

GENERAL PATHOLOGY

L-6 PATHWAYS:

HYPOXIC INJURY

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Cell Injury PATHWAYS OF INJURY

- ❑ Interference with Energy Production
- ❑ Direct Damage to membranes

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1. INTERFERENCE WITH ENERGY PRODUCTION

Hypoxic Injury

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Hypoxic Injury

- ❑ hypoxia decreased O₂ at the cell
- ❑ anoxia complete lack of O₂
- ❑ Hypoxemia decreased O₂ in the blood
- ❑ ischemia reduced blood supply to the tissue leads to hypoxia

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Ischaemia

- Occlusion of the blood vessels
- Failure of the heart to pump enough blood

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Hypoxaemia

- Too little oxygen in the blood
 - Too little oxygen in the air
 - Failure to properly ventilate the lungs
 - Failure of the lungs to properly oxygenate the blood
 - Failure of the heart to pump enough blood through the lungs
 - Tremendously increased dead space (i.e., pulmonary thromboembolus)

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Haemoglobin problems (anaemic hypoxia)

- Inadequate circulating red cell mass (anaemia)
- Inability of haemoglobin to carry the oxygen (carbon monoxide poisoning)
- High affinity haemoglobin that will not give up their oxygen to the tissues (methemoglobinemia)

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Failure of the Cells to Utilize Oxygen (cytochromes) (histotoxic hypoxia)

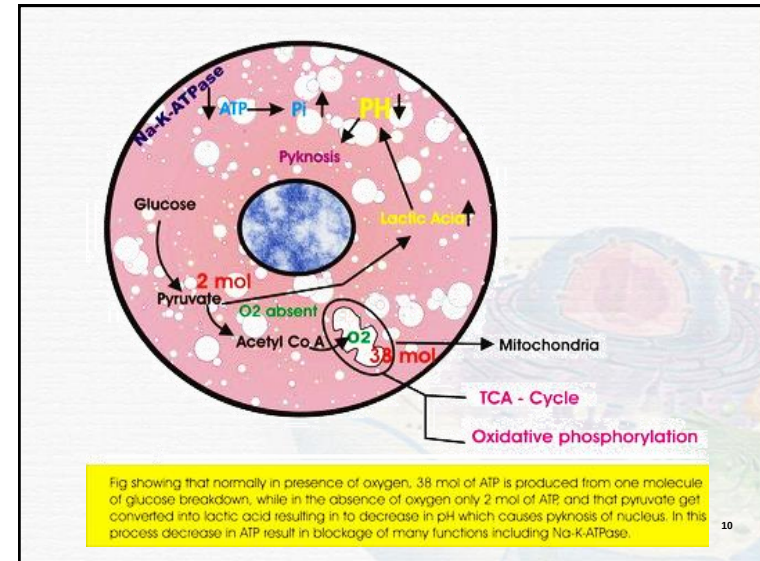
- Cyanide poisoning
- Rotenone poisoning
- Dinitrophenol poisoning

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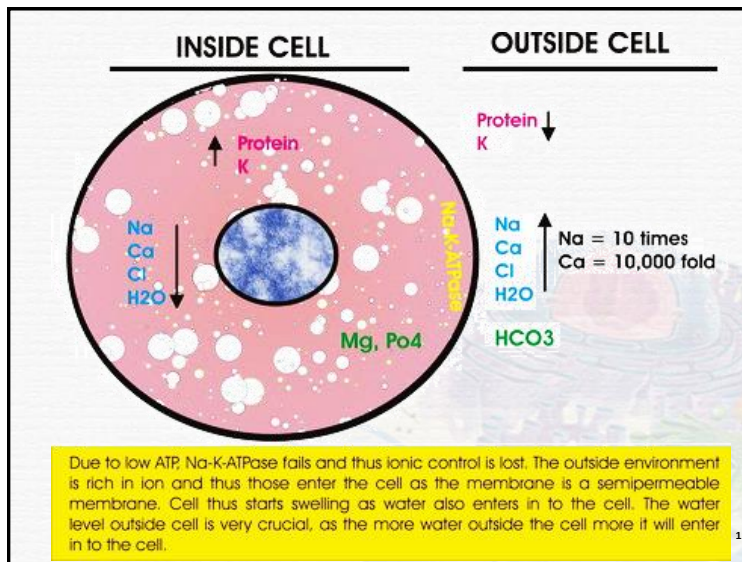
❑ Cell Deprived of oxygen

