

Slipping Up On Sliding Scales

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INTRODUCTION

Supplemental insulin is defined as additional insulin given when blood glucose levels (BGLs) are higher than the target range and can be given according to a 'sliding scale' or as a STAT dose.¹ Sliding scales are a crucial component in the proactive control of hyperglycaemia in hospital inpatients with diabetes.

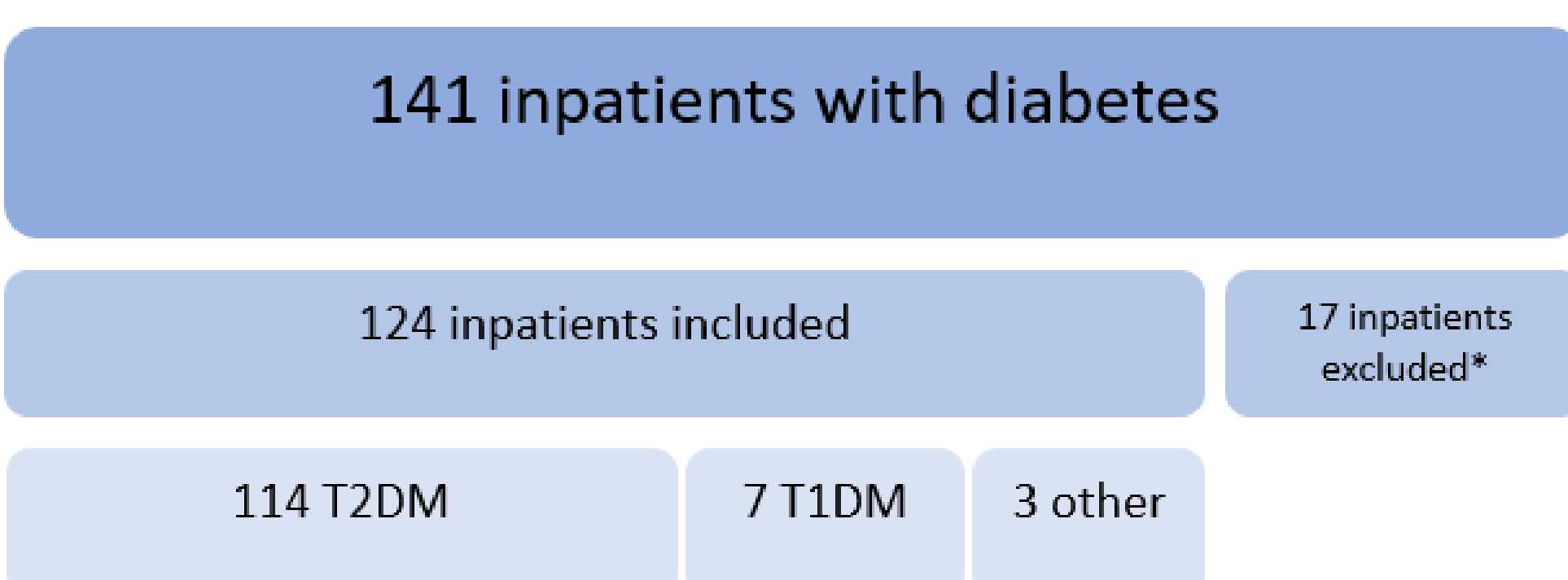
By charting sliding scales, hyperglycaemic episodes can be treated promptly which can reduce morbidity, mortality, length of hospital stays and costs.² As sliding scales are personalised, patients will have their own respective BGL targets and subsequent sliding scale doses. There were no formalised protocols for sliding scales at Northern Health at the time of this study. It is recommended that all inpatients with diabetes are charted a sliding scale.

AIM

To determine whether inpatients with diabetes at Northern Health Epping, are prescribed and administered sliding scales when indicated, in accordance with hospital recommendations.

