High-Dose Rate Temporary Prostate Brachytherapy

Policy Number: 8.01.33  Last Review: 4/2017

Policy
Blue Cross and Blue Shield of Kansas City (Blue KC) will provide coverage for High-Dose Rate Temporary Prostate Brachytherapy when it is determined to be medically necessary because the criteria shown below are met.

When Policy Topic is covered
High-dose rate (HDR) prostate brachytherapy may be considered medically necessary as monotherapy or in conjunction with external beam radiotherapy in the treatment of localized prostate cancer.

When Policy Topic is not covered
HDR prostate brachytherapy is considered investigational in the treatment of prostate cancer when used as salvage therapy.

Considerations
HDR brachytherapy as monotherapy is being used in low- and intermediate-risk patients with localized prostate cancer. HDR brachytherapy combined with EBRT (3-dimensional conformal radiotherapy [3D-CRT], intensity-modulated radiotherapy [IMRT], or proton) may be used for more advanced or aggressive prostate cancers. Adequate dose escalation should be achieved with combination HDR temporary brachytherapy and 3D-CRT. IMRT should be limited only to cases in which 3D-CRT planning is not able to meet dose volume constraints for normal tissue tolerance. Permanent low-dose rate (LDR) brachytherapy using only implanted seeds is generally used in patients whose prostate cancer is considered low risk. Active surveillance is generally recommended for very low-risk prostate cancer. Permanent brachytherapy combined with EBRT is used (sometimes along with androgen deprivation) to treat higher risk disease.

Prostate cancer risk is often defined using the following criteria:

- Low risk: prostate-specific antigen (PSA) 10 ng/mL or less, Gleason score 6 or less, and clinical stage T1c (very low risk) or T1-T2a.
- Intermediate risk: PSA > 10 but 20 ng/mL or less, or Gleason score 7, or clinical stage T2b-T2c.
- High risk: PSA > 20 ng/mL or Gleason score 8–10, or clinical stage T3a for clinically localized disease and T3b-T4 for locally advanced disease.

The CPT coding for HDR prostate brachytherapy will consist of a series of CPT codes describing the treatment planning, dosimetry, and delivery of radiotherapy. These codes overlap with those describing brachytherapy using permanent seed implantation. However, because the therapy is given over a course of several days, the last 2 CPT codes listed below may be used more than once.

76873: Ultrasound, transrectal; prostate volume study for brachytherapy treatment planning
77316-77318: Brachytherapy isodose plan; simple, intermediate, or complex
77770-77772: Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy code range
77778: Interstitial radiation source application complex
77790: Supervision handling, loading of radiation source

The surgical code for placement of the brachytherapy catheter is:

55875: Transperineal placement of needles or catheters into prostate for interstitial radionuclide application, with or without cystoscopy

There are codes specific to afterloading of HDR brachytherapy:

- 77770: Remote afterloading high-dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 1 channel
- 77771: 2-12 channels
- 77772: over 12 channels

### Description of Procedure or Service

<table>
<thead>
<tr>
<th>Populations</th>
<th>Interventions</th>
<th>Comparators</th>
<th>Outcomes</th>
</tr>
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<tbody>
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<td>Individuals: With localized prostate cancer</td>
<td>Interventions of interest are: • High-dose rate temporary brachytherapy plus external beam radiotherapy</td>
<td>Comparators of interest are: • External beam conformal radiotherapy alone • Surgery</td>
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High-dose rate (HDR) temporary prostate brachytherapy is a technique of delivering a high-intensity radiation source directly to the prostate gland for the treatment of prostate cancer. The radiation source is inserted through hollow catheters or needles inserted precisely into several areas of the prostate gland using ultrasound guidance and treatment planning computed tomography or ultrasound images. The radiation source is allowed to dwell in the target areas until the prescribed radiation dose is reached and is then removed with the goal of increasing direct tumor necrosis and reducing toxicity and surrounding tissue damage.

For individuals who have localized prostate cancer who receive HDR temporary brachytherapy plus external beam radiotherapy (EBRT), the evidence includes 2 randomized controlled trials (RCTs) that compared HDR brachytherapy with surgery (e.g., radical prostatectomy [RP]) or EBRT alone, plus nonrandomized comparative studies. Relevant outcomes are overall survival, disease-specific survival, and treatment-related morbidity. The evidence has shown similar overall survival and treatment-related morbidity in RCTs comparing HDR brachytherapy plus EBRT to RP. Limitations of the RCT evidence include some heterogeneity in patient populations and treatment protocols. The evidence is sufficient to determine quantitatively that the technology results in a meaningful improvement in the net health outcome.

