**Purpose**

To describe responsibilities of nurses providing care for patients using personal external continuous subcutaneous insulin infusion pumps (insulin pumps) during hospitalization.

**Presumes Nurse’s Knowledge** [insert name of relevant hospital guidelines and links after each entry, as needed]

* Blood Glucose Monitoring
* Use of a Patient’s Own Medication
* Patient Education Process and Documentation
* Safe Work Practices Policy in the Infection Control Manual
* Patient Identification Policy in Administrative and Medical Staff Manual
* Hand Hygiene Policy in Administrative and Medical Staff Manual

**Policy**

1. Treatment by a personal external continuous insulin pump in the hospital requires the following:
   1. Electronic order panel signed by a licensed independent practitioner (LIP) listed as “Insulin Pump Order Panel” on the facility list in the computerized prescriber order entry (CPOE) system.
   2. A signed patient consent form.
   3. Patient Insulin Pump Flow Sheet to be used daily.
   4. Hospitalized patients may only be treated with an insulin pump if they want to use the pump, are alert, and are mentally and physically competent to assume complete responsibility for their own pump management, according to criteria specified in the consent form.
2. Each patient using a pump will have a minimum of 4 blood glucose measurements a day order by the LIP, obtained by a certified hospital operator using a hospital glucose meter according to hospital policy, and documented in the electronic health record (HER) according to this policy.
3. Should the patient lose consciousness of if it is determined that using the pump is no longer appropriate, the pump will be discontinued.
4. The patient needs to change the infusion set and reservoir at least every three days or earlier. More frequent changes may be needed if bleeding is noted at the site; the site is red, swollen, or warm to touch; there is pain at the delivery site; a “no delivery” alarm without tubing problem occurs; or if two blood sugar readings are greater than 300 mg/dL in 4 hours.
5. Notify primary team for any glucose value below 70 mg/dL or above 350 mg/dL. Follow orders provided by primary team for treatment.
   1. Exposure: Blood
   2. Protective Equipment: Per Standard Precautions, assess risk for blood and body fluid exposure and don appropriate personal protective equipment (PPE) (e.g., gloves, gown, mask and goggles, or full face shield and gown)

**Definitions**

* Continuous subcutaneous insulin infusion (CSII) pump:A battery-operated programmable device that delivers fast or rapid-acting insulin 24 hours a day. The insulin is stored in a syringe/cartridge/reservoir and is delivered through a soft cannula or needle connected to plastic tubing (infusion set) that is attached to the pump. The insulin pump is usually programmed to deliver basal and bolus insulin.
* Basal rate: The amount of insulin that is continuously delivered to maintain a normal glucose level/metabolic state when not eating. This rate can vary over the course of the day, with different rates either manually changed or programmed into the pump.
* Bolus dose: The amount of insulin given for meals and/or correction of acute hyperglycemia. The patient determines this dose based on the glucose reading, the size of the meal or the estimated amount of carbohydrates he/she is consuming for a particular meal, and the anticipated amount of insulin needed to correct the hyperglycemia. This dose is given all at once just as if injected by a conventional syringe.

**Guidelines**

* CONTRAINDICATIONS: The following types of patients should not be treated with an insulin pump: the patient who is critically ill, has prolonged alteration of mental status (due to illness or iatrogenic), is physically unable to alter the pump settings, is suicidal, is in diabetic ketoacidosis (DKA), or does not have pump supplies in the hospital.
* RELATIVE CONTRAINDICATIONS: The following types of patients should use caution when treated with an insulin pump: the patient who is in acute psychiatric illness (nonsuicidal), has short-term alterations of mental status (e.g., iatrogenic), or has inadequate glycemic control (as defined by the primary team, Diabetes Management Service, or Endocrine Consult Service).

**Equipment**

The following should be provided by the patient:

1. External insulin pump
2. Cartridges, reservoirs, or syringes for the insulin
3. Infusion sets, tubing
4. Extra batteries for the pump
5. Dressings, if applicable
6. Insulin

**General Information**

1. The primary team should strongly consider a request for either a telephone discussion or a consult from the Diabetes Management Service (patients on surgical services, [insert pager number]) or the Endocrine Consult Service (patients on medical or OB-GYN services, [insert pager number]). The primary team will continue to be responsible for patient care. The consult team will provide recommendations for management of diabetes if a consult has been requested.
2. Disconnection from the pump or discontinuation of insulin infusion for more than one hour will require an alternative insulin delivery. The primary team should be contacted for instructions.
3. The insulin pump should be temporarily disconnected from the patient for showering/bathing if it is not waterproof.
4. The insulin pump should be temporarily removed for MRI and CAT scan tests. **X-ray may also interfere with insulin pumps. Ask the radiologist or radiology technician if this radiologic procedure (x-ray, CAT scan, MRI, or PET scan) will interfere with insulin pump performance.** If the procedure will last more than an hour or the pump must be temporarily removed,, alternative insulin delivery should be considered. The treating LIP should be notified for instructions.
5. [Insert institution name] does not usually supply insulin for personal continuous subcutaneous insulin pumps. If a patient is in need of insulin, the pharmacy will provide the medication if it is on formulary. If the insulin is not on formulary or if patient runs out of insulin, the primary team will need to determine orders for alternative insulin delivery.

