

A bridge to more advanced techniques

Sara Samiee MD FRCPC
Radiation Oncologist

PARDISNOOR IMAGING
AND CANCER CENTER

Physician's role as a Radiation Oncologist

- Robust decision making
- Back bone of an advance treatment:
 - Volumes
 - Do's
 - Don'ts

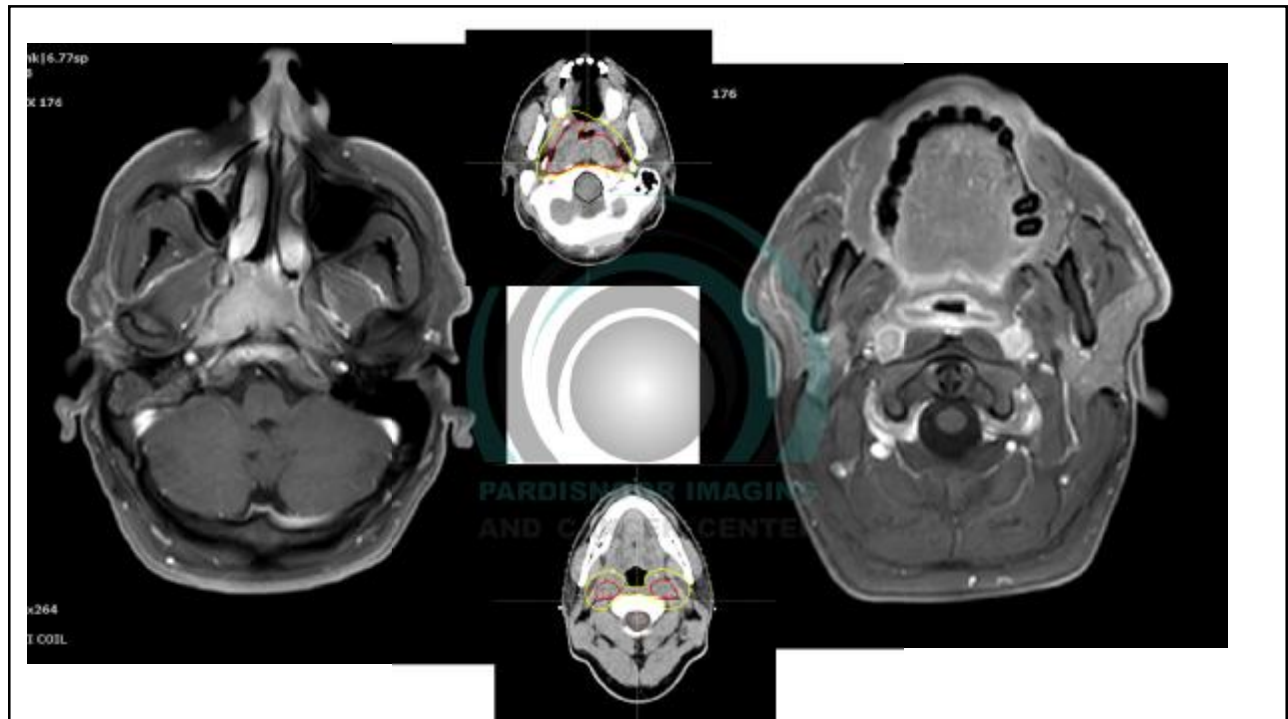
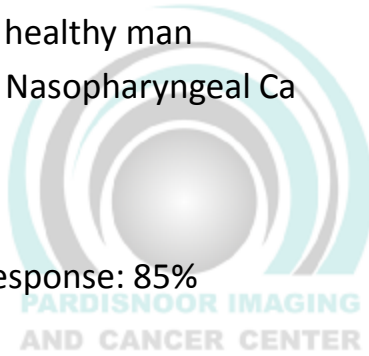
Paying attention to every single detail matters

Otherwise patient wouldn't benefit any technique



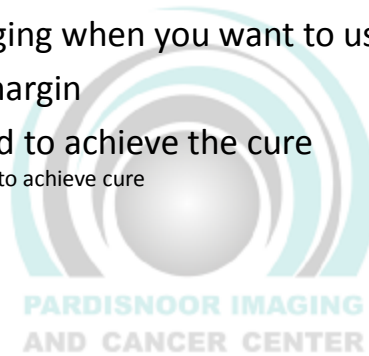
Step by step for an advance technique A case of Nasopharyngeal Ca

