



PROTON THERAPY CENTER CZECH

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PROTON
THERAPY
CENTER



Cyclotron at PTC

- IBA Proteus 235
- Output beam energy 233 MeV
- Energy on the nozzle – 226 MeV
 - Range 32 g/cm²
- Weight – cca 200 t





Equipment

- 1 fixed beam room
- 3 gantry rooms
- Robotic couch with six degrees of freedom
- Verisuite system
- Vision RT system
- Dyn'R system
- Diagnostic CT and MRI
- 4D CT for planning
- MRI for treatment planning
- PET/CT machine



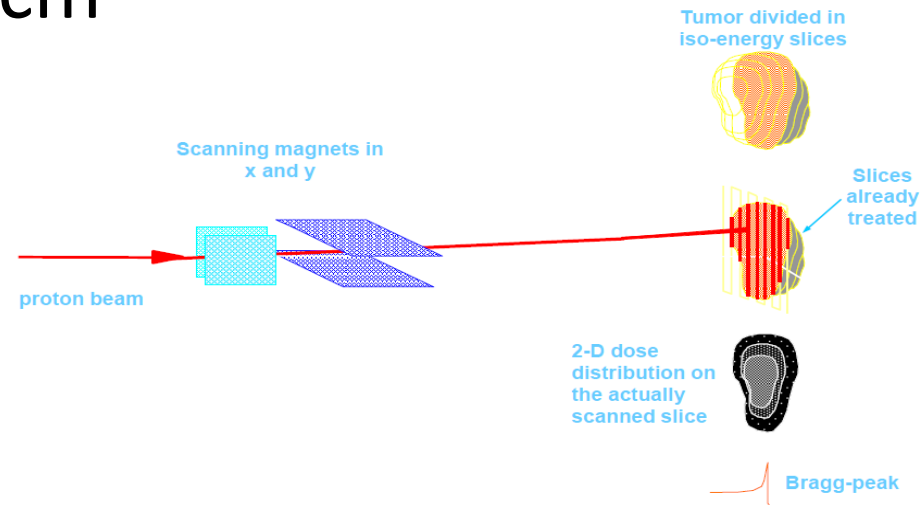


Pencil beam scanning

- Field size up to 30 x 40 cm

- Range 7,5 – 32 g/cm²

- For shallower targets RS



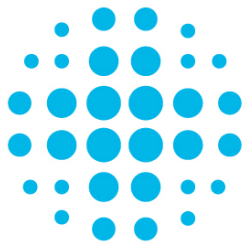
- Irradiation by layers, spot by spot

- No range compensators and apertures needed



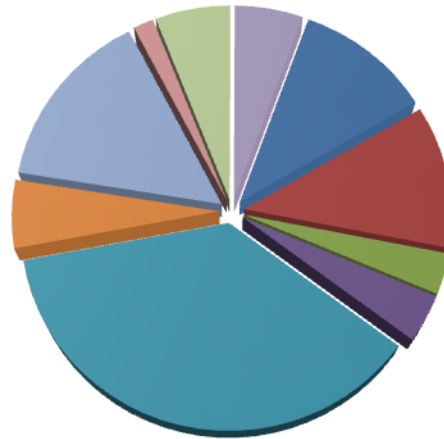
Radiobiology of protons

- Protons are more efficient than photon / electron treatment
- Conventionally assumed to be $RBE = 1,1$
 - Works nearly fine for scattered modes
 - In Pencil beam Scanning is probably be bigger
 - RBE is changing along beam path
 - Closer to the Bragg peak it is growing
 - Highest close behind Bragg peak (at nominal range ~ 80% of dose behind Bragg peak)

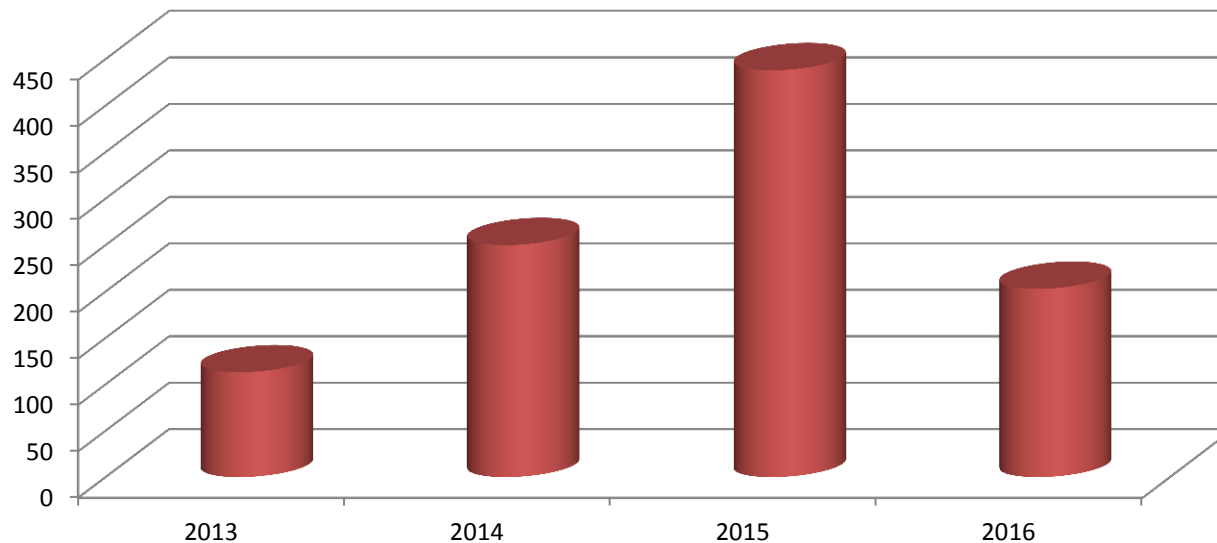


Patients treated

12/2012-3/2016
N= 1000



- CNS
- Head/Neck
- Pancreas
- GIT other
- Prostate
- Lymphoms
- Children
- Sarkomas
- Chordomas
- Other





Current state

- All rooms in clinical operation in PBS mode
- Approx. 70 treatments / day
- Approx. 100 new patients / month

