



Wolters Kluwer
Health

Lippincott
Williams & Wilkins

Introduction to Clinical Pharmacology

Chapter 45- Thyroid and Antithyroid Drugs



Thyroid Hormones: Actions

- Thyroid hormones increase:
 - Metabolic rate of tissues
 - Heart and respiratory rate
 - Body temperature; Cardiac output
 - Oxygen consumption
 - Metabolism of fats, proteins, carbohydrates



Thyroid Hormones: Uses

- Used in the treatment or prevention of:
 - Euthyroid goiters
 - Thyroid nodules and multinodular goiter
 - Subacute or chronic lymphocytic thyroiditis
 - Thyroid cancer



Thyroid Hormones: Adverse Reactions

- Most common adverse reactions:
 - Signs of overdose and hyperthyroidism as titration of drug is being attempted
- Adverse reactions other than symptoms of hyperthyroidism are rare



Thyroid Hormones: Contraindications and Precautions

- Contraindicated in patients with:
 - Known hypersensitivity to drug
 - Uncorrected adrenal cortical insufficiency
 - Thyrotoxicosis
- Used cautiously in patients:
 - With cardiac disease
 - During lactation



Thyroid Hormones: Interactions

Interactant Drug	Effect of Interaction
Digoxin, beta blockers	Decreased effectiveness of cardiac drug
Oral hypoglycemics and insulin	Increased risk for hypoglycemia
Oral anticoagulants	Prolonged bleeding



Thyroid Hormones: Interactions (cont'd)

Interactant Drug	Effect of Interaction
Selective serotonin reuptake inhibitors (SSRIs), antidepressants	Decreased effectiveness of thyroid drug
All other antidepressant drug categories	Increased effectiveness of thyroid drug



Nursing Process: Assessment

- Preadministration assessment:
 - Take vital signs and weigh patient after they receive a diagnosis of hypothyroidism and before therapy starts
 - Perform general physical assessment to determine outward signs of hypothyroidism
- Ongoing assessment:
 - Monitor vital signs as ordered and observe patient for signs of hyperthyroidism, which may signal excessive drug dosage



Nursing Process: Nursing Diagnosis

- Risk for ineffective therapeutic regimen management
- Anxiety



Nursing Process: Planning

- Expected outcome includes:
 - An optimal response to therapy
 - Support of patient needs related to the management of adverse reactions
 - Understanding of and compliance with the prescribed therapeutic regimen



Nursing Process: Implementation

- Promoting an optimal response to therapy:
 - Thyroid hormones are administered once a day, early in the morning and preferably before breakfast
- Monitoring and managing patient needs:
 - Risk for ineffective therapeutic regimen management:
 - Monitor patient for any adverse reactions, during initial stages of dosage adjustment and document them well to provide information for correct dosing



Nursing Process: Implementation (cont'd)

- Monitoring and managing patient needs (cont'd):
 - Anxiety:
 - Closely monitor: Patient with diabetes during thyroid hormone replacement therapy for signs of hyperglycemia- notify if problem occurs
 - Observe patients who have cardiovascular disease and who take thyroid hormones



Nursing Process: Implementation (cont'd)

- Educating the patient and family:
 - Replacement therapy is for life, with exception of transient hypothyroidism
 - Do not alter the dose unless advised
 - Take this drug in morning, before breakfast, unless advised to take it at different time of day



Nursing Process: Implementation (cont'd)

- Educating the patient and family (cont'd):
 - Weigh yourself weekly and report any significant weight gain or loss
 - Dosage of the drug may require periodic adjustments
 - Periodic thyroid function tests needed



Nursing Process: Evaluation

- The therapeutic effect is achieved
- Adverse reactions are identified and reported to the primary health care provider
- The patient verbalizes the importance of complying with the prescribed treatment regimen
- The patient verbalizes an understanding of the treatment modalities and importance of continued follow-up care
- The patient and family demonstrate an understanding of the drug regimen



Antithyroid Drugs: Actions

- Antithyroid drugs:
 - Inhibit the manufacture of thyroid hormones
 - Administered before surgery to temporarily return the patient to an euthyroid state
 - Radioactive isotope: Accumulates in cells of thyroid gland, where destruction of thyroid cells occurs without damaging other cells throughout the body



