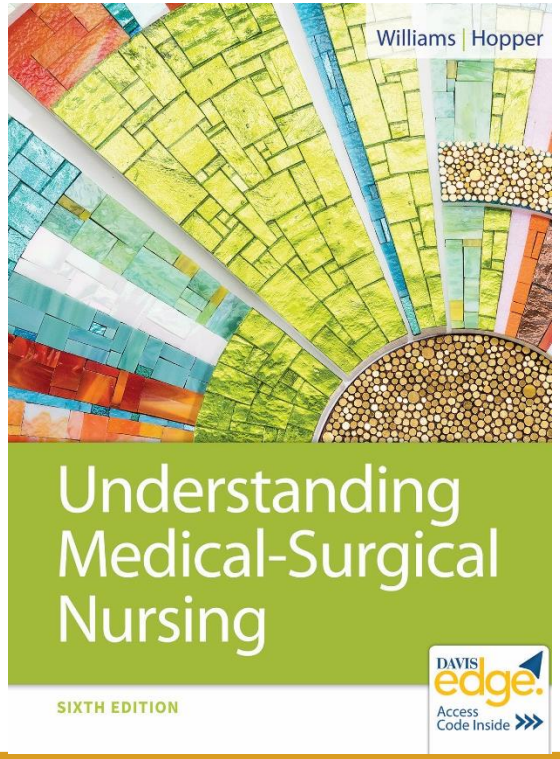


Chapter 39

Nursing Care of Patients With Endocrine Disorders

Learning Outcomes

- Identify disorders caused by variations in the hormones of the pituitary, thyroid, parathyroid, and adrenal glands.
- Explain the pathophysiology of each of the endocrine disorders presented.
- Describe the etiologies, signs, and symptoms of each of the endocrine disorders.

Learning Outcomes (continued)

- Describe current therapeutic measures used for each of the selected endocrine disorders.
- List data to collect when caring for patients with each of the endocrine disorders discussed.
- Plan nursing care for patients with each of the disorders.
- Explain how you will know if nursing interventions have been effective.

Endocrine Disorders

- Too much or too little hormone activity
  - Production/secretion
  - Tissue sensitivity
- Primary disorder
- Secondary disorder

Antidiuretic Hormone

- Diabetes insipidus (D I)
  - Too little antidiuretic hormone (A D H)
    - Increased urine output
    - Syndrome of inappropriate A D H (S I A D H)
  - Too much A D H
    - Decreased urine output

Diabetes Insipidus

- Pathophysiology
  - Insufficient A D H
  - Kidneys do not reabsorb water
  - Diurese 3 to 15 liters per day
- Causes
  - Pituitary tumor
  - Head trauma
  - Surgery
  - Drugs

Diabetes Insipidus (continued_1)

- Signs and symptoms
  - Polyuria
  - Polydipsia
  - Nocturia
  - Dilute urine
  - Dehydration
  - Hypovolemic shock
  - Decreased level of consciousness
  - Death

Diabetes Insipidus (continued_2)

- Diagnostic tests
  - Urine specific gravity <1.005
  - Plasma osmolality increased
  - Computed tomography (C T) scan or magnetic resonance imaging (M R I) for cause
  - Water deprivation test

Diabetes Insipidus (continued_3)

- Therapeutic interventions
  - Hypotonic I V fluids
  - Hypophysectomy if tumor
  - I V or subcutaneous (S Q) vasopressin
  - D D A V P (synthetic vasopressin)

Diabetes Insipidus (continued_4)

- Nursing diagnosis
  - *Deficient Fluid Volume* related to failure of regulatory mechanisms
- Expected outcome
  - Patient's fluid balance maintained as evidenced by
    - Urine specific gravity between 1.005 and 1.03
    - Skin turgor within normal limits
    - Stable daily weight

S I A D H

- Pathophysiology
  - Too much A D H
  - Water retention
  - Hyponatremia
  - Decreased serum osmolality
- Causes
  - Nervous system disorders
  - Cancer
  - Pulmonary diseases
  - Medications that stimulate A D H release

S I A D H (continued_1)

- Signs and symptoms
  - Weight gain without edema
  - Dilutional hyponatremia <135 milliequivalents per liter
  - Serum osmolality <275 milliosmoles per kilogram
  - Concentrated urine >1.03
  - Muscle cramps and weakness
  - Brain swelling, seizures, death

