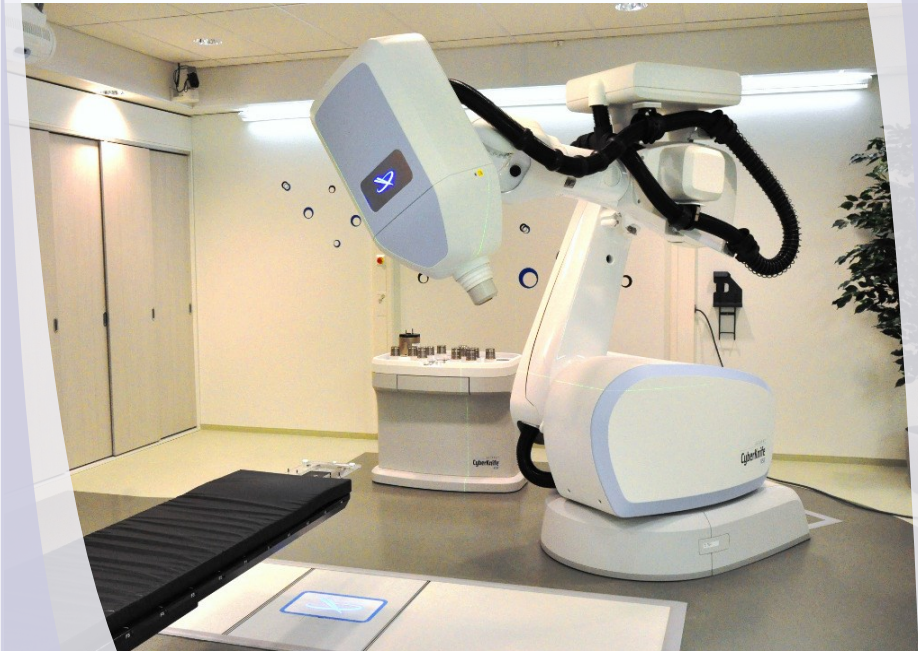




# *CyberKnife*<sup>®</sup>

*Patient Brochure*



*Robotic stereotactic radiotherapy  
at Kuopio University Hospital*

## Robotic Stereotactic Radiotherapy

The first CyberKnife robotic radiosurgery system in Scandinavia is located at the Cancer Center of Kuopio University Hospital (KUH).

CyberKnife is a safe and effective stereotactic radiotherapy delivery system, which can be used to treat both benign and malign tumors anywhere in the body.



The CyberKnife system is based on a small linear accelerator (LINAC) mounted on a flexible robotic arm. With robotic technology radiotherapy can be focused on to a desired point within an accuracy of even 0.5 millimeter from several different directions.

The treatment system also includes a treatment couch and ceiling mounted x-ray imaging sources. The X-ray imaging is used for the system to correct possible changes due to the patient's movement during the treatment. The robotic arm can follow the target in spite of the movement caused by a patient's breathing.



