



TYPES OF X-RAYS AND THEIR IMPORTANCE IN MEDICINE

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Abstract. *This article discusses in detail the physical nature of X-rays, their types, and their practical importance in medicine.*

The mechanism of X-ray generation, the differences between hard and soft X-rays, and their use in diagnostic and therapeutic processes are scientifically analyzed. The article discusses the advantages of X-ray examinations, safety issues, and their role in modern medicine.

Keywords: *X-rays, soft X-rays, hard X-rays, radiography, fluoroscopy, computed tomography, radiology, medical diagnostics.*

Enter

X-rays are a type of electromagnetic wave with a short wavelength and high permeability. These rays were discovered in 1895 by German scientist Wilhelm Conrad Roentgen, and marked a significant turning point in the development of medicine. Today, X-rays are widely used in the detection, diagnosis, and in some cases, treatment of diseases.

The physical nature of X-rays

The development of technical progress in the 21st century cannot fail to have its impact on the medical field. It serves as a reason for the increasing demand for medical equipment and devices for early detection of diseases before their symptoms appear. When it comes to human health, it allows for easy and quick detection of possible diseases and obtaining a clear picture of various bone-related traumas. Our current article will shed light on the biological and chemical effects of radioactive substances, their negative consequences, and the achievements achieved through their use in medicine. Examples such as diagnostic examination and accurate diagnosis through the use of X-rays in medicine will be considered.

X-rays are high-energy electromagnetic rays produced by the collision of accelerated electrons with a metal anode in an X-ray tube. These rays pass through living tissue to varying degrees, allowing images of internal structures.

Types of X-rays

X-rays are mainly divided into two types based on their energy and wavelength:

1. Soft X-rays

Soft X-rays have relatively low energy and longer wavelengths.



They are mainly used in the examination of superficial tissues.

Importance in medicine:

Skin and soft tissue examination

Imaging of teeth and jawbones in dentistry

Breast examination (mammography)

2. Hard X-rays

Hard X-rays are high-energy and have the ability to penetrate deep tissues.

Importance in medicine:

Identifying bone fractures

Examination of the lungs, heart, and internal organs

Detection of tumors and pathological changes

X-ray examination methods.

Radiography

This is the most common X-ray examination method, providing two-dimensional images of bones and internal organs.

Fluoroscopy

It allows for real-time observation of moving organs. For example, it is used to examine the gastrointestinal system.

Computed Tomography (CT)

CT creates a layered (cross-sectional) image of organs based on a large number of X-ray images and has high resolution.

The importance of X-rays in medicine

X-rays perform the following important functions in medicine:

Early diagnosis of diseases

Planning of surgical operations

Controlling the treatment process

Identifying trauma and internal injuries

X-ray safety

X-rays belong to the group of ionizing radiation, therefore, their use requires strict adherence to safety rules:

Keeping inspection time to a minimum

Use of protective equipment

Precautions to be taken by pregnant women.

X-rays are charged particles or

Electromagnetic radiation resulting from the interaction of photons with the atoms that make up the medium. Their wavelengths can range from 10^{-14} m to 10^{-7} m. X-rays were discovered by V. K. Roentgen in 1895. Roentgen called these rays X-rays (they are still called X-rays in some countries). They appear as a result of the deceleration of high-speed electrons in matter. X-rays are actually produced using an X-ray tube.



Summary

X-rays are an important diagnostic tool in modern medicine. Their various types and examination methods allow for accurate and rapid diagnosis of diseases. At the same time, the rational and safe use of X-rays is important for maintaining patient health

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