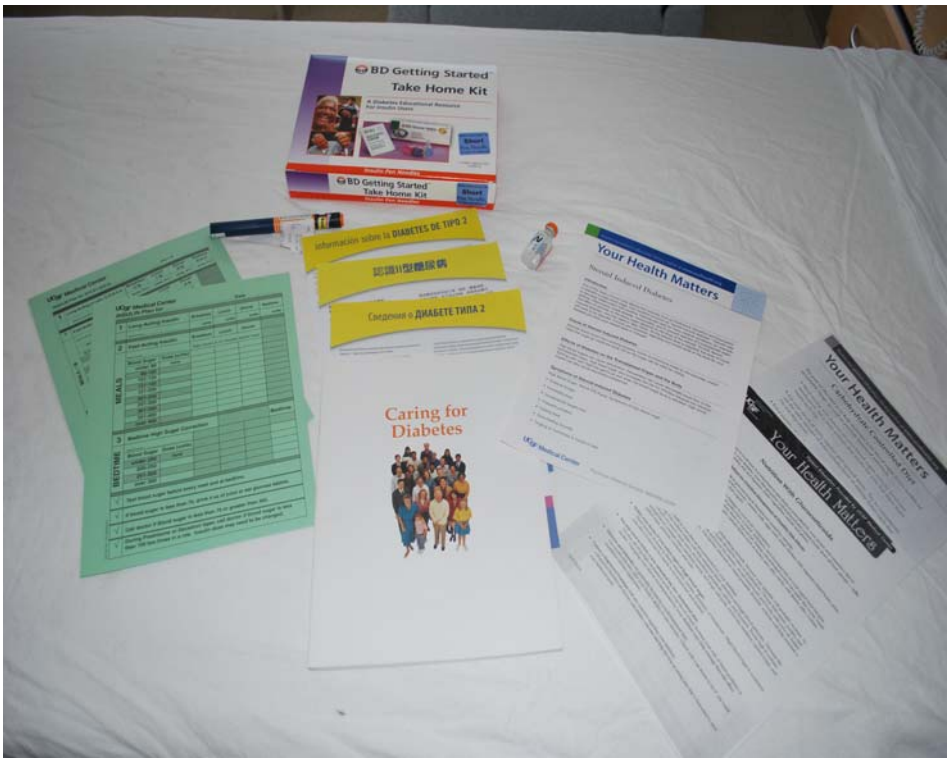
DIABETES TEACHING RESOURCE
For the Staff Nurse



Pete-Reuben Calixto, RN

Revised 2009

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Introduction

Diabetes has been known for centuries and although research has shed some light on this disease allowing us to provide life-saving treatments; its cause is still unknown and ways of preventing diabetes still eludes us. Since diabetes became known to man, efforts are exerted towards advancing our knowledge of the disease. Despite the progress of diabetes research, diabetes continues to be a primary disease that can cause devastating and debilitating complications. To date, the cause of diabetes is still unknown.

The purpose of this module is to provide updated basic diabetes information for the provider. This is for the purpose of effectively teaching the person with diabetes about contemporary practices and updated information. The desired outcome is for the person with diabetes to understand and fully comprehend the disease process. Understanding increases the likelihood that the patient will actively participate and take the initiative when making decisions about his daily care.

This new resource has three major sections. The first section gives an overview of diabetes, the classification, complications, treatment and medical management. This section has sufficient information to give the theoretical basis of the disease to the patient in the simplest manner. The second section is dedicated to teaching the newly diagnosed patient with diabetes. In this section, information is presented in the nursing process format: first, acquisition of knowledge by the learner; then acquisition of skills, evaluation of the patient and documentation.

The third section describes how to teach the skill of glucose monitoring and preparation and administration of insulin. Finally, this resource ends with a Discharge Teaching Checklist which delineates step by step the knowledge, and skills the patient must learn.

I want to thank and recognize former 9 Long Patient Care Manager Nenita Arroz, for the opportunity to come up with this project and to my current Patient Care Manager Margarita Ilumin for her continued support and encouragement. And finally, to Mary Sullivan, Diabetes Clinical Nurse Specialist who continues to pave the way and advocate UCSF nursing staff towards excellence in the care of our patients with diabetes for her wealth of knowledge in this field and for editing this final manuscript.

I hope that this will assist you in teaching the diabetic patient.

Sincerely,

Pete-Reuben Calixto, RN BSN CNN
Clinical Nurse III

Section I: Definition of Diabetes

Diabetes mellitus encompasses a group of diseases of various causes. The common fact of these diseases is that they all affect the ability of the pancreas to produce insulin for the body.

Diabetes is defined as a metabolic disorder in which the body's capacity to utilize sugar, fat and protein is disturbed due to insulin deficiency or insulin resistance. In the absence of insulin, the body is not able to utilize glucose.

Classification of Diabetes

1. Type 1 or insulin dependent diabetes
2. Type 2 or non-insulin dependent diabetes
3. Secondary diabetes
4. Gestational diabetes
5. Malnutrition-related diabetes
6. Maturity-onset diabetes of the young

Type 1 Diabetes

Usually affects children and young adults. This used to be called juvenile or insulin-dependent diabetes mellitus. This is usually seen in younger people but it can occur at any age. Generally, these people are dependent on exogenous insulin and are in danger of ketoacidosis if no insulin is administered.

Type 2 Diabetes occurs commonly among adults especially those over thirty years of age. The risks for developing this type of diabetes are:

a. being overweight
b. over forty years of age
c. genetics or th se with family history of diabetes
d. women who have had gestational diabetes or who had large babies

Secondary Diabetes is another class of diabetes mellitus. This can be due to other causes other than familial or genetic. Some of the causes are:

a. Diseases of the pancreas: chronic inflammation, infection (pancreatitis), or surgical removal (pancreatectomy), cystic fibrosis.
b. Hormonal as seen in acromegaly, Cushings syndrome, etc.
c. Drug –induced as seen in patients that develop diabetes after taking immunosuppressives. It can also be caused by other medications such as phenytoin and birth control pills. Steroid-induced diabetes belongs in this classification.

Diagnosis of Diabetes

Diabetes can be asymptomatic until it is detected by blood testing. Healthy individuals with no symptoms are accidentally diagnosed by routine physical examinations as required in pre-employment or school admission requirement for physicals or for other purposes. Other than those with obvious family predisposition to the disease, diabetes affect 0.5 to 4% of the population depending on the type of diabetes, age group and ethnic group. In 2008, diabetes affects 24 million Americans, of these 10% have Type I diabetes and 90% have Type 2 diabetes.

Diagnostic Tests

To confirm the diagnosis of diabetes, the following diagnostic tests are discussed in the order of effectiveness and sensitivity.

Fasting Blood Glucose

This is the standard laboratory test for the diagnosis of diabetes mellitus. A fasting blood sugar of 126 mg/dL or greater is diagnostic.

Interpretation	
Normal Values:	100 mg/dL or less
Impaired Fasting Glucose	100-125 mg/DL (now termed as prediabetes)
Diabetes	>125 mg/dL

Oral Glucose Tolerance Test

This is the most sensitive test for detecting diabetes mellitus. It follows a rigid preparation that includes a very specific dietary intake and intricate instructions prior to the test. Results of this procedure could be altered by other medications such as steroids, thiazide diuretics, salycylates and alcohol to name a few.

Interpretation: Results of 140mg/dL at 2-hr is interpreted as impaired glucose tolerance and 200 mg/dL or greater is diagnostic of diabetes mellitus.

Signs and Symptoms of Diabetes

The symptoms in uncomplicated diabetes are usually vague. Persons with diabetes may be asymptomatic. The causes of the symptoms of diabetes can be attributed to the effects of lack of insulin.

Glycosuria is the loss of glucose in the urine. When there is an excess of sugar in the blood, the excess is then lost into the urine. Consistent concentration of high sugar levels causes the withdrawal of fluids from the cells causing ***dehydration***. Since the diffusion of glucose through the cellular pores occurs with difficulty, there is an increase in the osmotic pressure of the extracellular fluids resulting in the movement of water out of the cells resulting in cellular dehydration.

Polyuria is the excess production of urine resulting from the osmotic diuretic effect of glucose in the renal tubules. This osmotic effect results in the loss of essential electrolytes particularly sodium and potassium. Loss of potassium can cause a serious state of electrolyte imbalance because of potassium's role in cardiac contraction.

Polydypsia is the state of excessive drinking or craving for fluids. This compensatory action is due to the massive loss of fluid and excessive urine flow.

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Diabetes Discharge Information

Diabetes is a condition which causes high blood sugar. **Type 1 diabetes** is caused by a defect in the immune system which triggers the body to destroy its own insulin producing cells in the pancreas. With **Type 2 diabetes**, there is a defect in insulin action. With **steroid induced diabetes**, prednisone or Decadron blocks insulin from working properly. You have _____ diabetes.

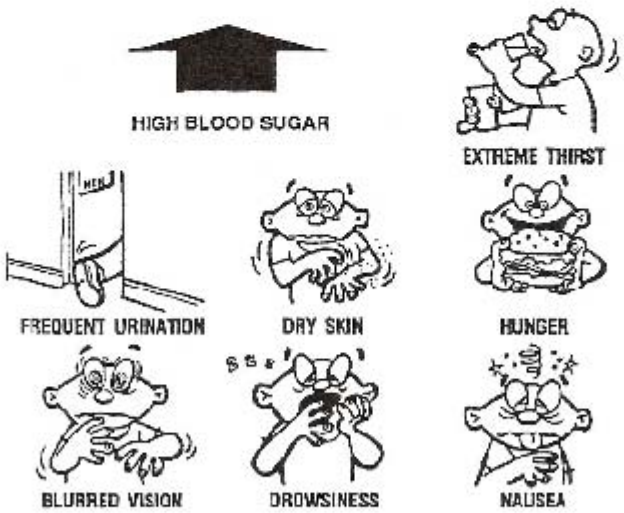
An acceptable blood sugar range is 80-180 mg/dl.

