

PAUL SCHERRER INSTITUT



INSELSPITAL
UNIVERSITÄTSSPITAL BERN
HÔPITAL UNIVERSITAIRE DE BERNE

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UNIVERSITÄT
BERN

USZ Universitäts
Spital Zürich



Universität
Zürich ^{UZH}



WIR SCHAFFEN WISSEN – HEUTE FÜR MORGEN

Prof. Damien C. Weber :: Zentrum für Protonentherapie :: Paul Scherrer Institut

Proton Therapy for adults and Children @ PSI

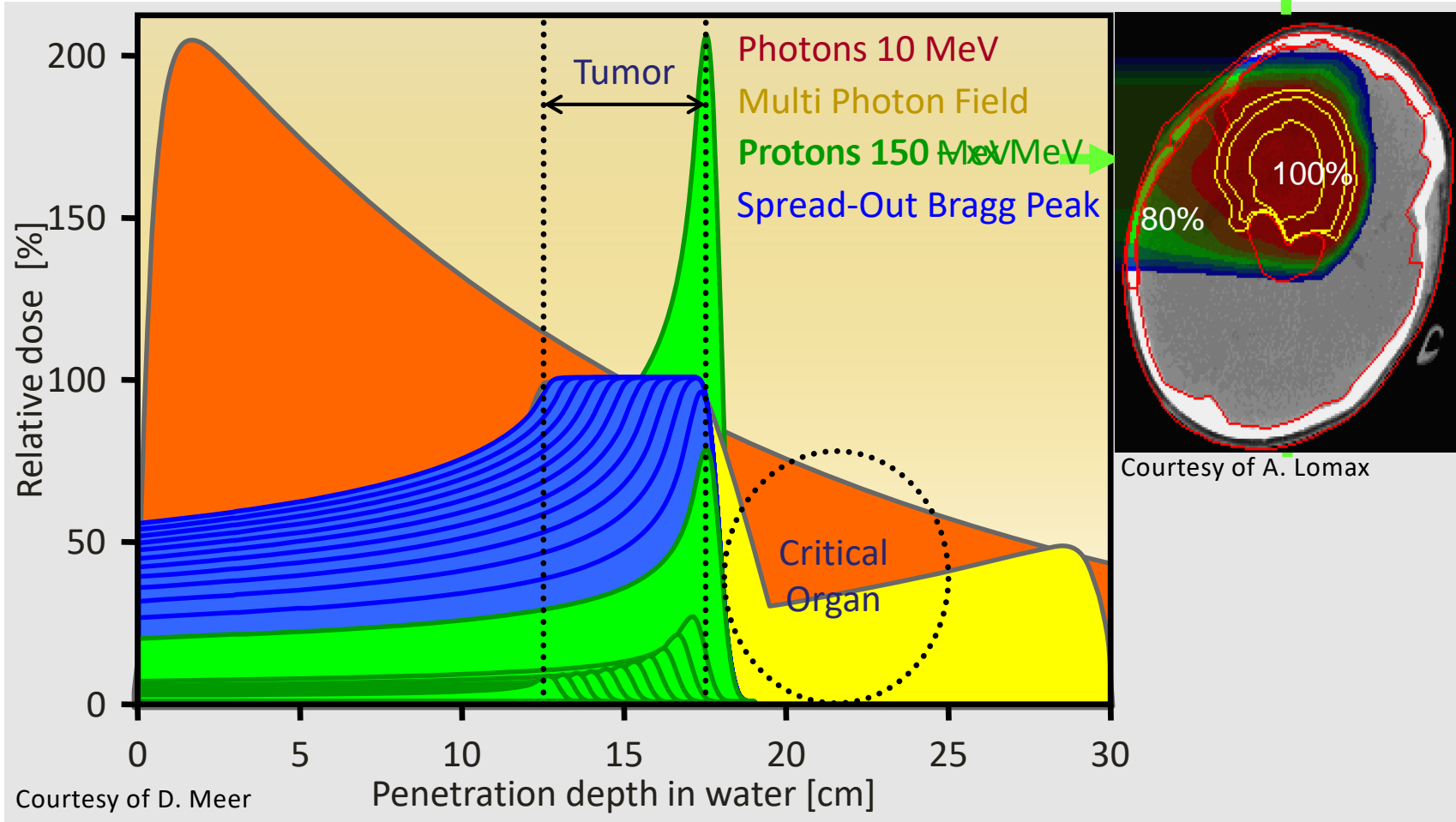
