# CHRONIC INFLAMMATION

SGD 3RD YEAR MBBS

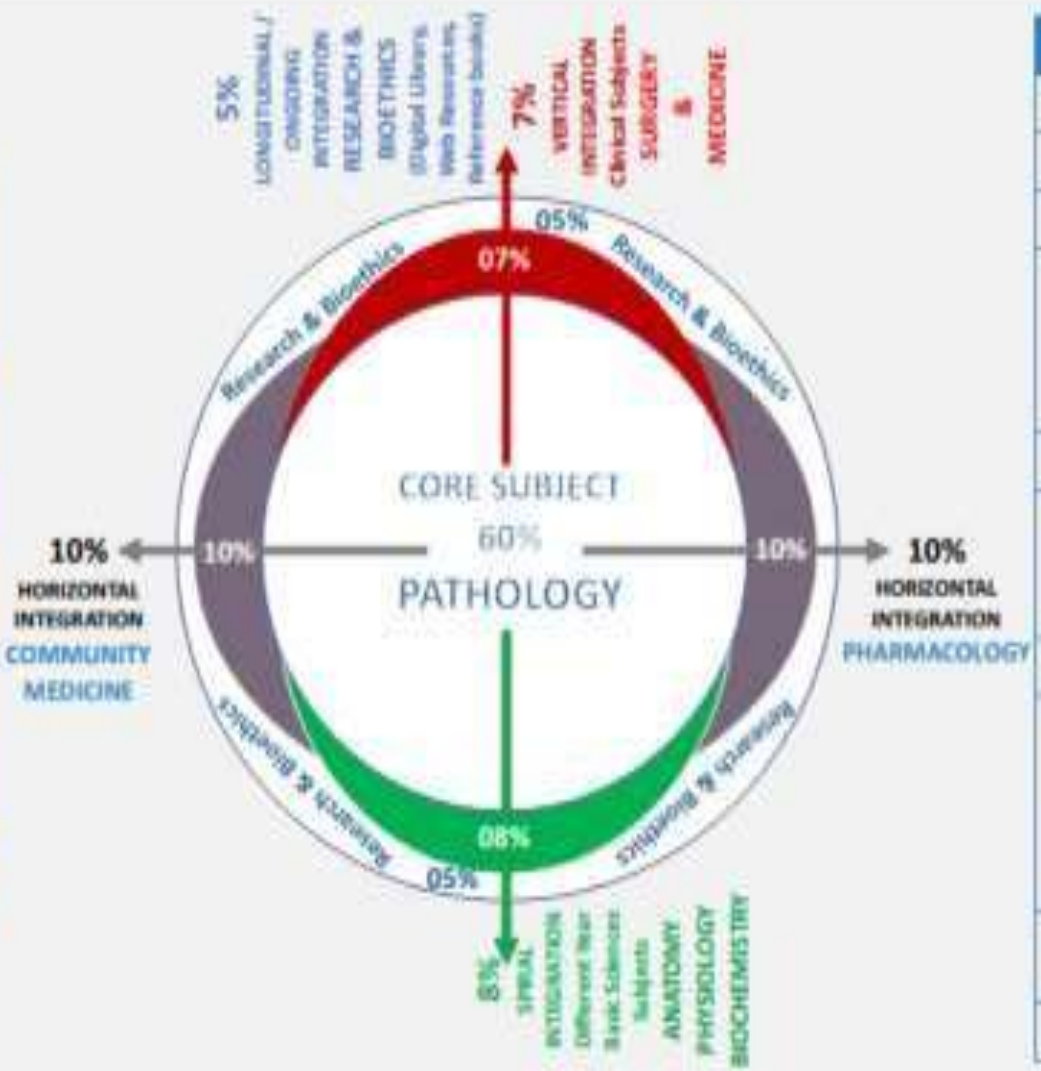
Foundation module

## Motto


## Vision; The Dream/Tomorrow

- To impart evidence based research oriented medical education
- To provide best possible patient care
- To inculcate the values of mutual respect and ethical practice of medicine

**Prof. Umar's Clinically Oriented Integration Model**
**For Basic Sciences Interactive Lectures**




| Model 3rd Year Pathology LGIS (≈30 slides) | |
|---|---|
| Core Subject – 60% (≈ 18-20 slides) | |
| **Pathology (≈ 18-20 slides)** | |
| Horizontal Integration – 20% (≈ 5-6 slides) | |
| **Same Year Subjects** | • Pharmacology (10%) (≈ 2-3 slides)<br>• Community Medicine (10%) (≈ 2-3 slides) |
| Vertical Integration – 07% (≈ 2-3 slides) | |
| **Clinical Subjects** | • Medicine (3-5%) (≈ 1-2 slides)<br>• Surgery (3-5%) (≈ 1-2 slides) |
| Spiral Integration – 08% (≈ 2-3 slides) | |
| **Different Year Basic Sciences Subjects** | • Anatomy (1-3%) (≈ 1-2 slides)<br>• Physiology (1-3%) (≈ 1-2 slides)<br>• Biochemistry (1-3%) (≈ 1-2 slides) |
| Longitudinal / Ongoing Integration – 05% (≈ 1-2 slides) | |
| **Research & Bioethics** (≈ 1-2 slides) | |

