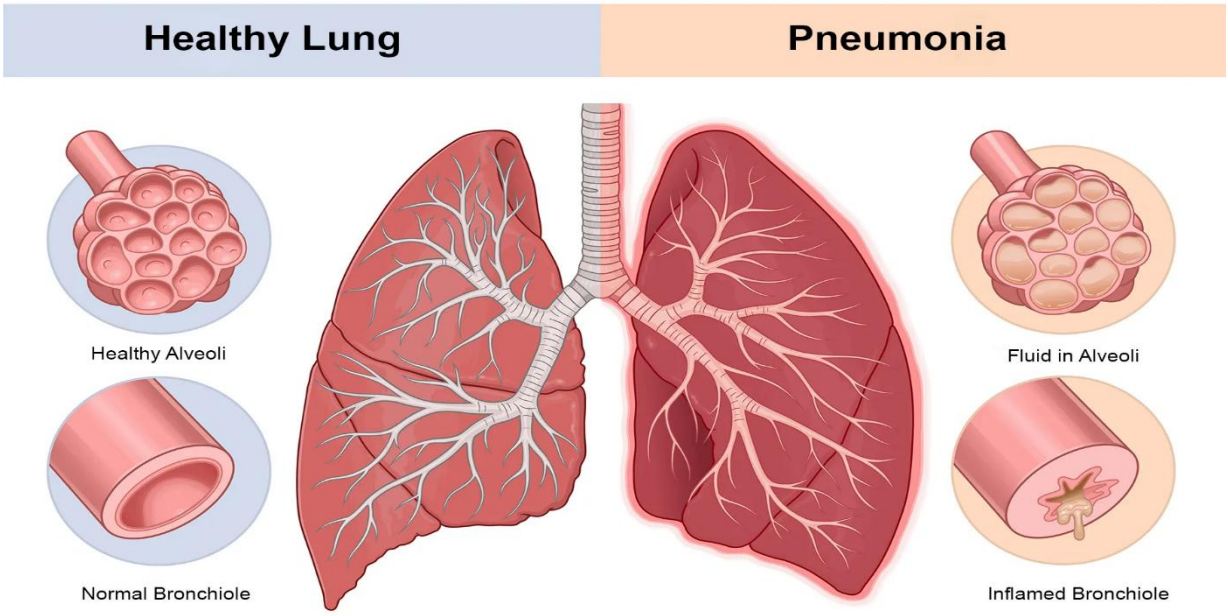
Respiratory I: Pneumonia, TB

What is Pneumonia?

Pneumonia is an infection of the lungs where the air sacs (alveoli) become inflamed and may fill with fluid or pus. This leads to breathing difficulty and reduced oxygen supply to the body.

It can be a serious illness particularly in young children, the elderly above 65 years old and those with conditions that weaken their immune system.



It can spread through:

- Coughing and sneezing
- Touching contaminated surfaces and then touching your face
- Inhaling microorganisms in the air

It usually affects people who have:

- Low immunity
- Chronic respiratory conditions
- Smoking habits

Symptoms of Pneumonia

- High fever and chills
- Persistent cough (often with yellow or green mucus)
- Shortness of breath

- Chest pain during breathing or coughing
- Fatigue and weakness

If the illness is severe, breathing can become difficult, requiring urgent medical care.

Diagnosis

- Chest X-ray to see infection in the lungs
- Blood tests to detect infection
- Sputum tests to identify the organism
- Pulse oximetry to check oxygen levels

Treatment

- Antibiotics for bacterial pneumonia
- Antiviral medication for viral infections
- Cough and fever relief medications
- Fluid intake and rest

Severe cases may require:

- Hospital care
- Oxygen support

Complications of Pneumonia

- Respiratory failure
- Fluid accumulation around lungs
- Sepsis (serious infection in the blood)

Prevention

- Get vaccinated (especially for children, seniors, and high-risk individuals)
- Wash hands regularly
- Avoid smoking
- Strengthen immunity with balanced nutrition

What is Tuberculosis (TB)?