High Blood Sugar — Above 200 mg/dl.

Causes

- Too much food, not enough insulin or diabetes pills, infection, stress

Symptoms



UCSF Medical Center Physician Referral Service: 888/689-UCSF

Treatment

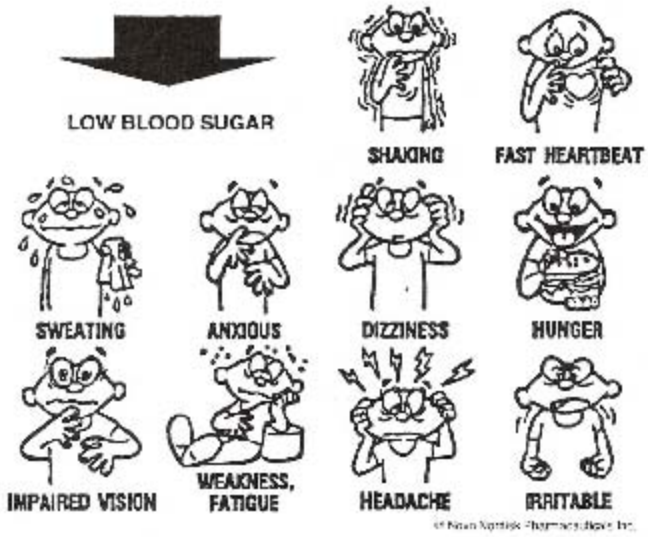
- Review and follow your meal plan. Drink sugar-free liquids

Low Blood Sugar - Less Than 70 mg/dl

Causes

- Too little food, skipped meals, too much insulin or diabetes pills, excess exercise

Symptoms



Treatment

- Check your blood sugar. If less than 70 mg, take 15 grams carbohydrate, (such as 4 oz. juice, or 3 glucose tablets). Recheck your blood sugar in 15 minutes. If less than 100 mg, repeat treatment
- Call your doctor to report low blood sugar values

Exercise Guidelines

Exercise helps to lower your blood sugar. When exercising you should:

- Carry a sugar source such as raisins or glucose tablets
- Wear identification — you can obtain a MedicAlert ID by calling 1-800-432-5378
- If you take insulin, check your blood sugar prior to and after exercise to determine how exercise affects your blood sugar level

Treatment and Management of Diabetes

The goal of diabetes management is to return blood glucose levels to within normal range. Hyperglycemia is managed in a number of ways. The way it is managed depends on the type of diabetes the patient has, its severity and the patient's compliance with the prescribed regimen. Diet therapy, weight loss and exercise are often successful with early Type 2 diabetes. Insulin replacement therapy along with diet and exercise is necessary for the person whose pancreas does not make insulin.

Successful management of diabetes depends on the harmonious interaction, collaboration and communication of the health team and the patient. Successful management depends on the patient's understanding of the disease process. Open communication between the patient and the health care team is critical in learning how to live with the disease and how to prevent its complications.

MEDICINES FOR TYPE 2 DIABETES

Lisa A. Kroon, Pharm.D., CDE

Medicine	FDA Approval	Formulations (color indicated if available by Brand only)	Dosing	Comments (SE= possible side effects)
STIMULATORS OF INSULIN RELEASE (Insulin Secretagogues) - increase insulin secretion from the pancreas[1]				
SULFONYLUREAS (SFUs)				
Tolazamide Tolinase® (no longer made) various generics	1965	100 mg, 250 mg, 500 mg tablets	Initial: 100-250 mg daily Range: 100-1000 mg Dosed once or twice (if >500 mg) daily	SE: hypoglycemia, weight gain
Tolbutamide Orinase® various generics	1957	500 mg tablets	Initial: 1000-2000 mg daily Range: 250-3000 mg (seldom need >2000 mg/day) Dosed two or three times daily	SE: hypoglycemia, weight gain Preferred SFU for elderly Must be taken 2-3 times daily
Glimepiride Amaryl® various generics	11/95	1 mg, 2 mg, 4 mg tablets	Initial: 1-2 mg daily Range: 1-8 mg Dosed once daily	SE: hypoglycemia, weight gain Need to take only once daily
Glipizide Glucotrol® Glucotrol XL® various generics	 5/84 4/94	5 mg, 10 mg tablets ER: 2.5 mg, 5 mg, 10 mg tablets	Initial: 5 mg daily Range: 2.5-40 mg[2] (20 mg for XL) Dosed once or twice (if >15 mg) daily	SE: hypoglycemia, weight gain Preferred SFU for elderly ER = extended release/take once a day
Glyburide Micronase®, DiaBeta® various generics	5/84	1.25 mg, 2.5 mg, 5 mg tablets	Initial: 2.5-5 mg daily Range: 1.25-20 mg[2] Dosed once or twice daily	SE: hypoglycemia, weight gain
Glyburide, micronized Glynase PresTab® various generics	3/92	1.5 mg, 3 mg, 4.5 mg, 6 mg micronized tablets	Initial: 1.5-3 mg daily Range: 0.75-12 mg Dosed once or twice (if >6 mg) daily	SE: hypoglycemia, weight gain
GLINIDES				
Repaglinide Prandin®	12/97	0.5 mg (white), 1 mg (yellow), 2 mg (red) tablets	Initial: 1-2 mg daily (0.5 mg if A1C <8%) Range: 0.5-16 mg Max dose per meal is 4 mg Dosed two, three, or four times daily	SE: hypoglycemia Safe for elderly Duration of action is only 4 hours Take within 15-30 minutes of meal
Nateglinide Starlix®	12/00	60 mg (pink), 120 mg (yellow) tablets	Initial: 120 mg three times daily (if A1C close to goal, use 60 mg) Range: 60-120 mg three times daily	SE: hypoglycemia Safe for elderly Duration of action is only 2 hours Take within 30 minutes of meal

[1] SFUs, repaglinide and nateglinide can cause hypoglycemia. The risk of hypoglycemia is increased when meals are skipped. Avoid skipping meals.

[2] "Clinical" maximum daily dose for glyburide is 10 mg and glipizide is 20 mg; higher doses are not likely to further lower the blood glucose.

COMBINATION ORAL PILLS				
Glyburide/Metformin Glucovance® various generics	7/00	1.25 mg/250 mg (pale yellow), 2.5 mg/500 mg (pale orange), 5 mg/500 mg (yellow) capsule shaped	Initial: 1.25 mg/250 mg once or twice daily Range: up to – 20/2000 mg Dosed once or twice daily	Same as above with glyburide and metformin
Glipizide/Metformin Metaglip® various generics	10/02	2.5 mg/250 mg (pink), 2.5mg/500 mg (white), 5mg/500 mg (pink) oval tablets	Initial: 2.5 mg/250 mg daily or 2.5mg/500 mg twice daily Range: up to 20/2000 mg Dosed once or twice daily	Same as above with glipizide and metformin
Rosiglitazone/Metformin Avandamet®	10/02	2 mg/500 mg (pale pink), 2 mg/1000 mg (yellow), 4 mg/500 mg (orange), 4 mg/1000 mg (pink) oval tablets	Initial: 2 mg/5000 mg once or twice daily Range: up to 8 mg/2000 mg; Dosed twice daily	Same as above with metformin and rosiglitazone
Pioglitazone/Metformin ActoPlus Met®	8/05	15 mg/500 mg, 15 mg/850 mg (white to off-white) oblong tablets	Initial: 15 mg/500 mg or 15 mg/850 mg once or twice daily Range: up to 45 mg/2550 mg Dosed once or twice daily	Same as above with metformin and pioglitazone
Pioglitazone/Glimepiride Duetact®	7/06	30 mg/2 mg, 30 mg/4 mg (white to off-white) tablets	Initial: 30 mg/2 mg or 30 mg/4 mg once daily Range: max of one tablet daily Dosed once daily	Same as above with pioglitazone and glimepiride
Rosiglitazone/Glimepiride Avandryl®	11/05	4 mg/1 mg (yellow), 4 mg/2 mg (orange), 4 mg/4 mg (pink) rounded triangle tablets	Initial: 4 mg/1 mg or 4 mg/2 mg once daily Range: up to 8 mg/4 mg Dosed once daily	Same as above with rosiglitazone and glimepiride
Sitagliptin/Metformin Janumet®	03/07	50 mg/500 mg (light pink), 50 mg/1000mg (red) oblong tablets	Initial: 50 mg/500 mg or 50 mg/1000 mg twice daily Range: up to 100 mg/2000 mg Dosed twice daily	Same as above/below with sitagliptin and metformin
Repaglinide/Metformin PrandiMet®	06/08	1 mg/500 mg (yellow), 2 mg/500 mg (pink) tablets	Initial: 1 mg/500 mg twice daily Range: 10 mg/2500 mg, Max per dose 4 mg/1000 mg Dosed twice or three times daily	Same as above with repaglinide and metformin