PSI, December 20th 2023

Visit of

Prof. Eliezer Rabinovici, President of the CERN Council

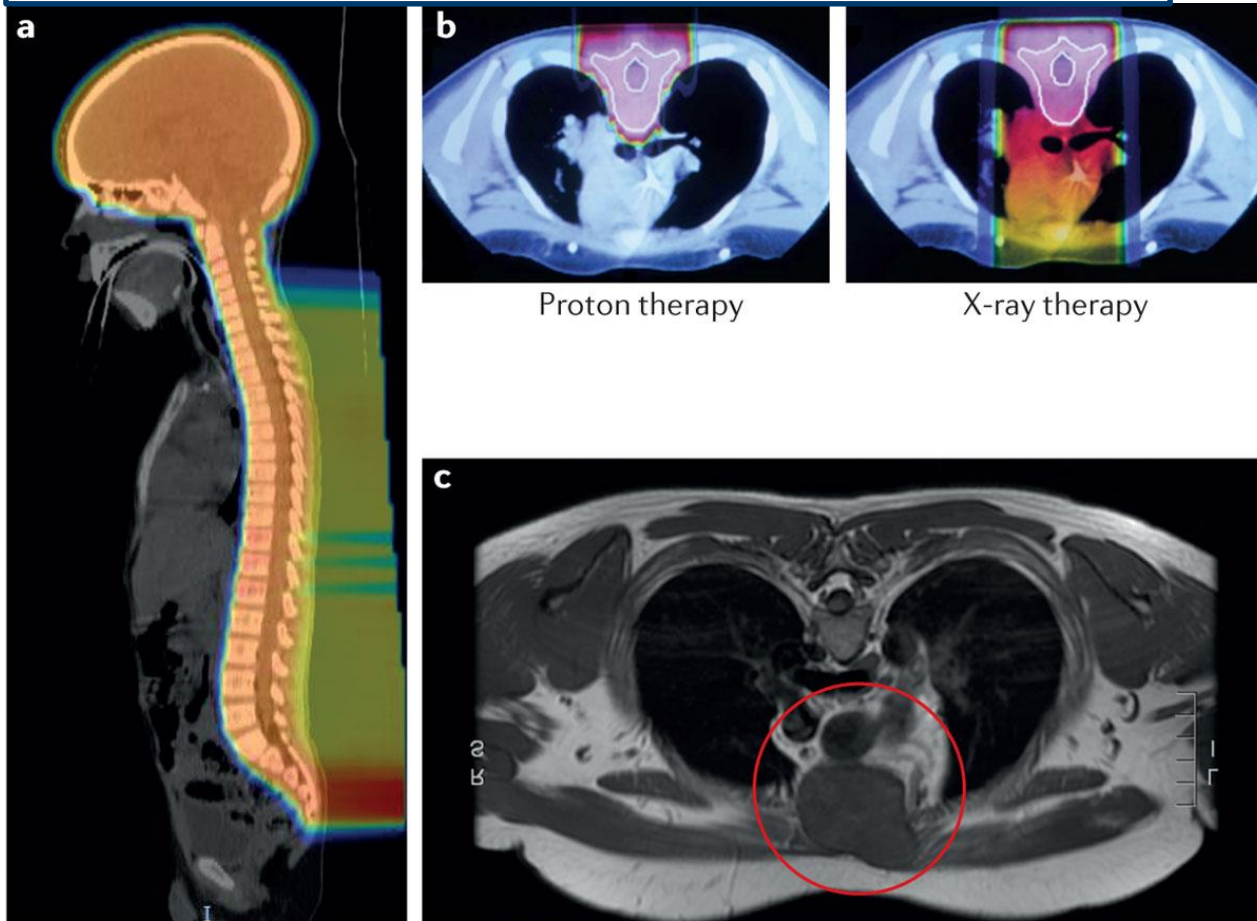
Animation adapted from:
D. Meer,

Photonen- und Protonentiefendosis-Kurven in Wasser



Unterschied zwischen Photonen und Protonen

Risikoreduktion von Sekundärmalignomen



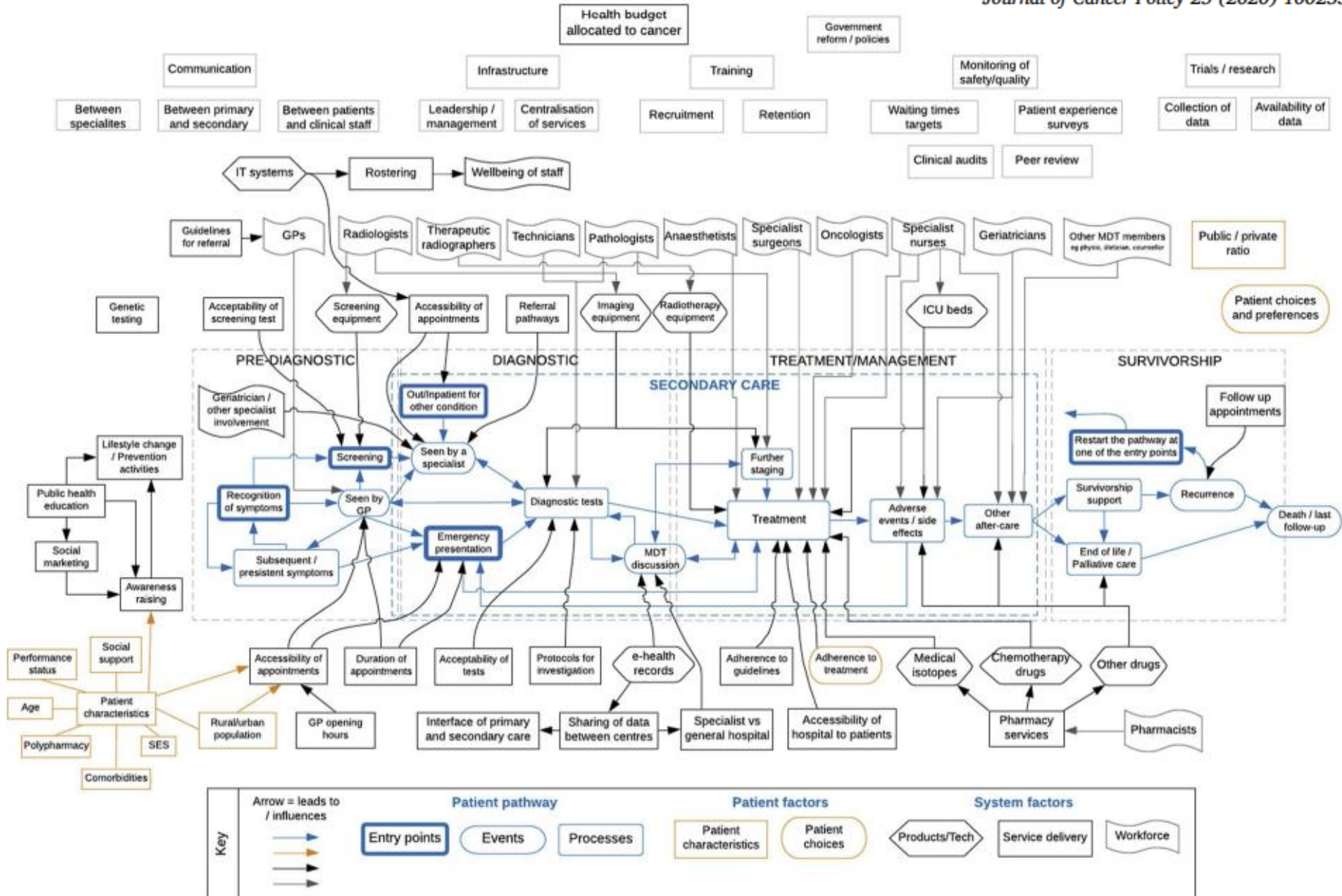
Only one Proton therapy Center

in Switzerland



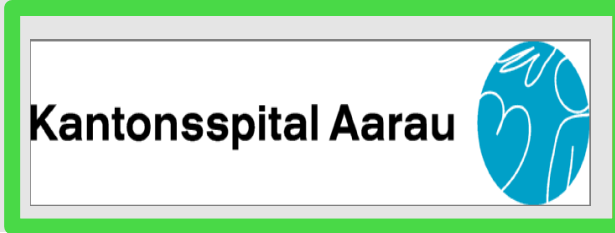
