“My patient has a pump!... What do I do now?”

An Overview of Diabetes Technology in the Hospital Setting

Tamara Swigert, MSN, RN, CDE
Tamara.swigert@dhha.org
• Tammy Swigert has no conflicts of interest to disclose, with the exception of the following:
  • Tammy wears an insulin pump and CGM. Her current model is manufactured by Medtronic; CGM system is manufactured by Dexcom.
  • Tammy has been certified as a pump trainer on the following pumps:
    • Medtronic (multiple models)
    • T-slim
    • OmniPod
    • Animas (not current model)
  • Tammy does not currently receive any compensation from any insulin pump manufacturer.
At the end of this presentation, the participant should be able to:

1. Describe how an insulin pump works, including basic pump concepts.

2. List “five Cs” (actions) that frontline nursing staff should take when they have a patient who is using a pump.

3. Distinguish between appropriate hospitalized pump candidates and inappropriate pump candidates.

4. Discuss guidelines for pump use in the hospital.
What is an insulin pump (CSII) anyway?

- Medical device that delivers insulin
- Attached to the body via small cannula
- Worn continuously (24/7)
- Infusion set and reservoir is changed every 2-3 days
- Only fast-acting insulin is used in pump
  - *Humalog, NovoLog, Apidra*, *Regular*, or *U500* insulin

* Very uncommon
Who might use an insulin pump?

People with Type 1 diabetes (kids and adults)

People with Type 2 diabetes requiring insulin (with very low C-peptide levels)

Those with DM who are pregnant (need maximum control and frequent insulin titration)
WHY an insulin pump?

- Facilitates better glucose control
- Allows for more flexibility in the patient’s lifestyle
- Allows more flexibility in meal planning
- Eliminates need for multiple daily injections
- Mimics physiological insulin delivery
- May prevent complications
- May prevent severe hypoglycemia
- Less insulin variability > Less swings in blood glucose
A typical profile of basal insulin rates in CSII: Many people are more insulin resistant before dawn, more sedentary after dinner, or hypoglycemic at night, necessitating adjustment to the basal rate.

Deliver Customized Boluses

What does the research show?

• Better glycemic control: CSII more effective at lowering A1C, compared to multiple daily injection (MDI) therapy

• Less severe hypoglycemia episodes (3 studies, 1996, 1999, 2002)

• Better control with less risk: *5-Naitons Study* (2006) showed improved A1C with no increase in hypoglycemia, compared with MDI

• No increased DKA in study subjects: Devries (2002) reviewed 4 studies which showed no change in rates of DKA compared to MDI (2002 and 2003, mean duration: 32 weeks, total of 79 patients)

• Improved patient satisfaction
What are some potential downsides of pump therapy?

- Can cause weight gain ("blank check" effect)
- Possible increase risk of DKA (if not properly prepared)
- High cost
- Patient feels "attached" (on leash)
- Intensive training/self-management (for patient)
- Complex management requires specialty care
What patient characteristics are key for success?

- Have a solid understanding of diabetes
- Know how to count carbohydrates
- Be willing to monitor blood glucose often
- Have reasonable expectations of pump therapy
- Hypoglycemia and DKA prevention/plan
- Have a sufficient payment source (i.e. insurance)
- Internally motivated (vs “talked into”)
- Follow up routinely with provider
- Okay with disclosing their dx to others
Who Should Prescribe Pumps?

“... insulin pumps should only be prescribed by clinicians who possess the necessary knowledge, skills, and resources to provide effective and safe initiation and maintenance of the complex and time-consuming therapy”*

- Keep in mind ...
  - Pump patients need to be seen more frequently, especially at first
  - Pump clinic visits require considerably more time than regular diabetes/insulin titration visits
  - Pumps require annual prescriptions and letters of medical necessity (which must include lab values, clinical notes, etc.)
  - Extra training required for medical professionals, but this can usually be obtained the respective companies (at no cost)

* AACE/ACE Consensus Statement on Insulin Pumps, 2014
What about insulin pumps makes healthcare professionals uneasy?

