
THERYQ

FOR
HEALTH

pioneers in **flash radiotherapy**

Introducing A Revolution in Cancer Treatment

FLASH Radiation Therapy

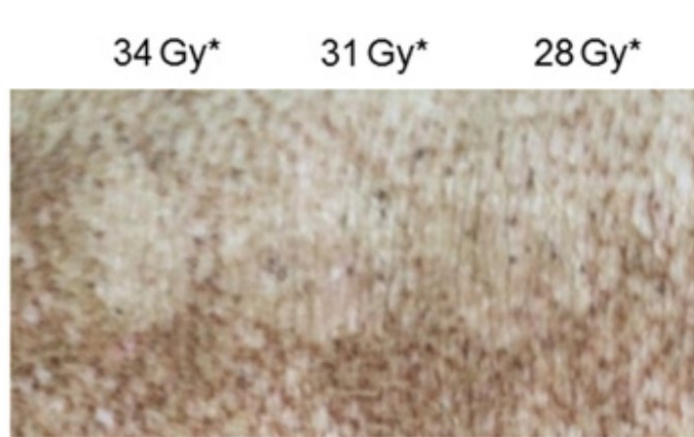
Philippe Liger, Radiotherapy Product Manager at THERYQ

A Revolution in Cancer Treatment

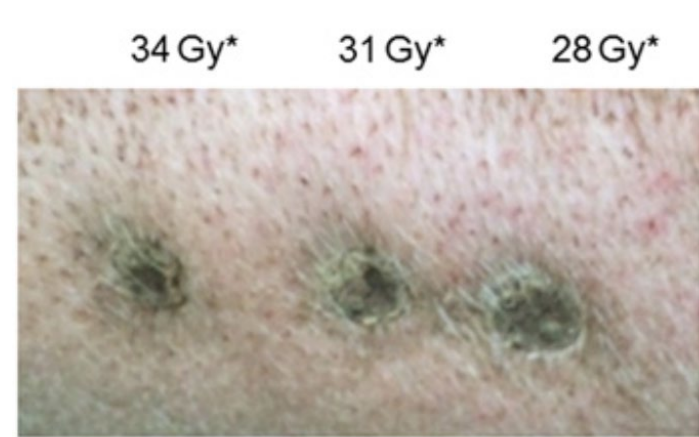
- With 2 FLASH radiotherapy devices, THERYQ is starting a real therapeutic revolution
- It can treat all types of cancer with solid tumors including the ones with no therapeutic alternative available
- By expanding the range of treatable cancer, THERYQ will significantly increase the number of patients living longer, cancer-free lives

FLASH Radiotherapy: a Game-Changing Therapy

- Comparison with the same radiation dose between conventional and FLASH mode:



FLASH Mode



Conventional Mode

- Experiments with FLASH-Radiotherapy show that it has, for the same dose, the same destructive effect on the tumor as conventional radiotherapy, while sparing normal tissue, allowing a dose increase and a more efficient treatment.

