



King Saud University

College of Nursing

Medical Surgical Department

Application of Adult Health Nursing Skills

(NUR 317)

Care of patients with endocrine system disorders

Prepared by

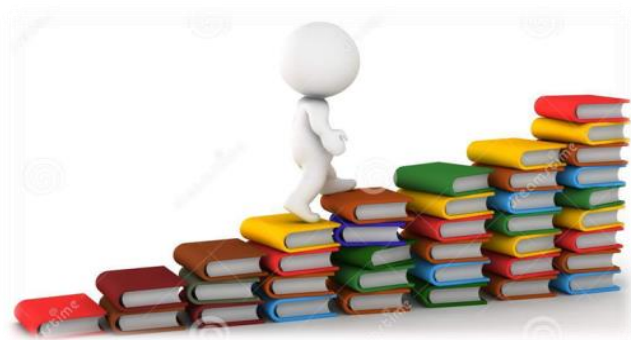
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- **Outline of lecture;**

- ✓ Blood Glucose monitoring
- ✓ Insulin administration
- ✓ Radioactive iodine uptake
- ✓ Medication:
 - Insulin
 - Glucophage
 - thyroxin



Care of patients with endocrine system disorders

Introduction

- The endocrine system is a network of glands that produce and release hormones that help control many important body functions, especially the body's ability to change calories into energy that powers cells and organs.
- Common endocrine disorders are;
 - Diabetes (type 1 or type 2)
 - Thyroid disorder (hyperthyroidism or hypothyroidism)

1. Blood Glucose monitoring

A) Blood glucose and monitoring

- **Blood glucose** is the amount of glucose in the blood (mmol/L).
- Blood glucose is regulated by insulin and glucagon.
- **Blood monitoring (BM)** is used to indicate when blood glucose is not within the normal range (4-7mmol/L) (70-120 mg/dl) .
- It is used to monitor and manage the treatment of both insulin-dependent diabetes mellitus (IDDM) and non-insulin dependent diabetes mellitus (NIDDM).

B) Goals for BGM

- **The Goal:** To maintain blood glucose within target range.
- **Immediate benefit:** Identification, treatment, and prevention of high and low blood glucose levels.
- **Long-term benefit:** Decrease risk of long-term complications.

C) Who's client need to measure BG (Indications)

- type 1 and type 2 diabetic patients.
- unstable diabetes, (hyperglycemia, hypoglycemia, and diabetic ketoacidosis).
- To make a diagnosis of diabetes indicated by signs and symptoms of polyuria, polydipsia, weight loss of type 1 or weight gain, family history of type 2 .
- Patients taking steroids and other drugs that cause raised blood glucose.

D) Contraindications;

Some conditions affect the accuracy of blood glucose monitoring (need a venous sample) :

1. Peripheral circulatory failure and severe dehydration e.g., **diabetic ketoacidosis, shock, hypotension**. These conditions cause peripheral shutdown, which can cause artificially low capillary readings.
2. Some **renal dialysis** treatments.
3. Hyperlipidemia: cholesterol levels above 13 mmol/L may lead to artificially raised capillary blood glucose readings
4. Pre-eclampsia

E) Equipment;

- Blood glucose monitor
- Patient record book
- disposable test strips
- Disposable lancets
- Quality control solution
- Gauze swabs
- disposable gloves
- Sharps container
- cleaning wipes



F) Steps;

- 1) Reviews doctors orders and identifies individual .
- 2) Washes hands and applies gloves, uses clean technique for procedure.
- 3) Gathers equipment/supplies and explain procedure to the patient .
- 4) Cleanses site to be tested (fingertip) Do not use alcohol gel . Also , Sites should be rotated if testing is frequent to reduce risk of infection and prevent areas from toughening.
- 5) Turns on glucometer by inserting testing strip.
- 6) Properly uses lancet and injects site.
- 7) While holding individual's finger, allows sip-in of blood on testing strip.
- 8) Wipes site while applying pressure with a clean dry tissue until bleeding stops, then disposes of lancet into biohazard container.
- 9) Reads results and documents on MAR.

Symptoms of High Blood Sugar (Hyperglycemia)

Some Symptoms:



VERY THIRSTY



NEED TO URINATE OFTEN



DRY SKIN



HUNGRY



BLURRY VISION



SLEEPY



SLOW HEALING INJURY OR INFECTION

HIGH BLOOD SUGAR MAY LEAD TO A MEDICAL EMERGENCY IF NOT TREATED.

What Can You Do?