Tuberculosis is a chronic bacterial infection caused by *Mycobacterium tuberculosis*. It primarily affects the lungs but can spread to the bones, kidneys, brain, or lymph nodes if not treated.

Cause and Transmission

TB spreads through the air when a person with active TB coughs, sneezes, or speaks.
Unlike pneumonia, TB symptoms develop slowly and last for weeks or months.

TB does not spread by:

- Sharing food or utensils
- Touching clothes or shaking hands

Symptoms of Tuberculosis

- Persistent cough for *more than 2–3 weeks*
- Evening or night fever
- Weight loss and loss of appetite
- Night sweats
- Chest pain
- Coughing blood (in advanced cases)

Diagnosis

Tests commonly done include:

- Chest X-ray
- Sputum smear or culture
- CBNAAT / GeneXpert test to confirm TB
- TB Skin Test (Mantoux)

Treatment

TB treatment requires:

- Multiple medications taken together
- Duration of 6 months or longer

Stopping treatment early can cause:

- TB relapse
- Drug-resistant TB (much harder to treat)

Regular follow-up is essential during treatment.

Complications of Tuberculosis

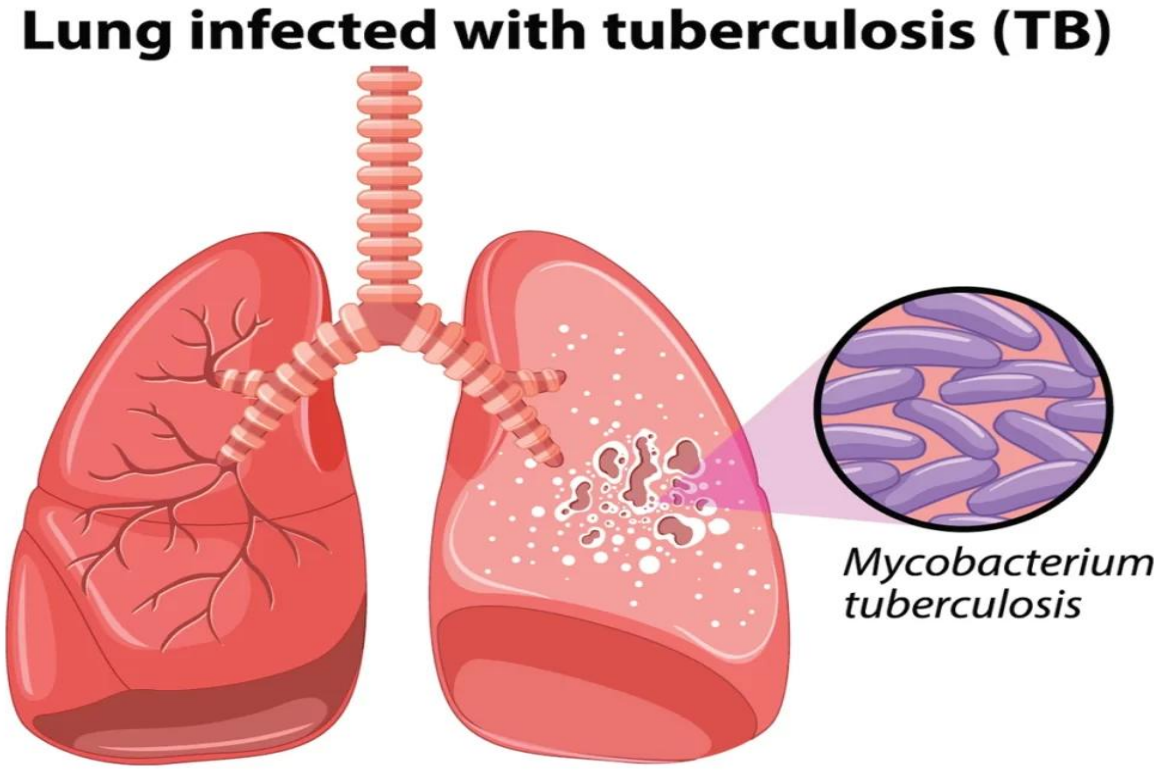
If left untreated, TB may:

- Damage lung tissue
- Spread to other organs
- Cause long-term breathing issues

- Become life-threatening

Prevention

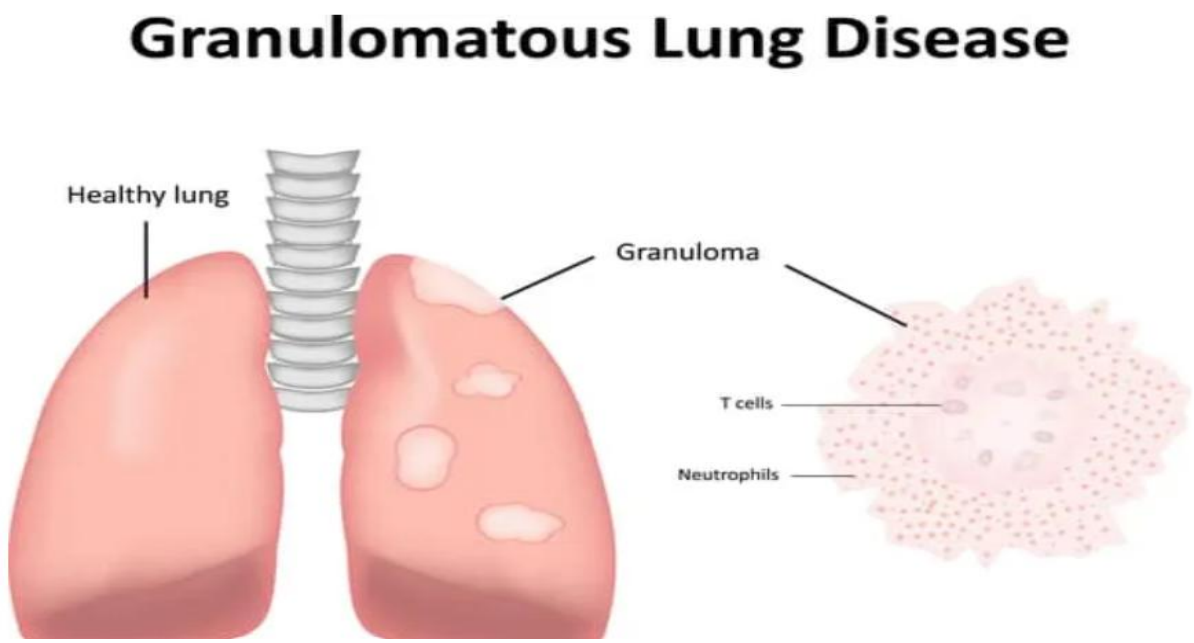
- BCG vaccine in childhood
- Proper ventilation in indoor spaces
- Wearing a mask when coughing
- Early diagnosis and complete treatment



Key Differences: Pneumonia vs Tuberculosis

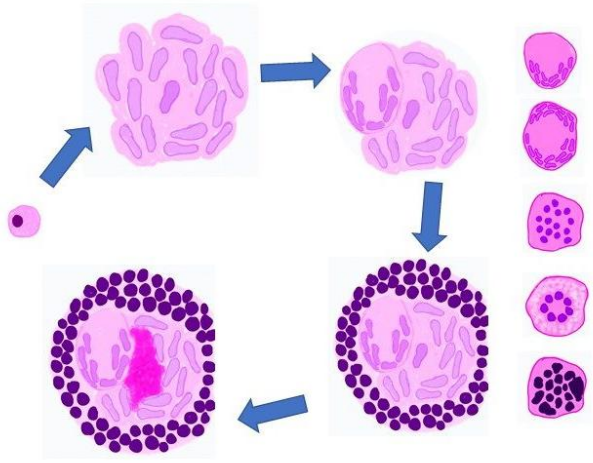
Feature	**Pneumonia**	**Tuberculosis**
Speed of Onset	Sudden, rapid	Slow, gradual
Main Cause	Bacteria/virus/fungus	*Mycobacterium tuberculosis*
Contagiousness	Moderate	Highly contagious (airborne)
Treatment Duration	1–2 weeks	6+ months
Common Symptom Pattern	High fever, wet cough	Persistent cough, weight loss, night sweats