<table>
<thead>
<tr>
<th>Lack of experience and expertise (out of our comfort zone)</th>
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<tr>
<td>Relies on the patient input to determine dose</td>
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<td>We have to take the patient’s word for it (boluses, etc.)</td>
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<td>We do not control or supply the consumable parts</td>
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<tr>
<td>When glucose is not in target it is hard to pinpoint why</td>
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<tr>
<td>When we do have an idea, how do we make the change?</td>
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<tr>
<td>Expertise (to advise, verify, etc.) is in short supply</td>
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<tr>
<td>It is possible for users to manipulate</td>
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How do Pumps Work?

Pumps deliver insulin in 2 phases (with rapid-acting insulin):

**BASAL**
- A constant “background” amount of insulin
  - Maintains ongoing metabolism during fasting

**BOLUS**
- Insulin coverage for meals
  - Extra correction insulin for a high glucose level
Pump Concepts

**Basal Rate(s)**

- Basal rate determines how much insulin is delivered per hour.
  - Example: Basal rate of 0.8 means 0.8 units will be delivered over the course of the hour
  - Basal rates can differ throughout the day.
    - Pumps allow for up to 48 different rates to be set (can change up to every 30 minutes)
    - Helpful in managing hypoglycemia as well as dawn phenomenon, etc.
  - The schedule of all basal rates over a 24-hour period is called a basal profile/program
**Insulin:Carb Ratio (ICR)**

- A ratio that equates one unit of insulin to treat the glycemic effect of a specific amount of carbohydrates
  - Example: ICR = 1:10 (or “10”)  
    - 1 unit will be given for every 10 grams of CHO entered
  - Example: ICR = 1:3 (or “3”)  
    - 1 unit will be given for every 3 grams of CHO entered
  - The smaller the number, the more insulin delivered.
Pump Concepts, cont.’d

**Sensitivity or Correction factor:**

- The expected drop in blood glucose (mg/dL) for every unit of insulin delivered.
- Example: $CF = 40$, current BG is 160, it is expected 1 unit will decrease BG to 120.
- The smaller the number, the more insulin delivered when making a correction.
Pump Concepts, cont.'d

- **Active insulin or insulin-on-board**
  - Pump tracks amount of insulin likely still active in a person’s bloodstream when providing correction insulin (to prevent overtreatment and hypoglycemia).
  - Measured in hours (average: 3 to 4 hrs)
  - Less hours for youth, more hours for older adults or renal impairment

- **Blood Glucose Target**
  - Blood glucose value that the pump uses to calculate needed insulin.
  - May be a single target value or a range
  - Pump will “correct” to maximum target and subtract from meal insulin to reach minimum.
## Pump Concepts, cont.’d

| Temporary Basal Rate option: | • Enables user to increase or decrease the current basal rate for a specified amount of time (typically in %).  
• Appropriate for exercise, sick days, etc. |
|-------------------------------|---------------------------------------------------------------------------------------------------|
| Alternate Basal Profile options: | • Can match basal program to activity level, work/sleep schedule, etc.  
• Helpful for work, weekends, menstrual cycles, steroid treatment, marathons, etc. |
| Extended/Square Wave bolus options: | • Bolus (or a portion of the bolus) can be delivered over a specified period of time, ranging from 30 min. to multiple hours.  
• May be useful for high-fat meals |
Pumps today all offer...

- Way to look up basal rates and all settings
- Easy suspend option (often on 1st screen)
- Confirmation of last bolus administered
- Home screen: battery, insulin left, alarms, etc.
- Intuitive menus under which info/options fall
- Report that can be downloaded (for analysis)

- Most of the time you can find what you need by scrolling through menus
- Make sure pump is not connected to patient when pushing any buttons
A brief history of pumps ...

You’ve come a long way, baby!

Dr. Arnold Kadish (1963) with first insulin pump.

Pump Technology:
1978-1987

AutoSyringe AS 2C 1979
AutoSyringe AS 6MP 1983
C.P.I. 9100 1982
Travenol Eugly 1984
C.P.I. Betatron II 1983
MiniMed Technologies Model 504-S 1987
Anatomy of a pump

Infusion set with catheter under the skin; tubing can easily detach for showers, swimming, etc.

