SRS: The Use of SGRT in a High Dose World

Welcome to Kelsey-Seybold

4 Radiation Oncology Clinical Sites
5 Truebeams, 1 Edge
All Sites Use AlignRT
4 CT Simulators
3 sites use Solstice System
1 site uses Encompass System
All sites treat SRS

What are we going to talk about

- Discuss why SGRT is so important in today's clinical treatments
- Benefits of SGRT concerning SRS
- Other Ways to Treat SRS
- Look at the trends of SRS treatments across 4 clinical sites
- Clinical Study of SRS Plan and Treatment
- Masks and ROIs
- Obstacles during treatment

Why this topic is important

More SRS treatments

Statistics over 5 years

Growth in number of facilities

Higher doses with less treatments

SRS

SRT/SBRT

Hypofractionation

Need for better patient monitoring

Assurance for therapists treating and physics/physician overseeing

Patients can move in any mask, even closed-face

Unseen movement in closed-face masks

Benefits of SGRT with SRS

Constant patient monitoring

Safer and more accurate treatment

Reduction in mid-treatment imaging

Less table time for patient

Opens up schedule for more treatments

Other Ways to Treat SRS

5 Point Closed-Face Mask

- Lose direct patient monitoring
- Patients are claustrophobic

Brain Lab

- Expensive
- Imaging dose is much higher

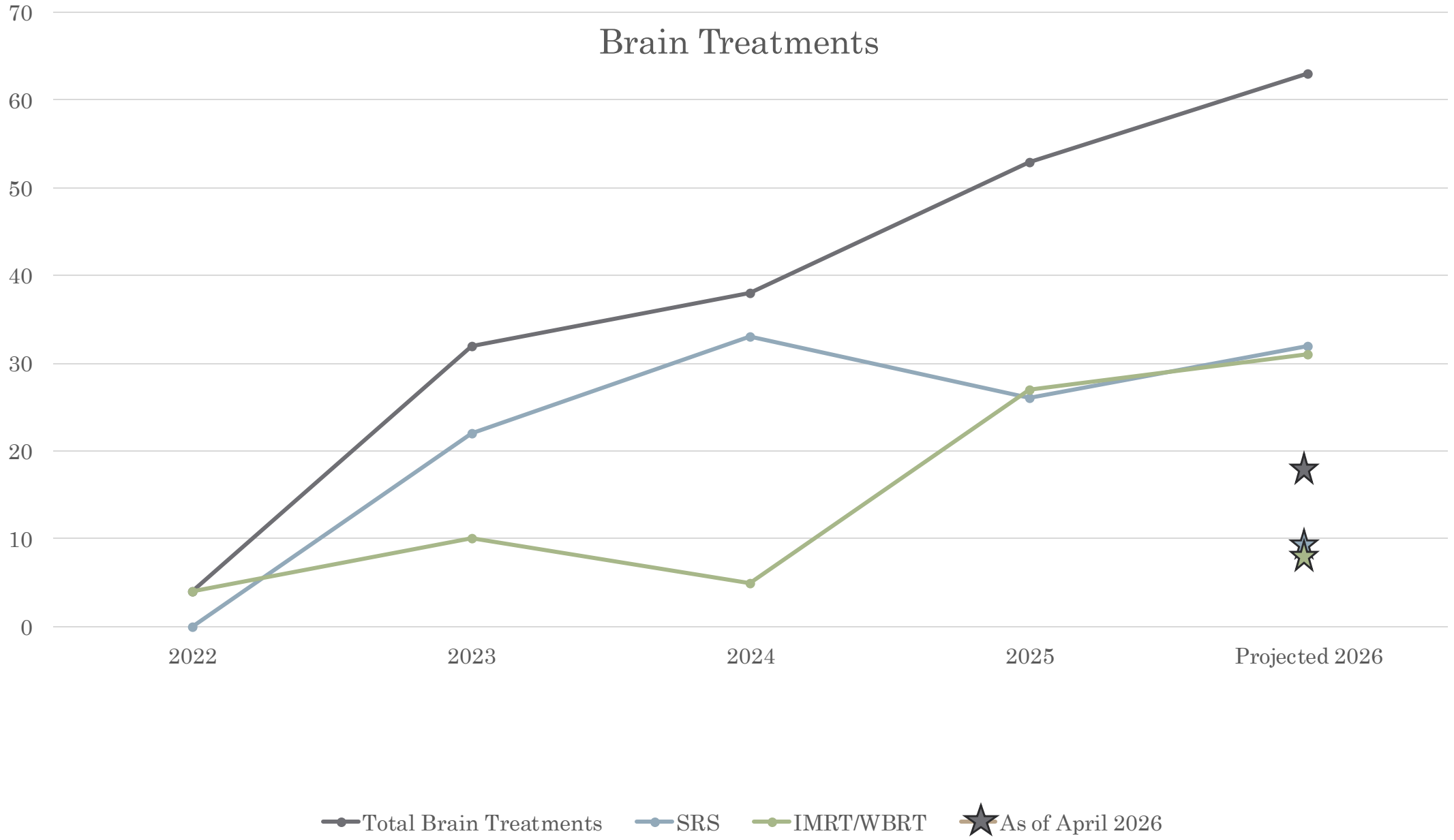
Gamma Knife

- Halo is difficult on the patient
- Is an all day process

SRS Cones

- Outdated
- Limited dose conformity

Statistics Over 5 Years



Statistics

General increase in brain treatments

- We opened 3 centers over 3 years

Consistent incline in SRS treatments

SRS is favored over IMRT or WBRT

- The statistical data does not break down IMRT and 3D by year

Sit Down with Physics

- What defines an SRS treatment
- Talk about margins and concentrated high dose
- SRS vs WBRT or IMRT
- Increase in SRS over WBRT
- How they feel about SGRT

What Makes SRS, SRS?

- Planning:
  - Single fraction
  - Tumor is no larger than 2 cm to be planned SRS
  - Dose is typically 18-21 Gy
  - Margin is 1mm PTV tolerance
    - S/I, A/P, R/L
  - Can treat up to 13 isos
    - Our highest so far has been 4 isos

What does physics say?

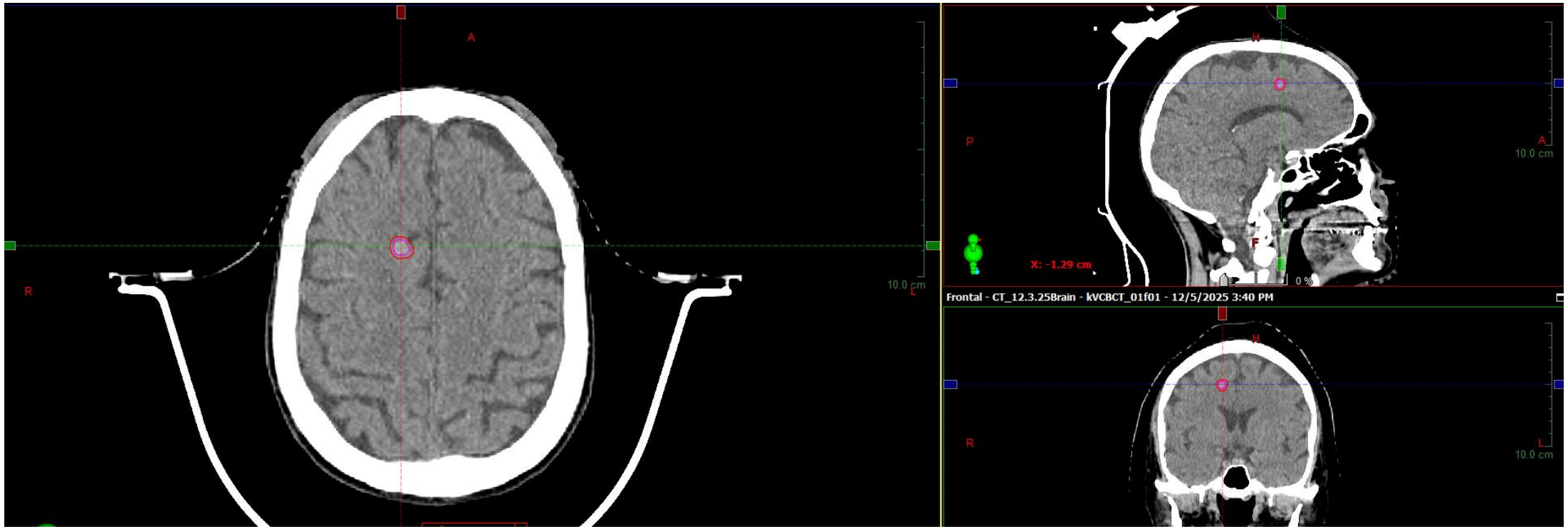
- Trending increase in SRS over WBRT or IMRT
  - SRS is favored over WBRT for patient longevity
    - WBRT is a last option and used to treat symptoms
  - SRS is favored over IMRT for better isodose lines