- 47 year old otherwise healthy man
- Recent diagnosis with Nasopharyngeal Ca
- Staging → PET CT
 - No distant met
- T1N2M0
- Chance of complete response: 85%

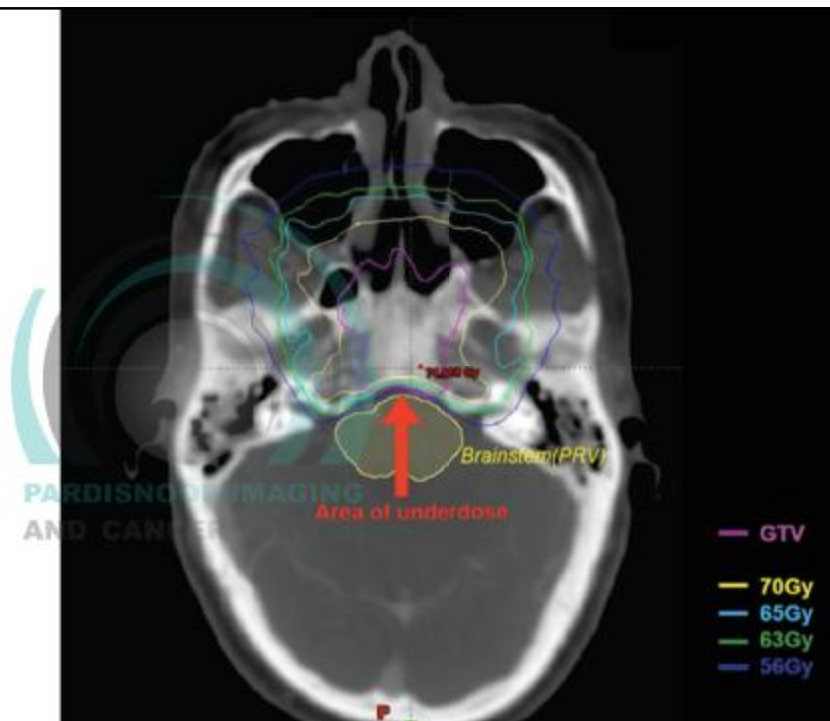


Nasopharyngeal Ca, Rad Onc Challenge

