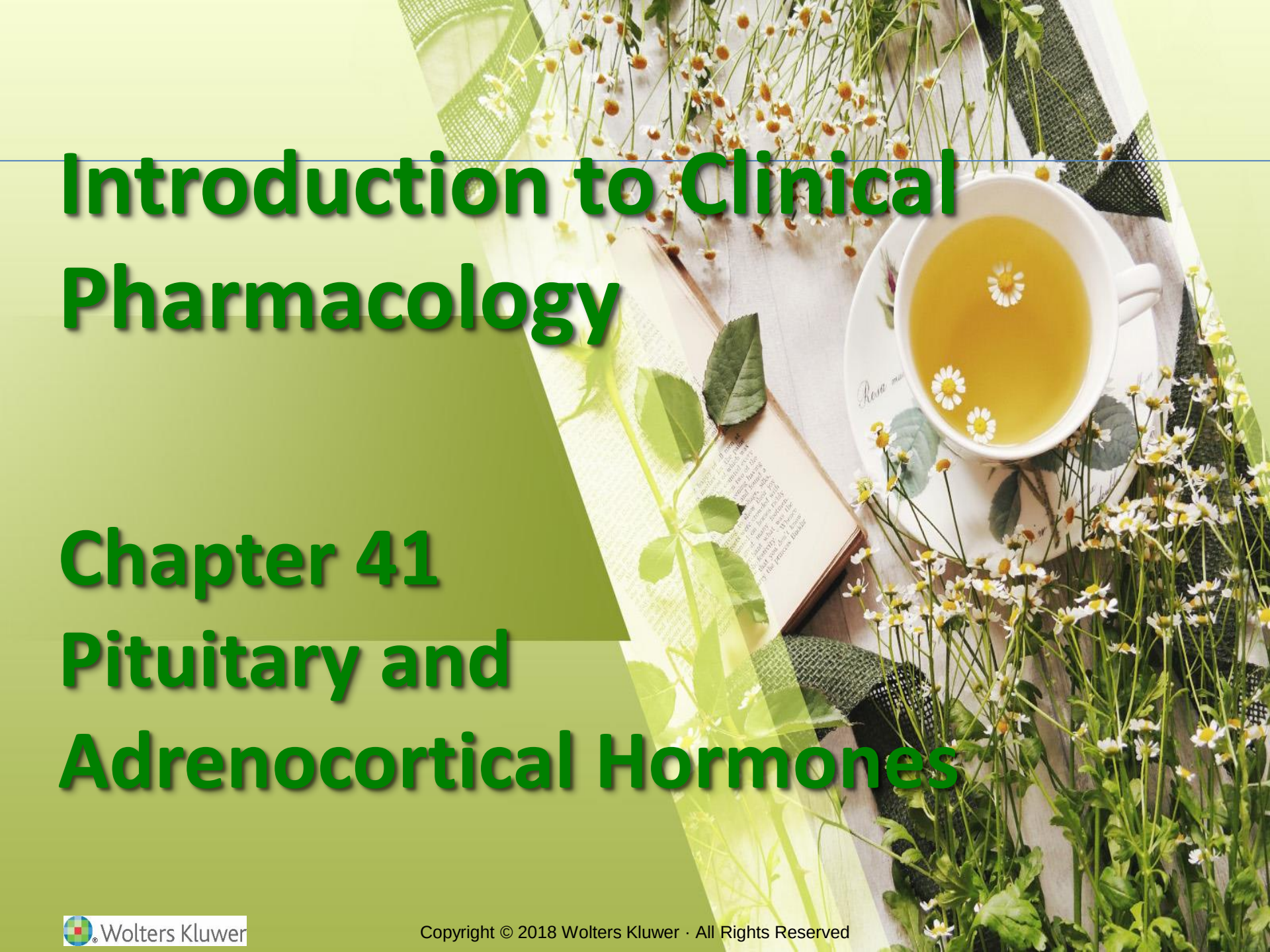
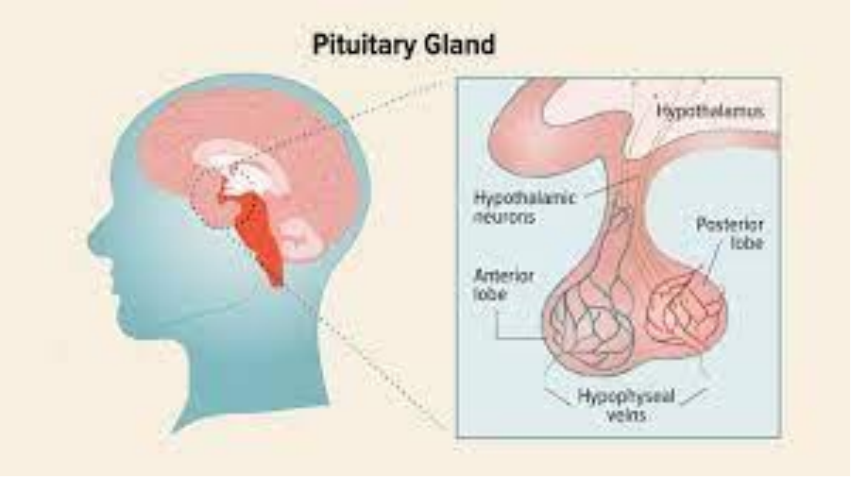
Introduction to Clinical Pharmacology

