STEPP-UP Instructors Manual

SESSION 6: How Do I Use an Insulin Pump?

Objectives

Goals of Class:
The purpose of this class is to provide information to patients with type 1 diabetes that will show you the steps for starting pumps with tubing and pumps without tubing. It will provide all the steps of an insulin pump, how the pump works, how to program the pump and how to solve common pump problems. Patients' understanding of the knowledge will translate into specific skills. Patients will be frequently assessed to determine their comprehension of knowledge and acquisition of skills.

After this session, participants will be able to:

- Explain the difference between pumps with tubing and a pump without tubing
- Describe the basics of filling pump reservoirs
- Describe the basics of inserting infusion sets or pods
- Explain what a basil setting is
- Explain what a bolus calculator does
- List common pump problems
- Discuss the importance of ketone testing and how it is done

Materials Needed

- ❑ Sign-in sheet
- ❑ Pens, pencils, markers
- ❑ Name tags
- ❑ Flip chart - to keep track of "parking lot items" or questions, participant responses
- ❑ Sample pump without tubing
- ❑ Pump supplies for tubeless pump (pod packet, needle, syringe and PDM)
- ❑ Pump supplies for pump with tubing (infusion set, tubing, inserter)
- ❑ Sharps container
- ❑ Saline vial
- ❑ Ketone bottle and strips
- ❑ Alcohol pads
- ❑ Copy of guide: How Do I Use An Insulin Pump?
- ❑ Handouts in English and Spanish:
  1. *Agenda*

Before the Session

- Give all participants a reminder call the day prior to class.
  - Ask them to bring water, a snack in case of low blood sugar, and bring a pen or something to write with. Instruct them on class logistics (parking, location, floor, etc.).
- Set up the classroom with enough tables and chairs. Try to arrange it in a formation that facilitates group participation (such as a circle or U shape).
  - ❑ Prior to class set up the sample insulin pumps and pump supplies as well as alcohol pads, saline vial, ketone supplies and sharps container.

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Agenda	Estimated Time
I. Welcome	3 minutes
II. Introduction a. Icebreaker	10 minutes
III. Using an Insulin Pump Session **A.** Getting started with an insulin pump **B.** What are the steps for starting pumps with tubing? **1.** How do I take of my pump with tubing? **C.** What are the steps for starting a tubeless pump? 1. How do I take of my pump with tubing? **D.** What do I need to know about insulin and the pump? 1. What is basal insulin? 2. What is bolus insulin? 3. How do basal doses work with the pump? 4. How does rapid acting insulin work? 5. How do bolus doses work with the pump? 6. What is a correction bolus? 7. How would I cancel or stop a bolus with the pump? 8. What is the basal rate setting? 9. What is a bolus calculator? **E.** How Can I stay safe when I am using the pump? 1. How will I know the pump is working right? 2. What are the basic rules when I use the pump? 3. How do I deal with sudden high blood sugars when using my pump? 4. What should I do if I am feeling sick? 5. What should do if I am not feeling sick but have high blood sugars? 6. Why should I check for urine ketones and how do I do it? **F.** What are the common pump problems and how do I troubleshoot? 1. Who can I call if I am having a problem with my pump? 2. How do I know if my pump fails or is not working as it should? 3. What should my plan be if the pump fails? 4. What do I do if the pump falls off? 5. What if I start to have an allergy to the tape? 6. How do I know if the infusion site gets infected? 7. What do I do if the infusion site gets infected? **G.** Conclusion	65 minutes
IV. Closing	2 minutes

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I. WELCOME (3 MINUTES)

A. Greet participants as they arrive, give them a nametag to fill out.
B. Give each participant a participant notebook with handouts

II. INTRODUCTION (10 MINUTES)

[If the space allows, set up tables and chairs in a U shape so everyone can see each other. Make the nutrition session as interactive as possible; ask questions frequently and get everyone involved.

A. *Welcome everyone to the program. Begin* by introducing the staff and any volunteers. We are here to learn about insulin pumps.

B. *By the end of this class, our goal is that you will be able to:*
- *Understand the different kind of pumps available with tubing and without tubing*
- *Identify common software in pumps*
- *Identify the steps on how to get a pump*
- *Identify where to place pumps*
- *Identify what kind of insulin is used in a pump*

Are there any questions?

C. *Set some initial ground "rules."*
[Have these already written out on the flipchart, with space to add additional rules. These can be referred to throughout the program if necessary. If there are no new people, just remind everyone about the rules.]
1. Everyone is to respect each other.
2. One person talks at a time.
3. Please refrain from using your cell phone and texting. If you need to make or receive a call, please step out of the room.
4. Confidentiality—everyone should respect each other's privacy by not talking about one another outside of the program.
5. Note that some people prefer to say blood glucose and others blood sugar. Have your audience decide which terminology they prefer.