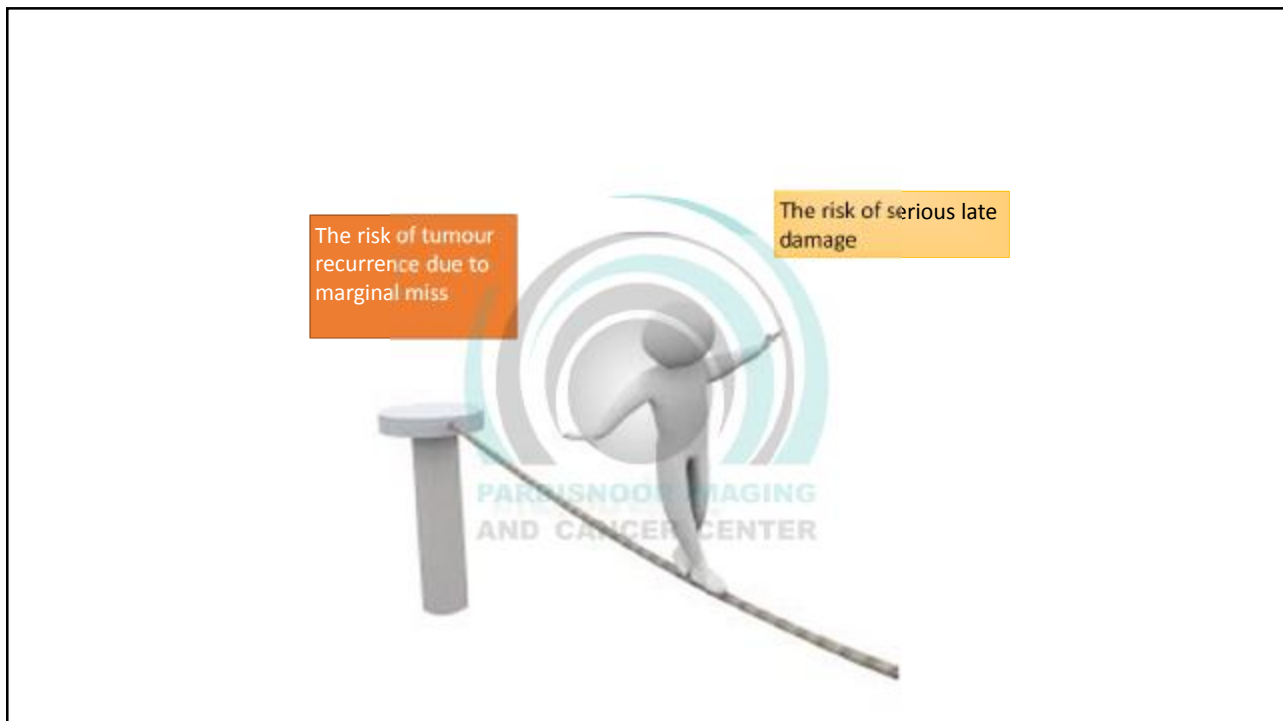
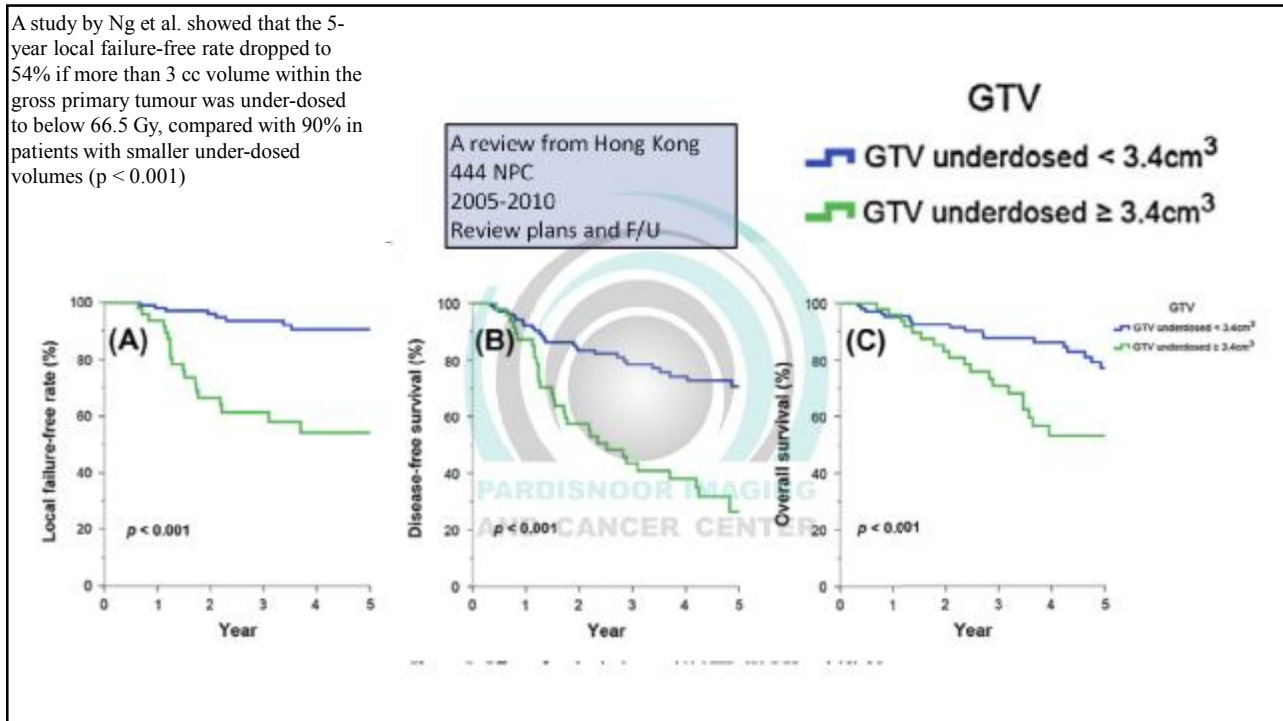
- And it's more challenging when you want to use Tomo!
- Narrow therapeutic margin
- High doses are needed to achieve the cure
 - And it's actually pretty likely to achieve cure



