THE CHILD WITH A METABOLIC CONDITION

Chapter 31

Niomi Quinteros BSN, RN

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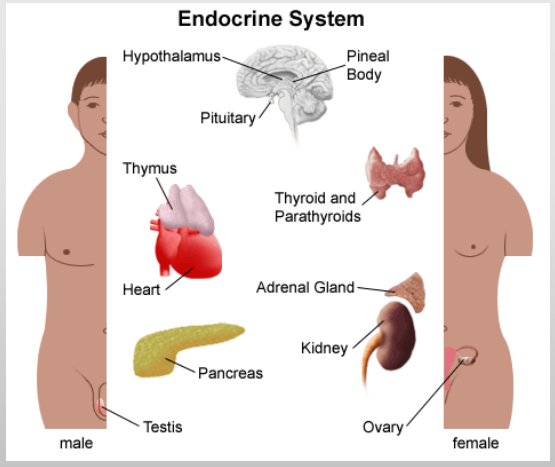
ENDOCRINE SYSTEM

- Two major control systems
  - Nervous system
  - Endocrine system
- Endocrine
  - Ductless glands- regulate body's metabolism
  - Responsible for:
    - Growth/maturation
    - Reproduction
    - Body's response to stress



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ENDOCRINE SYSTEM

- Early signs of a Metabolic disorder
  - Lethargy
  - Failure to thrive
  - Poor feeding
  - Enlarged liver
- Diagnostic tests
  - X-ray
  - Thyroid function
  - Blood chemistries
  - Ultrasound/CT scans

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TAY-SACHS DISEASE

Deficiency of lysosomal-beta-hexosaminidase

- Manifestations
  - Slow physical development
  - Head lag/inability to sit
  - Cherry red deposits on optic nerve
  - Blindness
  - Mental retardation
- Treatment and Nursing Care
  - No cure/no treatment
  - Palliative care

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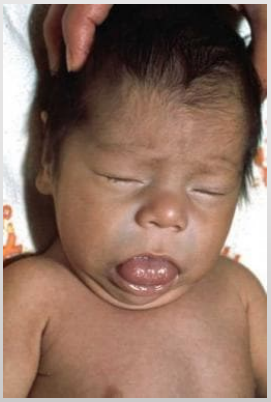
HYPOTHYROIDISM

Deficiency of secretions from the thyroid gland

- Symptoms
  - Floppy
  - Enlarged tongue-noisy respirations
  - Dry skin
  - Cold feet/hands
- Treatment
  - Untreated – irreversible mental retardation, physical disabilities
  - Hormone levels monitored regularly
  - Thyroid replacement – LIFE LONG
    - Take medication same time every day
    - Compliance



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TREATMENT FOR HYPOTHYROIDISM

- Signs of too much thyroid replacement
  - Rapid pulse rate
  - Dyspnea
  - Irritability
  - Weight loss
  - Sweating
- Signs of too little thyroid replacement
  - Fatigue
  - Sleepiness
  - Constipation
- Parents should be instructed about both

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DIABETES INSIPIDUS

- Symptoms
  - Polyuria
  - Polydipsia
  - Weight loss
  - Craves water
  - Dry skin
  - FTT
  - Dehydration
  - Drop in BP
- Treatment/Nursing care
  - Hormone replacement
    - Desmopressin (DDVAP)
  - Monitor for overdose
    - Water intoxication
  - Medical ID bracelet
  - Limiting access to water—dangerous
  - Patient/family education

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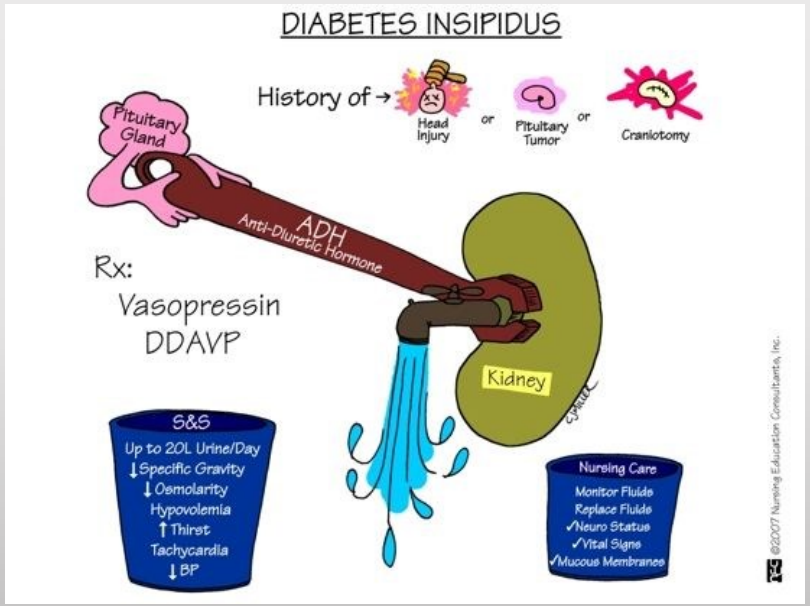

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DIABETES MELLITUS

- Chronic metabolic syndrome
- Impairment of glucose transport
- Inability to store and use fats properly
- 2 Types
  - Type I – Juvenile; insulin-dependent. Destruction of beta cells in pancreas results in lack of insulin production. Autoimmune condition with genetic predisposition for child to get.
  - Type II – Adult onset; non-insulin-dependent. Resistance to insulin or decreased insulin production, triggered by sedentary lifestyle and obesity.

