Personal Insulin Pump use during Hospitalization

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OBJECTIVES

1. Relate to Intermountain Commitments and Behaviors
2. Gain empathy toward a patient’s concerns regarding hospitalization and personal insulin pump use
3. Providing basic terms and understanding of insulin pump therapy
4. Process for initiation personal insulin pump use
Myths or Facts:
Insulin pumps are used only for people with severe level of diabetes control.

Insulin pumps can be used for the smallest infants to adults for improved control and flexibility in their diabetes management.
Myth or Fact: An insulin pump can effectively eliminate individual insulin injections.

Insulin pumps can deliver insulin more accurately than injections can. They can help deliver micro units of insulin at different times of days to reduce irregular fluctuations of blood sugar levels.

Down to the 0.05 unit
Myth or Fact:
People with Type 2 diabetes can’t use insulin pumps, they are only designed for people with Type 1 diabetes.

Many insulin –requiring people with Type 2 diabetes use an insulin pump with great success. It is not a last resort, but simply a different and for many, a more effective way to deliver insulin.
Intermountain Healthcare Commitments and Behaviors

I help you feel safe, welcome and at ease
I listen to you with sensitivity and respond to your needs
I treat you with respect and compassion
I keep you informed and involved
I insure our team works with you
I take responsibility to help solve problems
Patient Perspective: Hospitalization and personal insulin pump use

- Apprehension
- Lack of trust
- Loss of control

How can we help the patient?
Empathy toward a patient’s concerns
Why is it scary to come to the hospital?

General patient Comment: “They’re going to kill me here—I’m Scared”

1. Apprehension  “I help you feel safe, welcome and at ease”
2. Loss of control “I insure our team works with you”
3. Lack of trust   “I take responsibility to help solve problems”
Insulin Pumps

Delivers rapid acting insulin similar to the way the human pancreas delivers insulin. It delivers both Basal and bolus insulin therapy.
Reservoirs and Insertion sets – Tubing

Infusion set – Tubing: An infusion set includes the thin plastic tubing that delivers insulin from the pump to your body. This tubing comes in different lengths to accommodate various needs.

Reservoir: Small 2mL-3mL syringe that can hold several days of insulin.
Cannula (can.nu.la) The end of the tubing either a soft flexible cannula or a stainless steel needle
Glucose Sensors and Transmitter

A sensor measures your interstitial glucose levels every 5 minutes and sends that information through the transmitter to a receiver (a receiver monitor, insulin pump or smart phone app to display sensor glucose readings.)

Transmitter: Receives signals from glucose sensor relaying signals through radio frequency or blue tooth waves to a receiver.
Providing basic terms and understanding of Insulin Pump therapy

**Basal Rate:** Insulin that is produced by the pancreas in tiny amounts 24 hours a day
- Similar in function as long acting insulin such as Lantus, Toujeo, Basaglar, Levemir, Tresiba,
- Sometime referred to as “background” insulin

**Bolus Rate:** Insulin that is produced by the pancreas in larger amounts.
- A Bolus is given when you eat carbohydrate, or when you have a high blood glucose level.
Basal/Bolus Insulin Delivery

Carbohydrate counting matches your pre-meal bolus of insulin to the actual amount of food you plan to eat.
Pump and Sensor Resources: Look on back of pumps for Custom Support numbers

Minimed Insulin Pump & Enlite/Guardian Glucose Sensors
Medtronicdiabetes.com Customer Support: 1-800-646-4633
Tool Bar: Support→ Alerts & Alarms, Infusion Sets, Insertion & Site Management

Animas Insulin Pump- Ping & Vibe
Tool bar: Training & Education

Onmipod- Tubeless pump
Toolbar: Learning Center→ Troubleshooting

Continuous Glucose Monitoring Systems

Dexcom
Dexcom.com Customer Support: 1-844-607-8398
Toolbar: Support → Tutorials

Minimed Enlite/Guardian Glucose Sensors
Medtronicdiabetes.com Customer Support: 1-800-646-4633
Initiating Insulin Pump Therapy in Hospital Setting

