

Radiotherapy and radiation oncology: the right treatment is what counts

The Department of Radiation Oncology at Heidelberg University Hospital is a state-of-the-art centre for radiation oncology and cancer research. It treats patients with malignant and benign tumours and various functional disorders.

Professor Jürgen Debus, Medical Director of the Department of Radiation Oncology at Heidelberg University Hospital



Over the course of its 100-year history, the centre for radiation oncology and tumour research has become one of the world's largest and most modern facilities for radio-oncology and radiotherapy.

Radiation oncology is one of the three main pillars of cancer treatment together with surgery and chemotherapy.

More than 3,500 people are treated at the centre every year by specialist doctors and nurses, on both an inpatient and outpatient basis. All modern radiotherapy procedures for the treatment of tumours are offered at Heidelberg University Hospital. The department currently has eight radiotherapy systems including two tomotherapy units (which surround the patient like a CT scan), plus a facility for intraoperative radiotherapy in the departments of surgery and gynaecology. In addition, we offer the complete spectrum of brachytherapy, in which a localised radiation source is positioned near the tumour.

The Heidelberg Ion Therapy Centre (HIT), the only centre of its kind in Europe, represents a continuation of a long tradition of precision radiotherapy, which was developed in Heidelberg and is now a routinely performed

clinical procedure. Professor Debus and his team are proud that they have been able to 'close the gap' by treating patients whose tumours would have previously been regarded as incurable, thereby also establishing the scientific framework for new cancer treatments. The HIT celebrated its second anniversary in November 2011 – for the clinic, of course, it was business as usual. In the last two years, around 600 cancer patients have been successfully treated there.

The pioneering efforts of doctors, scientists and technicians, the perseverance of all involved and the entrepreneurial spirit of Heidelberg University Hospital and its partners have yielded tremendous results – for the good of patients and scientific progress.

The HIT is a unique treatment facility. Ion therapy, consisting of protons or heavy ions, can be applied to tumours that are located particularly deeply in the body or have been resistant to conventional radiation therapy.

The right dose

The unit of measurement for dosage in radiotherapy is Gray (Gy), named after the English physicist and radiologist Louis Harold Gray (1905-1965). The dose required to eradicate a tumour depends on how the tumour reacts to radiation. Usually the dose is between 30 and 70 Gy, although it is adjusted to the individual patient and illness and is determined by radiotherapists prior to treatment. Depending on the patient's tolerance of radiation therapy and the reaction of the tumour, small changes can be made during the course of the therapy.

How does radiotherapy affect tissue?

Before the actual radiotherapy begins, doctors and medical physicists work closely together to plan the specifics of the treatment based on the patient's individual situation. During the radiotherapy itself, the radiation kills cancer cells by destroying their DNA. A course of radiation treatments, known as fractions, is necessary to achieve this. The intervals between radiotherapy sessions are scheduled so that healthy tissue is able to recover and repair damage caused by the radiation. Cancer cells cannot do this as quickly, which means that the radiation damage from each treatment builds up in the tumour until it finally destroys it.

We are always striving to further improve our treatment strategies through numerous internationally renowned projects, through the Clinical Cooperation Unit for Radiation Oncology at the German Cancer Research Centre (DKFZ) and by developing the National Centre for Tumour Diseases (NCT) along the lines of the Comprehensive Cancer Centres in the US.