Safety Action Bundle – Adverse Drug Events (ADE)

**Hypoglycemic Agents**

**Background**

- The Institute of medicine (IOM) estimates that 1.5 million preventable Adverse Drug Events (ADE) occur each year.\(^i\)
- On average, every patient admitted to a hospital is subject to at least one medication error per day, accounting for approximately $3.5 billion additional costs.\(^{ii, iii}\)
- According to the United States General Accounting Office (GAO) report from February 2000, individual state studies have shown ADE occurrence rates as high as 0.56 to 3 per 100 hospital admissions.\(^{iv}\)
- According to the 2004 Medicare Patient Safety Monitoring Study sample of 25,145 hospital visits, an estimated 10.7% of patients exposed to insulin/hypoglycemic agents experienced associated ADE.\(^v\)

**Aims**

To reduce the incidence of ADE related to hypoglycemic agents by 40% by the end of 2017.

**Measures**

*Outcome*: Option chosen must remain consistent for optimal data trending.

*Primary Measure*:

- **Numerator**: Number of patient blood glucose (BG)* levels of <50 mg/dl after any hypoglycemic agent administration (patients cared for in an inpatient area)
- **Denominator**: Number of patients (cared for in an inpatient area) receiving hypoglycemic agents (oral & insulin)

*Option #2*:

- **Numerator**: Total number of patient blood glucose (BG)* levels of <50 mg/dl (for patients cared for in an inpatient area).
- **Denominator**: Total patient days (excluding healthy newborns).

*Blood glucose (BG) is Point of Care (POC) and/or serum test results.*

*Process*: Adherence to Safety Action Bundles and Data Submission Trends

*Submit*: Washington State Hospital Association Quality Benchmarking System
### Adverse Drug Events (ADE) – Hypoglycemic Agents

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| **Leadership**  | - Identify administrative, quality and pharmacy leaders to champion ADE reduction strategies, including hypoglycemic agents.  
- Set aims, goals and timelines for practice changes.  
- Develop training programs on hypoglycemic agents for all providers, pharmacists and nursing staff.  
- Implement high-risk medication policies that clearly delineate roles and responsibilities of providers, pharmacists and nursing. |
| **Prevent**      | - Establish blood glucose targets for specific populations such as: critically ill patients, post-surgical patients, pregnant patients with gestational diabetes mellitus (GDM) or pre-existing diabetics, and pediatric/neonates.  
- Create and implement blood glucose monitoring guidelines to address existing diabetic patients, hyperglycemia acquired in hospital, pregnant patients with GDM or pre-existing diabetics and pediatric/neonates.  
- Ensure processes are in place to manage insulin procurement, storage, preparation and dispensing:  
  - Use individualized insulin pens, or have pharmacy prepare individual scheduled intermediate or long-acting insulin doses.  
  - Remove or minimize stock of insulin on patient care units.  
  - Pharmacist reviews all insulin orders prior to insulin availability in automated dispensing cabinets.  
  - Double-checks required for non-standard insulin concentrations or in override emergent situations by two professionals.  
  - Pharmacy prepares all insulin infusions, dilutes insulin and concentrated (U-500) insulin.  
  - Limit the number of insulin infusion standard concentrations to one.  
- Effectively display the patient’s insulin administration record, blood glucose results, and carbohydrate intake in order to efficiently and accurately assess patient status.  
- Eliminate the use of sliding insulin dosage scales; convert to basal/bolus insulin dosing. If a sliding scale is used, standardize it through the use of a protocol and preprinted order form or computer order set that clearly designates the specific increments of insulin coverage.  
- Implement judicious use of independent double checks of subcutaneous insulin.  
- Establish and implement standard practices for situational subcutaneous insulin dosing (e.g. non-standard concentrations, basal prandial dosing, with conversion to oral and pre-operatively).  
- Establish and implement insulin infusion protocols for patients in the ICU, diabetic ketoacidosis and hyperosmolar hyperglycemic state.  
- Establish and implement standards for oral and injectable non-insulin hypoglycemic agents.  
- Ensure a policy is in place and staff are educated on the use of patient self-management of insulin pumps, including that the patient must meet cognitive requirements. |
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| Mitigate | - Streamline formulary for insulin type to a single brand source with approved substitutions.  
- Ensure policy/process is in place to administer all insulin infusions via an IV pump with capability to program max/min infusion rates, overrides and alerts – recommend smart pump technology.  
- Independent double checks required for all insulin administration.  
- Utilize alerts to flag changes in patient condition and hypoglycemic triggers such as:  
  - NPO status, dietary and/or nutritional changes, surgery, acute illness (e.g. sepsis, acute renal or liver failure) and any additions or changes in medications that may affect blood glucose levels.  
- Ensure coordination processes are available for blood glucose checks with meals and insulin administration, including monitoring for an inconsistency with nutritional intake and a fixed prandial dosing.  
- Include in hand-off communication for patients on hypoglycemic agents the patients last blood glucose level (date/time) and the last dose of insulin or oral agent, as well as any pertinent patient assessment that may cause a hypoglycemic event. |
| Performance and Variation | - Conduct an interdisciplinary failure modes and effects analysis (FMEA) within your facility to identify organization-specific sources of failure with the use of hypoglycemic medications.  
- Present your performance compared to others to the board and other key stakeholder groups. |
| Leverage Expert Teams and Information Technology to Embed Safety in Process | - Interface EHR with laboratory systems to provide alerts to practitioners when action is needed.  
- Develop and implement hypoglycemic protocols for vulnerable populations such as elderly, pediatric, and obese patients. |
| Patient and Family Engagement | - Engage patients and care givers to understand how to take their medications, potential drug/food interactions and how to identify symptoms that indicate harm.  
- Remind patients the importance in having a medication list whenever they visit a provider and have him/her review it.  
- Develop a robust communication plan to share information and to ensure timely follow-up with the next provider at time of discharge from the hospital. |
| Culture | - Encourage collaboration across ranks and disciplines to seek solutions to patient safety problems.  
- Promote transparency of results from display on units to the board and public. |

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