

Study Questions

Choose the ONE best answer.

- 42.1 Which is an appropriate treatment for a nutritional anemia that presents as a hunger for ice and/or upward curvature of the fingernails?

A. Vitamin B₁₂ (cyanocobalamin)
B. Folic acid
C. Vitamin D
D. Iron

Correct answer = D. Vitamin B₁₂, folic acid, and iron deficiencies all contribute to anemia, but iron deficiency is associated with pica (hunger for ice or dirt) and koilonychia (upward curvature of toenails/fingernails). Vitamin D deficiency does exist but does not cause anemia.

- 42.2 Which iron supplement contains the highest percentage of elemental iron?

A. Ferrous sulfate
B. Carbonyl iron
C. Ferrous gluconate
D. Ferric ammonium citrate

Correct answer = B. Ferrous sulfate contains 20% (or 30% in the anhydrous formulation), ferrous gluconate contains 12%, and ferric ammonium citrate contains 18% of elemental iron. These are all well below the percent of elemental iron in carbonyl iron, which contains 100% elemental iron.

- 42.3 A 56-year-old woman is discovered to have megaloblastic anemia. Her past medical history is significant for alcoholism. Which would be the best treatment option for this patient?

A. Oral vitamin B₁₂
B. Parenteral vitamin B₁₂
C. Oral folic acid
D. Oral vitamin B₁₂ with oral folic acid

Correct answer = D. The patient has a history of alcoholism, which would suggest folic acid deficiency anemia. However, folic acid administration alone reverses the hematologic abnormality and masks possible vitamin B₁₂ deficiency, which can then proceed to severe neurologic dysfunction and disease. The cause of megaloblastic anemia needs to be determined in order to be specific in terms of treatment. Therefore, megaloblastic anemia should not be treated with folic acid alone but, rather, with a combination of folic acid and vitamin B₁₂.

- 42.4 A 60-year-old woman presents to her primary care physician complaining of dizziness and fatigue. Following laboratory testing, the patient is diagnosed with iron deficiency anemia, and oral iron supplementation is needed. Which would be the most appropriate dosing regimen for the patient?

A. Ferrous fumarate 325 mg once daily
B. Ferrous gluconate 256 mg once daily
C. Polysaccharide-iron complex 150 mg two to three times daily
D. Ferrous sulfate 325 mg two to three times daily

Correct answer = D. The recommended dose of iron supplementation in iron deficiency anemia is typically about 150 mg of elemental iron in two to three divided doses. Extended-release formulations (such as polysaccharide-iron complex) may be dosed once daily. Ferrous sulfate 325 mg contains approximately 65 mg of elemental iron, ferrous fumarate 325 mg contains about 107 mg elemental iron, ferrous gluconate 256 mg contains approximately 30 mg elemental iron, and polysaccharide-iron complex 150 mg contains 150 mg elemental iron.

- 42.5 A 63-year-old female patient with anemia secondary to chronic kidney disease and a hemoglobin level of 8.6 g/dL is treated with epoetin alfa. Eight days after the initial dose of epoetin alfa, the patient's hemoglobin is 10.5 g/dL. Which would be the next step in the management of this patient's anemia?

A. Discontinue epoetin alfa
B. Discontinue epoetin alfa and initiate darbepoetin
C. Continue epoetin alfa
D. Increase the dose of epoetin alfa

Correct answer = A. Hemoglobin has increased to more than 10 g/dL and more than 1 g/dL in 2 weeks, so epoetin alfa should be discontinued or the dose reduced. Switching to darbepoetin, continuing epoetin alfa, or increasing the dose of epoetin alfa would continue to increase hemoglobin and lead to increased risk of cardiovascular events.

- 42.6 Which drug would be beneficial to reduce the frequency of painful crises in a patient with sickle cell disease?

