

## Computer tomography (CT)

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In the case of X-ray CT it is well known that a cross-sectional image of the patient free of disturbing shadows is reconstructed from a multitude of projections. A transformation formula stated by Radon as far back as 1917 supplies the theoretical basis for this. This formula can be derived directly and plausibly without the round-about method of the Fourier transformation.

The simple dual-motion machines were developed further into fan-beam machines in order to satisfy the demand for shorter and shorter scan times. The scan times achievable nowadays of a few seconds must nevertheless still be reduced by more than one order of magnitude for radiography of the beating heart. It is questionable if the known attempts to realize this are practicable.

Attempts to transfer the X-ray CT procedure to other types of radiation lead in the rule to considerable difficulties. In nuclear diagnosis these are in part the basic problem of the self-absorption of the radiation and partly the considerable organizational and financial difficulties connected with making radionuclides available. Apart from image quality impairment through a multitude of physical interference effects, the limited range of application conceivable stands in the way of the use of ultrasound. Fundamental objections can also be raised against rheographical methods (undefined radiation paths) and the application of microwaves (inadequate penetration depth). A real break-through with non-ionizing radiation is to be expected, one can assume, with the highest degree of probability from nuclear spin tomography. The image quality already obtainable currently is extremely encouraging with this although diagnostic relevance has still to be proven.