Ask the group if there are any other rules they would like to suggest.

Finally, we encourage all questions. NO question is a stupid question.
Sometimes you might ask a question that we do not know the answer to right away. When this happens, we will write it down on this flip chart to remind us to find out the answer.

-Ask if there are any other rules they would like to add.
-Ask if everyone in the group can agree to all of the rules.

D. **Icebreaker**: *Form a circle and have each person introduce him or herself and tell the group their favorite celebrity. You can use a ball to facilitate the*

process. For example: Angie has the ball and states: "My name is Angie, and I like Tom Hanks." *Angie would then toss the ball to someone else, and it is then that person's turn. Repeat until everyone has had a chance to introduce him or herself and state an activity they enjoy.*

III. INSULIN PUMP SESSION (60 MINUTES)

H. Getting started with an insulin pump

(Fast paced, keep this to 3 minute or less)
[Refer to the guide, "How Do I Use An Insulin Pump?"]

The guide "How Do I USE An Insulin Pump?" will let you know the steps you will need to follow to use the pump. We have tried to make the steps to prepare for and start using your pump simple. As you read this, it may seem complicated. But once you have filled your pump with insulin, changed infusion sets and played with all the buttons a few times it will get easier.

As much as we can, we have tried to make the information "unbranded". This means not specific for one type or brand of pump. Each pump comes with its own booklet. It often comes with a DVD and a website that lets you go through the steps while watching someone do it. Once you have your pump you should review the pump specific guide and use our guide to help. You will have help from your diabetes team. One of your team members will teach you how to use your pump and make sure you can do everything just right before you wear the pump and take it home. Once you are home and realize you forgot how to do something or just need help you can call the pump hotline provided in your specific pump manual. You can also call your diabetes team. It is very common for someone who starts the pump to have many questions and call their team or pump assistants. There is no need to feel embarrassed or like you are bothering people. Pump safety, using it correctly and getting the correct amount of insulin for your body is important. The information in the guide, "How Do I Use An Insulin Pump" will help you learn the steps to wearing a pump with or with out tubing.

I. What are the steps for starting pumps with tubing?

(10 minutes or less)
[Refer participants to the pictures on pages 1-15 of "How Do I Use An Insulin Pump" and have them follow along. Demonstrate with a sample pump and supplies. Ask participants if the have question every couple of steps.]

We start with the steps for someone already wearing a pump because you will most likely already be wearing your pump.

STEP #1: Get all the supplies you will need and put them in one place. This includes your insulin. Make sure the place is clean and dry. Also, make sure it has good lighting so you can see.

STEP #2: Make sure you have a trash basket or sharps container nearby so you can throw out what you finished with.

STEP #3: Wash your hands.

STEP #4: Put your pump on “suspend”. The suspend mode stops the pump from giving insulin. Then remove the cannula from under the skin. Take the tubing and reservoir from the pump and throw it out.

STEP # 5: Program the pump to know you are making a site change. You need to rewind the piston.

STEP #6: Fill the reservoir. This is the little round tube that holds the insulin. Each pump will tell you to do this a bit differently. But the main point is that you take insulin from your insulin vial and put it into the reservoir.
To fill the reservoir, follow these steps:

1. Remove the reservoir from the package.
2. Pull the plunger rod down to fill the reservoir with air.
3. Wipe the top of the insulin vial with alcohol. Then hold down the transfer guard and press it down onto the insulin vial.
4. Use your thumb to push air from reservoir into vial. Keep holding the plunger rod down.
5. Flip the vial over so it is now on top. Slowly pull the plunger down to fill the reservoir.
6. Check the reservoir for air bubbles. Tap the side of the reservoir to force any bubbles to rise to the top. Push the plunger up to move the air bubbles from the reservoir into the insulin vial.
7. After getting rid of the air bubbles, slowly pull the plunger down to fill the reservoir with enough insulin to last 2 to 3 days.
8. You do not want insulin on the top of the reservoir. To make sure this does not happen, flip the vial over, so the vial is upright. Hold the transfer guard, and turn the reservoir counter-clockwise. Pull the reservoir straight up to remove it from the transfer guard. Discard the transfer guard into a sharps container.

Step #7: Connect the reservoir to the tubing connector.

