 0/9 (0%) to 7/16 (43.8%) and 6/8 (75.0%), respectively. However, unnecessary additional monitoring increased from 6.7% at baseline to 26.2% following Cycle 2, while recorded escalation following elevated glucose readings remained limited.

Conclusions

Nursing education and electronic documentation prompts were associated with improved adherence to guideline-recommended CBG monitoring. Longer-term evaluation is required to assess sustainability. Future improvement efforts should focus on appropriate escalation following elevated readings and reducing unnecessary monitoring.

Categories: Quality Improvement, Pulmonology, Endocrinology/Diabetes/Metabolism
Keywords: capillary blood glucose monitoring, inpatient glycemic monitoring, quality improvement, steroid-induced hyperglycemia, systemic corticosteroids

Introduction

Systemic glucocorticoids are widely prescribed to hospitalized patients for the treatment of acute and chronic respiratory disease. Although clinically valuable, these agents can induce hyperglycemia in individuals without known diabetes and exacerbate existing diabetes [1]. This may lead to complications, including infection, impaired recovery, and acute metabolic emergencies [2]. Golubic et al. studied over 450,000 hospitalized patients and found that those receiving systemic corticosteroids had more than twice the risk of developing high blood glucose compared with those not receiving corticosteroids [3].

The Joint British Diabetes Societies for Inpatient Care (JBDS-IP) guidelines recommend capillary blood glucose (CBG) monitoring for patients receiving systemic corticosteroids. For patients without established diabetes, initial once-daily (OD) testing is advised, preferably prior to lunch or the evening meal or alternatively one to two hours after either meal. Patients with pre-existing diabetes should undergo four-times-daily (QDS) monitoring before or after meals and at bedtime [4]. For patients without diabetes, a CBG reading above 12.0 mmol/L should prompt an increase to QDS monitoring. For patients with pre-existing diabetes, two consecutive readings above 12.0 mmol/L within 48 hours should prompt use of the treatment algorithm [4]. Implementing these recommendations in routine ward practice can be challenging, as CBG monitoring involves several healthcare professionals with different responsibilities, requiring effective communication and coordination between medical and nursing staff.

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Despite established guidelines, adherence to recommended CBG monitoring in clinical practice can be inconsistent due to variability in staff awareness [5]. Khan et al. identified gaps in staff knowledge and the absence of standardized protocols as potential barriers to effective inpatient glycemic management, with improvements observed following educational and protocol-based interventions [6]. Similarly, Kempegowda et al. demonstrated initial improvements in screening for steroid-induced hyperglycemia following staff education and guideline revisions, although these were not sustained [7]. Such difficulties in sustaining guideline adherence may be particularly relevant in busy respiratory wards, where corticosteroids are frequently prescribed, and appropriate glucose monitoring may be overlooked in patients with or without pre-existing diabetes.

On the respiratory wards at Ulster Hospital, Northern Ireland, informal observations suggested that monitoring was inconsistent among patients receiving high-dose systemic corticosteroids. Baseline assessment found that only 28.1% of eligible patient-days met JBDS monitoring recommendations. This quality improvement project aimed to increase guideline-appropriate CBG monitoring to at least 70% within six weeks. The target of 70% was selected as a pragmatic improvement goal, representing a substantial increase from baseline adherence of 28.1%, while the six-week timeframe was intended to allow implementation and assessment of two sequential Plan-Do-Study-Act (PDSA) cycles. Secondary measures assessed adherence to recommended monitoring frequency and timing, completion of QDS monitoring in patients with pre-existing diabetes, additional CBG monitoring following elevated readings, and unnecessary additional testing.

Materials And Methods

Setting and study design

This prospective, single-center quality improvement project was conducted on the adult respiratory wards at Ulster Hospital, Dundonald, Northern Ireland, from September to October 2026. A baseline assessment was followed by two consecutive PDSA cycles. The project was registered and approved as a clinical audit by the Multiprofessional Audit Team, South Eastern Health and Social Care Trust, Northern Ireland (registration number: NAC640; approval letter dated October 20, 2026). As a clinical audit rather than research, research ethics committee review was not required.