CHECK BLOOD SUGAR

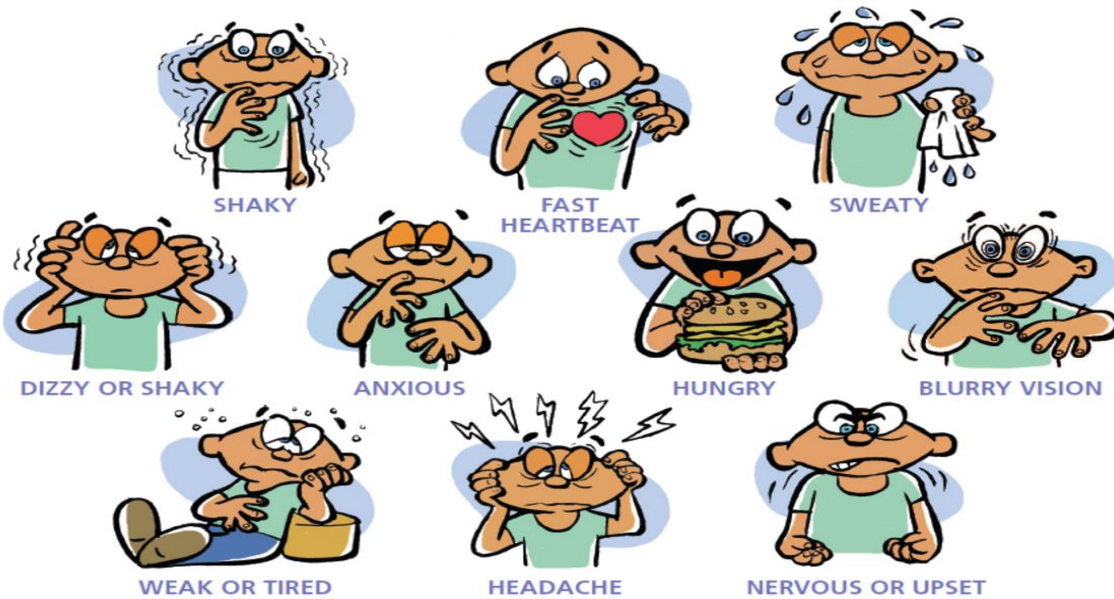
If your blood sugar levels are higher than your goal for three days and you don't know why,

CALL YOUR DOCTOR



Symptoms of Low Blood Sugar (Hypoglycemia)

Some Symptoms:



IF LOW BLOOD SUGAR IS LEFT UNTREATED, YOU MAY PASS OUT OR NEED MEDICAL HELP.

What Can You Do?



CHECK your blood sugar right away. If you can't check, treat anyway.



TREAT by eating 3 to 4 glucose tablets or 3 to 5 hard candies you can chew quickly (such as peppermints), or by drinking 4-ounces of fruit juice, or 1/2 can of regular soda pop.



CHECK your blood sugar again after 15 minutes. If it is still low, treat again. If symptoms don't stop, call your doctor.

G) Role of nurse;

- 1) Check BG as order
- 2) Document results
- 3) Give medication or glucose (insulin\oral diabetic drug)
- 4) Communicate blood glucose results to physician according to policy.

2. Insulin administration

A) Insulin types;

- Rapid-acting - Humalog[®], Novolog[®]
- Short-acting - Regular
- Intermediate - Lente, NPH
- Long-acting - Ultralente, Glargine (Lantus)

Main types of insulin preparations				
Type	Onset	Peak	Duration	Comments
Rapid-acting insulin analogue	5-15 min	30-60 min	2-5 hr	Can be injected at the start of a meal
Short-acting (soluble/regular insulin)	30 min	1-3 hr	4-8 hr	Usually injected 15-30 minutes before a meal. Clear solution
Intermediate or long-acting insulin (isophane or zinc insulin)	1-2 hr (NPH, Lente) 2-3 hr (Ultralente)	4-8 hr 4-8 hr	8-12 hr (NPH) 8-24 hr (Ultralente)	Used to control glucose levels between meals. May be combined with short-acting insulin
Long-acting insulin analogue	30-60 min	No peak	16-24 hr	Usually taken once daily

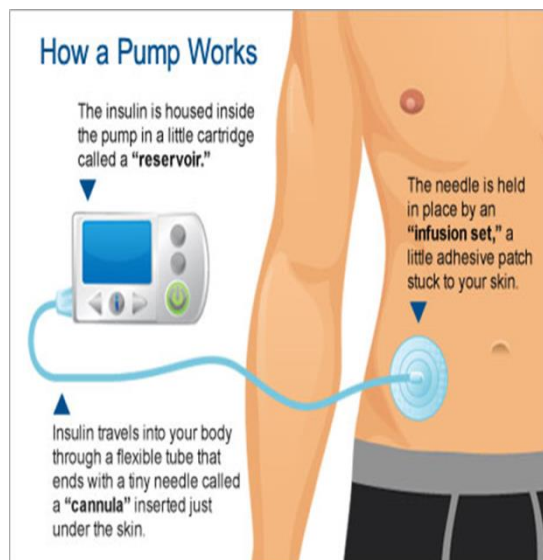
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B) Delivery Methods;