Importance of coverage

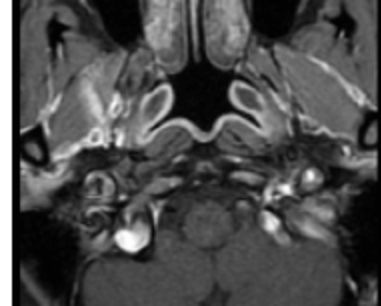
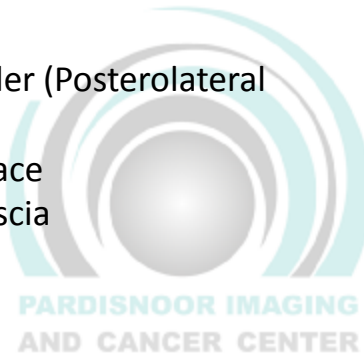


A study by Ng et al. showed that the 5-year local failure-free rate dropped to 54% if more than 3 cc volume within the gross primary tumour was under-dosed to below 66.5 Gy, compared with 90% in patients with smaller under-dosed volumes ($p < 0.001$)

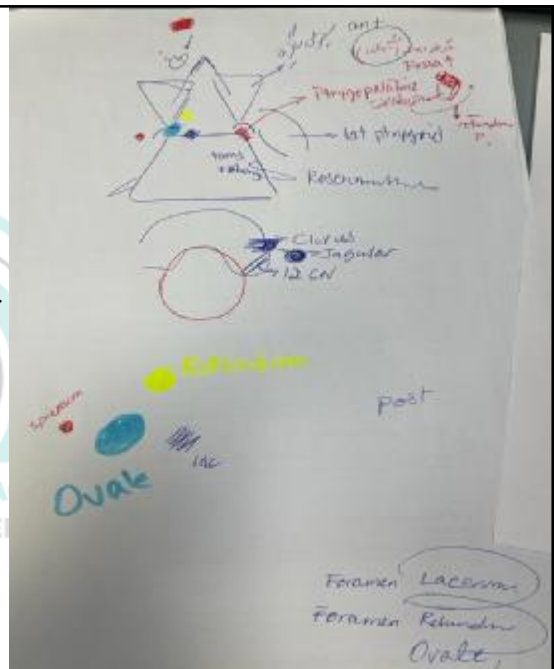
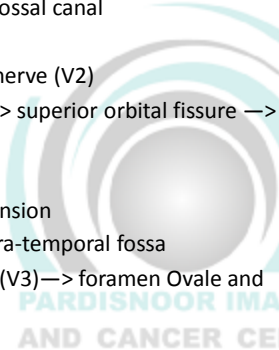


