Accurate Timing of Insulin Administration.

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BACKGROUND/SIGNIFICANCE

- In the week of 6/8/2015, POC results taken on the unit were in the 70-180 mg/dl range 61% of the time.
- Previous glucometrics were reviewed, and it was observed that that RHCM was consistently in the red zone (less than 70% of the time in range).
- We had to investigate factors attributing to POC testing and insulin administration.
- Due to many factors that can affect a patient's blood sugar, we focused on what the nurse can control.
- We decided to evaluate the administration of corrective insulin (ISF) within the 30 minutes allowed for ISF coverage after blood sugar POC testing.
- Our study consisted of monitoring nurses during their workflow and implementing a collaborative effort between nurses and technical partners in the inpatient setting.

PICO QUESTION

- In diabetic adult patients, how does collaborative care of accurate timing (less than or equal to 30 minutes from time of POC testing) of POC glucose testing and insulin administration compared to current unit practice affect obtaining glycemic control within the defined parameters of 70 mg/dl to 180 mg/dl?

- **P**: Diabetic Patients
- **I:** Collaborative methods, where POC glucose testing and insulin administration, is within 30 minutes
- **C**: Receiving correctional insulin after 30 minutes
- **O**: Glycemic control within the defined parameters of 70 mg/dl to 180 mg/dl.

TRIGGER?

- **Knowledge v. Problem**
  - Problem Focused Trigger
    - Process Improvement Data
      - Correctional insulin should be given within 30 minutes of a blood glucose.
      - Recent history has shown blood glucose levels have been poorly controlled on RHCM.

EVIDENCE

- **Search Engines Used:**
  - CINHAL, EBSCO, PEPID

- **Key Words:**
  - Glycemic Control
  - Timing Of Insulin Administration
  - Insulin Administration
  - Inpatient Diabetic Glucose Control
  - Collaborative Care

EVIDENCE

- Glucose control is important, but intense glucose control can actually have detrimental results in critically ill patients.
    - Hypoglycemia can trigger increases in cardiac demand, leading to tachycardia, chest pain, and myocardial ischemia
    - Hyperglycemia can impair oxygen utilization

- The incidence of hypoglycemia was significantly higher in patients randomized to tight glycemic control, per a study conducted by Marik et al (2010).

- When numerous team members execute key procedures related to insulin administration, there is an increase in the lack of coordination of care.
    - In a study conducted by Lampe et al. (2014) on 4 cardiology units, 65% of BG tests were performed outside ideal time frame with the longest testing interval occurring over 2 hours prior to next dose.
    - Blood glucose is dynamic, and when testing is performed outside the ideal time range, it may no longer be relevant for calculating insulin dosing needs

- In an observational study conducted by Lampe et al. (2014), only 14% of patients had BG testing and insulin administered within established time frames.
    - Time frames: Insulin administered within 15 minutes from first bite of food an d blood glucose testing 1 hour prior to arrival of meal. In summary, timing was considered successful if less than 1 hour.
    - Time frame was based on endocrinologist's recommendation

EVIDENCE

- Enhancing communication between team members and restricting schedules of inpatient procedures during mealtimes reduced disruptions to insulin administration.
  - Communication enhanced via coordination of unlicensed and licensed professionals
    - Techs called nurses after POC testing was completed
    - Techs would call nurse if trays were delayed or if patients did not want meals (Yamamoto et al., 2010).

- Through collaborative care, nurses play an important role in successfully controlling hyperglycemia in an intensive care unit.

- Nurse driven hypoglycemia policy has the most significant effect on hypoglycemia frequency (Munoz et.al,2012)
  - Under this policy, the key process to the nursing care includes: promptness of hypoglycemic treatments, notification of providers for persistent hypoglycemia, timeliness of scheduled basal insulin administration, appropriate withholding of carb coverage, timeliness of BG monitoring, and making sure the administered basal, carb coverage and correctional insulin accurately reflect the orders (Munoz et.al,2012)

CURRENT PRACTICE AT LVHN

- Currently at LVHN, policy dictates that correctional insulin should be given within 30 minutes of a blood glucose level. Allowing too much time puts the patient at risk.

IMPLEMENTATION

1. Process Indicators and Outcomes
   - Compliance to 30 minute window from POC testing to insulin administration
2. Baseline Data:
   - See Pre-Data Collection Slide
3. Design (EBP) Guideline(s)/Process
   - See Implementation Slide
4. Implemented EBP on Pilot Units
   - Project implemented on RHCM
5. Evaluation (Post data) of Process & Outcomes
   - Post data collection using EPIC
   - See Final Results Slide
6. Modifications to the Practice Guideline
   - Further research is necessary
7. Network Implementation
   - Inpatient Diabetes Education Department is currently conducting research regarding timing of insulin administration

IMPLEMENTATION

- August 17th, 2015 – September 17th, 2015
- Education provided via handout, verbal reinforcement regarding importance of POC testing and insulin administration.
- Nurse and Technical Partner(TP) were to enter patient rooms together to take POC glucose and to administer insulin coverage.
- If TP was unavailable for collaborative testing, we kindly requested that the nurse check the blood sugar and administer coverage if necessary.

