

中山醫學大學附設醫院 放射腫瘤科

Radiotherapy Guideline for Esophageal Cancer

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本版與上一版的差異：

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檢閱後無異動	

RT indication

- Neoadjuvant CCRT
 - Clinically > T3 or clinically N positive
- Definitive CCRT
 - Clinically inoperable status, including poor performance status/poor surgical candidate, or locally advanced inoperable stage, such as T4 or N3
 - Cervical or cervicothoracic esophageal carcinomas, poor surgical candidate
- Adjuvant RT/CCRT
 - R1 or R2 resection
 - Pathologically positive lymph nodes, pT3 / pT4 status.

Simulation and immobilization

- CT-based simulation (preferring 3-5 mm slice thickness with contrast) is required.
- Patients may be simulated with a supine position
- Immobilization devices
 - Vacuum cushion
 - Thermoplastic mask with headrest for cervical portion if necessary

Field design and treatment volume

- IMRT (intensity-modulated radiotherapy) is strongly encouraged; VMAT (volumetric-modulated arc therapy) may further improve conformity and normal tissue sparing. Advanced techniques such as TomoTherapy or Radixact may be used if available.
 - GTV: primary tumor and involved regional lymph nodes as identified
 - CTV: the areas at risk for microscopic disease defined as the primary tumor plus a 3-4 cm expansion superiorly and inferiorly along the length of the esophagus and cardia and a 1 cm radial expansion; coverage of elective

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nodal regions should be considered

- Elective treatment of node bearing regions depends upon the location of the primary tumor in the esophagus
 - ◆ Cervical esophagus: treat the bilateral supraclavicular nodes
 - ◆ Proximal third of the esophagus: treat peri-esophageal lymph nodes and bilateral supraclavicular lymph nodes
 - ◆ Middle third of the esophagus: treat peri-esophageal lymph nodes, sup. Ant. Mediastinal lymph nodes, consider including bilateral Supraclavicular lymph nodes and or celiac trunk lymph nodes
 - ◆ Distal third of esophagus and the gastro-esophageal junction: peri-esophageal lymph nodes, lesser curvature lymph nodes in the situation of distal lesions, and the celiac axis

Dose prescriptions

- Neoadjuvant CCRT
 - Gross tumor 45-50.4 Gy (1.8-2 Gy/day)
 - Regional lymph nodes 45-50.4 Gy (1.8-2 Gy/day)
- Definitive CCRT
 - Gross tumor 50-66 Gy (1.8-2 Gy/day); 60-70 Gy (1.8-2 Gy/day) if cervical or cervicothoracic esophageal carcinomas
 - Elective nodal areas 45-50 Gy
- Adjuvant RT/CCRT
 - Gross residual tumor 50-66 Gy (1.8-2 Gy/day)
 - Regional lymph nodes and tumor bed 45-50.4 Gy (1.8-2 Gy/day)

Constraints for organ at risk

- Spinal cord: Dmax<45 Gy
- Lung (combined lung): V20 <30%
- Heart: V45 <67%
- Liver: Dmean< 25 Gy
- Kidney (bilateral): V20 <32%

Reference

- NCCN Practice Guidelines in Oncology, 2025
- Perez and Brady's : Principles and Practice of Radiation Oncology, 7th ed, 2018
- K.S. Clifford Chao. Practical Essentials of Intensity Modulated Radiation Therapy, 3rd ed, 2013
- Jane Dobbs, Ann Barrett. Practical Radiotherapy Planning, 4th ed, 2009

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- Shapiro, Joel, et al. "Neoadjuvant chemoradiotherapy plus surgery versus surgery alone for oesophageal or junctional cancer (CROSS): long-term results of a randomised controlled trial." *The lancet oncology* 16.9 (2015): 1090-1098.
- Urschel, John D., and Hari Vasan. "A meta-analysis of randomized controlled trials that compared neoadjuvant chemoradiation and surgery to surgery alone for resectable esophageal cancer." *The American journal of surgery* 185.6 (2003): 538-543.
- Malthaner, Richard A., et al. "Neoadjuvant or adjuvant therapy for resectable esophageal cancer: a systematic review and meta-analysis." *BMC medicine* 2.1 (2004): 35.