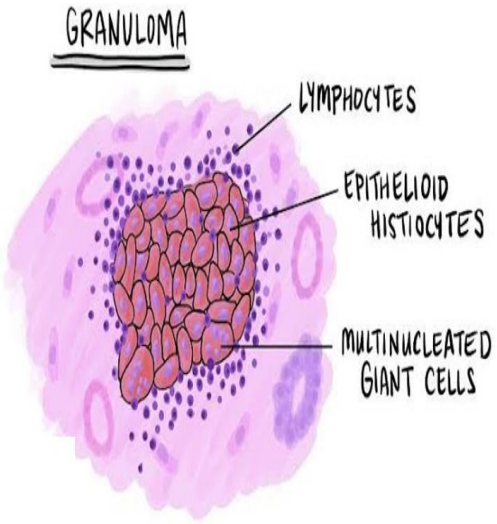
Granulomas in pneumonia are small, organized clusters of immune cells (macrophages, lymphocytes) that form in the lungs during chronic inflammation to wall off persistent infections or irritants. Common causes include bacterial/fungal infections (TB, histoplasmosis), sarcoidosis, or inhalation of substances. They often appear as nodules on imaging.



Symptoms that may happen with infections include:

- Fever.
- Chest pain when inhaling or exhaling.
- Swollen and sore lymph glands.
- An ongoing runny nose.
- Skin irritation that may include a rash, swelling or redness.
- Swelling and redness in the mouth.
- Trouble swallowing.
- Gastrointestinal problems that may include:
    - Vomiting.
    - Diarrhea.
    - Stomach pain.
    - Bloody stool.
    - A painful pocket of pus near the anus, called an abscess.





1. Pneumonia is primarily an infection of the:
a) Heart
b) Kidneys
c) Liver
d) **Lungs**
e) Brain

2. In pneumonia, the alveoli become filled with:
a) Air only
b) Blood only
c) **Fluid or pus**
d) Fat
e) Mucus only

3. Pneumonia most seriously affects:
a) Teenagers only
b) Athletes
c) **Young children and elderly**
d) Office workers
e) Healthy adults only

4. Pneumonia can spread through:
a) Drinking water
b) Skin contact only
c) **Coughing and sneezing**
d) Insect bites
e) Sunlight exposure

5. A major risk factor for pneumonia is:
a) Exercise

b) Balanced diet
c) **Low immunity**
d) Adequate sleep
e) Hydration

6. A common symptom of pneumonia is:
a) Hair loss
b) **Persistent cough with mucus**
c) Ear ringing
d) Blindness
e) Nose bleeding

7. Chest pain in pneumonia usually occurs:
a) During sleep
b) After meals
c) While walking
d) **During breathing or coughing**
e) While speaking

8. Severe pneumonia may require:
a) Vitamin tablets
b) Exercise therapy
c) Herbal tea
d) **Oxygen support**
e) Massage

9. A diagnostic test used to visualize pneumonia is:
a) ECG
b) MRI brain
c) **Chest X-ray**
d) EEG
e) Colonoscopy

10. Bacterial pneumonia is treated mainly with:
a) Antifungals
b) **Antibiotics**
c) Antihistamines
d) Sedatives
e) Vaccines

11. A serious complication of pneumonia is:
a) Hair growth
b) Vision improvement
c) **Respiratory failure**
d) Nail thickening
e) Hearing gain

12. Sepsis in pneumonia refers to:
a) Skin rash
b) Bone fracture

c) **Blood infection**
d) Muscle spasm
e) Nerve damage

13. One preventive method for pneumonia is:
a) Smoking
b) Skipping meals
c) **Vaccination**
d) Staying indoors always
e) Avoiding sleep

14. Tuberculosis is caused by:
a) Virus
b) Fungus
c) Parasite
d) **Mycobacterium tuberculosis**
e) Protozoa

15. TB primarily affects the:
a) Skin
b) Eyes
c) **Lungs**
d) Nails
e) Hair

16. TB spreads mainly through:
a) Water
b) Food
c) Soil
d) Blood transfusion
e) **Airborne droplets**

17. TB symptoms usually develop:
a) Within minutes
b) Immediately
c) In hours
d) **Slowly over weeks or months**
e) Overnight

