Protons: Myth versus Reality

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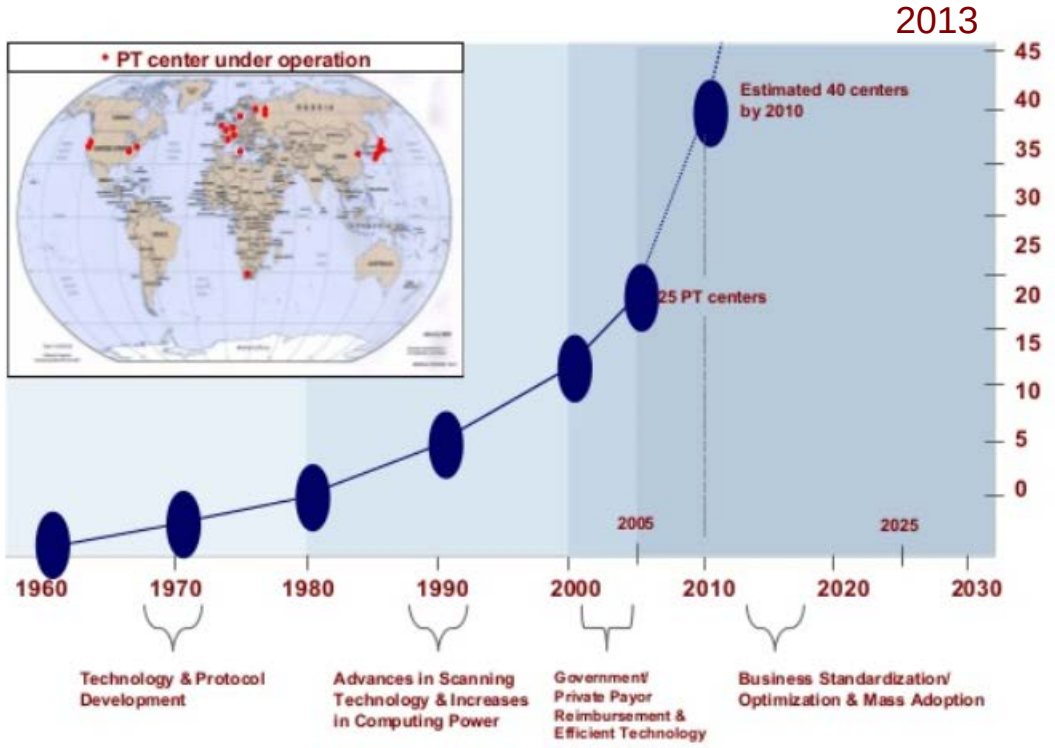
June 23, 2017

