PENNSYLVANIA HOSPITAL ENGAGEMENT NETWORK: ORGANIZATION ASSESSMENT OF SAFE INSULIN PRACTICES

As a **high-alert medication class**, insulin products bear a heightened risk of causing significant patient harm when used in error.[1]

Proactively assessing safety practices, especially those involving insulin use, can provide hospitals with valuable information about the weaknesses that exist within their medication-use system. As the harm from errors involving insulin can be potentially devastating, identifying the risks associated with insulin use should be considered a priority by healthcare organizations.

This tool will help you assess the safety of insulin practices in your facility and identify opportunities for improvement.* The findings may be used to develop an action plan for implementing recommended error reduction strategies in order to assist your hospital in enhancing insulin safety.

Instructions for Completing the Assessment

Please note:
It is important for each hospital in a multihospital system to complete the assessment *individually*.

1. **Establish an interdisciplinary team** consisting of the following (or similar) roles:

   - Chief medical officer

   - Nurse executive

   - Director of pharmacy

   - Clinical information technology specialist

   - Medication safety officer/manager

   - Risk management and quality improvement professionals

   - At least two staff nurses from different specialty areas

   - At least two staff pharmacists (one clinical and one distribution)

   - At least one active staff physician who regularly orders insulin

   Provide the team with sufficient time to complete the assessment. Also, charge the team with the responsibility to evaluate, accurately and honestly, the current status of insulin practices in your facility. Because medication use is a complex, interdisciplinary process, *the value and accuracy of the assessment is significantly reduced if it is completed by a single discipline involved in medication use.*

2. **Read and review the assessment in its entirety (including the instructions) before beginning the assessment process.** Provide each team member with either a hard copy or electronic version of the assessment and the definitions for review before the first team meeting.

3. **Verify your demographic information.** *Before* the first team meeting, the team leader may complete this section and, if necessary, verify any responses with hospital administration. Answer all demographic questions.

4. **Convene the team.** During the evaluation process, ensure that each team member can view the assessment during the meeting by providing each member with a printed hard copy of the assessment and definitions.

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[1] Institute for Safe Medication Practices. ISMP list of high-alert medications in acute care settings [online]. 2014 [cited 2014 Jul 28]. http://www.ismp.org/Tools/highAlertMedications.asp

Instructions for Completing the Assessment (continued)

5. **Discuss each assessment item.** As necessary, investigate and verify the level of implementation with other healthcare practitioners outside your team. When a consensus on the level of implementation for each assessment item has been reached, select the appropriate choice. For the majority of the assessment items, your hospital will have the following options: Not implemented, Partially implemented, and Fully implemented.

   Key: Please use the following key and guidelines to select the most appropriate response:

   - Not implemented: This item has *not* been implemented within the hospital.

   - Partially implemented: This item has been *partially implemented in some or all areas* of the hospital, or this item has been *fully implemented in some areas* of the hospital.

   - Fully implemented: This item is *fully implemented throughout the hospital*.

   Consider assigning an individual to record any discussion generated around each assessment item and the rationale behind the selected choice.

   Definitions: Within the assessment, defined terms are highlighted throughout the text in bold letters. Definitions are provided on the last page of this tool.

   For all assessment items: Unless otherwise stated, assessment items refer to insulin prescribed, dispensed, and administered to all inpatients and outpatients typically seen in most hospitals, including patients admitted to the emergency department and ambulatory surgery/procedure units.

   - **For assessment items with multiple components:** The choice of "Fully implemented" should only be selected if *all components* are present in *all areas* of the hospital. If only one or some of the components have been partially or fully implemented in some or all areas of the hospital, a choice of "Partially implemented" should be selected.

   - **For assessment items with an option of "Not applicable":** Select "Not applicable" *only* if your hospital meets the statement that follows. For example, for assessment item #39, only select "Not applicable" if your hospital does not provide self-management education.

6. **Repeat the process outlined in step 5 for all assessment items.** All assessment items must be answered. *Save the paper copy* of your hospital's assessment.

Adapted with permission from the Institute for Safe Medication Practices, Horsham, Pennsylvania.

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DEMOGRAPHIC QUESTIONS

1. Please select the *one category* that best describes the number of inpatient beds currently staffed for use in your hospital.

   Fewer than 100 beds   100 to 299 beds   300 to 499 beds   500 beds and over

2. Please select the *one category* that best describes the type of service that your hospital provides to the majority of its admissions.

