Chapter 15: Drugs That Affect Urine Output

MULTIPLE CHOICE BASIC CONCEPTS

1. What is the main intended action of any type of diuretic drug?

   a. Weight loss

   b. Potassium loss

   c. Increased urine output

   d. Decreased sense of thirst

ANS: C

Diuretics are drugs that help rid the body of excess water and sodium by increasing a person’s urine output. They may work on the kidneys directly or may increase blood flow to the kidney. Either way, these drugs cause a person to urinate more and lose water from the body. Although potassium is often lost with a diuretic that is not a diuretic’s main intended action.
2. For which complication should you remain alert when a patient is taking any type of diuretic?

   a. Loss of appetite
   
   b. Bladder spasms
   
   c. Hypertension
   
   d. Dehydration

ANS: D

Any type of diuretic increases water loss through urination. This water loss can cause dehydration if a patient’s fluid intake does not keep pace with his or her urine output.

3. What is the most common health problem treated by diuretic drugs?

   a. High blood pressure
b. Tongue swelling

c. Constipation

d. Obesity

ANS: A

Diuretics are used most often to treat problems when the body is retaining too much water, too much sodium, or too much potassium. They are often prescribed for people who have the following health problems: high blood pressure (hypertension), heart failure, kidney disease, and liver disease (cirrhosis).

DIF: Cognitive Level: Remembering       REF: p. 241

4. Which type of diuretic can cause higher than normal blood calcium levels?

a. Loop diuretics

b. Osmotic diuretics

c. Thiazide diuretics

d. Potassium-sparing diuretics
ANS: C

Potential side effects of thiazide diuretics include fluid and electrolyte imbalances such as decreased blood volume, decreased potassium (hypokalemia), decreased sodium (hyponatremia), decreased chloride (hypochloremia), and decreased magnesium (hypomagnesemia), along with increased calcium (hypercalcemia) and increased urea (hyperuremia).

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5. Which class of diuretics is the most powerful?

a. Loop diuretics
b. Osmotic diuretics
c. Thiazide diuretics
d. Potassium-sparing diuretics

ANS: A

Loop diuretics (also called “high-ceiling” diuretics) slow down or turn off the sodium pumps in the nephron tubes in a place different from thiazide diuretic action. They cause more sodium, potassium, and water to stay in the urine and leave the body through urination. Loop diuretics are the most powerful diuretics.
6. Which symptom indicates too much sodium has been lost when a loop diuretic has been used?

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>a.</td>
<td>Blood pressure gets higher as the day passes.</td>
</tr>
<tr>
<td>b.</td>
<td>Blood levels of potassium are increased every morning.</td>
</tr>
<tr>
<td>c.</td>
<td>The patient’s urine is a light yellow color and has no perceptible odor.</td>
</tr>
<tr>
<td>d.</td>
<td>The patient becomes light-headed and dizzy when moving from a sitting to a standing position.</td>
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</table>

ANS: D

Among the more common side effects of loop diuretics is dizziness or light-headedness when the patient moves from a sitting or lying position to a standing position. This occurs because blood pressure drops in response to the loss of fluid from the blood vessels (postural hypotension). Other signs and symptoms of low sodium include confusion, convulsions, decreased mental activity, irritability, muscle cramps, and unusual fatigue or weakness.
7. Which diuretic is potassium-sparing?

a. Chlorothiazide (Oretic)

b. Furosemide (Lasix)

c. Ethacrynic acid (Edecrin)

d. Spironolactone (Aldactone)

ANS: D

Spironolactone is a potassium-sparing diuretic. Chlorothiazide is a thiazide diuretic; furosemide and ethacrynic acid are loop diuretics.

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8. Which diuretic can cause breast enlargement?

a. Amiloride

b. Bumetanide

c. Chlorothiazide
ANS: A

Amiloride (Midamor) is a potassium-sparing diuretic. A side effect in both men and women prescribed these drugs is the possible development of breast enlargement (gynecomastia in men).

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9. What is a common side effect of antispasmodic drugs for overactive bladder (OAB)?

a. Dry mouth
b. Diarrhea
c. Insomnia
d. Incontinence

ANS: A

Frequent side effects of drugs for OAB include dry mouth, dry eyes, headache, dizziness, and constipation.
10. Which side effect is associated only with loop diuretics?

a. Dizziness

b. Hearing loss

c. Urinary frequency

d. Increased sun sensitivity

ANS: B

All loop diuretics are ototoxic (can cause hearing loss). No other class of diuretics is ototoxic.