Reservoir (filled with insulin)

Tubing

Pump
Continuous Glucose Monitoring (CGM)

- Small and inconspicuous sensor in subq tissue; with transmitter
- Some systems need to finger stick (to calibrate and verify)
- Measures glucose in interstitial fluid (versus blood)
- Expensive (most insurances will cover for type 1, however)
  - Now Bluetooth enabled
  - Accuracy has improved significantly
  - Three “players” in the market, all with unique features
    - Future uses ... inpatient setting, artificial pancreas!
Pump with CGM (Continuing Glucose Monitoring)

A: Insulin pump and receiver (where the user sees the sensor data)

B: Pump infusion set and tubing (through which insulin is delivered)

C: Sensor: inserted into skin; collects glucose samples in interstitial fluid

D: Transmitter: sends glucose data to the receiver (pump)
What types of pumps might my patients have?

- Medtronic 530G®
- Medtronic 630G® /670G®
- Insulet OmniPod®
- Tandem t:slim X2®
- Accu-Chek Spirit Combo®
- Animas Vibe®
Can pumps self-adjust insulin?

Recently FDA-approved Medtronic 670G is one step closer to “closed loop” artificial pancreas:

- FDA approved September 2016
- CGM provides constant data on BG level
- Pump adjusts basal rates up or down as glucose rises/falls (within parameters)
- Goal is to keep BG at specific target
- Less variability, hypoglycemia, hyperglycemia
- Suspends if BG hits low threshold; restarts when BG back within acceptable range
- User still boluses for meals
- Other companies have similar models “in the pipeline”
Are pumps even recommended in the hospital setting?

American Diabetes Association (2017) recommends that pump therapy may be appropriate for select youth and adult patients if the following conditions apply:

• Patient has cognitive and physical skills needed to perform diabetes self-management actions.

• Patient demonstrates good understanding of his/her regimen, equipment, carb counting, etc.

• Hospital has a policy and procedures delineating guidelines for pump therapy including the changing of infusion sites are advised.

“My patient has a pump! What do I do?”

First ... Don’t Panic!
Then ... remember the “Five C’s”

Consult policy:
• What is expected of me in my role?

Consider:
• Is pt appropriate for pump therapy?

Check:
• Are the correct orders, etc., in place?

Contact:
• Alert the Diabetes Clinical Specialist

Chart:
• Record all settings, insulin infused, etc.
SHARP Subcutaneous Insulin Pump Therapy (SIPT) Policy & Procedure
Sharp Insulin Pump Policy/Procedure

**Patient Selection**
- Medical status, level of alertness, competency, procedures patient will undergo

**Physician Responsibilities**
- Initial assessment, orders, referrals, follow-up

**Nursing Responsibilities**
- Assessment/agreement, provide assist pt. with log, monitor glucose, treat hypo, document

**Patient Responsibilities**
- Demonstrate understanding, provide supplies, log all activities (BG, CHO eaten, insulin given)
<table>
<thead>
<tr>
<th>Nursing Actions (per SIPT policy)</th>
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<tbody>
<tr>
<td><strong>Provide/review forms/signage</strong></td>
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<tr>
<td>• Patient questionnaire (to assess competency), agreement, provide log and instruct on its use, post sign</td>
</tr>
<tr>
<td><strong>Pump activities documentation</strong></td>
</tr>
<tr>
<td>• Ensure patient is documenting basal rates, CHO eaten, BG, insulin boluses given, site changes, other activities (RN signs)</td>
</tr>
<tr>
<td>** Communicate with Pharmacy**</td>
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<tr>
<td>• Notify pharmacy, request inspection of insulin vial prior to administration; collaborate if using uncommon insulin</td>
</tr>
<tr>
<td><strong>Disconnect/remove as needed</strong></td>
</tr>
<tr>
<td>• Some procedures require temp disconnection; may require alternative insulin orders, reconnect as appropriate</td>
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</tbody>
</table>
Subcutaneous Insulin Pump

**Disconnect** for: X-ray, Fluoroscopy, CT Scan, MRI, Surgery & Hyperbaric Therapy

Continuous Glucose Monitor (CGM)

**Disconnect** Sensor, Transmitter & Receiver for: CT Scan, MRI, Diathermy, Electro-Cautery and Direct X-Ray

**Shield** Transmitter and Sensor & **Keep** Receiver out of area for: Indirect X-Ray, Body Fluoroscopy, Bone Density, Cardiac Catheterization, Nuclear Stress Test, Pacemaker/AICD Placement or reprogramming

CGM Components:  A. Transmitter    B. Sensor    C. Receiver
Not all hospitalized patients who use pumps at home may be good candidates for pump therapy in the hospital, including most of the example below. Which case below is NOT an automatic *disqualification* for pump therapy in the hospital?