   General medical and surgical   Specialty: pediatric

   Long-term acute care   Specialty: psychiatric

   Specialty: cardiology   Specialty: rehabilitation

   Specialty: oncology   Specialty: women and children

   Specialty: orthopedic   Other:

3. Which of the following services does your hospital provide? (Select all that apply.)

   Oncology services (select even if chemotherapy is administered infrequently)

   Pediatric services (select even if pediatric care is provided only in the emergency department and/or outpatient surgery)

   Neonatal intensive care (select for any level of service)

   Trauma services (select for any level of service)

   Transplant services

   None of the above

4. Is your hospital accredited?

   No (Please proceed to item 5.)

   Yes

   Who accredits your hospital?

   The Joint Commission

   Healthcare Facilities Accreditation Program (HFAP)

   Det Norske Veritas (DNV)

   Other:

5. Is a pharmacist available in the hospital 24 hours a day, seven days per week to review orders and dispense medications?

    No

    Please specify how many hours a day a pharmacist is available.

        Monday through Friday: hours

        Saturday and Sunday: hours

    Yes

6. Please select the *one category* that best describes the type of medication administration records (MARs) used at your hospital?

    Handwritten MARs

    Paper MARs printed from the pharmacy information system

    Electronic MARs

7. Does your hospital use **bar-code technology**?

    No, we do not have bar-code technology in our organization. (Please proceed to item 8.)

    Yes

    Please select the *one category* that best describes your hospital's use of bar-code technology.

        Bar-code technology is *only* used in the pharmacy for drug selection.

        Bar-code technology is *only* used at the patient bedside for medication administration.

        Bar-code technology is used *both* in the pharmacy and at the patient bedside.

8. Does your hospital use **smart infusion pumps** with computer software that is capable of alerting the user to unsafe doses for continuous insulin infusions?

    No, we do not have smart infusion pumps in our organization.

    Yes

9. Does your hospital use a **computerized prescriber order entry (CPOE)** system?

    No, we do not have CPOE in our organization. (Please proceed to item 10.)

    Yes

    Please select the *one category* that best describes the area(s) where CPOE is used.

        All inpatient areas

        Emergency department only

        CPOE is used in both the inpatient areas and the emergency department.

        Other:

10. Please select the insulin products that are on your hospital's formulary. (Select all that apply.)

Rapid-acting insulin

Insulin aspart (NovoLOG®)

Insulin glulisine (Apidra®)

Insulin lispro (HumaLOG®)

Short-acting insulin

Insulin regular (HumuLIN® R)

Insulin regular (NovoLIN® R)

Intermediate- and long-acting insulin

Insulin NPH (HumuLIN® N)

Insulin NPH (NovoLIN® N)

Insulin detemir (Levemir®)

Insulin glargine (Lantus®)

Combination insulin

Insulin aspart protamine and insulin aspart (NovoLOG® Mix 70/30)

Insulin lispro protamine and insulin lispro (HumaLOG® Mix 50/50™)

Insulin lispro protamine and insulin lispro (HumaLOG® Mix 75/25™)

Insulin NPH and insulin regular (HumuLIN® 70/30)

Insulin NPH and insulin regular (NovoLIN® 70/30)

Concentrated insulin

Insulin regular (HumuLIN® R U-500)

11. Please select the statement(s) that best describe(s) the distribution of insulin used for subcutaneous administration within your hospital. (Select all that apply.)

Insulin vials are dispensed for *single*-patient use.

Insulin vials are dispensed for *multiple*-patient use.

Insulin pens are dispensed for *single*-patient use.

Long-acting insulin doses are drawn up and dispensed by pharmacy in **patient-specific doses**.

Other:

12. Please select the statement(s) that best describe(s) where insulin used for *subcutaneous* administration is stored on patient care units. (Select all that apply.)

Automated dispensing cabinet (ADC) (not refrigerated)

Patient-specific drawer or bin (not refrigerated)

Refrigerator (associated with an ADC)

Refrigerator (not associated with an ADC)

Other:

13. Please select *all* areas where insulin vials or pen devices are stored on patient care units.

Catheterization lab

Dialysis

Emergency department

Endoscopy

Intensive care units (ICUs)

Labor and delivery units

Medical-surgical units

Neonatal ICUs

Newborn nursery

Oncology units

Operating room

Outpatient ambulatory care clinics

Pediatric units

Pediatric ICU

Postanesthesia care unit

Radiology

Same-day surgery/pre-op

Other:

14. How are bedside point-of-care (POC) blood glucose values documented at your hospital?

        Manually documented on a paper form (e.g., diabetic flow sheet, MAR)

        Manually documented into an electronic health record (EHR)

        Electronically imported into the EHR via a blood glucose monitor that is docked with a computer

        Electronically imported into the EHR from a blood glucose monitor via wireless technology

15. Please select the healthcare professionals who can be consulted within your hospital regarding insulin and nutritional management or to provide patient education to patients with diabetes. (Select all that apply.)