11. Which diuretic may cause an adverse effect of a higher than normal serum potassium level?

a. Spironolactone (Aldactone)
ANS: A

Spironolactone (Aldactone) is a potassium-sparing diuretic that reduces the amount of potassium excreted by the kidneys. As a result, serum potassium levels can become higher than normal.

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12. Which laboratory value is always checked before giving a dose of furosemide (Lasix)?

a. Calcium

b. Magnesium

c. Creatinine

d. Potassium
ANS: D

Blood levels of potassium often decrease when furosemide (a loop diuretic) is administered, causing dry mouth, increased thirst, irregular heartbeat, mental and mood changes, muscle cramps or muscle pain, nausea/vomiting, tiredness, weakness, and weak pulses.

DIF: Cognitive Level: Remembering  REF: p. 245

ADVANCED CONCEPTS

13. How do antispasmodic drugs for overactive bladder work?

a. They reduce the urine-making action of the kidney.

b. They relax the muscles of the bladder.

c. They shrink the prostate gland.

d. They reduce the thirst reflex.

ANS: B

Antispasmodic drugs relax the muscles of the bladder and decrease the spasms of the detrusor muscle.
14. A patient who has been taking a diuretic for the past 2 weeks now experiences all of the following changes. Which change indicates that the diuretic is effective?

a. Weight loss of 7 lb

b. Heart rate increased from 72 to 80 beats/min

c. Respiratory rate decreased from 20 to 16 breaths/min

d. Morning blood glucose decreased from 142 to 110 mg/dL

ANS: A

Diuretic drugs cause water loss and are often prescribed for edema. One liter of water weighs 2.2 lb. In helping the patient rid the body of excess water, the patient is expected to lose weight.

15. A patient prescribed a once-daily diuretic calls the prescriber’s office to report that yesterday’s drug dose was missed. What is your best advice?
a. “Take today’s dose now and restrict today’s fluid intake to 1 L.”

b. “Take yesterday’s dose now and take today’s dose after another 6 hours.”

c. “Take today’s dose now and maintain your normal intake of food and fluids.”

d. “Skip today’s doses of all your medications and then begin everything fresh tomorrow.”

ANS: C

Too much time has passed to take both yesterday’s dose and today’s dose. Additional dosing would amount to doubling the dose, which could lead to more side effects and possible complications.

DIF: Cognitive Level: Applying or Higher

REF: p. 242

16. You are teaching a patient about diuretic therapy. Which statement made by the patient indicates that more teaching is needed?

a. “I am so thankful that my high blood pressure has been cured by this drug.”
b. “I always try to drink just about the same amount of fluid that I urinate each day.”

c. “I will call my health care provider if my heart rate is less than 60 beats/min.”

d. “I have been taking this drug early in the day so that I don’t have to get up during the night.”

ANS: A

Diuretics do not cure high blood pressure (hypertension), they only control the problem. If the patient stops taking the diuretic, blood pressure will increase.

DIF: Cognitive Level: Applying or Higher 

17. A patient taking a thiazide diuretic has the following blood laboratory values for kidney function. Which value will you report to the prescriber immediately?

a. Sodium 136 mEq/L

b. Potassium 2.6 mEq/L

c. Creatinine 0.9 mg/dL
ANS: B

Normal blood levels of potassium range between 3.5 and 5.0 mEq/L. The value listed here, 2.6 mEq/L, is low (hypokalemia) and can weaken the skeletal muscles of respiration. Most likely, the diuretic therapy caused the kidneys to excrete too much potassium. Although the blood urea nitrogen level is also lower than normal, it does not pose an immediate health threat. As the potassium level decreases, the patient is more at risk for cardiac dysrhythmias.

DIF: Cognitive Level: Applying or Higher

REF: p. 243

18. Why should you teach a patient who is prescribed a thiazide diuretic to change positions slowly?

a. Moving rapidly from a standing position to a sitting position can raise blood pressure and increase the patient’s risk for a stroke.

b. Moving rapidly from a standing position to a sitting position can cause excess body fluids to collect in the feet and ankles increasing the patient’s risk for edema.

c. Moving rapidly from a sitting position to a standing position can put pressure on the bladder and increase the patient’s risk for incontinence.
d. Moving rapidly from a sitting position to a standing position can cause blood pressure to drop and increase the patient’s risk for falling.

ANS: D

Diuretics reduce the amount of blood in the circulatory system at any one time, lowering blood pressure. When the patient moves from a sitting position to a standing position too rapidly, blood pressure falls very quickly (orthostatic hypotension), causing too little blood to reach the brain and making the patient dizzy. This can cause the patient to faint or fall.