Health systems :: Cancer patient Journey

Journal of Cancer Policy 25 (2020) 100233



Gantry 2 Rotation Assistenzärzte

Patientenversorgung

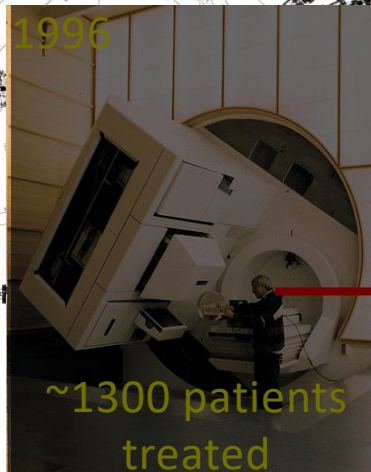
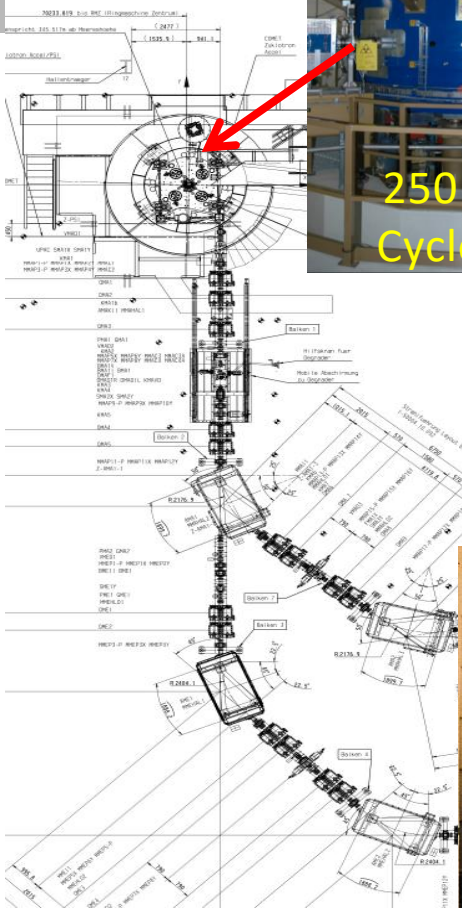
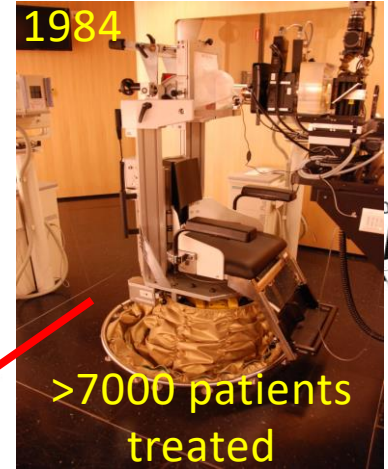
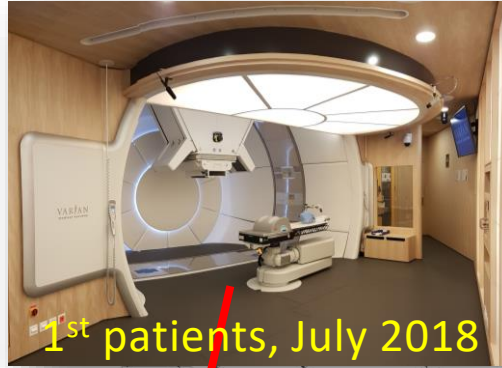


Gantry 3



Proton therapy at PSI

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Established Indications treated at PSI

