

Could Regular Supplemental Insulin Order Be the Answer to Glycaemic Control for Inpatients?

A review on change

Background

A review conducted within a New South Wales Local Health District suggested supplemental insulin was often omitted when clinically indicated for patients with hyperglycaemia. The Basal Bolus Supplemental (BBS) Powerplan was developed using the electronic medical record (Cerner Millennium) care package released by eHealth which modified the as required (PRN) supplemental insulin order to a regular order. This change aimed to improve cognitively informed administration of insulin and glycaemic control. This change was implemented in a 200-bed Sydney metropolitan hospital to identify gaps in clinical practice prior to district-wide implementation.

“Old” Insulin Careset

- Supplemental insulin was a PRN order
- Only the low dose option was available for supplemental insulin
- Giant list of all insulin

PRN

insulin aspart (novoRAPID FlexPen 100 units/mL injectable solution)
0 to 6 units, Subcut, Soln, inj, morning (with breakfast), PRN for Other: See comments, T2DM, Administration time is a guide only: MUST be injected immediately before meals
Give 2 units when BSL 10-12 4 units when BSL 12.1-18 6 units when BSL 18.1-20 Clinical review whe...

insulin aspart
Blood Glucose Level Bedside
Blood Glucose Level, Bedside High/Low

“New” BBS Powerplan

- Supplemental insulin is charted as a regular order

insulin aspart (novoRAPID 100 units/mL SUPPLEMENTAL)
Low-dose supplemental (0 to 6 units), Subcut, Soln, inj, TDS with meals, Hyperglycaemia, Max Dose/24 hrs = 3, Administration time is a guide only: MUST be injected immediately before or with meals
If BGL (mmol/L) is: 0.1 - 10, then document 'Not Given'; 10.1 - 12, then administer 2 unit; 12.1 - ...

insulin aspart
Blood Glucose Level Bedside
Blood Glucose Level, Bedside High/Low

- Multiple strengths of Supplemental insulin available

Low-dose supplemental (0 to 6 units), Subcut, Inj, TDS with food, Max Dose/24 hrs = 3
Mid-dose supplemental (0 to 14 units), Subcut, Inj, TDS with food, Max Dose/24 hrs = 5
High-dose (Endocrine team only), Subcut, Inj, TDS with food, Max Dose/24 hrs = 3, 5

- Improve decision support and warning for prescribers

Aim

To evaluate regular supplemental insulin orders in improving the administration of supplemental insulin and glycaemic control in patient with type 2 diabetes

Methods

Snapshot audits were performed by a pharmacist at one week pre-, and at weeks one to four and 26 post-implementation of the insulin prescribing tool to review pre-meal and bedtime blood glucose levels (BGL). Each scheduled insulin dose was reviewed to identify whether supplemental insulin was administered when clinically indicated, and if adequate documentation existed when not administered.

Results

A total of 587 BGL readings from 46 patients were reviewed during the study period.

- Hyperglycaemic events decreased by 31% (78% to 47%) ($p < .001$)
- Blood glucose levels maintained in normal glycaemic range increased by 31% (22% to 53%) ($p < .001$)
- No hypoglycaemia events were observed in the study period

