**StuNews Case March 2018**

**Reviewed by Clinical Pharmacy Challenge Exam Panel**

History of Present Illness: A 46-year-old male with a 25-year history of ethanol abuse presents after being found down and unresponsive by his family. In the week prior, the patient had complained of burning urination, flank pain, and loss of appetite. The patient had a possible seizure during transport with emergency medical services for which he was given lorazepam. The lorazepam had to be given intramuscularly since no intravenous access could be established. No other therapies were administered. Due to concern for protecting his airway, he was intubated upon arrival to the emergency department and sufficient intravenous access obtained.

Past Medical History: Alcohol use disorder, depression, hypertension, type II diabetes

Social History: Lives alone. Family reports he drinks 12-24 beers daily.

Current Medications: Paroxetine 20 mg daily, amlodipine 10 mg daily, metformin 750 mg twice daily

Allergies: Penicillin (rash)

Vital Signs: Heart rate 122 bpm, Blood pressure 68/42 (mean arterial pressure 51 mm Hg)

Lab Values: White blood cell count 27.8 x 103/µL (27.8 x 109/L); Hemoglobin 11.1 g/dL (111 g/L); Hematocrit 33.1 % (0.331); Platelet count 325 x 103/µL (325 x 109/L); Sodium 147 mEq/L (147 mmol/L); Potassium 4.9 mEq/L (4.9 mmol/L); Chloride 111 mEq/L (111 mmol/L); Bicarbonate 19 mEq/L (19 mmol/L); Blood urea nitrogen 23 mg/dL (8.21 mmol/L); Serum creatinine 1.68 mg/dL (148.5 µmol/L); Glucose 110 mg/dL (6.1 mmol/L); Aspartate aminotransferase 93 U/L; Alanine aminotransferase 105 U/L; Alkaline Phosphatase 147 U/L; INR 1.5

Urinalysis: Positive for leukocyte esterase, positive for nitrite.

Procedure Data: Completed in emergency department: Rapid sequence intubation; Central line access obtained

Other Data: N/A

**Question 1**

What agent is most crucial to administer in the setting of altered mental status and possible malnutrition, given the patient’s extensive alcohol abuse history?

1. Dextrose
2. Folic acid
3. Magnesium
4. Thiamine

Answer: 4. Thiamine

Rationale: Given that the patient meets 2 of the 4 criteria for Wernicke’s encephalopathy (possible malnutrition and altered mental status), he should receive intravenous thiamine. Although the other items listed may also be of benefit, thiamine is the most important to administer to prevent these complications.

Citation: Flannery AH, Adkins DA, Cook AM. Evidence for the Banana Bag: Evidence-Based Recommendations for the Management of Alcohol-Associated Vitamin and Electrolyte Deficiencies in the ICU. Crit Care Med. 2016 Aug;44(8):1545-52.

**Question 2**

The patient is diagnosed with septic shock with a possible urinary source and started on ceftriaxone. What should be initiated first with regard to septic shock resuscitation?

1. 0.9% sodium chloride bolus
2. Epinephrine
3. Norepinephrine
4. Vasopressin

Answer: 1. 0.9% sodium chloride bolus

Rationale: The patient has not received any fluids or other therapies as of yet for his resuscitation of septic shock. Fluid resuscitation is the first component of septic shock resuscitation and should be attempted prior to adding vasopressors.

Citation: Rhodes A, Evans LE, Alhazzani W, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Crit Care Med. 2017 Mar;45(3):486-552.

**Question 3**

The patient’s mean arterial pressure remains at 55-58 mm Hg despite adequate fluid resuscitation. What should be administered next?

1. Hydrocortisone
2. Hydroxyethyl starch
3. Norepinephrine
4. Phenylephrine

Answer: 3. Norepinephrine

Rationale: If fluid resuscitation does not restore perfusion and MAP sufficiently, vasopressors are recommended next in national sepsis guidelines. Norepinephrine is the first line vasopressor recommended and is the appropriate answer. Starches are not recommend due to risks of bleeding and kidney injury. Hydrocortisone should not be given unless the patient remains refractory to both fluid and vasopressors.

Citation: Rhodes A, Evans LE, Alhazzani W, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Crit Care Med. 2017 Mar;45(3):486-552.

**Question 4**

The medical team would like to administer a benzodiazepine per tube for his alcohol withdrawal, but are concerned with the patient’s liver function based on his extensive drinking history. Which is the best choice in this situation?

1. Diazepam
2. Lorazepam
3. Midazolam
4. Propofol

Answer: 2. Lorazepam

Rationale: Although not first-line therapy for the general ICU patient, benzodiazepines remain the drugs of choice in alcohol withdrawal. Lorazepam is not impacted by hepatic dysfunction near the degree that midazolam and diazepam are, making it the drug of choice for alcohol withdrawal in patients with impaired liver metabolism.

Citation: Barr J, Fraser GL, Puntillo K. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Crit Care Med. 2013 Jan;41(1):263-306.

**Question 5**

The team wishes to extubate the patient but is concerned about his level of agitation. Which agent is most appropriate to start now and continue after the patient is extubated?

1. Dexmedetomidine
2. Midazolam
3. Propofol
4. Pentobarbital

Answer: 1. Dexmedetomidine

Rationale: Dexmedetomidine has been shown to be benzodiazepine sparing when studied for alcohol withdrawal in the ICU. It has also been shown to be superior to propofol in these situations where agitation remains the only indication for intubation and it can be continued once extubated. It is not recommended to continue either of the other 3 options once extubated.

Citation: 1. Barr J, Fraser GL, Puntillo K. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit.Crit Care Med. 2013 Jan;41(1):263-306.

2. Reade MC, Eastwood GM, Bellomo R, et al. Effect of Dexmedetomidine Added to Standard Care on Ventilator-Free Time in Patients With Agitated Delirium: A Randomized Clinical Trial. JAMA. 2016 Apr 12;315(14):1460-8.