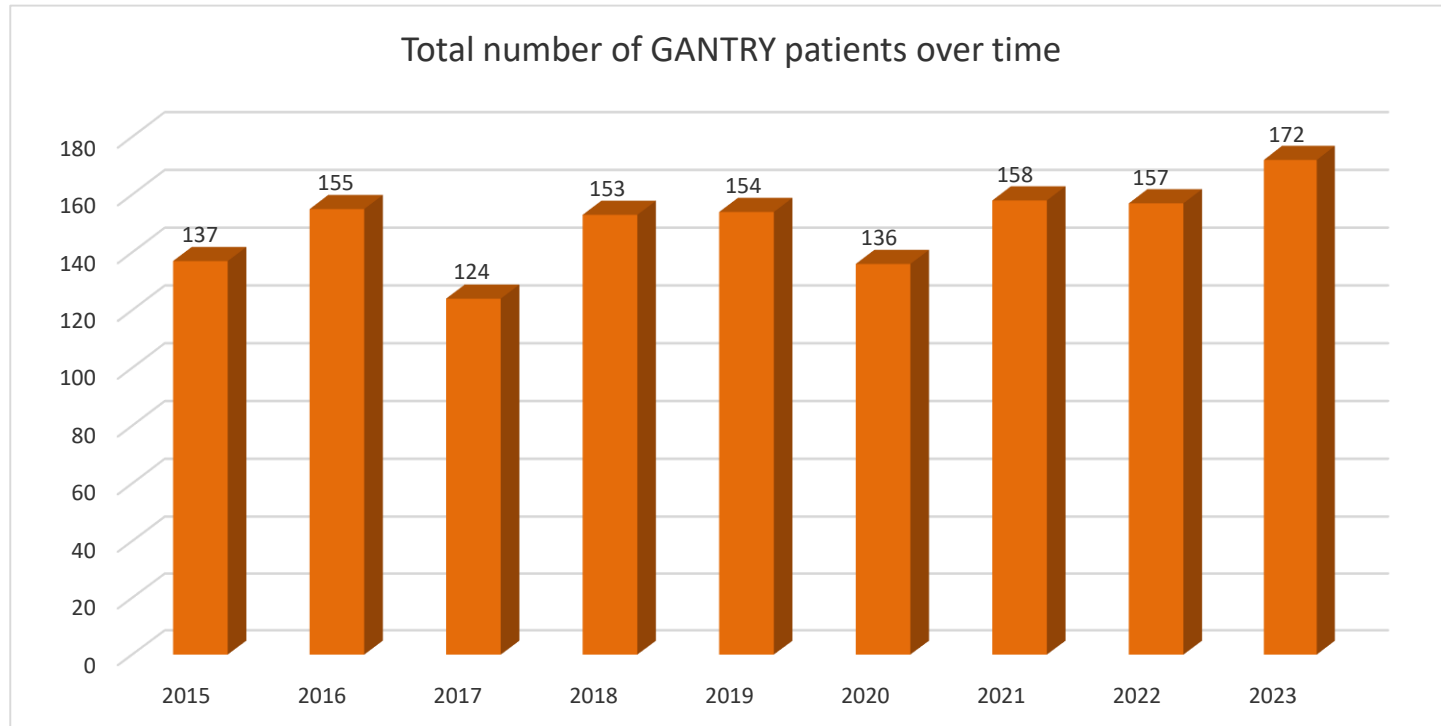
(accepted by insurance carrier and BAG)

- **Ocular Melanomas**
- **Chordomas and Chondrosarcomas** of skull base and axial skeleton, pelvis
- **Head & Neck*** Tumors and other histologies related to skull base and paraspinal location
- **Meningiomas***
- **Low Grade Gliomas**
- **Sarcomas**
- **Pediatric Neoplasms**
- **Advanced NSCLC Stage IIIA-B (RTOG 1308)**
- **Esophageal cancer (PROTECT)**

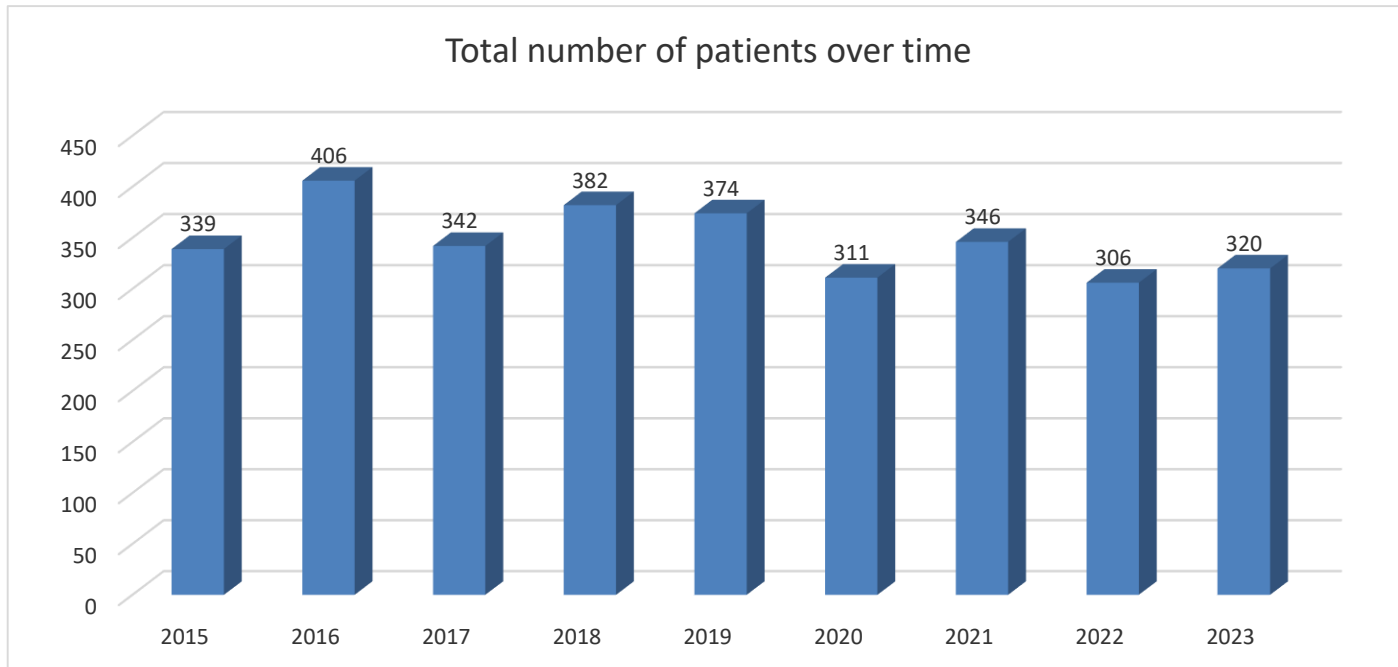
Anhang 1 der Krankenpflege-Leistungsverordnung (KLV)

