

Continuous Medical Education

➡ Part 1 | What do you know about Ebola Virus Disease (EVD)

Choose the most appropriate answer

1. **Ebola virus formerly called:**
 - a. Congo virus
 - b. Zaire virus
 - c. Ziombe virus
 - d. Marbung virus
2. **Ebola virus is a:**
 - a. DsRNA
 - b. ssRNA
 - c. DsDNA
 - d. ssDNA
3. **Regarding Ebola virus reservoir are:**
 - a. Flies
 - b. Birds
 - c. Bats and dogs
 - d. Fishes
4. **Ebola is introduced into the human population through close contact with:**
 - a. Blood of infected person
 - b. Secretions of infected person
 - c. Organs or other bodily fluids of infected person
 - d. All of the above
5. **Ebola specific treatment and vaccine:**
 - a. There are specific treatment and vaccine
 - b. There is specific treatment but no vaccine
 - c. There is no specific treatment but there is vaccine
 - d. There is neither specific treatment nor specific vaccine
6. **Death in patients with EVD occurs due to (all true expect):**
 - a. Blood loss.
 - b. Low blood pressure
 - c. Focal tissue necrosis
 - d. Disseminated intravascular coagulation
7. **Regarding transmission of Ebola in recovered men: the disease can still transmit the virus through:**
 - a. blood for up to 7 weeks
 - b. semen for up to 7 weeks
 - c. saliva for up to 7 weeks
 - d. urine for up to 7 weeks
8. **The incubation period of infection is:**
 - A. 2 to 21 months
 - b. 2 to 21 weeks
 - c. 2 to 21 days
 - d. None of the above
9. **Person is becoming infectious:**
 - a. Soon after getting infection
 - b. During convalescent stage
 - c. Until he develops symptoms
 - d. Two weeks after infection
10. **Laboratory findings include:**
 - a. Low white blood cell and platelet counts and elevated liver enzymes.
 - b. High white blood cell and platelet counts and decreased liver enzymes.
 - c. Low white blood cell and high platelet counts and elevated liver enzymes.
 - d. None of the above
11. **Confirmation of Ebola virus infection is made using the following investigations:**
 - a. (ELISA) and (RT-PCR)
 - b. Antigen-capture detection tests and serum neutralization test
 - c. Electron microscopy and virus isolation by cell culture
 - d. All of the above
12. **The average EVD case fatality rate is around:**
 - a. 25%
 - b. 50%
 - c. 75%
 - d. 100%
13. **Ebola is a hemorrhagic fever that**
 - a. Sometimes affects the central nervous system.
 - b. Always affects the central nervous system.
 - c. Never affects the central nervous system
 - b. None of the above
14. **Outbreak in west Africa has involved:**
 - a. Rural area only
 - b. Urban area only
 - c. Major urban as well as rural areas
 - b. None of the above
15. **Key for successful outbreak controlling:**
 - a. Case management, surveillance
 - b. Contact tracing, a good laboratory service
 - c. Safe burials and social mobilization.
 - d. All of the above

➡ Part 2 | Answer these questions:

Questions from the Case Presentation P 41

Q1: What are the differential diagnosis of multiple pulmonary nodules?

Q2: What are the causes of positive c-ANCA?

Q3: Mention three important side effects of cyclophosphamide?

➡ Part 3 | Imaging in Clinical Medicine:

Look at the Chest X ray on the next column its for an 11 year-old girl, who presented for assessment as a contact to open tuberculosis case:



- What is the radiological lesion seen?
- What are the differential Diagnosis?
- What is the diagnosis?

➡ Part 4 | Statistical Terms in Clinical Practice:

Population versus sample: The accurate results of a study can be obtained by studying the whole population. But most of the time this is impossible mission. So we do the study on a sample of that population.

Statistical inference: is the process of drawing conclusions regarding a population based on studying part of it.

In order to generalize the results obtained from a sample on its population the sample should be:

1. Homogenous
2. Representative to the larger group
3. Chosen randomly to decrease sampling error.

For each sample we need to measure the central tendency and the dispersion

Measure of Central tendency: to provide information regarding the data composing the bulk of a distribution. This can be made through calculating Mean, Median, and Mode.