The unit of analysis was the eligible patient-day, defined as one day of inpatient care during which a patient met the inclusion criteria. This was selected because the project aimed to assess whether guideline-recommended CBG monitoring was completed correctly on each eligible day, rather than assess monitoring at the individual patient level. Patients receiving qualifying corticosteroid treatment on multiple days could therefore contribute more than one observation. Data collection reviewed blood glucose recordings for the preceding inpatient day. Results were analyzed descriptively at the patient-day level, without adjustment for repeated observations from the same patient.

Patient selection and eligibility criteria

The project included adult inpatients receiving high-dose systemic corticosteroids. For this project, high-dose corticosteroid treatment was defined as prednisolone ⩾ 20 mg/day, hydrocortisone ⩾ 80 mg/day, methylprednisolone ⩾ 16 mg/day, dexamethasone ⩾ 3 mg/day, or equivalent doses of other systemic corticosteroids. This threshold was informed by published literature identifying prednisolone doses greater than 20 mg/day as higher-dose exposure warranting glucose monitoring, as well as NHS (National Health Service) inpatient guidance [8,9]. Equivalent corticosteroid doses were based on standard glucocorticoid potency conversions [4].

Eligible patients were identified through review of electronic prescribing records on Encompass, the hospital's electronic health record system. Patients were eligible if they remained in hospital during the relevant CBG monitoring period, allowing sufficient opportunity for guideline-recommended monitoring to occur. No patients receiving end-of-life care were identified during the data collection period. Such patients may require individualized glucose monitoring rather than standard JBDS-IP recommendations.

Outcome, process, and balancing measures

The primary outcome was the percentage of eligible patient-days with guideline-appropriate CBG monitoring, defined as the completion of the recommended CBG monitoring frequency and timing according to diabetes status and relevant glucose readings as specified in JBDS-IP guidance [4]. Four process measures were used to evaluate individual aspects of monitoring practice, alongside a balancing measure assessing unnecessary additional CBG testing (Table *1*).

Measure	Definition	Denominator
Primary outcome: Guideline-appropriate CBG monitoring	Monitoring met the required frequency and timing according to JBDS-IP guidance	All eligible patient-days
Process 1: Required monitoring frequency	Recommended OD or QDS frequency achieved according to diabetes status and relevant CBG readings	All eligible patient-days
Process 2: Appropriate OD timing	OD CBG recorded within the recommended meal-related monitoring period	OD patient-days assessed for timing
Process 3: QDS monitoring in diabetes	All four recommended CBG measurements completed	Eligible patient-days in patients with diabetes
Process 4: Escalation following elevated CBG	Appropriate monitoring escalation or referral to the treatment algorithm following elevated readings, as indicated by JBDS-IP guidelines	Patient-days meeting the applicable escalation criteria
Balancing: Unnecessary over-monitoring	More than the recommended OD CBG measurements in patients without diabetes whose CBG remained ≤12 mmol/L, without another clinical indication	Eligible OD patient-days without diabetes with at least one OD reading ≤12 mmol/L requiring OD monitoring

TABLE 1: Definitions of outcome, process, and balancing measures used to evaluate adherence to JBDS-IP CBG monitoring recommendations

CBG: Capillary blood glucose; JBDS-IP: Joint British Diabetes Societies for Inpatient Care; OD: Once daily; QDS: Four times daily.

Monitoring standards were adapted from the JBDS-IP guidelines [4].

According to JBDS-IP guidance, patients without pre-existing diabetes should initially receive once-daily CBG monitoring, increasing to QDS monitoring following a reading above 12 mmol/L. Patients with pre-existing diabetes should receive QDS monitoring. Two consecutive readings above 12 mmol/L within 48 hours should prompt consideration of the treatment algorithm [4].