PRE-INTERVENTION DATA

- Morning
  - **36%** within 30 minutes
- Noon
  - **62%** within 30 minutes
- Afternoon
  - **54%** within 30 minutes
- Evening
  - **65%** within 30 minutes
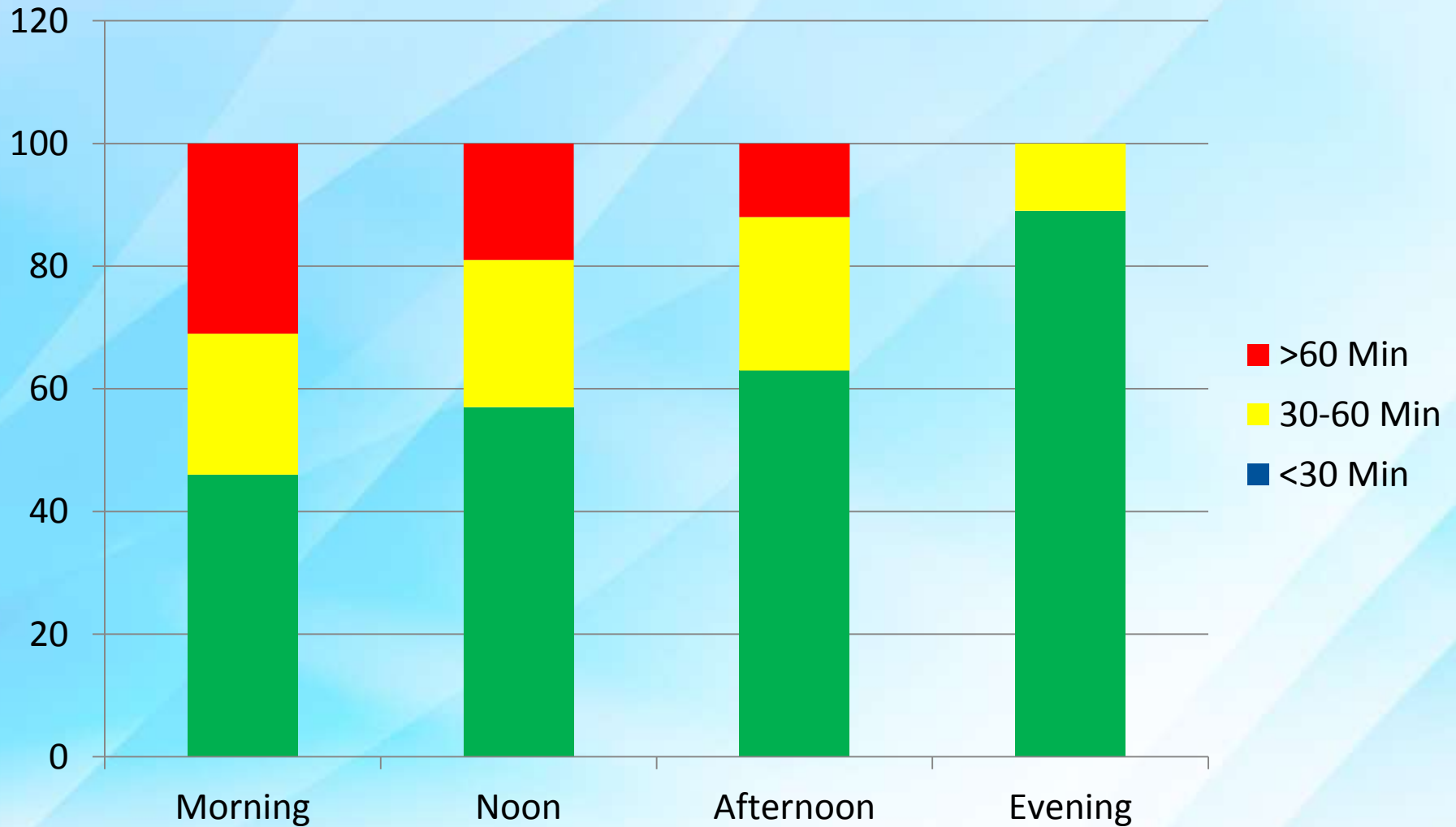- Average Compliance
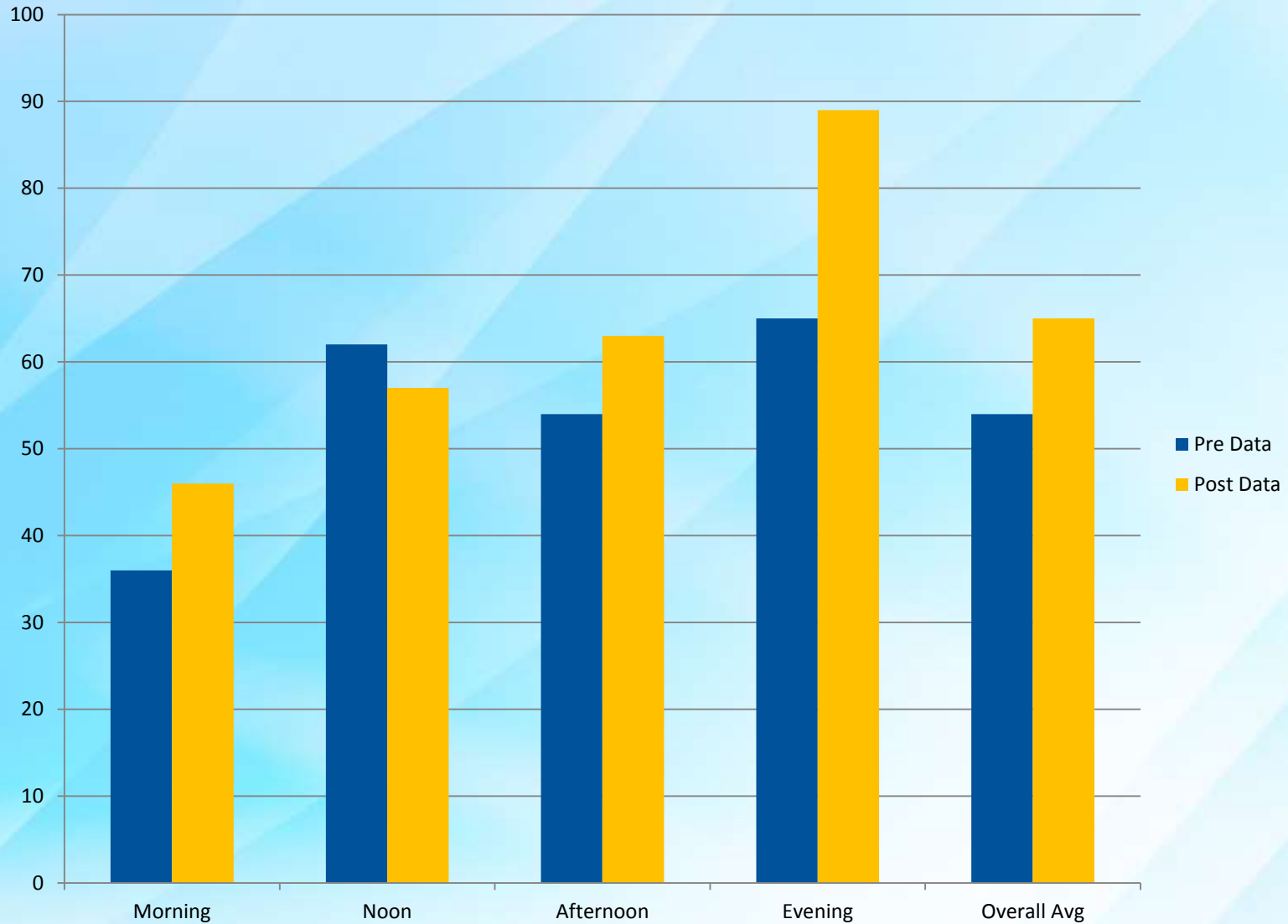 - **54%** within 30 minutes