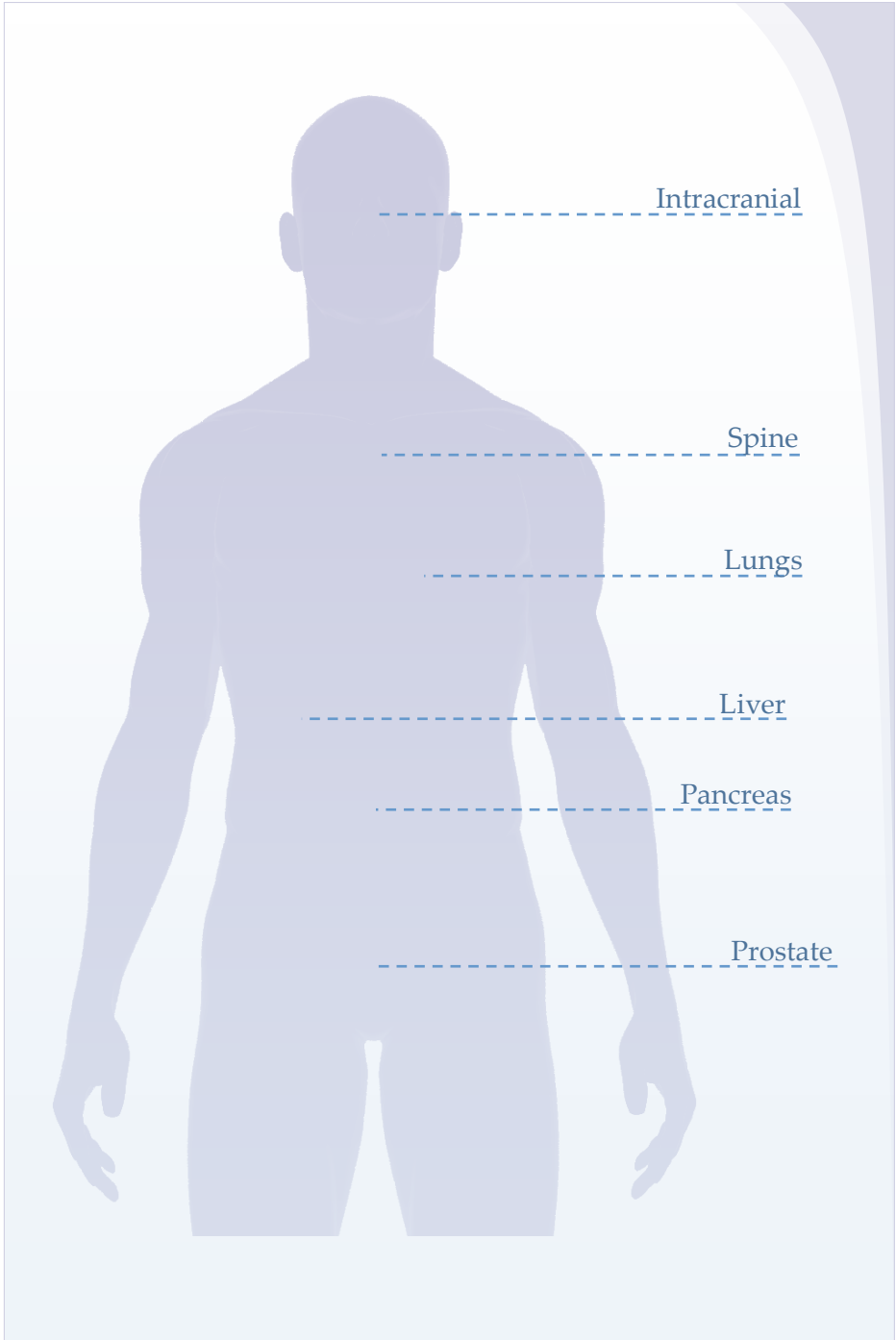
## Who Can Be Treated With CyberKnife?

Definite and relatively small (<7 cm) tumors are suitable for treatment with CyberKnife. Most typical targets are tumors in the brain, spine, prostate and lungs. Tumors in the liver, pancreas and kidneys as well as single, difficultly located tumors or metastasis can also be treated with CyberKnife.

With its accuracy CyberKnife is especially suitable for treating tumors in the brain, spine and prostate. CyberKnife is also used for treating benign neurosurgical diseases, such as different meningiomas and vascular malformations.

For example, when treating prostate cancer with conventional radiotherapy, the treatment may last up to 36–39 times. With CyberKnife the same effect can be achieved within 5 treatments.

The disease and its grade as well as location affects always the decision, which treatment is the most suitable. Ask your doctor if CyberKnife treatment is suitable for you.



## Patient Friendly Treatment

Radiotherapy is performed within multi-professional working groups, which include doctors, physicists and radiographers. During the treatment, the patient's individual needs and hopes are considered.