Data collection and analysis

The project was led by an internal medicine trainee who developed the standardized data collection tool, established the monitoring definitions, and supervised foundation doctors assisting with data collection. Variables included corticosteroid type and dose, pre-existing diabetes status, and the number and timing of CBG measurements. Monitoring was assessed against the agreed JBDS-IP standards for frequency and timing. Data were collected prospectively across successive measurement periods through review of CBG recordings from the preceding inpatient day. The project lead also undertook data collection and reviewed collected records for consistency. Following CBG readings above 12 mmol/L, recorded glucose measurements were reviewed to assess whether additional CBG monitoring was performed. Medical and nursing documentation and treatment changes were not independently reviewed to establish whether other clinical actions had occurred.

All measures were assessed at baseline and following each PDSA cycle. Results were summarized descriptively using numerators, denominators, and percentages, with changes expressed as absolute percentage-point differences. A run chart was used to display the percentage of eligible patient-days meeting the primary outcome on each data collection day, with intervention dates annotated. Formal hypothesis testing was not undertaken because the project focused on evaluating iterative improvements in routine clinical practice.

PDSA Cycle 1: improving awareness of CBG monitoring requirements

Plan

Baseline assessment identified low adherence to guideline-recommended CBG monitoring, particularly incomplete QDS monitoring in patients with diabetes. A ward-based educational intervention was therefore planned to improve nursing staff awareness of the recommended monitoring frequency and timing. The intervention was expected to increase overall adherence to approximately 70%.

Do

Following discussion with the respiratory ward sisters, who supported the project, the intervention was introduced on September 18, 2026. The ward sisters reinforced the monitoring requirements with nursing

staff, emphasizing OD monitoring at the recommended time for patients without diabetes and QDS monitoring for those with pre-existing diabetes.

Study

Monitoring practice was reassessed using the same measures as baseline. Overall adherence improved, and the project target was achieved. However, QDS monitoring in patients with diabetes remained incomplete, identifying an area for further improvement.

Act

The findings suggested that education alone had not fully addressed the remaining monitoring gaps, particularly those involving QDS monitoring in patients with diabetes. In response to the remaining gaps in QDS monitoring, the second cycle focused on improving communication of monitoring requirements between medical and nursing staff through clearer documentation in the daily medical plan.

PDSA Cycle 2: introducing a standardized medical documentation prompt

Plan

In response to the remaining gaps in QDS monitoring, the second cycle focused on improving communication of monitoring requirements between medical and nursing staff. A prompt within the existing electronic daily review process was selected to reinforce whether OD or QDS monitoring was required.

Do

Doctors working on the respiratory wards were asked to document the required CBG monitoring frequency as OD or QDS in the daily Encompass medical review plan, according to diabetes status and previous CBG readings.

Study

Monitoring was reassessed using the same outcome, process, and balancing measures. Further improvement in overall adherence and completion of QDS monitoring in patients with diabetes was observed.

Act

The findings supported continued use of an explicit OD/QDS monitoring prompt within routine daily medical reviews. Further reassessment was proposed to evaluate whether improvement could be sustained over time.

Results

Primary outcome

Across the three measurement periods, 224 eligible patient-days were assessed: 57 at baseline, 89 following PDSA Cycle 1, and 78 following PDSA Cycle 2. The proportion of eligible patient-days involving patients with pre-existing diabetes varied between the three measurement periods: 9/57 (15.8%) at baseline, 16/89 (18.0%) following PDSA Cycle 1, and 8/78 (10.3%) following PDSA Cycle 2.

At baseline, guideline-appropriate CBG monitoring was achieved on 16/57 eligible patient-days (28.1%). Following the nursing education intervention in Cycle 1, adherence increased to 65/89 patient-days (73.0%), representing an absolute improvement of 44.9 percentage points and exceeding the predefined target of 70%.

Following the introduction of the medical documentation prompt in Cycle 2, adherence increased further to 70/78 patient-days (89.7%). This represented an additional improvement of 16.7 percentage points from Cycle 1 and an overall improvement of 61.7 percentage points from baseline.