A. Confused and combative
B. Does not have infusion set supplies and no way to get
C. Cannot tell you all pump settings without looking at the pump
D. Expressing suicidal ideation
Is my patient appropriate for pump therapy?

**If the patient is alert,** consider continuing.

- However, nursing is responsible for knowing details of insulin delivered via pump, which will require patient cooperation.
- What about family member/caregiver?

**Is patient familiar with and competent to operate the pump?**

- Consider Patient Insulin Pump Questionnaire

**For consideration patient must understand and sign the insulin pumps therapy agreement.**

- Lists patient and nurse responsibilities.
- Informs patient of situations when it may need to be discontinued.
The Patient Insulin Pump Questionnaire

Patient insulin pump safety is a primary concern at Sharp HealthCare. For you to continue with the use of your insulin pump while in hospital you must demonstrate that you are able to independently self-manage your pump and insulin requirements. If you are unable to answer any of the questions below your physician will be contacted and alternate insulin delivery may be necessary.

1. The brand of my insulin pump is:
   - [ ] Medtronic Paradigm
   - [ ] Omnipod
   - [ ] Animas
   - [ ] Coz More
   - [ ] Accu-Chek Spirit
   - [ ] Other ________

2. The serial number of my insulin pump or PDM (Omnipod only) is ________

3. My infusion site is currently located on ________ (body area)

4. I last changed my site and infusion set on ________ (date)

5. Who changes your site and infusion set ________

6. I have brought the following insulin pump supplies with me:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin</td>
<td>Tape (i.e. Tegaderm, IV 3000)</td>
</tr>
<tr>
<td>Batteries</td>
<td>Blood Glucose Meter</td>
</tr>
<tr>
<td>Reservoir / Cartridge</td>
<td>Blood Glucose Strips</td>
</tr>
<tr>
<td>Infusion set / tubing</td>
<td>Skin prep</td>
</tr>
</tbody>
</table>

7. My personal blood glucose goals: Fasting ________ before meals ________ Bedtime ________

8. My Basal rates are:

<table>
<thead>
<tr>
<th>TIME</th>
<th>Insulin Units/ Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 AM TO ________</td>
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<tr>
<td>TO ________</td>
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<tr>
<td>TO ________</td>
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</tbody>
</table>

9. I give the following insulin dose with each meal:

<table>
<thead>
<tr>
<th>MEALS</th>
<th>Insulin Units/ Grams of Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAKFAST</td>
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<tr>
<td>LUNCH</td>
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<td>DINNER</td>
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<tr>
<td>SNACKS</td>
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</tbody>
</table>

10. One (1) unit of insulin will lower my blood glucose ________ points

11. I give meal boluses with (check all that apply):
   - [ ] Standard bolus
   - [ ] Dual wave bolus
   - [ ] Square wave bolus
   - [ ] Other meal bolus

   Patient Identification

<table>
<thead>
<tr>
<th>Patient Signature:</th>
<th>Date/Time:</th>
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</thead>
<tbody>
<tr>
<td>Family/Guardian Signature:</td>
<td>Date/Time:</td>
</tr>
<tr>
<td>RN Signature:</td>
<td>Date/Time:</td>
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</tbody>
</table>

Place in the chart when completed. To be scanned as part of the permanent records.

SHC-D-4348 (Questionnaire)
SHARP
PATIENT INSULIN PUMP THERAPY AGREEMENT

Pump therapy is a form of diabetes self-management not commonly used in a hospital setting due to hospital liabilities, training required to use a pump and changes that may affect patient ability to use the pump in a hospital setting. Sharp HealthCare respects your wish to maintain tight control through the use of your pump, but must ensure that your treatment is both safe and effective. Please read the guidelines below and sign that you agree to comply with the following hospital requirements.

