

CATEGORY: ONCOLOGY

Question 1. A 62-year-old man presents with nausea and diarrhea 7 days after receiving a second cycle of cytotoxic chemotherapy for diffuse large B-cell lymphoma. His serum uric acid is 20 mg/dL and his serum calcium is 6.8 g/dL. You establish venous access and initiate treatment with which one of the following medications?

- A. Aminoglycosides
- B. Corticosteroids
- C. Allopurinol
- D. Sodium bicarbonate
- E. Potassium chloride

CORRECT ANSWER: C

EXPLANATION: This patient's history and presentation suggest tumor lysis syndrome (TLS), which is associated with treatment of hematologic malignancies, especially non-Hodgkin lymphomas. Option 3 is correct because initial treatment for this disorder includes emergent treatment of hyperuricemia with allopurinol or rasburicase. Option 1 is incorrect because TLS is not an infectious process. Nephrotoxic antibiotics may aggravate TLS. Option 2 is incorrect because corticosteroids are not a treatment for TLS, but are associated with development of TLS. Option 4 is incorrect because alkalinization of urine with sodium bicarbonate is not a recommended treatment for TLS. Option 5 is incorrect because TLS is associated with hyperkalemia. Although intravenous fluid is appropriate for this patient, potassium is not indicated.

SOURCE: Hochberg J, Cairo MS, Coccia PF. Tumor lysis syndrome. In: Abelson, MD et al. *Abelson's Clinical Oncology*. 4th ed. Philadelphia, PA: Churchill Livingstone; 2008:759-62.

Question 2. A 55-year-old man referred to you for diagnosis brings chart notes indicating a *JAK2V617F* mutation and a hemoglobin value of 20 mg/dL. Which one of the following laboratory evaluations is most helpful for establishing the diagnosis?

- A. Erythropoietin
- B. Platelet count
- C. Bone marrow blast percentage
- D. WBC count
- E. Arterial blood gas

CORRECT ANSWER: A

EXPLANATION: The presence of a *JAK2V617F* mutation and elevated hemoglobin suggest a diagnosis of congenital polycythemia vera (PV). Elevated hemoglobin and *JAK2* mutation are the two major criteria for PV. For a diagnosis of PV, a patient must meet these two major criteria plus one of 3 minor criteria, or must have elevated hemoglobin plus two minor criteria. Minor criteria for PV are bone marrow biopsy showing hypercellularity with trilineage growth, serum erythropoietin level below normal, and endogenous erythroid colony formation in vitro. The correct answer is Option 1 because low serum erythropoietin is a minor criterion for PV. Option 2 is incorrect because although platelet count is not a diagnostic criterion for PV. Option 3 is incorrect because PV is associated with bone marrow hypercellularity, not blasts. Option 4 is incorrect because PV is not diagnosed using WBC, and alterations in white cells are not a feature of the disease. Option 5 is incorrect because changes in arterial blood gases are not a feature of PV. Chronic lung disease and hypoventilation syndromes are associated with acquired PV, but unlike congenital PV, acquired PV is not associated with *JAK2* mutations.

SOURCE: Tefferi A. Myeloproliferative disorders. In: Abelson, MD et al. *Abelson's Clinical Oncology*. 4th ed. Philadelphia, PA: Churchill Livingstone; 2008:2261-9.

CATEGORY: PULMONARY

Question 3. A 74-year-old woman with recent acute stroke is on ventilatory support but demonstrates significant improvement. Her family asks when she can breathe on her own. Which one of the following values suggests that weaning her from the ventilator is inadvisable?

- A. $O_2 = 70$ mmHg on $F_{I_{O_2}}$ of 0.4
- B. PEEP = 4.5 cm H_2O
- C. Temperature = 37.8 °C
- D. Heart rate = 155 bpm
- E. Hemoglobin = 8.5 mg/dL

CORRECT ANSWER: D

EXPLANATION: Option 4 is correct as this patient's heart rate (HR) is > 140 bpm, which does not meet guideline criteria for weaning. Guidelines for considering discontinuation of ventilatory support include $pO_2 \geq 60$ mmHg on $F_{I_{O_2}} \leq 0.4$, PEEP ≤ 5 -10 cm H_2O , HR ≤ 140 bpm, temperature < 38 °C, and hemoglobin ≥ 8 -10 g/dL. Other criteria for discontinuation include $pO_2/F_{I_{O_2}} > 150$ -300, stable blood pressure on minimal or no vasopressors, no significant respiratory acidosis, adequate mentation, stable metabolic status, and adequate cough. Options 1, 2, 3, and 5 are incorrect as the values listed in these options meet criteria for considering discontinuation of ventilatory support.

SOURCE: Collective Task Force facilitated by the American College of Chest Physicians, the American Association for Respiratory Care, and the American College of Critical Care Medicine. Evidence-based guidelines for weaning and discontinuing ventilatory support. *Respir Care*. 2002;47(1):69-90.