1. Subcutaneous Insulin Pump Order Set
2. Criteria for a Patient to use Insulin Pump while Inpatient
3. Continuous Subcutaneous Insulin Pump Therapy Pt. Agreement
4. Subcutaneous Insulin Pump Daily Log
Subcutaneous Insulin Pump Order Set

- Eliminate all other previous hospital insulin orders and initiate subcutaneous insulin pump
- Elude consult per facility specific process (i.e., Diabetes Educator, Diabetes Management Team)
- If subcutaneous insulin pump is stopped, notify physician immediately and obtain order for alternate insulin administration
- Inhibit hypoglycemia protocol for any blood glucose <90 mg/dL; adult >80 mg/dL; pediatric
- Patient/designated trained caregiver to self-administer insulin via subcutaneous insulin pump and document all insulin dosing on the Subcutaneous Insulin Pump Daily Log Sheet
- Nurse to review and verify that patient/designated trained caregiver is documenting on the Subcutaneous Insulin Pump Daily Log Sheet every shift
- Patient/designated caregiver to change insertion set/site every 48-72 hours and per
- Stop insulin pump usage if patient is unwilling to follow process or is physically/mentally unable to manage insulin pump

Check blood glucose (see hospital blood glucose monitor):

- ACME
  - Every 4 hours
  - Every 6 hours
  - CO2O
  - Other

Elix.:

- Regular
- Other
- Dietitian consult

Subcutaneous Insulin Pump Orders: (for use in subcutaneous insulin pump) Pharmacy will send val to unit, patient to fill own pump

- Liraglutide (Humalog) Do Not Substitute
- Insulin Aspart (Novolog) Do Not Substitute
- Insulin Glulisine (Apadale) Do Not Substitute
- Other:

Pump Settings

- Basal Rate
- Carbohydrate Ratio
- Target Blood Glucose (BG)

<table>
<thead>
<tr>
<th>Time</th>
<th>Rate</th>
<th>Time</th>
<th>Ratio</th>
<th>Target BG</th>
</tr>
</thead>
</table>

Correction Intensity

<table>
<thead>
<tr>
<th>Time</th>
<th>Rate</th>
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24 hr Total Insulin

Insulin Action Time/Insulin on Board

CGM Date of site change

- Patient to continue using current pump settings
- Patient to continue basal rates only
- Patient to make the following changes to pump settings:

Notify Physician for any of the following:

- If the subcutaneous insulin pump is discontinued for any reason
- If blood glucose is >300 mg/dL, two times consecutively
- If there is any 60 mg/dL, adult = 80 mg/dL, pediatric
- If patient is unwilling or physically/mentally unable to use insulin pump
- If patient is or will be NPO or changes to IF, TPN, or tube feedings

Physician Signature

Date

Time
Criteria for a Patient to use Insulin Pump while Inpatient

- Patient* is alert and oriented
- Patient must be able to use pump -physically and cognitively
- Patient must be assessed upon admission, every 4 hours, and prn any changes
- Patient willing to use own insulin pump appropriately
- Patient must fill out bedside log form
- Patient is to provide own noninsulin pump supplies
- Hospital to perform blood glucose monitoring
- Physician order to use own insulin pump
- Patient cannot be in DKA
- Patient is not a suicide risk
- Patient is not critically ill requiring intensive care
- Other circumstances identified by physician (ie: MRI, surgical procedures, medications)

*Caregiver may also be designated to complete patient responsibilities

Hospital Admission and Ongoing Procedures for Patients Receiving Subcutaneous Insulin Pump Therapy

- Admit nurse identifies that patient has a personal insulin pump during initial physical assessment
- Patient assessed upon admission, every 4 hours, and prn any physical or neurological changes and any hyperglycemic or hypoglycemic events
- Staff identifies presence of insulin pump, type/name of insulin used, and current pump settings
Continuous Subcutaneous Insulin Infusion Pump Therapy Patient Agreement

For your safety and optimal medical care during this hospital stay, we request that you agree to the following recommendations. If you feel you cannot agree to these recommendations, we would like to treat your diabetes with insulin injections and request that you discontinue the use of your insulin pump.