For individuals who have localized prostate cancer who receive HDR temporary brachytherapy as monotherapy, the evidence includes large observational studies and systematic reviews. Relevant outcomes are overall survival, disease-specific survival, and treatment-related morbidity. The similarity in survival and adverse event rates achieved across studies, plus indirect comparison of outcomes of RCTs using HDR brachytherapy with or without EBRT, has suggested that the beneficial effects of HDR brachytherapy alone are real and sustainable. Limitations of the evidence include some heterogeneity in patient populations and treatment protocols, as well as when the studies were conducted—generally encompassing the period 1993 to 2005—since which treatment protocols and patient selection criteria have evolved. The evidence is sufficient to determine quantitatively that the technology results in a meaningful improvement in the net health outcome.

For individuals who have treatment-resistant or recurrent prostate cancer who receive HDR temporary brachytherapy as salvage treatment with or without EBRT, the evidence includes case series. Relevant outcomes are overall survival, disease-specific survival, and treatment-related morbidity. Only 2 cases series have reported survival outcomes; no comparative studies have been published. The
evidence is insufficient to determine the effects of the technology on health outcomes.

**Background**
Prostate brachytherapy can be delivered in a variety of ways. Perhaps the most familiar technique is the use of radioactive seeds permanently implanted into prostate tissue. These seeds contain isotopes that slowly emit radiation of relatively low energy. In contrast, temporary prostate brachytherapy involves use of higher energy radioisotopes such as iridium-192. The latter isotopes deliver radiation at higher dose rates than permanent seeds, which may be more effective in destroying rapidly dividing cancer cells. In this technique, needle catheters are placed into the prostate gland using transrectal ultrasound guidance. Once the needles are placed, a dosimetric plan is developed, and the radioactive source is inserted into each needle using an afterloading device. The radioactive source is left in the needle for a predetermined time, called the “dwell” time. The radiation is delivered once or twice daily over a course of several days. The dwell time can be altered at various positions along the needle’s length to control dose distribution to the target volume and critical surrounding structures, such as the rectum or urethra. This strategy contrasts with permanent seed implantation in which dosimetry is calculated before needle placement and which cannot be altered after seed implantation. The treatment typically consists of 4000 to 5000 cGy delivered with external beam radiotherapy (EBRT) to the prostate and periprostatic tissues, while high-dose rate (HDR) brachytherapy is used as the method of dose escalation to the prostate gland. The total boost doses are variable. In addition, studies are also being conducted using HDR brachytherapy as the sole treatment modality (monotherapy) in those with prostate cancer.

It is an accepted premise that increasing doses of radiotherapy are associated with improved biochemical control (ie, stable levels of prostate-specific antigen), and thus there has been interest in exploring different techniques of dose escalation, simultaneously limiting both early and late toxicities in surrounding tissues. In patients with locally advanced disease, it is hypothesized that local failure may be related to the large volume of tumor and radioresistant cell clones, both of which might respond to higher radiation doses. HDR brachytherapy has been primarily investigated as an adjunct to EBRT as a technique of dose escalation. Other techniques for dose escalation include EBRT using intensity-modulated radiotherapy (IMRT) for treatment planning and delivery, proton beam radiotherapy (which may also use IMRT), or EBRT combined with brachytherapy using interstitial seeds.

**Rationale**
This evidence review was originally created in April 2000 and has been updated regularly with searches of the MEDLINE database. The most recent literature review was performed through June 7, 2016. The following is a summary of key literature to date.
High-Dose Rate Brachytherapy Plus External Beam Radiotherapy

Systematic Reviews
In 2014, Zaorsky reviewed 38 prospective and retrospective studies (total N=8008 patients) reporting on high-dose rate (HDR) brachytherapy boost with external beam radiotherapy (EBRT) for prostate cancer. Five-year freedom from biochemical failure rates were 85% to 100% for low-risk, 80% to 98% for intermediate-risk, 59% to 96% for high-risk, and 34% to 85% for locally advanced patients. In all risk groups, 5-year rates of cancer-specific survival, overall survival (OS), local recurrence and distant metastases were 99% to 100%, 85% to 100%, 0% to 8%, and 2% to 12%, respectively. Late Radiation Therapy Oncology Group (RTOG) grade 3 or 4 genitourinary (GU) or gastrointestinal (GI) toxicities occurred in less than 6% of patients. Comparisons of HDR brachytherapy to other radiation techniques were inconclusive. Interpretation of results from this systematic review is limited by reports from single-institution studies, the lack of comparative studies, and insufficient reporting on toxicity and quality of life (QOL).

