FLASHKNiFE
PMB

FLASH Radiation Therapy

Electron Beam FLASH Radiotherapy System for Clinical Investigations

Combining an ultra-high dose rate electron beam linear accelerator, with an interactive robot on a mobile base, FLASHKNiFE helps translate FLASH radiation therapy into clinical practice and gives patients access to a more tolerated and better cancer treatment.

Together with surgery, radiation therapy is one of the main treatments for cancer. Intensive research as well as great technological advances have made radiotherapy more powerful and more efficient on tumors. However, conventional radiotherapy is still limited by the side effects caused to healthy tissues, and certain tumors remain resistant to radiotherapy.

FLASH radiotherapy, for sparing healthy tissues and expanding indications

Today, around 30% to 40% of patients are resistant to conventional radiotherapy treatment. Moreover, there are many radiation-induced side effects and damages to healthy tissue surrounding the treated area. These constraints severely limit the radiation dose given to the patient, therefore impacting treatment efficacy and lowering survival rates.

By significantly reducing the treatment time, from several minutes to a fraction of a second, FLASH radiotherapy can give a greater dose of radiation in a single session, with less side effects. It provides a more efficient and better tolerated outcome in cancer treatment, while also expanding potential indications and widening the therapeutic window.

FLASH radiotherapy has been tested in several pre-clinical and clinical studies, including the treatment of a first patient, and is shown to have a reproducible effect of sparing healthy tissue, while still efficiently destroying cancer cells.

FLASHKNiFE, a system designed for external and intraoperative radiotherapy

Ultra-high dose rate 10 MeV radiation head, able to deliver dose rates up to 350 Gy/s

Interactive 6-axis robot to position and align the electron applicator close to the tumor

Mobile base to easily move the system inside and out of operating rooms

A breakthrough solution to current limitations in radiotherapy

FLASHKNiFE combines usability, flexibility and FLASH mode, for external and intraoperative radiotherapy.

The treatment can be given in a single session.
Conventional radiotherapy treatment is usually given in 5 to 20 sessions spread out over several weeks, involving many trips to the medical center. FLASH radiotherapy is given in a single session, providing a cost-saving solution.

FLASH radiotherapy decreases the toxicity on normal tissues.
This allows to increase the doses given to the patient, also called dose escalation, which provides a better treatment and expands the indications.

FLASHKNiFE can be used for several external and intraoperative radiotherapy indications.
The degrees of freedom of the system are such that it can be used in most patient and table configurations and specialties: visceral, head & neck, and gynecology. It allows intraoperative radiotherapy to treat the deepest and least accessible tumors.

Patient comfort and safety are improved.
The patient receives their treatment in one single session, suffers from less side effects and benefits from a higher treatment efficiency.

Scientific literature on the FLASH effect:

Located near Aix-en-Provence, in France, PMB is a 130-employee SME. With a strong expertise in brazing, the company designs and manufactures complex mechanical assemblies and components (ceramic-metal, radio-frequency…) and linear particle accelerators. PMB is part of the industrial group ALCEN, working in the fields of Defense & Security, Energy, Medical & Healthcare, Aeronautics & Space and Large Scientific Instruments.

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