Protonen-Strahlentherapie	Ja	Durchführung am Paul-Scherrer-Institut Villigen	28.8.1986/ 1.1.1993
		a) Bei intraokulären Melanomen.	
		b) Wenn aufgrund von enger Nachbarschaft zu strahlenempfindlichen Organen oder aufgrund von besonderem Schutzbedarf des kindlichen oder jugendlichen Organismus keine ausreichende Photonenbestrahlung möglich ist.	1.1.2002/ 1.7.2002/ 1.8.2007/ 1.1.2011/ 1.7.2011
		Bei folgenden Indikationen:	
		- Tumore im Bereich des Schädels (Chordome, Chondrosarkome, Plattenepithelkarzinome, Adeno- und adenocystische Karzinome, Lymphoepitheliome, Mucoepidermoidkarzinome, Esthesioneuroblastome, Weichteil- und Knochensarkome, undifferenzierte Karzinome, seltene Tumore wie z.B. Paragangliome)	
		- Tumore des Hirns und der Hirnhäute (Gliome Grad 1 und 2, Meningiome)	
		- Tumore ausserhalb des Schädels im Bereich der Wirbelsäule, des Körperstamms und der Extremitäten (Weichteil- und Knochensarkome)	
		- Tumore bei Kindern und Jugendlichen.	

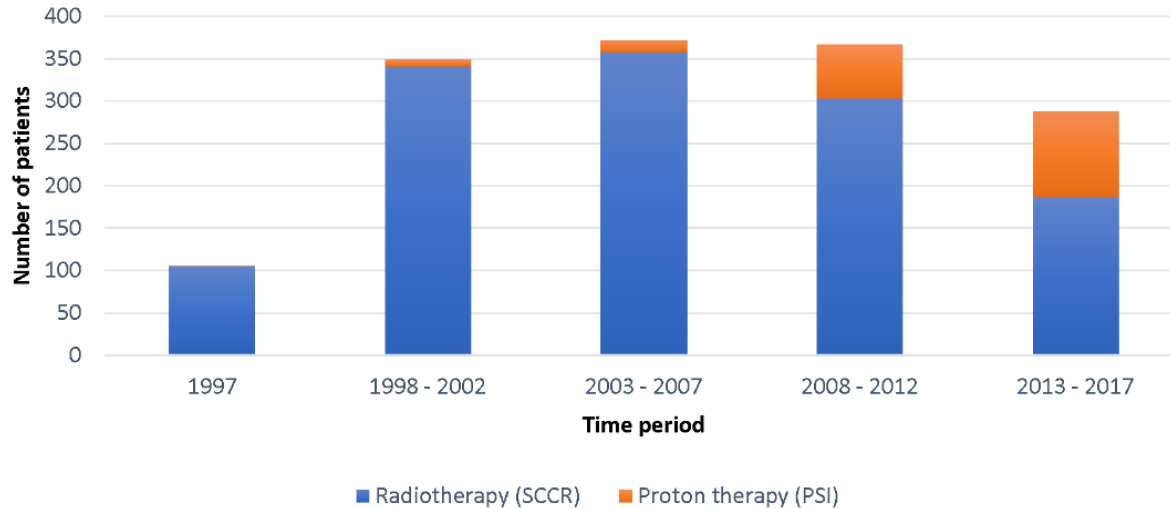
Anzahl der Patienten seit 2011



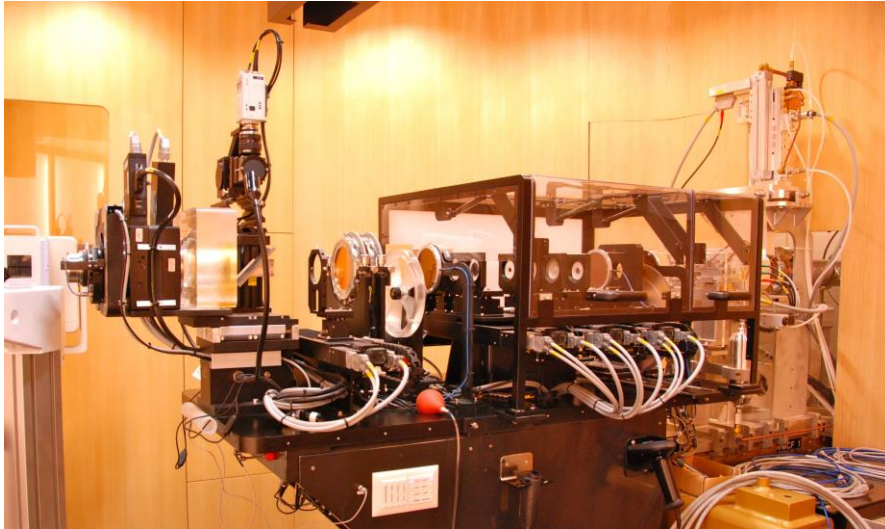
Anzahl der Patienten seit 2011 (O2+Gantries)