S I A D H (continued_2)

- Diagnostic tests
  - Serum/urine sodium
  - Serum/urine osmolality
  - C T scan or M R I for underlying cause

S I A D H (continued_3)

- Therapeutic interventions
  - Eliminate cause
  - Surgical removal of tumor
  - Fluid restriction
  - Hypertonic saline I V
  - Furosemide (Lasix)
  - Conivaptan (Vaprisol)

S I A D H (continued_4)

- Nursing diagnosis
  - *Excess Fluid Volume* related to compromised regulatory mechanism
- Expected outcome
  - Patient's fluid balance maintained as evidenced by
    - Weight
    - Intake and output
    - Serum sodium within normal limits

Growth Hormone Imbalance

- Too little = short stature
- Too much = gigantism, acromegaly

Growth Hormone Deficiency

- Pathophysiology
  - Deficient growth hormone (G H) in childhood
  - Growth not affected in adults
- Causes
  - Pituitary tumor
  - Heredity
  - Psychosocial
  - Malnutrition

Growth Hormone Deficiency (continued_1)

- Signs and symptoms
  - Grow only to 3 to 4 feet (5th percentile)
  - Slowed sexual maturation
  - May have mental retardation
  - Other symptoms depend on other pituitary hormones involved

Growth Hormone Deficiency (continued_2)

- Signs and symptoms in adults
  - Fatigue, weakness
  - Excess body fat
  - Hypercholesterolemia
  - Decreased muscle and bone mass
  - Sexual dysfunction
  - Risk for cardiovascular disease
  - Risk for cerebrovascular disease
  - Decreased quality of life

Growth Hormone Deficiency (continued_3)

- Diagnostic tests
  - G H level
- Therapeutic interventions
  - Synthetic G H, S Q or intramuscular
    - Somatropin (humatrope)
  - Surgery if needed

Growth Hormone Deficiency (continued_4)

- Nursing diagnosis
  - *Ineffective Health Management* related to knowledge deficit
- Expected outcome
  - Patient will have necessary knowledge to manage self-care as evidenced by
    - Statements and demonstration of self-care activities

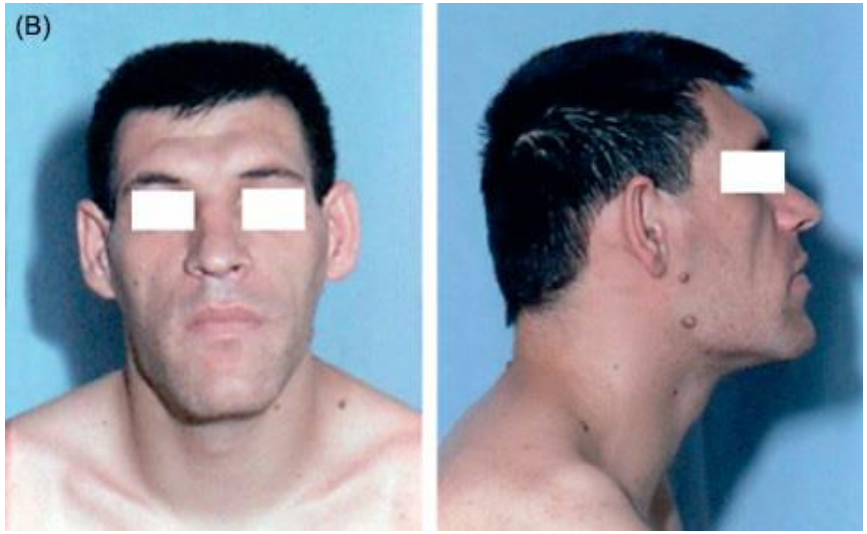
Acromegaly

- Pathophysiology
  - Excess G H in adults
  - Bones grow in width, not length
  - Organs and connective tissues enlarge
- Causes
  - Pituitary hyperplasia
  - Pituitary tumor
  - Hypothalamic dysfunction

Acromegaly (continued_1)

- Signs and symptoms
  - Change in shoe or ring size
  - Nose, jaw, brow enlarge
  - Teeth may be displaced
  - Difficulty speaking and swallowing
  - Sleep apnea
  - Headaches, visual changes
  - Diabetes mellitus
  - Arthritis
  - Sexual dysfunction

