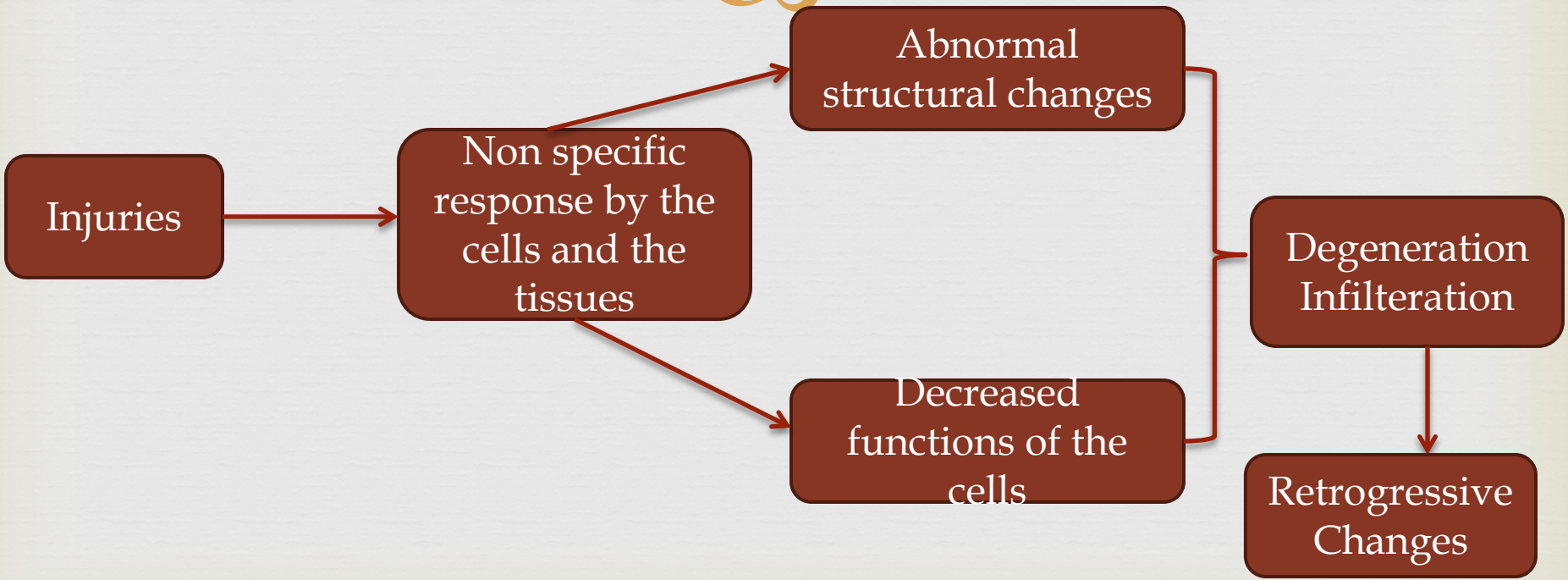
RETROGRESSIVE CHANGES

TYBSC PAPER 2

RETROGRESSIVE CHANGES



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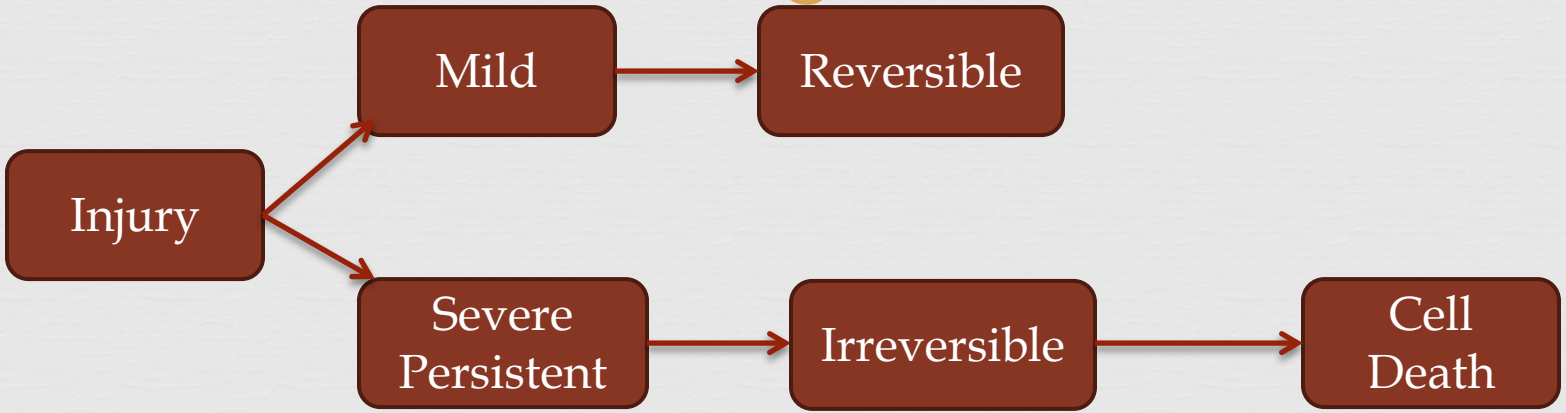
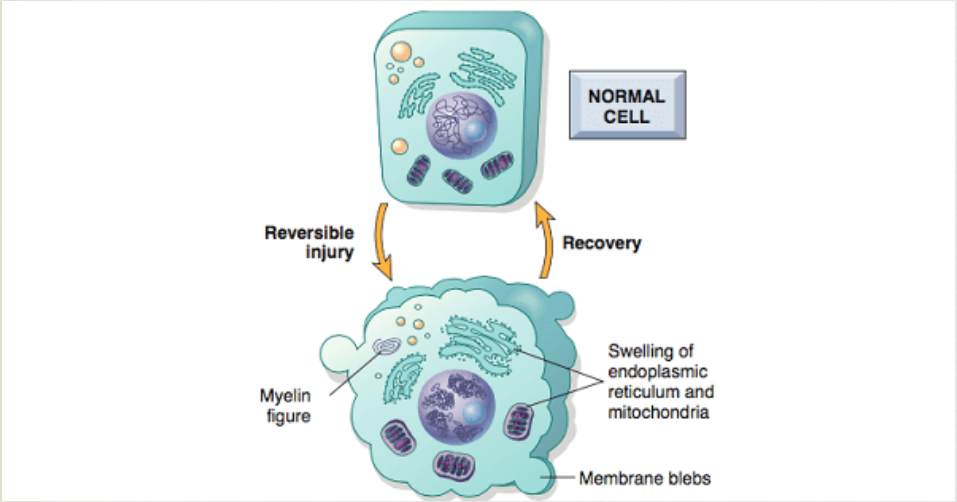


