

PRESS RELEASE

What is nuclear medicine?

(Vienna, 4 March 2010) Many people associate the term, nuclear medicine, with dangerous radiation. These concerns are unfounded. While it is true that radioactive substances are used, the exposure doses to the patient are so low according to the European Association of Nuclear Medicine (EANM) that they do not call into question the benefits of the diagnostic and therapeutic possibilities of nuclear medicine. The average exposure to radiation from a nuclear medicine examination corresponds to the radiation dosage a person receives from the environment over the course of a year. Radioactive iodine, for example, has been used in medical treatment for over 60 years without any evidence of side effects during this long period.

Nuclear medicine procedures play a vital role in diagnosing and treating cancer as well as cardiac, neurological and endocrinological diseases.

In nuclear medicine **diagnosis**, metabolic processes are made visible by administering radioactive pharmaceuticals – so-called radiopharmaceuticals – to patients by injection into a vein or skin, in tablet form or by inhalation. These substances accumulate in certain parts of the body where they make metabolic processes visible. By using special examination equipment, so-called gamma cameras, the weak radiation can be made visible and converted into a diagnostic image, a scintigram, which shows the spatial distribution of the diseased cells in the body.

In nuclear medicine **therapy**, special radiation with short-range effects is used. The substances administered reach the diseased cells and destroy them by radioactive radiation. The best-known example of this is radioiodine therapy for thyroid patients.

Radiopharmaceuticals consist of a radioactive particle, the radioisotope, incorporated in a transport molecule that is directly involved in the metabolic process to be examined and serves to transport the isotope. Dextrose is used for this purpose in cancer diagnosis, for example, because cancer cells have a metabolic rate approximately ten times greater than healthy cells. The diagnostically or therapeutically effective radioisotope is thus smuggled by the transport molecule to its respective destination where it can make visible early pathological changes, even at a molecular level, or, in addition, destroy individual cancer cells located far apart from each other.

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