Table is prepared with information from package inserts of the various medications and opinion of the UCSF Diabetes Teaching Center.
This table is not meant to be all inclusive and contains important educational information, as viewed by the UCSF Diabetes Teaching Center

EUGLYCEMICS: Medicines that bring the blood glucose into the normal range. These medicines should not cause hypoglycemia.[3]				
BIGUANIDES: decreases glucose release from liver				
Metformin Glucophage® Extended release (ER): Glucophage XR® Fortamet® Glumetza Riomet® (liquid, 500 mg/5ml)	12/94 10/00	Glucophage: 500 mg, 850 mg, 1000 mg tablets Glucophage XR: 500 mg, 750 mg tablets Fortamet: 500 mg, 1000 mg tablets Glumetza: 500 mg, 1000 mg tablets Generic metformin ER: 500 mg, 750 mg tablets	Initial: 500 mg twice daily or 850 mg once daily Range: 500-2550 mg Dosed two or three times daily ER: Initial: 500 mg once daily Range: 500-2000 mg Dosed once daily	SE: Gastrointestinal symptoms (diarrhea, nausea, upset stomach), metallic taste (3%), lactic acidosis (0.03 cases/1000 people)[4,5] Take with meals (ER with evening meal) Cannot use if have liver or kidney problems, take a drug to treat heart failure, or drink alcohol excessively
ALPHA-GLUCOSIDASE INHIBITORS: STARCH BLOCKERS - delay digestion and absorption of carbohydrates				
Acarbose Precose® various generics	9/95	25 mg, 50 mg, 100 mg tablets	Initial: 25 mg three times daily Range: 75-300 mg (max 150 mg if <60 kg) Dosed three times daily	SE: flatulence Take with first bite of meal Start with low dose and slowly ↑ to minimize GI intolerance.
THIAZOLIDINEDIONES (Glitazones or TZDs): decrease insulin resistance in the body (muscle and fat tissues)				
Rosiglitazone Avandia®	5/99	2 mg (pink), 4 mg (orange), 8 mg (red-brown) tablets	Initial: 4 mg daily Range: 4-8 mg Dosed once or twice daily	SE: anemia, swelling (edema) from fluid retention, weight gain, bone loss in women, macular edema (in eye) May ↑ risk of heart problems such as heart-related chest pain (angina) or heart attack (myocardial infarction) May cause or worsen heart failure Cannot use if have liver problems or severe heart failure Requires liver monitoring[6]
Pioglitazone Actos®	7/99	15 mg, 30 mg, 45 mg (white to off-white) tablets	Initial: 15-30 mg daily Range: 15-45 mg Dosed once daily	SE: anemia, swelling (edema) from fluid retention, weight gain, bone loss in women, macular edema (in eye). May cause or worsen heart failure Cannot use if have liver problems or severe heart failure Requires liver monitoring[6]
INCRETIN-BASED THERAPIES: increase insulin secretion, reduce glucose release from liver after meals, delay food empyting from stomach (exenatide only) and promote satiety (exenatide only)				
Exenatide (GLP-1 analog) Byetta®	4/05	5 mcg per dose and 10 mcg per dose injected under the skin (subcutaneous/SQ) Available as a pen device	Initial: 5 mcg SQ twice daily Range: up to 10 mcg SQ twice daily Dosed twice daily	SE: nausea, headache, hypoglycemia (when used with insulin secretagogues) 36 reports of sudden pancreatitis (inflammation of pancreas) May cause mild weight loss
Sitagliptin (DPP-4 inhibitor) Januvia®	11/06	25 mg (pink), 50 mg (light beige), 100 mg (beige) tablets	Initial: 100 mg daily Range: 25-100 mg daily Dosed once daily	SE: runny nose, upper respiratory infection, rare severe allergic reactions (swelling of tongue, throat, face or body; severe rash) No weight gain Lower doses used if kidney problems

[3] These medicines do not cause hypoglycemia when used *alone*. However, when used *with* SFUs, repaglinide, nateglinide, or insulin, hypoglycemia may occur.

[4] Lactic acidosis symptoms: feeling very weak, tired or uncomfortable; unusual muscle pain, trouble breathing, unusual or unexpected stomach discomfort, feeling cold, feeling dizzy or lightheaded, or suddenly developing a slow or irregular heartbeat.

[5] Radiologic tests using iodinated contrast media: stop metformin at the time of or prior to the procedure, and withhold for 48 hours after procedure and restart after kidney function has been re-evaluated and found to be normal.

[6] Liver toxicity symptoms: unexplained nausea, vomiting, stomach pain, unusual tiredness, loss of appetite, dark urine, or yellowing of the skin or whites of eyes.

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Injections

Insulin

Insulin is a hormone produced in the Islets of Langerhans in the pancreas. When there is deficiency in the production of insulin, some attempt must be made to correct the deficiency. The administration of insulin is critical to survival of patients with Type 1 diabetes and essential to the health of patients with Type 2 diabetes whose disease can no longer be controlled by antidiabetic oral agents.

Patients with Type 1 diabetes need insulin to survive

Types of Insulin

Classification	Onset	Peak	Duration
Rapid Acting			
Humalog (Lispro)	5-15 minutes	0.5-1.5 hours	3-4 hours
Novolog (Aspart)	10-20 minutes	0.5-1.5 hours	3-4 hours
Short Acting			
Regular Insulin	0.5-1 hour	2-3 hours	6-8 hours
Intermediate Acting			
NPH	2-4 hours	6-10 hours	14-18 hours
Long Acting			
Lantus	1.1 hours	Peakless	24 hours
70/30 mixture of NPH (70%) and Regular (30%). See timing for each above 50/50 mixture of NPH (50%) and Regular (50%) 75/25 mixture of (75%) neutral protamine lispro (NPL) and (25%) Lispro			

Nutrition Therapy

Nutrition is a very important component of diabetic management. For a long time, nutrition has been the most underestimated and misunderstood part of diabetes control. The key to satisfactory management lies in the sound and realistic education of the individual.

Facts:

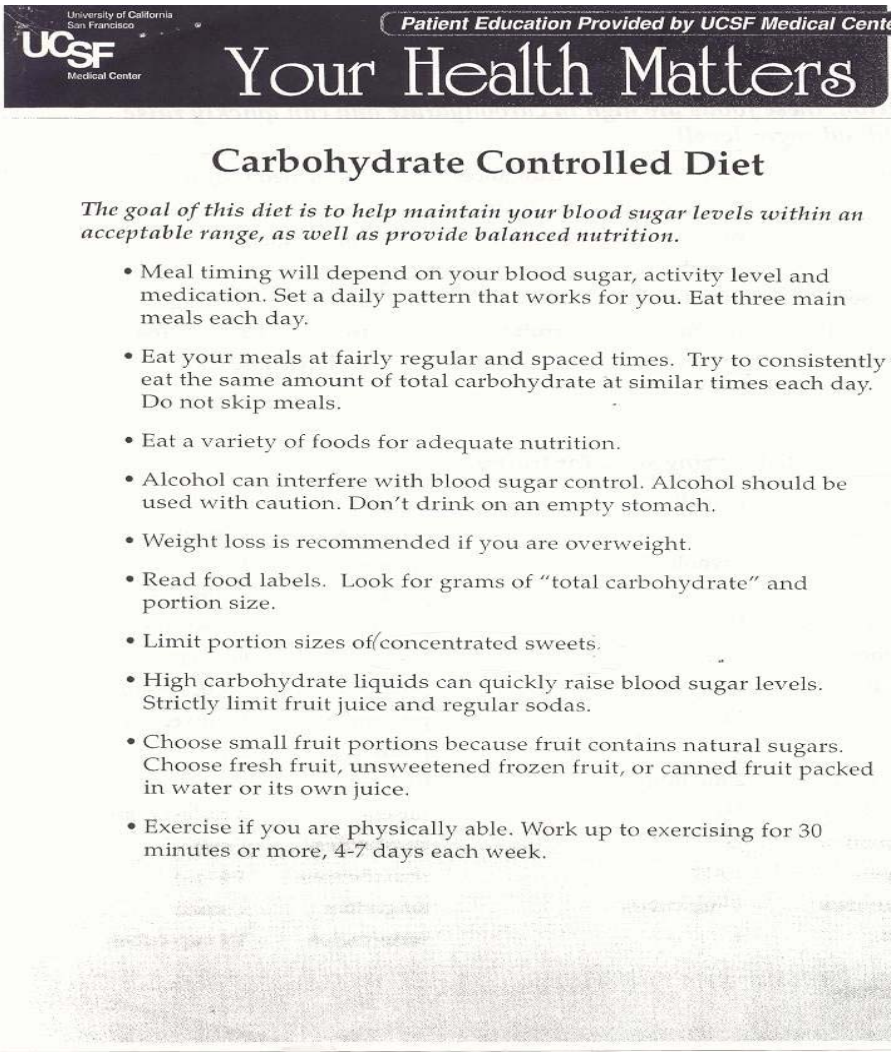
a. There is no specific diabetic diet or ADA diet. Meals are planned individually as

recommended based on lifestyle and activity.

b. Meals are flexible and allow for a variety of choices

Below are the specific goals of nutritional therapy as outlined by the American Dietetic and American Diabetes Association.