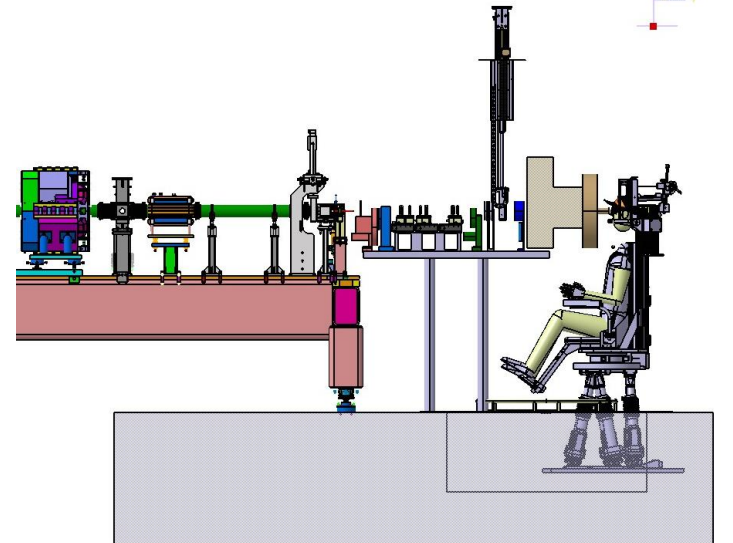
Proton therapy in Switzerland (Children)



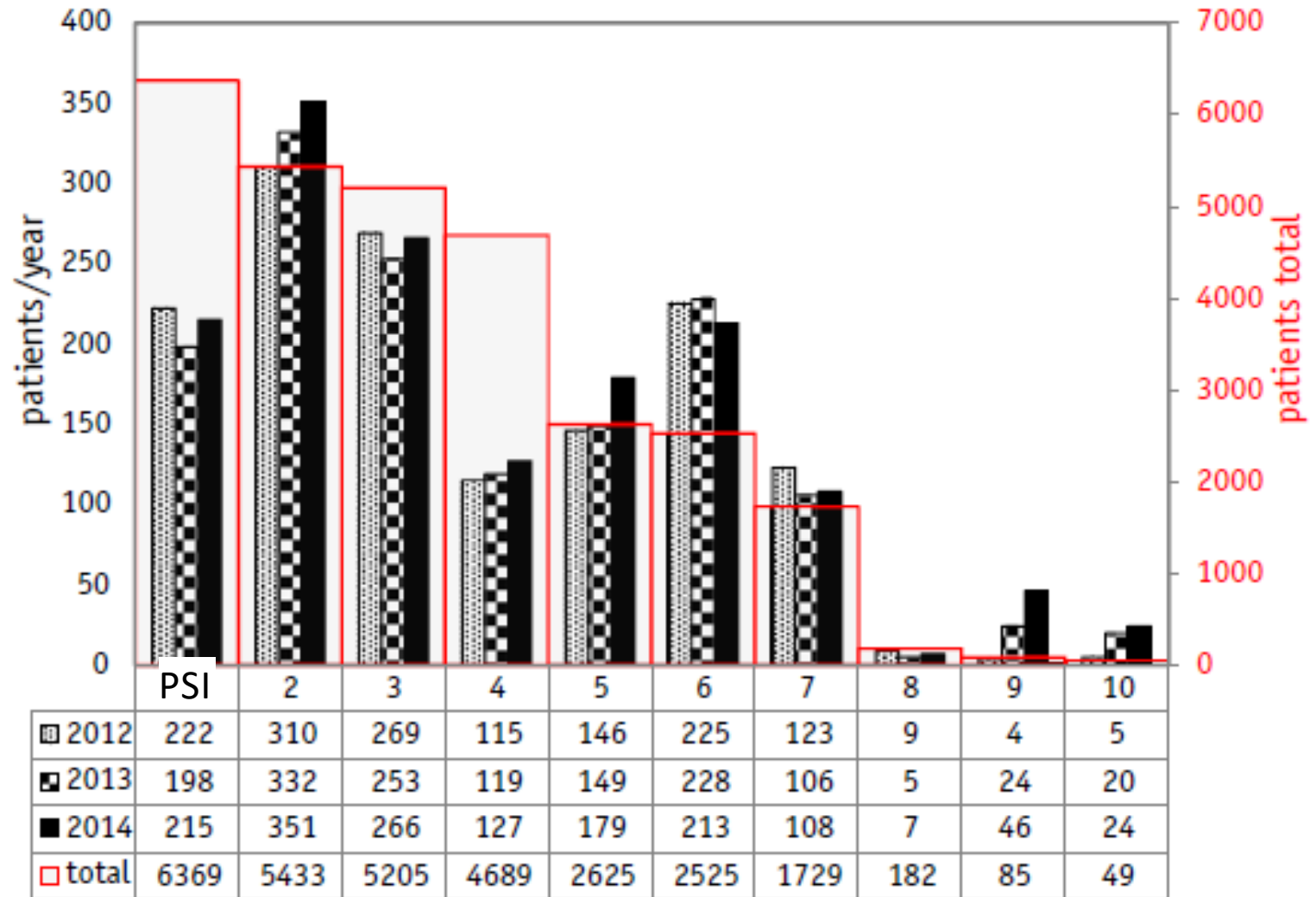
Ocular Proton Therapy: A Success Story (1984)