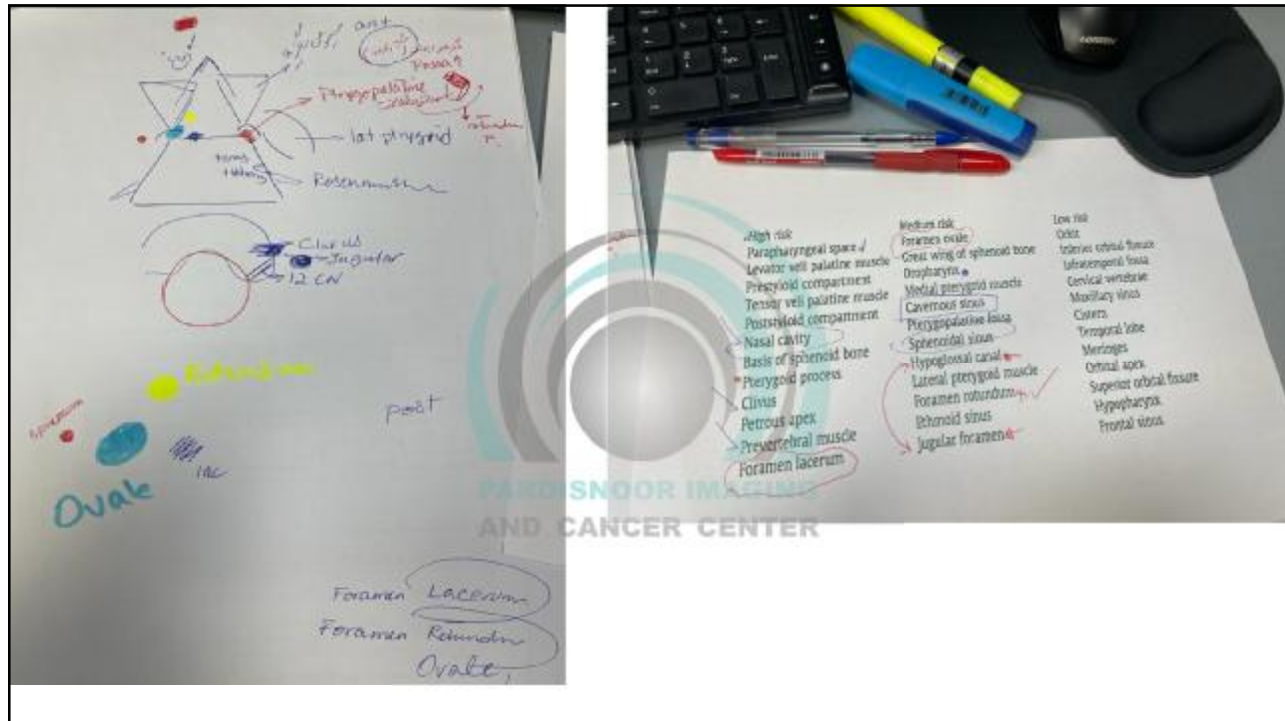
Anatomy, anatomy, anatomy

- Area of easy spread:
 - Fossa of Rosenmüller (Posterolateral pharyngeal recess)
 - Parapharyngeal space
 - Pharyngobasilar fascia
 - Neural pathways



- Anteriorly
 - Nasal fossa
 - —> Pterygopalatine fossa via the Sphenopalatine foramen
- Postero-lateral —> Jugular foramen; hypo-glossal canal
- Superiorly
 - Foramen Rotundum along the maxillary nerve (V2)
 - Inferior orbital fissure —> orbital apex —> superior orbital fissure —> intracranial invasion
 - Foramen Lacerum
 - —> cavernous sinus and intracranial extension
- Laterally —> Para-pharyngeal spaces —> Infra-temporal fossa
 - Perineurally along the mandibular nerve (V3)—> foramen Ovale and upwards into the cavernous sinus.





