CHAPTER 3:

INITIATING INSULIN PUMP THERAPY

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TEAM EVALUATION

Ideally, a diabetes care team (referred to as the "Team" when including the patient/family) is available to assist in the education process. The diabetes care team should include a physician who specializes in diabetes, a diabetes nurse educator, a certified pump trainer (who is sometimes the same person), a dietitian/nutritionist and a social worker/psychologist. We ask all team members to meet with the family to assess the readiness and appropriateness of the patient and family to initiate pump therapy. Sometimes, after this initial evaluation, we suggest waiting for a more appropriate time. If the Team decides to move ahead, the family then contacts their health insurance organization about support of insulin pumps and annual supply needs. The family is then scheduled to attend the Pump Basics Class.

PUMP BASICS CLASS

Objectives:

- Explore the pros and cons of pump management
- Provide patients and families with a beginning knowledge of insulin pump therapy
- Inform patients and families of the commitment and key learning required to achieve successful outcomes with pump management
- Discuss the process for getting on the pump

At our Center, the class is taught by a diabetes educator with expertise and experience in pump initiation and management. In this class, as in all the subsequent encounters, we stress safety issues, emphasizing that pump therapy is not an appropriate option for people who are not able to check blood sugars at least four to six times a

TABLE 1:

A PROGRAM FOR STARTING AN INSULIN PUMP

• **Pump Evaluation (at clinic visit)**	
• **Pump Basics Class (pros/cons)**	**(1.5 hours)**
• **Pump Initiation Class**	**(4 hours)**
• **Saline Pump Start**	**(3-4 hours)**
• **Insulin Pump Start**	**(2-3 hours)**
• **Daily Phone Calls/E-mails/Faxes**	**(throughout first week)**
• **Advanced Pump Training Class**	**(2 hours)**

day and who are not willing to check ketones when blood sugar levels are high. We also point out that the problem of missing insulin boluses for food is the single most important reason that pump therapy will fail to give good blood sugar control. We encourage a commitment to avoid that pitfall.

The class provides an interactive forum to:

- Explore the pros and cons of pump management
- Provide an overview of the steps required for successful outcomes with pump therapy
- Emphasize the importance of skills related to carb counting
- Review use of correction factors
- Explore with volunteers where they would place a pump site, specific to body size and shape
- Discuss how to switch from shots to the pump
- Evaluate how basal insulin and bolus insulin dosages are utilized to fit the insulin regimen to the person

In addition:

- Family support and training are emphasized to ensure daily routines are maintained
- Real life scenarios allow the audience a chance to evaluate the value of pump management
- Information about pump products is presented
- The value of pumps to provide maximum flexibility for a variety of age groups and life styles is emphasized
- The participants review the process (Table 1) to help guide them through the steps of going on the pump
- The family is given a realistic picture of what to expect — both with the pump education process and with being a pump user

After the family, with input from their diabetes care providers, has selected the pump, our clinic sends a letter to the family's health insurance company to request financial support for that pump and the annual supply needs. A copy of the glucose meter download is included with the letter to demonstrate that the person is performing at least four blood sugar checks per day in recent months. When approval from the insurer is received, the family is then scheduled for the Pump Initiation Class.

PUMP INITIATION CLASS

The purpose of this class is to teach pump terminology and the basics of using an insulin pump. The insulin pump is not started at this time. The topics include:

- Basal insulin therapy
- Bolus insulin therapy
- Blood sugar checking
- Management of exercise
- Hypoglycemia
- High blood sugar levels and ketones
- A school plan
- "Smart" pump features
- Carb counting using food models

This class lasts approximately four hours. Families have found it helpful to review aspects of diabetes care that may have been forgotten or not previously learned. This is particularly true for youth who may have been too young to fully comprehend the information at the time of the initial diagnosis.

Most of the pump companies have pump videotapes/DVDs and we ask the families to watch the ones related to their pump several times at home. Additional information may also be found on the companies' websites.

SALINE PUMP START VISIT

The family must have the pump and bring it and other supplies (including at least three infusion sets) along for this visit. The Saline Pump Start Visit, which usually lasts three to four hours, allows the person/family to get used to operating the pump and to learn how to insert the infusion set. Some centers skip the Saline Pump Start Visit, but it is our impression that this helps to reduce the stress of the actual insulin pump start. The physician prescribes the basal rates

and the person/family learns how to program these into the pump. Likewise, the insulin to carbohydrate (I/C) ratios and the various insulin sensitivity ratios are programmed into the pump at this time. All of the basic functions of the pump are reviewed. The person/family inserts an infusion cannula, which is worn at home for the next three days. Saline (salt water) is infused by the pump (rather than insulin). A site change is then done by the person/family in the home setting to wear for another two or three days. As the pump has only saline in it, injections of insulin must be continued until the Insulin Pump Start Visit.