Protons

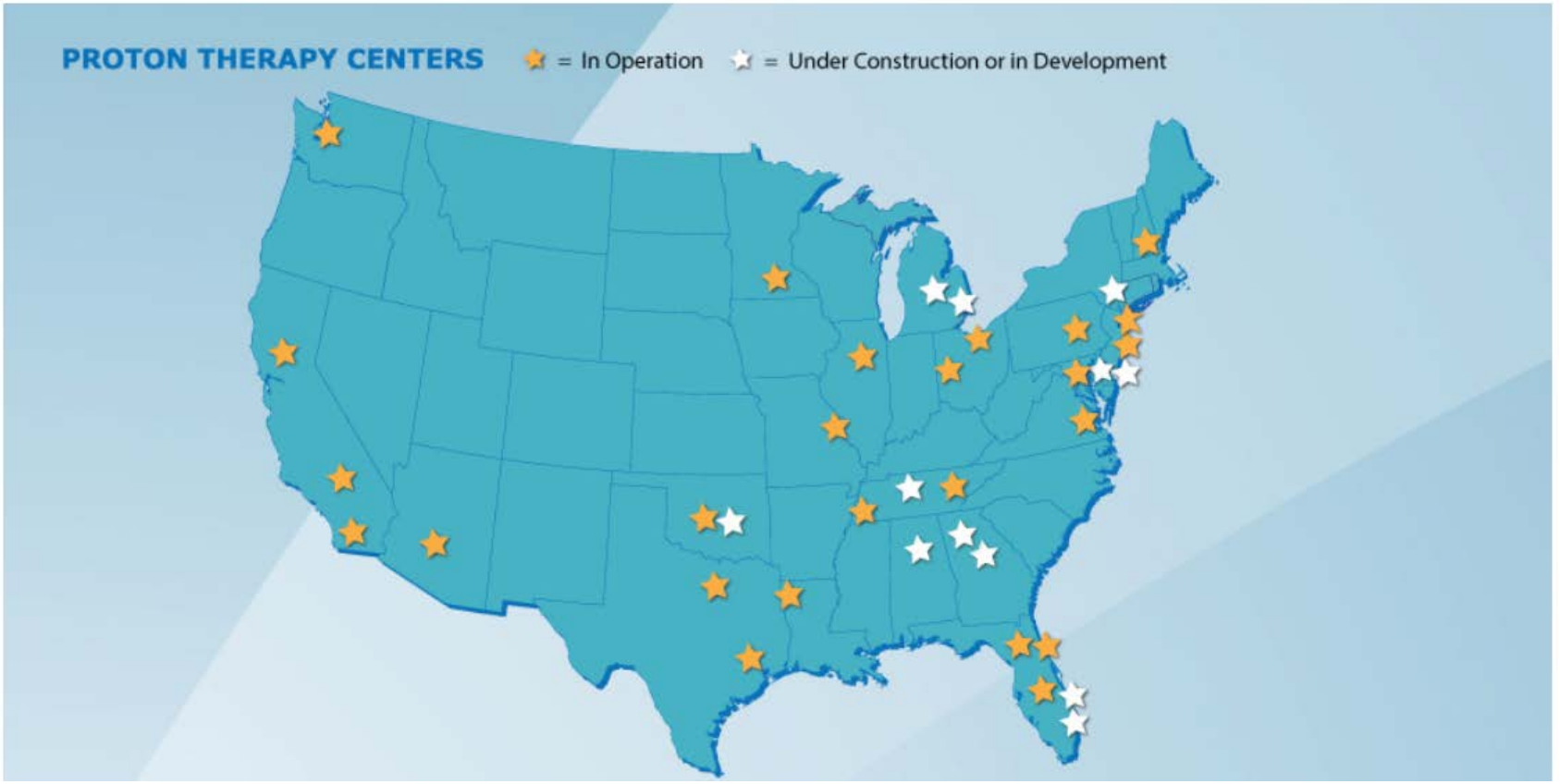
- Long history
- Another “tool”
- Continued evolution

Locations

- **MGH – Harvard Cyclotron**
- **Loma Linda**



2017 - US



http://www.proton-therapy.org/map.htm

Worldwide – Protons Only

Operational

Austria	1
Canada	1
Czech Rep	1
China	2
England	1
France	2
Germany	6
Italy	3
Japan	11
Poland	1
Russia	3
South Africa	1
South Korea	2
Sweden	1
Switzerland	1
Taiwan	1
USA	25