Acromegaly (continued_2)



Acromegaly (continued_3)

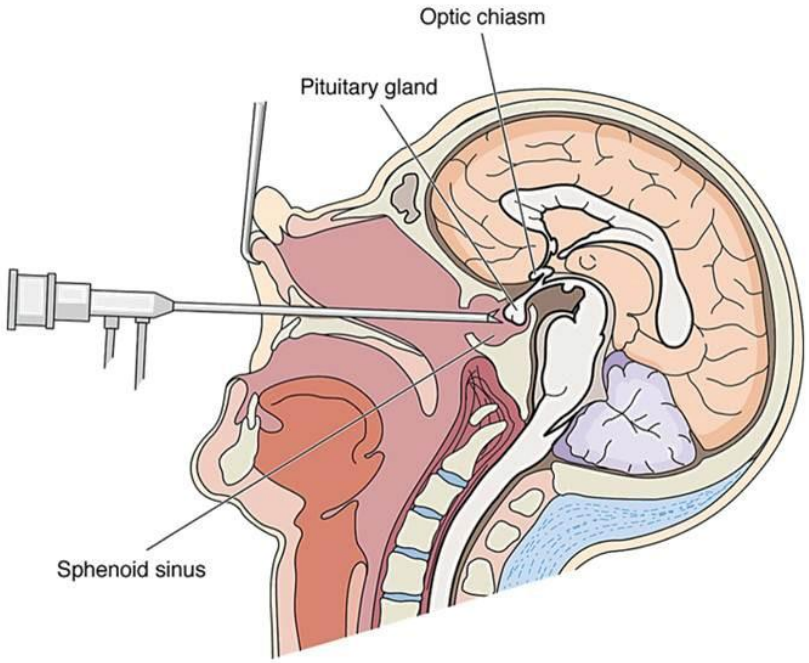
- Diagnosis
  - G H level
  - G H response to oral glucose
  - Bone x-rays
  - C T scan or M R I

Acromegaly (continued_4)

- Therapeutic interventions
  - Treat cause
  - Hypophysectomy
    - Lifelong thyroid hormone (T H), steroid, sex hormone replacement
  - Medications to block G H

Hypophysectomy

- Removal of the pituitary gland
- Minimally invasive endoscopic surgery



Hypophysectomy (continued_1)

- Baseline neurological assessment
- Preoperative care teaching
  - Teach to avoid actions that increase pressure on surgical site (example, coughing, sneezing, straining).
  - Teach deep-breathing exercises, incentive spirometry.

Hypophysectomy (continued_2)

- Postoperative care
  - Neurological assessment
  - Urine for specific gravity (risk for D I)
  - Nasal packing and mustache dressing
  - No coughing, sneezing, blowing, straining, bending.
  - Report cerebrospinal fluid drainage.
  - Hormone replacement therapy with target hormones

Hypophysectomy (continued_3)

- Patient education
  - Blow nose gently.
  - Take stool softeners and antitussives as needed.
  - Take care with brushing teeth.
  - Take hormones as prescribed.
  - Call if fever, drainage, frequent urination, thirst.

Thyroid Hormone Imbalance

- Hypothyroidism
- Hyperthyroidism

Hypothyroidism

- Pathophysiology
  - T H deficiency
  - Metabolic rate reduced
  - Primary = not enough T H
  - Secondary = not enough thyroid-stimulating hormone (T S H)

Hypothyroidism (continued_1)

- Causes
  - Congenital
  - Inflammatory
  - Iodine deficiency
  - Thyroidectomy
  - Autoimmune (Hashimoto thyroiditis)

Hypothyroidism (continued_2)

- Signs and symptoms
  - Fatigue
  - Bradycardia
  - Constipation
  - Mental dullness
  - Cold intolerance
  - Hypoventilation
  - Dry skin and hair
  - Weight gain
  - Heart failure
  - Hyperlipidemia
  - Myxedema

Hypothyroidism (continued_3)

- Complications
  - Myxedema coma
    - Hypothermia
    - Decreased vital signs and level of consciousness
    - Respiratory failure
    - Death

Hypothyroidism (continued_4)

- Diagnostic tests
  - T subscript 3 and T subscript 4 low
  - T S H high in primary
  - T S H low in secondary
  - Serum cholesterol and triglycerides