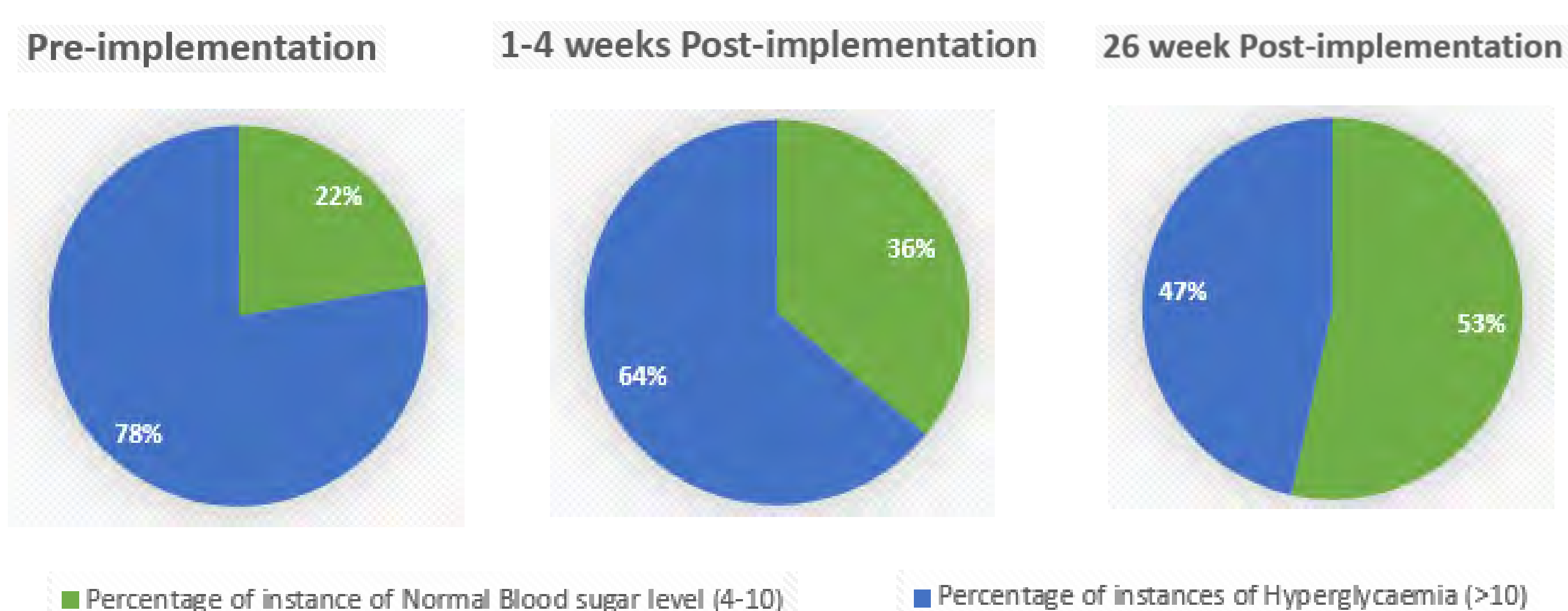


Figure 1. Glycaemic Control Pre and Post implementation

Poor documentation was identified in instances where insulin should have been administered but was not given. The audit also identified significant improvements in documentation from 54% to 100% compliance ($p < .001$).

Analysis Hospital Acquired Complications (HACs)

A 5 fold decrease in HACs at Canterbury Hospital was identified post implementation of the Insulin Powerplan (figure 2)