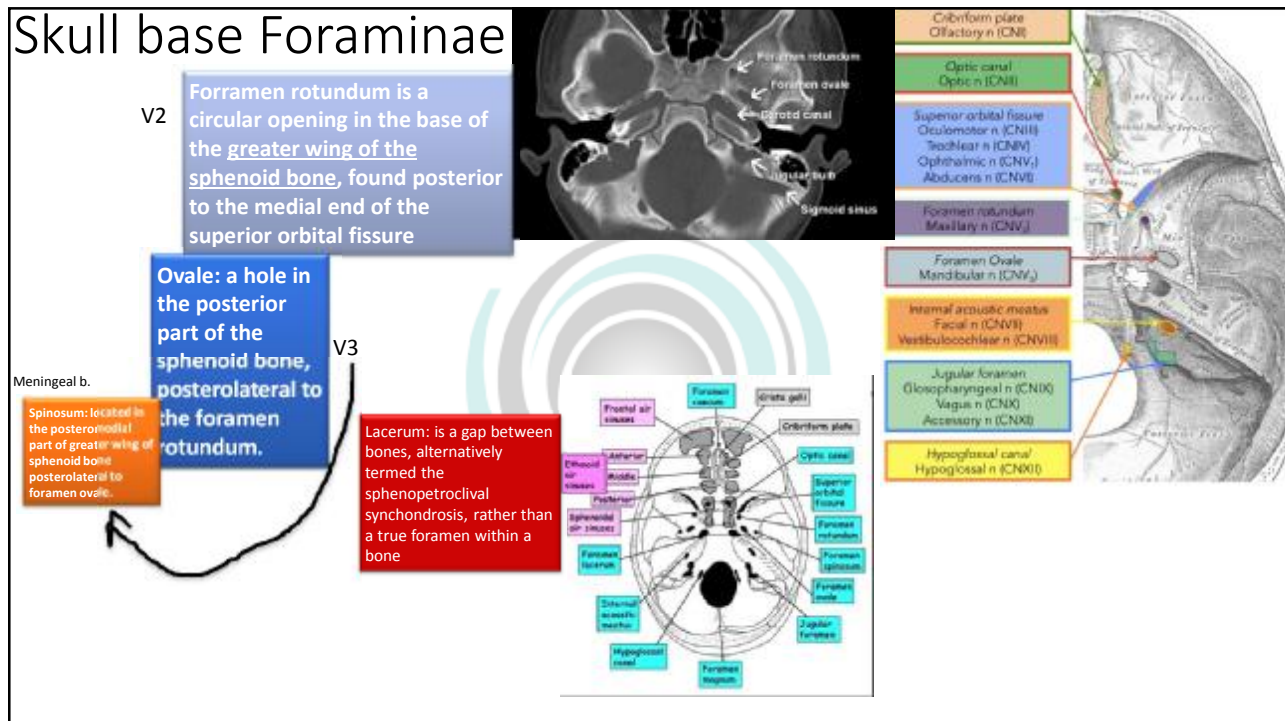
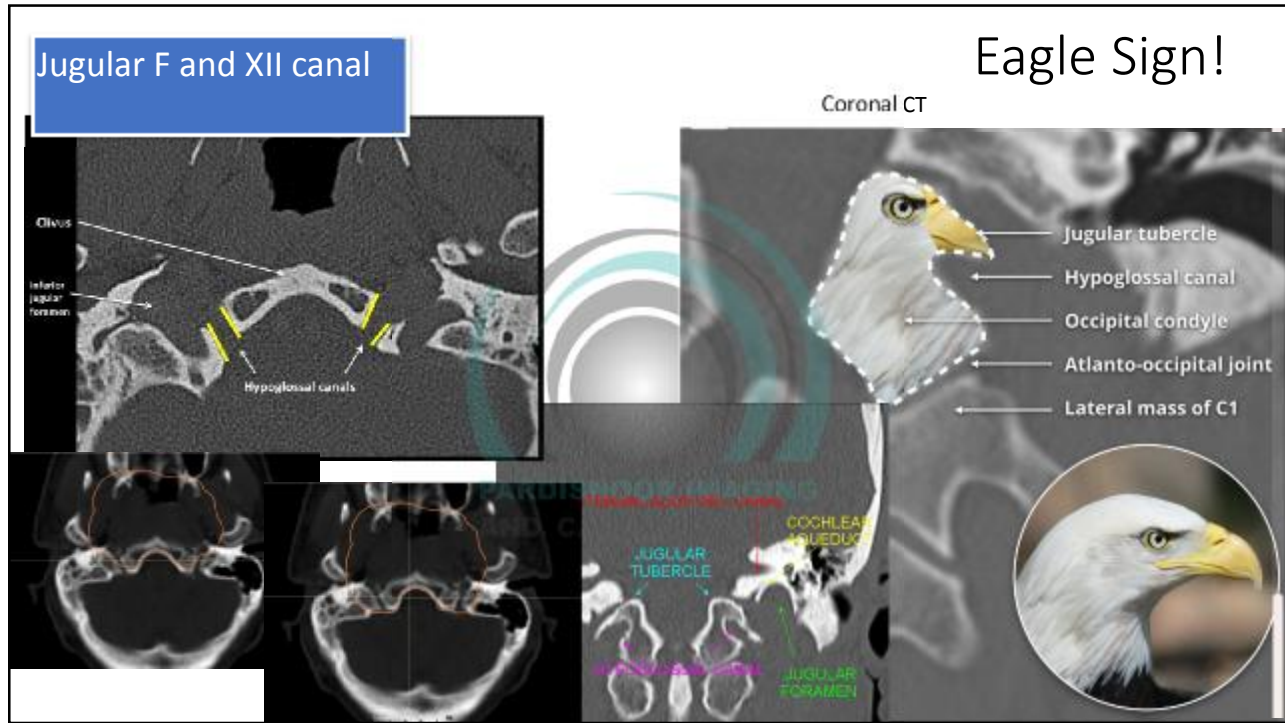
Pterygopalatine Fossa