Chapter 41 Pituitary and Adrenocortical Hormones



Pituitary Gland

- The pituitary is a small gland suspended from the hypothalamus in the brain
- Called the ”master gland,” the pituitary controls many of the body processes
- The gland has two lobes, the anterior and posterior pituitary

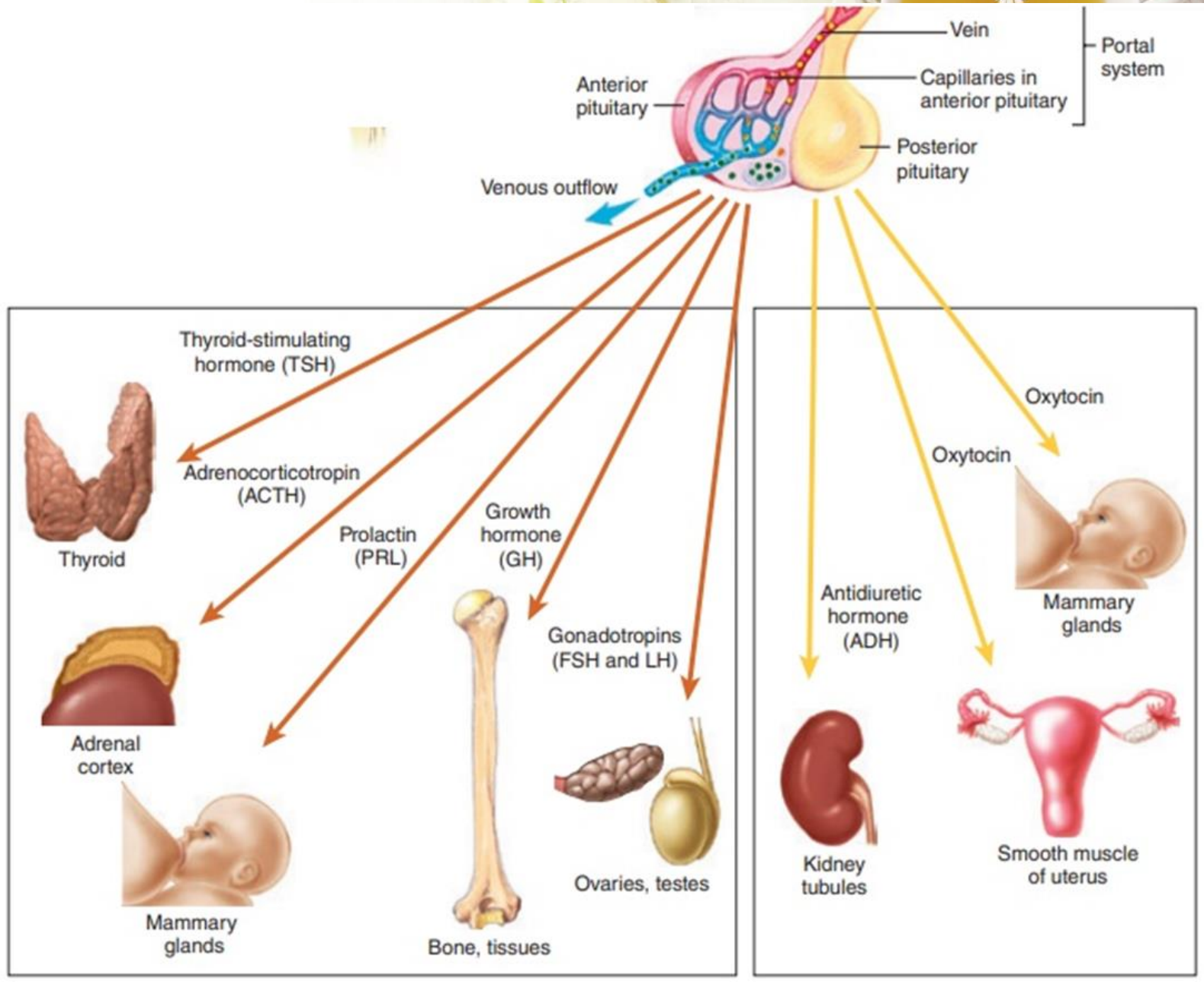


Anterior Pituitary Gland

- The anterior pituitary secretes many hormones, including prolactin, luteinizing hormone (LH), follicle-stimulating hormone (FSH), thyroid-stimulating hormone (TSH), adrenocorticotropic hormone (ACTH), and growth hormone (GH)
- These all help in the regulation of growth, metabolism, reproduction, and stress

Posterior Pituitary Hormones: Vasopressin

- Regulates reabsorption of water by the kidneys
- Secreted by pituitary when body fluids must be conserved
- Used in treating diabetes insipidus
- Adverse reactions: tremor, sweating, vertigo, nasal congestion, nausea, abdominal cramping, water intoxication



The pituitary gland.

Nursing Process: Assessment #1

- Preadministration assessment:
  - Take blood pressure, pulse, and respiratory rate; auscultate the abdomen; record the findings
- Ongoing assessment:
  - Observe patient for signs of an excessive dosage after administration of the drug
  - Reassure the patient that recovery will occur in a few minutes

Nursing Process: Nursing Diagnoses #1

- **Deficient Fluid Volume** related to inability to replenish fluid intake secondary to diabetes insipidus
- **Acute Pain** related to abdominal distention

Nursing Process: Planning #1

- Expected outcomes:
  - Optimal response to therapy
  - Support of patient needs related to management of adverse reactions
  - Understanding of the therapeutic regimen

Nursing Process: Implementation #1

- Promoting an optimal response to therapy:
  - Administer two injections of 10 units each when the drug is administered before abdominal roentgenography
  - Instruct patient to hold bottle upright with the head in vertical position when administering the drug