Hypothyroidism (continued_5)

- Therapeutic interventions
  - Levothyroxine (Synthroid)
    - Hormone
    - Maintain 0.1 to 0.2 milligram per day
  - For myxedema coma
    - Hormone
    - Monitor vital signs
    - Warming blanket
    - Mechanical ventilation
    - I V fluids
    - I V levothyroxine (Synthroid)

Hypothyroidism (continued_6)

- Nursing diagnoses
  - *Activity Intolerance*
  - *Risk for Impaired Skin Integrity*
  - *Imbalanced Nutrition*

Hyperthyroidism

- Pathophysiology
  - Increased metabolic rate
  - Increased beta receptors
  - Primary
    - Too much T H
  - Secondary
    - Too much T S H

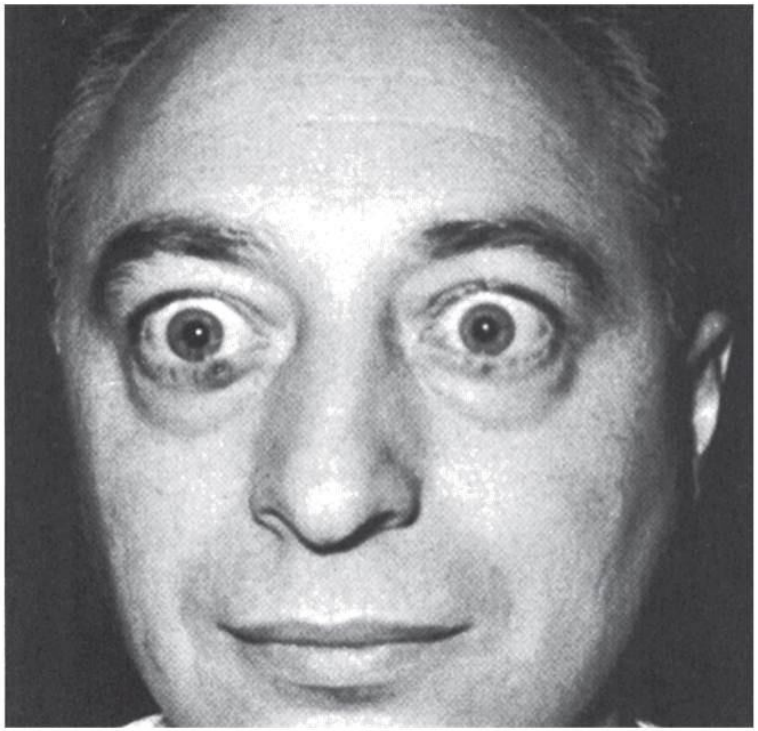
Hyperthyroidism (continued_1)

- Causes
  - Autoimmune (Graves disease)
  - Multinodular goiter
  - Toxic adenoma
  - Thyroiditis
  - Pituitary tumor (secondary)
  - Synthroid overdose

Hyperthyroidism (continued_2)

- Signs and symptoms
  - Hypermetabolic state
  - Heat intolerance
  - Increased appetite
  - Weight loss
  - Frequent stools
  - Nervousness
  - Tachycardia, palpitations
  - Tremor
  - Heart failure
  - Warm smooth skin
  - Exophthalmos (Graves disease)

Exophthalmos



Hyperthyroidism (continued_3)

- Signs and symptoms in elderly
  - Heart failure
  - Atrial fibrillation
  - Fatigue
  - Apathy
  - Depression

Hyperthyroidism (continued_4)

- Complications
  - Thyrotoxic crisis (thyroid storm)
    - Tachycardia, hypertension
    - Fever, dehydration
    - Coma
    - Death

Hyperthyroidism (continued_5)

- Diagnostic tests
  - Elevated T subscript 3 and T subscript 4
  - T S H low in primary
  - T S H high in secondary
  - T R H stimulation test
  - Thyroid-stimulating immunoglobulin
  - C T scan or M R I if tumor suspected

Hyperthyroidism (continued_6)

- Therapeutic interventions
  - Methimazole (Tapazole)
  - Beta blockers
  - Radioactive iodine (^{131}I or R A I)
  - Thyroidectomy
  - For thyrotoxic crisis
    - I V fluids
    - Cooling blanket
    - Beta blocker
    - Acetaminophen (avoid aspirin) for fever
    - Oxygen