- Interrupts oxidative metabolism
- Depletion of Energy Sources (Glucose)
- Decreased Energy in the cell
 - ❑ Na/K pump failure

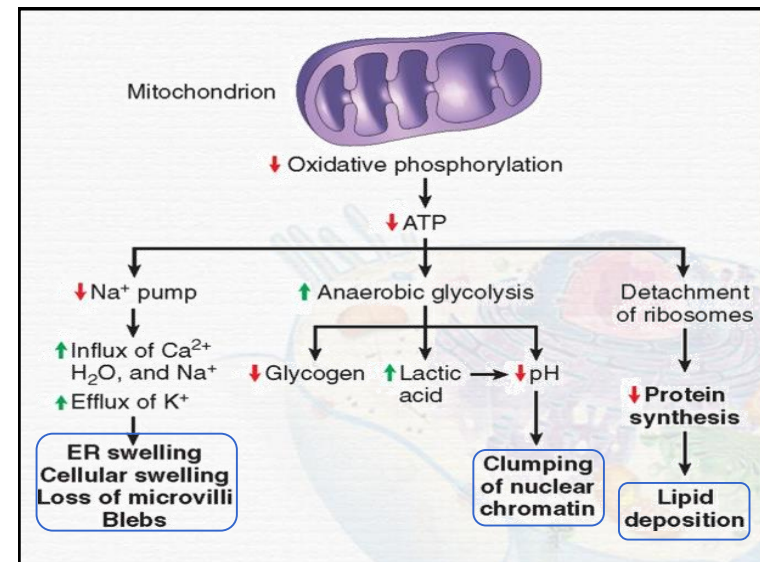
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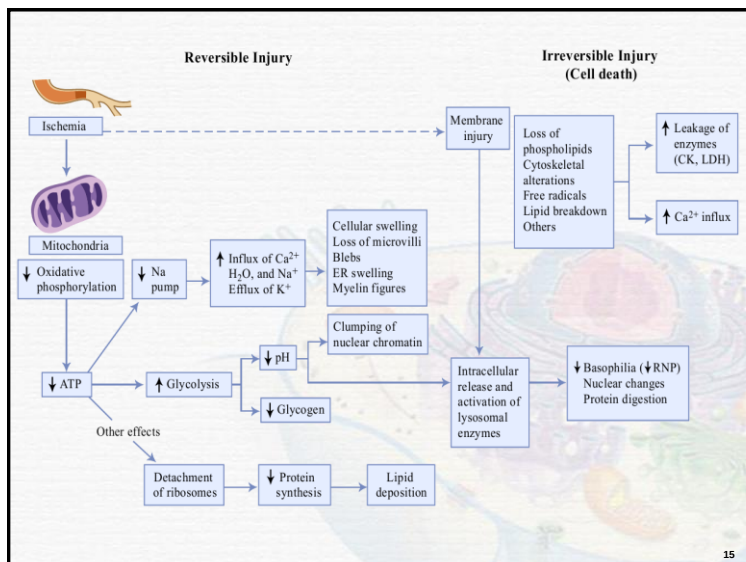
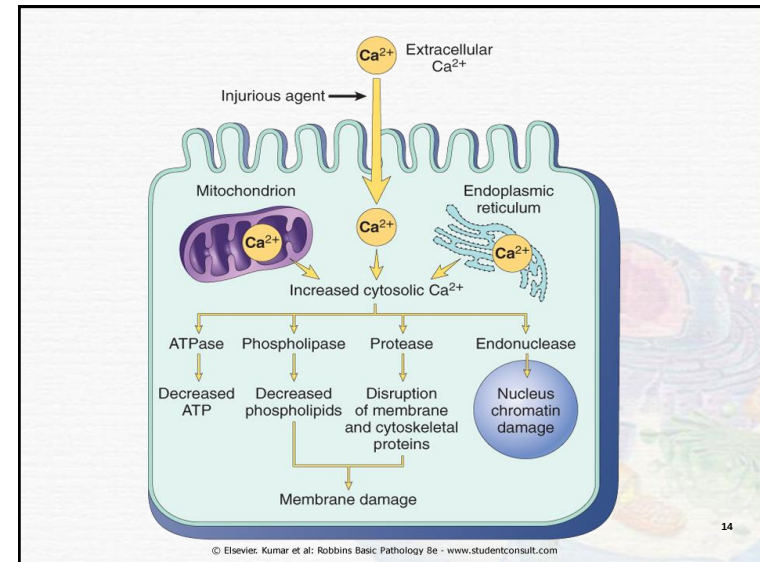
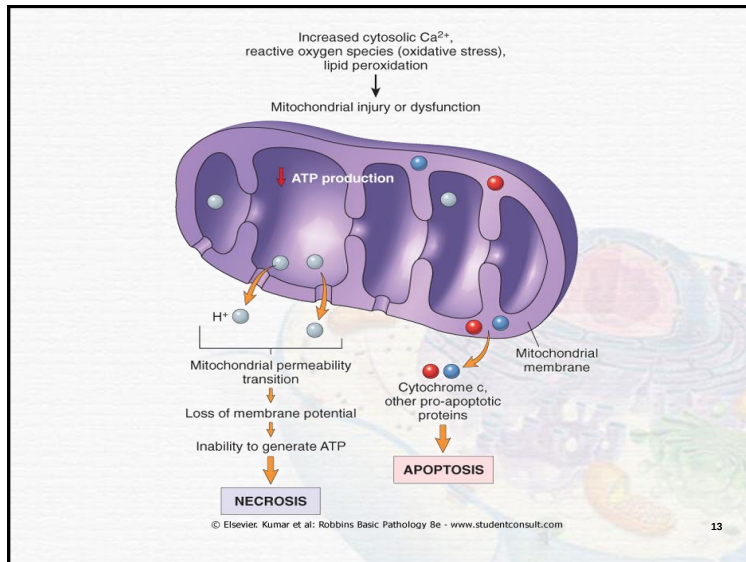