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DIABETES MELLITUS (DM)

- Long-term complications related to hyperglycemia
  - Blindness
  - Circulatory problems, including but not limited to amputation
  - Kidney disease
  - Neuropathy

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DIAGNOSTIC TESTS FOR DM

- Random blood glucose
  - Blood is drawn at any time, no preparation; results should be within normal limits for both diabetic and nondiabetic patients
- Fasting blood glucose
  - If greater than 126 mg/dL on two separate occasions, and the history is positive, patient is considered as having DM and requires treatment
- Glycosylated hemoglobin (HbA_{1c}):
  - Values above 10% indicate poor control
  - Target should be under 7.5%

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TYPE 1 DIABETES MELLITUS

- Most common metabolic disorder
- Can occur at any time in childhood, new cases highest among
  - 5- and 7-year-olds: Stress of school and increased exposure to infectious diseases may be a triggering factor
  - 11- to 13-year-olds: During puberty, rapid growth, increased emotional stress, and insulin antagonism of sex hormones may be implicated
- More difficult to manage in childhood because of growing, energy expenditure, varying nutritional needs
- Initial diagnosis may be determined when the child develops ketoacidosis

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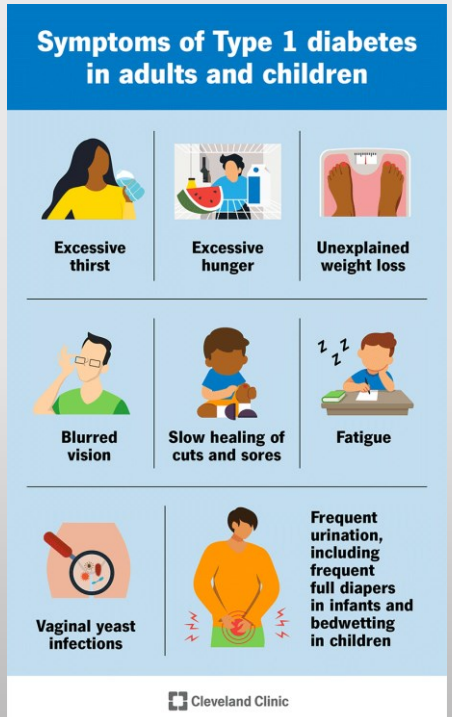

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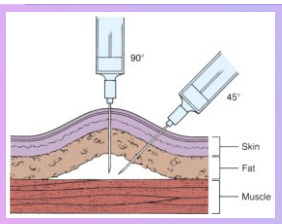
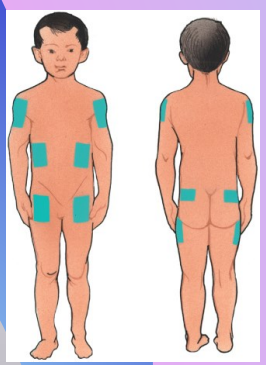
INSULIN ADMINISTRATION

- Teach parents and child
- Insulin cannot be taken orally because it is a protein and would be broken down by the gastric juices
- Usual method of administration is subcutaneously
- In general, a child can be taught to perform self-injection after 7 years of age
- Sites of injections are rotated to prevent poor absorption and injury to tissue
- Should not inject into areas that would have a temporarily increased circulation, such as in a child pedaling a bike, you would not inject into the leg
- When mixing insulin, always withdraw the regular insulin (clear) first and then add the intermediate-acting insulin (cloudy) into the syringe





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TYPE 2 DIABETES

- Sedentary Lifestyle
- Familial Tendency
- Average Age 50 Years
- Hx of ↑ BP
- Fatigue ↓ Energy
- Obese
- Recurrent Infections
- Polyuria
- Polydipsia
- FBS > 126 mg/dl