18. TB is NOT spread by:
a) Coughing
b) Sneezing
c) Speaking
d) **Sharing utensils**
e) Air droplets

19. A classic symptom of TB is:
a) Sudden blindness
b) **Persistent cough >2–3 weeks**
c) Toothache

d) Joint fracture
e) Hearing loss

20. Night sweats are commonly associated with:
a) Asthma
b) Pneumothorax
c) **Tuberculosis**
d) Migraine
e) Arthritis

21. Weight loss in TB occurs due to:
a) Overeating
b) Exercise
c) Increased sleep
d) **Loss of appetite and chronic infection**
e) Cold weather

22. Advanced TB may cause:
a) Hair fall
b) **Coughing blood**
c) Sneezing only
d) Ear discharge
e) Tooth decay

23. A confirmatory molecular test for TB is:
a) ELISA
b) CT scan
c) ECG
d) **GeneXpert / CBNAAT**
e) Ultrasound

24. TB skin test is also called:
a) Coombs test
b) Widal test
c) RPR test
d) **Mantoux test**
e) Patch test

25. TB treatment requires:
a) Single drug for 3 days
b) Vitamins only
c) Surgery only
d) **Multiple drugs for ≥6 months**
e) No treatment

26. Stopping TB drugs early may cause:
a) Faster cure
b) Immunity boost
c) **Drug-resistant TB**

d) Hair growth
e) Weight gain

27. Untreated TB can spread to:
a) Teeth only
b) Skin only
c) Nails only
d) Hair only
e) **Other organs**

28. The childhood vaccine that helps prevent TB is:
a) MMR
b) Polio
c) Hepatitis B
d) Influenza
e) **BCG**

29. Compared with TB, pneumonia onset is usually:
a) Slower
b) Chronic
c) **Sudden**
d) Delayed
e) Gradual

30. Compared with pneumonia, TB treatment duration is:
a) Shorter
b) Equal
c) 1 day
d) **Much longer**
e) Not needed

31. Pneumonia contagiousness is generally:
a) Extremely high
b) None
c) **Moderate**
d) Permanent
e) Unknown

32. TB is considered:
a) Noninfectious
b) Mildly contagious
c) Rarely spread
d) **Highly contagious airborne disease**
e) Genetic disease

33. Granulomas are:
a) Blood clots
b) Fat deposits
c) Tumors

d) **Clusters of immune cells**
e) Dead tissue

34. Granulomas form mainly to:
a) Destroy bones
b) Increase oxygen
c) **Wall off persistent infections**
d) Stop heartbeats
e) Produce hormones

35. A disease commonly associated with granuloma formation is:
a) Influenza
b) Measles
c) Chickenpox
d) **Tuberculosis**
e) Tetanus

36. Fever during infection is caused by:
a) Dehydration only
b) Lack of sleep
c) **Immune response**
d) Exercise
e) Sunlight