Nursing Process: Implementation #2

- Monitoring and managing patient needs:
  - Deficient fluid volume:
    - Measure fluid intake and output accurately
    - Observe for signs of dehydration

  - Pain:
    - Explain method of treating problem and necessity of monitoring drug effectiveness
    - Auscultate abdomen and measure abdominal girth as ordered

Nursing Process: Implementation #3

- Educating the patient and family:
  - Explain the importance of measuring fluid intake and output
  - Emphasize avoiding alcohol while taking the drugs
  - Explain the method of administrating injection
  - Advise on wearing medical identification naming the disease and the drug regimen

Nursing Process: Evaluation #1

- Therapeutic effect is achieved
- Anxiety is reduced
- Signs of significant fluid volume loss are absent
- Patient verbalizes an understanding of the treatment modalities and the importance of continued follow-up care

Nursing Process: Evaluation #2

- Patient and family demonstrate understanding of drug regimen
- Adverse reactions are identified, reported, and successfully managed
- Patient verbalizes the importance of complying with prescribed therapeutic regimen

Gonadotropins: FSH and LH

- Induce ovulation and pregnancy in anovulatory women
- Adverse reactions: vasomotor flushes, breast tenderness, abdominal discomfort, ovarian enlargement, hemoperitoneum
- Generalized reactions: nausea, vomiting, headache, restlessness, fatigue, edema

Nursing Process: Assessment #2

- Preadministration assessment:
  - Take and record patient's vital signs and weight before therapy begins
- Ongoing assessment:
  - Question patient regarding the occurrence of adverse reactions and record the patient's vital signs and weight

Nursing Process: Diagnoses #1

- **Acute Pain** related to adverse reactions (ovarian enlargement, irritation at the injection site)
- **Anxiety** related to inability to conceive, treatment outcome, other factors