        Diabetes educator/coordinator

        Dietician

        Endocrinologist

        Nurse

        Pharmacist

        Physician (non-endocrinologist)

        Other:

ASSESSMENT ITEMS

Organizational Structure

1. Current insulin management protocols and guidelines for treating patients with HYPERglycemia are available to guide prescribers, pharmacists, and nurses when insulin is ordered, dispensed, or administered, as well as when monitoring its effects.

        Not implemented   Partially implemented   Fully implemented

2. Current insulin management protocols and guidelines for treating patients with HYPOglycemia are available to guide prescribers, pharmacists, and nurses.

        Not implemented   Partially implemented   Fully implemented

3. Meal delivery times are coordinated with bedside POC blood glucose testing and insulin administration.

        Not implemented   Partially implemented   Fully implemented

4. Patients with diabetes admitted to the hospital have their diabetes clearly documented in a location within the medical record that is readily accessible by healthcare practitioners when prescribing, dispensing, or administering insulin.

        Not implemented   Partially implemented   Fully implemented

5. A standardized process has been established for alerting physicians, pharmacists, and nurses that insulin doses must be adjusted, held, or discontinued when changes occur in the patient's carbohydrate intake (e.g., changes in enteral feedings, parenteral nutrition, or "nothing by mouth" [NPO] status).

        Not implemented   Partially implemented   Fully implemented

6. A limited variety of insulin products (e.g., insulin aspart for **prandial** and **correction** doses, insulin glargine for **basal** doses, regular insulin for insulin infusions) are included on the hospital formulary.

        Not implemented   Partially implemented   Fully implemented

7. An insulin comparison chart that lists the types of insulin, pharmacodynamic characteristics (e.g., onset and duration of action), and appropriate timing of administration for each of the different insulin products has been established and is easily accessible to all practitioners when prescribing, dispensing, and administering insulin.

        Not implemented   Partially implemented   Fully implemented

8. Please select all of the locations where you have seen the error-prone abbreviation "u" or "U" for units used when communicating drug information and orders in the past 12 months. (Select all that apply.)

    Handwritten orders   Pharmacy inventory shelves

    Preprinted order forms/CPOE order sets   ADC screens

    MARs   Smart infusion pump screens

    Chart notations/progress notes   CPOE or pharmacy order entry screens

    Organization-developed drug references   Other:

Prescribing

9. **Sliding scale** insulin is *not* used to solely manage blood glucose levels in patients.

    Not implemented   Partially implemented   Fully implemented

10. Scheduled subcutaneous insulin with basal, prandial, and correction doses is used to manage blood glucose levels in non–critically ill patients.

    Not implemented   Partially implemented   Fully implemented

11. Standardized preprinted order forms/CPOE order sets are used to order insulin.

    No (Please proceed to item 12.)

    Yes (Please answer items a through e below.)

    a) Please select the indications for which preprinted order forms/CPOE order sets and protocols are used to order insulin. (Select all that apply.)

        Insulin infusions for critically ill patients (e.g., ICU)   Subcutaneous insulin

        Adult diabetic ketoacidosis (DKA)   Other

        Hyperosmolar hyperglycemic nonketotic syndrome (HHNK)

    b) Preprinted order forms/CPOE order sets for *subcutaneous* insulin include guidelines for calculating basal and prandial insulin doses.

        Not implemented   Partially implemented   Fully implemented

        Not applicable: Our hospital does *not* have a preprinted order form/CPOE order set for ordering *subcutaneous* insulin.

    c) Preprinted order forms/CPOE order sets for subcutaneous insulin include standardized scales when determining correction doses (e.g., insulin-sensitive, usual, insulin-resistant).