METHOD

A prospective quality improvement spot audit was conducted on patients with diabetes on five wards at the Northern Health Epping campus over a two-week period. Surgical and medical patients with diabetes documented in their past medical history were recruited utilising the ward nursing handover sheets.



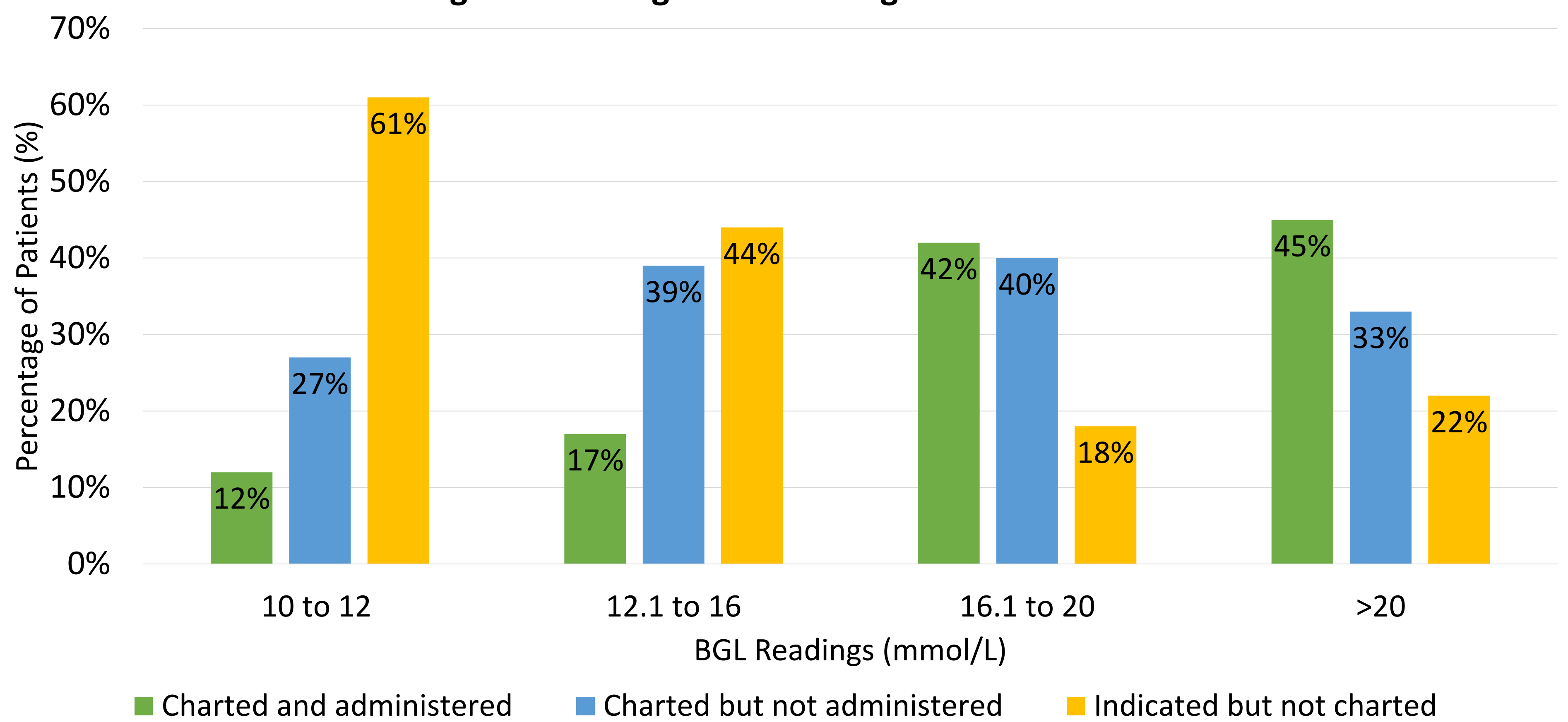
*Exclusion criteria comprised of people <18 years, patients for end-of-life care and patients that had unattainable data.