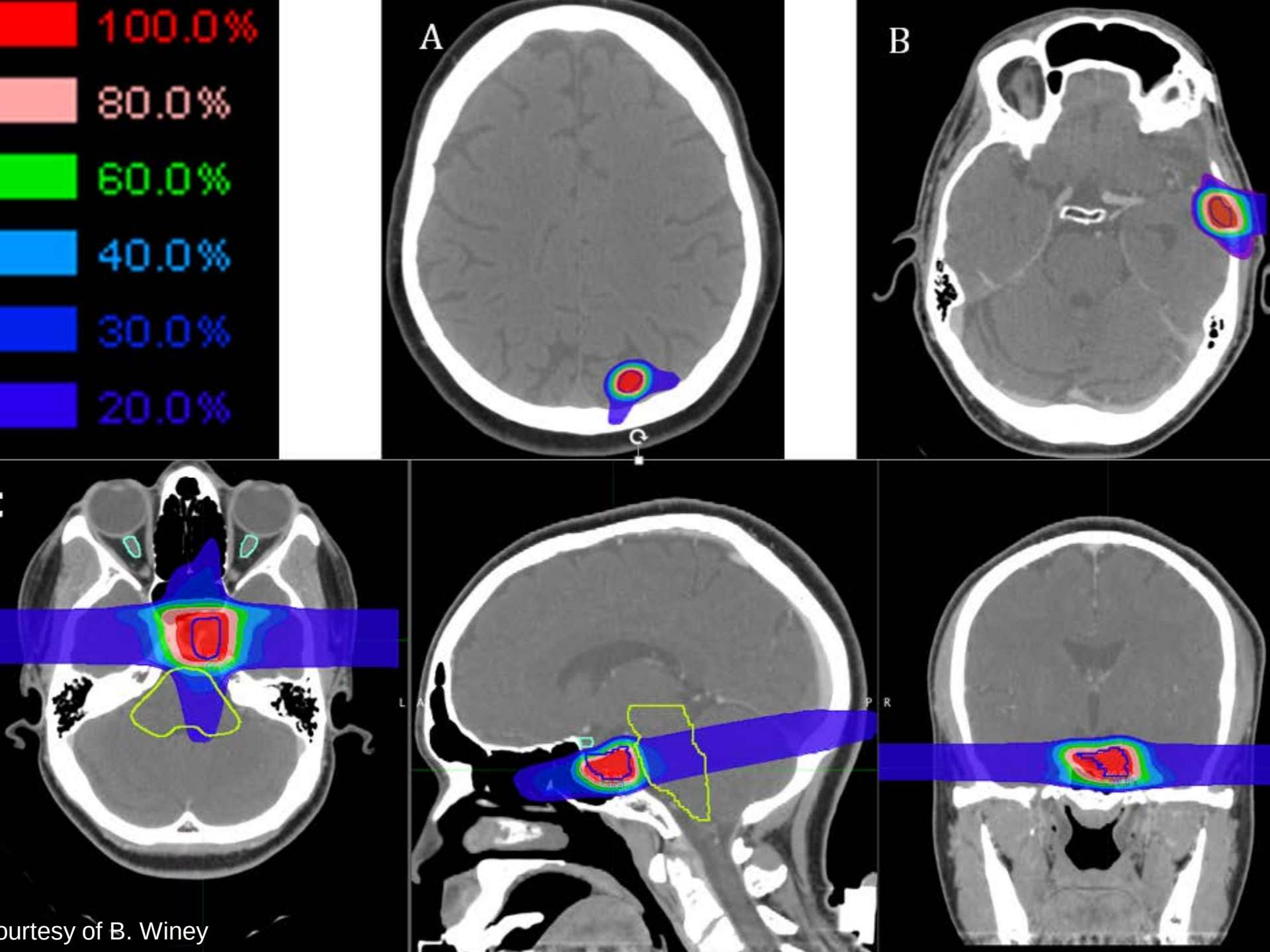
Under Construction

Belgium	1
China	6
Denmark	1
Emirate-Abu Dhabi	1
France	1
India	2
Japan	4
Netherland	2
Russia	2
Saudi Arabia	1
Singapore	1
Slovak Rep	1
Taiwan	1
United Kingdom	6
USA	10