1. Maintenance of near normal blood glucose levels by balancing food intake with insulin or oral hypoglycemic medications and exercise levels.
2. Achievement of optimal serum lipid levels, including total cholesterol, LDL cholesterol, triglycerides, VLDL cholesterol, and HDL cholesterol
3. Provision of adequate calories for maintaining or attaining reasonable weight for adults, to meet the normal growth and development needs for children and adolescents, to meet increased metabolic needs for children and adolescents, and to meet increased metabolic needs during pregnancy and lactation, or to recover from catabolic illness.
4. Prevention, delay or treatment of nutrition-released risk factors and complications such as obesity, dyslipidemias, and hypertension.
5. Improvement of overall health through optimal nutrition.



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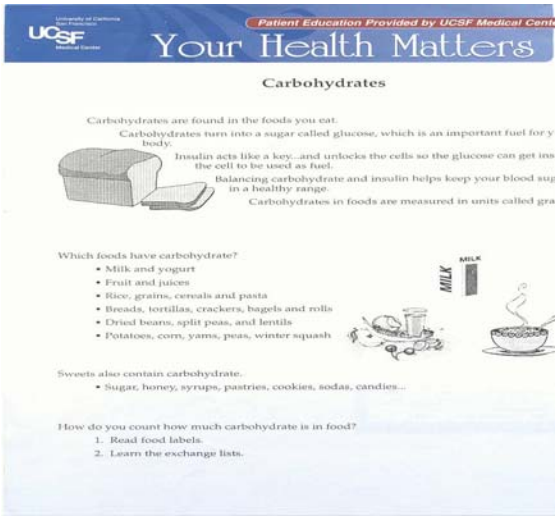
Carbohydrate Controlled Diet

The goal of this diet is to help maintain your blood sugar levels within an acceptable range, as well as provide balanced nutrition.

- Meal timing will depend on your blood sugar, activity level and medication. Set a daily pattern that works for you. Eat three main meals each day.
- Eat your meals at fairly regular and spaced times. Try to consistently eat the same amount of total carbohydrate at similar times each day. Do not skip meals.
- Eat a variety of foods for adequate nutrition.
- Alcohol can interfere with blood sugar control. Alcohol should be used with caution. Don't drink on an empty stomach.
- Weight loss is recommended if you are overweight.
- Read food labels. Look for grams of "total carbohydrate" and portion size.
- Limit portion sizes of concentrated sweets.
- High carbohydrate liquids can quickly raise blood sugar levels. Strictly limit fruit juice and regular sodas.
- Choose small fruit portions because fruit contains natural sugars. Choose fresh fruit, unsweetened frozen fruit, or canned fruit packed in water or its own juice.
- Exercise if you are physically able. Work up to exercising for 30 minutes or more, 4-7 days each week.

Carbohydrate Controlled Diet

Carbohydrate control is basic in the management of diabetes so meal planning needs to be individualized for each person. A listing of foods containing carbohydrates is available from the unit dietician. In order to adhere to the diet, patient education must focus on reading the product labels. The figure below is a tremendous help for the patient in the selection of food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Carbohydrates

Carbohydrates are found in the foods you eat.

Carbohydrates turn into a sugar called glucose, which is an important fuel for y body.

Insulin acts like a key...and unlocks the cells so the glucose can get ins the cell to be used as fuel.

Balancing carbohydrate and insulin helps keep your blood su in a healthy range.

Carbohydrates in foods are measured in units called gra

Which foods have carbohydrate?

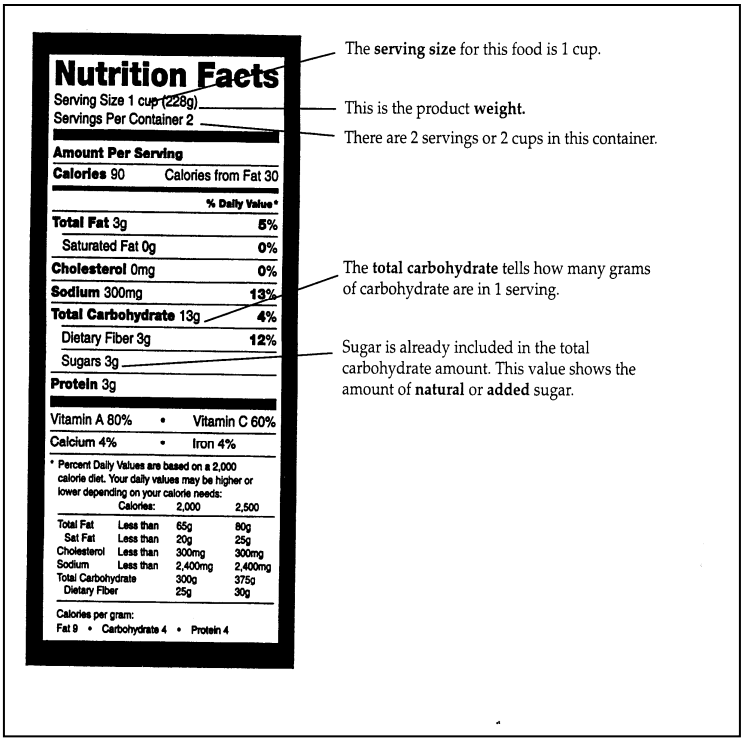
- Milk and yogurt
- Fruit and juices
- Rice, grains, cereals and pasta
- Breads, tortillas, crackers, bagels and rolls
- Dried beans, split peas, and lentils
- Potatoes, corn, yams, peas, winter squash

Sweets also contain carbohydrate.

- Sugar, honey, syrups, pastries, cookies, sodas, candies...

How do you count how much carbohydrate is in food?

1. Read food labels.
2. Learn the exchange lists.



Exercise

Exercise lowers blood glucose levels by utilizing glucose as an energy source. It also plays a major role in decreasing cardiovascular disease by delaying or stopping damage to large blood vessels. With or without diabetes, the importance of a routine exercise cannot be underestimated. Exercise prevents the occurrence of various complications such as deep vein thrombosis and tissue atrophy. According to the American College of Sports Medicine (ACSM), "the benefits of physical activity are well established and emerging studies continue to support the role for habitual exercise in maintaining overall health and well-being." Other benefits of exercise are:

a. Decreases blood glucose level and increases insulin sensitivity and maybe instrumental in preventing

Type 2 diabetes
b. Improvement in cardiorespiratory function by increasing maximal oxygen intake
c. Reduction in coronary artery disease risk factors
d. Decreases anxiety and depression and enhances a sense of well-being, performance of work and recreational activities.

Complications of Diabetes

The two major acute complications of diabetes are hyperglycemia and hypoglycemia.

Acute Complications

Hypoglycemia or low blood glucose levels fall too low in patients taking oral medications or insulin.
Causes:

a. Too much oral hypoglycemic agent or insulin or insufficient food intake
b. Increased exercise without extra food intake. Exercise increases glucose use resulting in insulin surplus and decrease in available glucose to the brain. The body responds by releasing epinephrine from the adrenal glands or glucagon from the pancreas to stimulate the liver to convert glycogen to glucose and to release the resulting glucose into the blood stream.
c. Too much oral hypoglycemic agents or insulin and not enough glucose present.

The classic symptoms of hypoglycemia are: nervousness, shakiness, weakness, perspiration, headache, double vision and hunger. These are primarily symptoms of falling or moderately low blood glucose level due to increased epinephrine release. As the blood sugar levels continue to fall, late neurological symptoms can be manifested by severe headache, disorientation, light-headedness, unconsciousness, convulsions and eventually coma.

To avoid hypoglycemia, the patient must be taught to identify factors that can cause it. Situations that can cause hypoglycemia include:

a. Eating less than usual.
b. Exercising more than usual.
c. Alcohol intake. Alcohol can also decrease the awareness of hypoglycemia.
d. Erratic meal schedule
e. High insulin or oral diabetes medication dose.

Hyperglycemia results when there is too much glucose and not enough insulin present.

Causes:

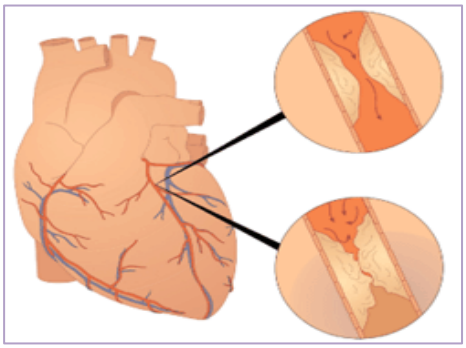
1. Deviation from diet by ingesting large quantities of carbohydrates

2. Infection caused by the activation of the adrenal medulla and cortex, producing epinephrine and cortisol. Elevated blood glucose levels slow down the healing process.
3. Stress-caused hyperglycemia is emotionally-related. Stress causes the release of epinephrine from the adrenal medulla releasing into the blood stream increasing the rate of glycogenolysis and lipolysis. As a result, glucose and fatty acids from the liver are released.