INSULIN PUMP START VISIT

Prior to this visit, the physician has outlined a plan for changing from insulin injections to the pump insulin (Table 2). If a basal insulin (Lantus/Levemir) is given at dinner or in the evening, it is usually omitted the night prior to initiating insulin via the pump. Multiple injections of a rapid-acting insulin or a low dose of NPH insulin may be recommended to cover the nighttime. On the morning of insulin initiation, only the rapid-acting insulin (for food and/or a correction) is given.

The pump trainer observes the family do another infusion set insertion (possibly of a different type of set). The family is reminded to do the set changes during the daytime hours rather than in the evening or at bedtime. This is advised because the person may be more sensitive to the insulin when it goes into a fresh site. Another advantage of changing the infusion site at this time is early detection of hyperglycemia should the new infusion set not function properly. If a set change must be done at bedtime or during the night, many families use an 80% temporary basal for three or four hours or check blood sugars during the night.

The pump trainer demonstrates how to initiate insulin treatment and reviews the other pump functions discussed previously during the Saline Pump Start Visit. In addition, daily aspects of wearing a pump and how to troubleshoot specific situations are discussed.

The physician discusses with the family the times to do blood sugar checking during the first week of insulin therapy and how to best communicate the results on a daily basis. It is usually necessary to do at least seven or eight blood sugar checks per day during the first week of using insulin in the pump.

The physician also discusses the plan for dealing with exercise and any other upcoming special events. New prescriptions are needed for the increased number of vials of rapid-acting insulin since it will be the only insulin used in the pump. An HbA1c value is usually obtained on this day as baseline for comparison with the value after three months on pump therapy. Appointments are made for a follow-up clinic visit and for the Advanced Pump Training Class in approximately one month.

ADVANCED PUMP TRAINING CLASS

This class usually occurs about one month after initiation of insulin pump therapy and lasts two hours. Families are asked to write down their questions or problems to bring to the class along with supplies (e.g., blood sugar meter) and a pen and paper for taking notes.

Some of the advanced features usually discussed at this class (even if discussed earlier) are:

- Use of temporary basal rates
- Alternate basal rates
- Basal rate checking
- Correction bolus checking
- Meal bolus checking
- Specialized meal boluses
- Dual Wave (or Combination)
- Square Wave (or Extended)
- Ketone checking
- Infusion site and set checking
- Special pump features (e.g., child block, maximum bolus, audio/vibrate options, “easy” bolus and use of a remote control)
- Other available infusion sets

All of these features are discussed/defined in later chapters of this book.

TABLE 2:

PRE-INSULIN PUMP START INSTRUCTIONS

Name: _____ Saline Start Date: _____ Insulin Start Date: _____

The following instructions should be discussed at the Saline Pump Start Visit:

IF YOU ARE CURRENTLY ON N (NPH), or Lantus/Levemir at dinner or in the evening, your physician recommends the following changes for **the night before your insulin pump start** (physician to check all that apply):

❑ Switch your evening dose of Lantus/Levemir to N (NPH) and take ____ units of (N) NPH at ____ p.m.* (If on Lantus/Levemir, the NPH dose will be approximately 40% of the usual Lantus/Levemir dose.)
OR:
❑ Do not take any long-acting insulin the evening before your pump start. Instead, supplement with ____ units of rapid-acting insulin (Humalog, NovoLog, or Apidra) every ____ hours through the evening and night.

* If needed, get a prescription from your physician for Humulin-N or Novolin N (NPH).

If you are currently taking Lantus/Levemir in the morning, you may take it the morning of the day before your pump start. (Do not take it the morning of your insulin pump start!)

The night before the insulin pump start:

Give the usual dose of rapid-acting insulin at dinner and follow the directions prescribed above for your other insulin. Eat a regular meal.

Get all of your supplies (see below) organized to take to the clinic.

Watch the pump instructional video or use the interactive computer software one more time.

The morning of the insulin pump start:

DO NOT give any N (NPH) or Lantus/Levemir this a.m.

Give the usual Humalog/NovoLog/Apidra dose with breakfast. Do not take any other insulins.

Bring your pump and pump supplies, Humalog/NovoLog/Apidra insulin, blood sugar checking equipment, snacks and written materials with you to the clinic.

