Radiotherapy Guideline for Nasopharyngeal Cancer

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RT indication

- Definitive treatment: T1-4, N0-3b, M0
  - Radiotherapy alone: T1N0M0
  - CCRT ± adjuvant chemotherapy: T2-T4, N1-3b
- Palliative treatment : M1 status for relief of symptoms

Simulation and immobilization

- CT-based simulation (preferring 1.5-3 mm slice thickness with contrast) is required.
- Patients may be simulated with a supine position
- Immobilization devices
  - Thermoplastic mask with headrest

Field design and treatment volume

- **3D-CRT/IMRT/VMAT/Tomotherapy/Radixact treatment planning; IGRT is preferred**
  - Gross tumor volume (GTV, PTV-H): nasopharyngeal tumor and enlarged lymph nodes
  - Clinical target volume one (CTV-1, PTV-M): depend on the tumor invasion; whole nasopharyngeal cavity, lower third of sphenoid sinus, post. fourth of maxillary sinus, bilateral parapharyngeal space, bilateral upper neck lymph nodes, and/or involved nodal areas
  - Clinical target volume two (CTV-2, PTV-L): bilateral lower neck region and bilateral supraclavicular region

Dose prescriptions

- GTV (PTV-H): 70 to 76 Gy in 2.0 to 2.2 Gy per fraction
- CTV-1 (PTV-M): 55 to 63 Gy in 1.8 to 2.0 Gy per fraction
- CTV-2 (PTV-L): 48 to 52 Gy in 1.8 to 2.0 Gy per fraction

Constraints for organ at risk

- Spinal cord: Dmax<50 Gy
- Chiasm/optic nerves: Dmax< 50 Gy
- Brainstem: Dmax< 60 Gy

- Eyes (globe): Dmean<35 Gy, Dmax<54 Gy
- Lens: Dmax<7 Gy
- Inner ear/cochlea: Dmax< 45 Gy
- Parotid gland(s): Dmean< 30Gy
- Larynx: Dmean< 44 Gy
- TMJ: Dmax< 70 Gy

Reference

- NCCN Practice Guidelines in Oncology, 2023
- Perez and Brady's : Principles and Practice of Radiation Oncology, 7th ed, 2018
- Eric K. Hansen, Handbook of Evidence-Based Radiation Oncology