

Classification of inflammation according to the result

If hyperplasia occurs; ***hyperplastic*** inflammation

If hypertrophy occurs; ***hypertrophic*** inflammation

If fibrous connective tissue is produced; ***fibrous*** inflammation

If atrophy occurs; ***atrophic*** inflammation

If the lumen is obstructed; ***obliterative*** inflammation

If adhesion occurs; ***adhesive*** inflammation

The nomenclature of inflammatory reactions

❖ Inflammation is expressed by using a prefix that refers to the organ and the **'-itis'** suffix.

For example; if the kidney is inflamed, the prefix “nephro-” is combined with the suffix “itis” to form the word “**nephritis**”.

Exceptions : typhlitis, proctitis, etc...

Outcomes of the Acute Inflammatory Response

The four main outcomes of acute inflammation are as follows:

- ✓ Resolution (the return to normal structure and function)
- ✓ Healing by fibrosis and regeneration
- ✓ Abscess formation
- ✓ Spread of inflammation
- ✓ Progression to chronic inflammation
- ✓ Death

Healing of injured tissues

The “healing” responses of affected tissues include

(1) Healing by **regeneration**

(2) Healing by **fibrosis**

(3) Healing by **sequestration** (organization)

Healing by regeneration

- Healing by regeneration is in the replacement of dead or damaged cells by new, healthy cells of the same morphological and functional characteristics.

- Regeneration requires :
 1. An intact connective tissue framework
 2. Enough cells to regenerate
 3. Labile or stable parenchymal cellular elements

There are three cell types based on ability to regenerate:

Permanent cells: (almost never divide). Cells in which regenerative attempts are generally absent or limited. Example; neuron and cardiac muscle cells.

Stable cells; (will divide if stimulated). Cells with a capacity for rapid division and cell proliferation in response to stimuli or insults. Example; fibroblasts, osteoblasts, parenchyma of liver, kidney,

Labile cells; (multiply through life). Cells that under normal physiological conditions continually multiply at a rapid rate. Example; epithelial cells of surfaces or linings of ducts, lymphoid and hematopoietic cells .

Healing by fibrosis

- ❑ Parenchyma cells of injured tissue are **replaced** by stromal elements (**connective tissue cells**)
- ❑ Dead tissue and the acute inflammatory exudate are **removed** by **macrophages** (phagocytosis by cells of the monocyte-macrophage system), and the space is filled with **fibrovascular tissue**.
- ❑ Endothelial cells give rise to **new blood vessels**.

These blood vessels establish blood circulation in the healing area, and fibroblasts produce collagen that imparts mechanical strength to the growing tissue.

Eventually a scar consisting of densely packed collagen is formed.

Healing by sequestration (organization)

- If chronic inflammation is unable to remove the inciting agent/substance, then the affected tissue attempts to “heal” itself by using defensive mechanisms that act to isolate and sequester the lesion and limit the spread of additional tissue damage.
- These outcomes are not healing but instead serve as compensatory defensive mechanisms to protect the animal against the cause.
- Defensive sequestration healing includes;
 - (1) healing by abscess or granuloma formation with fibrosis and
 - (2) healing by granulomatous inflammation with or without fibrosis.

Transplantation

- Transplantation is the transfer (engraftment) of cells, tissues or organs from a donor to a recipient with the aim of restoring function(s) in the body.
- **Autotransplantation** is the transplantation of organs, tissues, or even particular proteins from one part of the body to another **in the same person**.
- **Allotransplantation** is the transplantation between **individuals of the same species**. Example; human to human or animal to animal.

■ **Syngenic transplantation** is the transplantation between two **genetically identical individuals of the same species.**

Example; monozygotic or identical twins.

■ **Xenotransplantation**

is the transplantation of living cells, tissues or organs from **one species to another.**

Example; from human to animal (chimpanzee-to-human kidney transplantations,...)