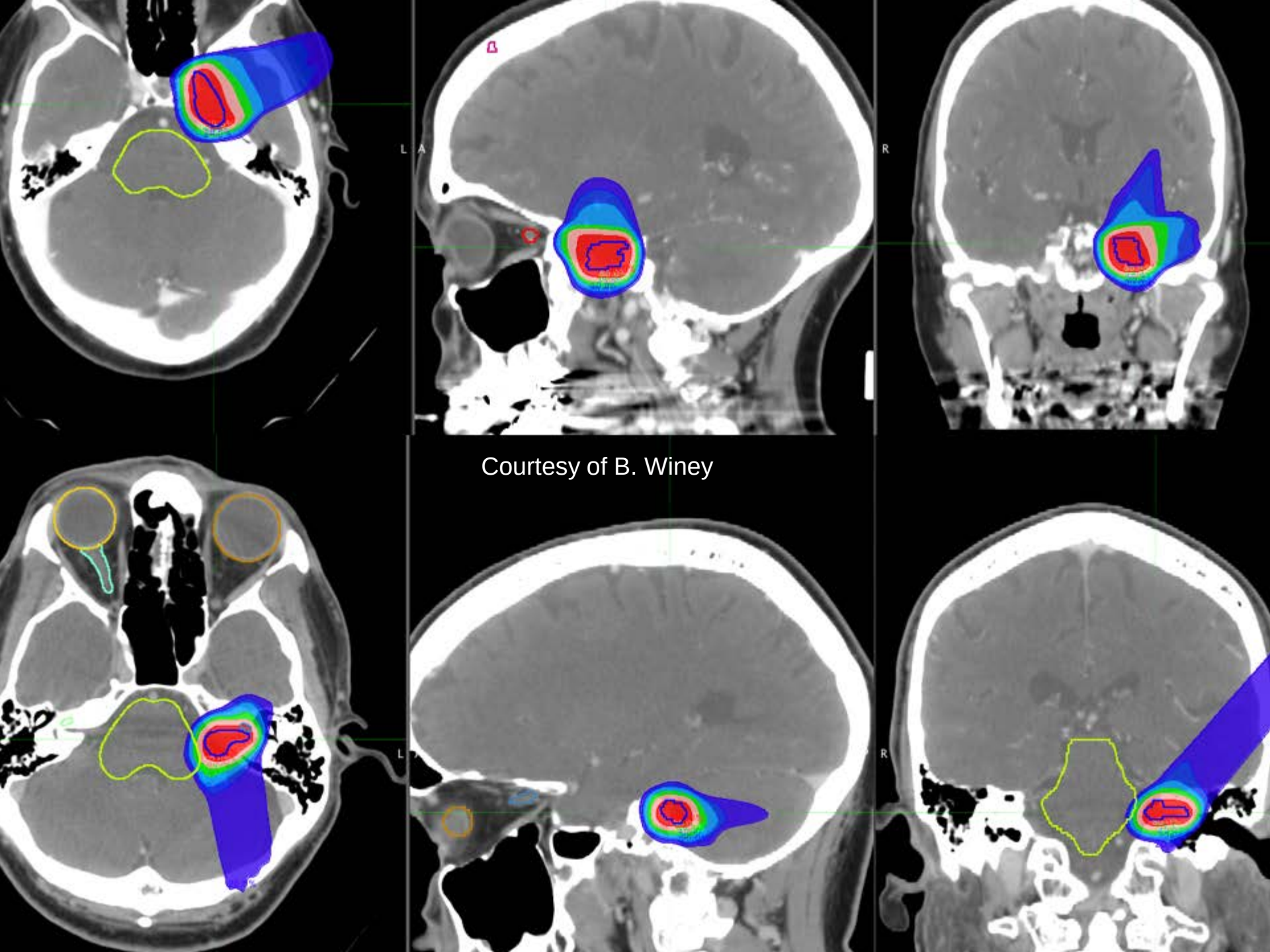
Planning Stage

Australia	1
Argentina	1
Belgium	1
China	2
Egypt	1
India	1
Japan	1
Netherland	2
Russia	1
Singapore	1
Slovak Rep	1
Spain	1
Switzerland	2
Taiwan	1
USA	4

