

# NIO AKI deel 1

1. (4) A 67-year-old woman with a history of stage G2 CKD secondary to diabetic nephropathy is evaluated for AKI complicating septic shock. She recently underwent autologous stem cell transplantation for acute myelogenous leukemia. Her serum creatinine level has risen from 1.0 mg/dl [88  $\mu$ mol/l] to 4.9 mg/dl [433  $\mu$ mol/l]. She now has fever, hypotension, and suspected septic shock. Over the past 10 hours, the urine output has decreased to 0.2 mg/kg per h. A norepinephrine infusion increases the mean arterial pressure to 65 mmHg. You initiate continuous RRT. An angiotensin II infusion is initiated, and the mean arterial pressure increases to 75 mmHg.

Which ONE of the following is CORRECT about the impact of adding the angiotensin II infusion?

- (A) She is at decreased risk for inpatient mortality
- (B) Her duration of RRT will be shorter
- (C) Her Sequential Organ Failure Assessment (SOFA) score will increase
- (D) Her duration of mechanical ventilation will be shorter

2. (5) You are caring for a 71-year-old man with stage G3a CKD disease who has recently undergone a right hemicolectomy for colon cancer. Postoperatively, he arrives in the intensive care unit receiving mechanical ventilatory support. He does not require vasopressor support. On physical examination, the blood pressure is 130/82 mmHg. He is alert and follows commands. The heart and lung examination results are unremarkable, and there is trace peripheral edema. His surgical and anesthesia teams initially plan a "restrictive" intravenous fluid regimen designed to provide a net zero fluid balance.

Which ONE of the following is associated with this restrictive fluid strategy compared with a liberal fluid strategy?

- (A) A decreased risk of surgical site infections
- (B) An increased risk of AKI requiring RRT
- (C) An increased length of stay in the intensive care unit
- (D) An increased risk of mortality at 1 year

**3.** (6) A 63-year-old kidney transplant recipient is seen in consultation for stage 2 AKI complicating urosepsis. She has received 4 L Ringer's lactate solution over the past 8 hours. She remains intubated and ventilated, and she requires support with norepinephrine and vasopressin. Laboratory studies show sodium 138 mEq/L, potassium 4.9 mEq/L, chloride 98 mEq/L, total CO<sub>2</sub> 18 mmol/L, BUN 36 mg/dl [12,9 mmol/l], and creatinine 2.6 mg/dl [230 μmol/l] (increased from her most recent values, which averaged 1.1 mg/dl [97 μmol/l]). An arterial blood gas shows pH 7.17 and PaCO<sub>2</sub> 20 mmHg [2,7 kPa]. In the setting of acidosis, AKI, and shock, you recommend an infusion of 4.2% sodium bicarbonate titrated to achieve an arterial pH of 7.30.

In this setting, administration of bicarbonate as specified will be associated with which ONE of the following outcomes?

- (A) Increased risk of mortality
- (B) Increased risk of hypercalcemia
- (C) Decreased risk of progressive AKI requiring dialysis
- (D) Decreased risk of intensive care unit-associated delirium
- (E) Fewer vasopressor-free days

**4.** (11) Implementing a Kidney Disease Improving Global Outcomes—based care bundle for postoperative patients with urinary tissue inhibitor of metalloproteinase 2\*IGF binding protein factor 7 levels >0.3 [(ng/ml)<sup>2</sup>/1000] MOST consistently leads to which ONE of the following patient outcomes?

- (A) Shorter length of mechanical ventilation
- (B) Decreased rate of stage 2 and 3 AKI
- (C) Decreased requirement for RRT
- (D) Reduced inpatient mortality
- (E) Decreased urine output

**5.** (16) A 70-year-old man with stage G3b:A3 CKD, diabetes mellitus, and hypertension is seen in consultation before coronary angiography. There is no history of congestive heart failure, and the physical examination is normal except for signs of diabetic retinopathy and neuropathy. An echocardiogram shows normal left ventricular function. You are asked to recommend the best prophylactic regimen to prevent AKI. His eGFR is 43 ml/min per 1.73 m<sup>2</sup>. The urine albumin-to-creatinine ratio is 978 mg/g [110,5 mg/mmol].

Which ONE of the following recommendations is MOST consistent with the findings of the Prevention of Serious Adverse Events Following Angiography (PRESERVE) trial?