1. Hold the reservoir in one hand. With the other hand, gently push the tubing connector of the infusion set onto the top of the reservoir. Turn clockwise until it slides and locks into place.
2. Tap the sides of reservoir to force any air bubbles to rise to the top. Push up on the plunger rod until the bubbles are out and until there is some insulin in tubing.
3. Unscrew the plunger rod from the reservoir. Do this by turning the plunger rod **counter-clockwise** until it unscrews from the reservoir. Be careful not to pull out the plunger rod from the reservoir or the insulin will spill out.

Step #8: Fill the tubing. This is called “priming”.

The infusion set is the tubing that goes from the reservoir of insulin in the pump to the cannula that is on your body. It comes in different lengths. So, you can decide how long you want your tubing to be.

Once you have attached the reservoir to the tubing you need to have insulin run through the tubing to fill it up. This is priming the tubing.

To prime the tubing:

1. Press the “rewind complete” button. Insert the newly filled reservoir into the pump’s reservoir compartment. Lock it into place by turning the reservoir **clockwise** until it locks.
2. Press the “fill tubing” screen. Make sure the infusion set in not connected to your body. Then select “yes”.
3. Press and hold down the button to fill the tubing. The pump will beep as the insulin fills the tubing. Release the button when you see drops at the tip of the connector needle. Then press the button once more.
4. If you see drops at the end of the insertion needle and there are no air bubbles in the tubing select “yes” and press the button. If “no”, repeat the earlier steps.
5. When the “fill cannula” screen appears, you are ready to insert the infusion set.

Step #9: Prepare the inserter.

1. The way you do this is based on the type of pump and infusion set you are using.
2. What you are doing is getting the inserter device ready to push the needle and the cannula under the skin.
3. The needle will then come out. And the plastic cannula will stay under the skin.

The guide shows three examples of how to prepare the inserter by brand.

Example 1: Quick set® infusion set used by Medtronic
Example 2: Inset® infusion set used by Animas
Example 3: Cleo® 90 Infusion set used by Tandem t-slim

Step #10: Choose a site to insert your infusion set.
[Please see diagram on page 11]

Step #11: Clean the site with alcohol.

Clean an area the size of a tennis ball with an alcohol wipe here you will be putting in your infusion set. Start from the center of where you will put it in and clean outwards in a circular motion.

Step #12: Choose a site to insert your infusion set. Put the cannula under the skin. The cannula is the part of the setup that goes under the skin. It has adhesive tape on the bottom that holds it in place. On the top, there is a spot where you attach your tubing.

In most cases, the cannula has some sort of tool that inserts it under the skin. This is the inserter. It has some sort of spring inside of it to quickly push the cannula under the skin.

There are many different types of inserters. So, if one type does not work or is not comfortable, you can ask the pump company or your diabetes team for a different type.

To insert:

1. Clean your skin. Slowly remove the needle guard. Do this by turning it to loosen it. Then lift it away to expose needle of inserter set.
2. Hold the inserter against site on your body that you just cleaned. Then find the button of the inserter.
3. Push the button of the inserter to insert the needle and cannula under the skin. Each inserter has its own button to push. So, you will need to learn how yours works.
4. Pull the inserter and the needle away from your body. Press the tape firmly against skin. Put the needle into a sharps container.

The guide shows three different pump infusion sets.

- Quick set from Medtronic
- Animas Infusion set
- Cleo® 90 Infusion set used by Tandem t-slim

Step #13: Fill the cannula.
In this step, you fill the empty cannula before you start your insulin pump.

1. Press the button to fill cannula.
2. The small amount of insulin you need to fill the cannula is based on how long the cannula is. If it is 6 mm long you would enter 0.3 units of insulin. If it is 9 mm long you would enter 0.5 units.

Step #14: Make sure the pump has restarted and is giving you insulin. Check your blood sugar in 2 hours to be sure you are getting insulin.

1. **How do I take off my pump with tubing?**
   (Fast paced, keep this to 2 minute or less)
   [Refer to page 15 of the "How Do I Use and Insulin Pump"]

   To take it off, just follow the instructions for your own infusion set. In most cases you must squeeze, twist and gently take the infusion set off from the cannula. You can do this if you want to take a shower, swim or exercise. But **never keep the pump off for more than one hour** because your body will not have any insulin.

J. What are the steps for starting a tubeless pump?

(5 minutes or less)
[Refer participants to the pictures on pages 16-20 of "How Do I Use An Insulin Pump" and have them follow along. Demonstrate with a sample pump and supplies. Ask participants if the have question every couple of steps.]

Many of these steps are the same as pumps with tubing but there are some differences.

Step #1: Get all the supplies you will need. This includes your insulin. Put them all together in one place that is clean, dry and has good lighting so you can see.

Step #2: Make sure you have a trash basket and a sharps container nearby so you can throw out what you are finished with.