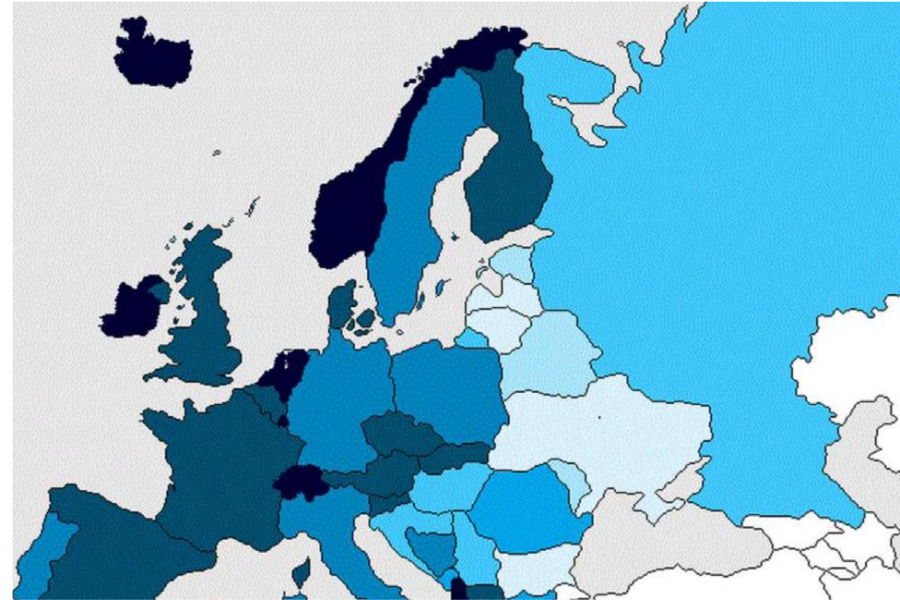
- irradiation of eye tumors
- proton beam degraded to 70 MeV
- Passive proton scattering:
scatter foils, collimator, compensator
- Largest number of patients worldwide
> 6700 pts, 230 pts/year, 4-8 pts/day
- 4 fractions in one week
- Tumor control rate of 98%!



Ocular patient numbers world wide



GLOBOCAN



RT patients 2025 in Europe

Radiotherapy and Oncology

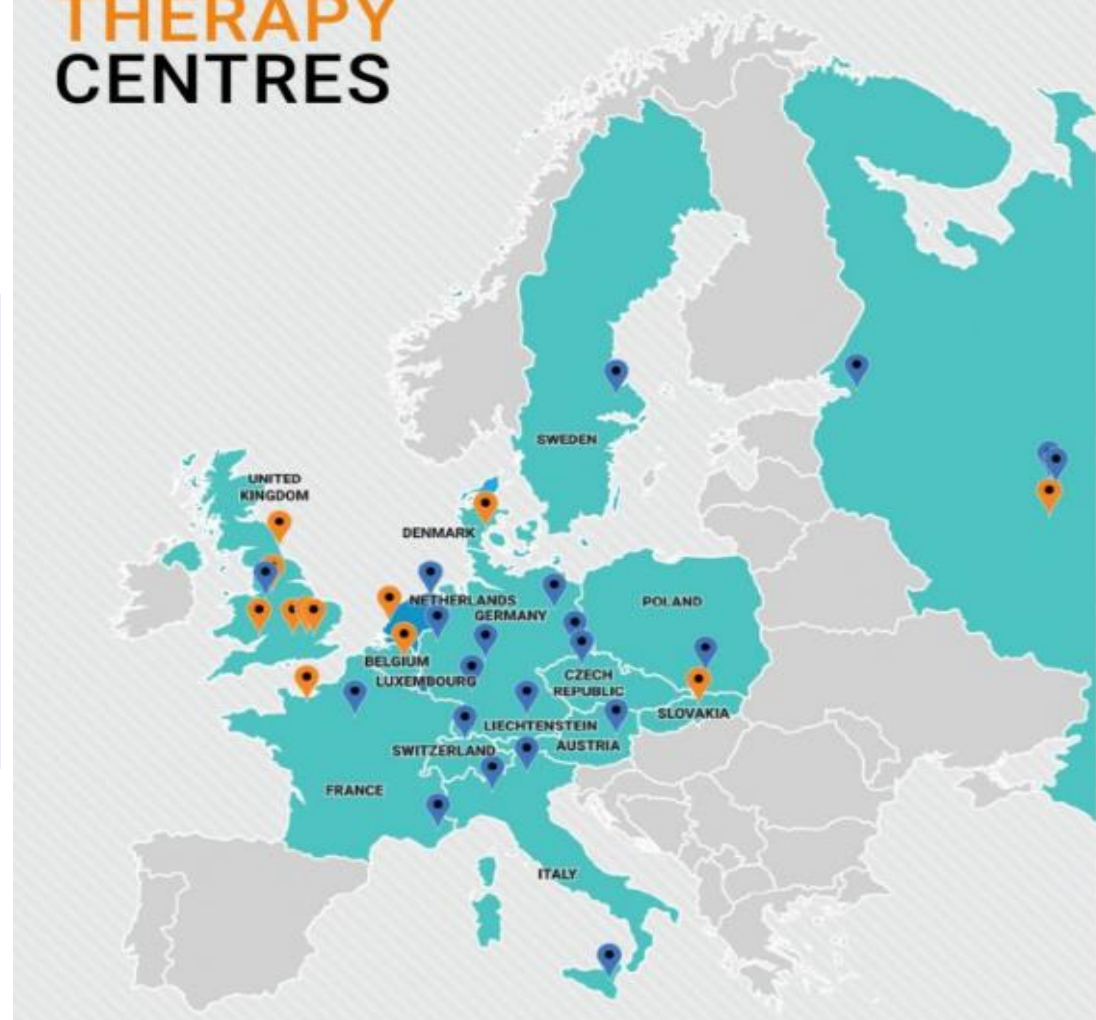
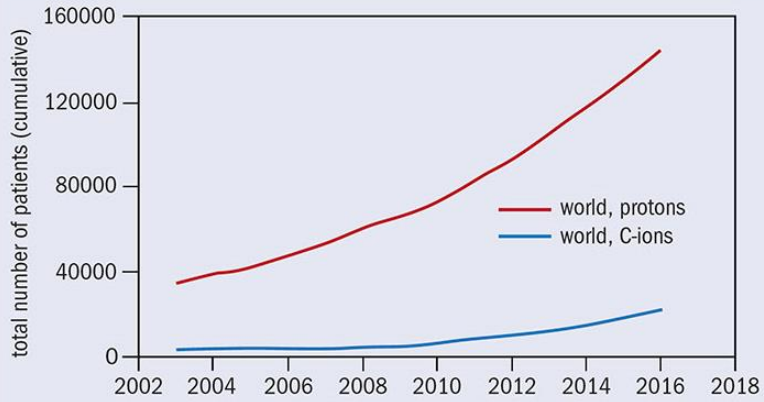
2025	Mean
Increase in prostate Cancer	24%
Increase in lymphoma	13%
Increase in RT (range)	16% (5-30%)