A pre-formulated data collection tool was used to gather data about the patient, their BGL control over the prior 48 hours and their sliding scales. In this study, hyperglycaemia was classified as BGLs exceeding 10mmol/L, if the patient's personal targets were not documented.

RESULTS

- Of the 124 inpatients, 55 had a sliding scale charted and 27 of those had been reviewed by a diabetes team (Diabetes Nurse Educator, Northern Inpatient Diabetes Service or Endocrinology).
- There were 90 medical patients and 34 surgical patients. 44% of medical patients and 44% of surgical patients were charted a sliding scale.
- A total of 79 inpatients had at least 1 hyperglycaemic episode. Of these, 50 had a sliding scale charted but only 17 of those had a dose administered when indicated (Figure 2).
- Of the 51 patients who utilised regular insulin for their diabetes management, 33 were charted a sliding scale. Of those, 26 experienced at least one hyperglycaemic episode and only 8 received their appropriate sliding scale dose (Figure 3).
- Of the patients who received sliding scales, none of them experienced an episode of hypoglycaemia post administration.
- The highest proportion of inpatients who were both charted and administered a sliding scale experienced BGLs between 16 to 20mmol/L (42%, n=55) and BGLs greater than 20mmol/L (45%, n=18) (Figure 1).
- 61% (n=64) of patients who experienced BGLs between 10-12mmol/L did not have a sliding scale charted or administered, even though it was indicated (Figure 1).

Figure 1: Sliding Scale Charting and Administration*



*This figure takes into consideration patient's personal targets, and whether this corresponded to a hyperglycaemic episode and a subsequent sliding scale dose administration. Those with no personal targets and BGLs >10mmol/L were classified as experiencing a hyperglycaemic episode and requiring sliding scale insulin.