Step #3: Wash your hands.

Step #4: The Personal Diabetes Manager (PDM) will beep and alert to change your pod at day 3. Hit "action" on the PDM and select "activate new pod". (Please note: the PDM will guide you through all the steps).

Step #5: Open new pod packet. Remove the pod from the packet. Put together the syringe and the needle.

Step #6: Fill the syringe with 2 to 3 days of insulin. Clear any air bubbles.

Step #7: Insert the syringe in the small hole on the pod. Press down and fill pod with insulin and wait until you hear 2 beeps. Remove the syringe. Screw off the needle and throw it away in a sharps container. Press "next" on the PDM and it will prime itself.

Step #8: Remove the old pod you are wearing and throw it out. Press "next" on the PDM. Then press "YES, activate a new pod now".

Step #9: Find a site on your body where you will put your new pod.

Step #10: Clean the site with alcohol. Clean an area the size of a tennis ball with an alcohol wipe where you will be putting on your pod. Start from the center of the insertion site and clean outwards in a circular motion.

Step #11: Remove the needle cap. Take off the adhesive, or tape, on the back of the pod. Hold the pod by the side and stick it on your skin. Pat down the adhesive on your skin.

Step #12: You will use the PDM to have the pod insert the tiny cannula under the skin and start the insulin flowing into the body. Press "next" on the PDM. Then it will tell you to press start to insert the cannula. You can pinch your skin to get a good angle. You will hear a beep, then the needle will quickly poke under the skin to put the cannula under the skin. The needle will move back up, into the pod. So you will not feel it when you are wearing the pump.

Step #13: Check to be sure that the cannula is inserted in the right way. To do this, look through the pod-viewing window to check that the cannula is in place. If it is inserted right, hit "YES" on the PDM. Now you are all set to go.

1. How do I take off my tubeless pump?

To prevent infections, wash your hands before you remove the pod. Here are a few suggestions on how to remove pods:

- You can start at one point and peel the adhesive off slowly. Then clean that area with an alcohol pad.
- You can remove the pod when you are in the shower. This will clean the area where the pod was and clean your skin for a new site. Be sure the new site is clean and dry.
- You can use an adhesive remover like Medi-Sol® pads or spray that you can find on line. Then clean the area with an alcohol pad or alcohol wipes to get the adhesive goo off. Put some antibiotic ointment on the area to heal.
- You can also use De-Solv-it. This is an adhesive remover they use for newborns in hospitals. You can find it at your local pharmacy.

K. What do I need to know about insulin and the pump?

(15 minutes or less)

[Refer participants to the pictures on pages 16-20 of "How Do I Use An Insulin Pump" and have them follow along.]

In order to learn about how insulin works with a pump, you first need to know about insulin.

1. What is basal insulin?

[Ask participants, “Who can tell me what basil or background insulin does?” Allow participants to respond and cover key concepts they do not describe.]

Basal insulin is also “background” insulin. Basal means base, or baseline amount.

Someone without diabetes always has a little bit of insulin in their body to keep blood sugar levels normal. The liver makes sugar all the time. And the pancreas makes a little bit of insulin to balance it.

The basal level of insulin goes up and down based on the blood sugar levels. So, people without diabetes do not have low blood sugar levels overnight or if they miss a meal. That’s because the body is very good at keeping sugar levels just right.

If you have diabetes your body does not make enough of its own insulin. So, you must give yourself basal insulin. You do this with a shot of long acting insulin. In most cases, you give yourself these shots once or twice a day.

[Ask participants, “Who can tell me names of long acting insulin?” Allow participants to respond write names given on the white board or paper chart. Add insulin shown below and if new brands are available feel free to add them as well.]

LONG ACTING INSULIN NAMES

Generic Name	Brand Name
Cloudy Insulin	NPH
Glargine	Lantus®
Touejo®	Basaglar®
Detemir	Levemir®
Degludec	Tresiba®

[Ask participants, “Do pumps use long acting insulin?” Allow participants to respond. Refer participants to page 22 of the guide.]

The pump does not use long acting insulin. The pump uses rapid acting insulin for the basal insulin. It gives out small amounts of short acting insulin constantly to give you the basal insulin level your body needs.

The chart on page 22 shows a picture of basal insulin in the body. Look at how the basal insulin line is a little wavy. This is very different than bolus insulin, which we will describe next.

2. What is bolus insulin?

[Ask participants, "Who can tell me what bolus insulin does?" Allow participants to respond and cover key concepts they do not describe. Refer participants to page 22 of the guide.]