The run chart (Figure *1*) illustrates the daily variation in guideline-appropriate monitoring across the baseline and intervention periods, with generally higher adherence following both interventions.

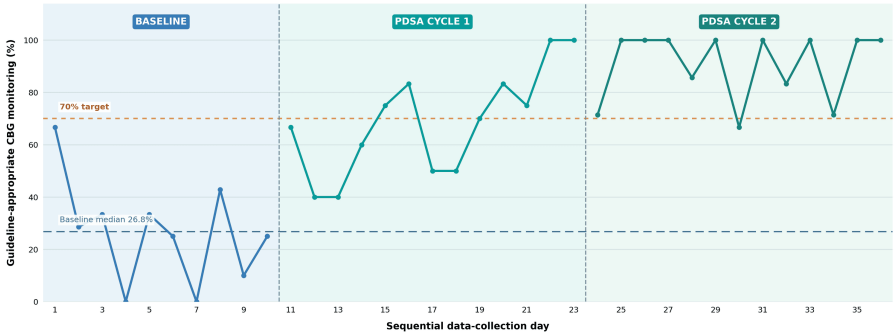


FIGURE 1: Run chart showing guideline-appropriate CBG monitoring across baseline and two PDSA cycles

Each point shows daily compliance with recommended monitoring. Dashed lines indicate the baseline median (26.8%), target (70%), and intervention boundaries.

CBG: Capillary blood glucose; PDSA: Plan–Do–Study–Act.

Table 2 shows results for all measures at baseline and across both cycles.

Measure	Baseline	After PDSA Cycle 1	After PDSA Cycle 2
Eligible patient-days	57	89	78
Guideline-appropriate monitoring	16/57 (28.1%)	65/89 (73.0%)	70/78 (89.7%)
Required frequency achieved	18/57 (31.6%)	72/89 (80.9%)	75/78 (96.2%)
Correct OD timing	16/18 (88.9%)	58/65 (89.2%)	64/69 (92.8%)
Complete QDS in diabetes	0/9 (0%)	7/16 (43.8%)	6/8 (75.0%)
Escalation after >12 mmol/L	0/8 (0%)	3/15 (20.0%)	0/7 (0%)
Balancing unnecessary extra OD checks	1/15 (6.7%)	4/62 (6.5%)	17/65 (26.2%)

TABLE 2: Comparison of outcome, process, and balancing measures across baseline and two PDSA cycles

Values are n/N (%) unless otherwise stated. Denominators represent eligible patient-days within the relevant subgroup.

OD: Once daily; QDS: Four times daily; PDSA: Plan–Do–Study–Act.

Process measures

Achievement of the required CBG monitoring frequency increased from 18/57 patient-days (31.6%) at baseline to 72/89 (80.9%) following Cycle 1 and 75/78 (96.2%) following Cycle 2.

Among assessed patient-days requiring OD monitoring, appropriate timing remained consistently high, increasing from 16/18 (88.9%) at baseline to 58/65 (89.2%) and 64/69 (92.8%) following Cycles 1 and 2, respectively.

The most notable improvement was observed in patients with pre-existing diabetes. Complete QDS monitoring increased from 0/9 patient-days (0%) at baseline to 7/16 (43.8%) following Cycle 1 and 6/8 (75.0%) following Cycle 2.

Recorded escalation following elevated CBG readings remained limited, occurring on 0/8 patient-days (0%) at baseline, 3/15 (20.0%) after Cycle 1, and 0/7 (0%) after Cycle 2.

Balancing measures

Unnecessary over-monitoring was assessed in patients without pre-existing diabetes whose CBG readings remained ⩽12 mmol/L and who had no other clinical indication for additional monitoring. The proportion of

eligible patient-days with unnecessary additional CBG measurements changed from 1/15 (6.7%) at baseline to 4/62 (6.5%) following PDSA Cycle 1, before increasing to 17/65 (26.2%) following Cycle 2. Patient-days with CBG > 12 mmol/L comprised 5 with diabetes and 3 without diabetes at baseline, 12 with diabetes and 3 without diabetes after PDSA Cycle 1, and 3 with diabetes and 4 without diabetes after PDSA Cycle 2.