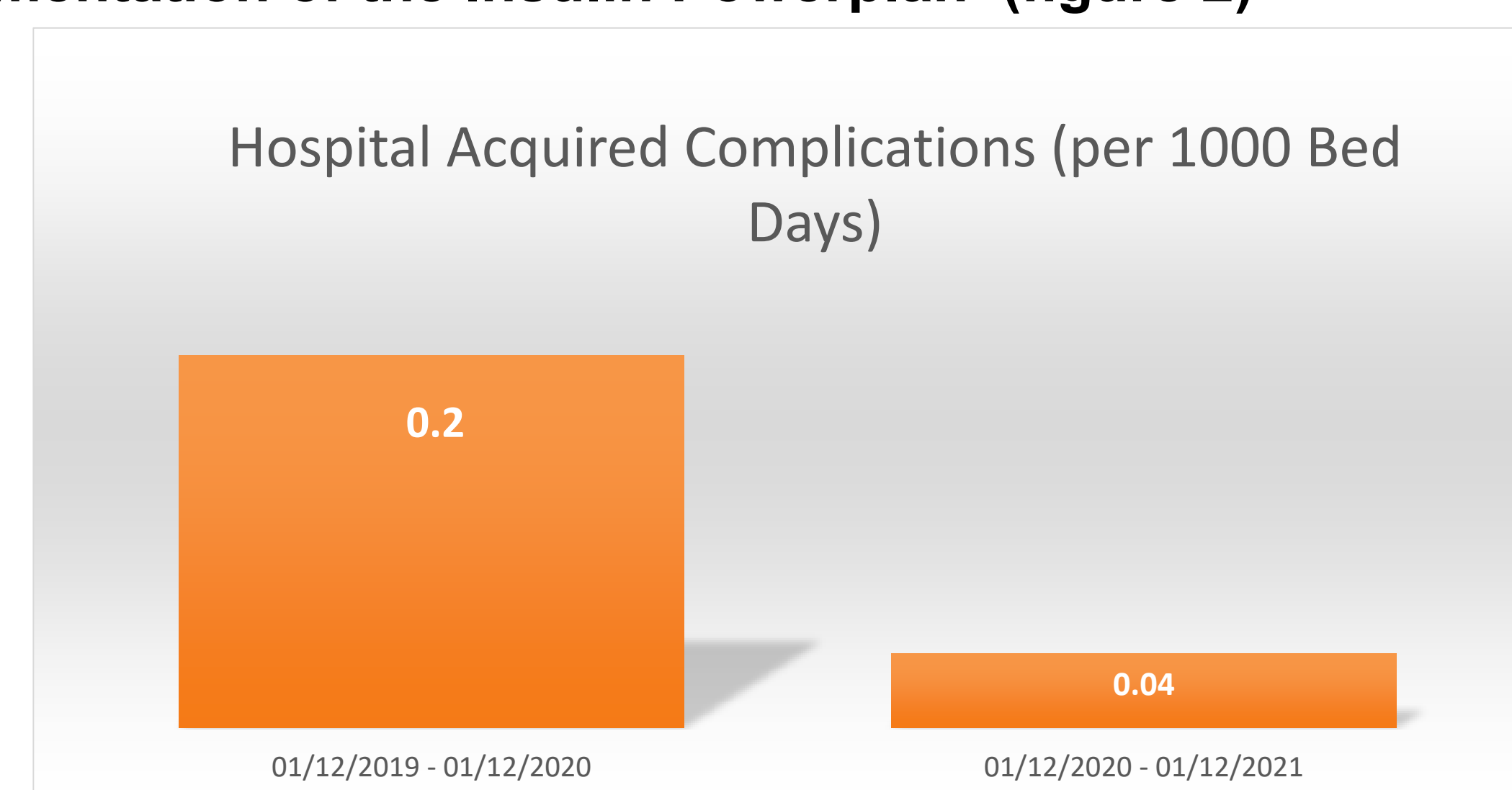


Figure 2. HACs Pre and Post Implementation

Discussion

This study demonstrates the use of a regular supplemental insulin order can improve the use of supplemental insulin resulting in better glycaemic control compared to as-required supplemental insulin orders.

Although this study demonstrates the benefits of a regular supplemental insulin order in an electronic medical record, care must be taken when conducting a similar strategy in a larger facility since other factors such as greater patient variability, supplemental dose ranges, and other complexities with managing glycaemic control may impact its utility.

Acknowledgements

Rosemary Burke² Cassandra Chan¹, Julianne Chong³, Dr Matthew Chu¹, Linda Do¹, Jacky Hanh², Rebecca Ho^{1,3}, Shona Hanson¹, Aaron Jones², Simon Latham⁴, Rebekah Lee³, Chris Lovell², Jocelyn Ong¹, Minh Tri Pham¹, Garry Soo³, Shailja Tewari¹, Joanna Tsang³, Tony Tu², Jason Trinh¹, Raj Ubeja⁴, Venkatesha Venkatesha⁴

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