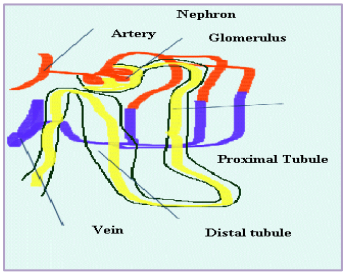
Chronic Complications

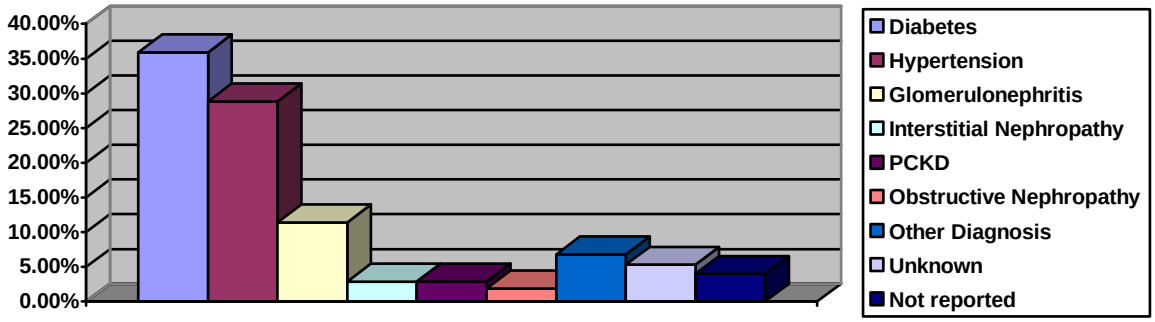
Chronic complications of diabetes include massive involvement of the large vessels to the heart, the brain and the periphery particularly those of the lower extremities.

1. **Coronary artery disease** (CAD) is the leading cause of death in diabetes.
2. **Cerebrovascular disease** manifested by the rupture of a cerebral artery with the escape of blood into the brain tissue. This may come without warning although preliminary symptoms include dizziness, headaches, disturbances in speech, anxiety and numbness of one side of the body.



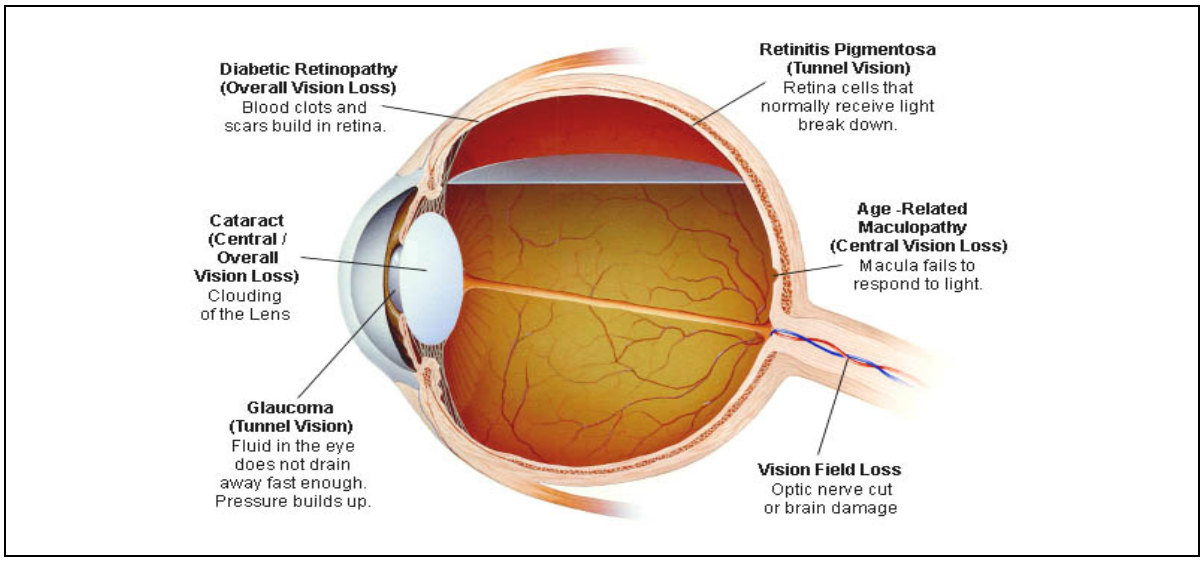
3. **Carotid artery disease** is subject to arteriosclerotic changes. Blockage causes decreased blood flow to the brain causing periods of lightheadedness and fainting.
4. **Peripheral vascular diseases**. Walking upright places a tremendous burden on peripheral blood flow. Arteriosclerosis results in decreased circulation into the area. This contributes to decreased blood supply. A decreased blood supply can jeopardize a traumatized area to infection and gangrene.
5. **Nephropathy** is caused by persistent hyperglycemia. The microvasculature of the kidneys is sensitive to changes in blood sugar levels. Of the over 50,000 patients enrolled in the ESRD program in 1991, the primary cause of their kidney failure was diabetes.





The kidney's functional units are the nephrons composed of a tuft of arterioles called glomeruli. They are responsible for filtering waste materials from the blood. Overtime, the capillary basement membrane of the glomeruli is damaged by hyperglycemia. In hyperglycemic states, an enzyme transfers more glucose to the basement membrane causing thickening allowing larger molecules such as proteins to pass through and be lost in the urine. This condition known as diabetic nephropathy may lead to edema, hypertension, proteinuria, uremia and death. The kidneys also normally excrete insulin into the urine. As renal failure progresses, this process is eliminated thus requirement for exogenous insulin must be reduced.

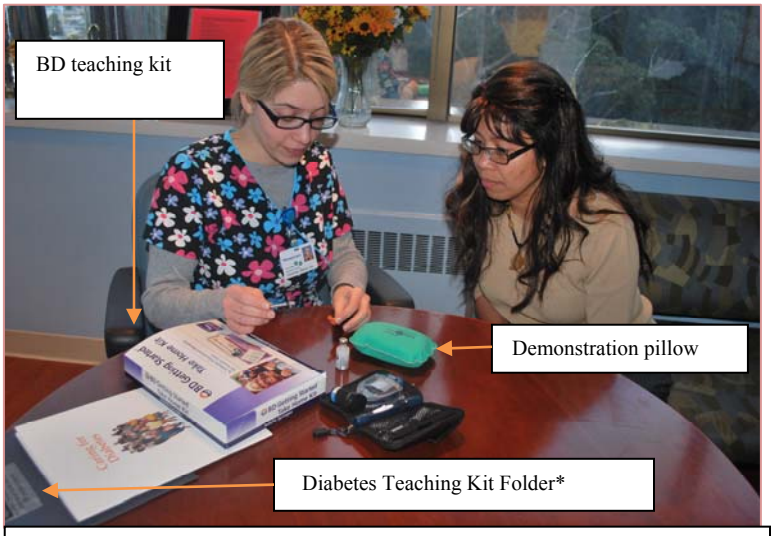
6. **Retinopathy** is caused by the thickening of the capillary basement membrane. This membrane serves as a filtering system. In case of diabetes, the split pores of the basement membrane that allows only small particles to pass through in normal condition, allows the passage of substances composed of larger molecules such as proteins. This leak of protein into the kidney and the eyes could trigger eye pathology.



Section II: Teaching Process for the Person Newly Diagnosed With Diabetes

Before teaching any diabetes self-care behaviors, the nurse must know the essential information that needs to be conveyed to the patient. Teaching is imperative in order to promote diabetes self-care behaviors.

During the last few years, several new publications and policies have been adopted and implemented at UCSF. These include the predominant use of aspart as the primary agent of choice over the classic regular insulin in treating and managing hyperglycemia. In addition, the insulin pen (see appendices) continues to gain popularity and utilization for patients that are being discharged.



*Diabetes Teaching Kit Folders are available on all units

At UCSF, we have the following resources to assist you with DM patient education.

- To meet the increasing demand of non-English speaking patients, diabetes teaching packets that contain information about the insulin pen and insulin medication cards are now available in Chinese, Russian and Spanish languages.

- Today's health care providers and consumers are getting more comfortable in accessing the computer to obtain information. The Diabetes Teaching Center at the University of California, San Francisco is a very valuable resource. It can be accessed through the URL address, www.dtc.ucsf.edu.

- Diabetes educational TV videos in English and Spanish are also available for patients and families. This is accessed on Channel 38 (Spanish) and 39 on UCSF television. Refer to schedule in the Appendices section.

- Before teaching new information or a skill to a patient, the nurse should take into account principles related to adult learning theories. This applies to all instructions that the patient will receive prior to discharge. Below are some strategies for successful teaching of the adult learner.

Teaching Resources

1. Video channels channel 39 (English) and channel 38 (Spanish)
2. BD teaching kit
3. Your Health Matters
4. Caring for Diabetes
5. Diabetes Teaching Resource for Staff Nurses
6. Online www.dtc.ucsf.edu for patient education teaching
7. Discharge Diabetes Folders (located in each nursing unit)
8. Diabetes Teaching Patient Assessment Decision Tree

DIABETES TEACHING PATIENT ASSESSMENT DECISION TREE

I. HISTORY

1. Does patient have new diagnosis of diabetes mellitus?	☐ Yes	☐ No
2. Is the patient taking any medication that can impact on blood sugar? If 'YES" what medications? _____	☐ Yes	☐ No
3. If insulin, how much? _____		
4. Is insulin total daily dose ≥ 10 units?	☐ Yes	☐ No
5. If insulin total daily dose < 10 units are BG > 200?	☐ Yes	☐ No

If **YES** to any of the above questions, then

1. Activate Diabetes Teaching Record
2. Initiate Diabetes Mellitus Care Plan
3. Give patient Diabetes Mellitus Your Health Matters
4. Give patient booklet, Caring for Diabetes
5. Give patient, Steroid Induced Diabetes Your Health Matters (if appropriate)

II. BLOOD GLUCOSE MONITORING *(For ALL Patients on BG impacting Medications*)

1. Does patient check blood glucose at home?	☐ Yes	☐ No
2. Patient can state name of meter and how old it is.	☐ Yes	☐ No
3. How often does patient check finger stick blood sugar?		
4. When was the last time patient checked blood sugar? (time and date>>>>>>)		
5. Patient can state signs and symptoms of hypo/hyperglycemia.	☐ Yes	☐ No

If patient says "NO" to Questions 1,2, and 3

1. Obtain MD order for glucose meter and strips from pharmacy
2. Begin teaching blood glucose monitoring pre-meals and bedtime
3. Complete DM Teaching Record

III. SELF-INSULIN ADMINISTRATION (For patients going home on insulin)

1. Patient can self-administer insulin with syringe and/or pen	☐ Yes	☐ No
2. Patient can draw up insulin dose correctly	☐ Yes	☐ No
3. Patient can determine insulin dose.	☐ Yes	☐ No

If **NO**,

1. Check with pharmacy if pen is covered by insurance
2. Obtain BD® Teaching kit and Novolog® Pen (Teaching Kit
3. Write Insulin Plan Card
4. Instruct patient regarding insulin administration
5. Instruct patient regarding insulin plan and dose determination.