        Not implemented   Partially implemented   Fully implemented

        Not applicable: Our hospital does *not* have a preprinted order form/CPOE order set for ordering *subcutaneous* insulin.

    d) Preprinted order forms/CPOE order sets for insulin include orders for treatment options for HYPOglycemia (e.g., orange juice, dextrose 50%, glucagon) based on the patient's symptoms, blood glucose level, and NPO status.

        Not implemented   Partially implemented   Fully implemented

    e) Preprinted order forms/CPOE order sets for insulin include orders for routine blood glucose monitoring and the goal blood glucose level based on the patient's nutritional status and indication (e.g., 140 to 180 mg/dL for a critically ill patient receiving an intravenous insulin infusion).

        Not implemented   Partially implemented   Fully implemented

12. All patients with diabetes or receiving insulin have an order for routine blood glucose monitoring.

    Not implemented   Partially implemented   Fully implemented

13. Patients are screened for the following elements that may affect the dose, monitoring parameters, or route of administration when ordering insulin. (Select all that apply.)

    Nutritional status (e.g., NPO, receiving enteral or parenteral nutrition)

    Patient weight

    Concomitant medications that may impact blood glucose levels (e.g., corticosteroids, octreotide, immunosuppressive medications)

    Criticality of illness

    Renal impairment

    Hepatic impairment

14. New orders for insulin include the unit/kg dose along with the patient-specific calculated dose (e.g., 0.5 units/kg/day x 40 kg = 20 units/day, 20 units/2 = 10 units of insulin glargine at bedtime, and 10 units/3 = 3 units of insulin aspart before/with meals).

    Not implemented   Partially implemented   Fully implemented

15. An endocrinologist or specialist trained in insulin management/diabetic care (e.g., physician, pharmacist, nurse practitioner) is automatically consulted for patients with complex insulin issues (e.g., using U-500 insulin, uncontrollable HYPERglycemia, other high-risk patients).

    Not implemented   Partially implemented   Fully implemented

Insulin Storage, Order Review, Compounding, and Distribution

16. Pharmacists validate that the patient has an appropriate diagnosis/indication (e.g., diabetes, hyperkalemia, receiving high-dose glucocorticoid therapy or other drug/therapy that places the patient at high risk for HYPERglycemia) before verifying or entering an order for insulin.

    Not implemented   Partially implemented   Fully implemented

17. Pharmacists have easy access to all blood glucose monitoring results (including bedside POC blood glucose monitoring) in real time and take it into consideration before verifying or entering an order for insulin.

    Not implemented   Partially implemented   Fully implemented

18. Insulin infusions for adult patients are standardized to a single concentration.

    Not implemented   Partially implemented   Fully implemented

19. Insulin infusions for pediatric patients (including neonates) are standardized to a single concentration and are used in at least 90% of the cases.

    Not implemented   Partially implemented   Fully implemented

    Not applicable: We do not provide care to pediatric patients, even in our emergency department.

20. Patient-specific doses of intermediate- and long-acting insulin (e.g., insulin glargine, insulin detemir) are prepared and dispensed by the pharmacy in a patient-specific labeled syringe.

    Not implemented   Partially implemented   Fully implemented

    Not applicable: We dispense pen devices for our intermediate- and long-acting insulin.

21. All insulin infusions are prepared in the pharmacy (i.e., nurses do not prepare insulin infusions).

    Not implemented   Partially implemented   Fully implemented

22. A pharmacist double-checks all insulin products before they are dispensed from the pharmacy, including those insulin products placed into ADCs.

    Not implemented   Partially implemented   Fully implemented

23. An **independent double check** is performed in the pharmacy for *prepared* insulin products (e.g., insulin infusions, diluted insulin). (One of the checks *must* be done by a pharmacist.)

    Not implemented   Partially implemented   Fully implemented

24. Discontinued patient-specific insulin vials or pens are appropriately secured and removed from patient supplies in a timely manner (e.g., upon the patient's discharge, discontinuation of the drug) to prevent accidental administration or borrowing of the medication for another patient.

    Not implemented   Partially implemented   Fully implemented

25. **Tall man letters** are used to differentiate look-alike insulin names (e.g., HumaLOG and HumuLIN; NovoLOG and NovoLIN) on the following. (Select all that apply.)

    Pharmacy-prepared medication labels

    MARs

    Medication bin labels

    Preprinted order forms/CPOE order sets

    Other:

    Drug listings in computer order entry systems (pharmacy or prescriber order entry/verification systems)

    ADC screens

    Not applicable: We do not use tall man letters.

