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MATRIC NO: 17/mhs02/015
DEPT: Nursing Science
LEVEL: 300
OURSE: Cellular Pathology

1.a NECROSCOPY/NECROPSY:

A necropsy is the post-mortem examination of an animal to determine the cause of disease or death. It involves dissecting an animal and conducting a detailed examination of all organ systems. Necropsies are performed by veterinary pathologists, who are veterinarians with specialty training in the diagnosis of animal disease based on macroscopic and microscopic tissue examination, as well as the use of diagnostic tests.

Necropsy samples are often referred to other laboratory sections (e.g. bacteriology, virology, toxicology, and histology) for further testing. When all necessary tests have been completed, results are collated by the pathologist assigned to the case into a final written report that is mailed, faxed or emailed to the owner

Importance of Necroscopy

-Necropsy contributes to the body of scientific knowledge by increasing our understanding of anatomy and physiology in health and disease.

-Public health and regulatory veterinarians use the necropsy as a surveillance tool to monitor for emerging or foreign animal diseases.

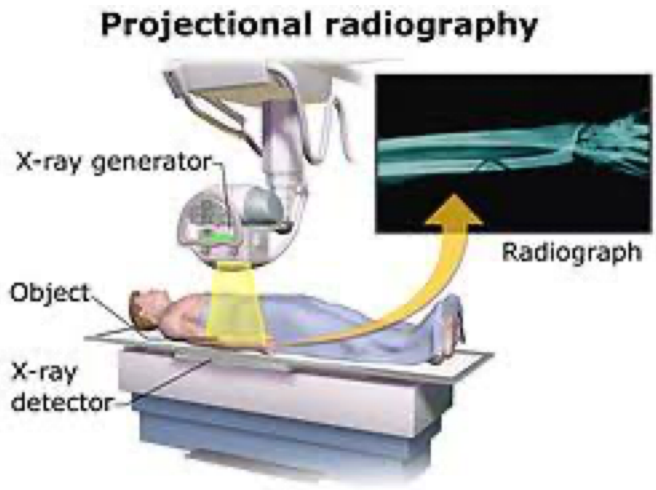
-Necropsy complements clinical medicine. Pre-mortem diagnoses can be confirmed, refuted or augmented on the necropsy floor, providing an invaluable educational tool for both clinicians and students.

-Necropsies save lives! They can alert us to the presence of diseases that may be transmissible to other animals (or humans!)

-In some cases, necropsy findings can give comfort or closure to an owner, especially in the case of a seemingly sudden or unexplained death.