Difference between the two processes is vague.

RETROGRESSIVE CHANGES

ULTRASTRUCTURAL CHANGES OF REVERSIBLE CELL INJURY

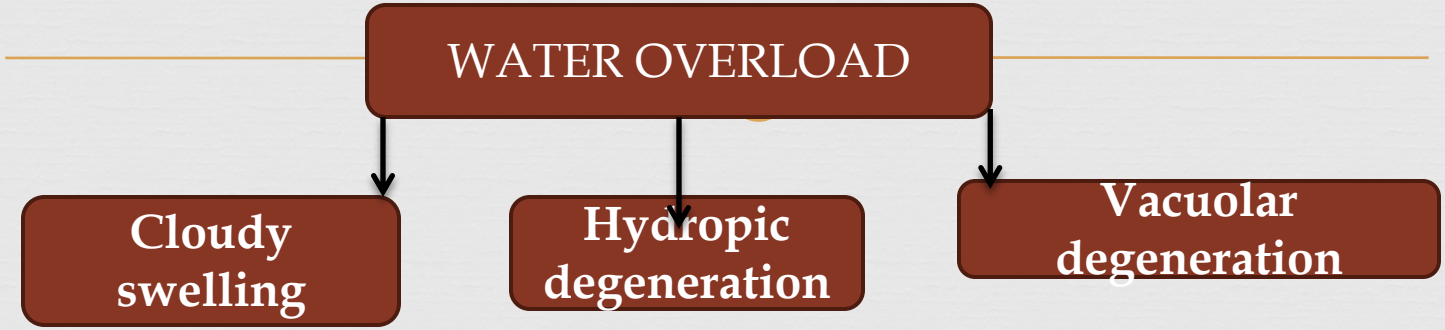


- Blebbing
- Blunting
- Distortion of Microvilli
- Loosening of intercellular attachment
- Mitochondrial changes
- Dilation of Endoplasmic reticulum