The benefits of CyberKnife treatment are most of all its patient friendliness and accuracy, which makes it possible to give larger doses of radiotherapy in one treatment visit. Due to a larger dose per visit, CyberKnife treatment has only a few visits (typically 1–6 visits, depending on the disease).

Because of CyberKnife's accuracy, healthy tissue around the treated target can be protected very effectively. Side effects caused by the treatment are individual. When treating with CyberKnife, occurring of side effects is less than when treating with conventional radiotherapy.

The CyberKnife treatment is easy and painless for the patient. Special recovery time is not needed after the treatment period.

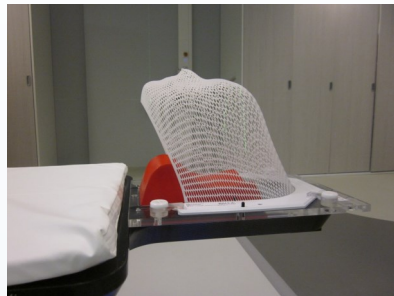


## Treatment Process

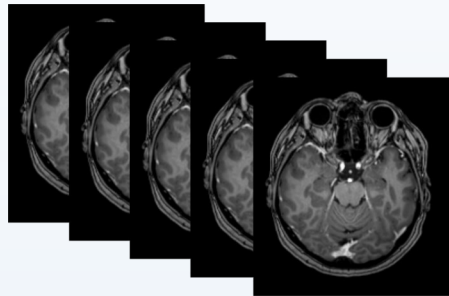
The treatment always demands a referral from a doctor. An oncologist always evaluates the patient's suitability for the CyberKnife treatment. When treating neurosurgical targets the doctor in-charge is a neurosurgeon.

While treating intracranial targets, the thermoplastic mask will be created to keep the head still during the treatment.

Certain treatments require fiducial markers inside the tumor or its proximity and they are placed in local anesthesia. These markers are used to tracking the target position during the treatment.



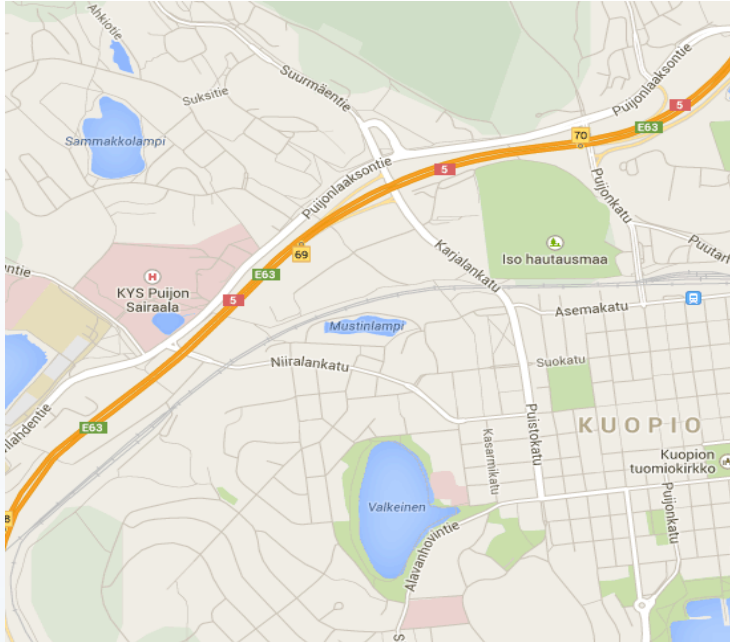
Radiotherapy always requires planning pictures from the treatment target. These planning pictures will be taken with a CT-scan. MRI may be also necessary. The actual treatment begins about a week after the planning pictures have been taken.



In the treatment the patient is positioned to the treatment couch exactly in the same position as in the CT-scan. The patient's position should be relaxed for staying still during the treatment is easier. While the treatment is on, breathing can be normal. At the end of the treatment period the patient will have an appointment with a doctor where among other things the follow-up location and the date are set.



## Contact Information



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