# Study Questions

- Define chronic inflammation.( Core )
- What are the causes of chronic inflammation. (Core )
- Define the morphological features of chronic inflammation. (Core )
- Define the morphological features of chronic granulomatous inflammation. (Core )
- What is the role of family medicine in management of chronic inflammation (spiral )
- What is the therapeutic options for chronic inflammation (horizontal )
- Give three clinical examples and their presentations of chronic inflammation (vertical )
- How is presentation of chronic inflammation different from acute inflammation (vertical )

# Chronic inflammation

- It is the inflammation of **prolong duration** (weeks or months).
- It is occurred as:
- Following acute inflammation.
- Occurs, incidentally as active inflammation.
- With tissue destruction.

  With repair process.

# Chronic Inflammation (Chronic Bronchitis)

Normal bronchi

Bronchitis

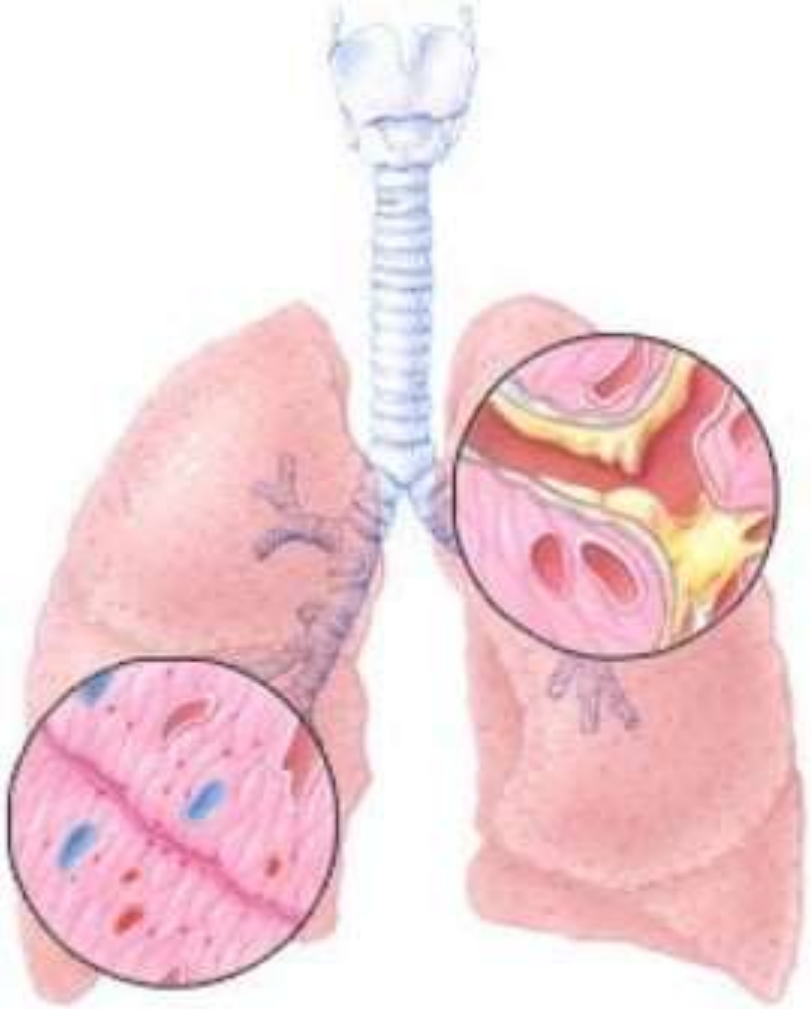
# Causes of Chronic inflammation

I - Persistent infection.