Hyperthyroidism (continued_7)

- Nursing diagnoses
  - *Hyperthermia*
  - *Diarrhea*
  - *Imbalanced Nutrition*
  - *Disturbed Sleep Pattern*
  - *Anxiety*
  - *Risk for Injury*

Nursing Care of the Patient Receiving Radioactive Iodine

- In hospital
  - Limit time spent with patient.
  - Glove and gown.
  - Avoid if pregnant.
  - Take precautions with urine, emesis, body fluids.
  - Double flush toilet.
  - Call radiation safety officer for emesis or incontinence.

Nursing Care of the Patient Receiving Radioactive Iodine (continued)

- At home
  - Avoid close contact for a week.
  - Sleep alone.
  - Wash hands carefully after urinating.
  - Avoid oral contact.
  - Drink fluids.
  - Avoid pregnancy for at least a year.

Goiter

- Pathophysiology
  - Enlarged thyroid gland
  - Elevated T S H
  - Hyperplasia
- Causes
  - Low T H
  - Iodine deficiency
  - Virus
  - Genetic
  - Goitrogens

Goiter (continued_1)

- Signs and symptoms
  - Enlarged thyroid
  - Hypothyroid or hyperthyroid, or euthyroid
  - Dysphagia
  - Difficulty breathing

Goiter (continued_2)

- Diagnostic tests
  - Thyroid scan
  - T S H, T subscript 3, and T subscript 4
- Therapeutic interventions
  - Treat cause.
  - Avoid goitrogens.
  - Treat hypothyroidism or hyperthyroidism.
  - Thyroidectomy if size causing symptoms

Goiter (continued_3)

- Nursing care
  - Monitor breathing (stridor).
  - Swallowing evaluation
  - Dietary consultation

Cancer of the Thyroid Gland

- Tumor of the thyroid gland
  - Usually benign
  - More common in women
- Causes
  - Hyperplasia
  - Radiation
  - Genetics

Cancer of the Thyroid Gland (continued_1)

- Signs and symptoms
  - Hard painless nodule
  - Dysphagia
  - Dyspnea if obstruction
  - T H usually normal

Cancer of the Thyroid Gland (continued_2)

- Diagnostic tests
  - Thyroid scan shows “cold spot”
  - Biopsy
- Therapeutic interventions
  - Radioactive iodine
  - Chemotherapy
  - Thyroidectomy (partial or total)

Thyroidectomy

- Preoperative nursing care
  - Monitor breathing and swallowing.
  - Assess nutrition status.
  - Monitor vital signs.
  - Administer iodine or antithyroid drugs to achieve euthyroid state.

Thyroidectomy (continued_1)

- Preoperative teaching
  - Teach postoperative care
    - Gentle range of motion
    - Support neck during position changes.
    - Incentive spirometer

Thyroidectomy (continued_2)

- Postoperative nursing diagnoses
  - *Ineffective Airway Clearance*
  - *Risk for Injury* (tetany, thyrotoxic crisis)
  - *Acute Pain*
  - *Ineffective Health Management*
- Complications
  - Thyrotoxic crisis
  - Tetany

Parathyroid Hormone

- Hypoparathyroidism
- Hyperparathyroidism

Hypoparathyroidism

- Pathophysiology
  - Decrease in parathyroid hormone (P T H)
  - Calcium stays in bones
  - Hypocalcemia
  - Hyperphosphatemia
- Causes
  - Heredity
  - Accidental removal of parathyroids during thyroidectomy

Hypoparathyroidism (continued_1)

- Signs and symptoms
  - Tetany
    - Neuromuscular irritability
    - Numbness and tingling of fingers and perioral area
    - Muscle spasms
    - Cardiac arrhythmias

Hypoparathyroidism (continued_2)

- Signs and symptoms
  - Positive Chvostek sign
  - Positive Trousseau sign

Hypoparathyroidism (continued_3)

- Diagnostic tests
  - P T H low
  - Serum calcium low
  - Positive Chvostek sign
  - Positive Trousseau sign

Hypoparathyroidism (continued_4)