RETROGRESSIVE CHANGES

- Water overload
- Metabolic overload
- Storage loading

RETROGRESSIVE CHANGES

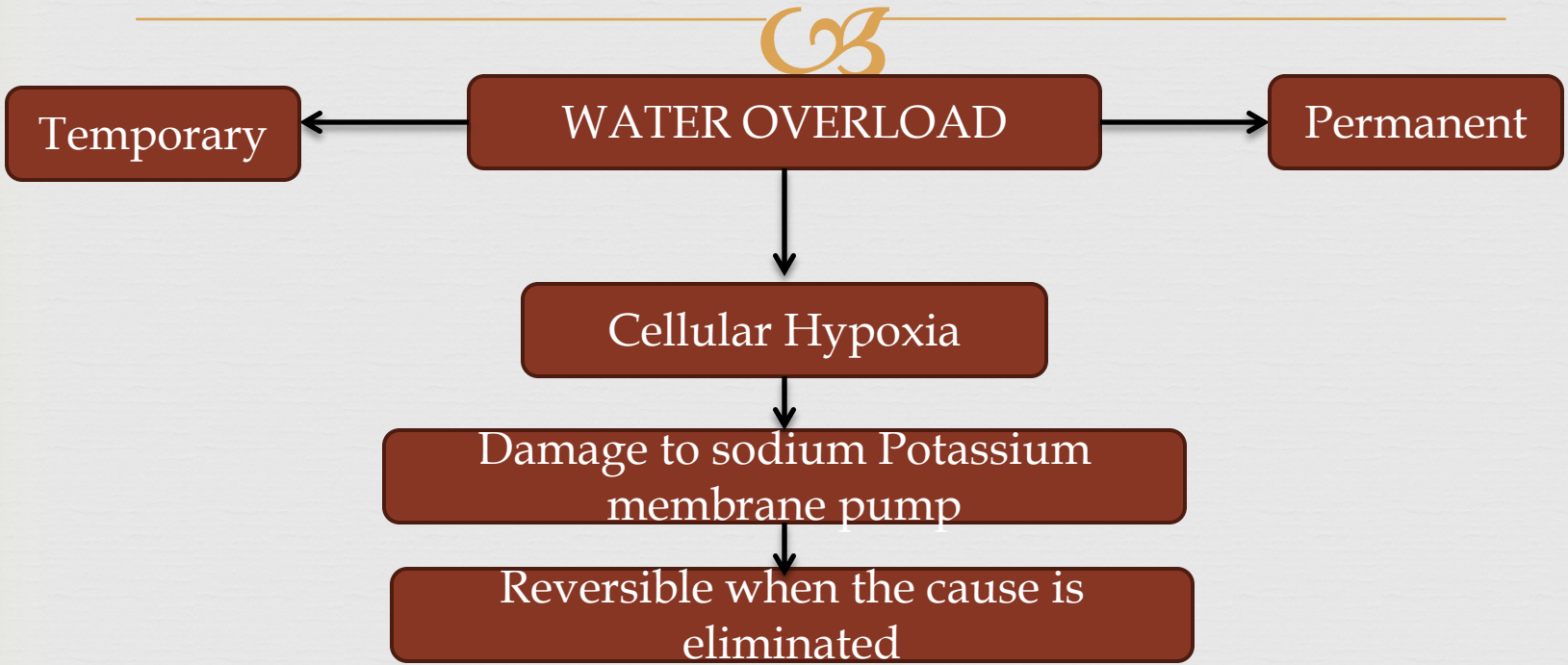


Accumulation of water in the cell

One of **the early signs of cellular degeneration** in response to injury

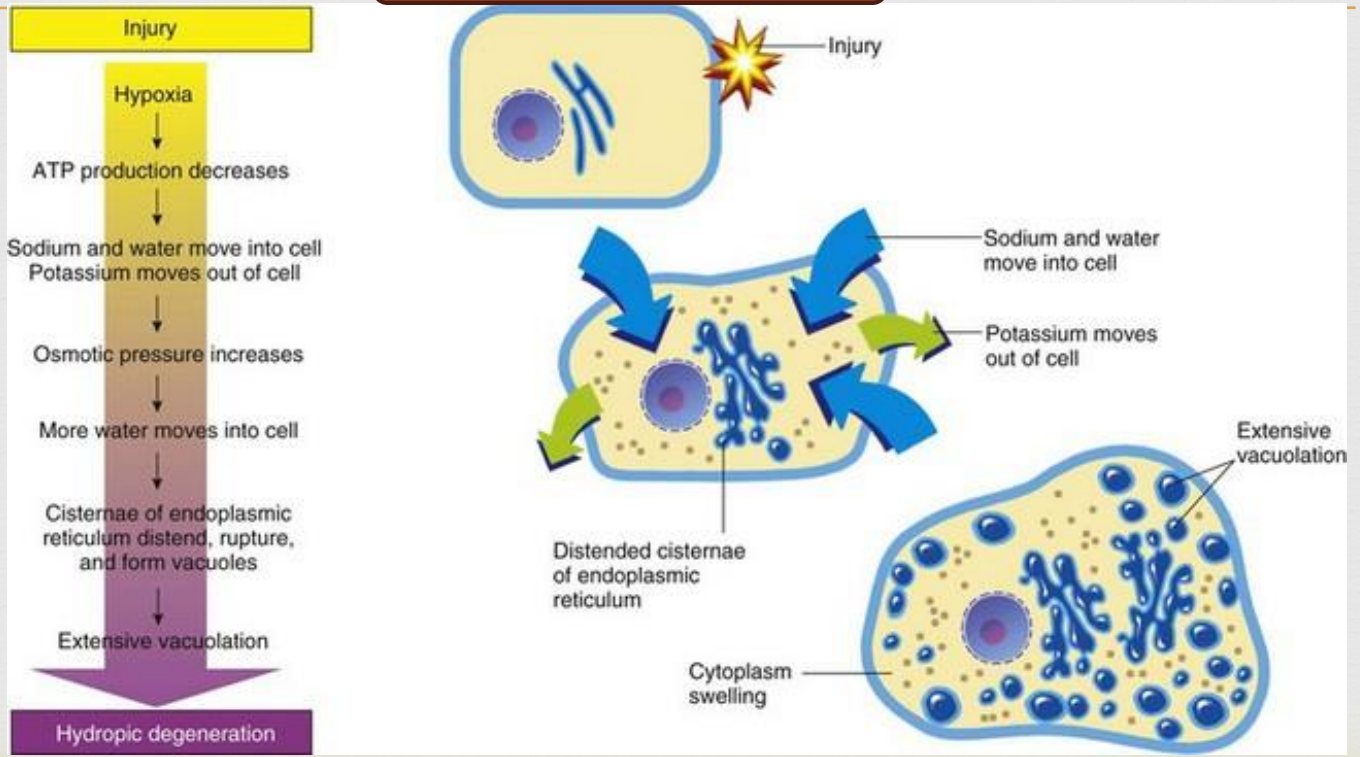
Hypokalemia due to vomiting or diarrhea.