Discussion

Principal findings and interpretations

This quality improvement project demonstrated substantial improvement in guideline-appropriate CBG monitoring among respiratory inpatients receiving high-dose systemic corticosteroids, increasing from 28.1% at baseline to 89.7% following two sequential PDSA cycles. The predefined target of 70% was achieved during the first cycle, with further improvement observed during the second.

Examination of the individual process measures revealed important differences in monitoring practice. Appropriate OD timing was already relatively high at baseline, whereas achievement of the required monitoring frequency was low, suggesting that incomplete monitoring was a greater contributor to non-adherence than incorrect timing. Burt et al. demonstrated that prednisolone-associated hyperglycemia predominantly occurs during the afternoon and evening in patients admitted with chronic obstructive pulmonary disease (COPD) [10]. This highlights the importance of appropriately timed CBG monitoring to detect steroid-induced glucose elevations. Encouragingly, appropriate OD monitoring timing was already high in the present project at baseline (88.9%) and remained consistently high following both interventions, reaching 92.8% after Cycle 2.

In contrast to OD monitoring timing, complete QDS monitoring among patients with pre-existing diabetes was a significant area for improvement. This is consistent with findings by Limbachia and Dhatariya, who reported that only 50% of diabetic inpatients receiving glucocorticoids at Norfolk and Norwich University Hospital, Norwich, England, underwent the recommended QDS monitoring [11]. In the present project, complete QDS monitoring increased from 0% at baseline to 43.8% following Cycle 1, although more than half of patient-days involving patients with diabetes still did not meet the recommended frequency. Some patients received three rather than four daily CBG measurements. This finding informed Cycle 2, which introduced explicit documentation of OD or QDS monitoring requirements within the daily medical plan. Complete QDS monitoring subsequently increased to 75.0%, suggesting that combining staff education with a clear prompt within an established clinical workflow may help improve adherence to monitoring recommendations.

Comparison with existing literature

The findings are consistent with previous quality improvement studies highlighting the potential benefits of staff education and standardized clinical processes in inpatient glycemic management. Khan et al. reported improvements in inpatient glycemic control following educational and protocol-based interventions, including printed guidance [6]. As the display of educational posters was discouraged on the wards due to infection control considerations, the present project focused on ward-based nursing education, followed by a prompt within the existing Encompass medical review process to reinforce OD or QDS monitoring requirements. This illustrates how interventions can be adapted to local clinical workflows. Similarly, Kempegowda et al. demonstrated initial improvements in screening for steroid-induced hyperglycemia following staff education and revisions to local guidance, although these improvements were not sustained [7]. In the present project, nursing education was associated with an improvement in guideline-appropriate CBG monitoring from 28.1% at baseline to 73.0% following Cycle 1. This supports the potential benefits of staff education while highlighting the importance of longer-term follow-up to determine whether improvements are sustained.

A similar quality improvement project at Craigavon Area Hospital, Craigavon, Northern Ireland, by Kyaw demonstrated improved glucose monitoring among patients receiving high-dose corticosteroids during chemotherapy, following the introduction of standardized guidance, nursing involvement, and electronic alerts [12]. These findings are consistent with the present project, where guideline-appropriate CBG monitoring increased from 28.1% to 89.7% following nursing education and a medical documentation prompt. However, the present project also assessed monitoring timing, QDS completion, escalation following elevated readings, and unnecessary monitoring. This identified important areas for further improvement, particularly the persistently low rates of escalation despite improved overall monitoring adherence.

