DIABETIC URINES AND BLOODS

A. Overview of Diabetes Mellitus

1. Definition: A metabolic alteration in which complete or relative lack of insulin results in impaired carbohydrates utilization and altered protein and fat metabolism. Glucose cannot be utilized by the cells and glucose concentration in the blood rises (hyperglycemia).

2. Signs and Symptoms:
   - increased urine output (polyuria)
   - increased thirst (polydipsia)
   - increased appetite (polynphagia)
   - weight loss
   - weakness/tachycardy
   - elevated fasting blood glucose
   - glycosuria

3. Significance of Urine Testing: Glucose is ordinarily completely reabsorbed from renal tubules before excretion of urine occurs. When concentration of glucose in the blood is > 180 ML glucose/100 ML plasma, the kidneys cannot reabsorb the entire amount of glucose and glucose appears in the urine. The point at which glucose begins to be lost through the tubules is termed the renal threshold. The greater the overload of glucose in the blood, the greater amount of glucose appearing in the urine.

   Urine testing will also indicate the amount of fat metabolism occurring in the body. Since the body is not able to utilize glucose due to a deficiency of insulin, fats are used as a source of energy. Ketones are breakdown products of fatty acids and are produced in large numbers when the body breaks down large quantities of fat for energy. Ketones are known carriers of free hydrogen ions. Evidence of ketones is a serious sign that body cells are acutely deprived of needed glucose.

B. Methods of Collecting Urine Specimens

1. Double Voided: Urine that has accumulated in the bladder reflects conditions in the body at the time urine was formed. First A.M. specimen contains urine secreted throughout the night therefore is impossible to know whether glucose was secreted at midnight or 6 A.M.
   - clean as if obtaining a clean catch specimen
   - have pt. void. Do not discard in case 2nd void is not obtained
   - wait 30 mins., ask pt. to void again (only need 1-2 MLS)
   - test the urine
   - If the first specimen is the only specimen, a negative reading can be recorded. If glucose is present, a second specimen must be obtained.

2. Indwelling Catheter
   - clamp 15 min.
   - cleanse port
   - aspirate with sterile needle
2. **Type of Insulin** - Regular (short acting)

F. **Method of Blood Collection**

1. **Laboratory Collection and Analysis** - vacutainer, capillary tube

2. **Simple Reagent Strip** - Bedside Collection of drop of blood on strip and compare color of strip after timing with colored blocks on back of container (indicates a general range only)

3. **Accuchek, Glucometer, Glucoscan (Bedside and Home Use)**: A meter determine glucose content by reading color on a reagent strip. Each brand varies in procedure. Provides the most precision in measurement of blood glucose. Gives the client greater control over management of disease and prevention of complication. Must continue to check urine for ketones if ill or if blood glucose levels run high.

**Standard Equipment:**
- meter
- skin puncturing device
- alcohol wipe or soap and water
- cotton ball and reagent strip