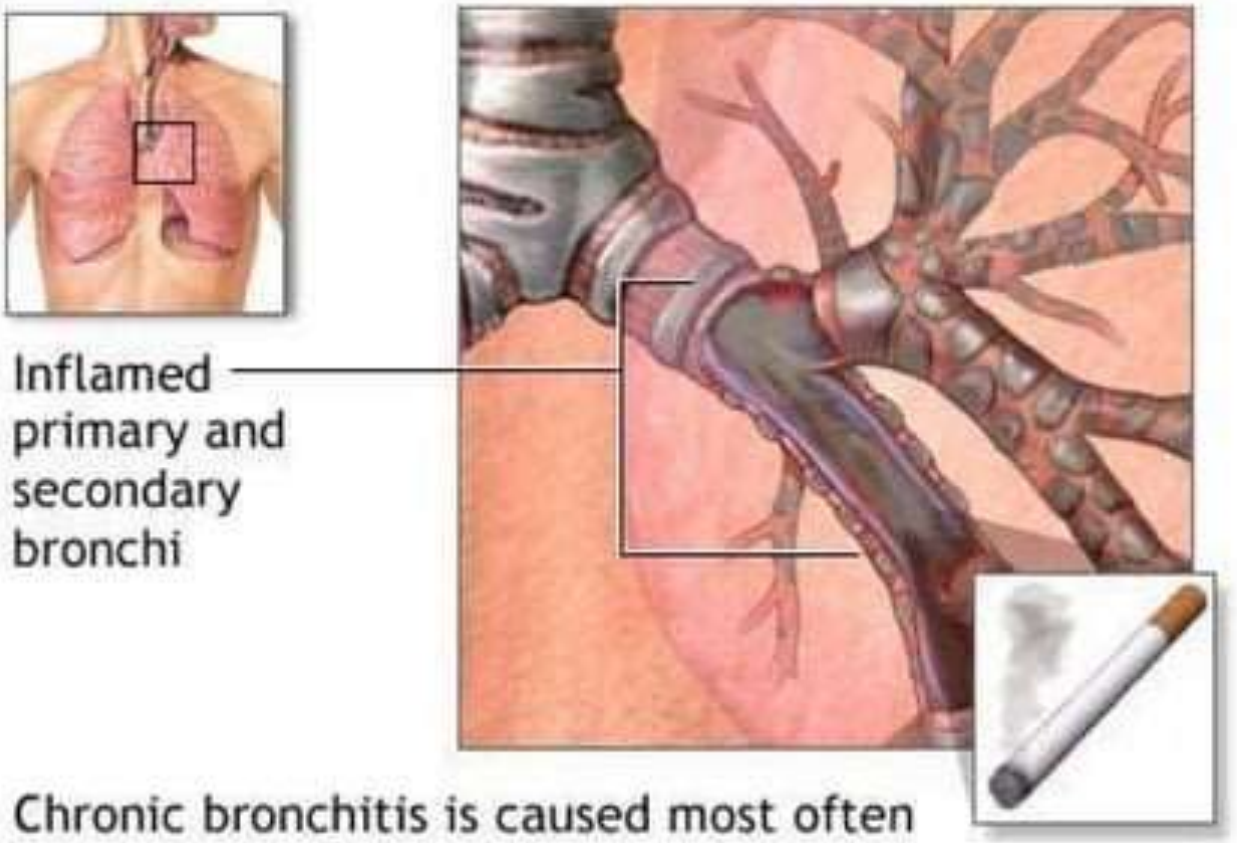
II - Prolonged exposure to potentially toxic agents.

III - Autoimmunity.

