

CHAPTER 25. ACUTE KIDNEY INJURY, SELF-ASSESSMENT QUESTIONS

Questions 1 and 2 refer to the following case. A 71-year-old man is transferred to the ICU with pneumonia and sepsis. His baseline serum creatinine upon admission to the hospital was 0.9 mg/dL (80 $\mu\text{mol/L}$). Two days later, his serum creatinine has increased to 2.1 mg/dL (186 $\mu\text{mol/L}$). His urine output is 1800 mL in the past 24 hours.

1. His acute kidney injury would best be classified as which of the following based on the KDIGO staging system?
 - A. Stage 1
 - B. Stage 2
 - C. Stage 3
 - D. Loss
 - E. End stage
2. His urine output would be classified as which of the following?
 - A. Anuria
 - B. Oliguria
 - C. Normal
 - D. Polyuria
 - E. Unable to assess

Questions 3 and 4 refer to the following case. A 66-year-old woman (weight 140 pounds [63.5 kg], height 5'4" [163 cm]) is admitted to the hospital for a GI bleed. She has a history of diabetes mellitus and baseline Scr 1.4 mg/dL (124 $\mu\text{mol/L}$). Laboratory work today reveals BUN 65 mg/dL (23.2 mmol/L) and SCr 2.8 mg/dL (248 $\mu\text{mol/L}$).

Chronic medications include metoprolol, atorvastatin, and glyburide.

3. What of the following statements is true regarding assessment of kidney function in this patient?
 - A. MDRD equation should be used to estimate GFR
 - B. Cockcroft-Gault equation should be used to estimate GFR
 - C. 24-hour urinary data should be used to estimate GFR
 - D. Equations that estimate C_{ICr} with a single SCr are not accurate in this patient

E. Her renal function is similar to baseline

4. Based on the patient's BUN and SCr concentration, which of the following is a likely cause for her AKI?

A. Prerenal AKI due to GI bleed

B. Intrinsic AKI due to diabetes

C. Postrenal AKI due to obstruction

D. Intrinsic AKI due to history of CKD

E. Prerenal AKI due to a chronic medication

Questions 5 to 7 refer to the following case: A 63-year old man (70 kg [154 lb]) is diagnosed with intrinsic acute kidney injury (AKI) secondary to ischemia after cardiac surgery. Three days later, his urine output is 350 mL in the last 24 hours. His estimated CrCl is 20 mL/min (0.33 mL/s). He has signs of volume overload, including 2+ pedal edema, crackles, weight gain, and increased jugular venous pressure.

5. Which of the following would be a reasonable starting dose of furosemide for this patient?

A. 1 g IV

B. 500 mg IV

C. 200 mg orally

D. 80 mg IV

E. 5-mg/h IV continuous infusion

6. The patient has a prior history of a sulfonamide allergy. Which of the following statements is true regarding administration of furosemide in this patient?

A. Furosemide should be continued; cross-reactivity with furosemide is low

B. Furosemide should be discontinued; cross-reactivity with furosemide is moderate

C. Furosemide should be discontinued; cross-reactivity with furosemide is high

D. Furosemide should be continued; furosemide does not contain a sulfa moiety

E. Furosemide should be discontinued; initiate bumetanide

7. Little increase in his urine output is noted following initial furosemide administration. Which of the following recommendations would be warranted at this time?

A. Increase dose of furosemide

- B. Switch to bumetanide
 - C. Switch to spironolactone
 - D. Add hydrochlorothiazide
 - E. Add mannitol
8. Extended-interval aminoglycoside dosing decreases the incidence of nephrotoxicity over conventional multiday dosing regimens by which of the following rationales?
- A. Dilation of the afferent arterioles at high doses, which decreases glomerular capillary pressure
 - B. Saturation of proximal tubule uptake sites, allowing excretion of the remaining aminoglycoside molecules
 - C. Maintaining aminoglycoside trough concentrations consistently less than 2 mcg/mL (2 mg/L)
 - D. Shorter total length of treatment with once-daily dosing compared with multiday dosing
 - E. There is no benefit of once daily dosing of aminoglycosides to decrease AKI
9. Which of the following aminoglycosides is more nephrotoxic in clinical practice?
- A. Amikacin
 - B. Gentamicin
 - C. All equally nephrotoxic
 - D. Tobramycin
 - E. Netilmicin
10. The incidence of AKI as a result of amphotericin B is highest with which of the following formulations?
- A. Conventional desoxycholate amphotericin B
 - B. Amphotericin B lipid complex (ABLC)
 - C. Liposomal amphotericin B (L-AmB)
 - D. Amphotericin B colloidal dispersion (ABCD)
 - E. All are equally nephrotoxic
11. A 66-year-old woman with AKI (SCr = 4.6 mg/dL [407 μ mol/L]) presents with mild pain. Her physician initiates therapy with naproxen. You recommend which of the following?
- A. Discontinue naproxen; initiate therapy with acetaminophen
 - B. Discontinue naproxen; initiate therapy with ibuprofen

- C. Discontinue naproxen; initiate therapy with sulindac
- D. Continue naproxen but at a reduced dose
- E. Continue naproxen; monitor kidney function closely

Questions 12 to 14 refer to the following case. A 69-year-old white woman has a past medical history of chronic kidney disease (CKD), diabetes mellitus (DM), and hypertension. Her serum creatinine is stable at 1.4 mg/dL (124 μ mol/L), and she is not volume overloaded. She will be receiving IV contrast dye for a cardiac catheterization.

12. All of the following have been found to decrease the risk of contrast-induced AKI except which of the following?

- A. Hydration with normal saline
- B. Reduced volume of contrast
- C. Nonionic contrast agent administration
- D. Administration of oral acetylcysteine
- E. Hydration with sodium bicarbonate

13. Which of her medications is most likely to contribute to worsening AKI?

- A. Hydrochlorothiazide
- B. Atorvastatin
- C. Enalapril
- D. Atenolol
- E. Acetaminophen

14. Following the catheterization, she develops acute kidney injury and is fluid overloaded. She is receiving furosemide 200 mg IV every 6 hours, with an increase in urine output from 600 mL in the last 24 hours to 1300 mL in the last 24 hours. Which of the following would you recommend next to improve urine output?

- A. Add spironolactone, 50 mg orally daily
- B. Switch to bumetanide, 4 mg IV every 6 hours
- C. Increase the dose of furosemide to 1 g IV every 12 hours
- D. Add metolazone, 5 mg orally daily

- E. Add dopamine, 5 mcg/kg/minute IV
15. A 63-year-old man has suffered a GI bleed. His BUN and serum creatinine are elevated at 52 mg/dL (18.6 mmol/L) and 2.4 mg/dL (212 μ mol/L), respectively. His blood pressure is 105/68 mm Hg, urinary sodium concentration is 10 mEq/L (10 mmol/L), and fractional excretion of sodium is 0.5%. Which of the following treatments is recommended at this time?
- A. loop diuretic, such as furosemide
 - B. bolus of IV fluids, such as normal saline
 - C. ACE Inhibitor, such as enalapril
 - D. thiazide diuretic, such as hydrochlorothiazide
 - E. Dopamine agonist, such as fenoldopam

ANSWERS

1. B

2. C

3. D

4. A

5. D

6. A

7. A

8. B

9. C

10. A

11. A

12. D

13. C

14. D

15. B