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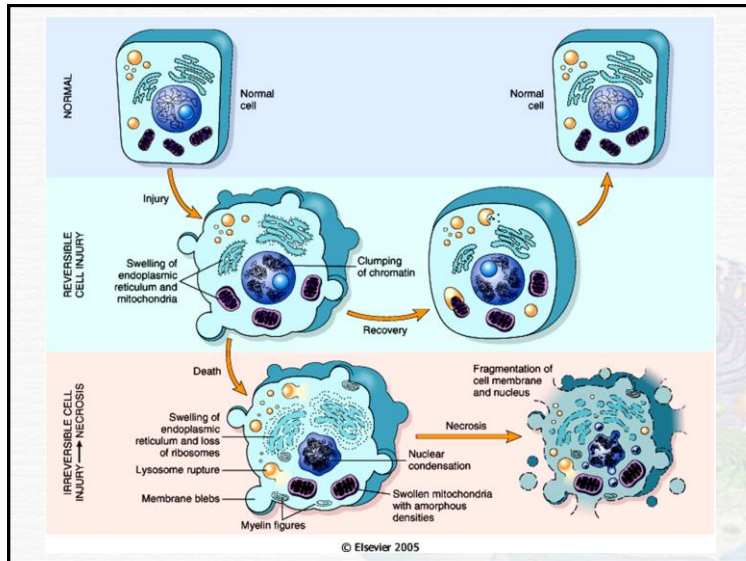
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Biochemical “point of no return”:

- Inability to restore mitochondrial function
 - phospholipase activation → mitochondrial permeability increases
- Plasma membrane defects-contributing factors
 - phospholipase activation → degradation of membrane phospholipids
 - lipid degradation products → membrane detergent effect
 - Ca^{2+} proteases → cytoskeletal degradation → membrane detachment



3 R's of success:

Respect for self,

Respect for others

Responsibility for all your actions

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QUESTIONS
???



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