Pioneering FLASH Radiotherapy with CHUV



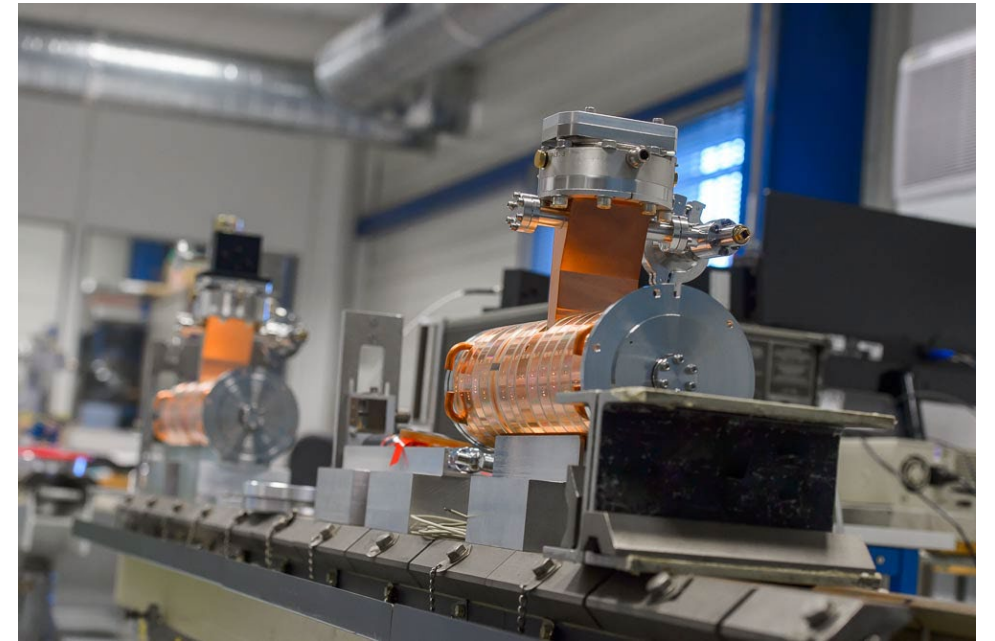
Experimental linac for FLASH radiotherapy manufactured by THERYQ (PMB-ALCEN) at CHUV

Research at CHUV
(Switzerland)
using THERYQ technology
pioneered the field of FLASH
radiotherapy



ORIATRON Linac: Description

- High X-ray or Electron Energy Generator from 3 MeV to 7 MeV
- PMB manufactures all components and performs the assembly in-house
- Applications include Non-Destructive Testing & Radiotherapy



Evolution of the Oriatron Linac



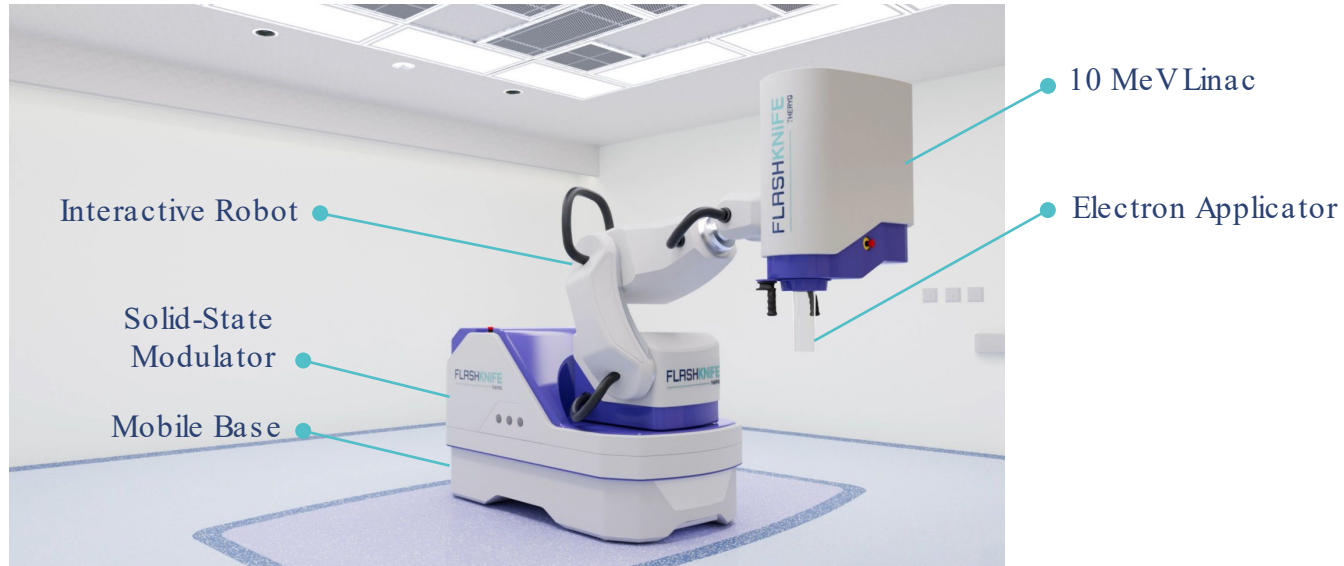
“Old-fashioned” Oriatron with
PFN-type modulator