Bolus insulin is what the body needs to keep blood sugar levels stable after eating. In someone without diabetes, the pancreas also makes bursts of insulin. These bursts happen when people eat. These bursts also happen when their blood sugar levels rise because of stress or illness. This is insulin that comes out in addition to the basal insulin level.

If you have diabetes, you inject rapid acting insulin before you eat food or if your blood sugar level is too high. This gives your body the burst of insulin it needs to control your blood sugar.

The chart on page 22 shows a picture of bolus insulin in the body. Look how the line is very wavy.

3. How does basal insulin work with the pump?

An insulin pump gives out both basal and bolus insulin in a way that is close to how the pancreas does. This is because the pump only gives out rapid acting insulin.

Basal insulin covers your insulin needs between meals and through the night.

The pump sends out small amounts of basal insulin 24 hours a day. This is close to how the pancreas does when there is no diabetes.

Your diabetes team will tell you what your basal insulin rates should be. Once you set the basal rates in the pump, it will give out the same basal rate profile every day until you program it to give out different basal rates. Your diabetes team can make changes to your basal rate each time you see them.

After you have more experience you can program how much basal insulin your pump gives out based on your body's needs throughout the day. For instance, you can program your pump to:

- ✓ Give out less basal insulin during the night than during the day or
- ✓ Give out more insulin during the early morning than the afternoon

In other words, you can program your pump to give out basal insulin at different rates and times to match your needs. If you are not sure, you can always check with your diabetes team.

The pump also has a feature called a temporary basal rate. You can set it to make temporary changes in your basal insulin based on your needs. For instance, you can decrease the basal rate for exercise. You can increase it when you are sick.

4. How does rapid acting insulin work?

Rapid acting insulin acts fast. It acts a lot like insulin that the pancreas makes. Studies show that rapid acting insulin lowers sugar levels in a very steady way. You can count on how your body will absorb and use it.

The pump uses only rapid acting insulin. When rapid acting insulin enters the body, it:

- Enters the bloodstream in 10 to 15 minutes estimated
- Has its strongest sugar lowering effect in 1 to 1½ hours
- Stops lowering sugar levels in 5 to 6 hours

5. How do bolus doses work with the pump?

Each time you eat and test your blood sugar level, your pump will tell you how much bolus insulin to give. It tells you based on the information you give it.

You will always have a choice about the dose you give. If you think the pump is wrong, you can “override” it. That means you can give more or less of what it says. You are the one that controls the pump. It does not control you.

You will tell the pump to give you insulin when you eat and if your blood sugar levels are too high. These are bolus doses or pre-meal doses.

The pump will use a “dose calculator” to figure out how much insulin to give you. You need to put this information into the pump:

- Your blood sugar level
- How many grams of carbohydrates (carbs) you are eating

This is so the pump can figure out your dose.

The dose the pump suggests is based on:

- The pump settings that are put into your pump by your diabetes team

- How many grams of carbs you are eating
- Whether you need a correction dose to bring your blood sugar down or up

This will mean that the pump may say “give 5.6 units” or “give 7.2 units”. You get to choose if you think this is the right dose. If you want to, you can give a little bit more or a little bit less based on what you know about your own diabetes. Insulin pumps leave the choice up to you.

You can also decide not to use the pump dose calculator and put in your own dose. So, you can just say “give 4 units” or “give 2 units”. This is a sort of short cut, if you do not want to put in the carbs or blood sugar level.

6. What is a correction bolus?

A correction bolus is when you give yourself an insulin shot to correct a blood sugar level that is out of your target range.

7. How would I cancel or stop a bolus with the pump?

There may be times when you want to stop or interrupt a bolus. Such times might be if you find your blood sugar falling too fast or you eat less food than you expect. The pump lets you stop sending out a bolus if you need to. You do this by setting the pump to “Suspend” mode.

When the pump is in Suspend, no insulin at all goes into your body.
No matter what kind of pump you have you will need to enter your pump settings. You will do this with your diabetes team.

There are two important settings:

1. The **basal rate**
2. The **bolus calculator** that includes your carbs ratio and correction dose

8. What is the basal rate setting?

The basal rate is the small amount of insulin your pump gives you every hour. It is supposed to be the right amount of insulin to keep your sugar from going too high or too low in between meals and through the night.

Often the basal rate is around 1.0 units per hour. Although this is different in different people. Sometimes the basal rate is highest early in the morning and lowest later in the day. You will work with your diabetes team to figure out what your starting rates will be and how they will change throughout the day.

If you want your pump to stop giving insulin, you can turn off, or suspend, your basal rate. You can also do something called a temporary basal rate. This means you can lower or raise your basal rate for a certain amount of time. For instance, if your blood sugar is low and you want to give less insulin,

you can lower your basal rate by half for the next two hours. That is, you can set a 50% basal rate for 2 hours. Your diabetes team will help you learn to do this if it is something that could help you.