June 2017



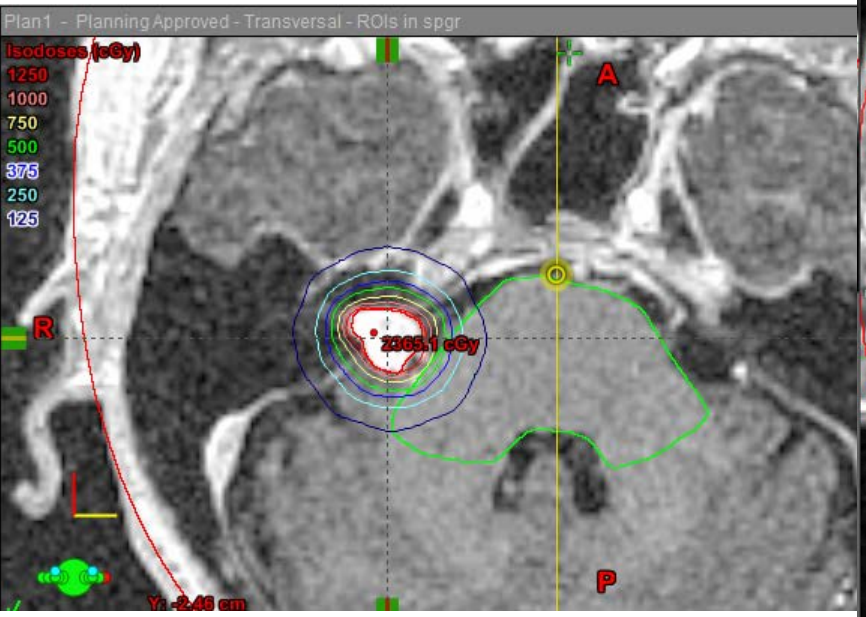
ourtesy of B. Winey

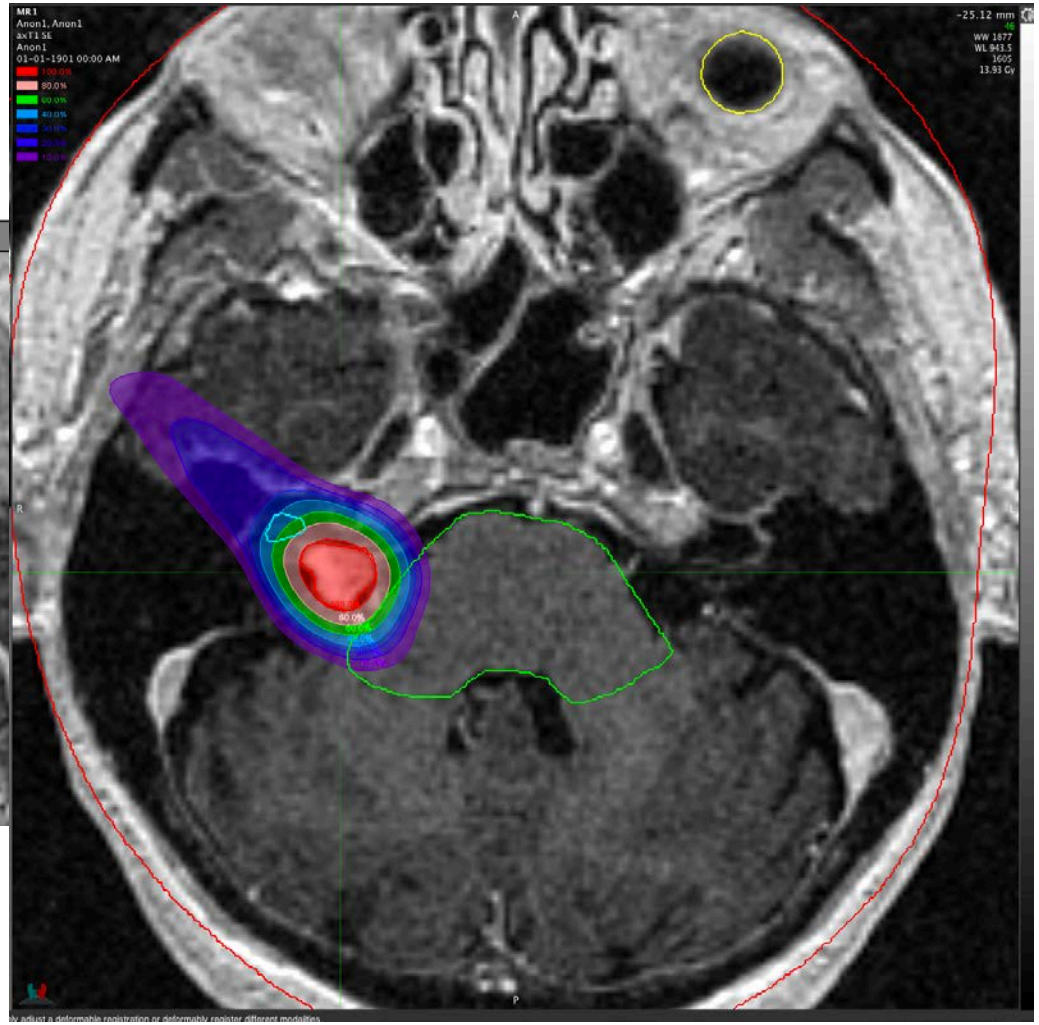


Courtesy of B. Winey

Current Study: UPENN and MGH

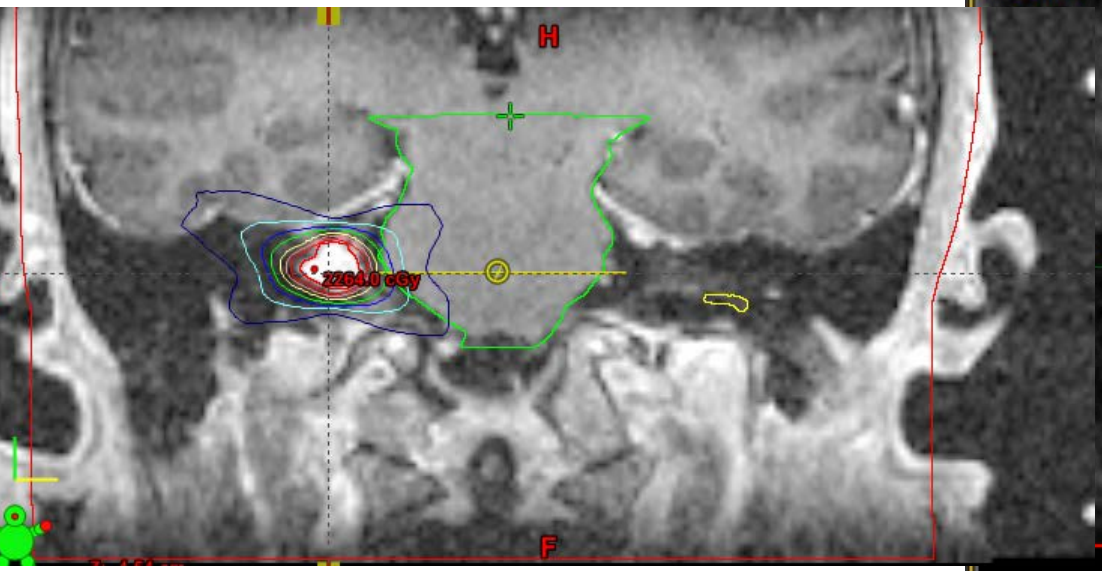
Gamma Knife

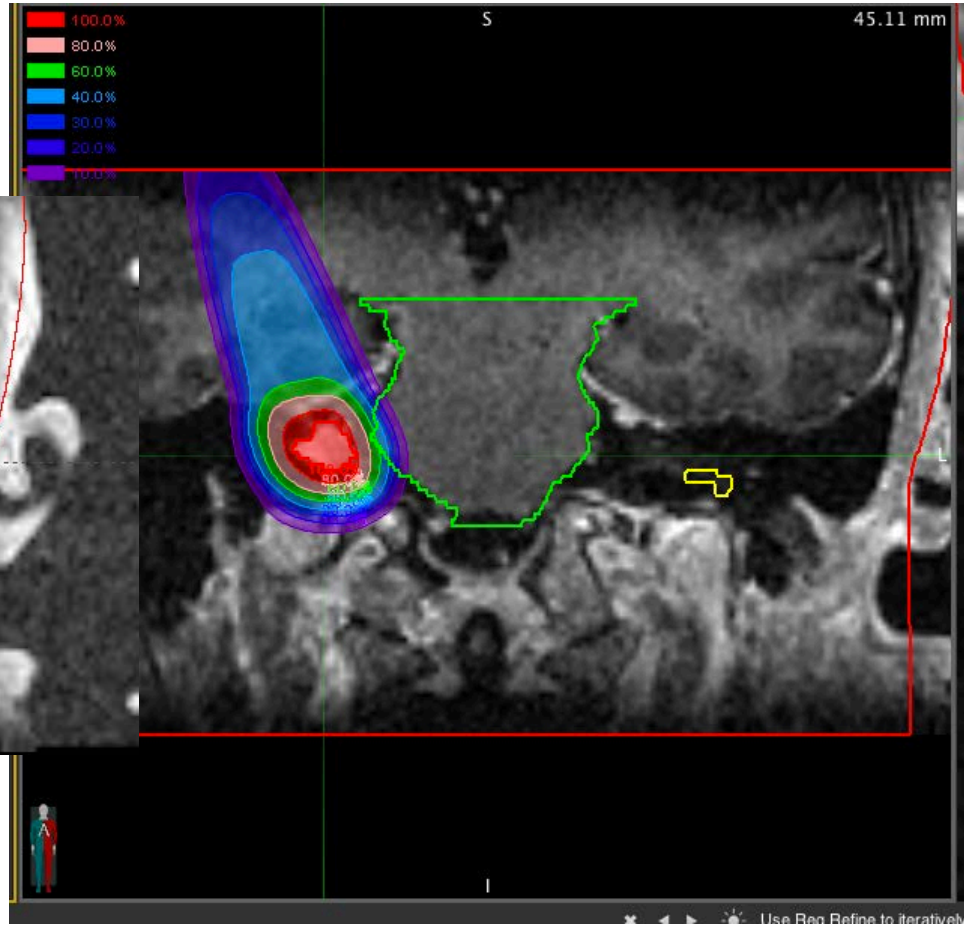




Proton - STAR

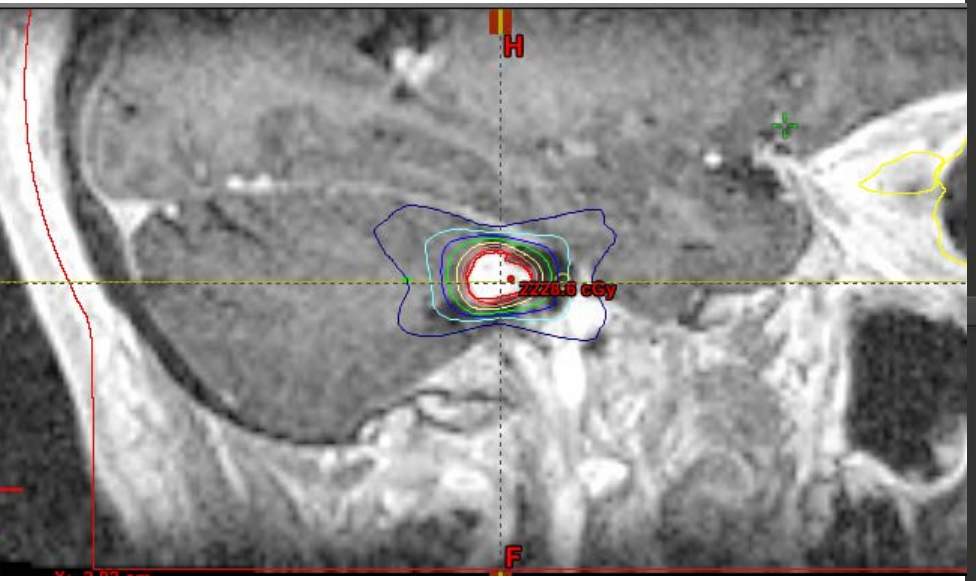
Gamma Knife

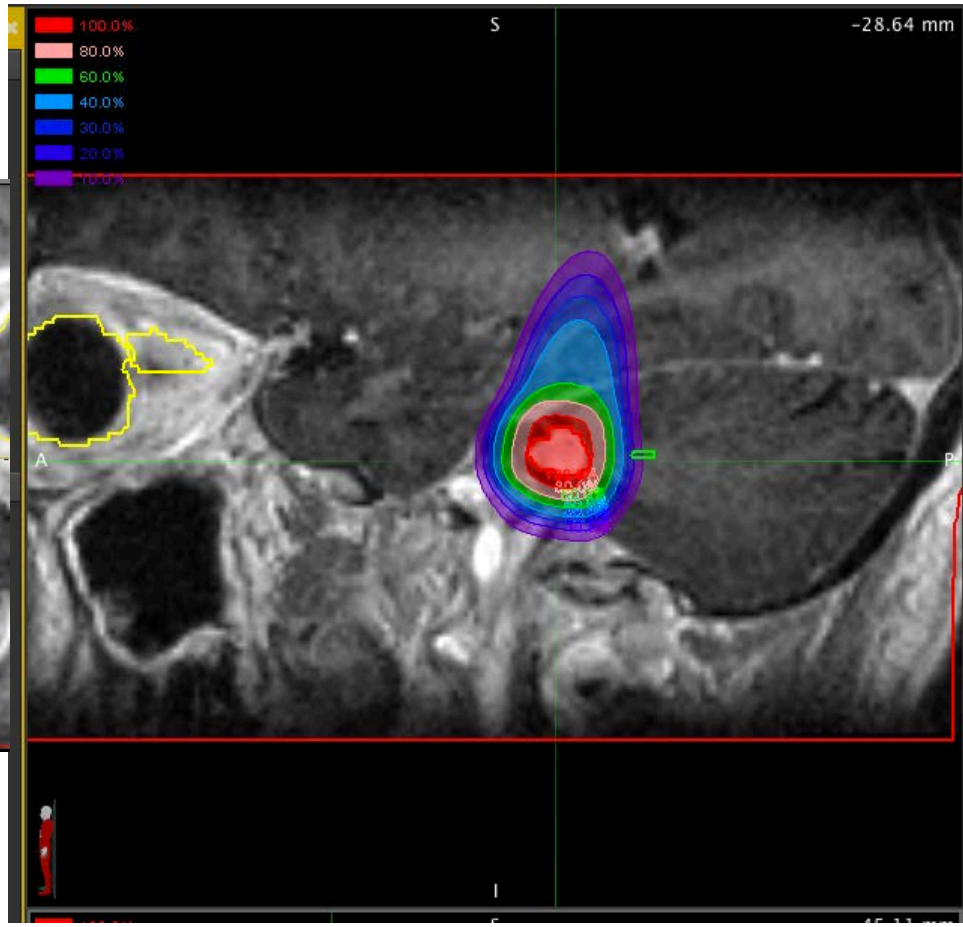




Proton - STAR

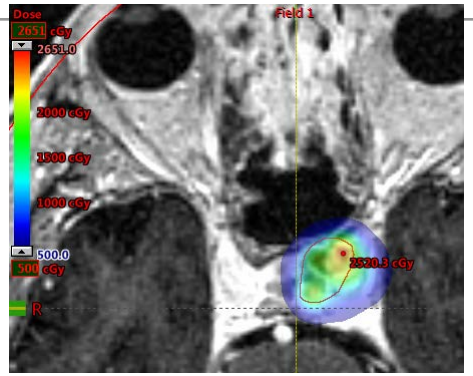
Gamma Knife

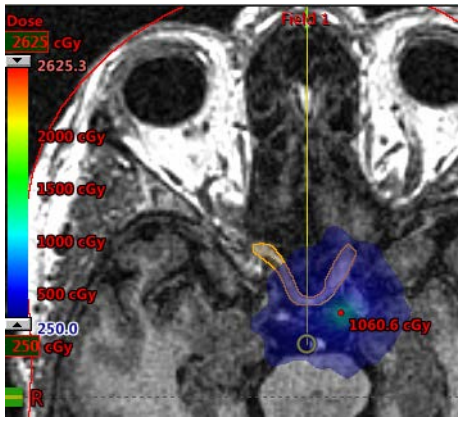


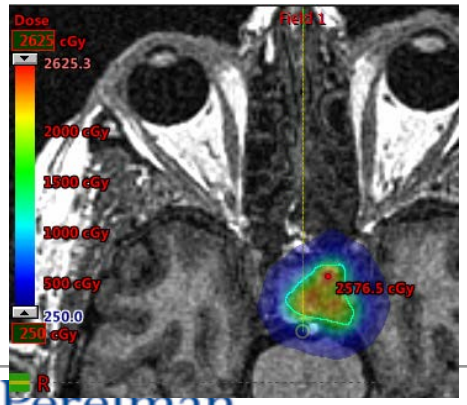


Proton - STAR

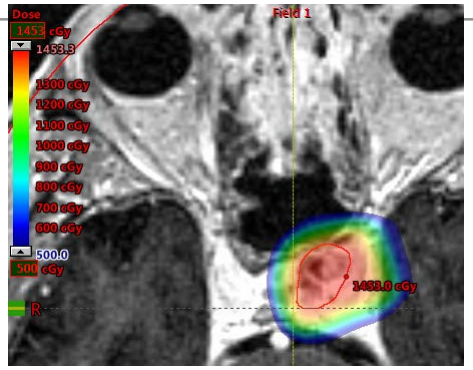
Gamma Knife®