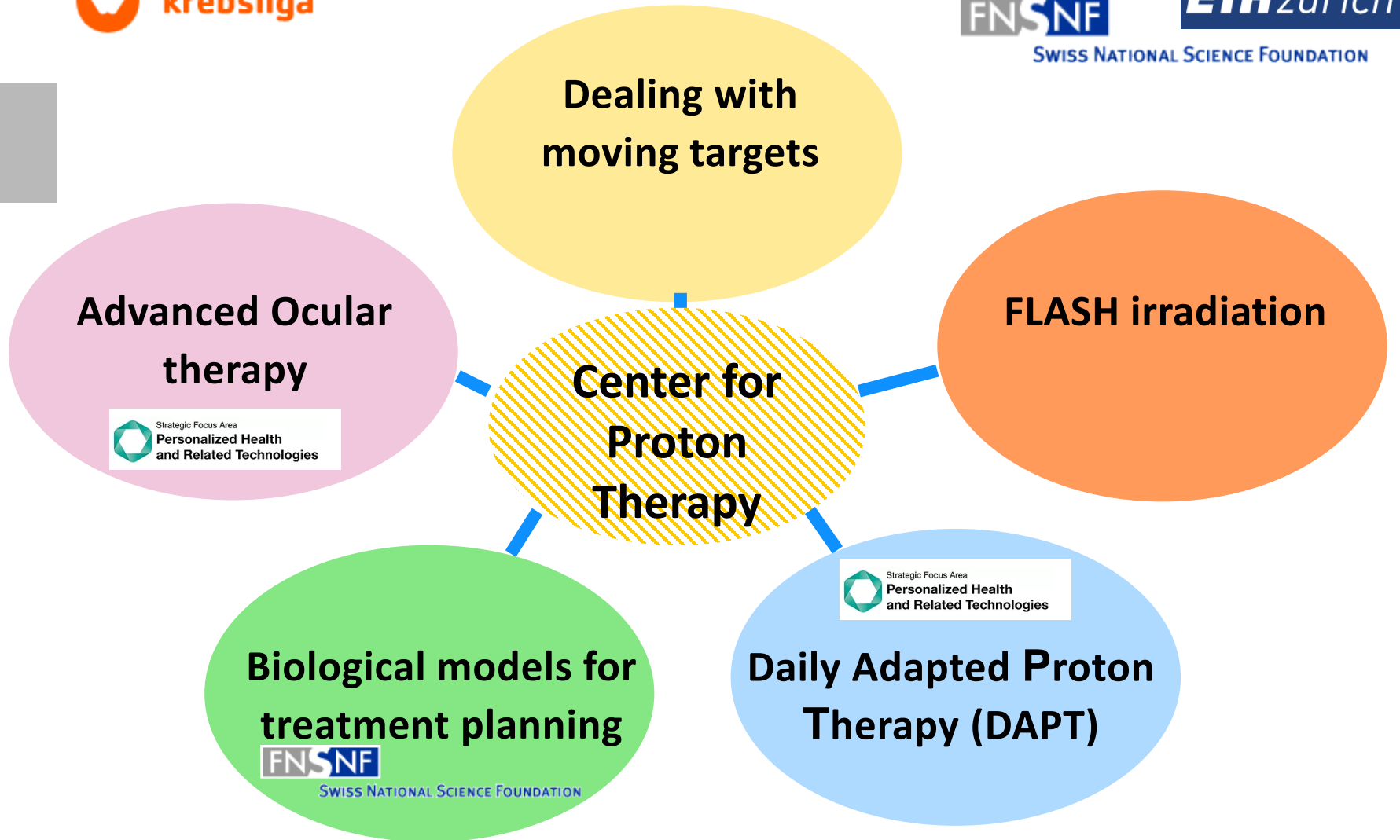
ESTRO-HERO Analysis


How many new cancer patients in Europe will require radiotherapy by 2025? An ESTRO-HERO analysis



PARTICLE THERAPY CENTRES





- The most experienced PBS center worldwide (Nov 2021: 25 years of PBS delivery)
- Patient throughput: available slots @ PSI
- Proton therapy in :  limited indication, constrained by the FOPH
- Active research program-substantial know-how
- Clinical end educational experience
- PSI willing to foster the creation of new Proton Center, providing that the patient-capture region and business plan is correct