Figure 2: Number of Sliding Scale (SS) Administrations

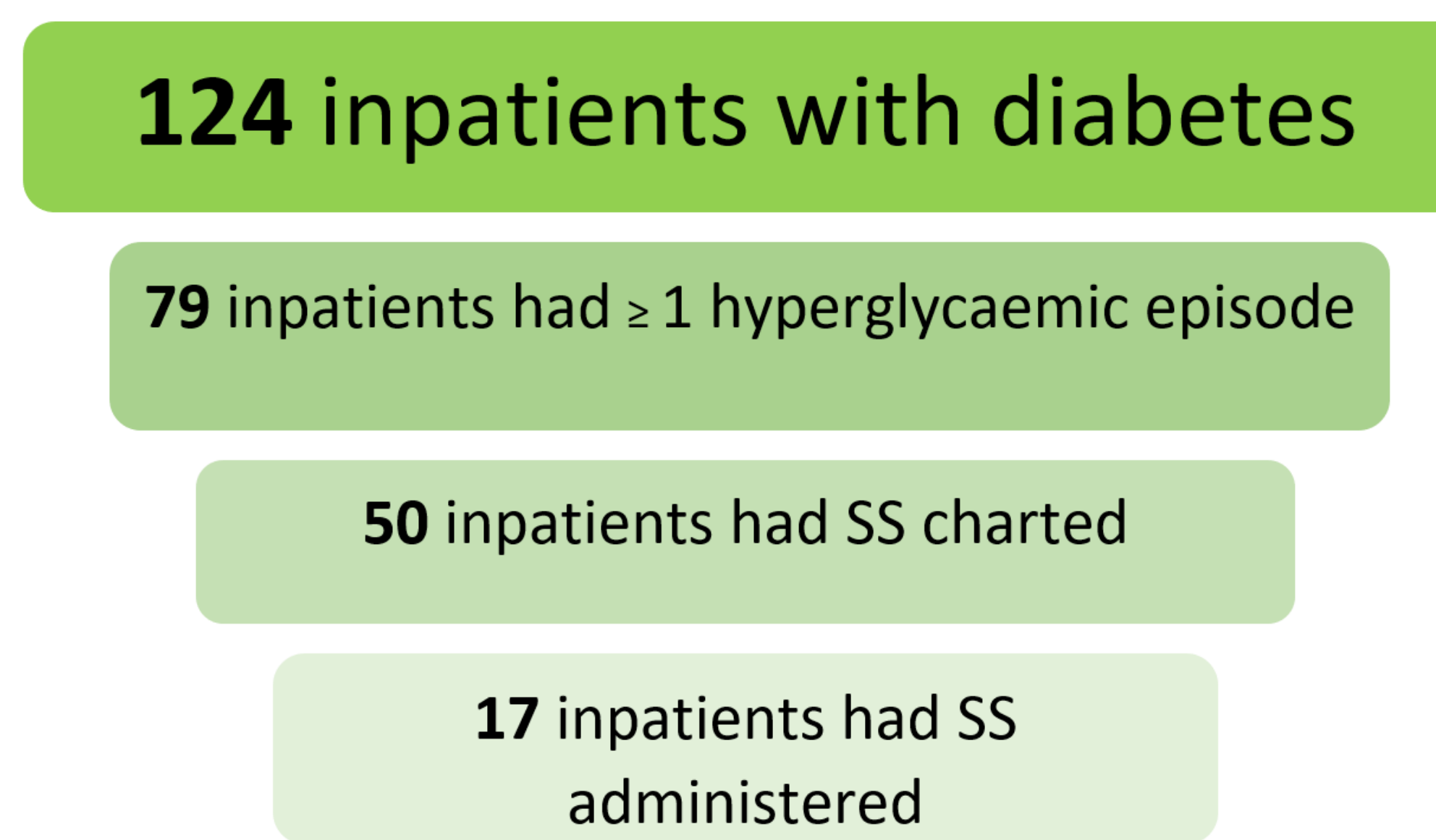
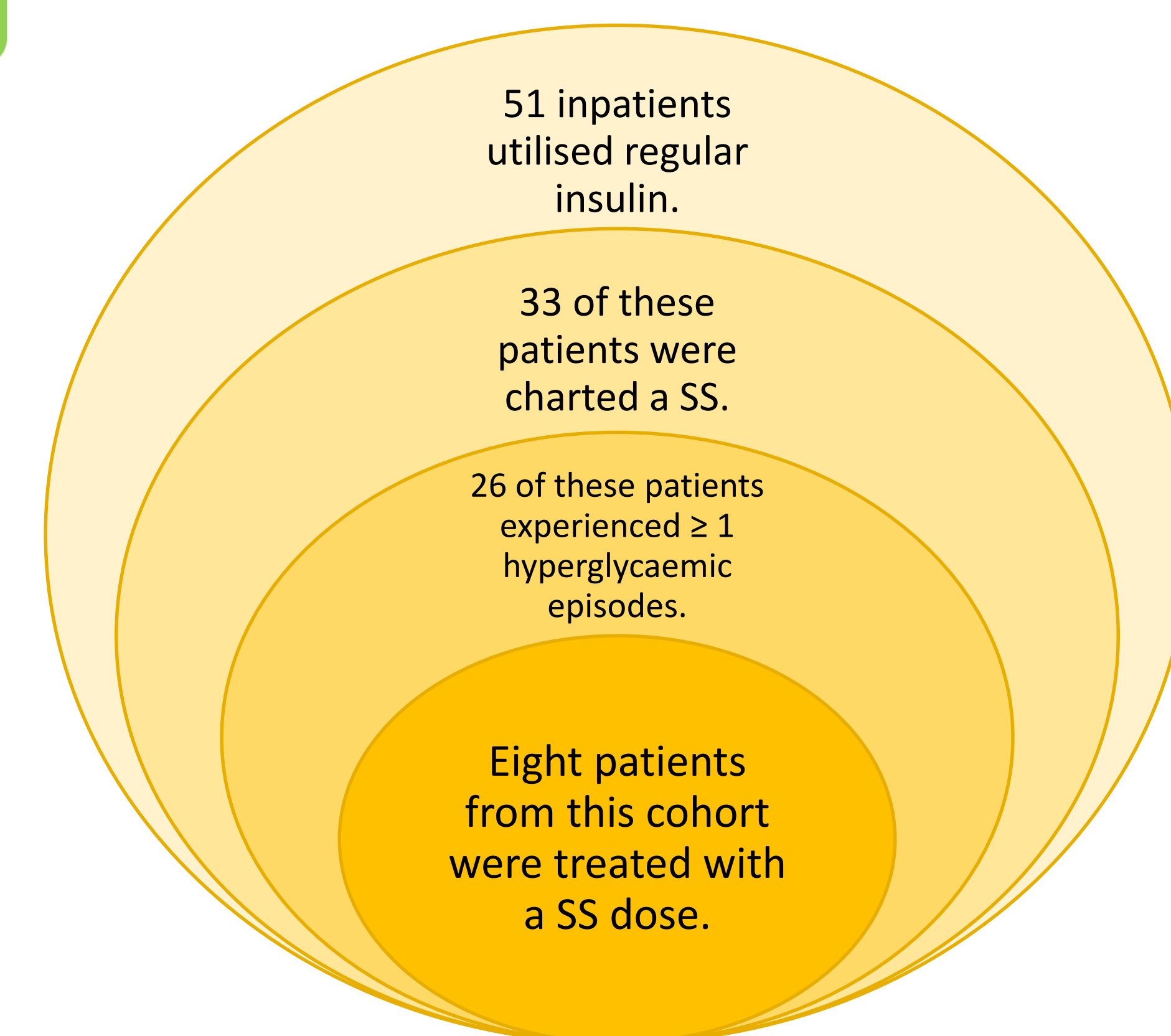


