

Lesson 2-2: Hemoglobin

MULTIPLE CHOICE

1. The hemoglobin molecule:
- a. is made up of eight globin chains
 - b. contains protein and heme
 - c. contains four heme groups
 - d. all of the above

ANS: B PTS: 1

2. Which is true concerning hemoglobin(s)?
- a. They cannot be measured on small handheld analyzers.
 - b. They are named according to the type of globin chain.
 - c. Thalassemias are caused by abnormalities in the heme portion.
 - d. Hb A_{1c} is the major hemoglobin in infants.

ANS: B PTS: 1

3. Which is true of hemoglobin analysis?
- a. It is an indirect measure of oxygen-carrying capacity.
 - b. It measures the red cell volume.
 - c. It is always determined from an anticoagulated venous blood sample.
 - d. No stable standard is available.

ANS: A PTS: 1

4. All of the following are true of hemoglobin EXCEPT:
- a. Hemoglobin is usually included in the CBC.
 - b. The reference value for females is higher than for males.
 - c. Hemoglobin transports CO₂ from the tissue to the lungs.
 - d. The reference value for newborns is higher than for adult males.

ANS: B PTS: 1

5. Which of the following is true for hemoglobin analysis?
- a. The specific gravity method estimates Hgb level.
 - b. The reference range for adult females is 12–17 g/dL.
 - c. The Hgb level is unaffected by RBC count.
 - d. It does not require use of Standard Precautions.

ANS: A PTS: 1

COMPLETION

1. The protein portion of the hemoglobin molecule is the _____.

ANS:
globin
globin chains

PTS: 1

2. Hemoglobin is the main constituent of _____.

ANS:
red blood cells
erythrocytes
RBCs

PTS: 1

3. The molecule that gives the characteristic red color to blood is _____.

ANS:
hemoglobin
Hb
Hgb

PTS: 1

4. The iron-containing portion of the hemoglobin molecule is _____.

ANS: heme

PTS: 1

5. A blood-diluting reagent that contains iron, potassium, cyanide, and sodium bicarbonate is called _____.

ANS:
Drabkin's reagent
Drabkin's

PTS: 1

6. Blood hemoglobin analysis using Drabkin's reagent measures the end product _____.

ANS:
cyanmethemoglobin
hemiglobincyanide

PTS: 1

7. The major functional component of RBCs that serves as the oxygen-carrying molecule is _____.

ANS:
hemoglobin
Hb
Hgb

PTS: 1

8. Cyanmethemoglobin is the stable colored compound formed when hemoglobin is reacted with _____.

ANS:
Drabkin's reagent
Drabkin's

PTS: 1

9. The factor for converting hemoglobin from g/dL to SI units is _____.

ANS:
ten
10

PTS: 1

10. The form of hemoglobin that is called "adult" hemoglobin is Hb _____.

ANS:
A_{1c}
A
A_{1c}
A₁
A₁

PTS: 1

11. Hemoglobin transports _____ from the tissues to the lungs.

ANS:
carbon dioxide
CO₂
CO₂

PTS: 1

12. The mineral required for hemoglobin synthesis is _____.

ANS:
iron
Fe

PTS: 1

MATCHING

Choose the best match for each item. Use an answer only once.

- | | |
|---------------------|--------------------------------|
| a. decreased oxygen | f. variant forms of hemoglobin |
| b. thalassemias | g. blood hemoglobin level |
| c. homozygous | h. carrier |
| d. CLIA waived | i. Hgb E |
| e. Hgb F | j. Hb A _{1c} |

1. makes up 95%–98% of adult hemoglobin
2. produced during gestation

3. mutations in genes that code for globin proteins
4. estimation of oxygen-carrying capacity
5. sickle shape
6. anemia and microcytosis in some people from Southeast Asia
7. inherited hemoglobin disorders with decreased production of normal Hgbs
8. heterozygous for a hemoglobin gene
9. always pass an affected gene to offspring
10. many hemoglobin meters or analyzers

- | | |
|------------|--------|
| 1. ANS: J | PTS: 1 |
| 2. ANS: E | PTS: 1 |
| 3. ANS: F | PTS: 1 |
| 4. ANS: G | PTS: 1 |
| 5. ANS: A | PTS: 1 |
| 6. ANS: I | PTS: 1 |
| 7. ANS: B | PTS: 1 |
| 8. ANS: H | PTS: 1 |
| 9. ANS: C | PTS: 1 |
| 10. ANS: D | PTS: 1 |