DIF: Cognitive Level: Applying or Higher

19. You are to administer 20 mg of furosemide (Lasix) to a patient by the intravenous (IV) route. Which action is most important for you to take?

a. Give the drug slowly over at least 2 minutes.

b. Check the patient carefully for symptoms of low blood glucose levels.

c. Mix the drug with potassium chloride to prevent a rapid drop in serum potassium levels.

d. Monitor the IV site after giving the drug because furosemide causes severe tissue damage if infiltration
Furosemide is ototoxic (can reduce hearing). This effect is more likely to occur when the drug is administered intravenously at a rapid rate (faster than 10 mg/min).

DIF: Cognitive Level: Applying or Higher

REF: p. 244

20. A patient is prescribed spironolactone (Aldactone). Why should you advise the patient to avoid the use of salt substitutes?

a. They increase a patient’s risk for a high potassium level.

b. They can increase the patient’s risk for hypertension.

c. They may lead to hypokalemia.

d. They can cause water retention.

ANS: A

Most salt substitutes are made by replacing sodium with potassium. Use of salt substitutes at the same time as potassium-sparing diuretics such as spironolactone increases the patient’s risk of a high potassium level (hyperkalemia).
21. A patient who has been prescribed amiloride (Midamor) for the past 3 months reports that she must shave her legs more frequently. What is your best action?

a. Hold the next dose and notify the prescriber immediately.

b. Instruct the patient to stop taking oral contraceptives while she is taking this drug.

c. Document the response and reassure the patient that this is an expected side effect.

d. Ask the patient whether she has noticed any changes in the thickness of her scalp hair.

ANS: C

A common and nonharmful side effect of amiloride and other potassium-sparing diuretics is an increase in body hair (hirsutism) in women. It is not necessary to stop taking this drug.
22. You prepare to give a second dose of furosemide (Lasix) to a patient by intravenous (IV) push. Before the injection is started, the patient reports having chest pain since the last dose of the drug. What is your best action?

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<tbody>
<tr>
<td>a.</td>
<td>Assist the patient to lay flat and encourage him or her to take slow, deep breaths.</td>
</tr>
<tr>
<td>b.</td>
<td>Document the report as the only action for this expected side effect.</td>
</tr>
<tr>
<td>c.</td>
<td>Slow the IV drip rate and examine the infusion site for infiltration.</td>
</tr>
<tr>
<td>d.</td>
<td>Hold the dose and notify the prescriber immediately.</td>
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</tbody>
</table>

ANS: D

Chest pain is a serious side effect or adverse reaction to furosemide and can indicate that the patient is having a heart attack. Another dose could cause a more severe response. The prescriber should be notified about this response immediately for preventive action.

DIF: Cognitive Level: Applying or Higher

REF: pp. 245-246

23. A patient with overactive bladder has been prescribed tolterodine (Detrol). While assessing the patient, you discover the presence of the following health problems. For which problem should you contact the prescriber and question the drug order?
ANS: B

Tolterodine (Detrol) is an anticholinergic drug that can close the angle of the iris of the eye and decrease the outflow of aqueous fluid in the eye. For people who have closed angle glaucoma, the intraocular pressure can become even higher and the risk for blindness increases.

DIF: Cognitive Level: Applying or Higher

REF: pp. 248-249

24. A patient is prescribed an extended-release drug for overactive bladder. Which precaution is most important for you to teach the patient?

a. “Avoid taking this drug at bedtime.”

b. “Drink at least 3 L of fluid daily.”
c. “Swallow the tablet or capsule whole.”

d. “Perform a home pregnancy test monthly.”

ANS: C

Extended-release tablets or capsules are meant to release a drug at a relatively even dose throughout the day. Chewing or crushing the drug ruins the timed-release feature and allows most of the drug dose to be absorbed at once. This can cause more side effects and limits how long the drug will be effective.

DIF: Cognitive Level: Applying or Higher

25. A patient is prescribed a urinary antispasmodic drug for overactive bladder. Which instruction should you provide to prevent a serious complication?

a. “Be sure to let your prescriber know if your symptoms do not improve.”

b. “When using the patch, press it firmly to make sure it stays in place.”

c. “Use alcohol in moderation while taking this drug.”

d. “Avoid becoming overheated or dehydrated.”
ANS: D

Urinary antispasmodic drugs decrease the sweating response, increasing the risk for heat stroke. Patients can reduce this risk by ensuring that they keep themselves well hydrated during exercise or when in hot environments.