Administration and Monitoring

26. There is a process for documenting bedside POC blood glucose values in a standard location that allows nurses to determine an appropriate dose of insulin and track the patient's overall response to therapy.

    Not implemented   Partially implemented   Fully implemented

27. An organizational policy prohibits verbal communication, except in emergencies, of bedside POC blood glucose values from staff who obtain bedside POC blood glucose values to nurses who are administering insulin.

    Not implemented   Partially implemented   Fully implemented

28. Minimum and **maximum dose** limits have been established in smart infusion pumps for insulin infusions.

    Not implemented   Partially implemented   Fully implemented

    Not applicable: We do not use smart infusion pumps for insulin infusions.

29. Standardized frequencies for bedside POC blood glucose monitoring have been established based on the patient's nutritional status and/or route of administration (e.g., for patients not receiving parenteral or enteral nutrition, glucose monitoring is performed every 4 to 6 hours; for patients on intravenous insulin infusions, glucose monitoring is performed every 30 minutes to every 2 hours).

    Not implemented   Partially implemented   Fully implemented

30. A single syringe or pen device is never used to administer insulin to multiple patients, even if the needle is changed in between patients.

    Not implemented   Partially implemented   Fully implemented

31. Fingerstick/lancing devices, lancets, needles, and blood glucose meters (unless the meter is cleaned and disinfected per manufacturer instructions after every use) are never used for multiple patients.

    Not implemented   Partially implemented   Fully implemented

32. Prior to the administration of *subcutaneous* insulin, practitioners (e.g., nurses, nursing assistants) perform an assessment of the following. (Select all that apply.)

    Bedside POC blood glucose value (fingerstick)

    Symptoms of HYPOglycemia

    Symptoms of HYPERglycemia

    Nutritional status (e.g., NPO, receiving enteral or parenteral nutrition, last oral intake)

    Changes in the patient's condition (e.g., infection)

    Changes in the patient's medication regimen (e.g., addition or discontinuation of a medication that may impact blood glucose levels [e.g., corticosteroid])

    Not applicable: A baseline assessment is not routinely performed prior to the administration of subcutaneous insulin.

    Other:

33. Following the administration of *subcutaneous* insulin, nurses perform a postadministration assessment within the hospital-designated time frame of the following. (Select all that apply.)

    Symptoms of HYPOglycemia

    Symptoms of HYPERglycemia

    Not applicable: An assessment is not routinely performed following the administration of subcutaneous insulin.

    Other:

34. For *intravenous* insulin, an independent double check is performed with each new infusion bag/bottle.

    Not implemented   Partially implemented   Fully implemented

35. For *intravenous* insulin, an independent double check is performed with each change in the rate of infusion.

    Not implemented   Partially implemented   Fully implemented

36. Medications used for the treatment of HYPOglycemia (e.g., dextrose 50%, glucagon) and accompanying guidelines for use (i.e., HYPOglycemia protocol) are readily available wherever insulin is administered.

    Not implemented   Partially implemented   Fully implemented

37. Before the administration of insulin, nurses inform patients of the type of insulin and the dose they are about to receive.

    Not implemented   Partially implemented   Fully implemented

38. The following are used to monitor adverse drug events with insulin. (Select all that apply.)

    Medication event reports

    Adverse drug reaction reports

    Pharmacy interventions

    Administration of dextrose 50% or glucagon

    Rapid response team calls

    Blood glucose levels below a certain level (e.g., 50 mg/dL)

    Blood glucose levels above a certain level (e.g., 300 mg/dL)

    Patient falls

Patient Education and Self-Management

39. Diabetes self-management education begins upon admission to the hospital, incorporates a teach-back method, and addresses the patient's knowledge of the following areas prior to discharge. (Select all that apply.)

    Diagnosis of diabetes and blood glucose goals

    Signs and symptoms of HYPERglycemia and HYPOglycemia

    Prevention and treatment of HYPERglycemia and HYPOglycemia

    Nutritional management

    Exercise

    Self-monitoring of blood glucose

    Proper use and disposal of needles and syringes

    Not applicable: We do not provide self-management education.

    Not applicable: We do not provide self-management education that begins upon admission to the hospital.

40. A process is in place for assessing a patient's ability to self-manage their subcutaneous insulin therapy while in the hospital through the use of criteria established by the organization.

      Not implemented   Partially implemented   Fully implemented

      Not applicable: We do not allow patients to self-manage their insulin.