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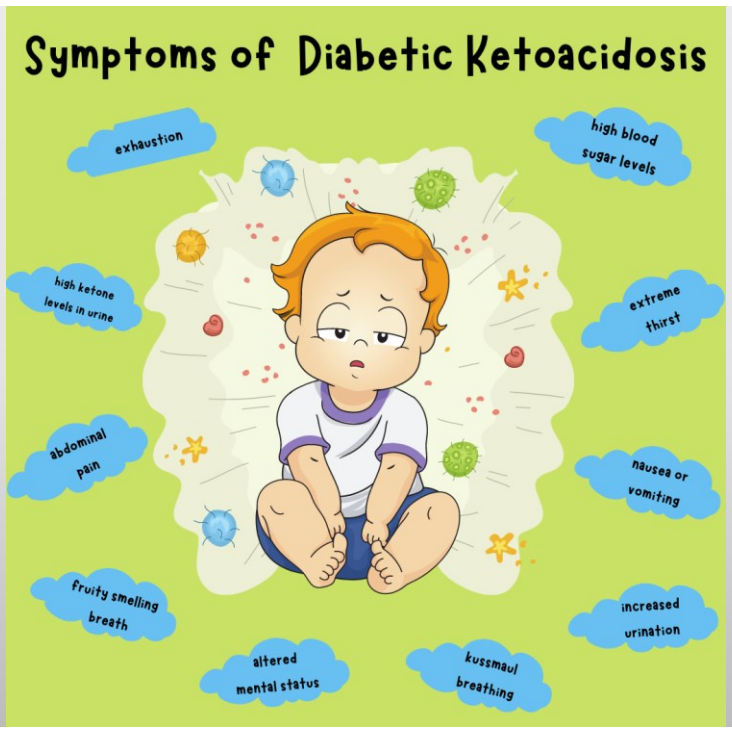

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INSULIN SHOCK

- Also known as hypoglycemia
- Blood glucose level becomes abnormally low
- Caused by too much insulin
- Factors
  - Poorly planned exercise
  - Reduced diet
  - Errors made because of improper knowledge of insulin and the insulin syringe

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INSULIN SHOCK

- Children are more prone to insulin reactions than adults because
  - The condition itself is more unstable in young people
  - They are growing
  - Their activities are more irregular
- Symptoms of insulin reaction
  - Irritable
  - May behave poorly
  - Pale
- May complain of feeling hungry and weak
- Sweating occurs
- CNS symptoms arise because glucose is vital to proper functioning of nerves

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INSULIN SHOCK

- Immediate treatment
  - Administering sugar in some form, such as orange juice, hard candy, or a commercial product
  - Begins to feel better within a few minutes and then may eat a small amount of protein or starch to prevent another reaction
  - Glucagon is recommended in cases of severe hypoglycemia

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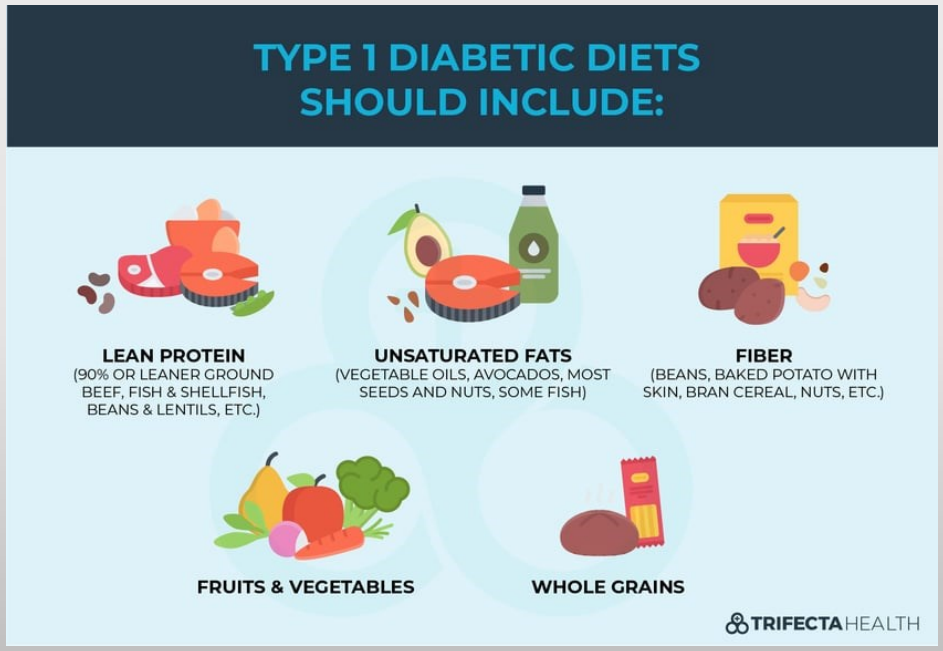

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TEACHING PLAN FOR A CHILD WITH DM

- Physiology of the pancreas and its function
- Function of insulin
- Blood glucose self-monitoring
- Diet therapy
- Insulin management
- Exercise
- Skin care
- Foot care
- Infections
- Emotional upsets
- Urine check
- Glucose-insulin imbalances
- Travel
- Follow-up care
- Illness or surgery

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