It is my responsibility to:
- Notify the nurse and complete the Insulin Pump Flow Sheet each time I give myself a bolus
- Show the nurse my basal rate(s) and comply with changes in the basal rates made by the doctor
- Maintain the Insulin Pump Flow Sheet, keeping it current with self-treatment
- Change the infusion set and site every 48-72 hours or as needed for skin irritation or two consecutive (in a row) blood sugar readings greater than 240mg/dL.
- Provide my own insulin pump supplies, including insulin, x3 insertion sets, pods, etc.
- Report signs/symptoms of low blood sugar to the nurse
- Report to the nurse any pump problems or suspected malfunction
- Check the insulin pump to make sure there is enough insulin for the day and document the amount on the flow sheet
- Document my blood sugar results a minimum of 4-6 times per day or per doctor’s order

The nurse will:
- Treat low blood sugar by providing snacks as needed or glucose per hypoglycemia protocol
- Call doctor for alternate insulin delivery order if indicated
- Check Infusion site every shift for redness or swelling
- Perform all blood sugar testing using the Hospital glucometer at least before meals, bedtime and 02:00 or every 4 hours if not eating.

Other Information:
I understand that my pump may be discontinued and a different method of insulin delivery given to me for any of the following:
- Changes in my judgment, level of awareness or consciousness
- Inability to fully cooperate with my healthcare team’s medical recommendations
- Any radiology/electromagnetic procedure that requires removal of the pump
- Failure to bring in ALL of my own pump supplies, x3 insertion sets, pods, insulin etc.
- An adverse event related to suspected pump malfunction. Should this occur, SHC will sequester the pump to evaluate the device per P&P # 06010.99, Defective Medical Devices.
- If caregiver is unable to stay 24hr/day and is overseeing the management of my pump

I have reviewed and agree to comply with all the above specifications in order to continue the use of my insulin pump in the hospital setting. I agree to be an active participant and will conform to the hospital requirements. In the event that my physician and healthcare team determine a change has occurred that interferes with my ability to use the pump it will be discontinued and an alternative insulin delivery method implemented. I agree to fully cooperate with my healthcare team recommendations and understand this is for my personal safety and recovery.

Patient’s Signature __________________ Date/Time ______
Family/Guardian Signature: __________________ Date/Time ______
RN’s Signature __________________ Date/Time ______

Place in the chart when completed. To be scanned as part of the permanent records

SHC-O-4348 (Agreement)
Bedside Subcutaneous Insulin Pump Flow Sheet
Patient to complete daily. The patient must complete daily.

<table>
<thead>
<tr>
<th>INSULIN (Select One):</th>
<th>Aspart (Novolog®)</th>
<th>Gliclazide (Apidra®)</th>
<th>Lispro (Humalog®)</th>
<th>Regular (Novolin®)</th>
<th>U500 Insulin</th>
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Site Change: Yes ___ No ___ New Site Location: ______________________________________________________________________________________

Comments:

Pt. Signature:
(Patient/Parent/Conservator/Guardian)

Reviewed by RN __________________ Date/Time: ________________
Reviewed by RN __________________ Date/Time: ________________
Reviewed by RN __________________ Date/Time: ________________

Patient Identification

Place in the chart when completed. To be scanned as part of the permanent records.

Revised: 10.20.16
SHCD-4348 (Flowsheet)
Case Study: The physician tells you that she has just put in orders for your patient to continue his insulin pump. When you check the EMR, you see all of the following orders in addition to the pump order. Which one should you immediately question?

A. 18 units glargine (Lantus®) insulin QHS
B. Hypoglycemia protocol for BG <70 mg/dL
C. POC glucose checks AC/HS
D. Diabetic diet
E. NPO after midnight
Test your understanding ...

For which one of the following patients will the insulin pump need to be removed (assume all have type 1 DM)?

A. In the ED for compound fracture; BG is 220 mg/dL, insulin orders pending

B. On med/surg unit with BG of 65 mg/dL

C. On step-down unit, just made NPO for surgery

D. In ICU; labs have just confirmed DKA (GAP: 27)
What if it is determined that the pump needs to be removed?

If pump therapy in the hospital is not a viable option for a patient who normally wears one, it may need to be removed.

- If a person wears a pump it means he/she is INSULIN DEPENDENT. What is the insulin replacement plan?
- Even if pump is d/c, settings can be used to determine most appropriate insulin orders.
- Revisit appropriateness as patient condition or situation changes.
- Ensure pump is stored appropriately and not misplaced.
Test your understanding …

If your patient must temporarily disconnected from his/her pump, what is the maximum amount of time before supplemental insulin is required?

A. 10 minutes
B. No set time; dependent on glucose level
C. Right away if eating but indefinitely if not eating
D. 2 hours
A pump should be disconnected for all of the following procedures except one. For which procedure below is it OKAY to leave the pump on?