Randomized Controlled Trials
A multicenter open-label randomized controlled trial (RCT) in Sweden allocated patients with localized and locally advanced (T1b-T3a, N0, M0) prostate cancer to either open radical prostatectomy (RP; n=45) or combined EBRT (3-dimensional conformal radiotherapy [3D-CRT], 25×2 Gray [Gy]) and HDR brachytherapy (2×10 Gy) between 1996 and 2001 (n=44). All patients received total androgen blockade that comprised a combination of leuprorelin and flutamide for 6 months. Follow-up assessments included digital rectal examinations if serum prostate-specific antigen (PSA) level exceeded 10 ng/mL. QOL changes were assessed using the European Organization of Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire C33 (EORTC QLQ-C33). Patients completed the RTOG/EORTC Toxicity Scale questionnaire at 12, 24, and 60 months posttreatment. No statistically significant between-group differences were reported for any of the EORTC QLQ-C33 variables or treatment-associated toxicities. A total of 68 (76%) patients were alive at 10-year follow-up; 8 patients (6 in the RP group, 2 in the 3D-CRT group; 9% total) died of prostate cancer, 13 (n=6 in the RP group, n=7 in the 3D-CRT group) died of other causes (p=NS).

In 2007, Hoskin et al reported on a European single-center randomized trial of 220 patients that was conducted between 1997 and 2005. It compared 55 Gy of EBRT with 35.75 Gy of EBRT plus HDR brachytherapy in patients with prostate cancer. With a median follow-up of 30 months, an improvement was reported in actuarial biochemical recurrence-free survival (BRFS), as well as a lower incidence of acute rectal discharge. In 2012, Hoskin et al subsequently reported on longer term follow-up of 218 patients from this phase 3 trial. Seventy-six percent of patients also received androgen deprivation therapy. BRFS was greater in the combination treatment group after 4 years, with a median time to relapse of 116 months versus 74 months in the EBRT-only treatment group. Estimates of BRFS for the combination group at 5, 7, and 10 years were 75%, 66%, and 46% versus 61%, 48%, and 39% for the EBRT-only group, all respectively (p=0.04). However, OS did not differ significantly between treatment arms. Estimates of OS for the
combination group at 5, 7, and 10 years were 88%, 81%, and 67% versus 89%, 88%, and 79% for the EBRT-only group, all respectively (p=0.2). Severe urinary symptoms (26% to 31%) and bowel events (6% to 7%) did not differ significantly between groups at 5 years and 7 years. Erectile dysfunction rates were not reported.

**Nonrandomized Comparative Studies**
In 2016, Boehm et al published a single-center retrospective analysis of 5619 patients with clinically localized prostate cancer who were treated between 1999 and 2009 with HDR brachytherapy plus EBRT (n=419) or RP (n=5200). Eligibility criteria included stage cT1 or cT2 prostate cancer, prostate volume of 60 mL or less, no neoadjuvant androgen suppression therapy, and no urinary retention symptoms. HDR brachytherapy treatment (18 Gy in 2 fractions) preceded EBRT (50.4 Gy, 1.8 Gy per fraction with 5 fractions per week). In the overall cohort (N=5619), 5-year OS rates were 97.1% in the RP group and 92.4% in the HDR brachytherapy plus EBRT group (p<0.01). An analysis was also conducted after matching the 2 groups on a number of variables including age, cardiovascular disease, diabetes, PSA level, Gleason score, clinical stage, and year of treatment. Five-year OS rates in the matched cohort (n=1257) did not differ significantly between groups. Rates were 95.7% after RP and 92.4% after HDR brachytherapy plus EBRT (p=0.5).

In 2013, Khor et al reported on a matched pair analysis of 344 patients who received EBRT (46 Gy in 23 fractions) plus HDR brachytherapy (19.5 Gy in 3 fractions) compared with 344 patients who received only EBRT (74 Gy in 37 fractions) for intermediate- or high-risk prostate cancer. Median biochemical follow-up was 60.5 months. Freedom from biochemical failure at 5 years was 79.8% (95% confidence interval [CI], 74.3% to 85.0%) for the HDR brachytherapy group and 70.9% (95% CI, 65.4% to 76.0%) for the EBRT-only group. However, significantly more grade 3 urethral strictures occurred with HDR brachytherapy (11.8%) than with EBRT (0.3%; p<0.001).