# Chronic Bronchitis



# Chronic Bronchitis

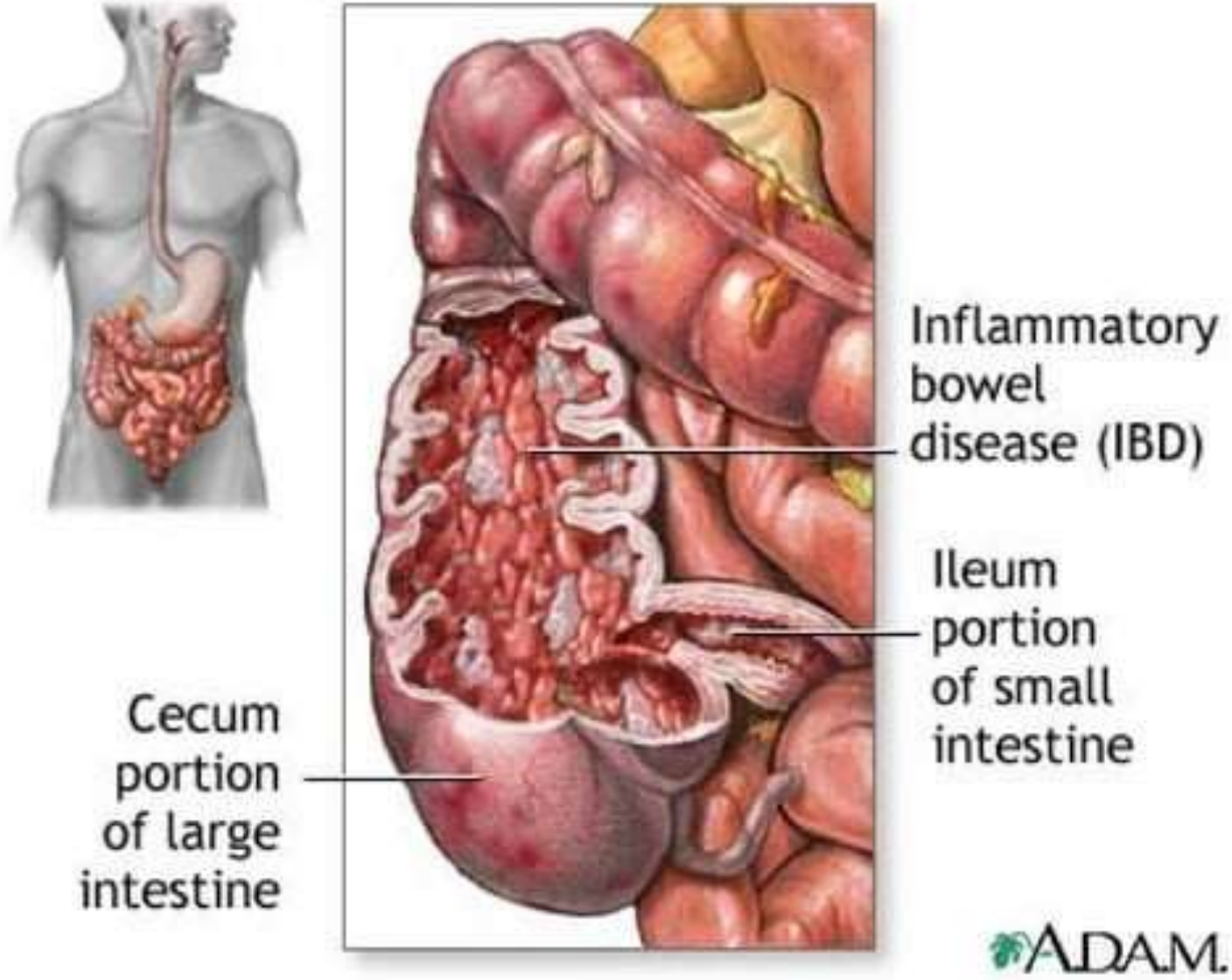


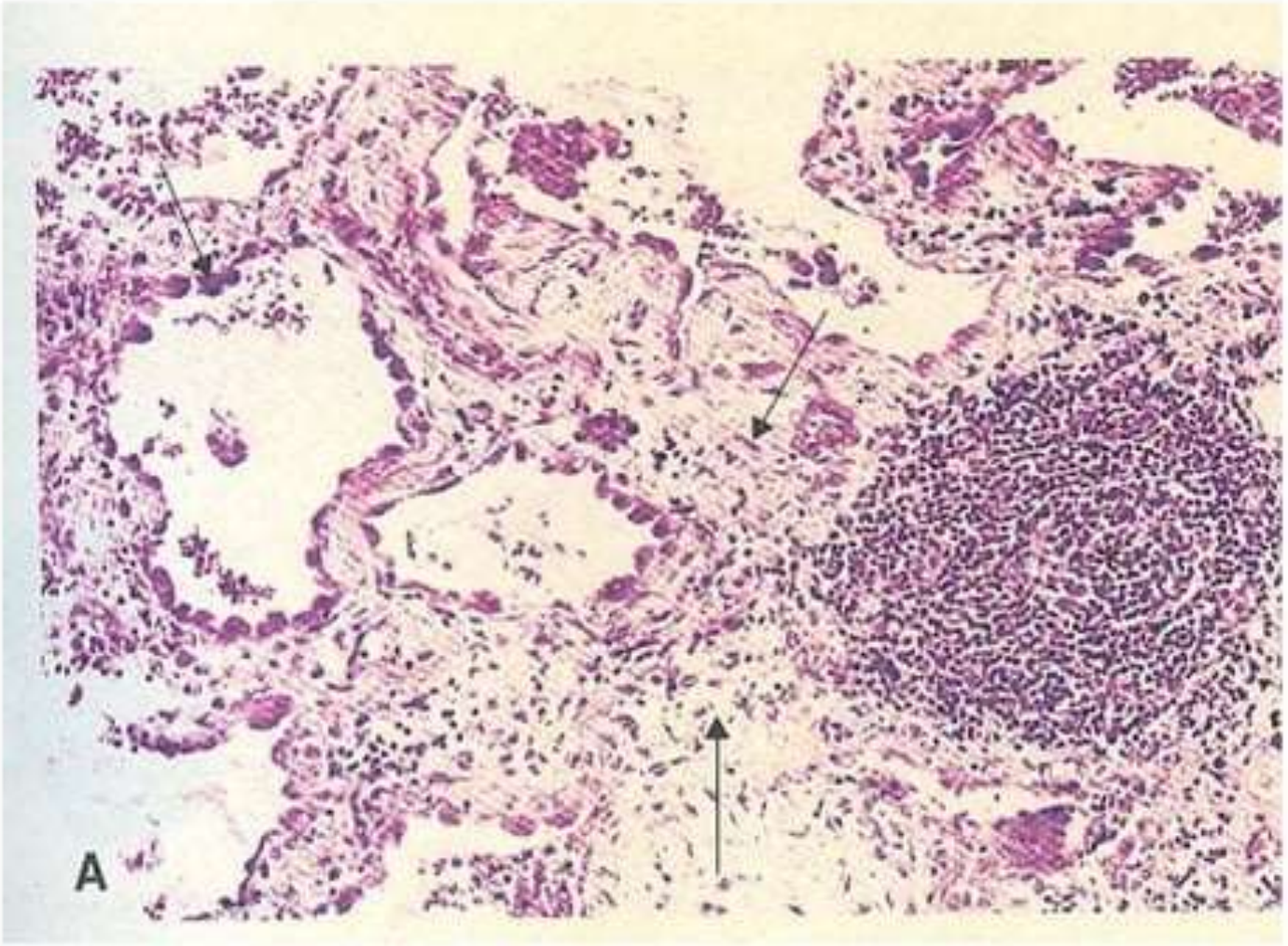
# Causes of Chronic inflammation

## I - Persistent infection:

- Bacteria.
- Viruses.
- Fungi.
- Parasites

# Chronic Inflammation

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# Causes of Chronic inflammation

**II - Prolonged exposure to potentially toxic agents:**

- Endogenous, (atherosclerosis).
- Exogenous, ( particulate silica-Silicosis).