Insulin Syringe



Insulin Pump

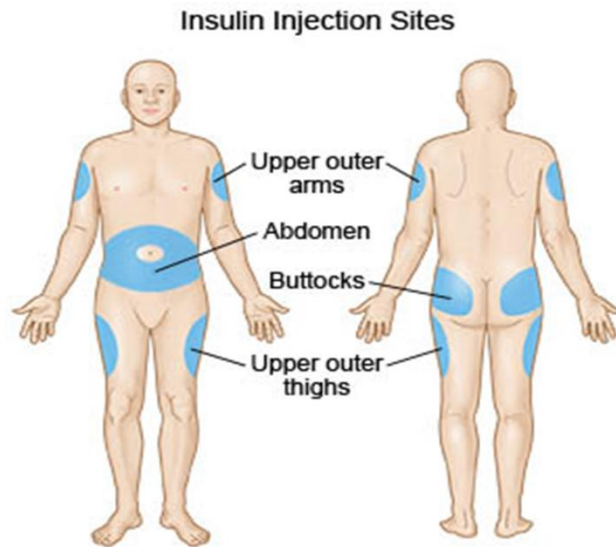


Insulin Pen



C) Route:

Subcutaneous



D) When to Give Insulin;

- Before meals or snacks.
- For blood glucose levels significantly above target range.

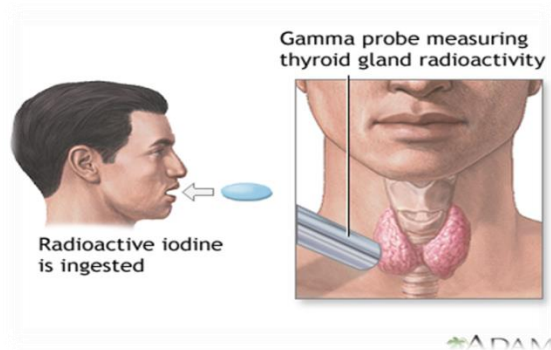
Insulin dose depending upon;

- Blood glucose readings ,
- Age/body weight,
- Physical activity level.

3. Radioactive Iodine Uptake

A) Radioactive Iodine Uptake Test;

- Radioactive iodine uptake test is a type of nuclear test performed to evaluate thyroid function.
- The test measures the amount of radioactive iodine (taken by mouth) that accumulates or absorbs in the thyroid gland.
- The patient ingests radioactive iodine capsules or liquid.
- After a time (usually 6 and 24-hours later), a gamma probe is placed over the thyroid gland to measure the amount of radioactivity in the thyroid gland.
- Normal Results
 - 6 hours: 3 – 16%
 - 24 hours: 8 - 25%
- The test takes about 30 minutes.



B) indication;

- Find the cause of an overactive thyroid gland (hyperthyroidism).
- Plan treatment for hyperthyroidism.
- Plan treatment for patients who have had thyroid cancer surgery

C) Contraindication;

- allergic to any medicines, such as iodine
- any test using radioactive materials or iodine dye, such as a CT scan, 4 weeks before the RAIU test
- pregnancy.
- breast feeding.

D) Patient Instructions after test;

- flush the toilet twice each time use (2days)
- wash hands thoroughly after each time of urinate.
- Sleep alone.
- Avoid kissing and hug for 5 days.
- Wash clothing separately.

E) What abnormal results mean;

- **Normal Results**

- 6 hours: 3 – 16%

- 24 hours: 8 - 25%

- **Increased**

(greater than 35% at 24 hours is considered elevated):

1. hyperthyroidism
2. goiter

- **Decreased:**

1. hypothyroidism
2. subacute thyroiditis

4. Medications

Insulin

Class & uses	Action	Side effect	Nursing role
C: Antidiabetic pancreatic hormone U: type 1&2 diabetes, gestational DM	Decrease BG by transport of glucose into cells and conversion of glucose to glycogen	Blurred vision, dry mouth, rash, flushing, hypoglycemia, anaphylaxis, warmth.	Assess: fasting BG , A1c test. S&S of hypo-hyperglycemia Evaluate: normal BG level, no S&S of hypo-hyperglycemia

Glucophage metformin

Class & uses	Action	Side effect	Nursing role
C: Antidiabetic U: type 2 diabetes	Inhibits hepatic glucose production and increases sensitivity of peripheral tissue to S&S of hypo-hyperglycemia	Weakness dizziness agitation, lactic acidosis, hypoglycemia, heart burn, diarrhea, thrombocytopenia decreased B12 level	Assess: hypoglycemia, CBC, liver and renal function, lactic acidosis Evaluate: normal BG level, no S&S of hypo-hyperglycemia

Thyroxin

Class & uses	Action	Side effect	Nursing role
C: thyroid hormone U: hypothyroidism, and thyroid cancer	replaces or provides thyroid hormone, controlling both development and maturation. It also controls metabolism in adult organisms.	Increased sweating, sensitivity to heat, mental/mood changes (such as nervousness, mood swings), tiredness, diarrhea, shaking (tremor), headache, shortness of breath.	Assess: thyroid gland hormone. Administration: on empty stomach for at least 1 hr. Evaluation: no S&S of the side effects, hormone at normal level

To summarize :

- Common endocrine disorders are;
 - Diabetes (type 1 or type 2)
 - Thyroid disorder (hyperthyroidism or hypothyroidism)
- Diabetes can be controlled by ant diabetic drug such as Insulin that administer subcutaneously through injections or pen or insulin pump.
- Thyroid disorders such as hyperthyroidism or hypothyroidism can be tested by Radioactive Iodine Uptake Test and treated administer thyroid hormone