- (A) N-acetylcysteine should be administered 2 days before radiocontrast exposure to reduce the risk of dialysis-requiring AKI in this high-risk patient
- (B) Intravenous isotonic bicarbonate infusion is superior to isotonic saline solution in this patient, who does not have congestive heart failure
- (C) Neither N-acetylcysteine compared with placebo nor isotonic bicarbonate therapy compared with saline solution is more likely to reduce the risk of dialysis-requiring AKI after radiocontrast exposure
- (D) He should receive both isotonic bicarbonate and N-acetylcysteine for prophylaxis because he is at extremely high risk for contrast-induced nephropathy

**6.** (18) A 70-year-old man with stage G3b:A2 CKD, diabetes mellitus, and hypertension is seen in the office after a recent hospitalization for hip surgery. His hospital course was complicated by stage 1 AKI. His baseline serum creatinine level was 1.9 mg/dl [168 µmol/l]. While he was hospitalized, the serum creatinine level peaked at 3.1 mg/dl [274 µmol/l] and eventually fell to the current level of 2.1 mg/dl [186 µmol/l].

Which ONE of the following is the MOST accurate statement regarding the impact of the AKI episode on his long-term cardiovascular prognosis?

- (A) It has no impact on his subsequent risk of cardiovascular events
- (B) It increases his risk of incident congestive heart failure
- (C) It is not associated with subsequent cardiac events because he did not experience dialysis-requiring AKI
- (D) It is not associated with cardiac events because the kidney function almost completely recovered to baseline

**7.** (21) A 72-year-old man with pneumonia due to *Staphylococcal aureus* is seen in consultation for nonoliguric AKI. He has been treated with intravenous vancomycin, and trough levels have ranged between 15 and 20 mg/L. On physical examination, he appears frail and is in mild respiratory distress. The blood pressure is 130/80 mmHg, and the temperature is 38.1°C. There are crackles and bronchial breath sounds in the left lower lung zone. There is trace peripheral edema. Over the past 3 days, the serum creatinine level has risen from 1.2 mg/dl [106 µmol/l] to 2.4 mg/dl [212 µmol/l]. The urinalysis shows 11 protein, no blood, and 5 to 10 muddy brown casts per high-power field.

Which ONE of the following should you indicate in your consultation?

- (A) Trough levels of 15 to 20 mg/L are not associated with nephrotoxicity
- (B) Only peak vancomycin levels correlate with nephrotoxicity
- (C) No change in vancomycin dosing is warranted because he does not have oliguria
- (D) Vancomycin nephrotoxicity has been associated with trough levels  $\geq 15$  mg/L

**8.** (25) A 70-year-old woman with advanced CKD due to diabetic nephropathy is evaluated before initiation of dialysis. She required coronary artery bypass surgery 2 months ago, which was complicated by stage 2 AKI. While hospitalized, the serum creatinine level rose from 2.0 mg/dl [177 µmol/l] to 4.0 mg/dl [354 µmol/l]. Although the creatinine at discharge had improved slightly to 3.5 mg/dl [309 µmol/l], she subsequently had progressive CKD. She now has subtle uremic symptoms and a mild degree of volume overload. On physical examination, she is in no distress. The blood pressure is 130/80 mmHg. There is 1+ leg edema. The remainder of the examination is unremarkable. Laboratory studies show serum sodium 138 mEq/L, potassium 5.4 mEq/L, chloride 102 mEq/L, total CO<sub>2</sub> 19 mmol/L, BUN 92 mg/dl [32,8 mmol/l], creatinine 8.5 mg/dl [751 µmol/l], calcium 9.2 mg/dl [2,30 mmol/l], and phosphorus 5.9 mg/dl [1,91 mmol/l]. The hemoglobin is 10.2 g/dl [6,3 mmol/l]. Plans are under way to start dialysis in the outpatient setting next week. She has an arteriovenous fistula that is ready for use.

Which ONE of the following statements MOST accurately characterizes the prognostic importance of AKI before initiation of longterm dialysis?

- (A) Her history of AKI in the predialysis period does not affect her mortality
- (B) The episode of AKI will not affect her survival on dialysis because she has an arteriovenous fistula
- (C) Given her history of AKI before initiation of dialysis, she should initiate dialysis in a hospitalized setting
- (D) Her pre-ESRD episode of AKI is associated with a 30% greater risk of mortality at 1 year in comparison with patients without AKI before incident dialysis