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Diagnostic Radiology-Technology Used in Radiology

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Introduction

Diagnostic radiology's purpose is to identify diseases and injuries by the use of imaging techniques such as X-rays, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), ultrasound, and nuclear medicine modalities like Positron Emission Tomography (PET). A variety of radiologic approaches are employed in the medical discipline of radiology to diagnose and treat disorders [1]. All facets of radiological diagnosis are covered by diagnostic radiology, which also includes a variety of diagnostic and image guided treatment approaches (nuclear radiology, diagnostic ultrasound, magnetic resonance, computed tomography, interventional procedures, and the use of other forms of radiant energy) [2]. Diagnostic radiologists work mostly in hospitals and have a variety of subspecialties to choose from, such as mammography, nuclear medicine, chest and heart imaging, neuroimaging, and interventional vascular radiology. The job of the radiologist has expanded as a result of significant advancements in diagnosis as well as technical advancements that enable several interventional radiology techniques. The eye of medicine is a diagnostic radiologist [3].

Examples of diagnostic radiology include:

- Radiography (X-rays).
- Ultrasound.
- Computed Tomography (CT) scans.
- Magnetic Resonance Imaging (MRI) scans.
- Nuclear medicine scans.

Description

The relationship between diagnostic radiology and the human body

A diagnostic radiologist is qualified to examine and decipher pictures of all the body's systems and organs. Diagnostic radiologists can monitor the body's reactions to particular medical treatments in addition to assisting doctors in the diagnosis of diseases and ailments such as cancer, heart disease, infections, and broken bones [4].

Modern diagnostic radiology tools

The treatments for radiation therapy are carried out by radiologic technologists. The precise placement of patients and the production of high quality diagnostic images are the duties of radiologic technologists who conduct medical imaging tests in close collaboration with radiologists. When arranging patients on the examination table and modifying immobilization devices to get the best views of particular body parts, radiologic technologists are in direct contact with patients and are responsible for explaining operations [5]. Using his or her understanding of the method, the technician positions the imaging apparatus and modifies the apparatus' settings.

Utilizing radiation safety procedures, the technologist is also accountable for making sure that patient and team exposures adhere to ALARA (As Low As Reasonably Achievable) guidelines. A technologist employs radiation protection tools, such as shields and lead aprons, to avoid unneeded radiation exposure. A proper collimation is also established by the technician to reduce scatter radiation. Collimation is the technique of focusing the X-ray beam on the specific anatomic region needed for the procedure.

Computed tomography: In CT imaging, often known as a "CAT scan," a diagnostic radiologist creates high resolution images of body tissues, organs, and arteries using X-ray and computer technology. Multiple tissue types, including lungs, bones, soft tissues, and blood arteries, can be seen on a CT scan.

Radiography: pictures the interior of the body using electromagnetic radiation. X-rays are the most popular and widely used type of radiography. High-energy waves are projected onto the body during this operation by an X-ray machine. The waves are not absorbed by soft tissues like skin and organs, but they are by hard tissues like bones. The X-ray results are transferred by the equipment onto a film, which depicts the bones of the body in white and the remaining elements in black.

Nuclear medicine: Nuclear medicine creates two and three dimensional images of the internal organs and structures of the body to examine their function. It does this by using minute amounts of radioactive chemicals. When using CT imaging to assess medical issues, a nuclear scan may or may not be used.

Conclusion

By taking pictures of the body's internal structure and analyzing them for signs of disease, foreign objects, structural damage, or anomalies, it is possible to diagnose or treat patients. A radiographic procedure involves passing an X-ray beam through the patient's body.

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