During my hospital stay, I will agree to:

1. Allow the hospital to monitor my blood glucose.
2. Show the nurse the bolus dose I am giving with each blood glucose, as needed.
3. Show the nurse my basal rate. Changes in any of my basal rates will only be made with a physician’s order.
4. Fill out the Subcutaneous Insulin Pump Daily Log Sheet
5. Change the infusion set every 48-72 hours or as needed for:
   a. Skin problems or
   b. Two consecutive blood glucose readings greater than 300 mg/dL
6. Provide my own non-medication insulin pump supplies.
7. Show and report the total daily dose of insulin.
8. Report signs of low blood glucose to the nurse.
10. Ask questions that I may have about the use of the pump or physician orders.
# Subcutaneous Insulin Pump Daily Log

**Today's Date:**

| Time  | 12 AM | 0 AM | 7 AM | 8 AM | 9 AM | 10 AM | 11 AM | 12 PM | 1 PM  | 2 PM  | 3 PM  | 4 PM  | 5 PM  | 6 PM  | 7 PM  | 8 PM  | 9 PM  | 10 PM | 11 PM |
|-------|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Glucose levels |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Insulin bolus for carbohydrates |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Insulin bolus for high glucose correction |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Grams carbohydrate |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Site location |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Date/time of site change |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Indicate if insulin reservoir was filled |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Indicate if pump suspended or use of temporary basal rate |       |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |

## PUMP SETTINGS

<table>
<thead>
<tr>
<th>Basal Rate</th>
<th>Correction/ Sensitivity</th>
<th>Target BG</th>
<th>Carbohydrate Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Rate</td>
<td>Time</td>
<td>Dose</td>
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- 24 Hour Total Basal Dose
- Insulin Action Time/Insulin On Board
- CGM
- Date of Site Change:
**RN ROLE**

- Initiate Personal Insulin Pump Protocol when orders received
- Review Criteria and Patient Agreement with patient/ family
- Determine patient has all pump supplies from home
- Explain daily log to patient/family and PCT (all should work together to coordinate)
- PCT will continue to monitor and record glucose levels in electronic chart.
- RN will record insulin doses as per insulin pump in electronic chart.
- Notify Diabetes Education that pump protocol is initiated.
What is the Diabetes Educator Role?

• Interrogate the Pump Functions
• Determine current settings
• Assess patient/family knowledge of pump function
• Assist with replacing pump site (pt. generally can do this independently)
• Support the nursing and medical staff in decision making
• Set the Temporary Basal rate as needed if pt. still has Long acting insulin on board.
What Diabetes Educators Can NOT Do

- Provide Pump Supplies
- Initiate insulin pump therapy for a person not previously on a pump
- Adjust pump settings including Carb ratio, Correction scale, or basal rates.
Trouble Shooting Pumps

If patient is admitted with DKA **ALWAYS** remove the insulin pump including removing the insertion set.

#1 cause of DKA when wearing a pump is related to the cannula either from bent cannula or occluded cannula. The only way to determine this is to remove it.
Trouble Shooting (continued)

- Tubing has a leak/tear/knot/crimped/cat bite
- Tubing not connected to insertion site
- Reservoir is empty
- Battery is dead
- Insulin has gone bad
- Pump malfunction
Reminder

- Re-establishing Pump Therapy is **NOT** an emergency
- Subcutaneous Basal/Bolus insulin injections can be continued until:
  - Pump Supplies are available
  - The pump is determined to be properly functioning
  - Patient/family are able to assume responsibility for proper use
Thank You for coming

Questions??