RETROGRESSIVE CHANGES



RETROGRESSIVE CHANGES

WATER OVERLOAD



RETROGRESSIVE CHANGES

WATER OVERLOAD

When many cells in an organ are affected

- Pallor
- Increased Tugor
- Organ Weight increases

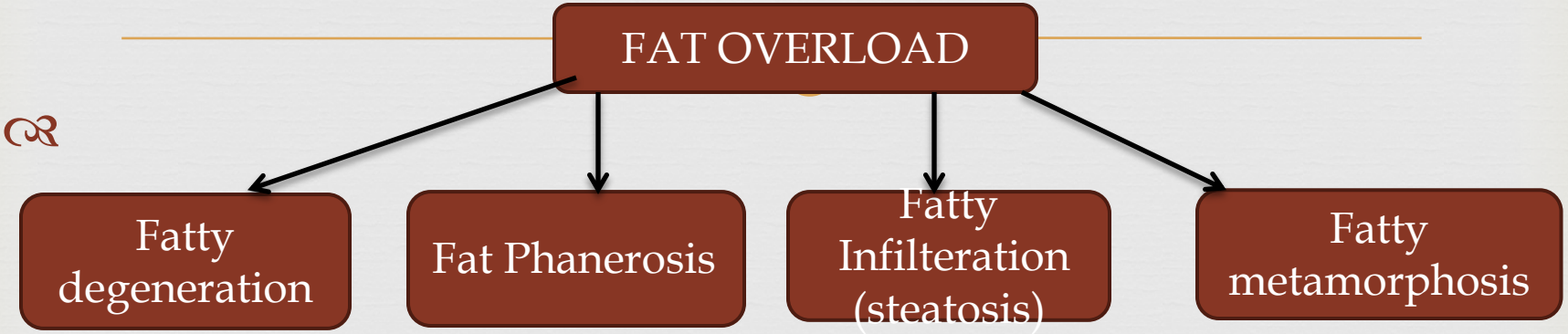
Microscopic examination: small clear vacuoles may be seen within the cytoplasm; these represent distended and pinched-off segments of the endoplasmic reticulum.

RETROGRESSIVE CHANGES

METABOLITE OVERLOAD

- FAT OVERLOAD
- PROTIEN OVERLOAD
- CARBOHYDRATE OVERLOAD

RETROGRESSIVE CHANGES



The cell is **unable to adequately metabolize fat** due to injury.

RETROGRESSIVE CHANGES

FAT OVERLOAD

- It is manifested by the appearance of small or large lipid vacuoles in the cytoplasm

Occurs in **hypoxic** and various **forms of toxic injury**.

It is principally encountered in cells involved in and **dependent on fat metabolism,** such as the **hepatocyte** and **myocardial cell**.