If you have any questions, please contact your healthcare provider.

Physician	Phone	Date
Nurse	Phone	Date

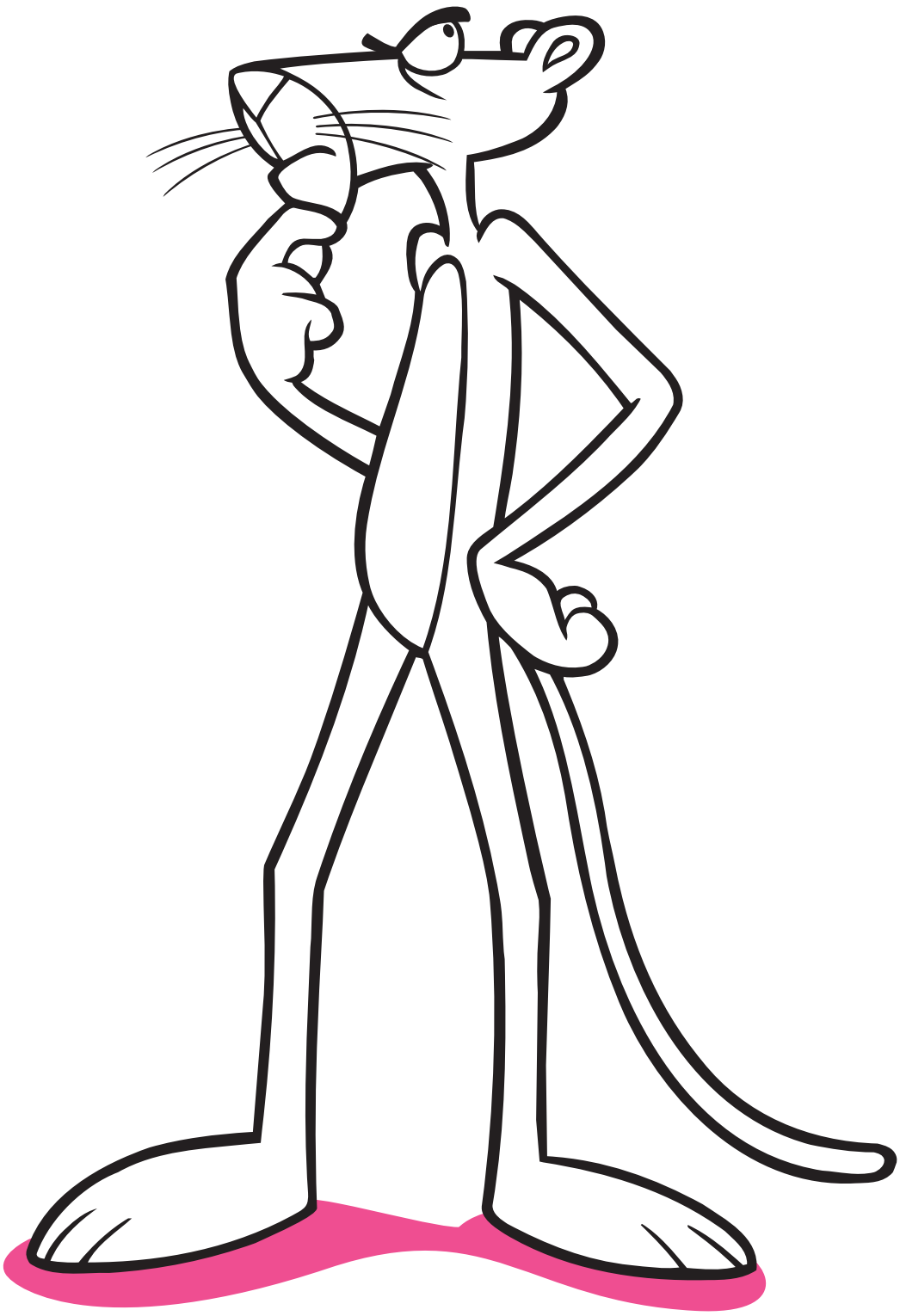
SUMMARY

The method of teaching insulin pump therapy varies. The goal of all instruction is to make insulin pump therapy easy and safe.

DEFINITIONS

Saline Pump Start Visit: A period of infusing saline (sterile salt water) by the pump. This allows the person/family time to get used to the pump and its features prior to starting insulin.

Insulin Pump Start Visit: The visit at which infusing insulin by the pump begins. Regular injections of insulin by syringe are then discontinued.



CHOOSING THE RIGHT PUMP CAN BE DIFFICULT.