41. A protocol or guideline that delineates the management of patients admitted to the hospital with their own insulin pump addresses the following. (Select all that apply.)

- Criteria to determine which patients are appropriate to manage their own pumps during the admission
- Process for prescribing insulin to be given via the patient's own insulin pump, including the type of insulin, rate of insulin infusion, and criteria for adjusting the insulin dose
- Protocol for transition from a pump to subcutaneous insulin and subcutaneous insulin back to the pump
- Standard process to measure (e.g., patient's own blood glucose meter, hospital-owned blood glucose meter, laboratory) and track the patient's blood glucose level
- Mechanism or process to communicate pump setting changes made by patients to the nursing staff
- Process to document on the MAR/insulin flow sheet the amount of insulin administered via the patient's insulin pump
- Procedures for pharmacists to verify insulin if supplied by the patient
- Education programs and competency assessments for nurses who will manage these patients and their pumps
- Procedures to manage the patient/pump when the patient is not able to do so (e.g., in the case of a medical emergency or surgery)
- Criteria for when an endocrinologist, diabetic educator, or other diabetes management specialist is contacted for consultation
- Not applicable: We do not have a policy or guideline that addresses patients admitted with their own insulin pumps.
- Not applicable: We do not allow patients to use their own insulin pumps when admitted to the hospital.

42. A process is in place to ensure that patients have the medications, equipment, and supplies they need to effectively manage their insulin therapy at home (e.g., insulin, syringes or pen needles, blood glucose meter and strips, lancets and lancing device, glucagon emergency kit) *prior* to discharge.

      Not implemented   Partially implemented   Fully implemented

Concentrated Insulin Products

The following self-assessment items relate to the use of concentrated insulin, such as HumuLIN R U-500 insulin. Although this product may not be on your hospital's formulary, the potential for error still exists when patients who are utilizing concentrated insulin at home are admitted to your hospital. Thus, safety strategies to reduce the risk of error and harm with this medication should be implemented in all hospitals. In addition, there are other forms of concentrated insulin that may be on the market in the near future (e.g., U-200 insulin, U-300 insulin), so organizations should proactively implement strategies in anticipation of more widespread use of concentrated insulin.

43. Our hospital has dispensed or provided care for patients with concentrated insulin (e.g., regular U-500 insulin) in the past.

      No (Please skip to item 53.)

      Yes (Please proceed to item 44.)

44. A policy and procedure that delineates the management of patients receiving U-500 insulin has been established by the hospital.

      Not implemented   Partially implemented   Fully implemented

45. When reviewing the patient's medication list upon admission, U-500 insulin regimens, including the dose and syringe used by the patient, are validated (e.g., 30 units on a U-100 insulin syringe = 150 units of U-500 insulin; 0.4 mL on a tuberculin syringe = 200 units of U-500 insulin).

      Not implemented   Partially implemented   Fully implemented

46. U-500 insulin can *only* be ordered using a designated, standardized preprinted order form/CPOE order set.

      Not implemented   Partially implemented   Fully implemented

47. U-500 insulin is restricted to use only in insulin-resistant patients with diabetes requiring daily doses of more than 200 units.

    Not implemented   Partially implemented   Fully implemented

48. Doses of U-500 insulin are communicated and prescribed in terms of both *units* and *volume* (e.g., 200 units, 0.4 mL).

    Not implemented   Partially implemented   Fully implemented

49. Storage of non-patient-specific vials of U-500 insulin is restricted to the pharmacy.

    Not implemented   Partially implemented   Fully implemented

50. Patient-specific doses of U-500 insulin are prepared and dispensed by the pharmacy.

    Not implemented   Partially implemented   Fully implemented

51. An independent double check of the patient (using two unique identifiers), drug name, concentration, dose (in units and mL), type of syringe, and route of administration is performed prior to administering U-500 insulin.

    Not implemented   Partially implemented   Fully implemented

52. Patients who use U-500 insulin are educated about how to correctly communicate their doses in terms of the type of insulin, the actual dose in units, and the volume in milliliters or U-100 syringe units needed for each dose.

    Not implemented   Partially implemented   Fully implemented

Note: Only complete item 53 if "No" was selected for item 43.

53. In anticipation for when a patient using U-500 insulin is encountered, a protocol or guideline that delineates the management of U-500 insulin therapy exists in the organization for the following. (Select all that apply.)

We have a process in place to convert patients from their concentrated insulin to a U-100 insulin product, as we will not order, dispense, or administer U-500 insulin.