RETROGRESSIVE CHANGES

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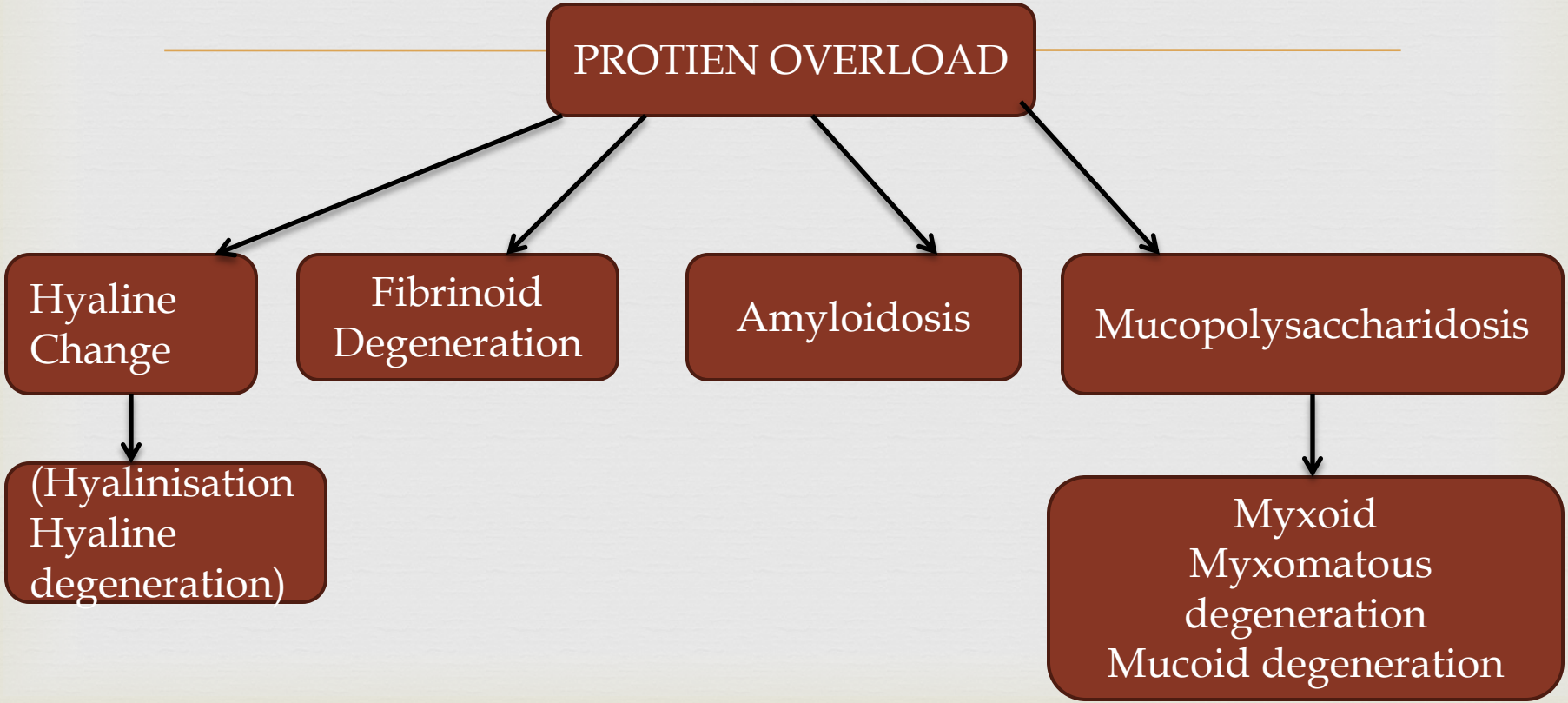
FAT OVERLOAD

In the liver, the enlargement of hepatocytes due to fatty changes may compress adjacent bile canaliculi, leading to **cholestasis.**

Cholesterolosis: Cholesteryl esters stick to the walls of the gallbladder.

Depending on the cause and severity of the lipid accumulation, fatty change are generally reversible.

RETROGRESSIVE CHANGES



RETROGRESSIVE CHANGES

HYALINIZATION

Tissue **degeneration** chiefly of **connective tissues**

Structural elements of affected cells are replaced by homogeneous translucent material

Zenker's degeneration--- severe glassy or waxy hyaline degeneration
Necrosis of skeletal muscles in acute infectious diseases

RETROGRESSIVE CHANGES

HYALINIZATION

- Occurs in severe Toxaemia as typhoid fever.
- It is also seen in electrical burns.

Grossly the muscles appear pale and friable

RETROGRESSIVE CHANGES

HYALINIZATION

Microscopically, the muscle fibres are swollen, have a loss of cross striations, and show a hyaline appearance.

Coagulative necrosis occurs here.