PRE-INTERVENTION DATA
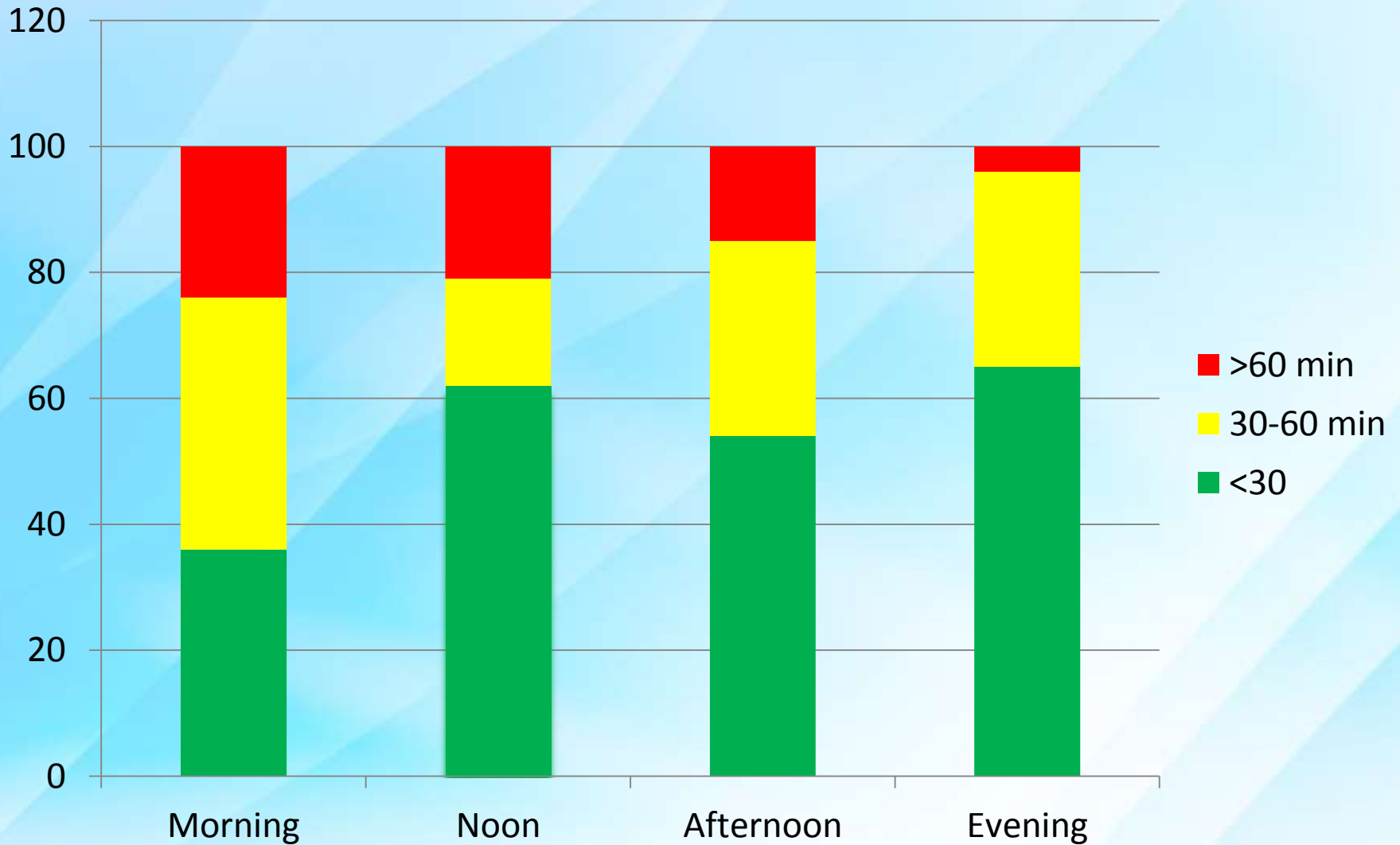
POST-INTERVENTION DATA

- Morning
  - **46%** within 30 minutes
- Noon
  - **57%** within 30 minutes
- Afternoon
  - **63%** within 30 minutes
- Evening
  - **89%** within 30 minutes
- Average Compliance
  - **65%** within 30 minutes

POST-INTERVENTION DATA

PRE VS. POST DATA

PRACTICE CHANGE

- No current practice change resulted from this study.

- Further research is necessary to improve timing of insulin administration.

- Post Survey Questionnaire handed out to staff indicated **higher priority tasks** and **communication barriers** were perceived to be inhibitors.

IMPLICATIONS FOR LVHN

- LVHN's Inpatient Diabetes Department is currently conducting additional research related to improving coordination of POC blood glucose and insulin administration and addressing barriers that nurses and technical partners are experiencing in the inpatient setting.

- Coordination of work flow is important between professionals in the inpatient setting.

LESSONS LEARNED

- Educating the staff on insulin administration policy demonstrated a **11%** increase in overall compliance.

- Night shift had the largest increase in compliance, **29%.**

- Noon had a **5%** decrease in compliance.

  - When discussed on the unit, feedback included that most patients are off the floor for testing.

- EPIC charting attributed to errors in data collection.

POST-QUESTIONAIRE

- Nurses and technical partners were given a post survey, asking them to list what they perceived to be their **primary** and **secondary** reasons for not being able to administer ISF insulin within 30 minutes of POC testing.
  - **52% listed <u>higher priority tasks</u> as their primary reason**
  - **48% listed <u>staff communication</u> as their secondary reason**

STRATEGIC DISSEMINATION OF RESULTS

- Data will be shared with the Director of Regional Heart Medical and the Inpatient Diabetes Department.

- Our study results were printed out, and are available to unit staff

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MAKE IT HAPPEN

- Questions/Comments

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