# Atheromatous Plaque

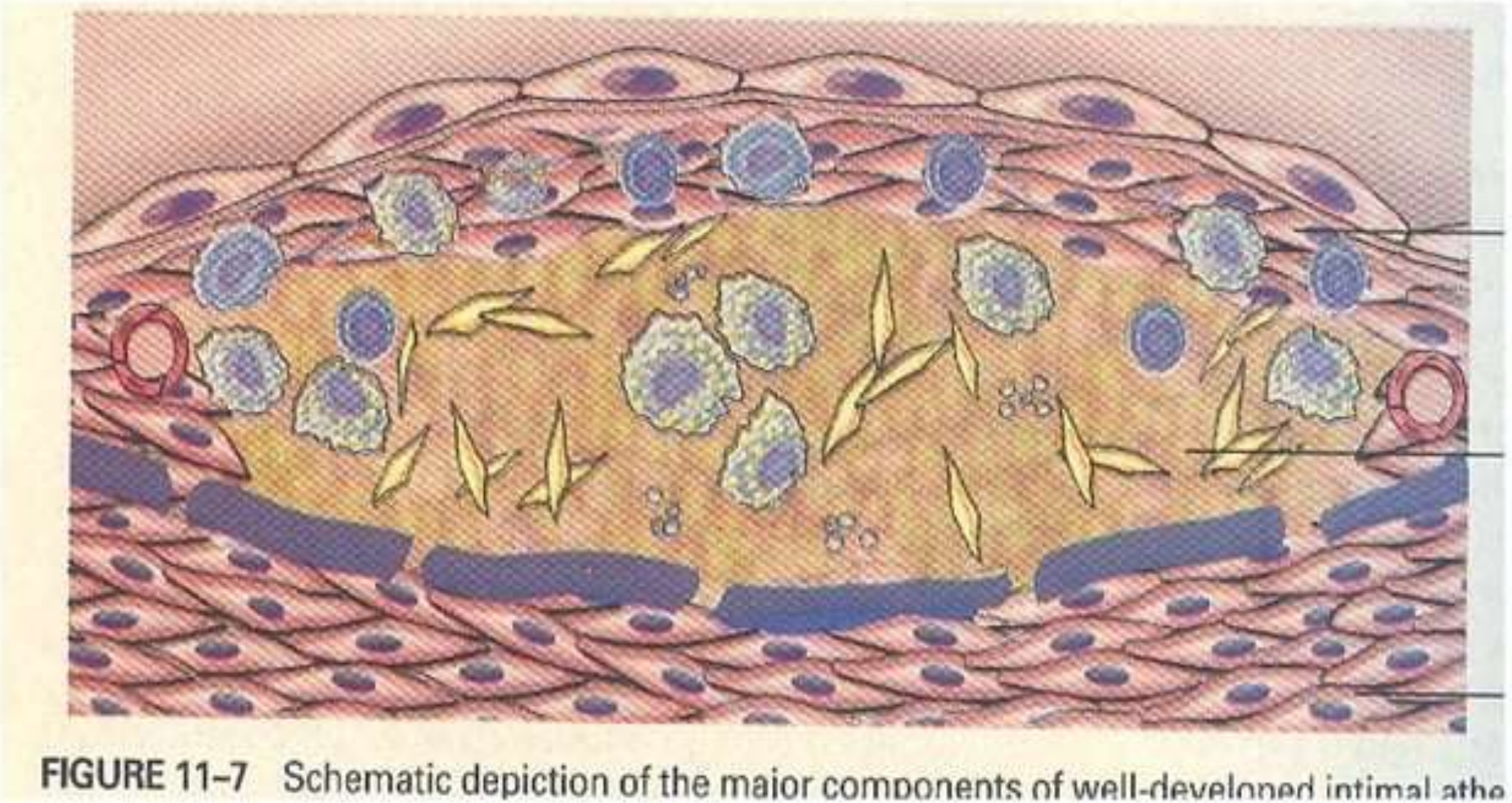


FIGURE 11–7 Schematic depiction of the major components of well-developed intimal athe

# Silicosis

# Causes of Chronic inflammation

**III - Autoimmunity:**

Occurs in:

- Rheumatoid arthritis.
- Lupus erythmatosus.