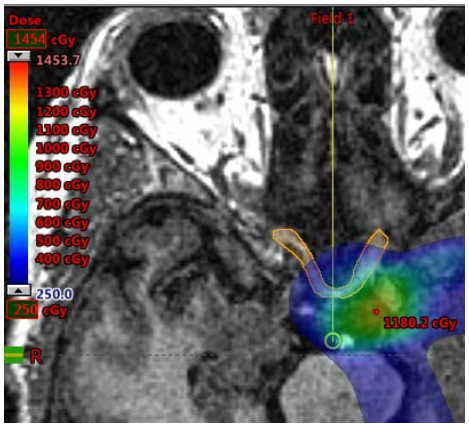


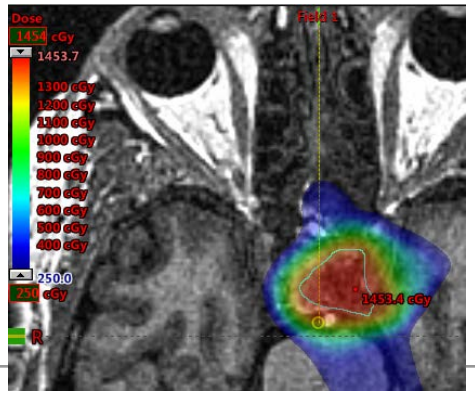




Proton SRS







Summary - Why is this important?

- If you are lucky to have every technology – review what makes sense for your patient and your group's workflow
- Paper is great – clinical data is more important
- Control as well as toxicity
- Future direction: looking at Proton SRS – there will be those that will think they can do it
- What's more important – technology or operator??
- We are not in a vacuum – it requires a multi-disciplinary approach

Collaborators – 2017

- **Radiation Oncology**
  - Physics/Dosimetry