A. X-Rays
B. Interventional procedures (IR, Cath Lab)
C. Computerized Tomography (CT)
D. Ultrasound (no Fluoroscopy being used)
E. Magnetic Resonance Imaging (MRI)
### Pumps/CGMs during Procedures

*(v) Denotes Should **NOT** be Exposed to Magnetic Fields and Radiation |

<table>
<thead>
<tr>
<th>Procedure</th>
<th>CGM Only</th>
<th>Insulin Pump Only*</th>
<th>CGM and Insulin Pump*</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>~Do Not Bring Pump/Transmitter/Sensor/Receiver into the same room where the procedure is being performed.</td>
</tr>
<tr>
<td>CT-Scan</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>~Teflon/plastic infusion set can remain in. Other types of Infusion sets must be removed.</td>
</tr>
<tr>
<td>Electro-Cautery</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Diathermy Treatments</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Direct X-Ray</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cardiac Catheterization</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Nuclear Stress Test</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pacemaker/AICD Placement/reprogramming</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
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*Pump may be disconnected from tubing and placed behind protective shield.
# Pumps/CGMs during Procedures

**(v)** Denotes a lead apron that completely covers the Sensor and Transmitter must be worn during the procedure.

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<tr>
<td><strong>X-Ray - Body Fluoroscopy</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>~ Teflon/plastic infusion set can remain in. Other types of Infusion sets must be removed.</td>
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<td>(Cardiac Catheterization; Nuclear Stress Test;</td>
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<td>Pacemaker/AICD Placement/reprogramming)</td>
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<td><strong>Bone Density</strong></td>
<td>X</td>
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<tr>
<td><strong>Portable X-ray</strong></td>
<td>X</td>
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*Pump may be disconnected from tubing and placed behind protective shield.
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<tr>
<td>Colonoscopy</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>No Restrictions</td>
</tr>
<tr>
<td>EKG</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Laser Surgery</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Ultrasound</td>
<td>X</td>
<td>X</td>
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Personal Story ...

• Surgery in March with overnight stay
• Major concern is glucose control
• From past experience, I know that subq injections may not offer optimal control
• Would they take off my pump/CGM?
• How did it go?
What needs to be charted?

Patient manages, but RN must still document:

- Pump settings:
  - Basal rates
  - Insulin/carbohydrate ratio(s)
  - Correction/sensitivity factor(s)
  - Glucose targets
  - Active insulin time
- Any insulin the patient delivers via pump
- The patient’s blood glucose levels (even if patient has/uses own meter, must still check using institutional meter)
How can I learn more about a pump?

There are multiple resources to help you understand this piece of equipment better. Before requesting removal, consider:

- **Pump patients have typically had comprehensive training ... Ask them!**

- **Consult hospital policy & resources**

- **Call the toll-free number for assistance (you can find this number on every pump)**

- **Go to pump website to learn more (most have a “providers’ guide” section)**

- **Always contact (page) the inpatient diabetes educator.**
Case study: Your patient is using a pump with CGM. Just before lunch, the patient’s BG reads **249** on the hospital meter and **217** on her CGM. Which value should be used to calculate the correction insulin to be given with the lunch dose?

A. CGM (it is integrated and calibrated with system)

B. Hospital meter (per policy)

C. Average of the two values

D. Decision is up to patient

E. Must contact provider to decide, since difference is significant
If an insulin pump needs to be discontinued, where should the pump be kept?

A. In the patient’s bedside table or a secure area on the unit

B. With a relative or friend for safe keeping; have the recipient sign a note saying they received.

C. At the main nurse’s station (so only staff have access)

D. In pharmacy (along with patient’s insulin vial)
Professional Guidelines for CSII

- 2014 Consensus Statement by the American Association of Clinical Endocrinologists (AACE) and the American College of Endocrinology Insulin Pump Management Taskforce

- 2007 Consensus Statement on Use of Insulin Pump Therapy in the Pediatric Age-Group Endorsed by American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD)

- 2006 American Academy of Pediatrics Position Statement on Use of Insulin Pump Therapy in Very Young Children With Type 1 Diabetes
For more information...

- http://www.medtronicdiabetes.com/
- http://www.animas.com/
- http://www.myomnipod.com/

- Also ...
  - http://integrateddiabetes.com/insulin-pump-comparisons/