New generation of Oriatron
with solid-state modulator

FLASHKNI_FE: For Shallow Tumors & IORT

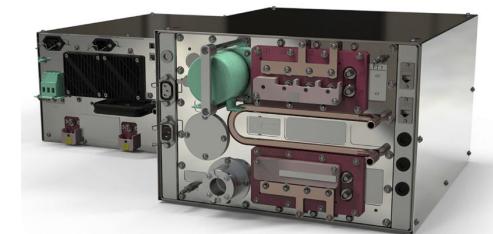
- External and intraoperative radiotherapy



- FLASHKNI_FE is a Class IIb Medical Device
- Able to treat tumors up to 3 cm deep/thick

ScandiNova

M100-i / M100D-i



FLASHKNIFE: Performance

- Pulsed electron beam
- Energy: 6 to 10 MeV
- Average dose rate: up to 350 Gy/s
- Instantaneous dose rate: up to 1 MGy/s
- Penetration depth: ~3 cm
- Field size: \varnothing 2 to 10 cm
- Treatment duration: from 0.5 μ s to several minutes



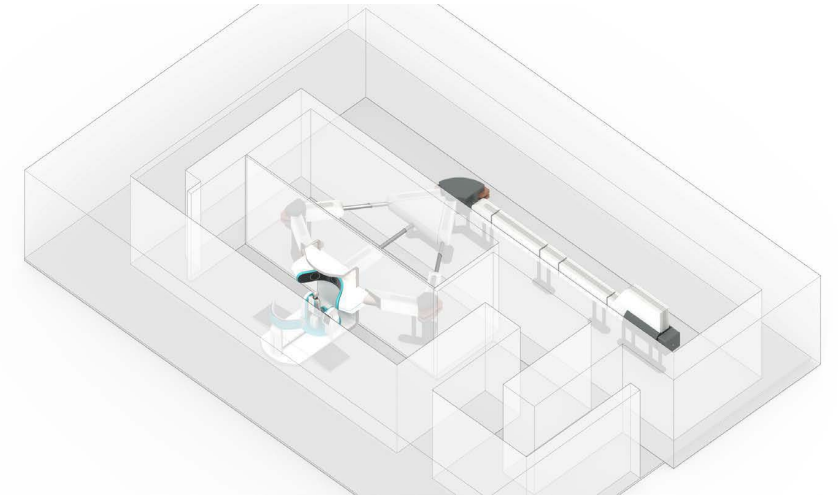
FLASHKNiFE: Clinical Trials

- Launch of a multicentric clinical trial on skin cancers (external radiotherapy) late 2023 / early 2024, funded by the EIT Health
 - Lausanne University Hospital – CHUV (Switzerland)
 - Universitätsklinikum Erlangen (Germany)
 - Institut Gustave Roussy (France)
 - Centro Hospitalar Universitario Lisboa Norte (Portugal)
- Launch of a clinical trial on intraoperative radiotherapy, focusing on head & neck and visceral tumors
 - Lausanne University Hospital – CHUV, in 2024