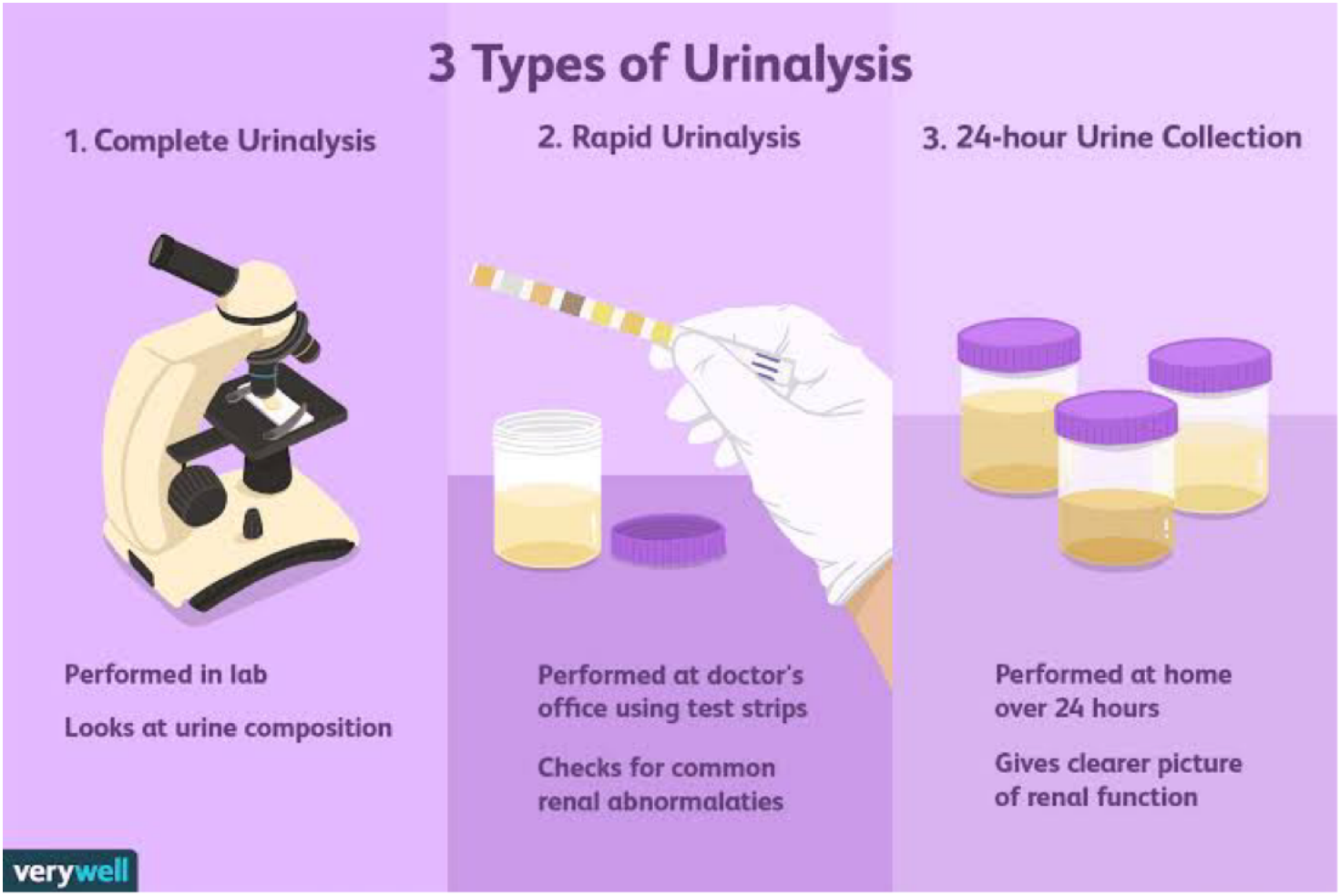
b) RADIOGRAPHY:

Radiography is an imaging technique using X-rays, gamma rays, or similar ionizing radiation and non-ionizing radiation to view the internal form of an object.
Other imaging modalities in radiography include:Computed tomography (CT), also known as a computerized axial tomography (CAT) scan, including CT angiography. Fluoroscopy, including upper GI and barium enema. Magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA).



Importance of diagnostic radiography
-it plays a huge role in disease management by giving physicians more options, tools, and techniques for detection and treatment. Diagnostic imaging allows for detailed information about structural or disease-related changes. With the ability to diagnose during the early stages, patients may be saved.

c) URINALYSIS:
This diagnostic technique identifies and measures the byproducts of normal and abnormal metabolism, that are eliminated from your body in urine.
Urinalysis consists of two distinct testing phases:
Chemical examination which tests chemically for a number of substances that provide valuable information about health and disease and
microscope examination, which identifies and counts the type of cells, casts, crystals, and other components (bacteria, mucus) that can be present in urine.
Complete urinalysis consists of three parts: Physical properties, chemical properties, and urine sediment findings.



Importance of urinalysis:

A urinalysis is used to detect and manage a wide range of disorders, such as urinary tract infections, kidney disease and diabetes. A urinalysis involves checking the appearance, concentration and content of urine. Abnormal urinalysis results may point to a disease or illness.

d) HAEMATOLOGIC TEST:

Hematology tests include tests on the blood, blood proteins and blood-producing organs. These tests can evaluate a variety of blood conditions including infection, anemia, inflammation, hemophilia, blood-clotting disorders, leukemia and the body's response to chemotherapy treatments.