RETROGRESSIVE CHANGES

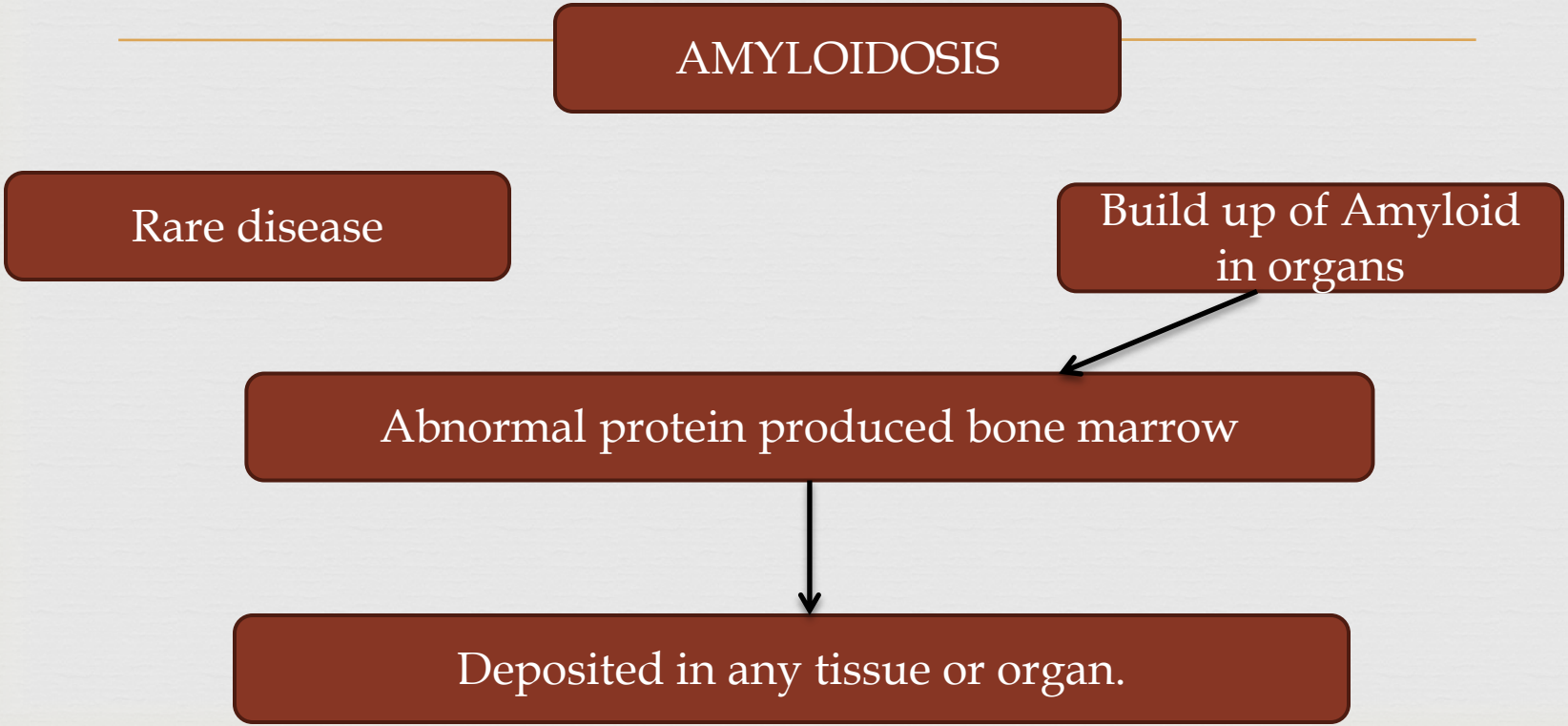
FIBRINOID DEGENERATION

Degeneration of connective tissue or blood vessels

Accumulates deposits of an acidophilic homogeneous material

Resembles fibrin when stained.

RETROGRESSIVE CHANGES



RETROGRESSIVE CHANGES

AMYLOIDOSIS

Can affect different organs in different people

- Heart
- Kidneys
- Liver
- Spleen
- Nervous system
- Digestive tract

Severe amyloidosis can lead to life-threatening organ failure

RETROGRESSIVE CHANGES

TYPES OF AMYLOIDOSIS

- AL AMYLOIDOSIS
- AA AMYLOIDOSIS
- HERIDITARY AMYLOIDOSIS
- DIALYSIS RELATED AMYLOIDOSIS

RETROGRESSIVE CHANGES

AL AMYLOIDOSIS

Immunoglobulin light chain amyloidosis

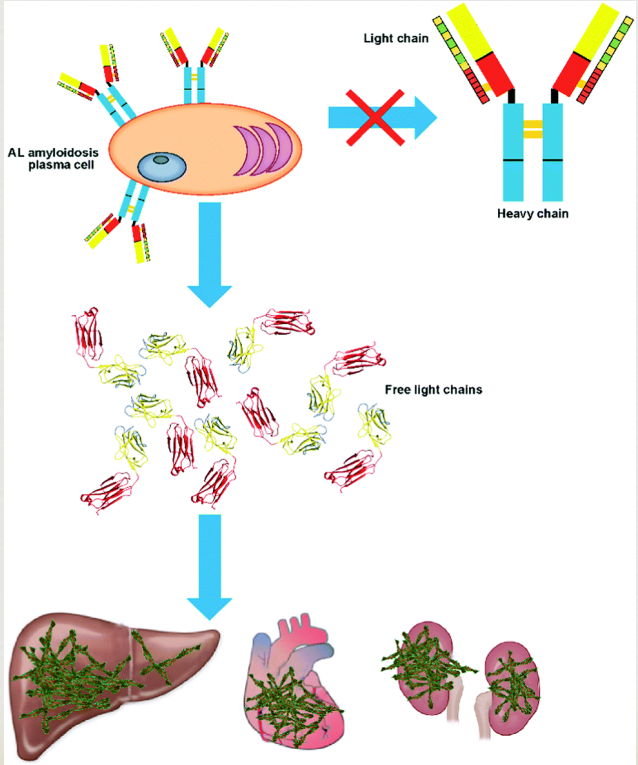
Primary amyloidosis

Most common type and can affect your heart, kidneys, skin, nerves and liver.

Occurs when bone marrow produces abnormal antibodies that can't be broken down.

The antibodies are deposited in tissues as amyloid, interfering with normal function.