The further improvement observed during PDSA Cycle 2 suggests that incorporating a documentation prompt into routine clinical practice may provide additional benefit alongside staff education. Bronner et al. evaluated electronic medical record prompts designed to improve adherence to recommended diabetes monitoring and found that the proportion of patient visits with all indicated tests ordered increased from 29% to 49% when appropriately designed prompts were combined with training support [13]. Similarly, in the present project, the introduction of a medical documentation prompt in PDSA Cycle 2 was associated with a further improvement in guideline-appropriate CBG monitoring from 73.0% to 89.7%. This finding is also consistent with broader research by Raban et al., who conducted a systematic review of electronic health record interventions in hospitals and found that 19 of 24 electronic interventions were associated with improvements in care delivery [14]. Although these interventions differed from the documentation prompt

used in the present project, the findings suggest that incorporating prompts into routine clinical workflows may help improve adherence to recommended practice. However, as the interventions were introduced sequentially, this additional improvement may have reflected the combined effects of the documentation prompt and the continuing influence of the earlier nursing education, rather than the independent effect of the documentation prompt alone.

In addition, Lyons et al. demonstrated improvements in inpatient blood glucose documentation in a tertiary hospital in the Caribbean, following the introduction of a standardized monitoring chart and staff education, with overall documentation compliance increasing from 44% to 92% [15]. Although their intervention involved a paper-based chart, these findings are consistent with the present project, where combining nursing education with a prompt in the electronic medical plan was associated with improved adherence to CBG monitoring recommendations.

The aim of the project was to improve guideline-appropriate monitoring rather than simply increase the number of CBG checks. Although the project achieved its primary aim, unnecessary additional monitoring remained similar at baseline and following Cycle 1 (6.7% and 6.5%, respectively) before increasing to 26.2% following Cycle 2. One possible explanation is that increased awareness of CBG monitoring requirements, reinforced by the medical documentation prompt introduced during Cycle 2, may have unintentionally encouraged staff to perform additional checks beyond those recommended by the JBDS-IP guidelines. However, the reasons for this increase were not formally assessed, and it is not possible to determine whether the documentation prompt contributed directly to unnecessary monitoring. Further evaluation could inform future interventions aimed at improving adherence while avoiding unnecessary CBG testing. Ng et al. identified established clinical habits and defensive medicine as potential contributors to inappropriate inpatient blood glucose monitoring [16]. Unnecessary testing may also increase nursing workload, healthcare costs, and patient discomfort without providing additional clinical benefit [16]. These findings highlight the importance of improving adherence without introducing unnecessary checks and associated nursing workload. Informal nursing feedback suggested that the additional monitoring requirements were manageable within routine ward practice, although workload was not formally quantified.

Limitations

This project was conducted on the respiratory wards within a single hospital, so the findings reflect local clinical practice. The project period was relatively short, and longer-term follow-up is required to determine whether the improvements are sustained.

The proportion of patient-days involving patients with pre-existing diabetes was lower during Cycle 2 (10.3%) than Cycle 1 (18.0%), which may have contributed to the improvement in overall adherence because monitoring requirements differ by diabetes status. Differences in other patient characteristics, corticosteroid doses, and ward distribution may also have influenced adherence rates, although their comparability across the three periods could not be fully established. Although complete QDS monitoring also improved within the diabetic subgroup, the small number of observations limits the certainty of this finding.

There was no contemporaneous control ward, and the sequential design means that the improvement observed during Cycle 2 cannot be attributed solely to the medical documentation prompt, as the effects of earlier nursing education may have continued. Individual patients could also contribute multiple patient-days, and observations were therefore not necessarily independent. As individual patients were not systematically tracked across observations, a reliable patient-level sensitivity analysis could not be performed. Patients with longer admissions may also have contributed more observations, potentially influencing the overall adherence rates. Furthermore, the project assessed adherence to monitoring recommendations rather than clinical outcomes, so it cannot establish whether improved monitoring reduced hyperglycemia-related complications.