# Chronic Inflammation (Rheumatoid arthritis)

# Chronic inflammation

- Lymphocyte, macrophage, plasma cell (mononuclear cell) infiltration
- Tissue destruction by inflammatory cells
- Attempts at repair with fibrosis and angiogenesis (new vessel formation)
- When acute phase cannot be resolved
  - Persistent injury or infection (ulcer, TB)
  - Prolonged toxic agent exposure (silica)
  - Autoimmune disease states (RA, SLE)

# Morphological Features of Chronic Inflammation

These are characterized by:

I - Infiltration by mononuclear cells.

II - Tissue destruction.

III - Removal of damaged tissue, (healing).

# Morphological Features of Chronic Inflammation

- **Macrophages**
  - Scattered all over (microglia, Kupffer cells, sinus histiocytes, alveolar macrophages, etc.
  - Circulate as monocytes and reach site of injury within 24 – 48 hrs and transform
  - Become activated by T cell-derived cytokines, endotoxins, and other products of inflammation

# Morphological Features of Chronic Inflammation

- **T and B lymphocytes**
  - Antigen-activated (via macrophages and dendritic cells)
  - Release macrophage-activating cytokines (in turn, macrophages release lymphocyte-activating cytokines until inflammatory stimulus is removed)
- **Plasma cells**
  - Terminally differentiated B cells (of lymphocytes).
  - Produce antibodies.

# Morphological Features of Chronic Inflammation

**I - Infiltration by mononuclear cells:**

The mononuclear cells are become predominant after **48 hours**.

**These include:**

- Macrophages.
- Lymphocytes.
- Plasma cells.
- Eosinophils.
- Mast cells.

# Morphological Features of Chronic Inflammation

**Eosinophils**

- Found especially at sites of parasitic infection, or at allergic (IgE-mediated) sites.
- Eosinophils have highly cationic proteins, which are toxic to parasites.

# Morphological Features of Chronic Inflammation

## II - Tissue destruction

Occur due to:

- Inflammatory cells.
- Persistent infecting material.

# Morphological Features of Chronic Inflammation

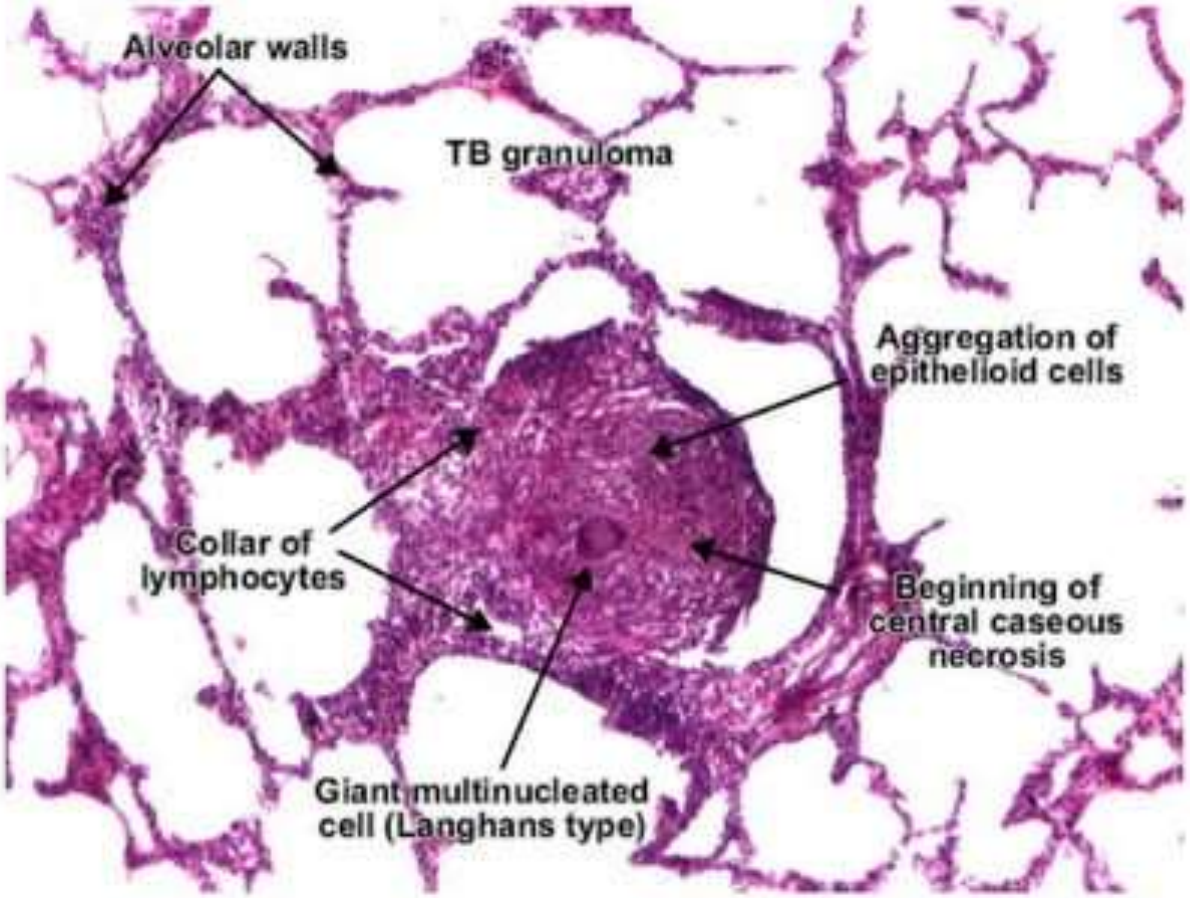
**III - Removal of damaged tissue, (healing):**

- Occur by proliferation of small blood vessels, (angiogenesis).
- Proliferation of fibroblast, (fibrosis-repair).