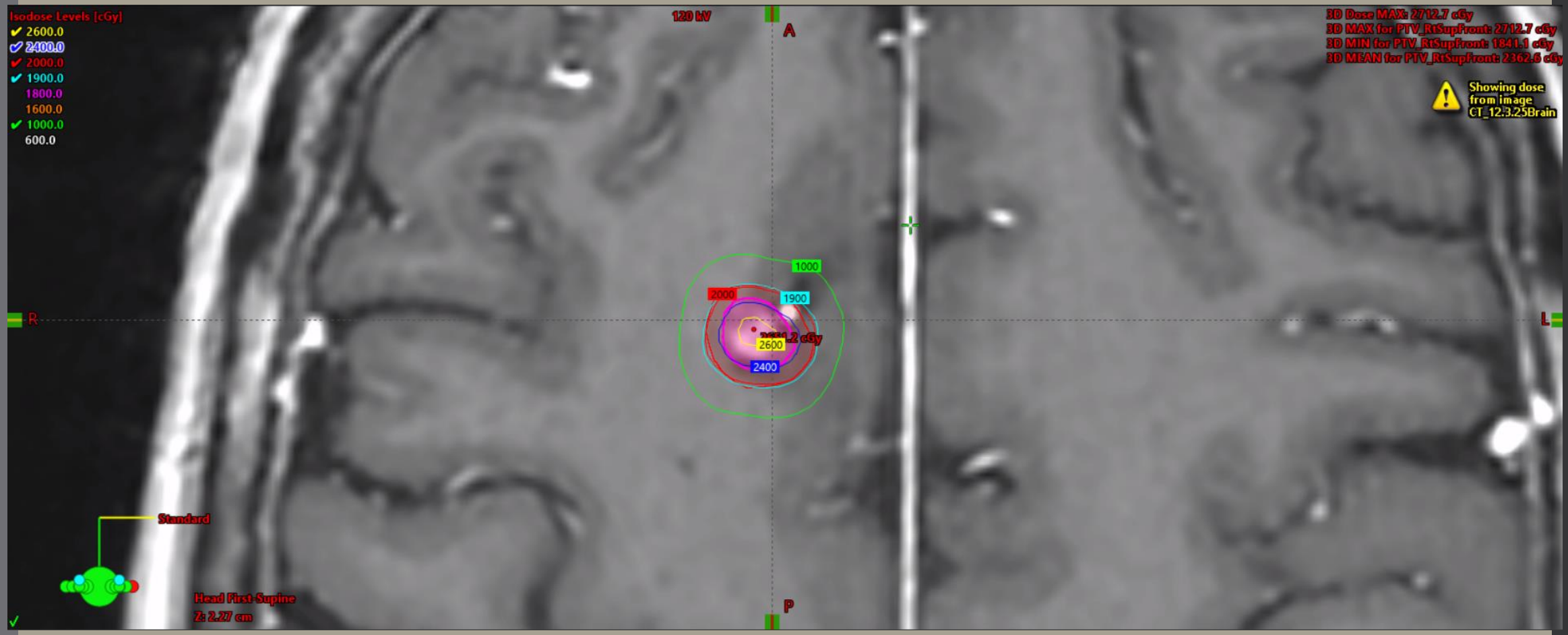
Physics and SGRT

- With small margins, constant patient monitoring is key
- The patient is not able to move
  - The machine will turn off
  - We see it
- Decrease in mid-treatment imaging for position verification

Case Study

Patient is a 61-year-old male
Stage IV melanoma metastatic to brain
Recommended SRS to a total of 20 Gy in 1 fraction

