

1. Which lipoprotein will never be found in a normal fasting serum?
a. chylomicrons
b. VLDL
c. LDL
d. IDL...even though it is in very tiny amounts, it is still there
e. HDL
2. Which lipoprotein contains the highest concentration of dietary triglyceride?
a. chylomicrons
b. VLDL this is not dietary, strictly speaking. The liver can also MAKE triglyceride de novo
c. LDL
d. IDL
e. HDL
3. Which lipoprotein contains the highest concentration of endogenous triglyceride?
a. chylomicrons...this is EXOGENOUS, meaning "from the outside"
b. VLDL ..."endogenous" means "from within". Here it means the lipoprotein made "from within", by the liver
c. LDL ...would be true if the question asked for the greatest amount of endogenous cholesterol
d. IDL
e. HDL
4. Which lipoprotein contains the highest concentration of apo-a?
a. chylomicrons...this has apo-B, and not too much of it!
b. VLDL...has apo-B, but a different one than chylomicrons
c. LDL ...also has apo-B
d. IDL...also has apo-B
e. HDL
5. Which lipoprotein will be increased significantly in the serum of patients with Type IV hyperlipoproteinemia?
a. chylomicrons ...will be increased in types 1 and 5
b. VLDL ...will be increased in types 4 and 5
c. LDL ...increased in type 3
d. IDL ...increased in type 2
e. HDL ...no pathology ever when increased. High HDL is a good thing!
6. For which lipoprotein is a "high serum concentration" considered desirable?
a. chylomicrons
b. VLDL
c. LDL
d. IDL
e. HDL ...only one!
7. Which hyperlipoproteinemia is characterized with having the serum appear "creamy over clear" after an overnight refrigeration?
a. chylomicrons
b. VLDL ...will make a sample be cloudy (lipemic)
c. LDL ...has no effect on sample appearance
d. IDL
e. HDL
8. The enzyme always used in the first step of triglyceride assays is a/an
a. oxidase
b. esterase
c. protease
d. lipase
e. peroxidase

A male patient, 63 years old, has the following testing values:

Fasting Total Cholesterol	256 mg/dL
Fasting HDL Cholesterol	37 mg/dL
Fasting Triglyceride	270 mg/dL
Blood Pressure	110/70
Fasting Glucose	83 mg/dL
Abdominal Measurement	43"

1. Calculate the VLDL: $\text{___ TG}/5 = 270/5 = \mathbf{54 \text{ mg/dL}}$ _____

2. Calculate the LDL: $\text{___ TChol} - (\text{HDL} + \text{VLDL}) = 256 - (37 + 54) = \mathbf{165 \text{ mg/dL}}$

3. Which of these lab values places him at risk for developing cardiovascular disease?
Explain your answer.

We know which ones place individuals at risk because they have been published as guidelines from the National Cholesterol Education Program in its "Adult Treatment Panel III" guidelines: total cholesterol, triglycerides and LDL are all higher than the target limits (200 mg/dL, 150 mg/dL and 100 mg/dL, respectively). HDL is less than the target value as well (>40 mg/dL)

4. Does this patient fit the pattern of "metabolic syndrome?" Explain your answer.

This individual has 3 of the 5 criteria for this syndrome: triglyceride, HDL and abdominal measurement

1. Which of the following chemical systems in the blood is considered the MOST important for buffering purposes?

1. **bicarbonate ion/carbonic acid**
2. reduced hemoglobin/oxyhemoglobin
3. amphoteric plasma proteins
4. monohydrogen phosphate/dihydrogen phosphate
5. glutamine/glutamic acid

2. The bicarbonate buffer system normally exists in the plasma in the mean bicarbonate/carbonic acid ratio of

1. 4:1
2. 10:1
3. **20:1...recall that normal pH range is actually ratios of about 17:1 to 22:1**
4. 100:1

3. Most of the CO₂ transported in the blood is in the form of

1. carboxyhemoglobin ...this is CO, not CO₂!
2. **bicarbonate**
3. carbamino hemoglobin **very tiny amounts**
4. dissolved carbon dioxide **very tiny amounts**