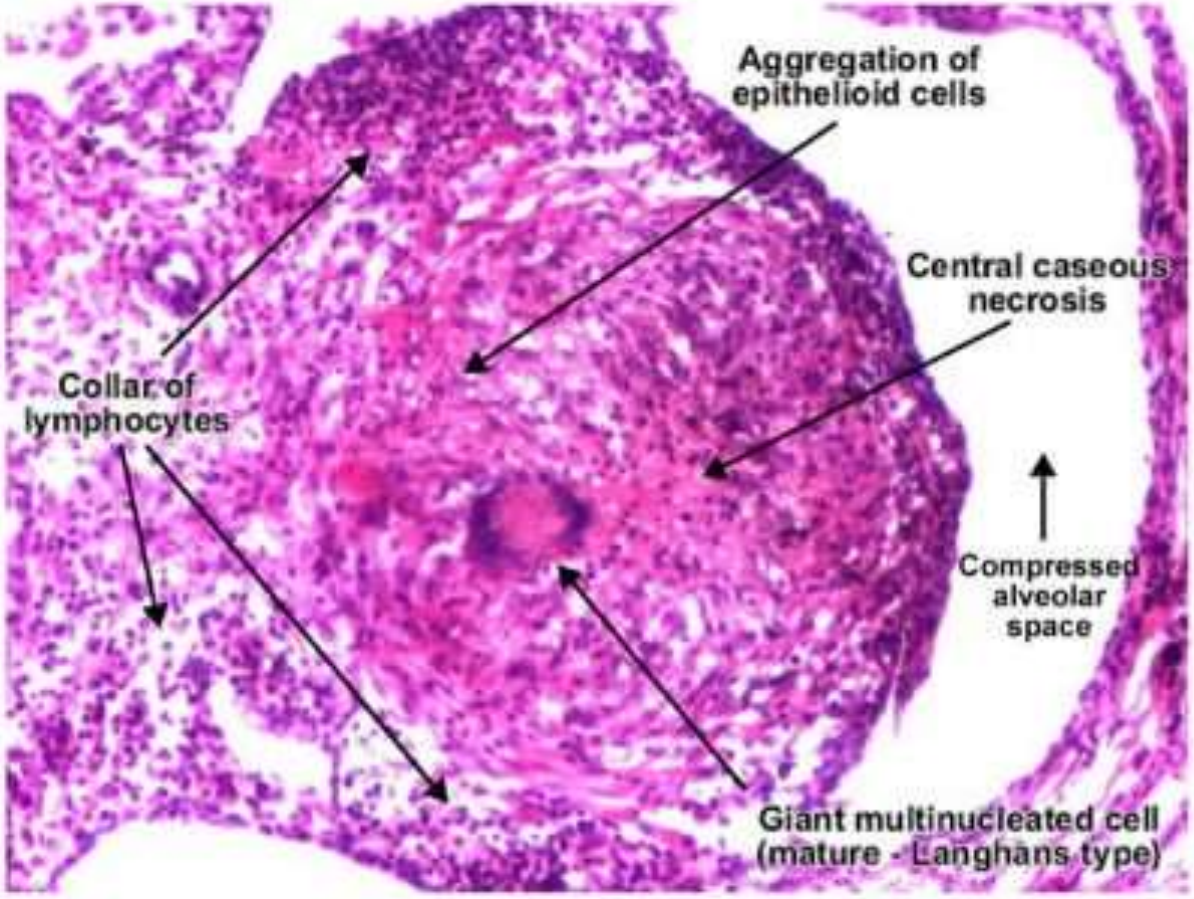
# Granulomatous Inflammation

- Clusters of T cell-activated macrophages, which engulf and surround indigestible foreign bodies (mycobacteria, *H. capsulatum*, silica, suture material)
- Resemble squamous cells, therefore called "**epithelioid**" granulomas with **peripheral lymphocytes, fibrosis & multinucleated giant cells.**