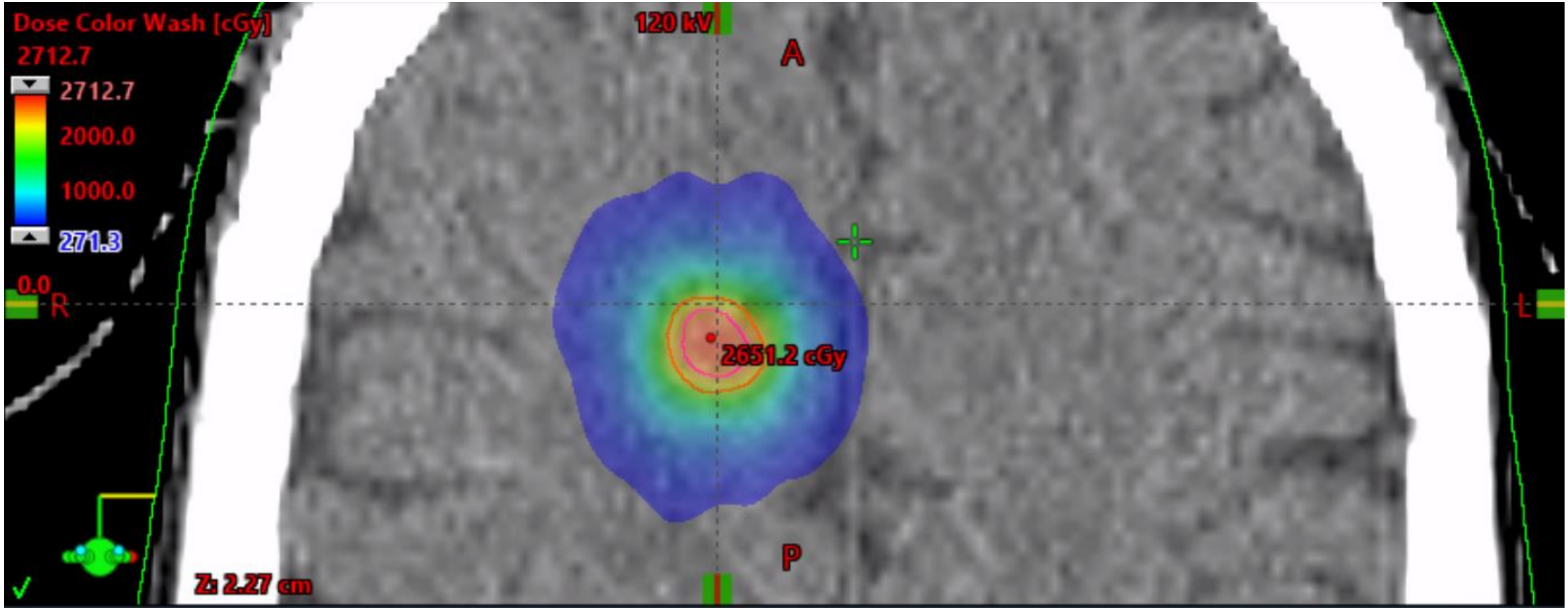




MRI revealed 5 mm lesion in the right superior gyrus

Prescription: 2000cGy x 1 = 2000cGy

Energy: 6xFFF


Dose Color Wash [cGy]
2712.7
2712.7
2000.0
1000.0
271.3
0.0
R
120 kV
A
2651.2 cGy
P
L
Z: 2.27 cm

