INTRODUCTION:

Prostate cancer is diagnosed by biopsy and evaluated (staged) to determine extent of disease (local, regional, or distant metastatic). The most appropriate treatment option may include active surveillance, radical prostatectomy or radiation therapy. An initial multidisciplinary interaction should take place to agree on stratification of patients into risk categories. Treatment options exist within each risk category and the specific course of treatment is based on disease extent and prognosis, acceptance of risks and benefits, as well as consideration of possible changes in quality of life.

Both surgery and radiation therapy is used to treat prostate cancers that are organ-confined or extend into tissues adjacent to the prostate. Such cancers are treated aggressively (for cure) with tolerance doses of radiation to achieve control of localized cancers yielding 5- and 10-year disease-free survival results that are comparable to those obtained by surgical options.

GOAL OF THE GUIDELINE:

This guideline outlines several methods suitable for delivering prostate radiation therapy. These include the use of external radiation (teletherapy) and internal radiation (brachytherapy). Advances in the treatment of prostate cancer with radiation have been the direct result of improved diagnostic accuracy and integration of imaging with precise treatment delivery. Improvements in technology result in more favorable distributions of radiation doses, and by extension should result in enhanced tumor control due to dose escalation or altered fractionation, and decreased complications by limiting dose to normal tissues. Fortunately, these complex improvements offer a myriad of regimens: the goal of this program is to guide diagnosis and treatment to the most efficient, comparatively effective radiation treatment pathway.

GENERAL CONSIDERATIONS:

- Patients with very low/low risk disease should be considered for active surveillance before considering radiation therapy.
- Patients with very low/low risk disease should not receive androgen deprivation therapy (ADT) unless it is used to reduce the prostate size prior to implant or the receipt of pelvic node irradiation.
- Combined treatment (3D-CRT/IMRT) + implants is not considered standard for very low/low risk patients.
Patients with history of recent transurethral resection of the prostate (TURP), elevated international symptom score (IPSS), bladder outlet obstruction, or enlarged gland (even after short course of Luteinizing hormone-releasing hormone [LHRH] agonist) may not be ideal candidates for implant due to increased risk of side effects.

Patients with intermediate risk disease may be considered for short course (4-6 months) of neoadjuvant/concomitant/adjuvant ADT.

Daily prostate localization can be accomplished with imaging modalities, e.g., ultrasound images, computed tomography (CT) images, or implanted fiducial markers, incorporated into an image guided radiation therapy (IGRT) system.

Patients with high risk disease may be considered for pelvic lymph node irradiation and 2-3 years of neoadjuvant/adjuvant ADT.

3D-CRT/intensity modulated radiation therapy (3D-CRT/IMRT) techniques should be employed.

Patients with adverse pathologic factors (detectable PSA, positive margins, seminal vesicle involvement or extracapsular extension) following prostatectomy, without evidence of metastatic disease, may be considered for adjuvant radiation therapy.

**MEDICALLY NECESSARY INDICATIONS FOR RADIATION THERAPY AND TREATMENT OPTIONS**

**Very Low Recurrence Risk** (Primary Tumor Stage [T] is T1c, PSA <10 ng/ml, and Gleason score ≤ 6, PSA density <0.15ng/ml per g, < 3 biopsy cores positive with < 50% cancer in each)

- Active surveillance
- External Beam Radiation Therapy
  - Highly conformal radiation therapy technique (3D-CRT/IMRT) – doses 75 – 79.2 Gy (up to 44 fractions)
  - Image guidance with ultrasound, (kV) match, or cone beam CT or intra-fraction tracking
- Brachytherapy
  - LDR -Iodine (I)-125, Palladium-103 or Cesium

**Low Recurrence Risk** (Primary Tumor Stage [T] is T1-T2a, PSA <10 ng/ml, and Gleason score ≤ 6)

- Active surveillance
- External Beam Radiation Therapy
  - Highly conformal radiation therapy technique (3D-CRT/IMRT) – doses 75 – 79.2 Gy (up to 44 fractions)
  - Image guidance with ultrasound, (kV) match, or cone beam CT or intra-fraction tracking
- Brachytherapy
  - LDR -Iodine (I)-125, Palladium-103 or Cesium

