

A History of Radiology

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W.C. Roentgen discovered x-rays during physics experiments in his laboratory in Wurzburg in 8th November 1895. He received the first Nobel Prize for Physics in 1901. Today 100 years later we know that this discovery affected medical diagnosis and therapy as no other before. Millions of people owe their health or their lives to the application of these x-rays. The discovery led to a separate medical discipline, brought medicine in the 20th century into the x-ray age- and set into motion an unparalleled process of medical and technical development.

Eastman introduced radiographic film in 1918. Fuji developed CR technology in 1980. The first English book on Chest Radiography was published in 1905. The last 25 years have been dominated by computed tomography and the possibilities that this technology created. Once acquired, a data set can be processed as desired via computer and reconstructed into images from which physicians of practically all disciplines can make an accurate diagnosis.

Roentgen's discovery was soon followed by the display of vessels. Angiography was first performed in 1923. A year later Brooks used sodium iodide as the new contrast dye.

In 1929 Forssmann inserted a catheter into his own heart by way of the cubital vein. Greg Schoenander developed the first cassette changer in 1946. The film changer was introduced by Sjogren in 1953. Over the years, ultrasound, CT and MR have developed non-invasive methods for vessel display. Despite these newcomers, angiography remains the diagnostic and therapeutic method of choice.

Hounsfield and Ambrose published their first paper on computed tomography and took the medical industry by storm. Godfrey Hounsfield invented CT in 1972. Comack and Hounsfield received Nobel Prize in medicine for CAT. Finally, a method had been found to image soft tissue. Ventricles of the brain could be distinguished from the brain. 3D reconstruction was possible by volume scanning with spiral CT. The availability of multi-slice CT technology has begun to change the traditional perception of CT imaging. In CT, distinction is traditionally made between transverse and in plane resolution. This distinction

is based mainly on historical reasons. Before the introduction of spiral CT, transverse resolution was determined by slice collimation only, while the convolution kernel determined in-plane resolution. With spiral CT, collimation is no longer the only factor determining transverse resolution, but the spiral interpolation function also has to be considered. This has been a first step towards decoupling image slice width from beam width as determined by the collimation. MDCT represents a further step in this direction, allowing for reconstruction of arbitrary slice widths from a given collimation [as long as the desired slice width is not smaller than the collimation]. In many applications, narrow collimation data is recommended independent of the slice width desired for primary viewing. The distinction between transverse and in-plane resolution will gradually become a historical curiosity, and the traditional axial slice will lose its clinical importance. It will be replaced by interactive viewing and manipulation of isotropic volume images, with only the key slices or views in arbitrary directions used for filming or stored for diagnostic purposes.

Whole body could be imaged without radiation by use of MRI since 1980. The first clinical use of MRI took place in England in 1967. The first human MRI images were produced in 1977. FDA approved MRI for commercial use in 1984.

Joliot and Curie discovered artificial radionuclides. Nuclear Medicine was discovered by accident in 1946. Anger camera was introduced in 1958. Kuhl introduced emission reconstruction tomography in 1962. PET and SPECT were discovered in 1970 and 1989 respectively. Clinical use of PET has been going on since 1988.

Hertz compound was discovered in 1958. Routine ultrasound has been introduced since 1968. Pulsed Doppler was introduced in 1978.

The challenge we are facing today is one of providing cost effective, yet optimal patient care. Digital system and networks have laid the foundation for this challenge. The age of digital imaging has begun since 1978. Digital archives enable high speed, reliable access to images and diagnoses of all imaging system directly at the workstation. Experts living far away can be consulted via teleradiology.

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