9. What is the bolus calculator?

All brands of pumps have a feature that figures out, or calculates, the amount of insulin you need to give:

- Before meals and snacks
- To lower high sugars between meals

When you start using the pump, you should already be carb counting and correcting. Your diabetes team puts your carb and correction ratios into the pump. So, it does the calculations for you.

Each pump is slightly different. So, you will need to learn how your pump figures out your doses. But the basic steps are the same:

1. Either your blood sugar reading will automatically go from your meter into your pump or you will enter it by hand.

2. You enter how many carbs you plan to eat.

3. You press the “activate” button and allow the pump to send out the bolus.

You can always increase or decrease your dose more than the pump says if you think the dose is not right.

The bolus calculator will lower the suggested dose of insulin based on your blood sugar level and based on “insulin on board” or “active insulin”. For instance, if your blood sugar is too low, the calculator will lower the insulin.

The idea of active insulin is very important because the pump keeps track of when you gave your last dose of insulin. If it was not very long ago (for instance in the past 4 hours), it will subtract it from the suggested bolus.

For instance, let’s say you give 10 units of insulin and the amount of time that it stays in your body is 4 hours. Then 2 hours after you have given the insulin half of it, or 5 units, will be left in your body. Your pump knows this and will subtract this amount from any bolus dose you give so you do not give too much.

L. How Can I Stay Safe When I am Using the Pump?

(15 minutes or less)

You will need to read this part of our guide many times. That is because it is how you will stay safe when you are using the pump.

You need to **take steps right away to fix the problem** if:

- ✓ Your pump stops working.
- ✓ Your blood sugars are too high for no reason.

If you don't get your pump to work and your blood sugar levels don't start to go down within an hour or two you need to give yourself a shot of insulin with an insulin pen or a syringe and insulin vial. This is so you are sure insulin has gone into your body.

DO NOT FORGET:

- ✓ If you are not sure you are getting insulin in your body, give yourself a shot of insulin if your blood sugars are high and not coming down.

- ✓ Even if you use a pump, always carry with you the supplies you need to give a shot of insulin.

If you use a pump with tubing, insulin comes through the pump tubing in a tiny flow. It can become clogged or stopped for all sorts of reasons that you might not notice. If you use a tubeless pump, insulin comes through the pod in a tiny flow into the skin.

1. How will I know the pump is working right?

The way you tell that your pump is working right is by testing your blood sugar level at least 4 times per day. And you should space these out 4 times over the course of the day:

- First thing in the morning
- Before lunch
- Before dinner
- At bedtime

2. What are the basic rules when I use the pump?

Test your blood sugar at least 4 times a day: before each meal and at bedtime. It is very important to test before bed so you can find and fix a problem before you go to sleep. If not, you may be high all night long.

- **Always test your blood sugar two hours after you start a new infusion set** to make sure the insulin pump is working.

- **Always test your blood sugar before you drive.** Also, make sure you keep a blood sugar level above 100 mg/dl to avoid low blood sugar during your journey.
- **Change and rotate your infusion set every 2 to 3 days.** Insulin in the pump stops working after 3 days due to the heat of your body and the pump or pod.
- **Keep emergency supplies on hand all the time.**
- **Each month check the end dates on your supplies.** This includes your glucagon emergency kit, insulin, test strips and other medications.
- **Order refills for medications way before you need them.** Give your diabetes team a complete list of what you need. This includes the type of insulin you use, strips for your meter and all pump supplies. Give this list to your team because they do not want you to run out of supplies.
- **Wear medical identification all the time.**

3. How do I deal with sudden high blood sugars when using my pump?

There are many reasons you may have sudden high blood sugars. Some causes could be:

- A pump problem
- Being sick
- Eating too many carbs
- Exercising less
- Feeling stressed

In most cases, preparing and giving yourself insulin shots will bring your blood sugar down to a safe level.

4. What should I do if I am feeling sick?

If you are feeling sick to your stomach or are vomiting, check your blood glucose and ketones right away. If your ketones are positive or you cannot eat and drink, call your diabetes team or go to an emergency department right away. We will talk a bit more about ketone in a minute.

5. What should I do if I am not feeling sick but have high blood sugars?

Sometimes there are reasons for blood sugars being too high. For instance, they could be high because you ate too many carbs.