Case courtesy of Dr Sachintha Hapugoda, Radiopaedia.org

- Roof**
 - part of greater wing of sphenoid bone
 - inferior orbital fissure
- Posterior**
 - pterygoid plates and part of lesser wing of sphenoid bone
 - foramen rotundum, vidian and palatovaginal canals
- Medial**
 - perpendicular plate of palatine bone
 - sphenopalatine foramen
- Lateral**
 - pterygomaxillary fissure (narrowing)
- Anterior**
 - maxillary sinus (posterior wall)
 - inferior orbital fissure (superiorly)
- Contents**
 - pterygopalatine ganglion
 - descending palatine artery
 - CNV (maxillary division)
 - nerve of the pterygoid canal
 - vidian nerve and artery
- Floor**
 - pyramidal process of palatine bone
 - palatine canals (narrowing)

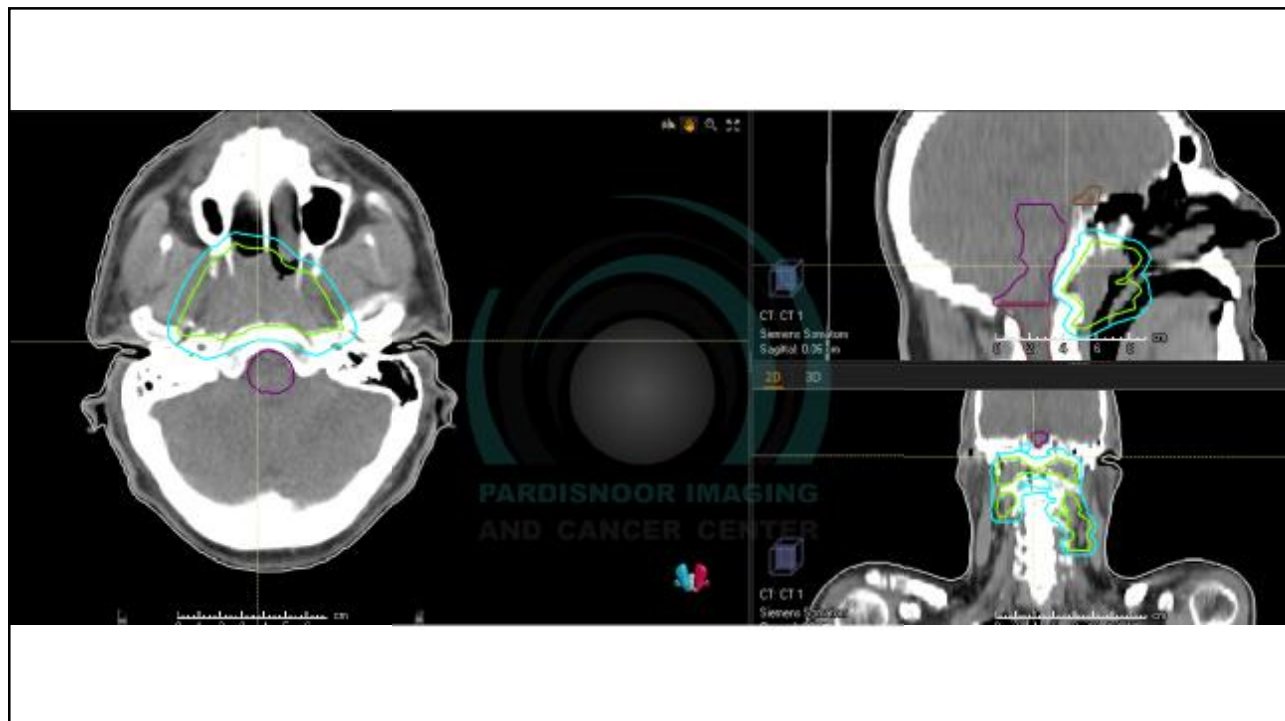
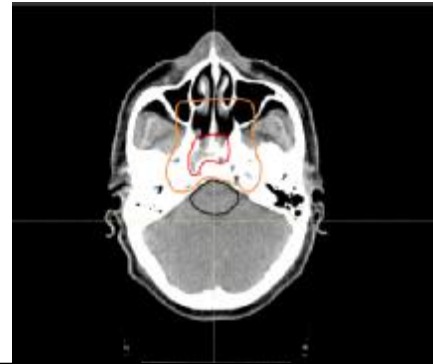
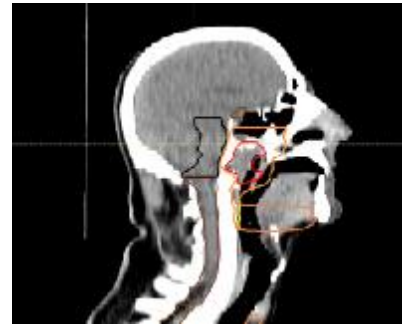
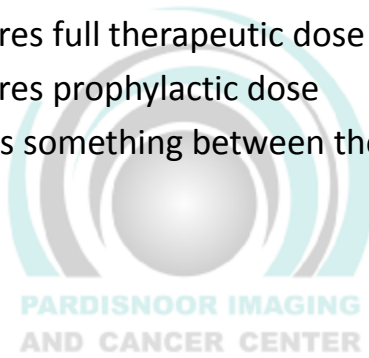
S Hapu
CC BY-NC-SA
Radiopaedia.org