The most common hematology tests are:

Full Blood Count Testing

Full blood count or FBC testing is a routine test that evaluates three major components found in blood: white blood cells, red blood cells and platelets. There are many reasons for a full blood count test, but common reasons include infection,

anemia and suspected haemato-oncological diseases.

White Blood Cells (WBC) Testing

White blood cells are responsible for assisting the body's defenses in fighting illnesses and disease. Knowing how many white cells are within the blood can prove invaluable for diagnosing and treating a range of conditions. Increased white blood cells are common in people fighting infection or suffering from anemia.

Red Blood Cells (RBC) Testing

The number of red blood cells in the body can increase through dehydration, stress and anxiety, or failure of the bone marrow, to name a few conditions. Decreased blood cells can be the result of receiving chemotherapy treatments, chronic inflammatory diseases, blood loss and some types of cancer.

Hemoglobin Testing

Without hemoglobin, oxygen would not be able to travel around the body. This oxygen-rich protein is essential to life, but it can increase or decrease due to a number of conditions. Dehydration, congestive heart failure and chronic obstructive pulmonary disease can all cause an increase in hemoglobin levels, while blood loss, anemia, liver disease and lymphoma can result in a decrease.

Hematocrit and Platelets

Hematocrit, or HCT as it is commonly known in medical circles, is the ratio of plasma to red blood cells. Plasma accounts for the fluid component in blood. HCT testing is usually carried out when hydration levels and anemia are suspected of causing problems. HCT levels can be affected in the same way as hemoglobin levels.