Mean: The arithmetic average of all items in the sample. Add all the sample values then divide the result by the size of the sample.

Median: The statistical median is the middle number in a sequence of numbers. Arrange the numbers from low to high value, the median is the size of sample+1/2 if the size is odd. For even number we have 2 values, the median would be = average of them.

Mode: The mode is the value with the highest frequency

in the sample. The sample may be unimodal when it has only one mode or bimodal when it has two. The sample may has no model.

Measure of dispersion: is the description of the distribution or spread of data. This can be made through calculating the Range, the Interquartile Range, the Variance, and the Standard Deviation.

Range: The range is the difference between the highest and lowest values within the sample. It measures the width of the distribution of the whole sample.

The Interquartile Range: Quartiles divide a distribution into quarters. The interquartile range is the difference between the first and third quartiles, so it is the range of the middle 50% of the data.

The Variance: The variance is a measure of the dispersion of the data set from the mean value. It is the square of the standard deviation

$$\text{Variance} = (\text{SD})^2$$

The Standard Deviation: It is the commonest used measure of the spread of data about their mean. It is calculated according to the following formula:

$$SD = \sqrt{\frac{\sum (x-m)^2}{n-1}}$$

SD: Standard Deviation
X : Individual value
Σ : Summation
m : Mean of the sample
n : size of the sample

The largest the SD of a sample is the more the spread of the data about the mean.

➔ Answers of Part 1 | What do you know about Ebola

1. **The answer is (b):**

EBOLA virus gets its name from Ebola River, which flows near one of the villages in the Democratic Republic of Congo, the place where the disease first appeared in 1976.

2. **The answer is (b):**

Ebola virus is ssRNA virus from the family Filoviridae, genus Ebolavirus.

3. **The answer is (c):**

Bats and dogs are reservoirs of Ebola virus and transmit the virus, but remain asymptomatic themselves.

4. **The Answer is (d):**

1. The Ebola virus is transmitted among humans through close and direct physical contact with infected bodily fluids, the most infectious being blood, faeces and vomit.
2. The Ebola virus can also be transmitted indirectly, by contact with previously contaminated surfaces and objects. The risk of transmission from these surfaces is low.
3. Ebola virus disease is not an airborne infection.

5. **The answer is (d):**

Early supportive care with rehydration, symptomatic treatment improves survival. There is as yet no licensed treatment proven to neutralise the virus but a range of blood, immunological and drug therapies are under development.

6. **The answer is (a):**

Death in the infected person does not occur due to blood loss. Multiple organ dysfunction syndrome due to low blood pressure, focal tissue necrosis and disseminated intravascular coagulation are the possible causes of death.

7. **The answer is (b):**

Men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness.

8. **The answer is (c):**

The incubation period, that is, the time interval from infection with the virus to onset of symptoms is 2 to 21 days.

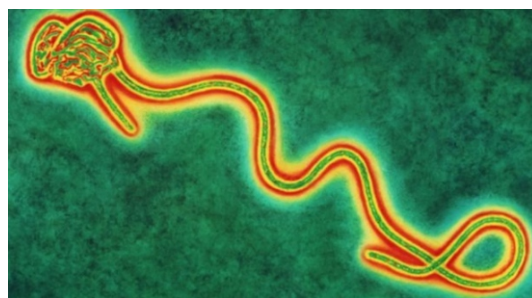
9. **The answer is (c):**

Scientists believe that the first patient becomes infected through contact with an infected animal (zoonotic), human-to-human transmission of Ebola has also been demonstrated. Humans are not infectious until they develop symptoms. First symptoms are the sudden onset of fever fatigue, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, symptoms of impaired kidney and liver function, and in some cases, both internal and external bleeding (e.g. oozing from the gums, blood in the stools).

10. **The answer is (a):**

11. **The answer is (d):**

Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes. It can be difficult to distinguish EVD from other infectious diseases such as malaria, typhoid fever and meningitis. Confirmation that symptoms are



caused by Ebola virus infection are made using all Of the above methods.

12. **The answer is (b):**

The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.

13. **The answer is (a):**

The disease sometimes affects the central nervous system that presents as symptoms like headache, confusion, agitation, seizures and sometimes coma.