  - James Metz
  - Robert A. Lustig
  - Goldie Kurtz
  - Jay F. Dorsey
  - Alexander Lin
  - Peter Ahn
  - J. Nicholas Lukens
  - James Kolker
  - Suneel Nagda
  - Geoffrey Geiger
- **NeuroRadiology**
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  - Kim Learned
  - Ron Wolf
  - John Woo
  - Suyash Mohan
  - Linda Bagley
  - Harish Poptani (London)
  - Ragini Verma
  - Christos Davatzikos
- **Neurosurgery**
  - M. Sean Grady
  - John Y.K. Lee
  - Donald O'Rourke
  - Steven Brem
  - Timothy Lucas
  - Eric Zager
  - Neil Malhotra
  - James Schuster
  - Paul Marcotte
- **Neuro-Ophthalmology**
  - Grant Liu
  - Madhura Tamhankar
- **Neuropathology**
  - Zissimos Mourelatos
  - MacLean Nasrallah
- **Neurology**
  - Amy Pruitt
  - Raymond Price
  - Danielle Becker
- **NeuroInterventional**
  - Bryan Pukenas
  - Robert W. Hurst
- **NeuroOncology**
  - Arati Desai
  - Gerald Linette
  - Stephen Bagley
- **Otorhinolaryngology**
  - Bert O'Malley
  - James Palmer
  - Jason Newman
  - Nithin Adappa
  - Christopher Rassekh
  - David Kennedy
  - Douglas Bigelow
  - Michael Ruckenstein
- **Neuropsychiatry**
  - Carol Armstrong
- **Cardiology**
  - Douglas Jacoby
- **Endocrinology**
  - Julia Kharlip
  - Peter Snyder

Thank You