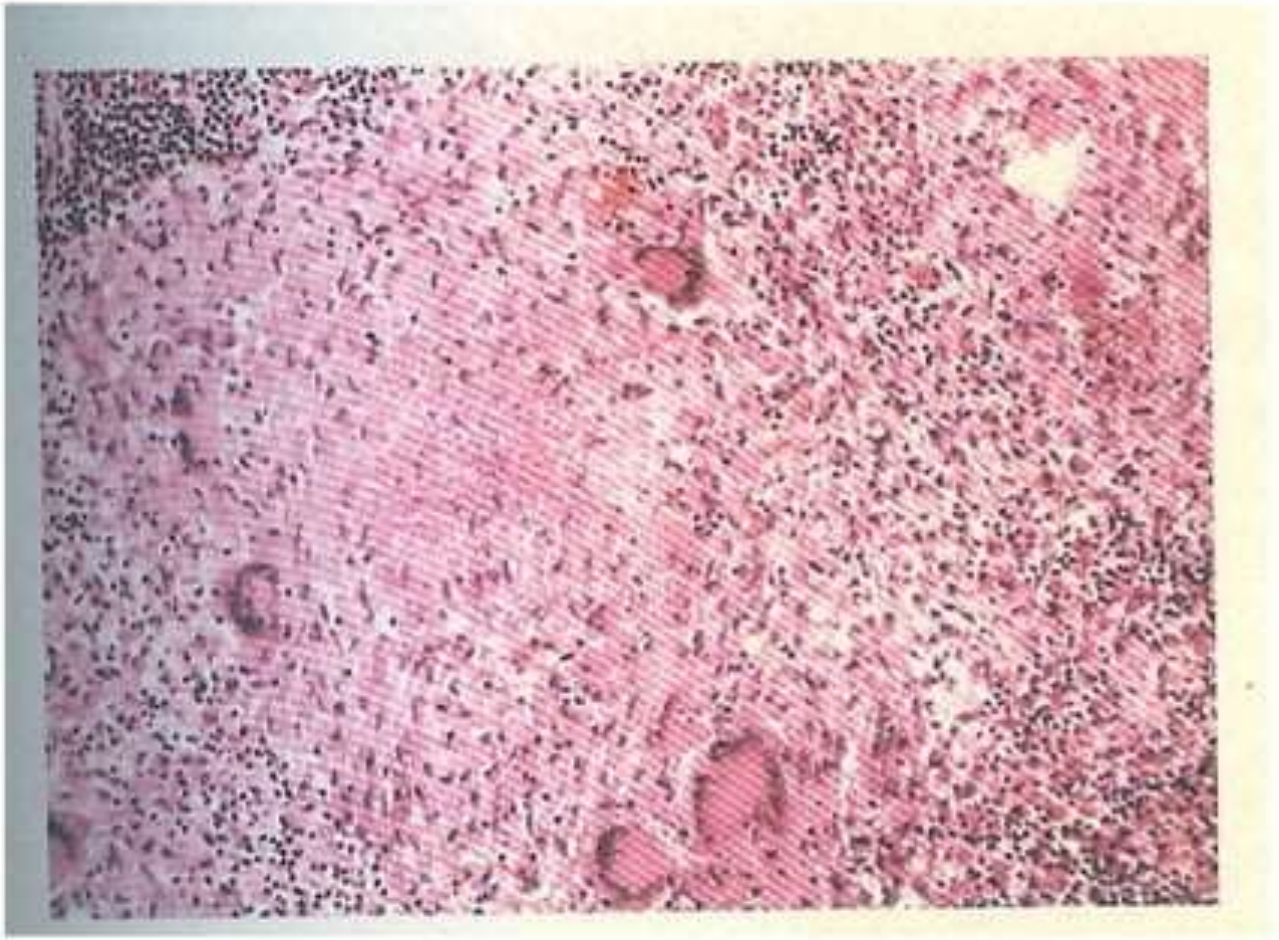
# Chronic Granulomatous Inflammation



# Chronic Granulomatous Inflammation



# Chronic Granulomatous Inflammation



# Causes Of Chronic Granulomatous Inflammation

- Infections e.g Tuberculosis
- Autoimmune Diseases
- Foreign Bodies
- Environmental Exposures
- Malignancies
- Chronic Inflammation

# Research



Oncotarget
Open Access Impact Journal

Oncotarget. 2017 Dec 14;9(6):7204–7218. doi: 10.18632/oncotarget.23208

## Inflammatory responses and inflammation-associated diseases in organs

Linlin Chen [1,#], Huidan Deng [1,#], Hengmin Cui [1,2], Jing Fang [1,2], Zhicai Zuo [1,2], Junliang Deng [1,2], Yinglun Li [1,2], Xun Wang [1,2], Ling Zhao [1,2]

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PMCID: PMC5805548 PMID: 29467962

## Abstract

# Family Medicine

•**Chronic inflammation** is a long-lasting immune response causing tissue damage, often linked to infections, autoimmune diseases, and lifestyle factors.
•Common causes include infections, obesity, smoking, stress, and autoimmune disorders.
•Symptoms include fatigue, persistent pain, low-grade fever, and swelling.
•Prolonged inflammation can lead to tissue damage, fibrosis, and increased risk of chronic diseases like heart disease and diabetes.
•Management includes medications (NSAIDs, corticosteroids), lifestyle changes (diet, exercise), and patient education on triggers and regular follow-ups.

# Thank You