Index **Normal Lab Values**

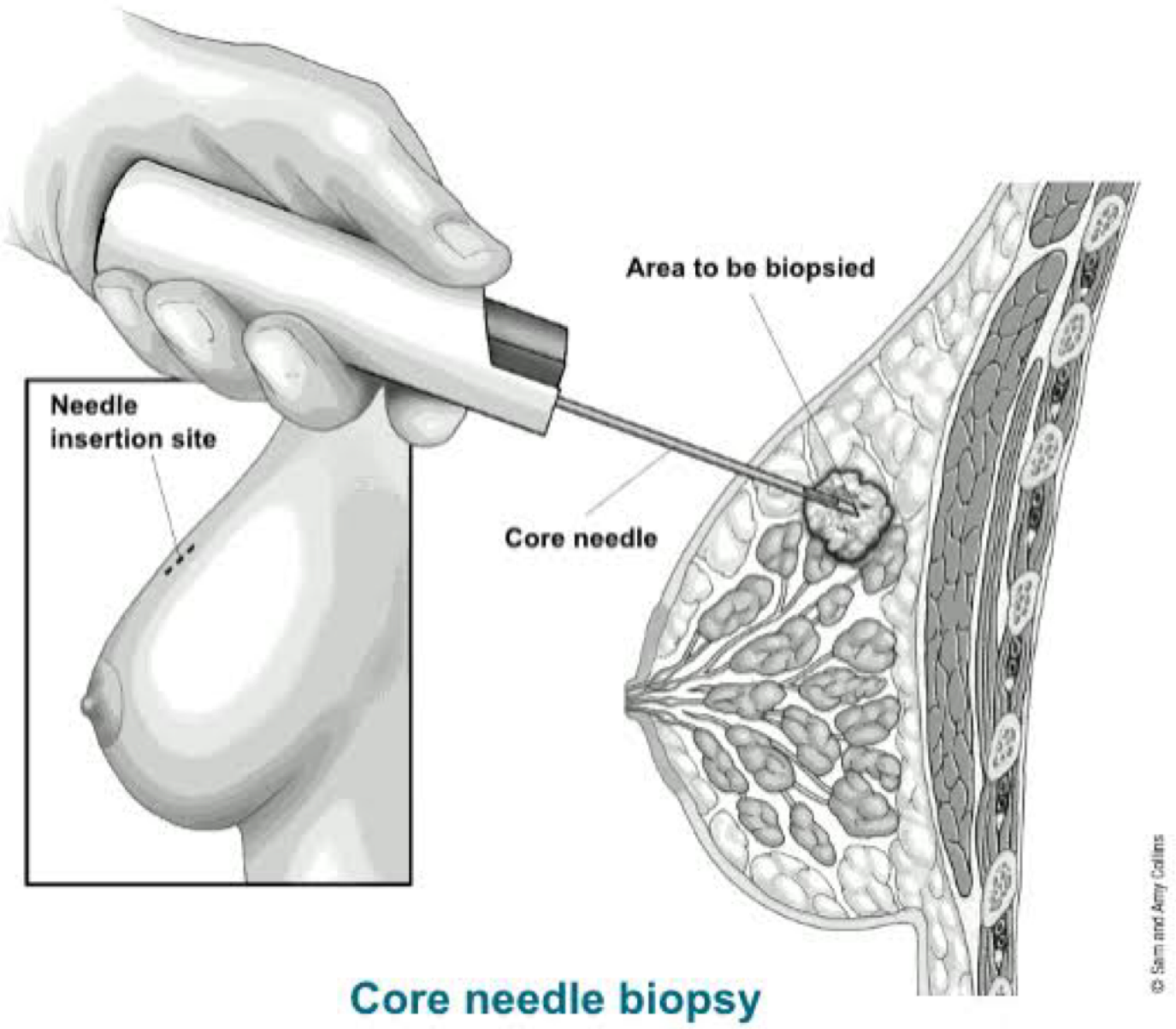
(Female)	
Hematology	
RBC (Male)	4.7 - 6.1 M/µL
RBC (Female)	4.2 - 5.7 M/µL
RBC (Child)	3.5 - 5.0 M/µL
WBC	4.5 - 11 K/µL
Hgb (Male)	14 - 18 g/dL
Hgb (Female)	12 - 16 g/dL
Hgb (child)	10 - 14 g/dL
Hgb (Newborn)	15 - 25 g/dL
Hct (Male)	40 - 50%
Hct (Female)	37 - 47%
Hct (Child)	30 - 42%
MCV	78 - 98 fL
MCH	27 - 35 pg
MCHC	31 - 37%
Neutrophils	50 - 81%
Bands	1 - 5%
Lymphocytes	14 - 44%
Monocytes	2 - 6%
Eosinophils	1 - 5%
Basophils	0 - 1%
Lipid Panel	
Cholesterol	Less than 200 mg/dL

e) BIOPSY:

A biopsy is a medical procedure that involves taking a small sample of tissue so that it can be examined under a microscope. A tissue sample can be taken from almost anywhere on, or in the body, including the skin, stomach, kidneys, liver and lungs. Biopsies can be used to investigate the cause of a person's symptoms or to help diagnose a number of different health conditions. Where a condition has already been diagnosed, a biopsy can be used to measure how severe it is or at what stage it is. For example, the results of a biopsy can show how severely an organ, such as the liver, is inflamed.

Biopsies are most often done to look for cancer, But biopsies can help identify many other conditions,the sample goes to a pathologist who analyzes the appearance of