But if your blood sugar is above 300 mg/dl without a reason for being high, follow these steps:

1. Take a correction bolus through the pump.

2. Drink plenty of fluids. This means 8 to 16 ounces of water per hour.

3. Test your blood sugar again in one hour.

4. If your blood sugar has not come down by at least 50 mg/dl then give a correction dose by shot with a syringe or pen and **not through the pump**.

   If your blood sugar does not come down with a correction dose through your pump it is possible that your pump is not giving you insulin. This could be due to clogged tubing, a bad site or other reasons. **The only way you can be sure you are getting insulin in your body is if you give it with a shot.**

5. After you have given yourself a shot and are sure you have insulin in your body, you can troubleshoot the pump. In most cases, this means changing your infusion site and tubing.

6. Why should I check for urine ketones and how do I do it?

There can be times that your blood sugar is too high due to a shortage of insulin in the blood causing your body to break down body fat for energy. When this happens, you produce a chemical called ketones.

Ketones can make your blood acidic. Acidic blood can cause a serious condition called diabetic ketoacidosis (DKA). When someone has ketones in their urine, it often means that person needs medical help.

Checking your urine for ketones can help you manage your diabetes better. When a pump fails, you can be at risk for having ketones.

Check your urine for ketones:

- If your blood sugar is more than 300 mg/dl without you eating too many carbohydrates and other sugars

- If you are sick to your stomach or vomiting

- If you think your pump is not working right

- When you are sick or have an infection, and are having trouble controlling your blood sugar levels

To check for ketones you will need:
[Demonstrate ketone testing]

- Urine ketone test strips
- A watch with a second hand
- How to check:
- Urinate (pee) on the end of the strip that has the light-colored square on it. Or dip the strip into a cup of your urine.
- Follow the instructions on the bottle of strips for the directions and how much time to wait for the color change.
- Compare the end of the ketone strip to the color chart on the bottle or in the package of the strips. This is how to find out the level of ketones in the urine.
- Write down your results for your records.

If the ketones are positive:

1. Drink at least 8 ounces of fluids every hour. Eight ounces are one cup.
2. If your positive ketones are in a low level, give yourself insulin by shot—at least every 4 hours based on your correction. If your ketones are at a moderate level or greater, call your diabetes team because you may need more insulin for your correction doses.
3. Test your blood sugar levels until ketones are gone, at least every 4 hours
4. Be sure to call your diabetes team right away if you:
   - Have ketones that are more than trace positive
   - Are not able to lower your blood sugar level into your normal range within 6 hours of giving yourself shots
5. Even though you have called your diabetes team, **go to the emergency room** if you:
   - Are vomiting
   - Are not able to drink fluids

M. What are the common pump problems and how do I troubleshoot?

(15 minutes or less)

To troubleshoot means to figure out and fix a problem. With a pump, it means learning how to understand if your pump is not working right. This includes knowing warning signs from your body that might relate to a pump problem such as high blood sugars or infection. It also includes being ready to solve problems that might happen.

There are problems that can happen when you wear a pump. And there is almost always a solution.

1. **Who can I call if I am having a problem with my pump?**
   You can call your diabetes team if you are having a pump problem. You can also call the company that makes your pump so they can help you. They can send you a new pump, if you need one.

2. **How do I know if my pump fails or is not working as it should?**
   Your pump will beep and warn you if something is not working right. You should also **check your blood sugar 2 hours after you start a new infusion set.** This way you can make sure your pump is sending insulin into your body.

3. **What should my plan be if the pump fails?**

   1. Give a shot of regular or rapid acting insulin every 4 hours using your carb and correction doses. Some rapid acting insulins are Apidra, Humalog and Novolog.

   2. If you are going to be off the pump overnight, give yourself a shot of long acting insulin at bedtime. Some long acting insulins are Lantus, Levemir and NPH.

      To find your dose, you need to know your total 24-hour basal insulin dose. This is most often 15 to 40 units. But it is sometimes more and sometimes less. You will need to divide the long acting insulin dose in half. Give half of it at bedtime. Then give the other half the next morning — unless you will be starting back on the pump.

      If you are starting back on the pump during the day, do not give the morning long acting insulin dose with a shot. As a fallback, giving 10 units of long acting insulin at bedtime is enough to avoid serious problems in most cases.

   3. Do not expect this technique to keep your blood sugar levels under good control. The goal is to keep you safe until you restart your pump.

   4. Ask your diabetes team for a pump failure plan so they can tell you how much long acting insulin you would need to give yourself. Also ask them to

give you a copy of your pump settings so you would know how to set up a new pump.

4. **What do I do if the pump falls off?**
   You can get something, like Skin Tac™, that makes the skin stickier so it holds the tape on better. You can get this at the pharmacy. You can also put a large bandage over the infusion set to hold it more tightly.