14. **The answer is (c):**

Outbreak in west Africa has involved major urban as well as rural areas.

15. **The answer is (d):**

Community engagement is key to successfully controlling outbreaks. Good outbreak control relies on applying a package of interventions, namely case management, surveillance and contact tracing, a good laboratory service, safe burials and social mobilization.

Sites for more reading:

Centres for Disease Control and Prevention

<http://www.cdc.gov/vhf/ebola/>

World Health Organization (WHO):

<http://www.who.int/mediacentre/factsheets/fs103/en/>

Answers of Part 2 | Case Presentation

The answer of question 1

Differential diagnosis of bilateral multiple variable-sized lung nodules:

1. Metastatic solid organ malignancy is the most likely diagnosis. Breast, thyroid, kidney, GIT, and Testis.
2. Infections: septic emboli, fungal infection, coccidioidomycosis, and histoplasmosis.
3. Non-inflammatory conditions such as sarcoidosis, lymphomatoid granulomatosis, amyloidosis, arteriovenous malformations (Rendu-Osler-Weber syndrome also called hereditary hemorrhagic telangiectasia, is a disorder of vascular development that is inherited as an autosomal dominant trait, and pneumoconiosis.
4. Inflammatory conditions such as rheumatoid arthritis or Wegner's granulomatosis.
5. Benign metastasizing leiomyoma is an infrequent cause of asymptomatic pulmonary nodules which is generally seen in pre-menopausal females following myomectomy or hysterectomy for uterine fibroids.

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1. Prager RL, Laws KH, Bender HW Jr. Arteriovenous fistula of the lung. *Ann Thorac Surg* 1983;36(2):231-239.
2. Pitts S, Oberstein EM, Glassberg MK. Benign metastasizing leiomyoma and lymphangioleiomyomatosis: sex-specific diseases? *Clin Chest Med* 2004;25: 343 - 360.

The answer of question 2

Differential Diagnosis of Positive c-ANCA

1. Wegner's Granulomatosis (usually).
2. Microscopic Polyangiitis (Sometimes).
3. Idiopathic Glomerulonephritis (sometimes).
4. Churg-Strauss Syndrome (sometimes).
5. Ulcerative Colitis (sometimes).
6. Other reported causes: Tuberculosis, Hodgkin's lymphoma, HIV infection, Monoclonal gammopathies, and drug-induced Wegner-like disease.

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1. Walport MJ et al .Connective tissue diseases: advances in diagnosis and management. *BJHM* 1993;50:121-31.
2. Rao JK et al. The role of antineutrophil cytoplasmic antibody (c-ANCA) testing in the diagnosis of Wegener's granulomatosis. *Ann Intern Med* 1995;123:925-932.

The answer of question 3

Side effect of cyclophosphamide

1. Chemotherapy induced nausea and vomiting
2. Bone Marrow suppression
3. Hemorrhagic cystitis
4. Myeloproliferative disorders
5. Infertility

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2. Lohrmann HP. The problem of permanent bone marrow damage after cytotoxic drug treatment. *Oncology* 1984;41(3):180-4
3. Talar-Williams C, Hijazi YM, Walther MM, et al. Cyclophosphamide-induced cystitis and bladder cancer in patients with Wegener granulomatosis. *Annals of Internal Medicine* 1996;124 (5): 477-84.
4. Radis CD, Kahl LE, Baker GL, et al. Effects of cyclophosphamide on the development of malignancy and on long-term survival of patients with rheumatoid arthritis. A 20-year followup study. *Arthritis and Rheumatism* 1995;38 (8):1120-7.

Answers of Part 3 | Imaging in Clinical Medicine:

a. Lt hilar mass

b.

- Infection
 1. Primary TB infection in children.
 2. Histoplasmosis.
- Pulmonary artery enlargement.
 1. Valvular pulmonic stenosis.
 2. Pulmonary artery aneurysm.
- Cyst –bronchogenic cyst.
- Malignancy
 1. Lymph node metastasis.
 2. Bronchogenic Carcinoma.
- Others: Sarcoidosis

c. Hair Braid ? Don't miss unexpected bodies
Look at the chest XR below after removal of the braid



Chest X ray after removal of the braid.

This Case is presented from:

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