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| **PROCEDURE** | **POINTS OF EMPHASIS** |
| 1. Identify the patient using two patient identifiers. [insert appropriate policy number]. | 1. All patients using an insulin pump should be identified on admission by nursing and LIP staff. |
| 1. On admission to [insert institution name], notify the LIP that    1. The patient has an insulin pump,    2. The LIP (primary team) is responsible for obtaining a signed patient consent form for use of the pump and    3. Pump orders are required (Insulin Pump Order panel within electronic health record [EHR]).    4. Notify pharmacy of the presence of insulin pump. The patient will fill their own pump reservoir using insulin provided by [insert institution name] Pharmacy that is ordered through the insulin pump order set. | 1. If the patient insists on using their own insulin, refer to [insert policy number, Use of a patient’s own medication]. |
| 1. Provide the patient with a Patient Self- management of Insulin Pump Consent Form to review prior to the LIP having them sign the form. The consent must be signed by the patient and the LIP if the patient is to continue the insulin pump treatment during the hospitalization. | 1. The patient can review the document while they are waiting for the LIP to address their questions and ask them to sign the form. Forms are available on each unit or can be found [indicate location]. |

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| **PROCEDURE** | **POINTS OF EMPHASIS** |
| 1. At a minimum of every 8 hours, assess and document the patient’s ability to manage the pump. | 1. If the patient cannot assume full responsibility for the management of the pump, it should be discontinued and alternative insulin orders obtained. |
| 1. Confirm the provider has entered an order for the continuous subcutaneous infusion. The order will display in the PRN section of the medication administration record (MAR). |  |
| 1. Documentation [Customize to reflect institution’s process]    1. Initial documentation: Go to the IV Line Assessment Flowsheet in the EHR 2. Select “Pump Device.” 3. Enter the date and time first assessed. 4. Enter prior placement description. 5. Select the type of pump device (i.e., insulin pump). 6. Select the device orientation as well as device location. 7. Each shift, document in the EHR 8. A site assessment 9. The status of the device (i.e., infusing, patient, other). 10. Dressing status 11. Dressing intervention 12. Dressing change due |  |
| 1. Give the patient a “Patient Insulin Pump Flow Sheet” each day. This documentation is for recording the type of insulin being used, the basal rate, bolus doses of insulin and blood glucose readings from hospital glucose meter. | 1. The patient, upon signing the consent for pump use in the hospital, is required to record the amount, time, and type of insulin that he or she is administering. This document should be placed in the paper medical record when completed. |
| 1. Confirm doses with patients using the “Patient Insulin Pump Flow Sheet.” |  |
| 1. The MAR order for the insulin appears as a PRN medication. |  |
| 1. Nursing staff will document on the MAR every 8 hours that the pump is infusing. | 1. Nursing staff will not enter any insulin amounts on the MAR. The “Patient Insulin Pump Flow Sheet” will remain as the only area for documentation of insulin amounts. |

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| **PROCEDURE** | **POINTS OF EMPHASIS** |
| 1. If patient requests to use their own glucose meter, instruct them that all insulin doses and adjustments ***must*** be based on values obtained by the hospital glucose meter. Additional values (such as postprandial values) can be obtained with a personal glucose meter, but no treatment decisions should be made based on these values. |  |
| 1. Review blood sugars and insulin use continuously. Conversations with the patient and primary team are imperative if the patient is to be in charge of their diabetic management. | 1. Patients managing their diabetes need to maintain adequate glucose control. Conversations with the patient and primary team are necessary for this process to work. |

**Related Documents**

* Patient Insulin Pump Flowsheet
* Patient Self-management of Insulin Pump Consent Form

**References**

* Cook CB, Boyle ME, Cisar NS et al. Use of continuous subcutaneous insulin infusion (insulin pump) therapy in the hospital setting: proposed guidelines and outcome measures. *Diabetes Educator*. 2005; 31:849-57.
* Clement S, Braithwaite SS, Magee MF et al. Management of diabetes and hyperglycemia in hospitals. *Diabetes Care*. 2004; 27:553-9.