- Therapeutic Interventions
  - Acute
    - I V calcium gluconate
  - Long term
    - Oral calcium with vitamin D
- Nursing diagnosis
  - *Risk for Injury* related to hypocalcemia and tetany

Hyperparathyroidism (continued_5)

- Pathophysiology
  - Overactivity
  - Increased P T H
  - Hypercalcemia
  - Hypophosphatemia
- Causes
  - Parathyroid hyperplasia
  - Benign parathyroid tumor
  - Heredity

Hyperparathyroidism (continued_6)

- Signs and symptoms
  - Fatigue
  - Depression
  - Confusion
  - Nausea and vomiting
  - Kidney stones
  - Joint pain
  - Pathological fractures
  - Arrhythmias
  - Coma
  - Cardiac arrest

Hyperparathyroidism (continued_7)

- Diagnostic tests
  - Serum calcium elevated
  - 24-hour urine for calcium
  - Phosphate decreased
  - P T H elevated
  - X-rays for bone density

Hyperparathyroidism (continued_8)

- Therapeutic interventions
  - Oral or I V fluids to dilute calcium
  - Furosemide (Lasix)
  - Cinacalcet (Sensipar)
  - Calcitonin, Alendronate
  - Estrogen therapy (women)
  - Parathyroidectomy

Hyperparathyroidism (continued_9)

- Nursing diagnosis
  - *Risk for Injury* (fracture, complications of hypercalcemia)

Pheochromocytoma

- Adrenal disorder
- Tumor of adrenal medulla
- Secretes epinephrine and norepinephrine
- Usually benign
- Hereditary or cause unknown

Pheochromocytoma (continued_1)

- Signs and symptoms
  - Fight or flight
    - Hypertension
    - Tachycardia
    - Palpitations
    - Tremor
    - Diaphoresis
    - Anxiety
    - Headache
    - Vision changes
    - Risk for stroke
    - Risk for organ damage

Pheochromocytoma (continued_2)

- Diagnostic tests
  - 24-hour urine for metanephrines and V M A
    - No caffeine or medications before test
  - C T scan or M R I to find tumor

Pheochromocytoma (continued_3)

- Therapeutic interventions
  - Calcium channel blockers
  - Alpha blockers
  - Beta blockers
  - Adrenalectomy

Adrenal Cortex Hormone Imbalance

- Hyposecretion = Addison disease
- Hypersecretion = Cushing syndrome

Addison Disease

- Pathophysiology
  - Deficient cortisol
    - And/or aldosterone
    - And/or androgens
- Causes
  - Autoimmune
  - AIDS
  - Cancer
  - Pituitary or hypothalamus problem
  - Abrupt discontinuance of long-term steroids

Addison Disease (continued_1)

- Signs and symptoms
  - Hypotension
  - Sodium loss
  - Potassium retention
  - Hypoglycemia
  - Weakness
  - Fatigue
  - Bronze skin
  - Nausea and vomiting

Addison Disease (continued_2)

- Diagnostic tests
  - Serum and urine cortisol level
  - Blood glucose
  - Electrolytes
  - Blood urea nitrogen and hematocrit levels
  - Adrenocorticotropic hormone (A C T H) stimulation test

Addison Disease (continued_3)

- Complications
  - Adrenal crisis
    - Profound dehydration
    - Hypotension
    - Hypoglycemia
    - Shock
    - Coma
    - Death

Addison Disease (continued_4)

- Therapeutic interventions
  - Glucocorticoids and mineralocorticoids daily for life
    - Double or triple in times of stress
  - High-sodium diet
- Nursing diagnoses
  - *Risk for Deficient Fluid Volume*
  - *Ineffective Health Management*