Nursing Process: Planning #2

- Expected outcomes:
  - Optimal response to drug therapy
  - Support of patient needs related to the management of adverse reactions
  - Reduction in anxiety
  - Understanding of the therapeutic regimen

Nursing Process: Implementation #4

- Promoting an optimal response to therapy:
  - Observe symptoms of ovarian stimulation
  - Discontinue therapy and notify primary health care provider if symptoms occur
- Monitoring and managing patient needs:
  - Pain: rotate injection sites and examine previous sites for redness and irritation
  - Anxiety: allow the patient time to talk about his or her problems or concerns about proposed treatment program

Nursing Process: Implementation #5

- Educating the patient and family
  - Hormonal ovarian stimulants: explain the possible adverse and generalized reactions before beginning therapy
  - Nonhormonal ovarian stimulants: explain the necessity of contacting the primary health care provider immediately if any adverse symptoms occur

Nursing Process: Evaluation #3

- Therapeutic effect is achieved
- Adverse reactions are identified, reported, and successfully managed
- Anxiety is reduced
- Patient demonstrates knowledge of treatment and dosage regimen

Growth Hormone

- Secreted by the anterior pituitary
- Regulates growth of individual
- Used before closure of the child's bone epiphyses
- Adverse reactions: hypothyroidism, insulin resistance, swelling, joint pain, muscle pain
- Used cautiously in patients with thyroid disease and diabetes; during pregnancy

Nursing Process: Assessment #3

- Preadministration assessment:
  - Record patient's vital signs, height, and weight before therapy starts
- Ongoing assessment:
  - Measure and record child's height and weight to evaluate the response to therapy

Nursing Process: Nursing Diagnoses #2

- Key nursing diagnosis for patients receiving growth hormone therapy:
  - Body Image Disturbance
    - Related to changes in appearance, physical size, or failure to grow

Nursing Process: Planning #3

- Expected outcomes:
  - Optimal response to drug therapy
  - Support of patient needs related to the management of adverse reactions
  - Reduction in anxiety
  - Understanding of the therapeutic regimen

Nursing Process: Implementation #6

- Promoting an optimal response to therapy:
  - Do not administer solution if it is cloudy
  - Periodic testing of growth hormone levels, glucose tolerance, and thyroid functioning done at intervals during treatment

Nursing Process: Implementation #7

- Monitoring and managing patient needs:
  - Body image disturbance: acknowledge feelings as normal; correct misconceptions regarding the treatment
- Educating the patient and family:
  - Instruct parents on proper injection technique if drug is to be given at bedtime
  - Explain the changes that may be experienced due to the therapy

Nursing Process: Evaluation #4

- Therapeutic effect is achieved; child grows in height
- Adverse reactions are identified, reported, and managed successfully
- Anxiety is reduced
- Parents verbalize understanding of the treatment program
- Child maintains a positive body image

Adrenocorticotropic Hormone (ACTH): Corticotropin

- Stimulates the adrenal cortex to produce and secrete adrenocortical hormones, primarily glucocorticoids
- Used for managing acute exacerbations of multiple sclerosis, nonsuppurative thyroiditis, hypercalcemia associated with cancer
- Contraindicated in patients with adrenocortical insufficiency, allergy to pork or pork products, systemic fungal infections, ocular herpes simplex, scleroderma, osteoporosis, and hypertension

Nursing Process: Assessment #4

- Preadministration assessment:
  - Obtain patient's weight and assess skin integrity, lungs, mental status
- Ongoing assessment:
  - Monitor patient's weight and fluid intake and output daily during therapy
  - Monitor blood glucose levels for a rise in blood glucose concentration
  - Check stools for evidence of bleeding

Nursing Process: Planning #4

- Expected outcomes:
  - Optimal response to therapy
  - Patient needs related to the management of adverse reactions are addressed
  - Understanding of the therapeutic regimen

Nursing Process: Implementation #8

- Promoting an optimal response to therapy:
  - Assess vital signs
  - Observe any adverse reactions that may occur
  - Observe patient for hypersensitivity reactions

Nursing Process: Implementation #9

- Monitoring and managing patient needs:
  - Risk for infection:
    - Observe skin daily for localized signs of infection, especially at injection sites or IV access sites
  - Disturbed thought processes:
    - Report evidence of behavior change
    - Encourage communication with staff and family members

