Pretest/Posttest

Question 1

A 32-year-old female patient with trauma is mechanically ventilated in the intensive care unit (ICU). Enteral nutrition (EN) is contraindicated, and the patient has a negative nitrogen balance. What is the best amino acid (AA) solution to meet the patient's individual nutritional needs?

- Standard of 15% AA
- **Solution containing up to 80 g/L of AA**
- 3% specialty AA and 3% glycerin injection with electrolytes
- Standard AA in dextrose

Rationale:

Two new specialty high-protein solutions are designed for patients who need parenteral nutrition (PN) when oral or EN is not possible, insufficient, or contraindicated. These solutions also treat negative nitrogen balance in patients. Both solutions contain up to 80 g/L of amino acids, which is the highest protein in any multichamber bag available in US, enabling clinicians to more easily reach patient protein targets—while delivering less fluid and dextrose versus existing formulations.

Resources:

- Baxter announces US FDA approval of Clinimix and Clinimix E with higher protein for patients requiring parenteral nutrition. September 23, 2020. Accessed Jan 2022. https://www.baxter.com/baxter-newsroom/baxter-announces-us-fda-approval-clinimix-and-clinimix-e-higher-protein-patients
- Wolk R, Foulks C. Renal disease. In: Mueller CM, ed. *The A.S.P.E.N. Nutrition Support Core Curriculum*. 2nd ed. American Society for Parenteral and Enteral Nutrition; 2012;500.

Question 2

Newly available high-protein premix formulations provide the flexibility to meet patient-specific nutritional needs due to which of the following?

- Available in peripheral formulations only, with or without electrolytes
- **Available in a variety of formulations in 1- and 2-liter bags**
- Developed exclusively for adult patients ≥18 years of age
- Provide up to 60 g/2L bag of amino acids

Rationale:

Newly FDA-approved parenteral nutrition formulations provide the highest concentration of protein/L (up to 80 g/L amino acids) in premix bags and can be used in both pediatric and adult patients. These higher protein formulations are available in 8/14 and 8/10, with and without electrolytes, and in 6/5, which is formulated for peripheral or central administration. The availability of these injections in a variety of formulations in one- and two-liter bags provides clinicians with the flexibility to help meet the individual nutritional goals of patients.

Resources:

- Ayers P, Guenter P, Holcombe B, Plogsted S, eds. *A.S.P.E.N. Parenteral Nutrition Handbook*. 2nd ed. American Society for Parenteral and Enteral Nutrition; 2014:123.
- Baxter announces US FDA approval of Clinimix and Clinimix E with higher protein for patients requiring parenteral nutrition. September 23, 2020. Accessed Jan 2022. https://www.baxter.com/baxter-newsroom/baxter-announces-us-fda-approval-clinimix-and-clinimix-e-higher-protein-patients
- Wolk R, Foulks C. Renal disease. In: Mueller CM, ed. *The A.S.P.E.N. Nutrition Support Core Curriculum*. 2nd ed. American Society for Parenteral and Enteral Nutrition; 2012;500.
- Working together for patient care. Baxter. Accessed March 24, 2022. https://ushospitalproducts.baxter.com/

Question 3

According to recent observational studies, which of the following methods of measuring energy expenditure has the potential to improve patient outcomes?

- Direct calorimetry
- Penn State Equation
- **Indirect calorimetry**
- Modified Penn State Equation

Rationale:

Measurement of energy expenditure (EE) enables identification of patients' resting metabolic rate and energy needs. Although predictive equations can estimate EE, they cannot account for unknown factors in this measurement process. In addition, recent observational studies have shown predictive equations over- or underestimate REE at different phases of critical illness.

In contrast to the limitations of predictive equations, routine use of indirect calorimetry (IC) in personalized nutrition has demonstrated the potential to improve patients' nutritional status and long-term outcomes.

Resources:

- Chapparo CJ, et al. *J Pediatr*. 2017;184:220-226.e5. doi:10.1016/j.jpeds.2016.12.063
- Mtaweh H, et al. *Front Pediatr*. 2018;6:257. doi:10.3389/fped.2018.00257
- Tah PC, et al. *Crit Care Med*. 2020;48(5):e380-e390. doi:10.1097/CCM.0000000000004282

Question 4

Per a recent study investigating the descriptive statistics of medication use data, which of the following is correct?

- There was significant variation in overall inter-rater reliabilities of medication administration records (MARs) versus smart pump records (SPRs)
- **SPRs captured the more discrepancies than electronic health record (EHR) MARs**
- The number of discrepancies for both SPR and MAR were >2.0

- MARs captured more discrepancies than SPR

Rationale:

A recent study, which integrated smart pump record (SPR) with electronic health record (EHR) data to analyze the most error-prone phases of medication lifecycle, showed that SPRs captured more discrepancies than EHR medication administration records (MARs). This study reviewed 2,307 medication orders with 10,575 MARs and 23,397 SPRs. Results identified 321 discrepancies from MARs (discrepancy rate 321/10,575, 3.0%) and 682 discrepancies from SPRs (discrepancy rate 682/23,397, 2.9%). The overall inter-rater reliabilities were 0.92/0.90 (MAR/SPR).

Resources:

- Ni Y, et al. *JMIR Med Inform*. 2020;8(9):e19774. doi:10.2196/19774