



## CHARACTERISTICS OF RONTGEN RAYS

**Urmanova Gulbahor Urunbaevna**

Assistant professor of the Tashkent Pediatric  
Medical Institute (scientific consultant)

**Abdusalomov Jawokhir son of Bozorjon**

Student of the Tashkent Pediatric Medical Institute

<https://doi.org/10.5281/zenodo.10820974>

In 1895, German physicist Wilhelm Konrad Rontgen observed that when an electric current was passed through a glass container (tube or tube) filled with liquefied gases, the tube vibrated. He closes the Rontgen tube with a cardboard box and is about to turn off the light and go home when he sees a light on the table.. It was green and the cyanide of barium was precipitated. This substance had the property of radiating when light fell on it. But the room is completely dark, and he thinks that the cathode ray tube is the cause of the crystals' radiation. How did the faint light of the tube pass through the cardboard box?!

The scientist does not go home for 7 days, makes a screen and continues the experiment by placing barium crystals on cardboard. A thick book, spruce board, aluminum, foil, copper plate, etc. are placed between the screen and the tube. he witnesses the passing of the light when he takes his turn. And when the rays fall on the luggage and the purse, strange shadows are formed on the screen. For the experiment, Roentgen even calls his wife. This gives rise to the famous picture of the ringed hand claw. His wife screams: "I saw my own death!".

The inventor announced this unique physical innovation on January 23, 1896. His lecture impressed not only scientists, but also representatives of other fields and even ordinary people.

Paid rooms have appeared in cities for those who want to take pictures of their skeletons. But this news made some people suspicious. "What a shame! Rays can pass through clothes and make a person look naked!" the newspapers wrote. Some fraudsters have started selling underwear that protects against the rays. Later, the distribution of the amount of rays was studied. Rontgen rays are useful for finding contraband, checking cargo that cannot be opened at customs.

In 1901, Roentgen received the world's first Nobel Prize in Physics, but did not attend the award ceremony. The prize will be sent by mail. He called his rays "X-rays", that is, unknown rays, because the scientist could not clearly explain their nature. The discovery was made 15 years after its discovery, and since then





"X-rays" have been called Roentgen rays in his honor. During the First World War, when the German government appealed to the population to help the state with money and valuables, W. Roentgen gave all his savings, including the Nobel Prize.

Currently, some fields of medicine cannot be imagined without roentgen rays. For example: Roentgen diagnostics and Roentgen therapy.

Roentgenodiagnostics is the detection of diseases of various organs and systems on the basis of information obtained in an Roentgen ray examination.

Currently, roentgendiagnostics include:

Roentgenoscopy; Radiography; Digital radiography; Fluorography; Roentgen microscope; Roentgen detector; Radiology; Roentgen tomography (CT) and others.

It is accepted to use photons with an energy of 60-120 keV for Roentgen diagnostics. At such energies, the mass coefficient of attenuation is mainly determined by the photoeffect.

Absorption of Roentgen rays does not depend on how atoms are combined in matter. Different tissues absorb Roentgen radiation to a different degree, allowing to see the image of the organ in the human body in a shadow projection.

Roentgenoscopy is a dynamic examination method using roentgen rays, which allows monitoring the state of internal organs in real time and choosing the best projection for the image. In this case, the image is recorded on an Roentgen ray luminescent screen. That is, the inspection is carried out using a monitor. To obtain reliable information, the roentgenogram of the stomach is performed only on an empty stomach, so it is often prescribed in the morning. Immediately before the examination, the patient is asked to drink a contrast liquid, such as barium sulfate. In some cases, the stomach may need to be inflated with air. In such cases, in addition to the contrast, soda solution is added. As the liquid moves through the stomach, a series of images, the roentgenogram, are taken that show irregularities in the surface and structure of the stomach and esophagus. The doctor analyzes the images of these roentgenogram and makes a diagnosis based on this.

A radiograph is a photograph using roentgenogram. The clarity of the image on the screen and the exposure time on the photographic film depend on the intensity of roentgen radiation. If this radiation is used for diagnostic purposes, its intensity should be low to avoid adverse biological consequences. Therefore, there are a number of technical devices that improve the clarity of the





image when using low-intensity roentgen radiation. Examples of such devices are electronic-optical converters. In this case, a lens with high light power is used for taking pictures, and the finished pictures are viewed in a special magnifier.

### References:

1. Remizov A.N. «Tibbiy va biologik fizika». // Darslik. 2005;
2. Ремизов А.Н. «Медицинская и биологическая физика». // Учебник, 2018;
3. Ремизов А.Н. «Медицинская и биологическая физика». // Учебник. 2016;
4. Raqamli rentgen uskunasi aholiga beminnat hizmat ko'rsatmoda. [https://ssv.uz/uz/news/2022.](https://ssv.uz/uz/news/2022;);
5. Рентгенотерапия [https://www.dr-kazansky.com/2022.](https://www.dr-kazansky.com/2022/);
6. [https://biographe.ru/uchenie/wilhelm-rentgen.2021.](https://biographe.ru/uchenie/wilhelm-rentgen.2021;);
7. [https://ru.wikipedia.org/wiki/ Компьютерная томография \(КТ\)2021.](https://ru.wikipedia.org/wiki/Компьютерная_томография_(КТ)2021)
8. [https://ru.wikipedia.org/wiki/ Рентген компьютерная томография \(РКТ\)2022.](https://ru.wikipedia.org/wiki/Рентген_компьютерная_томография_(РКТ)2022)

