

VIVA FOR PHYSIOLOGY

NAME	Hafiz Muhammad Adil
ID	16421
SUBJECT	Physiology
DEPARTMENT	DPT
INSTRUCTOR	Dr. Sara Naeem

QUESTION NO. 1

Respiratory Disease

EMPHYSEMA

- ▲ Emphysema is a lung condition that causes shortness of breath.
- ▲ In people with emphysema, the air sacs in the lungs (alveoli) are damaged.
- ▲ Over time, the inner walls of the air sacs weaken and rupture — creating larger air spaces instead of many small ones.
- ▲ Along with asthma and chronic bronchitis, emphysema belongs to a group of lung diseases known as chronic obstructive pulmonary disease (COPD).

Causes of emphysema:

- The cause of emphysema is usually long-term exposure to irritants that damage the lungs and the airways.
- Cigarette smoke is the main cause. Pipe, cigar, and other types of tobacco smoke can also cause emphysema, especially when they are inhaled.

- Exposure to other inhaled irritants can contribute to emphysema. These include secondhand smoke, air pollution, and chemical fumes or dusts from the environment or workplace.
- Rarely, a genetic condition called alpha-1 antitrypsin deficiency can play a role in causing emphysema

Symptoms:

- Frequent coughing or wheezing
- A cough that produces a lot mucus
- Shortness of breath, especially with physical activity
- A whistling or squeaky sound when breathe
- Tightness in chest
- Some people with emphysema get frequent respiratory infections such as colds and the flu.
- In severe cases, emphysema can cause weight loss, weakness in lower muscles, and swelling in ankles, feet, or legs.
- Dry cough
- Fever
- Headache
- Chest pain

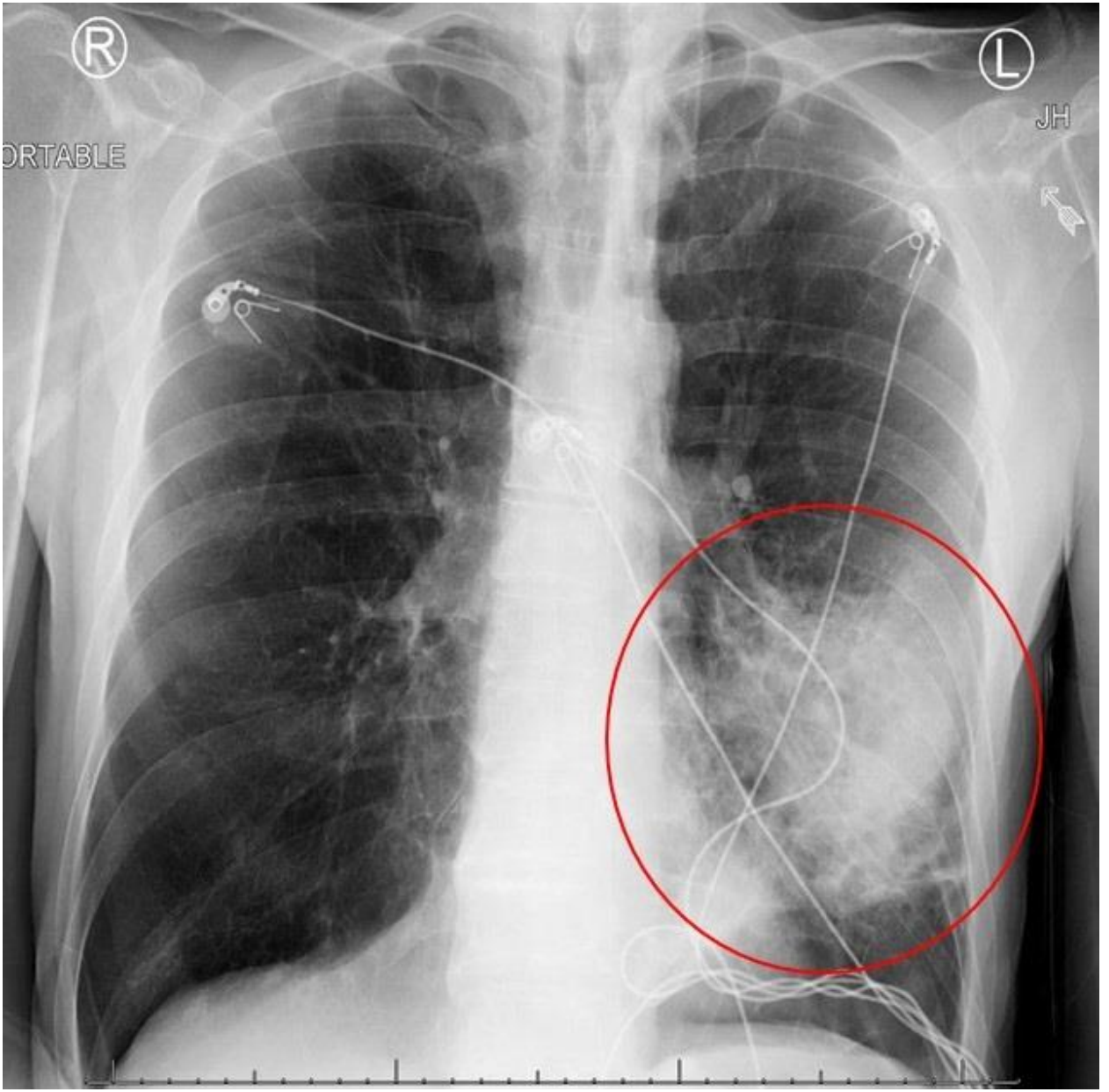
Conditions that put a person at risk:

Having the following conditions can also increase chances of emphysema after pneumonia:

- Bronchiectasis
- Chronic obstructive pulmonary disease (COPD)
- Rheumatoid arthritis
- Alcoholism
- Diabetes
- A weakened immune system
- Lung abscess

Chest X-Ray:

- *Emphysema is commonly seen on CXR as diffuse hyperinflation with flattening of diaphragms, increased retrosternal space, bullae (lucent, air-containing spaces that have no vessels that are not perfused) and enlargement of PA/RV (secondary to chronic hypoxia) an entity also known as cor pulmonale*
- If a person have advanced emphysema, his lungs will appear to be much larger than they should be:
- Doctor can't diagnose emphysema with an X-ray alone.
- A CT scan of your chest will show if the air sacs (alveoli) in your lungs have been destroyed
- In moderate to severe **emphysema**, chest radiographic **findings** include:
 - Bilaterally hyperlucent lungs of large volume,
 - Flattened hemidiaphragms with widened costophrenic angles,
 - Horizontal ribs
 - A narrow mediastinum



Treatment:

- Emphysema can't be cured, but treatments can help relieve symptoms and slow the progression of the disease.
- Depending upon the severity of symptoms, doctor might suggest:
 - **Bronchodilators:**
 - These drugs can help relieve coughing, shortness of breath and breathing problems by relaxing constricted airways.
 - **Inhaled steroids:**
 - Corticosteroid drugs inhaled as aerosol sprays reduce inflammation and may help relieve shortness of breath.
 - **Antibiotics:**
 - If you have a bacterial infection, like acute bronchitis or pneumonia, antibiotics are appropriate.



QUESTION NO. 2

Blood Disease:

- Blood disorders can affect any of the **three** main components of blood:
 - **Red blood cells**, which carry oxygen to the body's tissues
 - **White blood cells**, which fight infections
 - **Platelets**, which help blood to clot
- Blood disorders can also affect the liquid portion of blood, called plasma

ANEMIA

Types:

- Aplastic anemia
- Iron deficiency anemia
- Sickle cell anemia
- Thalassemia
- Vitamin deficiency anemia

Symptoms:

- Anemia signs and symptoms vary depending on the cause.
- If the anemia is caused by a chronic disease, the disease can mask them, so that the anemia might be detected by tests for another condition.

- Depending on the causes of your anemia, you might have no symptoms. Signs and symptoms, if they do occur, might include:

- Fatigue
- Weakness
- Pale or yellowish skin
- Irregular heartbeats
- Shortness of breath
- Dizziness or lightheadedness
- Chest pain
- Cold hands and feet
- Headaches

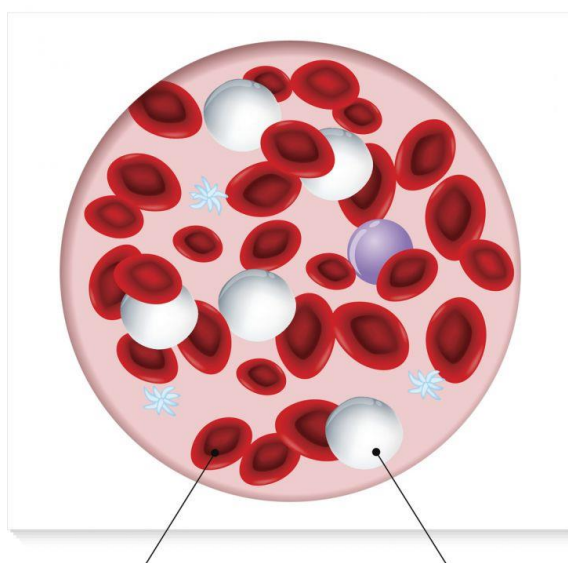
Causes of Anemia:

Different types of anemia have different causes. They include:

- **Iron deficiency anemia:** This most common type of anemia is caused by a shortage of iron in your body. Your bone marrow needs iron to make hemoglobin. Without adequate iron, your body can't produce enough hemoglobin for red blood cells.
- **Without iron supplementation:** this type of anemia occurs in many pregnant women. It is also caused by blood loss, such as from heavy menstrual bleeding, an ulcer, cancer and regular use of some over-the-counter pain relievers, especially aspirin, which can cause inflammation of the stomach lining resulting in blood loss.
- **Vitamin deficiency anemia:** Besides iron, your body needs folate and vitamin B-12 to produce enough healthy red blood cells. A diet lacking in these and other key nutrients can cause decreased red blood cell production.
- Also, some people who consume enough B-12 aren't able to absorb the vitamin. This can lead to vitamin deficiency anemia, also known as pernicious anemia.

- **Anemia of inflammation:** Certain diseases — such as cancer, HIV/AIDS, rheumatoid arthritis, kidney disease, Crohn's disease and other acute or chronic inflammatory diseases — can interfere with the production of red blood cells.
- **Aplastic anemia:** This rare, life-threatening anemia occurs when your body doesn't produce enough red blood cells. Causes of aplastic anemia include infections, certain medicines, autoimmune diseases and exposure to toxic chemicals.
- **Anemias associated with bone marrow disease:** A variety of diseases, such as leukemia and myelofibrosis, can cause anemia by affecting blood production in your bone marrow. The effects of these types of cancer and cancer-like disorders vary from mild to life-threatening.
- **Hemolytic anemia:** This group of anemias develops when red blood cells are destroyed faster than bone marrow can replace them. Certain blood diseases increase red blood cell destruction. You can inherit a hemolytic anemia, or you can develop it later in life.
- **Sickle cell anemia:** This inherited and sometimes serious condition is a hemolytic anemia. It's caused by a defective form of hemoglobin that forces red blood cells to assume an abnormal crescent (sickle) shape. These irregular blood cells die prematurely, resulting in a chronic shortage of red blood cells.

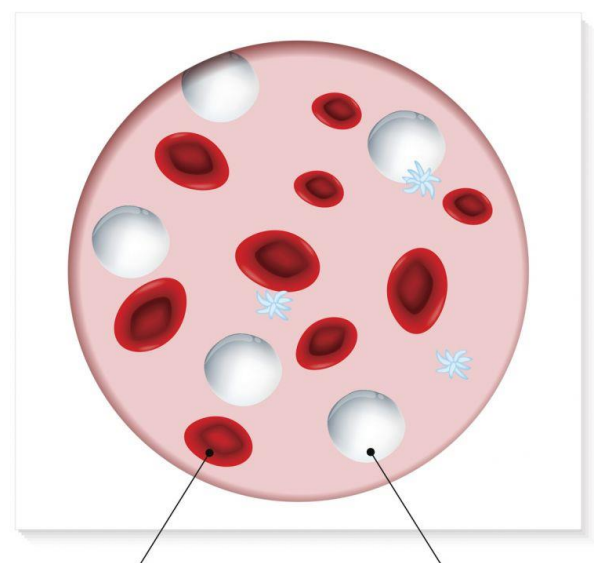
Normal



Red blood cell

White blood cell

Anemia



Red blood cell

White blood cell

Blood Test of Anemia:

Complete Blood Count

- Often, the first test used to diagnose anemia is a complete blood count (CBC). The CBC measures many parts of your blood.
- The test checks your hemoglobin and hematocrit (hee-MAT-oh-crit) levels. Hemoglobin is the iron-rich protein in red blood cells that carries oxygen to the body. Hematocrit is a measure of how much space red blood cells take up in your blood. A low level of hemoglobin or hematocrit is a sign of anemia.
- The normal range of these levels might be lower in certain racial and ethnic populations. Your doctor can explain your test results to you.
- The CBC also checks the number of red blood cells, white blood cells, and platelets in your blood.