DIF: Cognitive Level: Applying or Higher

REF: p. 249

26. What must you teach any patient who is taking a diuretic drug?

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<tbody>
<tr>
<td>a.</td>
<td>Avoid foods that are rich in potassium such as bananas and broccoli.</td>
</tr>
<tr>
<td>b.</td>
<td>Sit on the side of the bed for 1 to 2 minutes before getting out of bed.</td>
</tr>
<tr>
<td>c.</td>
<td>Notify the prescriber if the heart rate is less than 70 beats/min.</td>
</tr>
<tr>
<td>d.</td>
<td>Keep a record of dietary intake for a few weeks.</td>
</tr>
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</table>

ANS: B

A common side effect of diuretics is hypotension and patients should be advised to change positions slowly. Patients should also be taught the signs of hypotension such as dizziness and light-headedness.
27. A hospitalized patient has received furosemide (Lasix), 40 mg orally, 30 minutes ago. To prevent injury to the patient, what should you do?

a. Assist the patient to the bathroom
b. Keep the patient on bed rest
c. Place all four side rails in the elevated position
d. Provide the patient with a bedpan or urinal

ANS: A

An expected action of diuretic drugs is loss of excess fluid. This can lead to hypovolemia with signs of decreased volume including dizziness and light-headedness. To provide a safe environment for the patient, you should ensure that the patient has assistance when getting out of bed.

28. A patient who is prescribed hydrochlorothiazide (HCTZ) informs you that she plans to become pregnant. What should you teach the patient about this drug?

a. This drug is safe for use during pregnancy and
b. The prescriber will most likely decrease your dose while you are pregnant.

c. You may take this drug during pregnancy, but should not use it if you plan to breastfeed.

d. This drug should be avoided both during pregnancy and the time when you are breastfeeding.

ANS: D

Thiazide diuretics should be avoided during pregnancy because they may cause side effects in the newborn, including jaundice and low potassium levels. Thiazide diuretics should also be avoided during breastfeeding because they pass into breast milk. The action of these drugs may decrease the flow of breast milk.

DIF: Cognitive Level: Understanding    REF: p. 243

29. A patient taking tolterodine (Detrol) reports decreased urination, ankle swelling, and a weight gain of 5 lb over the past 2 days. What should you do next?

a. Hold the dose and notifies the prescriber.

b. Check the patient’s blood pressure and heart rate.
ANS: A

Adverse effects of drugs for overactive bladder include chest pain, fast or irregular heart rate, shortness of breath, swelling (edema) and rapid weight gain, confusion, and hallucinations. Additionally, these drugs may cause decreased urination or no urine output, and painful or difficult urination. The dose should be held and the prescriber notified.

30. A patient is prescribed a diuretic drug twice a day. When should you advise him or her to take the last dose each day?

a. Around noon with lunch
b. Before 6:00 p.m.
c. At 9:00 p.m. or bedtime
d. Twelve hours after the first dose
ANS: B

If a patient is taking more than one dose of a diuretic per day, the last dose should be taken no later than 6:00 p.m. to avoid frequent nighttime urination and disruption of sleep and rest.

DIF: Cognitive Level: Applying or Higher

REF: p. 242

31. For which diuretic should you teach a patient to wear long sleeves, a hat, and sunscreen when going outdoors?

|     |  
|-----|---
| a.  | Furosemide (Lasix)  
| b.  | Ethacrynic acid (Edecrin)  
| c.  | Torsemide (Demadex)  
| d.  | Spironolactone (Aldactone)  

ANS: A

A side effect of furosemide is increased sensitivity of skin to sunlight (photosensitivity), possibly with skin rash, itching, redness, or severe sunburn. Teach patients prescribed furosemide to stay out of direct sunlight, wear protective clothing, and use sun block products with a skin protection factor (SPF) of at least 15. Remind them not to use sunlamps or tanning beds.
32. A patient prescribed a drug for overactive bladder (OAB) tells you that he or she regularly exercises throughout the year. What would you be sure to teach him or her about exercising during summer heat?

<table>
<thead>
<tr>
<th>Option</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>“When the weather is hot, you are at increased risk for heat stroke.”</td>
</tr>
<tr>
<td>b.</td>
<td>“During summer always exercise early in the day or after the sun goes down.”</td>
</tr>
<tr>
<td>c.</td>
<td>“Exercise will help you lose weight which will help decrease your OAB symptoms.”</td>
</tr>
<tr>
<td>d.</td>
<td>“Be sure to wear disposable pads to absorb any urine that leaks from your bladder while exercising.”</td>
</tr>
</tbody>
</table>

ANS: A

Remind patients to avoid becoming overheated or dehydrated during exercise or hot weather. Patients may be at increased risk for heatstroke during exercise or hot weather because these drugs decrease perspiration (sweating).
33. A patient who has diabetes is now prescribed the thiazide diuretic metolazone (Zaroxolyn). In addition to the usual precautions, what else should you teach this patient about the new drug therapy?

a. Always carry a simple sugar with you.

b. Check your blood glucose level more frequently.

c. Be sure to restrict your fluid intake after 6:00 p.m.

d. Tell your dentist you are taking this drug before any dental work is performed.