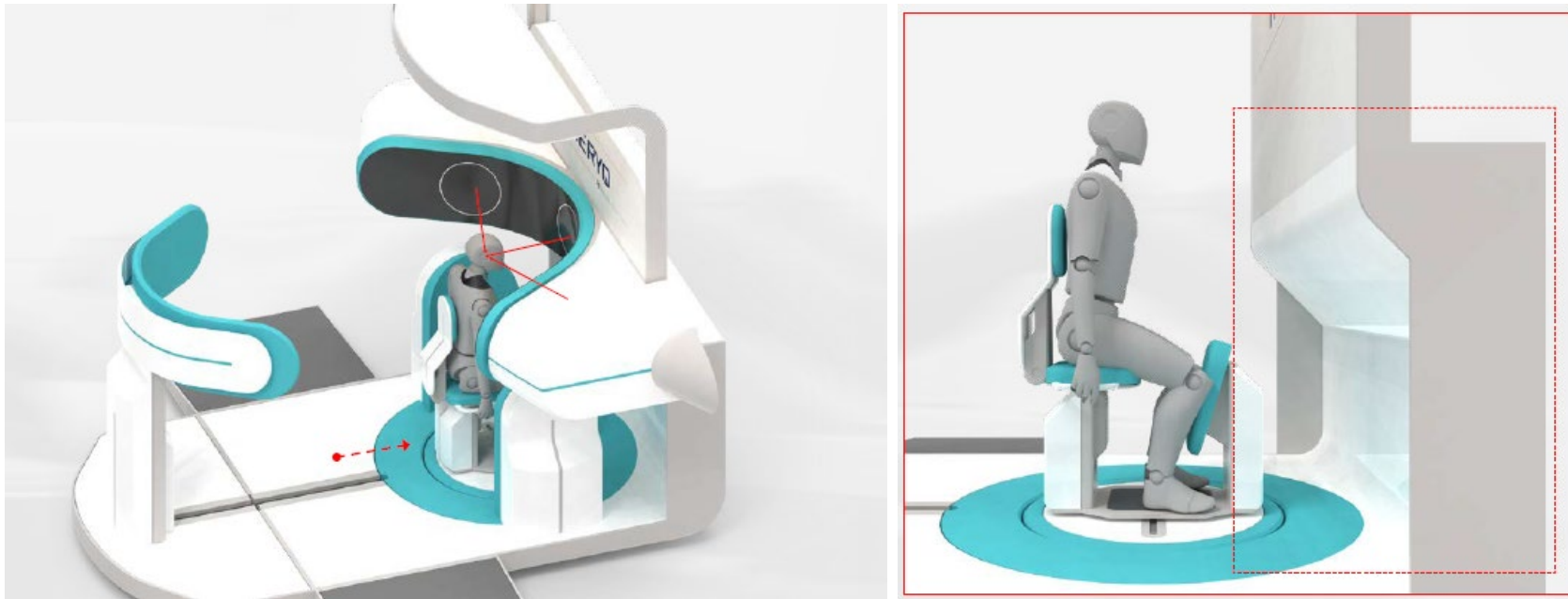


FLASHDEEP: Overcoming the Penetration Depth Limitation

- FLASHDEEP will overcome this limitation with the use of Very High Energy Electron (VHEE) beams, with energies of 100-200 MeV
- FLASHDEEP will be the first FLASH radiotherapy device able to treat every kind of solid tumor up to a depth of 20 cm



FLASHDEEP: Patient Positioning Concept



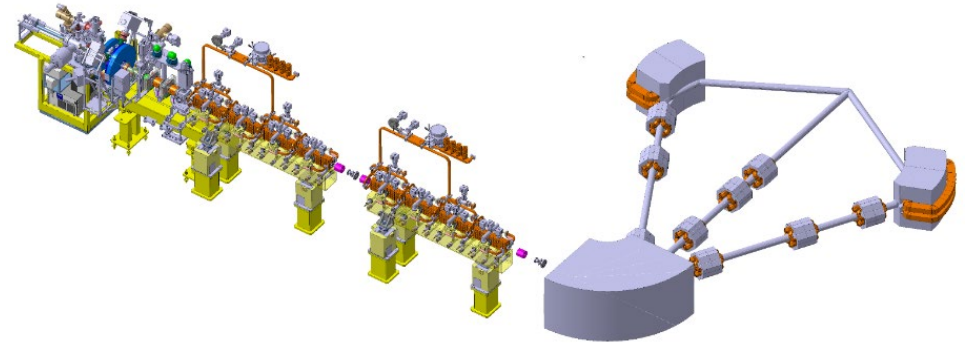
FLASHDEEP: clinical requirements

- Target depth up to 20 cm
- High treatment doses 2 Gy to 30 Gy
- Treatment time less than 100 ms
- Large target volume up to 15 x 15 x 15 cubic cm
- Conformal treatment



FLASHDEEP: performance requirements

- VHEE: 100 to 200 MeV
- High beam current $36 \mu\text{A}$
- Treatment time less than 100 ms
- Large beam size up to $15 \times 15 \text{ sqcm}$
- Linac with multiple static & isocentric beamlines



Thanks for your attention!

Q&A