Some Strategies For Successful Teaching of the Adult Patient

(Susan Barbour, RN MS FNP, Chairperson Patient Education Committee at UCSF)

1. Patient must recognize the need to learn the information.
    - Ask the patient what concerns he has and what he wants to learn. Adults unlike children only remember information which they recognize a need to learn.
    - Your patient's concerns should be the focus of your teaching.

2. Teach only a small amount at each patient encounter.
    - More information given often results in less information retained.
    - Determine what the patient must know to carry out a new skill or behavior and start from there.
    - Help the patient to make small successful steps to build confidence.

3. Keep the language simple
    - Avoid using medical terms or explain their meaning to the patient
    - Ask the patient to restate the new information in his own words.

4. Consistency and repetition are important for learning
    - Make certain the same information is repeated consistently at each visit.
    - Use patient education handouts to reinforce a new skill, concept, or instruction.
5. Relate new information to existing knowledge and culture patterns.
    - Discuss the patient's current health practices and beliefs.
    - Help the patient problem solve – How will the new prescribed behavior blend into his daily pattern.
6. Use a variety of teaching methods to increase learning and retention.
    - Question and answer
    - Reading materials
    - Small group discussions with family and other patients
    - Draw pictures
    - Demonstration and practice
    - Use of teaching aids.

Before Starting

1. Assess patient's learning ability. Review DM Patient Assessment Decision Tree

   Questions of Assessment:
    1. Do you know what diabetes is? Anyone from your family or close associates have diabetes?

2. What is or are the causes? Treatment?
3. Are you familiar with the signs and symptoms?.
4. Have you had any previous diagnosis of high blood sugar? What did you do to it?
5. Are you taking any oral hypoglycemic agents?
6. Have you in taken any insulin in the past? What type of insulin?

This is the best time to correct myths and misconceptions. It is helpful to have patient express these misconceptions so they can be addressed and corrected.

2. Provide teaching materials and instruct patient to review the information before the scheduled teaching session. An informed patient will facilitate the teaching process and allow flexibility in identifying which steps to skip or modify. Most of the time, patients are exposed to a wide variety of life experiences. Some patients might have been involved in the care of persons with diabetes from their family or friends and thus might have a good background of their newly-diagnosed illness. Also consider the patient's language and level of educational background and preparation.

   Reading Materials (These are available in Diabetes Educational folder). These are a collection of teaching materials in the folders.

   a. Caring for Diabetes BD Starter kit®
   b. Signs and symptoms of hypo and hyperglycemia
   c. Carbohydrate and carbohydrate controlled diet
   d. Steroid-induced diabetes:Your Health Matters
   e. Visual instruction of how to use the glucose meter
   f. How to administer subcutaneous injection of insulin
   g. Insulin medication cards (available in English, Chinese, Russian and Spanish)
   h. Insulin pen Your Health Matters in English, Spanish, Chinese and Russian

3. Obtain an order from the physician for a glucose meter and strips from the pharmacy.

Implementation

1. Review the following:
   a. Diabetes/Treatment and Medications
   a. Record keeping
   b. Signs and symptoms of hypo and hyperglycemia
   c. Disposal of needles, syringe, and pin needles

2. Demonstrate the following and allow patient to return the demonstration.
   a. Insulin preparation

b. Subcutaneous injection
c. Glucose monitoring and use of meter

Documentation (Refer to Adult Diabetes Mellitus Teaching Record)

1. Health Management
    a. Check box when information has been given
    b. Check box when skill has demonstrated by the RN including date
    c. Check box when a patient/family is able to demonstrate skill and the date
    d. Check box of identified proficiency level of patient or family
    e. Enter the date when patient/family have demonstrated competency.
2. Alert dietician to complete the section on nutrition
3. Precautions: Provide contact number for patient's questions.
4. Additional information and instructions:
5. At time of discharge, have patient/family sign teaching record and give copy to the patient.

UCSF Medical Center

UNIT NUMBER

PT. NAME

BIRTHDATE

LOCATION DATE

ADULT DIABETES MELLITUS TEACHING RECORD

Instructions: Check box when patient understands the content presented. Date and sign at bottom of form. Document problems/issues with learning on the Pediatric Flowsheet or Progress Notes. Patient/Family signs when form complete.

1. Health Management

a. I have received the following educational materials
- ☐ *Caring for Your Diabetes*
- ☐ *Starter Kit*
- ☐ *Diabetes Discharge Information*

b. I can demonstrate:

	RN demo	Date	PT / Family Demo	Date	Needs Reinforcement	Independent	Date
insulin injection with syringe, with insulin pen	☐		☐		☐	☐	
insulin injection sites	☐		☐		☐	☐	
insulin withdrawal from vial	☐		☐		☐	☐	
insulin pen dosing	☐		☐		☐	☐	
blood glucose monitoring	☐		☐		☐	☐	
ketone testing	☐		☐		☐	☐	
glucagon administration	☐		☐		☐	☐	
safe syringe/lancet disposal	☐		☐		☐	☐	
signs/symptoms/treatment of high and low blood sugar	☐		☐		☐	☐	

c. Check and keep a record of blood sugars before meals and at bedtime
- ☐ Keep a food record _____
- ☐ Check for ketones when the blood sugar is over 240 mg/dl or when ill.

d. Follow insulin/diabetes pill regimen _____

_____

_____

_____

2. Nutrition

I have received dietary instruction on carb control, no liquid sugar _____.

☐ I can identify carbohydrate food groups and action on blood sugar.

3. Precautions

Call _____ for the following:
name telephone

- blood sugar less than 70, greater than 400.
- positive urine ketones
- low blood sugar requiring glucagon administration
- no smoking referral to smoking cessation clinic 1-800-No Butts

4. Additional Instructions / Information

☐ Contact the Diabetes Teaching Center (415) 353-2266

_____

☐ Schedule appointment at UCSF Diabetes Clinic (415) 353-2497

Patient/Family Signature: _____ Date: _____

☐ Translator used for instructions

Instructor Signature:

name	title	date

962-349 (Rev. 12/96) WordPerfect CHILDREN - MEDICAL RECORD COPY YELLOW - INSTRUCTOR COPY

Section III: Living with Diabetes

Blood Glucose Monitoring

Urine testing has been replaced by the regular testing of capillary blood for glucose levels. Since the introduction of glucometers, they have become"must have" equipment for persons with diabetes. Capillary blood provides an accurate glucose level in order to gauge the estimated dose of insulin to be give. At UCSF, patients are being taught to use the *Bayer meter* ®. This device can be obtained from UCSF Pharmacy with a doctor's order.

Procedure:

1. Check blood sugar before meals and at bedtime
2. Wash hands with water and soap or alcohol gel. soap.
3. Identify the finger to be pricked. Make sure to prick on the side of the finger. This area contains less nerve endings minimizing discomfort.
4. Follow instructions according to the glucose meter's specifications.

Blood glucose monitoring must be done before meals and at bedtime.

Contour® QUICK TEST GUIDE

Personalized Testing Made Easy

Your new CONTOUR meter offers two levels of testing, for easy personalization.

Basic mode (L1) for simple testing: just insert the strip and test!

Advanced mode (L2) for comprehensive, individualized diabetes management.

Performing a test is simple, no matter what mode you're using. Follow these easy steps to get your result.

Wash your hands with warm, soapy water and dry them well before performing a test.

Remove the gray endcap from your MICROLET™ 2 lancing device.

In one hand, hold the lancing device with your thumb on the grip indent. In your other hand, hold the endcap dial and gently snap off the end cap with a downward motion. Rotate the endcap on the lancet a 1/4 turn, then insert the lancet into the lancing device until you hear it click. Remove the round endcap from the lancet, and save it for disposing of your lancet after you test.

Insert a CONTOUR® Test Strip into the meter.

The meter will turn on, and an image of a blood drop will immediately flash on the screen, telling you the meter is ready for you to apply a tiny (0.6mL) blood sample.

Place the MICROLET™ 2 device firmly against your fingertip and press the blue release button. To help form the blood drop stroke your hand and finger toward the puncture site. Do not squeeze around the puncture site.

