

Improving the Timing of Insulin Administration

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Improving the Timing of Insulin Administration

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Background/Significance

- The timing of insulin administration was noted outside that stated in LVHN policy, and an increase in hypo and hyperglycemic events was noted hospital-wide. Through this project, we gained further insight into the barriers to timely insulin administration and attempted to influence individual practice to better manage patient blood sugars and prevent hypo and hyperglycemic events.

PICO QUESTION

- In patients on clinical units 6B & 6C with diabetes, receiving ISF or carbohydrate coverage (CHO) insulin dosing, does 1:1 staff education compared to just a TLC education module, improve the % of ISF and/or CHO counting insulin coverage given within the appropriate timeframe before or after meal times?
 - P: Adult patients on clinical units 6B & 6C with a diabetes diagnosis, receiving either ISF correctional or CHO counting insulin dosing.
 - I: 1:1 staff education and TLC for staff on 6B regarding timely administration of ISF correctional insulin dose and/or CHO counting coverage.
 - C: TLC module (only) for staff on 6C regarding timely administration of ISF correctional insulin dose and/or CHO counting coverage.
 - O: % of ISF correctional insulin and/or CHO counting insulin coverage given within appropriate timeframe before or after meal.

TRIGGER?

- Knowledge v. Problem
 - IOWA Model Triggers
- We observed that the time between BG checks/meals and insulin coverage was significant and often did not meet hospital policy:
 - The mean time of ISF coverage on 6B and 6C was found to be 75 minutes after POC testing.
 - The mean time for CHO coverage on 6B and 6C was found to be 42 minutes after patient meal.

EVIDENCE

- Search engines used: CINAHL, OVID, PubMed
- Key words: insulin administration (timing of), mealtime insulin, prandial insulin, diabetes education, glucose monitoring in hospital, inpatient diabetes,

EVIDENCE

- “Rapid-acting analogue (RAA) insulins must be given within 15 minutes of meal consumption (before or after) to be effective in controlling BG without increased incidence of hypoglycemia” (Lampe et al, 2014).
- “The onset of rapid-acting insulin aspart is within 5 to 15 minutes and is to be given within 30 minutes of capillary blood glucose testing and 10 to 15 minutes of a meal” (Freeland et al, 2011).
- “Humalog should be given within 15 minutes prior to or immediately after a meal due to its rapid onset” (DiabetesinControl, Inc 2014).

EVIDENCE

- “Administering RAA outside the ideal timeframe can result in uncontrolled blood glucose (BG) and variation in glycemic control” (Lampe et al, 2014)
- Untimely insulin can result in prolonged hyperglycemia and potential for hypoglycemia if given too close to the next BG that is inadvertently taken too early and corrected (Najarian, 2014)
- Post-education quality assurance data reflected a 54% reduction in the rate of omission of subcutaneous pre-prandial insulin coverage (Citty et al, 2014)

Current Practice at LVHN

- As stated in LVHN hyperglycemia policy, POC blood glucose testing should be obtained immediately or no more than 30 minutes before start of meal.

IMPLEMENTATION

1. Process Indicators and Outcomes: Data points obtained included time of Accucheck, time meal arrived, time of ISF coverage, and time of CHO coverage.
2. Baseline Data: Data was gathered on both units and the time gap between Accucheck and insulin administration was evaluated. Mean time was calculated for the compiled data. Percentage of observations within appropriate timeframes was also calculated.
3. Design Process: TLC education on timing of insulin administration was created including data gathered, policy review, barriers, and strategies to overcome the barriers related to timely insulin administration.
4. Implemented: Implementation of this education included sharing the TLC with RNs and TPs on both 6B and 6C. In addition, 6B RNs were provided with one-on-one education reviewing information covered in the TLC education.

IMPLEMENTATION

5. Evaluation: Post-data was gathered on both units including the timing of Accucheck, time of ISF coverage, time meal arrived, and timing of CHO coverage. Mean time was calculated for the compiled data. Percentage of observations within appropriate timeframes was also calculated.
6. Modifications to the Practice Guideline: No modification was made to the practice guideline at this time. However, the current practice guideline was reviewed in an attempt to influence individual practice.
7. Network Implementation: Presenting at NRP graduation. In addition, LVHN diabetes educator was made aware of this project and is currently working on additional changes to care for patients with diabetes. Our team would be happy to assist with this process.

RESULTS

- Post-education data collected showed a decrease in the mean time of ISF coverage on 6B and 6C from 75 and 77 minutes to 68 and 41 minutes respectively.
- Only 27% of baseline ISF observations were within 30 minute policy window. Post-education, 47% of observations met policy requirements.

RESULTS

- The mean time between meal and CHO coverage decreased from 42 minutes to 38 minutes overall. 6B post-education time decreased from 44 to 20 minutes. 6C post-education time, however, increased from 32 to 59 minutes.
- None of the CHO baseline observations met best practice recommendations, whereas 57% of post-education observations did.
- One-on-one education vs. TLC alone, did make a difference in the % of ISF and/or CHO counting insulin coverage given within the appropriate timeframe before or after meal times.

Next steps

- Further research on barriers to timely insulin administration and possible solutions through conversations/surveys with RNs and TPs.
- Possibly include a TLC education module on the importance of timely insulin administration in RN yearly education bundle.

Practice Change

- The goal of our project was not to change hospital policy regarding insulin administration, but to influence individual practice through education and reinforcement of policy which already reflects best practices.

Implications for LVHN

- Improved timing of insulin administration through education and awareness of gap between current practice and best practices.
- Decreased episodes of hypo and hyperglycemic events.

Strategic Dissemination of Results

- Dissemination of results to nurse managers and PCS's on 6B & 6C.
- Dissemination of results to other nurse residents through project presentation.
- Dissemination of results to LVHN Diabetes & Endocrinology team.

Lessons Learned

- Difficulty in obtaining timely/accurate data:
 - We couldn't always be in the room when meal arrived
 - Patients don't always eat when tray arrives
 - Variability of staff on unit (floatpool nurses and turnover).
 - Had to narrow down project scope

- **HARD TO INFLUENCE CHANGE!**

Make It Happen

- As a team we can reach our goal of timely insulin coverage and tight glycemic control!



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