Figure 3: Sliding Scale (SS) charting and administration amongst the insulin-dependent population



DISCUSSION

This study found that those experiencing BGLs >20mmol/L were more likely to be administered sliding scales. This could be due to the urgency of the situation and the chance of it escalating to a MET call. Comparatively, although many of those experiencing BGLs from 10-16mmol/L did not have a sliding scale charted, a large proportion of those who did were not administered a dose.

The low proportion of sliding scale administration in the insulin-dependent population could be due to the fear of intensifying insulin use.³ The perceived risk of hypoglycaemia due to additional insulin or the lack of understanding thereof could be contributing to the non-compliance of administration. The presence of sliding scales or BGL criteria for administration may be overlooked, further highlighting the need for education on the role of sliding scales as additional insulin doses. There were no documented reasons for the omission of doses which poses a barrier to the optimisation of BGL control.

Although the total number of sliding scales charted was low, the proportion of sliding scales was consistent amidst the treating teams. This highlights the need for further training amongst all medical and surgical teams.

Whilst there were no formalised protocols at the time of the study, recommendations regarding charting sliding scales were provided to junior doctors at the start of the year. The high rate of non-compliance highlights the need for formalised protocols and further education in this space. Additionally, the transition to electronic medical records in the future could assist with flagging this to staff and improving compliance.

LIMITATIONS

- The data collection was reliant on documentation of the nursing staff. The absence of appropriate documentation can affect the accuracy of the results.
- The short time period of the study and lack of baseline data for comparison could affect the validity of the results.
- Observing BGLs over a 48-hour window may not have allowed for the full identification of hyperglycaemic episodes and the use of sliding scales.

CONCLUSION

The variability in sliding scale charting and administration contributes to poorer inpatient BGL control. There is a need to educate medical and nursing staff on the prescribing and administration of sliding scales through formalised protocols and education sessions. Further audits should be completed in the future for comparison and to evaluate the benefits of these interventions.

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