ANS: B

Metolazone can cause impaired glucose tolerance, glucosuria, and hyperglycemia in patients who have diabetes. This makes the disease harder to control.

DIF: Cognitive Level: Applying or Higher

REF: p. 243

34. During medication reconciliation, the patient tells you that he takes Luvox daily as a “water pill.” You note that this drug is not on his current list of ordered drugs. How should you proceed?

a. Ask him what strength or dose of Luvox he takes.
b. Request that the prescriber add Luvox to the patient’s orders.

c. Ask the patient to have all his drugs brought from home to the hospital.

d. Check with the pharmacist to determine whether Luvox interacts with his ordered drugs.

ANS: C

Luvox and Lasix are sound alike drugs and can easily be confused. Although this patient may indeed be prescribed to take Luvox (an antidepressant), the fact that he said he takes it as a “water pill” is a red flag. You must investigate this discrepancy further and not just make assumptions.

DIF: Cognitive Level: Applying or Higher

REF: p. 244

35. Which class of drugs can increase the blood potassium level when taken with triamterene (Dyrenium)?

a. High-ceiling “loop” diuretics

b. Metabolism inhibiting antibacterials

c. Angiotensin-converting enzyme inhibitors
d. Nonnucleoside analogue reverse transcriptase inhibitors

ANS: C

Drugs from the angiotensin-converting enzyme (ACE) inhibitor class promote potassium retention. When taken along with a potassium-sparing diuretic like triamterene, blood potassium levels can become too high. Drugs from the other classes on this list do not have the potassium retention action or effect.

DIF: Cognitive Level: Understanding  REF: p. 247

36. Why would a child be prescribed oxybutynin (Ditropan)?

a. To reduce bed-wetting
b. To prevent urinary retention
c. To increase elimination of urea
d. To decrease the risk for urinary tract infection

ANS: A

Bed-wetting is a form of urinary incontinence that occurs at night. The major indication for the use of oxybutynin is to control incontinence.
BASIC CONCEPTS

1. Which are common signs and symptoms when a patient is dehydrated? (Select all that apply.)

   a. Decreased pulse rate
   b. Low blood pressure
   c. Thirst
   d. Swollen eyeballs
   e. Dry mouth
   f. Skin tenting on back of hand

ANS: B, C, E
Dehydration is a condition caused by the loss of too much water from the body. Signs and symptoms of dehydration to watch for include: increased pulse rate with a “thready” pulse that may be hard to feel, low blood pressure (hypotension), thirst, sunken appearance to the eyeballs, dry mouth with thick sticky coating on tongue, and skin “tenting” on the forehead or chest.

DIF: Cognitive Level: Remembering  REF: p. 241

ADVANCED CONCEPTS

2. Which are intended responses of antispasmodic drugs used to treat overactive bladder? (Select all that apply.)

- a. Urine leakage is contained in adult diapers.
- b. Frequency of urination is decreased.
- c. Perspiration (sweating) is increased.
- d. Incontinence of urine is decreased.
- e. Detrusor muscle spasm is strengthened.
- f. Sense if urinary urgency is decreased.
ANS: B, D, F

Intended responses of urinary antispasmodic drugs include: urinary frequency is decreased, urinary urgency is decreased, and urinary incontinence is decreased.

DIF: Cognitive Level: Understanding  REF: p. 248

COMPLETION

ADVANCED CONCEPTS

1. A 10-year-old child is prescribed a one-time dose of oral furosemide (Lasix) 2 mg/kg. The child’s weight is 75 lb. How many milligrams will you give the child?

ANS:
68

1 kg = 2.2 lb. The child’s weight is pounds divided by 2.2 to find the child’s weight in kilograms.

75/2.2 = 34.09 kg rounded down to 34 kg. To determine the dose multiply the child’s weight in kilograms times 2 (34 · 2 = 68 mg).

DIF: Cognitive Level: Applying or Higher  REF: p. 244

2. The adult patient is prescribed 100 mg of hydrochlorothiazide (HCTZ [Oretic]) in 2 divided doses per day. HCTZ is available on 25 mg tablets. How many tablets per dose will you give the patient?
ANS:

2

Total dose per day is $100 \text{ mg}/2 = 50 \text{ mg}/dose$. Tablets come in $25 \text{ mg}/tablet$. $50/25 = 2$ tablets.

DIF: Cognitive Level: Applying or Higher

REF: p. 242