Monitoring During Treatment

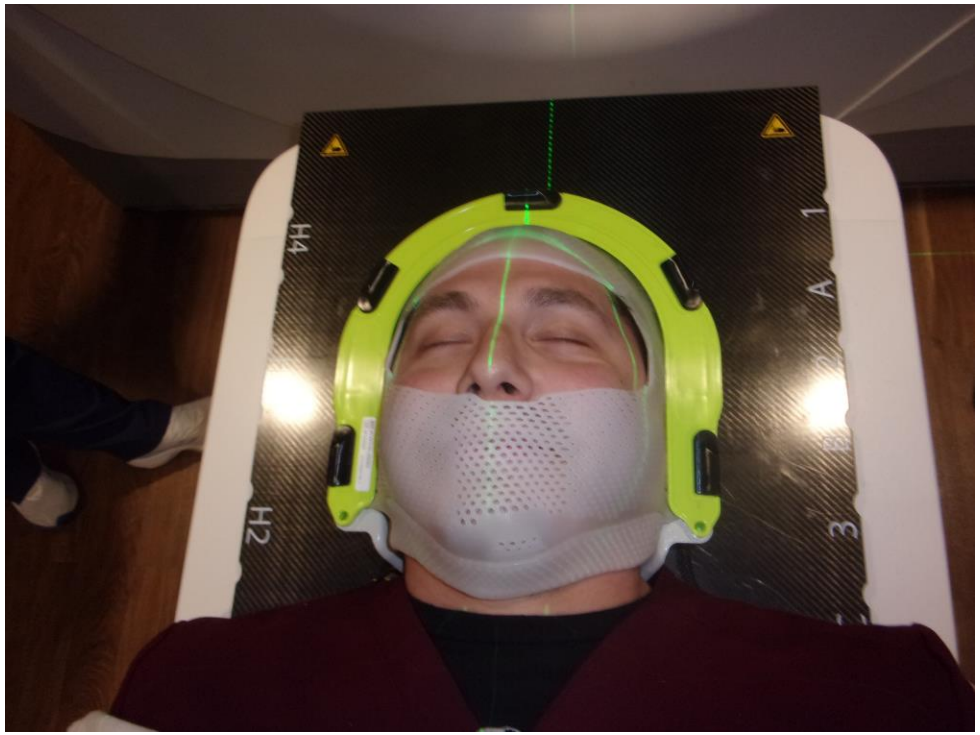
- SRS Protocol is 1mm
- During treatment, the deltas went out of tolerance
- 2nd CBCT was required

Patient Support Device Corrections		
Representation	Isocentric Standard	
Match Type	Online Match	
Vrt	-0.06	cm
Lng	-0.24	cm
Lat	+0.12	cm
Rtn	-0.3	°
Pitch	-0.5	°
Roll	-0.5	°

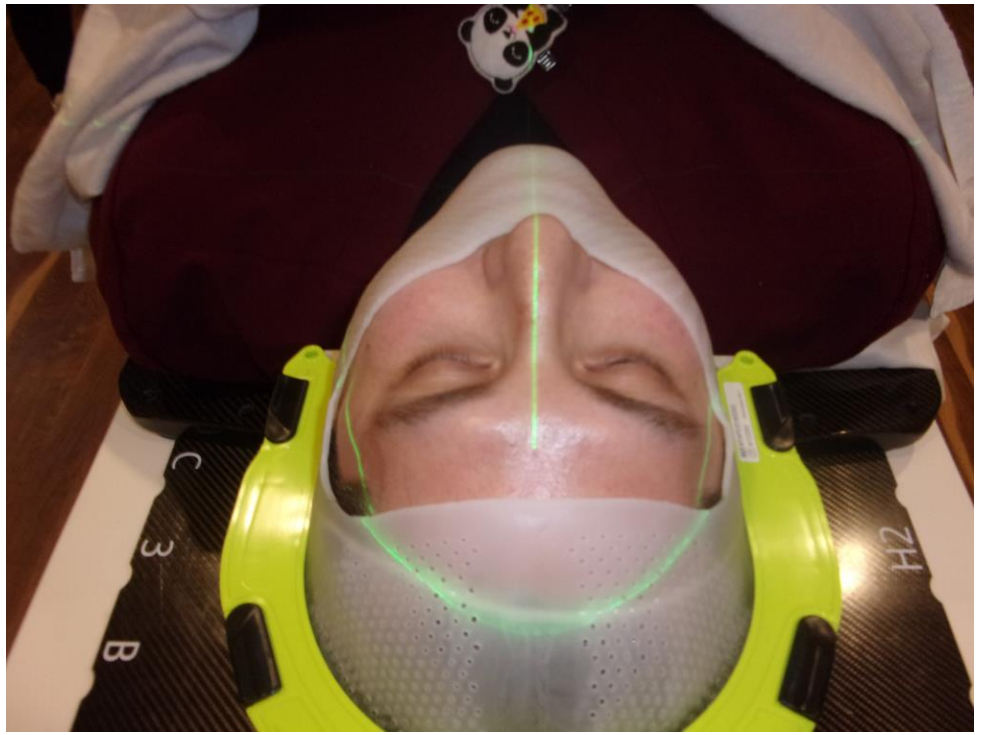
Initial CBCT shifts

Patient Support Device Corrections		
Representation	Isocentric Standard	
Match Type	Online Match	
Vrt	-0.09	cm
Lng	-0.11	cm
Lat	-0.09	cm
Rtn	-0.3	°
Pitch	+0.8	°
Roll	0.0	°