5. **What if I start to have an allergy to the tape?**
   If you have an allergy to the tape, your skin will irritate and turn red. Also, it may be hot to the touch. If you are starting to have an allergy to the tape, there are ways to help. Sometimes you can put a spray under the site that helps. Other times you can put a different bandage under the tape. Ask your diabetes team for help.

6. **How do I know if the infusion site gets infected?**
   Look at the site for any signs of infection every day and every time you take the pump off to put a new one on.

   These signs are normal:

   - The site may look a little red.
   - You may see a little lump the size of a pea at the point where the set went under the skin. These little bumps are “pump lumps” and go away over time.

   These are signs of infection:

   - Your skin is very red or tender.
   - Your skin is warm to the touch.
   - Your skin may hurt.
   - Pus may come out.

   If you have any of these signs of infection, call your diabetes team right away and get checked out. Page 42 of the guide shows what an infection from a pump infusion set can look like.

7. **What do I do if the infusion site gets infected?**

   A common problem with the pump can be an infection at the infusion site. It is one of the most common reasons why people stop using a pump.

If you have an infection, you will need to take off and throw away the reservoir and infusion set. You will need to use another infusion site until the infection has healed.

Sometimes you will need treatment with antibiotics. This can mean pills or ointment or both.

If you think you have a site infection call your diabetes team right away and get checked out.

If you keep getting site infections, check how you are cleaning the site and changing the infusion set. If you are correct in how you are cleaning the site, apply a topical antiseptic to the site before you insert the set. This kind of antiseptic is an antimicrobial agent that can kill, inhibit or reduce the number of microorganisms where you want to place the infusion set. It can help control infections.

Any pharmacy will have what you need to help prevent infections and your diabetes team can recommend some products.

If you are prone to site infections, use a triple antibiotic process. This means that you:

1. **Wash** the area with an antibacterial soap and let it dry.

2. **Clean** the area with an antibacterial solution and let it dry.

3. **Apply** an antiseptic and adhesive wipe to the area and let it dry.

N. Conclusion

(Fast paced, keep this to 2 minutes or less)
[Refer to page 46 and 47 in the “How Do I Use An Insulin Pump?” manual for the quick list on how to wear a pump.]

We hope that the information we have shared has helped you learn how to use an insulin pump. It is up to you to decide if you want to try using one.

See page 46 and 47 of your guide for the basic steps of starting a pump with tubing or one with out. There is no need to rush into using a pump so if you still are not sure about get as much information you can. A great way to learn about pumps is from people who use them. Your diabetes team may be able to suggest people you can talk to. Or you can look on-line to see what other people write about pumps. Remember that you can get a pump and try it. Then you could change your mind and go back to shots. It is not permanent. If you do get one, you should try it for a few months to see how you adjust to

it. The first few weeks of wearing it may be hard because it is new. Then after you have worn it for a while you will begin to see if you like it or not.

III. Wrap Up (2 MINUTES)

Congrats for committing to take good care of your diabetes. We know that it is not easy to treat type 1 diabetes. We know you can do it, and do it well. Keep up the good work.

STEPP-UP Handouts

Agenda	Estimated Time
I. Welcome	3 minutes
II. Introduction b. Icebreaker	10 minutes
III. Using an Insulin Pump Session **O.** Getting started with an insulin pump **P.** What are the steps for starting pumps with tubing? **1.** How do I take of my pump with tubing? **Q.** What are the steps for starting a tubeless pump? 1. How do I take of my pump with tubing? **R.** What do I need to know about insulin and the pump? 1. What is basal insulin? 2. What is bolus insulin? 3. How do basal doses work with the pump? 4. How does rapid acting insulin work? 5. How do bolus doses work with the pump? 6. What is a correction bolus? 7. How would I cancel or stop a bolus with the pump? 8. What is the basal rate setting? 9. What is a bolus calculator? **S.** How Can I stay safe when I am using the pump? 1. How will I know the pump is working right? 2. What are the basic rules when I use the pump? 3. How do I deal with sudden high blood sugars when using my pump? 4. What should I do if I am feeling sick? 5. What should do if I am not feeling sick but have high blood sugars? 6. Why should I check for urine ketones and how do I do it? **T.** What are the common pump problems and how do I troubleshoot? 1. Who can I call if I am having a problem with my pump? 2. How do I know if my pump fails or is not working as it should? 3. What should my plan be if the pump fails? 4. What do I do if the pump falls off? 5. What if I start to have an allergy to the tape? 6. How do I know if the infusion site gets infected? 7. What do I do if the infusion site gets infected? **U.** Conclusion	65 minutes
IV. Closing	2 minutes