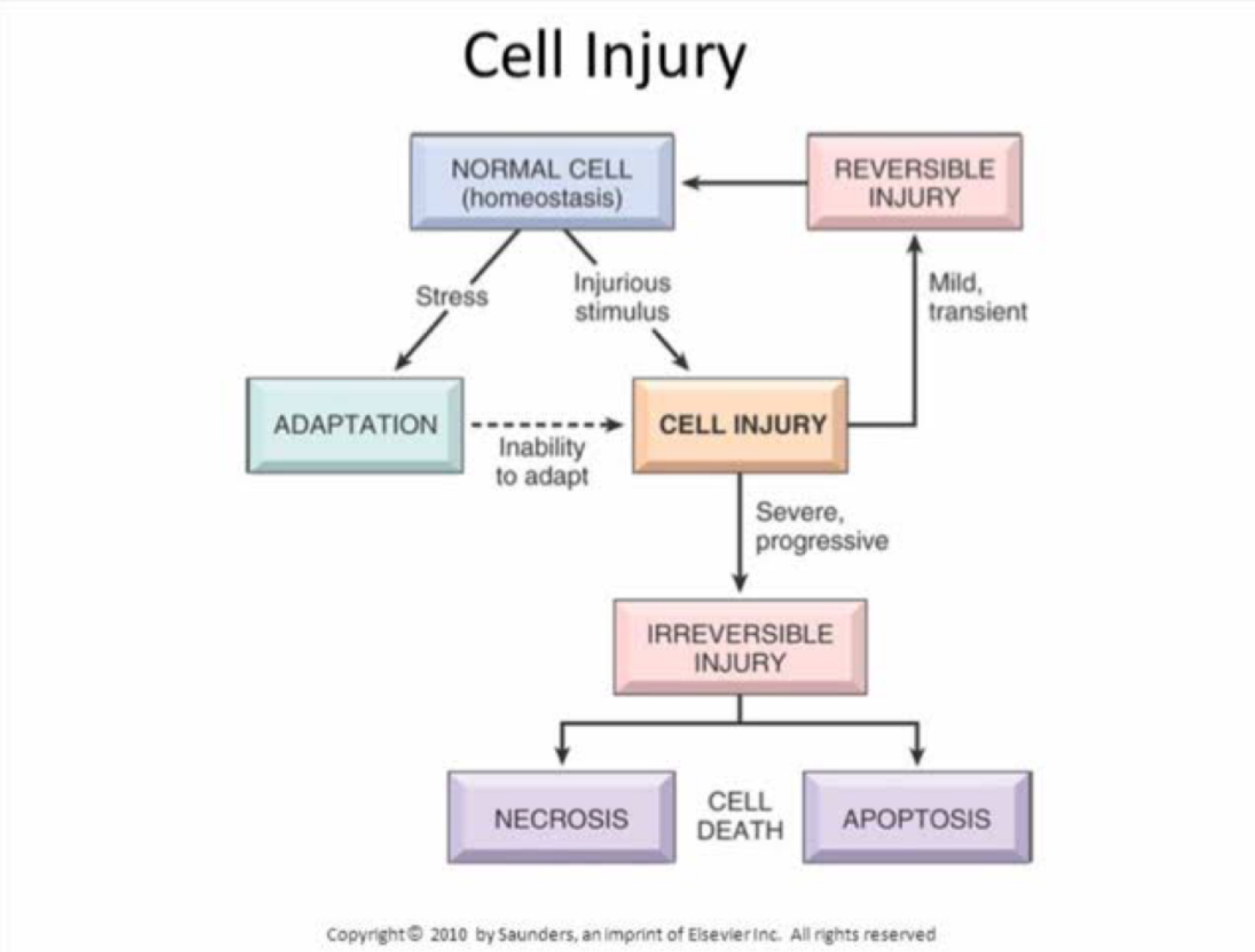
the cells under a microscope and determines whether the tissue that was removed is benign (noncancerous) or malignant (cancerous).
Most biopsies are needle biopsies meaning a needle is used to access the suspicious tissue.



Core needle biopsy

2.Cellular adaptation is the ability of cells to respond to various types of stimuli and adverse environmental changes. These adaptations include hypertrophy (enlargement of individual cells), hyperplasia (increase in cell number), atrophy (reduction in size and cell number), metaplasia (transformation from one type of epithelium to another), and dysplasia (disordered growth of cells).
When cells are injured or exposed to adverse environmental changes it may either be

reversible cell injury leading to adaption or irreversible cell injuries which occurs cells are not able to adapt to the adverse environmental changes, which leads cell death that occurs physiologically in the form of apoptosis, or pathologically, in the form of necrosis