4. A condition characterized by carbonic acid deficiency is

1. metabolic acidosis **bicarb deficiency**
2. metabolic alkalosis **bicarb excess**
3. respiratory acidosis **carbonic acid excess**
4. **respiratory alkalosis**

5. An arterial pCO₂ of _____ mmHg and a pH of _____ would be associated with respiratory acidosis.

1. 45.....7.34 **normal!**
2. 40.....7.22 **could be MAC since H₂CO₃ has not moved**
3. **80.....7.16**
4. 20.....7.20 **the pCO₂ looks like RAlk, so the pH must be caused by a MAC**

6. The "chloride shift" implies that

1. for each chloride ion leaving the cell, a potassium goes along to preserve electrostatic neutrality.
2. bicarbonate leaves the cell in the form of H₂CO₃, which forces chloride to leave the cell also.
3. **bicarbonate leaving the cell is replaced by chloride.**
4. bicarbonate and chloride leave the red blood cell when CO₂ is discharged by the lungs.

7. The renal response to an increased pCO₂ is to

1. decrease the secretion of sodium ions **sodium is irrelevant**
2. **increase the secretion of hydrogen ions** ...this tries to remove acid from the body
3. decrease the reabsorption of bicarbonate ...this would make you lose bicarb, and that would **only make the acidosis worse!**
4. increase the secretion of bicarbonate ...this would have the same effect as (c)

MEDT401 Acidbase #2 DUE on the Friday before exam 3

1. Blood which is stored in a blood bank eventually loses its effectiveness in being able to deliver oxygen to a donor even though the number of red cells has not changed. This is partially explained by
 1. continual glucose use by the cells during storage.
 2. gradually decreasing pH during storage. ...this would cause a shift in the O₂ dissociation curve to the right, and that would make it EASIER for the hemoglobin to release its oxygen!
 3. **gradually decreasing levels of DPG during storage.** ...DPG is a one way that helps hemoglobin release oxygen, by fitting into the space between the beta chains. If it is not there, hemoglobin will "latch onto" the oxygen more, even after it has been transfused into the patient.
 4. irreversible dissociation of oxygen from hemoglobin.
2. If blood pH is normal, pCO₂ and HCO₃⁻ will always be normal.
 1. true
 2. **false**
3. During a recent hospital stay, a patient, diagnosed as having asthma (which would make the pCO₂ increase = RAc), experienced an episode of severe diarrhea (which would make the bicarbonate ion be lost = MAc). If corrective therapy has NOT been initiated, which of the following laboratory values are compatible with the patient's resulting acid-base imbalance?
So you're looking for something with high pCO₂ and low bicarb...
 1. pH = 7.44; pCO₂ = 64 mm Hg; HCO₃ = 42 mmol/L
 2. pH = 7.76; pCO₂ = 35 mm Hg; HCO₃ = 47 mmol/L
 3. **pH = 7.20; pCO₂ = 50 mm Hg; HCO₃ = 19 mmol/L**
 4. pH = 7.30; pCO₂ = 55 mm Hg; HCO₃ = 26 mmol/L
4. Carboxyhemoglobin contains carbon dioxide reversibly bound to hemoglobin.
 1. true
 2. **false** ...if I could put this into letters sized 120 font, I would!!! This is carbon MONOXIDE.
5. Patients with metabolic acidosis will experience a right shift of the oxygen dissociation curve.
 1. **true**
 2. false
6. If heparinized whole blood remains capped (key words here) at room temperature for an extended time, pCO₂ may decrease.
 1. true
 2. **false** ...if anything, it will increase since the cellular metabolism continues, producing CO₂ and lactate, both of which make the sample acidic.
7. The most important BUFFER action of hemoglobin is acceptance of protons (H⁺) in the hemoglobin molecule by histidine.
 1. **true**
 2. false
8. Proteins can act as blood buffers because they
 1. bind carbon dioxide covalently in the circulation.
 2. **can bind either excess H⁺ or OH⁻ within the blood.** ...it's the ONLY way any buffer can be a buffer.
 3. deliver excess acid to the kidneys for excretion.
 4. deliver excess CO₂ to the lungs for excretion.