Nursing Process: Implementation #10

- Educating the patient and family:
  - Explain the necessity of contacting the primary health care provider immediately if adverse reactions occur
  - Explain the importance of avoiding contact with those who have infection
  - Explain to patients with diabetes the importance of monitoring blood glucose level and urine closely

Nursing Process: Evaluation #5

- Therapeutic effect is achieved
- Adverse reactions are identified, reported, and managed successfully
- Patient verbalizes an understanding of the therapeutic regimen

Adrenocortical Hormones

- Glucocorticoids and mineralocorticoids:
  - Essential to life and influence many organs and structures of the body
  - Collectively called corticosteroids

Nursing Process: Assessment #5

- Preadministration assessment:
  - Record vital signs
  - Perform an assessment of area of disease involvement and record the findings
- Ongoing assessment:
  - Record vital signs
  - Assess for signs of adverse effects and change in patient's mental status

Nursing Process: Diagnoses #2

- **Risk for Infection** related to immune suppression or impaired wound healing
- **Acute Confusion** related to adverse drug reactions
- **Risk for Injury** related to muscle atrophy, osteoporosis, or spontaneous fractures
- **Acute Pain** related to epigastric distress of gastric ulcer formation
- **Excess Fluid Volume** related to adverse reactions (sodium and water retention)
- **Disturbed Body Image** related to adverse reactions (cushingoid appearance)

Nursing Process: Planning #5

- Expected outcomes:
  - Optimal response to therapy
  - Support of patient needs related to the management of adverse reactions
  - Understanding of therapeutic regimen

Nursing Process: Implementation #11

- Promoting an optimal response to therapy:
  - Alternate-day therapy: used in treating diseases and disorders requiring long-term therapy
  - Diabetic patient: monitor blood glucose levels several times daily or as prescribed by the primary health care provider
  - Adrenal insufficiency: critical deficiency of mineralocorticoids and glucocorticoids

Nursing Process: Implementation #12

- Monitoring and managing patient needs:
  - Risk for infection: report slight rise in temperature, sore throat, other signs of infection
  - Acute pain: report any patient complaints of epigastric burning or pain, bloody or coffee-ground emesis, passing of tarry stools
  - Excess fluid volume: check for visible edema, keep accurate fluid intake and output record, obtain daily weight

Nursing Process: Implementation #13

- Monitoring and managing patient needs (cont.)
  - Body image disturbance:
    - Assess patient's emotional state and help the patient to express feelings and concerns
  - Disturbed thought process:
    - Document and report any mental changes
    - Evaluate mental status, memory, impaired thinking

Nursing Process: Implementation #14

- Educating the patient and family:
  - Explain the importance of taking the drug as directed for the following therapies:
    - Short-term glucocorticoid therapy
    - Alternate-day oral glucocorticoid therapy
    - Long-term or high-dose glucocorticoid therapy
    - Intra-articular or intralesional administration; mineralocorticoid (fludrocortisone) therapy

Nursing Process: Evaluation #6

- Therapeutic effect is achieved
- Adverse reactions are identified, reported, and managed appropriately
- Patient verbalizes an understanding of the dosage regimen
- Patient verbalizes importance of complying with the prescribed therapeutic regimen and importance of continued follow-up care

Nursing Process: Evaluation #7

- Patient and family demonstrate an understanding of the drug regimen
- Patient demonstrates an understanding of the importance of not suddenly discontinuing therapy

Question #1

- Is the following statement true or false?
- The pituitary is a large gland suspended from the hypothalamus in the brain.

Answer to Question #1

- False
- The pituitary is a small gland suspended from the hypothalamus in the brain.

Question #2

- Is the following statement true or false?
- The posterior pituitary secretes two hormones, oxytocin and vasopressin.

Answer to Question #2

- True
- The posterior pituitary secretes two hormones, oxytocin and vasopressin. Vasopressin regulates the reabsorption of fluid by the kidney. Diabetes insipidus occurs when vasopressin is not secreted properly. This results in unquenchable thirst and copious urination.

Question #3

- Is the following statement true or false?
- Patients taking vasopressin replacement can easily become dehydrated if unable to take the medication; therefore, a medical alert identification should always be worn.

Answer to Question #3

- True
- Patients taking vasopressin replacement can easily become dehydrated if unable to take the medication; therefore, a medical alert identification should always be worn.