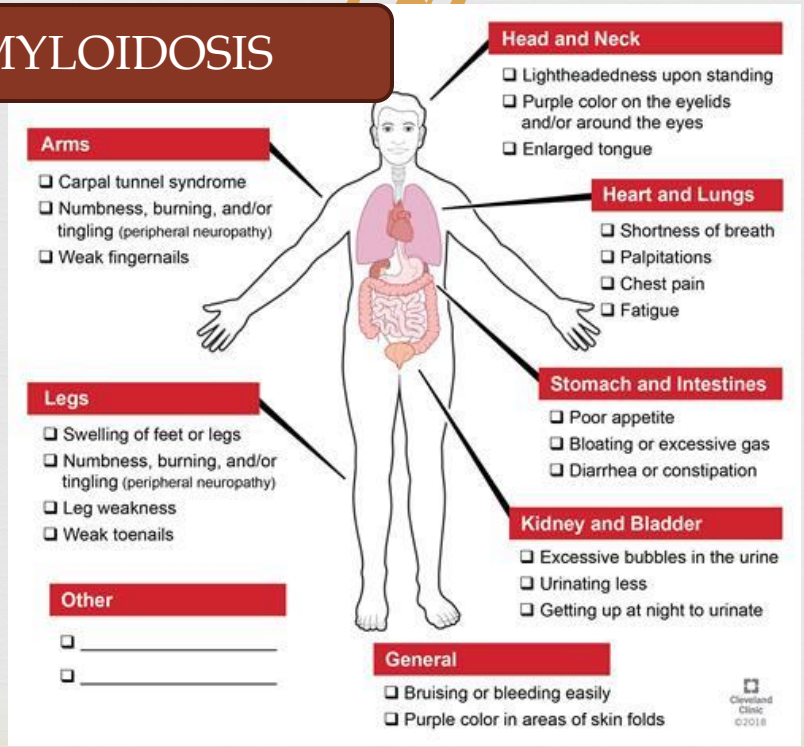
RETROGRESSIVE CHANGES



AL AMYLOIDOSIS

RETROGRESSIVE CHANGES

AL AMYLOIDOSIS



RETROGRESSIVE CHANGES

AA AMYLOIDOSIS

- Secondary amyloidosis.

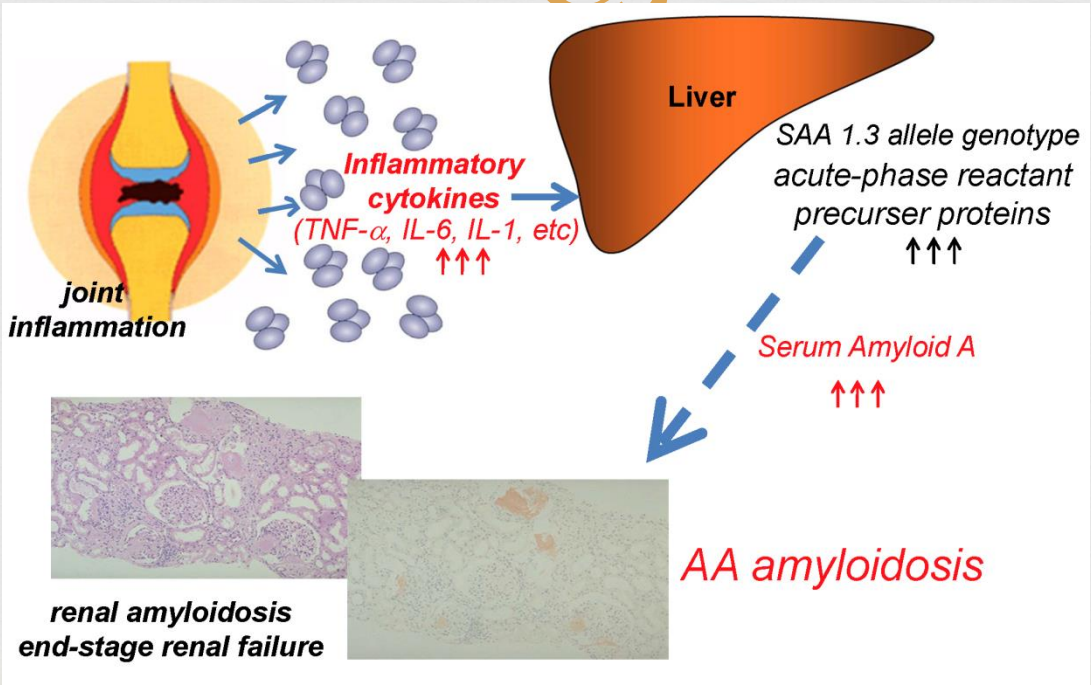
Characterised by extracellular tissue deposits of fibrils that are composed of **Serum Amyloid A protein**

Mostly affects kidneys but occasionally digestive tract, liver or heart.

It occurs along with chronic infectious or inflammatory diseases, such as rheumatoid arthritis or inflammatory bowel disease.

