

Radiotherapy Guideline for Bladder Cancer

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Carcinoma of the Bladder

- **Fractionation**
 - Conventional: 1.8–2.0 Gy per fraction daily.
 - Hypofractionation: 55 Gy in 20 fractions over 4 weeks; non-inferior to 64 Gy in 32 fractions (6.5 weeks) and superior in invasive local control.
- **Pre-treatment procedure**
 - Perform maximal TUR when safely feasible.
- **Simulation and treatment setup**
 - Preferred empty bladder for reproducibility; full bladder acceptable for boost with image guidance.
- **Technique**
 - Use high-energy linear accelerator with multiple fields.
 - Boost whole or partial bladder to 60–66 Gy.
- **Preoperative RT**
 - For invasive tumors, consider low-dose preoperative RT prior to partial cystectomy (category 2B).
- **Candidates for concurrent chemoradiotherapy**
 - Suitable: Solitary tumor, negative nodes, no extensive/multifocal CIS, no moderate/severe hydronephrosis, preserved bladder function.
 - Not suitable for EBRT alone
 - Stage Ta/T1 or CIS rarely appropriate. For recurrent Ta–T1 post-BCG unfit for cystectomy, concurrent chemoradiotherapy may be considered.
- **Target volumes**
 - Whole bladder ± pelvic nodes (hypogastric, obturator, internal/external iliac, perivesical, sacral, presacral).
 - Consider common iliac for nodal disease.
- **Dose recommendations**
 - Whole bladder: 39.6–50.4 Gy, then boost to 60–66 Gy.
 - Positive margin or extranodal extension: 54–60 Gy.
- **Adjuvant RT**
 - For pT3/pT4 pN0–2 urothelial carcinoma post-radical cystectomy with ileal conduit: pelvic RT 45–50.4 Gy; boost to 54–60 Gy if margins positive or extranodal extension.

➤ **Special considerations**

- In highly selected T4b tumors, intraoperative RT may be considered.

Palliative RT

- 30 Gy in 10 fractions or 21 Gy in 3 fractions.
- For metastatic/locally recurrent disease: RT + radiosensitizing chemotherapy (avoid chemo with >3 Gy/fraction regimens).

Constraints for organ at risk

- Normal organ dose responses from the QUANTEC project.

Reference

- NCCN Practice Guidelines in Oncology, 2024
- Perez and Brady's : Principles and Practice of Radiation Oncology, 7th ed, 2018
- Eric K. Hansen, Handbook of Evidence-Based Radiation Oncology
- K.S. Clifford Chao. Practical Essentials of Intensity Modulated Radiation Therapy, 3rd ed, 2013