Crisis Prevention

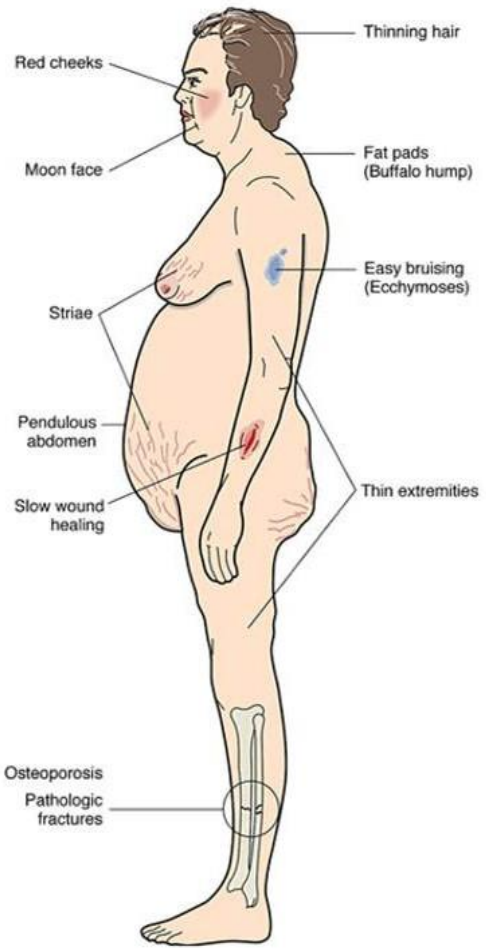
NEVER ABRUPTLY DISCONTINUE LONG-TERM STEROIDS!

Cushing Syndrome

- Pathophysiology
  - Excess adrenal cortex hormones
    - Cortisol
    - Aldosterone
    - Androgens
- Causes
  - Hypersecretion of A C T H
  - Hypersecretion of cortisol
  - Prolonged use of exogenous glucocorticoids

Cushing Syndrome (continued_1)

Signs and symptoms



Cushing Syndrome (continued_2)

- Signs and symptoms (continued)
  - Salt and water retention
  - Hypokalemia
  - Thin, fragile skin
  - Acne
  - Facial hair in women
  - Amenorrhea

Cushing Syndrome (continued_3)

- Diagnostic tests
  - Based on appearance
  - Plasma and urine cortisol
  - A C T H
  - Dexamethasone suppression test

Cushing Syndrome (continued_4)

- Therapeutic interventions
  - Surgery if tumor
  - Reduce dose of steroid.
  - Change schedule of administration.
  - Symptom control
  - Diabetes treatment
  - Low-sodium, high-potassium diet

Cushing Syndrome (continued_5)

- Nursing diagnoses
  - *Excess Fluid Volume*
  - *Risk for Impaired Skin Integrity*
  - *Risk for Infection*
  - *Risk for Unstable Blood Glucose*
  - *Disturbed Body Image*

Adrenalectomy

- Preoperative care
  - Monitor electrolytes, glucose.
  - Preoperative teaching
- Postoperative care
  - Monitor for adrenal crisis.
  - Lifelong hormone replacement

Review Question

Match the disorders.

1. Too much A D H
2. Too little A D H
3. Too much catecholamine
4. Too much steroid
5. Too little steroid

a. Cushing syndrome

b. S I A D H

c. Addison disease

d. Pheochromocytoma

e. Diabetes insipidus

Review Question Answer

Correct Answer:

b. S I A D H

e. Diabetes insipidus

d. Pheochromocytoma

a. Cushing syndrome

c. Addison disease

Review Question (continued_1)

Which assessment is most important for the patient with S I A D H?

1. Skin integrity
2. Daily weights
3. Bowel sounds
4. Mucus membranes

Review Question Answer (continued_1)

Correct Answer: **2**

Review Question (continued_2)

Note which apply to hypothyroidism and which apply to hyperthyroidism.

1. Constipation
2. Tremor
3. Heat intolerance
4. Dry skin
5. Myxedema
6. Exophthalmos

Review Question Answer (continued_2)

Correct Answer:

1. Constipation – **Hypothyroidism**
2. Tremor – **Hyperthyroidism**
3. Heat intolerance – **Hyperthyroidism**
4. Dry skin – **Hypothyroidism**
5. Myxedema – **Hypothyroidism**
6. Exophthalmos – **Hyperthyroidism (Graves)**

Review Question (continued_3)

Which assessment finding in the post-thyroidectomy patient should be reported S T A T?

1. Cough
2. Hoarse voice
3. Headache
4. Tingling fingertips

Review Question Answer (continued_3)

Correct Answer: **4**

Review Question (continued_4)

Which nursing diagnosis is the priority in the patient with hyperparathyroidism?

1. *Anxiety*
2. *Risk for Injury* (fracture)
3. *Knowledge Deficit* (medication administration)
4. *Fluid Excess*

Review Question Answer (continued_4)

Correct Answer: **2**