RETROGRESSIVE CHANGES

AA AMYLOIDOSIS



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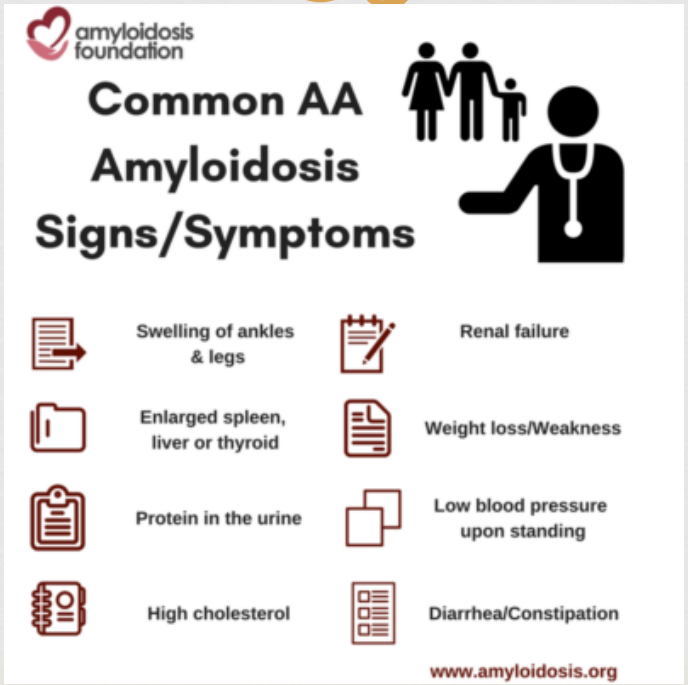


RETROGRESSIVE CHANGES

HERIDITARY AMYLOIDOSIS

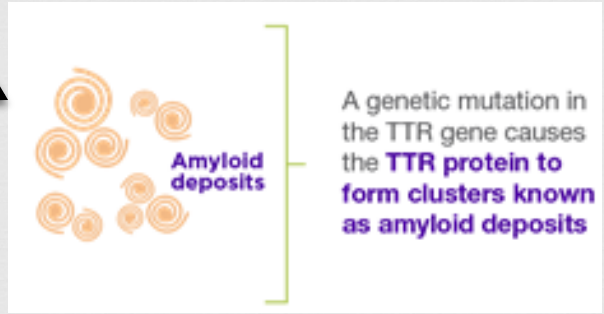
- **Familial amyloidosis**
- Inherited disorder that often affects the liver, nerves, heart and kidneys

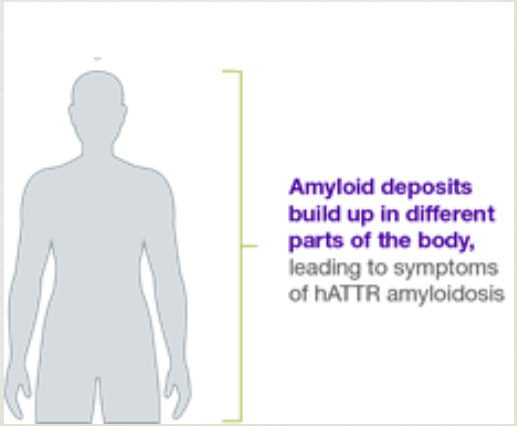
Gene abnormalities present at birth are associated with an increased risk of amyloid disease

The type and location of an amyloid gene abnormality can affect the risk of certain complications, the age at which symptoms first appear, and the way the disease progresses over time.

RETROGRESSIVE CHANGES

Transporter of Vitamin A and Thyroxine in body





RETROGRESSIVE CHANGES

DIALYSIS RELATED AMYLOIDOSIS

Develops when proteins in blood are deposited in joints and tendons – causing pain, stiffness and fluid in the joints, as well as carpal tunnel syndrome.

Generally affects people on long-term dialysis.

RETROGRESSIVE CHANGES

MUCO POLYSACCHARIDOSIS

Mucoid degeneration

Metabolic disorder → absence or malfunctioning of lysosomal enzymes → needed to break down molecules glycosaminoglycan (Mucopolysaccharide).

Long chains of sugar carbohydrates occur within the cells that help build bone, cartilage, tendons, corneas, skin and connective tissue.

Leads to abnormal accumulation of heparan sulfate, dermatan sulfate, and keratan sulfate.

RETROGRESSIVE CHANGES

MUCO POLYSACCHARIDOSIS

Shows many clinical features.
Varying degrees of severity

Symptoms may not be apparent at birth but progress as storage of glycosaminoglycan bone, skeletal structures, connective tissues and organs

RETROGRESSIVE CHANGES

MUCO POLYSACCHARIDOSIS

Neurological complications may involve:

- ✓ Damage to the neurons (Which send and receive impulses)
- ✓ Pain
- ✓ Impaired motor function

This results from compression of nerves or nerve roots in the spinal cord or in the peripheral nervous system

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