

Inflammatory response to diseases

- **Definition of Inflammation-** It is a complex biological response of body tissues to harmful stimuli. Its protective response involving;

1. immune cells
2. blood vessels
3. molecular mediators

Agents causing inflammation:

1. **Infective agents**-bacteria, viruses and their toxins, fungi, parasites.
2. **Immunological agents**-Cell mediated, Antigen antibody reactions.
3. **Physical agents**-Heat, Cold, Radiation.
4. **Chemical agents**-organic and inorganic chemical compound.

Types of Inflammation

- Two types-
 1. Acute inflammation
 2. Chronic inflammation

Acute inflammation features:

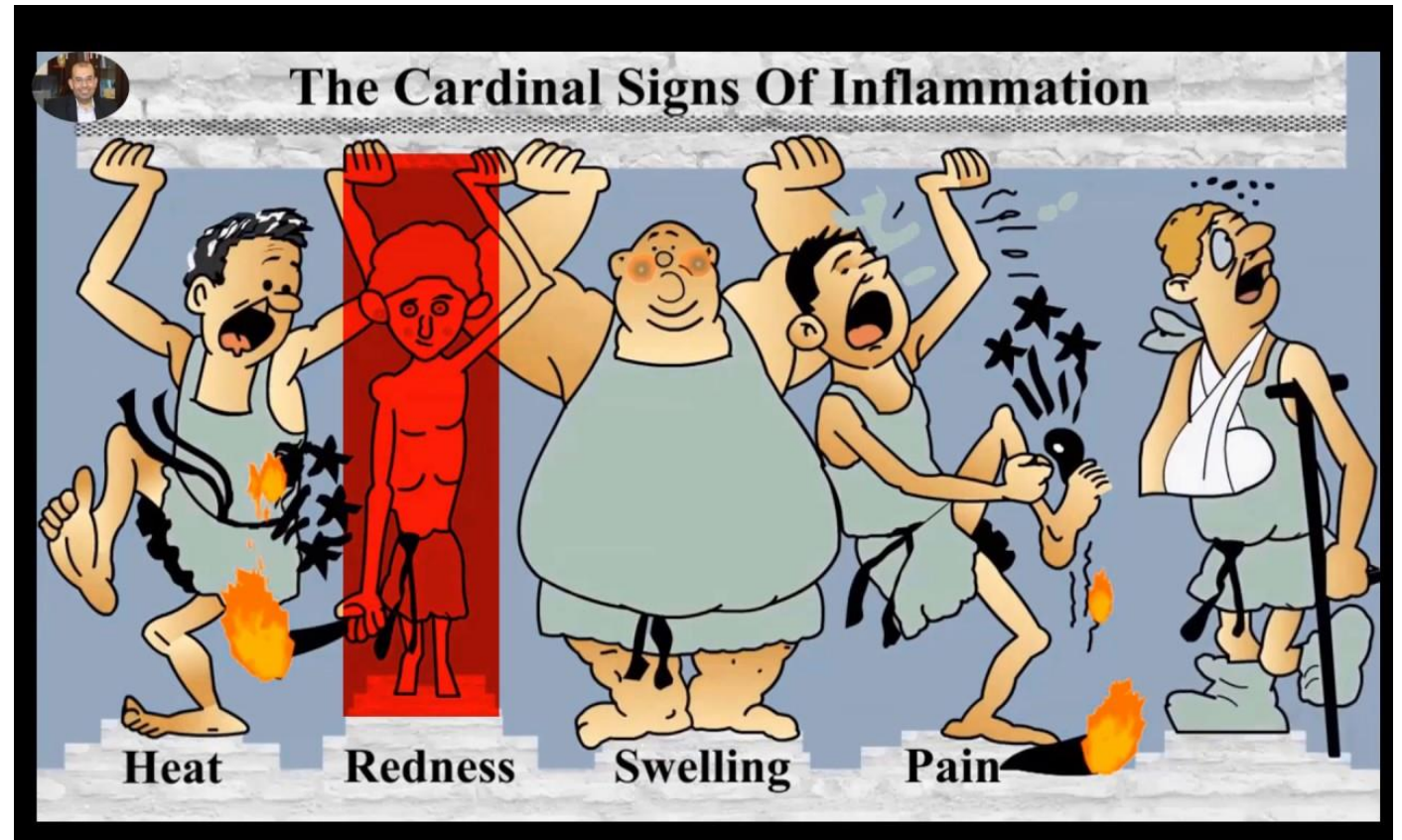
- Rapid onset
- Short duration (mins to few days)
- Fluid , plasma protein exudation
- Neutrophil accumulation

Chronic inflammation features:

- Onset- insidious
- Longer duration (days to years)
- Lymphocytes, macrophages, plasma cells
- Vascular proliferation & fibrosis

Cardinal signs of inflammation

- There are 5 types
1. **Calor** - heat
 2. **Rubor** - redness
 3. **Tumor** - swelling
 4. **Dolor** - pain
 5. **Functio laesa**-loss in function



Acute Inflammation

Acute inflammation has 3 major components:

- **Vascular changes:**
 - alterations in vessel caliber resulting in increased blood flow (vasodilation) and (increased vascular permeability).
 - **Cellular events:**
 - emigration of the leukocytes from the microcirculation and accumulation in the focus of injury (cellular recruitment and activation).
 - **Mediators**, derived from plasma proteins and cells
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Chronic inflammation

- Lymphocyte, macrophage, plasma cell (mononuclear cell) infiltration
- 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)

Types of inflammatory mediators

- Generally there 2 types:

1. **Cell derived**- cytokines (macrophage), histamine (mast cell), prostaglandins (all leukocytes)

2. **Plasma protein derived**- complement protein (liver cell): C3a-C5a (opsonization), C5b-9 (membrane attack complex-mac)

Pain: The inflamed area is likely to be painful, especially during and after touching. Chemicals that stimulate nerve endings are released, making the area more sensitive.

Redness: This occurs because the capillaries in the area are filled with more blood than usual.

Immobility: There may be some loss of function in the region of the inflammation.

Swelling: This is caused by a buildup of fluid.

Heat: More blood flows to the affected area, and this makes it feel warm to the touch.