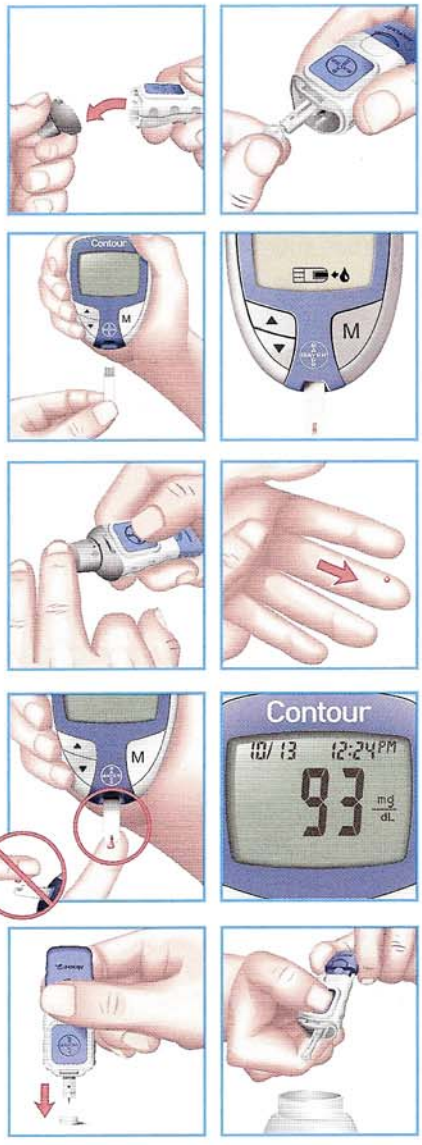
Touch the tip of the test strip lightly to the drop of blood until the meter beeps.

After the fast 5 second countdown, read the result.

After reading the result, remove and discard the used test strip. The reading will automatically be stored in memory, and the meter will automatically turn off.

To remove the lancet from the lancing device:

Remove the endcap as described above. Place the round lancet cap on a flat surface with the Bayer logo facing down. Push the lancet needle completely into the exposed side of the cap, as shown here. While pressing the blue release button, pull the blue cocking handle, and the lancet will drop into the container you have selected.



If you need more help or have any questions, please contact Bayer Customer Service at 800-348-8100

simplewins™

Contour® QUICK TEST GUIDE

Personalized Testing Made Easy

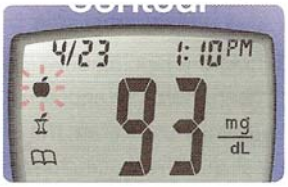
In Advanced Mode (L2), your new CONTOUR meter offers features that support comprehensive, individualized diabetes management.

If you are using Advanced Mode (L2), you have access to CONTOUR's quick and easy Meal Markers, which help provide information on how meals can affect your blood glucose levels. Ask your healthcare professional about the other features of the CONTOUR meter that can be personalized for your individual diabetes management. CONTOUR's Meal Markers and selectable post-meal test reminder support your decision-making about your insulin regimen.

Using the Meal Markers

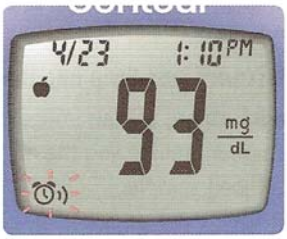
Marking a test result as pre-meal:

When your test result appears on the display, press ▲ or ▼ so the marker is flashing and press **M** to set.



Setting the test reminder:

If you mark a result with the , the will then flash. This allows you to set a reminder that will go off to remind you to do a post-meal test. Press **M** to set the reminder.



Marking a test as post-meal:

After the test reminder sounds, perform a test as described on other side. When you have completed this test and the result is shown, the will flash. Press **M** to set.

Marking a test as unique:

There are times you test your blood sugar that are unique, and not based around a meal. When your test result appears on the display, press ▲ or ▼ so the marker is flashing and press **M** to set. You may want to note this result in your CLINILOG® Log Book.

After marking the test result with the appropriate meal marker, remove the strip to turn the meter off and discard the used strip.

If you need more help or have any questions, please contact Bayer Customer Service at 800-348-8100

simplewins™

Preparation of Insulin

If a patient is going home on insulin. A patient will need to go home on insulin if requiring more than 10 units of insulin a day. (Refer to decision tree regarding initiation of diabetes teaching)

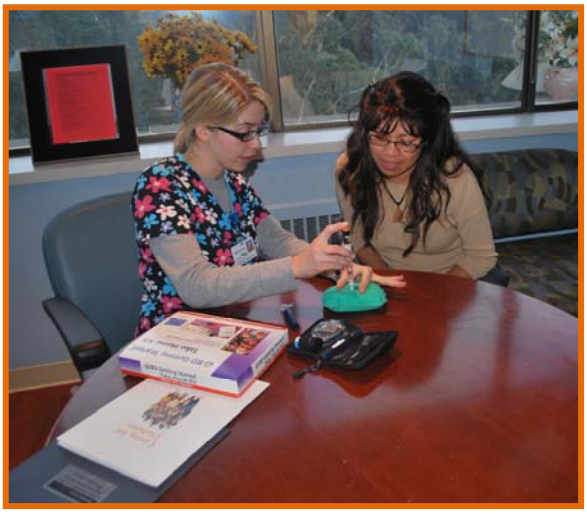
SYRINGE METHOD

Instruct the patient on the following

- Roll the bottle between the hands. Avoid vigorous shaking.
- Wipe the top of the bottle with alcohol
- Inject air into the insulin bottle equal to the dose of insulin to be taken out. *If mixing insulin, draw the clear insulin first then the cloudy insulin. Glargine insulins must be drawn and administered separately in a separate syringe.*
- Withdraw the insulin into the syringe. Make sure that the syringe does not have air bubbles.
- Purge the air bubbles from the syringe by pushing the plunger or tapping over the site of the bubble.
- Then, withdraw the insulin into the syringe for the second time adjusting to the required dose.

PEN METHOD

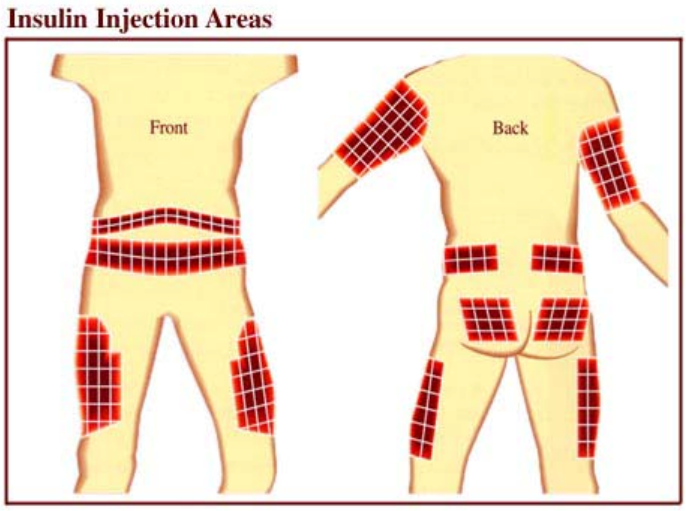
Check with the pharmacy to determine if patient's insurance covers insulin pens. If not, patient will have to be taught how to use insulin syringes.



Administration of Insulin

There are several areas where insulin can be administered. As a rule of thumb, insulin is best administered in subcutaneous tissue where it is least uncomfortable (less painful) and in an area where it is easily absorbed at a smooth rate. The most frequently used areas have been the thigh, abdomen, arms, and buttocks. These four areas are relatively painless, easily accessible, have almost equal absorption rates and can be pinched relatively easy.

Move injection site 1 inch from previous injection site.



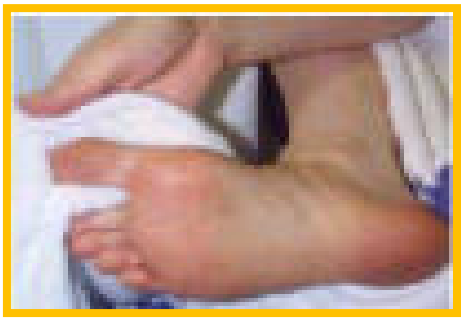
Hygiene

Persons with diabetes are more prone to infection due to decreased circulation and high blood glucose levels, abnormalities in immunologic responses, and poor white body cell activity due to high glucose concentration. For this reason, focus of teaching the diabetic patient must emphasize general hygiene paying particular attention to foot care.

Foot Care

The feet in diabetes are prone to develop vascular insufficiency, neuropathy and infection secondary to trauma. Although the diabetic foot is no different from someone with any peripheral vascular disease, diabetic neuropathy can interfere with the patient's perception of trauma or pressure. Foot care includes the following considerations:

1. Washing feet with lukewarm water using antibacterial soap.
2. Pat the feet dry gently but thoroughly paying attention in between the toes.
3. Cut toenails along the top of the toe without digging into the corners. A podiatrist needs to be consulted if there are thickened folds of skin on either side of the nail, or in the presence or corns and calluses that need to be removed.
4. Daily inspection of the feet.
5. Wear clean socks or stockings and properly fitting shoes
6. Avoidance of trauma.



Section IV: Outline Checklist in Discharge Teaching

Process	Activity
1. Knowledge	Issue the Diabetes Teaching Packet that includes handouts, BD Starter kit., for pen or syringe 1. Define diabetes 2. Discuss the how diabetes is diagnosed 3. Discuss symptoms of diabetes 4. Describe the signs and symptoms of hyperglycemia and hypoglycemia 5. Discuss the treatment and management of diabetes a. Medications and insulin b. Nutrition and Diet Therapy c. Exercise
2. Required Skills	Blood Glucose Monitoring (Obtain order for patient's own device) 1. Using glucose meter a. Obtaining blood sample b. Applying blood to the test strip c. Using meter memory 2. Finger stick 3. Recording reading Administering Insulin 1. Discuss insulin therapy 2. Describe dosing using "green card" 3. Describe subcutaneous injection 4. Identify injection site. Rotate sites 5. Drawing up and mixing insulin with syringe and pen. Hygiene
3. Evaluation	Have patient return demonstrate all the above required skills
4. Documentation	Refer to Adult Diabetes Mellitus Teaching Record

References

Funnel, M. M., Brown, TL., Childs, B.P, Hass, L.B., Hosey, G.M., Jensen, B., et al. National Standards for Diabetes Self-Management Education (2008). Diabetes Care, 31 (Supplement). S 87-S94.