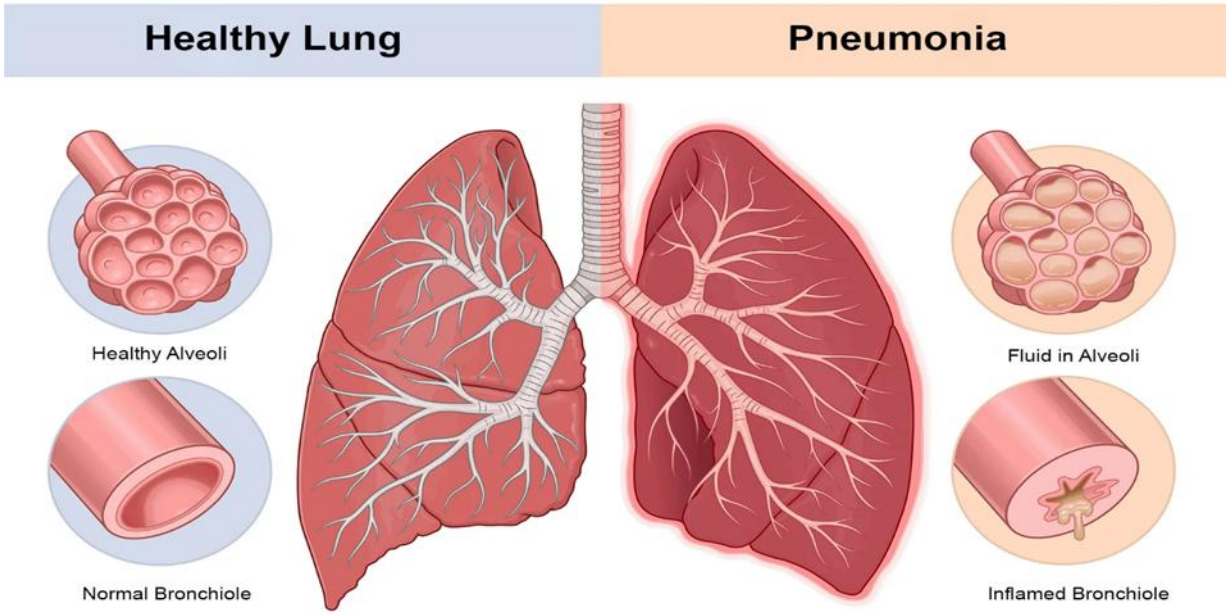
37. Swollen lymph glands during infection indicate:
a) Dehydration
b) Muscle injury
c) **Immune activation**
d) Bone fracture
e) Skin dryness

38. Gastrointestinal infection symptoms may include:
a) Blurred vision
b) Nosebleed
c) Hair loss
d) **Diarrhea**
e) Hearing loss

39. A painful pocket of pus near the anus is called:
a) Tumor
b) Ulcer
c) Cyst
d) Wart
e) **Abscess**

40. The best general prevention for respiratory infections is:
a) Avoiding food
b) Sleeping less
c) Smoking

d) **Regular hand washing**
e) Skipping vaccines



1. The main structural difference shown between healthy lungs and pneumonia lungs is:
a) Larger bronchi
b) Reduced blood flow
c) **Fluid-filled alveoli**
d) Absence of bronchioles
e) Increased oxygen level

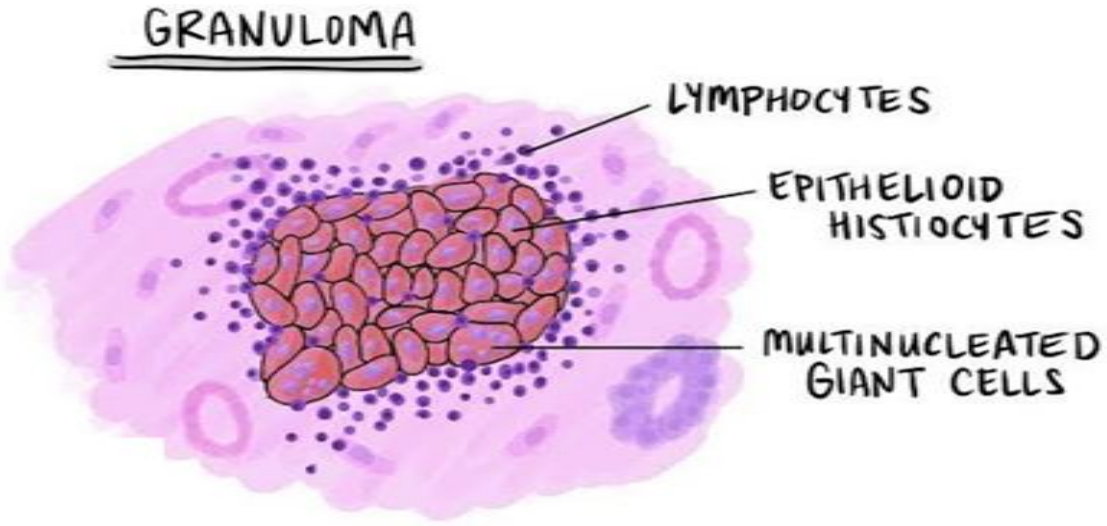
2. In the healthy lung diagram, the alveoli appear:
a) Collapsed
b) Filled with pus
c) Inflamed
d) **Clear and open**
e) Scarred

