Pathology is the study of diseases.

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Pathology is a field of medicine that studies and diagnoses disease by examining surgically removed organs, tissues (biopsy samples), physiological fluids, and, in certain situations, the entire body (autopsy). The general anatomical make-up of a body specimen, the appearance of the cells utilising immunological markers, and chemical signatures in the cells are all factors to consider. Pathology also encompasses the related scientific study of disease processes, which investigates the causes, mechanisms, and scope of disease. Cellular adaptation to injury, necrosis (death of living cells or tissues), inflammation, wound healing, and neoplasia are all areas of research (abnormal new growth of cells). Pathologists specialise in a wide range of disorders, including cancer, and pathologists make the great majority of cancer diagnosis. Under a microscope, the cellular pattern of tissue samples is examined to identify whether they are malignant or non-cancerous (benign). Genetic research and gene markers are also used by pathologists in the diagnosis of many disorders.

Pathology in Surgery

Surgical pathology is the most important and time-consuming discipline of pathology, with a primary focuses on analysing tissues for conclusive illness diagnosis with the naked eye or under a microscope. Surgically removed specimens come from a variety of places, including minor skin biopsies, core biopsies for cancer diagnosis, and the operating room when tumours are removed. Surgical pathology entails macroscopic (gross) and microscopic (histologic) tissue investigation, with immunohistochemistry or other laboratory procedures used to examine the molecular characteristics of tissue samples.

Chemical fixation or frozen sectioning are used to prepare tissue sections for microscopic examination. Frozen section processing entails freezing the tissue and slicing the specimen into thin frozen slices that are put on glass slides. Slides treated by chemical fixation or frozen section are either stained with chemicals or antibodies to reveal cellular components before being seen under a microscope.

Autopsy

An autopsy is a highly skilled surgical operation performed by a pathologist that involves a comprehensive examination of a body in order to establish the cause and manner of death, as well as to assess any disease or injury that may be present. The primary goal of an autopsy or post-mortem examination is to ascertain the cause of death, the person's state of health prior to death, and whether any medical diagnostic or treatment administered prior to death was appropriate.

Cytopathology

The area of pathology known as cytopathology investigates and diagnoses diseases at the cellular level. It is most commonly used to assist diagnose cancer, but it can also be used to diagnose some viral infections and other inflammatory problems. In contrast to histopathology, which investigates complete tissues, cytopathology is typically employed on samples of free cells or tissue pieces that spontaneously exfoliate or are taken from tissues by abrasion or small needle aspiration.

Molecular Pathology

Molecular pathology is a relatively new field that has made significant progress in the last decade. It focuses on the investigation and detection of disease using molecules found in organs, tissues, and physiological fluids. Many diseases, such as cancer, are caused by mutations or variations in a person's genetic code, and clinicians can diagnose a disease and determine the best treatment by identifying specific characteristic mutations. As a result, molecular analysis is helping to pave the path for customised treatment by allowing us to forecast a patient's reaction to anti-cancer medication based on their genetic makeup. The discovery of molecular and genetic techniques to the diagnosis and classification of human tumours, as well as the design and validation of predictive biomarkers for disease prognosis and susceptibility to developing certain cancers in individuals, are all part of Molecular Pathology. The great sensitivity of molecular assays enables for the detection of very small tumours that would otherwise go undetected by other methods, resulting in earlier diagnosis, better patient treatment, and better survival results.]

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