© Behrang Amini, MD/PhD



Nasopharynx Ca

- Think of volume requires full therapeutic dose
- Think of volume requires prophylactic dose
- The volume that needs something between these





Pardis Noor Yildiz Center
Department of Radiation Oncology
Planning Approval Form

CT No: 1	Date: 06 Jun 21	Accessions: 585- base - / 58, 2nd	Dose: 11.0, 1.0	Name: G. L. 2006
	Time: 11:00	Tomo	PTV Dose: 54130 60130 66130	Diagnosis: Nasopharyngeal Ca

Organ Priority	Organ Dose/ Dose Constraint	Approved Constraints	Physician Plan Approval
① Brainstem	< 52.8		
② Optic tracts OC Ran Lan	< 53 → < 54 → 54		
③ Spinal Cord	< 49		
④ PTV66 70 54	→ To be covered by AST PD		
⑤ Parotid L R	→ mean L24 → L35 L24 L35		
⑥ Cochlea L R	→ mean L45 L45		

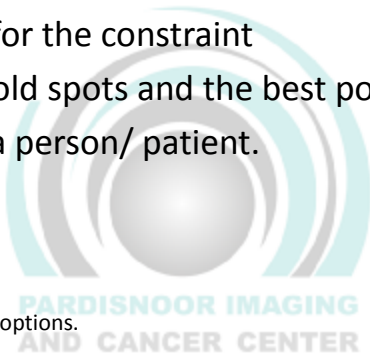
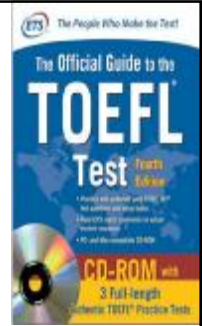
Signature: _____

• Now to the challenge of physics planning

Path to review a plan

- It is beyond checking for the constraint
- Check for hot spots, cold spots and the best possible plan.
- Think of your plan as a person/ patient.
 - Co-morbidities
 - Social Status
 - Habits
 - Co-operation
 - Age
 - AND choose wisely between options.



PardisNoor Imaging and Cancer Center
Department of Radiation Oncology
Planning Approval Form

PT#	25 Jan 2022	Site	562 - 1000 - 1000	Site	562 - 1000 - 1000	Name	Alireza
1	11:30	Time	11:30	Time	11:30	Physician	MD/Dr. Alireza

Organ at Risk	Organ at Risk Constraint	Organ at Risk Constraint	Physician Plan Approval
① Lung (Mean)	< 53.8	< 53.8	
② Lung (V20)	< 53	< 53	
③ Spinal Cord	< 49	< 49	
④ Myeloid	260	260	
⑤ Hematol	R 1.24	R 1.24	
⑥ Esophagus	< 45	< 45	

(Please check) OK