2nd CBCT shifts



Under the nose



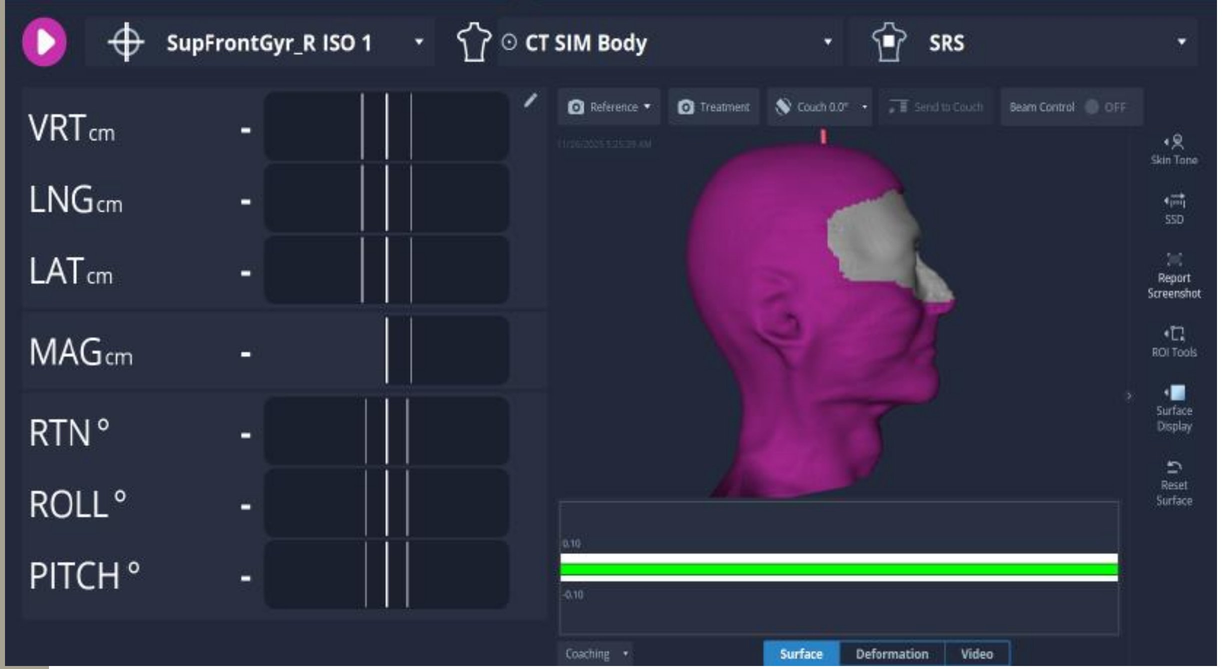
2 Fingers above the eyebrows

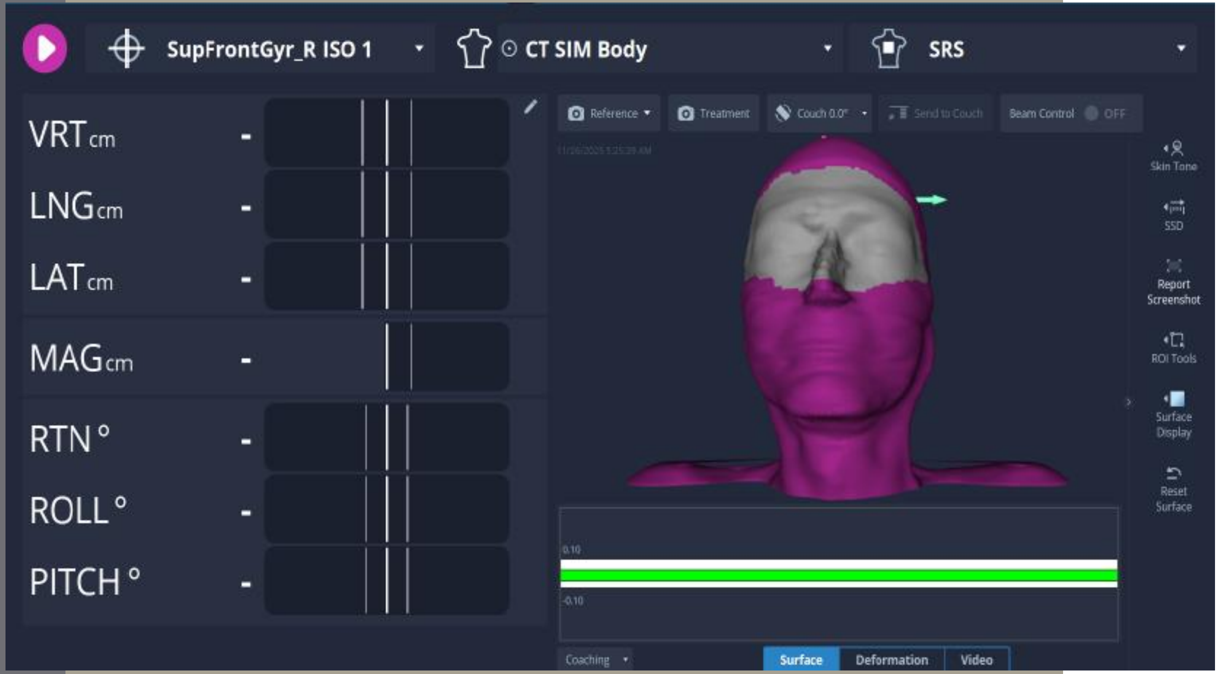
Making a Mask

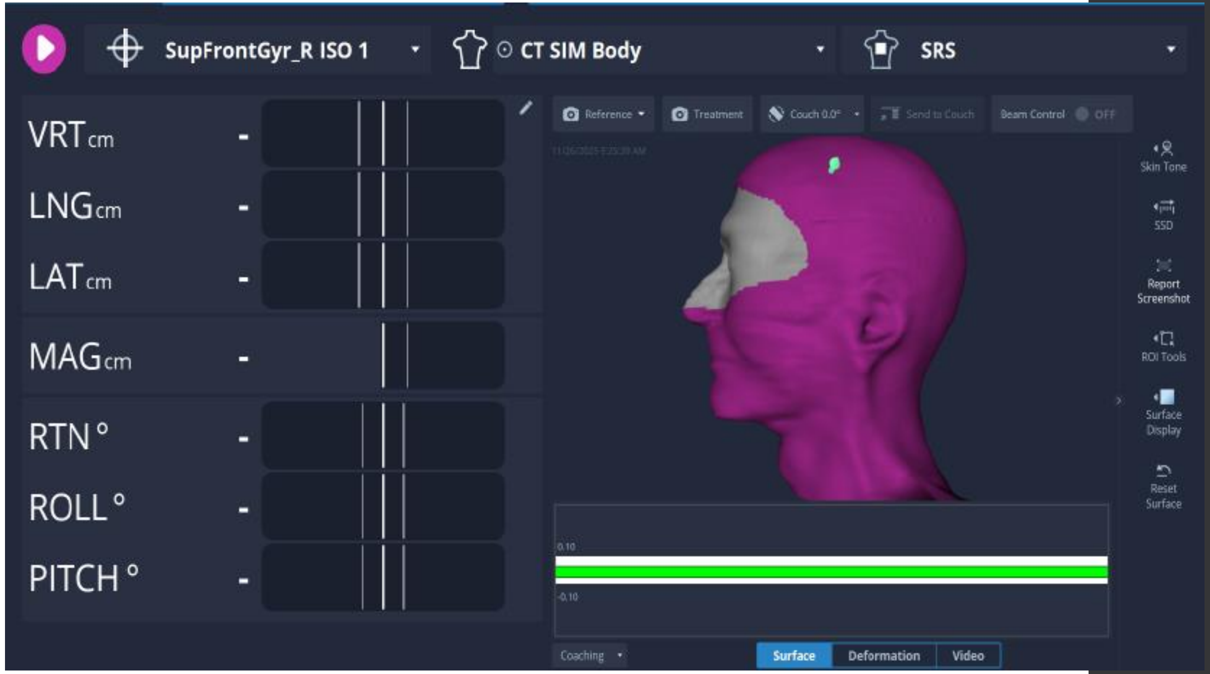
Making a Mask

Down to hairline or ears

Drawing an ROI







Obstacles

Couch kicks and blockage

It all goes back to making the mask and drawing the ROI

Conclusion

- Growing cases of SRS treatments
- Smaller margins with higher doses
- Creates greater need for accurate patient monitoring