3. The bronchiole in pneumonia is illustrated as:
a) Wider than normal
b) Completely absent
c) Smooth and clear
d) Hardened bone-like tube
e) **Inflamed and narrowed**

4. The presence of fluid in alveoli mainly leads to:
a) Faster digestion
b) Increased vision
c) Stronger heartbeat

d) **Difficulty breathing**
e) Faster hair growth

5. Which structure is primarily responsible for gas exchange and is affected in pneumonia?
a) Trachea
b) Bronchus
c) Diaphragm
d) **Alveoli**
e) Rib cage



1. A granuloma is best described as:
a) A viral colony
b) Dead tissue mass
c) Blood clot
d) **Organized cluster of immune cells**
e) Fat deposit

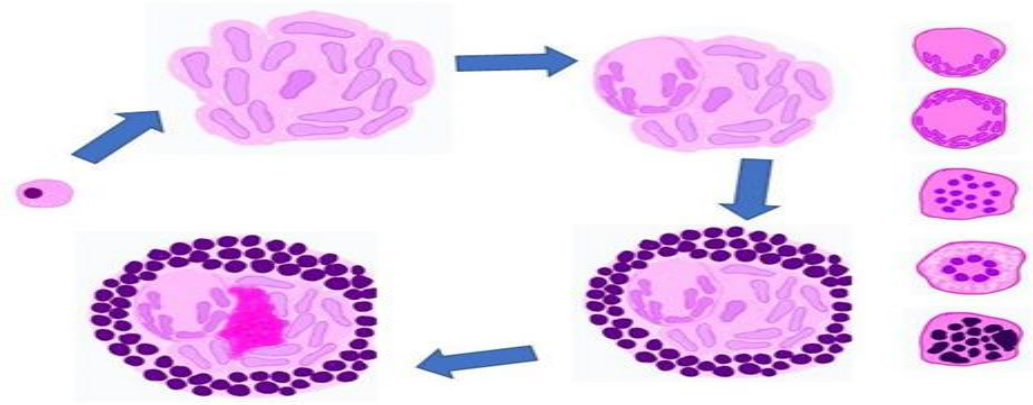
2. The central cells in a granuloma are mainly:
a) Neutrophils
b) Eosinophils
c) Platelets
d) Red blood cells
e) **Epithelioid histiocytes**

3. Multinucleated giant cells are formed by:
a) Bacterial division
b) Lymphocyte splitting
c) Plasma cell activation
d) **Fusion of macrophages**
e) Platelet aggregation

4. Lymphocytes in a granuloma are typically located:
a) Only in the center

b) Inside blood vessels
c) Attached to bacteria
d) **Around the periphery**
e) Outside the tissue

5. Granuloma formation usually occurs in response to:
a) Mild dehydration
b) Short-term irritation
c) **Chronic inflammation or persistent infection**
d) Muscle exercise
e) Normal aging



MCQs Based on the Image (Granuloma Formation Stages)

1. The image primarily illustrates which biological process?
a) Blood clotting
b) Cell mitosis
c) Tissue regeneration
d) **Granuloma formation**
e) Apoptosis

2. The first step shown in the sequence is:
a) Necrosis
b) Giant cell formation
c) Fibrosis
d) Lymphocyte ring formation
e) **Initial immune cell aggregation**

3. The dark outer ring of cells in later stages represents:
a) Red blood cells
b) Platelets

c) Bacteria
d) **Lymphocytes**
e) Neurons

4. The central area in mature granuloma mainly contains:
a) Adipose tissue
b) Fibrous cartilage
c) Smooth muscle
d) **Macrophage-derived cells**
e) Bone cells

5. The main purpose of granuloma formation is to:
a) Increase oxygen levels
b) Destroy all tissues
c) Produce hormones
d) Speed digestion
e) **Wall off persistent pathogens or irritants**