When reviewing the patient's medication list upon admission, U-500 insulin regimens, including the dose and syringe used by the patient, are validated (e.g., 30 units on a U-100 insulin syringe = 150 units of U-500 insulin; 0.4 mL on a tuberculin syringe = 200 units of U-500 insulin).

U-500 insulin can *only* be ordered using a designated, standardized preprinted order form/CPOE order set.

U-500 insulin is restricted for use *only* in insulin-resistant patients with diabetes requiring daily doses of more than 200 units.

Doses of U-500 insulin are communicated and prescribed in terms of both *units* and *volume* (e.g., 200 units and 0.4 mL).

We will allow the patient to use their own supply of U-500 insulin.

Storage of non-patient-specific vials of U-500 insulin is restricted to the pharmacy.

Patient-specific doses of U-500 insulin are prepared and dispensed by the pharmacy.

An independent double check of the patient (using two unique identifiers), the drug name, concentration, dose (in units and mL), and route of administration is performed prior to administering U-500 insulin.

Patients who take U-500 insulin are educated about how to communicate their doses correctly in terms of the type of insulin, the actual dose in units, and the volume in milliliters needed for each dose if using a tuberculin syringe or the unit mark drawn up to on a U-100 syringe.

References

1. American Diabetes Association. Standards for medical care in diabetes—2014 [online]. Diabetes Care 2014 Jan [cited 2014 Jul 1]. http://care.diabetesjournals.org/content/37/Supplement_1/S14.full

2. Minnesota Hospital Association. Hypoglycemic agent adverse drug event gap analysis: component of the medication safety road map [online]. 2012 [cited 2014 Jul 1]. http://www.mnhospitals.org/Portals/0/Documents/ptsafety/ade/Medication-Safety-Gap-Analysis-Hypoglycemic.pdf

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PENNSYLVANIA HOSPITAL ENGAGEMENT NETWORK: ORGANIZATION ASSESSMENT OF SAFE INSULIN PRACTICES—DEFINITIONS

Bar-code technology	Technology that reads bar codes with a computerized reading device, such as a scanner or imager.
Basal dose	A scheduled dose of long- or intermediate-acting insulin to supply constant blood levels of insulin and control blood glucose levels.
Computerized prescriber order entry (CPOE)	A computer system into which prescribers enter medical orders, including orders for medications.
Correction dose	A dose of rapid- or short-acting insulin administered in addition to the scheduled prandial dose when the patient's blood glucose level is elevated. The correction dose supplies supplemental insulin to account for an elevated blood glucose level.
High-alert medications (or drugs)	Medications that have a high risk of causing serious injury or death to a patient if misused. Errors with these products are not necessarily more common, but their results can be more devastating. Examples of high-alert medications are insulin, anticoagulants, opioids, chemotherapy drugs, and neuromuscular blocking agents. A complete list can be found at http://www.ismp.org/Tools/highAlertMedicationLists.asp.
Independent double check	A procedure in which two individuals, preferably two licensed practitioners, separately check each component of the work process. For example, the components that two individuals would independently check when administering an insulin infusion would include patient identity (using two patient identifiers); drug and base solution, drug concentration, and rate of infusion on the pharmacy label; blood glucose level; time of administration; pump channel selection; pump settings (e.g., drug, concentration, rate); and line attachment.
Maximum dose	The dose of a medication that represents the upper limit that is normally found in the literature and/or manufacturer recommendations. Maximum doses may vary according to age, weight, or diagnosis.
Patient-specific dose	A ready-to-administer dose of medication that exactly matches the dose ordered by the prescriber. This may or may not correspond to the manufacturer unit-dose package.
Prandial dose	A scheduled dose of rapid- or short-acting insulin given at mealtime to supply a burst of insulin to account for the intake of food (i.e., carbohydrates).
Sliding scale	The progressive change in the pre-meal or nighttime insulin doses, typically using a rapid- or short-acting insulin, based on a predefined set of blood glucose ranges.
Smart infusion pump	An infusion pump with computer software that is, at minimum, capable of alerting the user to unsafe dose limits and programming errors if standard concentrations and dose limits have been programmed into the pump's library.
Tall man letters	Refers to the use of mixed-case letters to help draw attention to the dissimilarities of certain look-alike drug name pairs. A list of look-alike drug names with recommended tall man letters can be found at https://www.ismp.org/Tools/tallmanletters.pdf.

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