- Abnormal results might be a sign of anemia, another blood disorder, an infection, or another condition.
- Finally, the CBC looks at mean corpuscular (kor-PUS-kyu-lar) volume (MCV).
- MCV is a measure of the average size of your red blood cells and a clue as to the cause of your anemia. In iron-deficiency anemia, for example, red blood cells usually are smaller than normal.

Other Tests and Procedures

If the CBC results show that you have anemia, you may need other tests, such as:

Hemoglobin electrophoresis: This test looks at the different types of hemoglobin in your blood. The test can help diagnose the type of anemia you have.

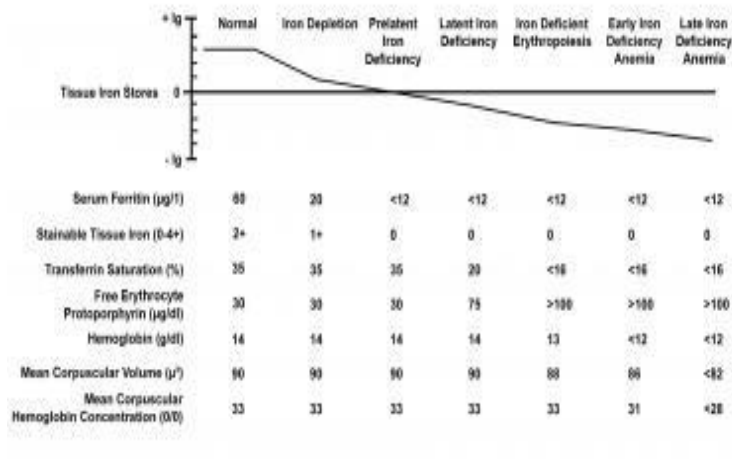
A reticulocyte count: This test measures the number of young red blood cells in your blood. The test shows whether your bone marrow is making red blood cells at the correct rate.

Tests for the level of iron in blood and body. These tests include serum iron and serum ferritin tests. Transferrin level and total iron-binding capacity tests also measure iron levels.

Because anemia has many causes, you also might be tested for conditions such as **kidney failure, lead poisoning (in children), and vitamin deficiencies (lack of vitamins, such as B12 and folic acid).**

If the doctor thinks that you have anemia due to internal bleeding, he or she may suggest several tests to look for the source of the bleeding. A test to check the stool for blood might be done in your doctor's office or at home. Your doctor can give you a kit to help you get a sample at home. He or she will tell you to bring the sample back to the office or send it to a laboratory.

If blood is found in the stool, you may have other tests to find the source of the bleeding. One such test is **endoscopy** for this test, a tube with a tiny camera is used to view the lining of the digestive tract.



Lab tests of iron deficiency of increased severity

	NORMAL	Fe deficiency Without anemia (prelatent)	Fe deficiency With mild anemia (latent)	Fe deficiency With severe anemia (IDA)
Serum Iron	60-150	60-150	<60	<40
Iron Binding Capacity	300-360	300-390	350-400	>410
Saturation	25-55	30	<15	<10
Hemoglobin	Normal	Normal	9-12	6-7
Serum Ferritin	40-200	<20	<10	0-10

Treatment of Anemia:

- Iron-deficiency anemia is treated with:
 - Iron supplements taken by mouth.
 - Foods high in iron and foods that help your body absorb iron (like foods with Vitamin C).
 - Iron given through an intravenous (IV) infusion. (This is often a choice if you have chronic kidney disease, or CKD.)
 - Transfusions of red blood cells.
 - If your anemia is caused by internal bleeding, your provider may need to do surgery to stop it. Surgical repair has been used to cure anemia in people with the paraesophageal type of hiatal hernias, with or without ulcers (called Cameron's ulcers).
 - Other types of anemia may require other types of treatment. For instance, genetic disorders (like beta thalassemia and sickle cell anemia) may require bone marrow transplant.
 - If CKD is causing your anemia, in addition to iron supplementation (through oral or IV means), treatment could also include injections of erythropoietin (EPO). EPO is a hormone that tells the bone marrow to make red blood cells.
-
- Anemia is also linked to cancer in some cases — both in terms of anemia being a symptom and in terms of cancer treatment. Both radiation and chemotherapy can cause anemia. It might be necessary to stall further cancer treatment until the anemia is improved by iron, blood transfusions, getting necessary B vitamins and/or getting shots of drugs to stimulate your body to produce EPO.