- A. Epoetin alfa
- B. Filgrastim
- C. Hydroxyurea
- D. Sargamostim

Correct answer = C. Clinical evidence supports the use of hydroxyurea for reducing the frequency and severity of painful sickle cell crises during the course of sickle cell disease. Epoetin alfa helps increase hemoglobin and red blood cell production in anemias secondary to chronic kidney disease, HIV, bone marrow disorders, and other disorders. Filgrastim and sargamostim stimulate granulocyte production in the marrow to increase the neutrophil counts and reduce the duration of severe neutropenia.

42.7 After completing his last cycle of chemotherapy, a 68-year-old man received a dose of pegfilgrastim prophylactically to reduce his risk of neutropenia. Twenty-four hours later, he returned to clinic to receive an additional dose of pegfilgrastim and was told he did not need another dose. Which would explain the rationale behind this recommendation?

- A. Absolute neutrophil count is above 1000/ μ L
- B. Pegfilgrastim is given as single dose
- C. Next dose of pegfilgrastim is due 72 hours after the first dose
- D. Next dose of pegfilgrastim is due 48 hours after the first dose

Correct answer = B. Pegfilgrastim is a pegylated form of G-CSF and has a longer half-life; therefore, it is administered as a single dose with no additional doses needed. Monitoring of the ANC is not necessary with pegfilgrastim due to the pharmacokinetics of the drug.

42.8 A patient has been taking ferrous sulfate 325 mg twice daily for two weeks and is complaining of a bad taste after each dose. Which once-daily, oral iron formulations would improve tolerability and provide a similar total daily dose of elemental iron as twice-daily ferrous sulfate?

- A. Ferric ammonium citrate 25 mg
- B. Ferrous gluconate 100 mg
- C. Ferrous sulfate, anhydrous 142 mg
- D. Polysaccharide-iron complex 150 mg

Correct answer = D. Once-daily polysaccharide-iron complex (150 mg = 150 mg elemental iron) is tasteless and odorless, with a similar total daily dose of elemental iron as ferrous sulfate 325 mg twice daily (130 mg elemental iron/day). Once-daily ferric ammonium citrate 25 mg (4.5 mg elemental iron) is less bioavailable than twice-daily ferrous sulfate. Ferrous sulfate and ferrous gluconate have similar tolerability, but once-daily ferrous gluconate has less elemental iron (12 mg elemental iron). Ferrous sulfate, anhydrous has better tolerability with the extended-release formulation, but has less elemental iron (43 mg elemental iron) administered once daily compared to twice daily *ferrous sulfate*.

42.9 Which patient with iron deficiency anemia would need the parenteral form of iron replacement?

- A. 22-year-old woman with heavy menstrual periods
- B. 58-year-old man with end stage renal disease on hemodialysis
- C. 32-year-old woman in the first trimester of pregnancy
- D. 40-year-old man with a diabetic foot infection

Correct answer = B. Clinical evidence supports the use of parenteral iron over oral iron in hemodialysis patients due to a significantly greater increase in hemoglobin levels and lower incidence of treatment-related adverse events. Parenteral iron is also preferred in patients who cannot tolerate oral iron or who have iron malabsorption. Patients with heavy menstrual periods, who are pregnant, or who have chronic disease states, such as diabetes, and infections, should be administered an initial trial of oral iron.

42.10 An 81-year-old woman presents to the emergency department with progressive weakness, fatigue, confusion, and reports of seeing people in her house who were trying to hurt her but who were not physically present. Her physical exam was positive for pallor but negative for koilonychia or cracking at the corners of the mouth. Which deficiency would be the highest priority in this patient's workup?

- A. Vitamin B₁₂
- B. Iron
- C. Folate
- D. Calcium

Correct answer = A. Based on the presentation of confusion and hallucinations, vitamin B₁₂ deficiency should be considered the highest priority. Second priority would be to assess folate deficiency, since symptoms are similar to vitamin B₁₂ deficiency. Iron would be the third priority due to the patient's age, even without the presence of koilonychia or cracking of the mouth. Last priority would be to assess age-related deficiencies in calcium, which could lead to fatigue as well as muscle cramps, poor appetite, and abnormal heart rhythms.