**Intermediate Recurrence Risk** (Primary Tumor Stage [T] T2b-T2c or PSA 10-20 ng/ml or Gleason score 7)

- External Beam Radiation Therapy +/- Androgen Deprivation Therapy (ADT) (4 – 6 months)
Highly conformal radiation therapy technique (3D-CRT/IMRT) – doses 75 – 81 Gy (up to 45 fractions)
- IGRT with ultrasound, kV match, or cone beam CT or intra-fraction tracking
- Brachytherapy boost (combined with EBRT after 40 -50 Gy)
  - LDR I-125 or Palladium-103 or Cesium
  - High-dose-rate (HDR) Iridium (Ir)-192

High Recurrence Risk (Primary Tumor Stage [T] T3a or PSA >20 ng/ml or Gleason score ≥8, or two or more intermediate risk factors)
- External Beam Radiation Therapy with ADT (long-term 2-3 years)
  - Highly conformal radiation therapy technique (3D-CRT/IMRT) – doses 78 – 81 Gy (up to 45 fractions)
  - IGRT with ultrasound, kV match, or cone beam CT or intra-fraction tracking
  - Brachytherapy boost (combined with EBRT after 40-50 Gy)
    - LDR I-125 or Palladium-103 or Cesium 131
    - High-dose-rate (HDR) Iridium (Ir)-192

Very High Recurrence Risk (Primary Tumor Stage [T] T3b-T4) without Metastasis
- External Beam Radiation Therapy with ADT (long term 2-3 years)
  - Highly conformal radiation therapy technique (3D-CRT/IMRT) – doses 78–81 Gy (up to 45 fractions)
  - IGRT with ultrasound, kV match, or cone beam CT or intra-fraction tracking
  - Brachytherapy boost (combined with EBRT after 40-50 Gy)
    - LDR I-125 or Palladium-103 or Cesium 131
    - High-dose-rate (HDR) Iridium (Ir)-192

Radiation Therapy for Patients with Locally Advanced or Metastatic Prostate (T3b – T4, or any T and N1 disease)
- External Beam Radiation Therapy
- Highly conformal radiation therapy technique (3D-CRT/IMRT) – Doses 64–70 Gy (up to 39 fractions)
- IGRT with ultrasound, kV match, or cone beam CT or intra-fraction tracking

Post-Prostatectomy
- One of the following must be met:
  - Detectable PSA or initially undetectable PSA, but with recent detectable and rising values on 2 or more measurements with no evidence of metastatic disease
  - Positive margins
  - Seminal vesicle invasion
  - Extracapsular extension
- External Beam Radiation Therapy
  - Highly conformal radiation therapy technique (3D-CRT/IMRT) Doses 64 – 70 Gy (up to 39 fractions)
  - Image guidance with ultrasound, kV match, or cone beam CT or intra-fraction tracking
TREATMENT OPTIONS REQUIRING ADDITIONAL CLINICAL REVIEW:

The radiation treatment options below require review by a physician reviewer and may include deliberation on whether or not active surveillance and surgery have been considered prior to the decision to request radiation therapy:

- Brachytherapy alone (monotherapy) may be approved for Intermediate Recurrence Risk (Primary Tumor Stage [T] T2b-T2c or PSA 10-20 ng/ml or Gleason score 7) upon review with a physician reviewer. Brachytherapy alone is not considered appropriate if the patient has multiple intermediate risk factors and is thus higher risk.
  - Studies comparing HDR brachytherapy as monotherapy have not shown clinical outcomes to be superior to conventional radiation therapy. Medical record documentation should include the medical rationale and necessity for performing HDR Brachytherapy rather than LDR brachytherapy, 3D conformal or IMRT.

- Stereotactic Body Radiation Therapy (SBRT) may be considered an alternative to conventionally fractionated treatment of prostate cancer, typically for patients with low to intermediate risk only. SBRT regimens consist of extremely hypofractionated image-guided delivery (6.5 Gy per fraction or greater) delivered at five fractions or less. SBRT would be used as a standalone radiation modality and NOT as a boost to other conventional methods of radiation treatment.

- Proton beam is not an approved treatment option for localized prostate cancer. Studies comparing proton beam therapy alone to 3-D conformal radiation or IMRT are limited. Overall, studies have not shown clinical outcomes to be superior to conventional radiation therapy. For peer review purposes supporting documentation from the radiation oncologist is required and should include the clinical rationale for performing proton beam rather than 3-D conformal or IMRT.
REFERENCES


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