Bardsley, J., Bronzini, B., Harrimon, K., Lumber, T. (2005). CQI: A Step by Step Guide for Quality Improvement in Diabetes Education, Chicago.

Masharani, U. (2007). Diabetes Demystified. McGraw Hill, New York.

APPENDICES

These are the available patient education materials at the University of California, San Francisco.

Access our patient education library online at **www.ucsfhealth.org**

Your Health Matters

Use of Insulin Pen

This is available in Chinese, Russian and Spanish languages

1. Remove protective tab

2. Screw needle onto pen

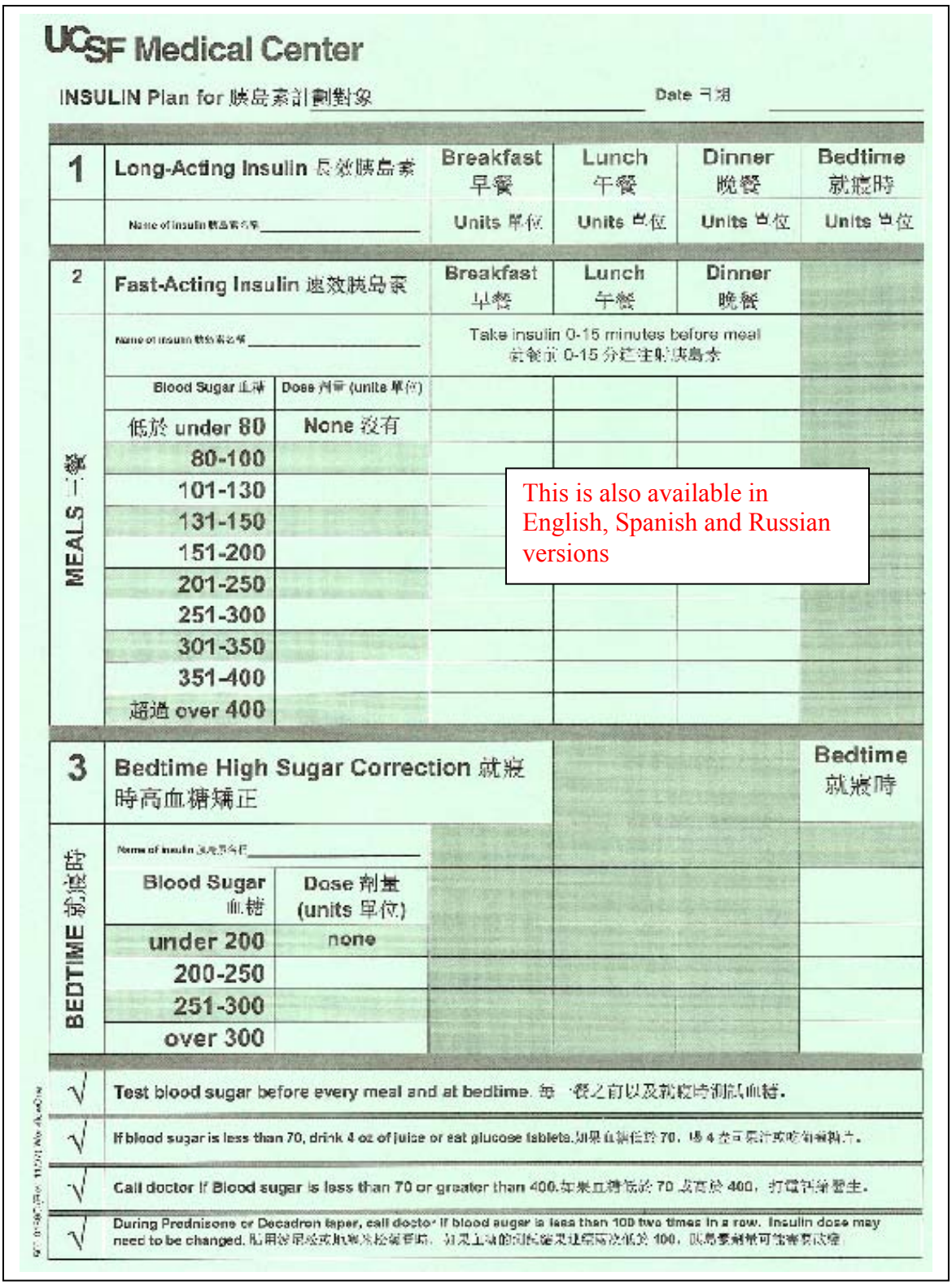
- Remove outer and inner plastic needle caps

3. Do air shot

- Dial to 2
- Press button
- Repeat until you see insulin leak out of needle
- Shake off excess insulin from tip

UCSF Medical Center Physician Referral Service: 888/689-UCSF

Caring for Diabetes



UCSF Medical Center

INSULIN Plan for 胰岛素計劃對象 _____ Date 日期 _____

1	Long-Acting Insulin 長效胰島素	Breakfast 早餐	Lunch 午餐	Dinner 晚餐	Bedtime 就寢時
	Name of insulin 胰島素名稱 _____	Units 單位	Units 單位	Units 單位	Units 單位

2	Fast-Acting Insulin 速效胰島素		Breakfast 早餐	Lunch 午餐	Dinner 晚餐	
MEALS 三餐	Name of insulin 胰島素名稱 _____		Take insulin 0-15 minutes before meal 就餐前 0-15 分鐘注射胰島素			
	Blood Sugar 血糖	Dose 劑量 (units 單位)				
	低於 under 80	None 沒有				
	80-100					
	101-130					
	131-150					
	151-200					
	201-250					
	251-300					
	301-350					
	351-400					
	超過 over 400					

This is also available in English, Spanish and Russian versions

3	Bedtime High Sugar Correction 就寢時高血糖矯正					Bedtime 就寢時
BEDTIME 就寢時	Name of insulin 胰島素名稱 _____					
	Blood Sugar 血糖	Dose 劑量 (units 單位)				
	under 200	none				
	200-250					
	251-300					
	over 300					

- √ Test blood sugar before every meal and at bedtime. 每一餐之前以及就寢時測試血糖。
- √ If blood sugar is less than 70, drink 4 oz of juice or eat glucose tablets. 如果血糖低於 70，喝 4 盎司果汁或吃葡萄糖片。
- √ Call doctor if Blood sugar is less than 70 or greater than 400. 如果血糖低於 70 或高於 400，打電話給醫生。
- √ During Prednisone or Decadron taper, call doctor if blood sugar is less than 100 two times in a row. Insulin dose may need to be changed. 服用強的松或地塞米松減量期間，如果連續兩次低於 100，胰島素劑量可能需要改變。

UCSF MEDICAL CENTER
DEPARTMENT OF NURSING
NURSING PROCEDURES MANUAL

USE OF SUBCUTANEOUS INSULIN PUMP (ADULT)

PURPOSE

A subcutaneous insulin pump is a battery-operated device that contains rapid acting lispro or aspart insulin in a syringe reservoir. The insulin pump can deliver insulin in a continuous or bolus mode. A patient will bring their own insulin pump and supplies from home, and the nurse will monitor the pump per physician order, once the patient has been evaluated by the Endocrine service.

TABLE OF CONTENTS AND FREQUENTLY USED SECTIONS

CRITICAL POINTS

A. Endocrine service must be contacted for an insulin pump plan consultation.

B. Before a patient can use an insulin pump in the hospital, the patient will need to change his pump reservoir and infusion set to insulin supplied by the hospital pharmacy.

C. Give patient form #107-0033 "Guidelines for Using Your Subcutaneous Insulin Pump While in the Hospital".

D. A MD writes an order for:
   1. self insulin pump management
   2. insulin type
   3. insulin basal rates
   4. carbohydrate ratios
   5. high glucose correction ratios.

E. A RN must check the infusion site every shift for signs of infection or dislodgement.

F. A RN should verify every shift the insulin pump's basal rate, carbohydrate ratio, high glucose correction ratio, and insulin reservoir amount.

G. The patient needs to supply his own infusion sets, reservoirs, and pump batteries. Pharmacy will supply the vial of lispro or aspart insulin.

H. The infusion set must be changed every 72 hours or sooner if signs of site infection or unexplained hyperglycemia (BG level > 300 mg/dL) occurs.

DIABETES EDUCATIONAL TV VIDEOS IN ENGLISH
FOR PATIENTS AND FAMILIES
CHANNEL 39

Time	Time	Time	Topic
12:01	08:01	4:01	What is Diabetes
12:17	08:17	4:17	Carbohydrate Counting Introduction
12:33	08:33	4:33	Crab Counting in Practice
12:59	08:59	4:59	Monitoring Blood Sugar
1:19	09:19	5:19	Skin and Foot Care
1:34	9:34	5:34	Oral Medications for Diabetes
1:59	9:59	5:59	Understanding Insulin
2:19	10:19	6:19	Injecting Insulin