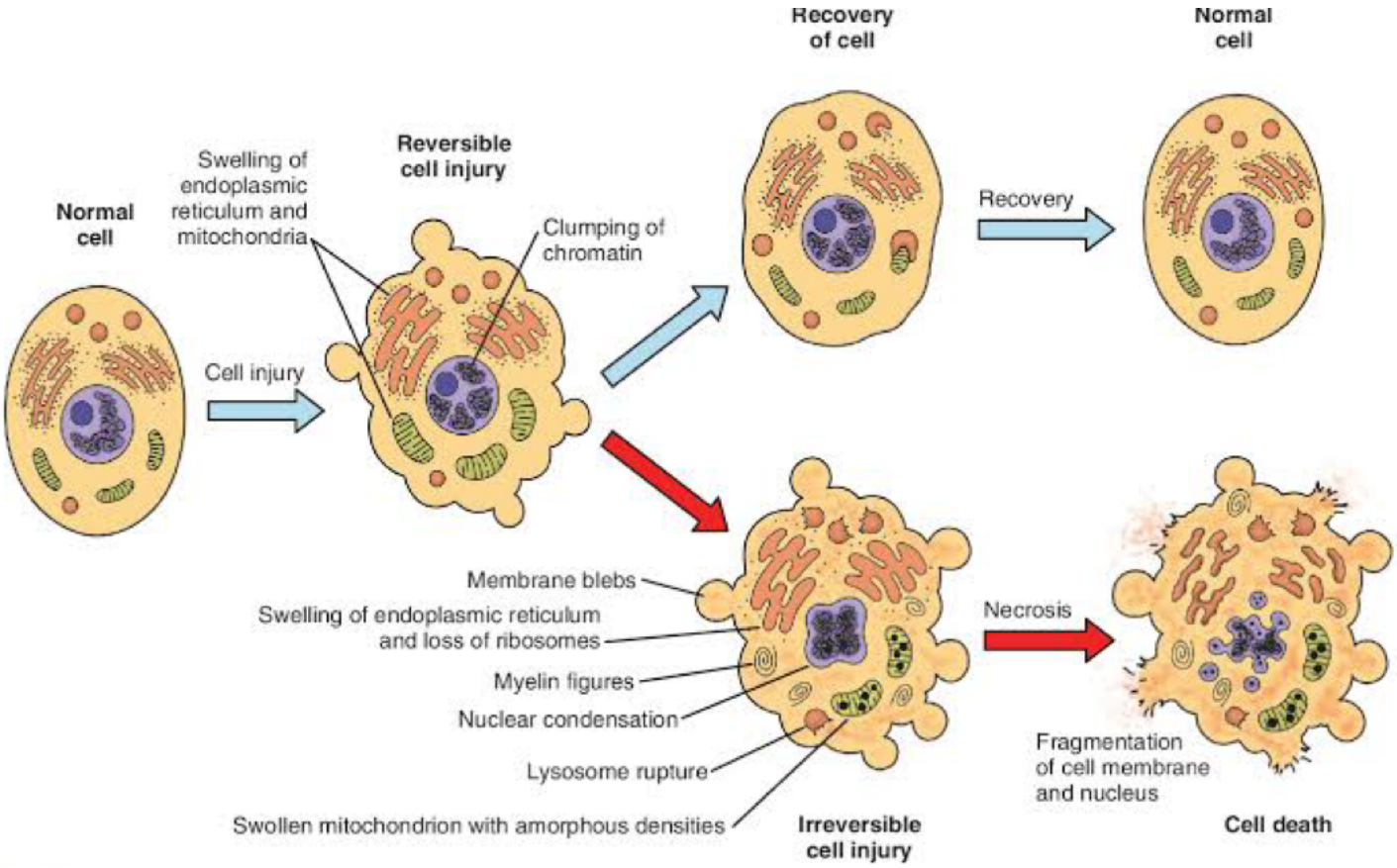


Figure 1-12 **Normal Cell and the Changes in Reversible and Irreversible Cell Injury.** Reversible injury is characterized by generalized swelling