

## Refeeding Syndrome: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

- The refeeding syndrome (RFS) is most likely to develop in which of the following patients?**
  - A 16-year-old boy after outpatient arthroscopic knee surgery
  - A 44-year-old hypertensive male executive with staphylococcal gastroenteritis
  - A 75-year-old woman with dementia and limited oral intake for the last 10 days
  - A 51-year-old man treated as an outpatient for cellulitis
- The hallmark laboratory abnormality associated with RFS is which one of the following?**
  - Hyperkalemia
  - Hypermagnesemia
  - Elevated erythrocyte sedimentation rate
  - Hypophosphatemia
- A 16-year-old girl with anorexia nervosa is hospitalized with severe malnutrition and placed on parenteral nutrition. All of the following statements are correct EXCEPT:**
  - Maximal caloric replacement during the initial 12 hours of hospitalization will improve her outcome
  - Telemetry monitoring should be utilized during the first few days of hospitalization
  - Fatal cardiac arrhythmia may occur
  - She is at risk of developing rhabdomyolysis
- Which form of electrolyte supplementation would be most useful in a patient with classic RFS?**
  - Sodium chloride
  - Potassium phosphate
  - Calcium chloride
  - Iron gluconate
- Which one of the following is NOT a potential complication of RFS?**
  - Respiratory failure
  - Hemolytic anemia
  - Ventricular tachycardia
  - Polycythemia

*(turn page for answers)*

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### EXPLANATIONS OF ANSWERS

1. (C) **A 75-year-old woman with dementia and limited oral intake for the last 10 days.** RFS is a common clinical syndrome that typically occurs in subnourished patients upon commencement of nutrition by the oral, intravenous, or enteral route. Intravenous saline-dextrose solutions also can precipitate RFS.<sup>1</sup> Patients with normal oral intake are not at risk for RFS, but an elderly patient with poor intake for 10 days would be at high risk upon reinstating nutrition. Acute electrolyte and fluid shifts are responsible for the bulk of morbidity and mortality of RFS.
2. (D) **Hypophosphatemia.** Hypophosphatemia is the most common abnormal laboratory value associated with RFS and is the hallmark of the syndrome. Prolonged malnutrition leads to depletion of intracellular phosphorus, and when a patient is repleted with carbohydrates, increased cellular uptake of phosphorus occurs for generation of high energy phosphate bonds and various enzyme systems, leading to hypophosphatemia.<sup>1,2</sup> Insulin release and hyperglycemia also may lead to transcellular shifts of phosphorus, potassium, and magnesium, resulting in hypophosphatemia, hypokalemia, and hypomagnesemia, respectively. Hyperkalemia and hypermagnesemia are not features of RFS. An elevated sedimentation rate is nonspecific and likely related to underlying disease and not RFS.
3. (A) **Maximal caloric replacement over the initial 12 hours of hospitalization will improve her outcome.** A cardinal rule in reinstating nutrition (especially parenteral or enteral nutrition) is the “start low and go slow” concept. Patients with anorexia nervosa are at high risk for life-threatening electrolyte depletion and fluid shifts, which can impair cardiac performance and result in fatal ventricular arrhythmias as well as respiratory muscle weakness precipitating acute respiratory failure.<sup>3</sup> In prisoners of war who were placed on vigorous nutritional repletion regimens after prolonged starvation, complications such as cardiac failure, arrhythmias, and sudden death fre-

quently occurred.<sup>2</sup> Other complications include hypophosphatemia-induced rhabdomyolysis, hemolysis, and phagocyte dysfunction.<sup>4</sup> It is prudent to begin nutritional support in low amounts and increase over several days, with careful monitoring of serum electrolytes and cardiac rhythm.

4. (B) **Potassium phosphate.** The most common electrolyte derangements associated with RFS are hypophosphatemia and hypokalemia. Correction with a potassium phosphate solution is convenient and safe. Oral preparations are adequate in mild cases. Intravenous infusion can be administered if hypophosphatemia is severe. Intravenous doses of 0.08 mmol/kg body weight or an infusion of 15 mmol is adequate in many patients.<sup>5</sup> Serial monitoring of potassium, phosphorus, and calcium is necessary to avoid complications.
5. (D) **Polycythemia.** Polycythemia is not associated with RFS, but anemia due to hemolysis can occur. Respiratory failure may complicate severe hypophosphatemia due to diaphragmatic muscle weakness from inadequate ATP production. Hypophosphatemia also may be detrimental to erythrocyte morphology leading to cell rigidity and hemolysis. Ventricular tachycardia is the most feared complication of RFS and results from hypokalemia, hypomagnesemia, and hypophosphatemia.

### REFERENCES

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