Antithyroid Drugs: Uses

- Methimazole and propylthiouracil are used for the medical management of hyperthyroidism
- Potassium iodide, may be given orally with methimazole or propylthiouracil to prepare for thyroid surgery
- Radioactive iodine (^{131}I) used for treatment of hyperthyroidism and selected cases of cancer of the thyroid



Antithyroid Drugs: Adverse Reactions

- Generalized System Reactions:
 - Hay fever; Sore throat; Skin rash; Fever; Headache
 - Nausea; Vomiting; Paresthesias
- Severe System Reactions:
 - Agranulocytosis
 - Exfoliative dermatitis; Granulocytopenia; Hypoprothrombinemia



Antithyroid Drugs: Contraindications, Precautions and Interactions

- Contraindicated in patients:
 - With hypersensitivity to drug or any constituent of drug
- Methimazole, propylthiouracil are used with caution: During pregnancy because they can cause hypothyroidism in the fetus
- Potential for bleeding increases when antithyroid drugs are taken with oral anticoagulants



Nursing Process: Assessment

- Preadministration assessment:
 - Obtain history of the symptoms of hyperthyroidism before patient starts therapy with antithyroid drug
 - Take a careful allergy history, particularly to iodine or seafood if the patient is prescribed an iodine procedure



Nursing Process: Assessment (cont'd)

- Ongoing assessment:
 - Observe patient for adverse drug effects
 - Question patient regarding relief of symptoms, signs or symptoms indicating adverse reaction related to decrease in blood cells, such as fatigue, fever, sore throat, easy bruising or bleeding, fever, cough, or any other signs of infection
 - Monitor patient for signs of thyroid storm



Nursing Process: Nursing Diagnosis

- Risk for ineffective therapeutic regimen management
- Risk for infection
- Risk for impaired skin integrity



Nursing Process: Planning

- Expected outcome includes:
 - An optimal response to therapy
 - patient needs related to the management of adverse reactions are addressed
 - Understanding of and compliance with the prescribed drug regimen



Nursing Process: Implementation

- Promoting an optimal response to therapy:
 - Discuss the problem with the primary health care provider if the patient with an enlarged thyroid gland has difficulty swallowing the tablet
 - patient with hyperthyroidism is likely to have cardiac symptoms such as tachycardia or palpitations



Nursing Process: Implementation

- Monitoring and managing patient needs:
 - Risk for ineffective therapeutic regimen management: Offer suggestions if patient expresses concern about dosage schedule
 - Suggest posting a notice on bathroom mirror to remind the individual that first dose is due immediately after rising
 - Suggest patient notify the primary health care provider if first or last dose interferes with sleep



Nursing Process: Implementation (cont'd)

- Monitoring and managing patient needs (cont'd):
 - Risk for infection: Monitor the patient throughout therapy for adverse drug reactions
 - Monitor patient frequently for signs of agranulocytosis
 - Monitor for signs of infection, particularly upper respiratory infection in visitors and other health care personnel



Nursing Process: Implementation (cont'd)

- Monitoring and managing patient needs (cont'd):
 - Risk for impaired skin integrity:
 - Carefully document affected areas, noting size, texture, extent of rash, and report occurrence of rash to the primary health care provider if the patient experiences a rash while taking methimazole or propylthiouracil



Nursing Process: Implementation (cont'd)

- Educating the patient and family:
 - Methimazole and Propylthiouracil: Take drugs at regular intervals and do not alter the dose
 - Notify promptly if sore throat, fever, cough, easy bleeding or bruising, headache, or general feeling of malaise occurs
 - Avoid use of nonprescription drugs unless primary health care provider has approved



Nursing Process: Implementation (cont'd)

- Educating the patient and family (cont'd):
 - Radioactive Iodine:
 - Follow department of nuclear medicine directions regarding precautions to be taken
 - Thyroid hormone replacement therapy is necessary if hypothyroidism develops
 - Schedule necessary follow-up evaluations to review the thyroid gland and effectiveness of treatment



Nursing Process: Evaluation

- The therapeutic effect is achieved
- Adverse reactions are identified and reported to the primary health care provider
- Anxiety is reduced
- The patient verbalizes an understanding of the dosage regimen



Nursing Process: Evaluation (cont'd)

- The patient verbalizes the importance of complying with the prescribed treatment regimen
- The patient and family demonstrate an understanding of the drug regimen



Wolters Kluwer
Health

Lippincott
Williams & Wilkins

End of Presentation