**NAME: ADEYANJU OLUFUNMILOLA FAYOKEMI**

**MATRIC NO: 17/MHS02/008**

**COURSE: CELLULAR PATHOLOGY NSC 308**

**LEVEL: 300 LEVEL**

**DEPARTMENT: NURSING**

A

**FIVE DIAGNOSTIC TECHNIQUES USED IN PATHOLOGY ARE:**

**IMMUNOHISTOCHEMISTRY**: This offers several distinct advantages when compared to traditional methods. It is a technique that is rapidly used and expands the capability of the pathologist. It permits rapid agent identification. The technique employs specific antibodies, which localize to the antigens of the etiologic agent of interest. It is a sensitive and specific test methodology for many micrporganisms and they result in direct, highly interpretable visual evidence of the presence of an infectious agent within tissues. Specimen transport Is simplified, allowing retrospective studies and minimizing laboratory worker exposure to infectious agent due to the use of formalin-fixed tissues.

**AUTOPSY**: Also known as necropsy, post-mortem examination, obduction or autopsia caderverum. It is a surgical process that consists of a thorough examination of a corpse by the dissection to determine the cause, mode and manner of death or to evaluate any disease or injury that may be present for research or educational purposes. In the case of animals, necropsy is used. Autopsies are usually carried out by pathologists. In most cases, a medical examiner can determine the cause of death.

**HISTOPATHOLOGICAL TECHNIQUE:** This studies tissues under the microscope. During the study, the pathologist looks for abnormal structures in the tissues. The tissues used in this technique are obtained through biopsy. Biopsy can be incisional and excisional. Once the tissue is removed from the patient, it has to be immediately fixed by putting it into adequate amount of 10% of formalin before sending it to the pathologist. At the arrival at the pathology department, the pathologist will examine it macroscopically (naked eye examination) before it is taken for microscopic examination.

**CYTOPATHOLOGICAL METHODS**: There are different cytopathologic methods including:

 1. Fine-needle aspiration cytology (FNAC): In FNAC, cells are obtained by aspirating the diseased organ using a very thin needle under negative pressure. Virtually any organ or tissue can be sampled by fine-needle aspiration. The aspirated cells are then stained & are studied under the microscope. Superficial organs (e.g. thyroid, breast, lymph nodes, skin and soft tissues) can be easily aspirated. Deep organs, such as lung, mediastinum, liver, pancreas, kidney, adrenal gland, and retroperitoneum are aspirated with guidance by fluoroscopy, ultrasound or CT scan. FNAC is cheap, fast, & accurate in diagnosing many diseases.

2. Exfoliative cytology: Refers to the examination of cells that are shed spontaneously into body fluids or secretions. Examples include sputum, cerebrospinal fluid, urine, effusions in body cavities (pleura, pericardium, peritoneum), nipple and vaginal discharge.

3. Abrasive cytology: Refers to methods by which cells are dislodged by various tools from body surfaces (skin, mucous membranes, and serous membranes). Example: collection of cervical smears with a spatula or a small brush to detect cancer of the uterine cervix at early stages. Such cervical smears, also called Pap smears, can significantly reduce the mortality from cervical cancer. Cervical cancer is the most common cancer in Ethiopian women.

**URINALYSIS**: A series of diagnostic tests used primarily to evaluate kidney and overall urinary tract disease but also some endocrine diseases and acid-base balance. Example: a urine sample is examined under a phase contrast microscope using the Neubauer counting chamber.

B

CELLULAR ADAPTATION PRECEDES CELL DEATH

Cellular adaptation refers to changes made by a cell in response to adverse or varying environmental changes. The adaptation may be physiologic (normal) or pathologic (abnormal). There are four types which include: atrophy, hyperplasia, and metaplasia, hypertrophy.

ATROPHY: This is a decrease in cell size. If enough cells in an organ undergo atrophy the entire organ will decrease in size. An example is skeletal muscle atrophy a common pathologic adaptation to skeletal muscle disuse (commonly called "disuse atrophy"). Tissue and organs especially susceptible to atrophy include skeletal muscle, cardiac muscle, secondary sex organs, and the brain.

HYPERPLASIA: is an increase in the number of cells. It is the result of increased cell mitosis or division. The two types of physiologic hyperplasia are compensatory and hormonal. Compensatory hyperplasia permits tissue and organ regeneration. It is common in epithelial cells of the epidermis and intestine, liver hepatocytes, bone marrow cells, and fibroblasts.

HYPERTROPHY:  is an increase in cell size and volume. If enough cells of an organ hypertrophy the whole organ will increase in size. Hypertrophy may involve an increase in intracellular protein as well as cytosol (intracellular fluid) and other cytoplasmic components. For example, adipocytes (fat cells) may expand in size by depositing more lipid within cytoplasmic vesciles.

METAPLASIA: occurs when a cell of a certain type is replaced by another cell type, which may be less differentiated. It is a reversible process thought to be caused by stem cell reprogramming. Stem cells are found in epithelia and embryonic mesenchyme of connective tissue. A prominent example of metaplasia involves the changes associated with the respiratory tract in response to inhalation of irritants, such as smog or smoke.

**DIAGRAM ILLUSTRATING CELL ADAPTATION.**

. 