Sustainability and future directions

The interventions were simple and required no additional specialist equipment, making them potentially feasible to incorporate into routine ward practice. Encouraging continued documentation of the required OD or QDS CBG monitoring frequency within the daily Encompass management plan could help embed the intervention into existing clinical processes.

Repeat data collection after one month and following staff rotations would help assess whether the improvements are sustained. Regular short educational updates for nursing staff, supported by continued engagement from medical and nursing teams, alongside periodic audits, could help maintain adherence to the JBDS-IP recommendations. The importance of ongoing audit and feedback is supported by Kempegowda et al., who found that improvements in inpatient diabetic ketoacidosis management were maintained with regular performance feedback but deteriorated when feedback was absent [17]. Although their study focused on a different aspect of inpatient diabetes care, these findings support the potential value of regular feedback in sustaining the improvements achieved in the present project.

Additional CBG monitoring following elevated readings remained limited throughout the project, occurring on 0/8 (0%) eligible patient-days at baseline, 3/15 (20%) following Cycle 1, and 0/7 (0%) following Cycle 2.

The first two PDSA cycles deliberately focused on improving routine monitoring frequency and timing. Targeted education on recognizing and escalating abnormal readings was deferred to a proposed third cycle to avoid introducing too many changes simultaneously and to maintain a manageable workload for nursing staff.

The absence of additional recorded CBG monitoring does not necessarily indicate that no clinical action occurred, as treatment decisions and other aspects of clinical management were not systematically assessed. Nevertheless, the low rates of additional CBG monitoring following elevated readings highlight an important patient-safety concern, as abnormal glucose readings require appropriate recognition and management. The absence of a targeted escalation intervention during the first two PDSA cycles may partly explain the lack of improvement in this measure. Struja et al. demonstrated that more intensive treatment of glucocorticoid-induced hyperglycemia can improve blood glucose control [18].

A proposed third PDSA cycle could introduce targeted staff education and clearer escalation guidance in accordance with the JBDS-IP recommendations, including appropriate monitoring, treatment, and diabetes/endocrinology input when indicated. Further education could also reinforce when additional CBG measurements are unnecessary, helping to avoid excessive monitoring and nursing workload. Continued assessment of both documented escalation and unnecessary testing would help evaluate the effects of these future interventions.

If sustained improvement is demonstrated within the respiratory wards, the interventions could subsequently be adapted and evaluated in other clinical settings where high-dose systemic corticosteroids are commonly prescribed. This could support a wider approach to improving the recognition and management of steroid-induced hyperglycemia across the hospital.

Conclusions

This quality improvement project demonstrated substantial improvement in guideline-appropriate CBG monitoring among respiratory inpatients receiving high-dose systemic corticosteroids, increasing from 28.1% at baseline to 89.7% following two PDSA cycles. The predefined target of 70% was achieved following nursing education, with further improvement observed after introducing a medical documentation prompt. These findings suggest that combining staff education with simple prompts embedded within existing clinical workflows may improve adherence to monitoring recommendations. However, the persistently low rates of documented escalation following elevated CBG readings and the increase in unnecessary additional monitoring highlight important areas for further improvement. Longer-term evaluation is required to establish sustainability. A proposed third PDSA cycle would focus on appropriate escalation following elevated CBG readings while continuing to assess unnecessary over-monitoring. If sustained, the approach could potentially be adapted to other inpatient settings where high-dose systemic corticosteroids are commonly prescribed.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Bethany Henry

Acquisition, analysis, or interpretation of data: Bethany Henry

Drafting of the manuscript: Bethany Henry

Critical review of the manuscript for important intellectual content: Bethany Henry

Supervision: Bethany Henry

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. South Eastern Health and Social Care Trust, Northern Ireland, issued approval NAC640 (clinical audit registration number). The project was registered and approved as a clinical audit by the Multiprofessional Audit Team, South Eastern Health and Social Care Trust (registration number: NAC640; approval letter dated October 20, 2026). As this was conducted as a clinical audit rather than a research study, review from a research ethics committee was not required. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other

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