**HDR Brachytherapy as Monotherapy**

**Systematic Reviews**
Zaorsky et al, in a 2015 comparative effectiveness review (CER), assessed the relative clinical effectiveness of HDR brachytherapy as monotherapy and robotic arm stereotactic body radiotherapy (SBRT). This CER was performed using Preferred Reporting Items for Systematic Reviews and Meta-Analyses conventions. Studies selected enrolled 35 or more men with localized (T1-T2, N0-Nx, M0) and locally advanced (T3-T4, N0-Nx, M0) prostate cancer who underwent either therapy and were followed for 12 or more months. To be included, studies had to report disease-related outcomes such as biochemical progression-free survival (BPFS), PSA kinetics, and late GU or GI tract toxicities. For SBRT, BPFS rates were generally 90% or greater at up to 5 years; for HDR brachytherapy as monotherapy, rates were generally 85% or greater at up to 5 years. Median follow-up was 2.9 years and longest reported actuarial outcomes were at 8 years. For SBRT, late GU RTOG grade 3 or 4 toxicity rates ranged from 0% to 12%;
RTOG late grade 3 or 4 GI toxicity rates ranged from 0% to 5%; for HDR brachytherapy, these rates were 0% to 26% and 0% to 16%, respectively.

In 2014, Demanes and Ghilezan published a systematic review analyzing published evidence on HDR brachytherapy as monotherapy for prostate cancer. Among more than 80 articles and abstracts published between 1990 and 2013, 13 met selection criteria, presenting clinical outcome and toxicity evidence with follow-up ranging from 1.5 to 8.0 years. All risk groups (low, intermediate, high) were represented in selected articles, and a variety of dose and fractionation schedules were reported. Information on study design, study quality, and other study and patient characteristics was very limited in this review. BPFS rates reported among the studies ranged from 79% to 100%, and local control rates ranged from 97% to 100%. Grade 3 GU toxicity rates, mainly related to urinary urgency or frequency, ranged from 0% to 16%; grade 3 GI tract toxicity rates ranged from 0% to 2%. Erectile functional preservation rates ranged from 67% to 89%.

Randomized Controlled Trials
No RCTs evaluating HDR brachytherapy as monotherapy for treating localized prostate cancer were identified.

Nonrandomized Comparative Studies
In 2015, Strom et al published a nonrandomized comparative study with 413 men who had low- or intermediate-risk prostate cancer. Patients received HDR brachytherapy (n=85), low-dose rate (LDR) brachytherapy (n=249), or IMRT (n=79). Median follow-up was 32 months. Primary outcomes were patient-reported validated health-related quality of life (HRQOL) measures obtained before treatment and at 1, 3, 5, 12, and 18 months posttreatment. No survival outcomes were reported. Sixty-percent of patients completed pre- and posttreatment HRQOL questionnaires (49 HDR brachytherapy patients, 149 LDR brachytherapy patients, 49 IMRT patients). Statistically significant differences involving the HDR brachytherapy group are as follows:

- At 1 and 3 months posttreatment, HDR brachytherapy patients reported significantly less deterioration in urinary HRQOL than LDR brachytherapy patients (p=0.005).
- At 18 months, the IMRT group had significantly worse bowel HRQOL than either brachytherapy group (p=0.007 for both comparisons).
- HDR brachytherapy patients had significantly worse sexual HRQOL than LDR brachytherapy at 1, 6, 9, and 18 months after irradiation (p=0.02, p=0.003, p=0.006, p=0.02, respectively).

Another comparative study was published by Martinez et al in 2010. It compared 454 patients treated with either palladium-103 seed LDR brachytherapy (n=206) or HDR brachytherapy as monotherapy (n=171) during the period of 1993 through 2004. Patients selected their treatment option. Also included in the study analysis were 77 patients who received HDR brachytherapy as monotherapy during the period of 1996 through 2002. All selected patients were low-to-intermediate risk and had PSA levels of 12 ng/mL or less, Gleason scores of 7 or less, and clinical
stage T1c to T2a disease. The HDR brachytherapy dosages were 9.5 Gy × 4 and 7 Gy × 6. Treatment outcomes at 5 years included biochemical control rates (PSA nadir + 2) of 89% in the LDR group, 91% in the HDR group, and 88% in the second HDR group. Overall and cause-specific survival rates at 5 years did not differ statistically between groups. The HDR groups experienced statistically significant lower rates of dysuria, urinary frequency and urgency rates, and acute rectal pain. Rates of diarrhea, rectal bleeding, and acute urinary incontinence and retention were similar. Most toxicities were grade 1 in both groups, but more grade 3 acute GU toxicities were seen in the LDR group. Potency was 30% in the LDR group and 20% in the HDR groups.

In 2013, Tselis et al reported on short-term outcomes of 351 patients with clinically localized prostate cancer treated with HDR brachytherapy as monotherapy. At 36 and 60 months, biochemical control rates were 98% and 94% and metastasis-free survival rates were 99% and 98%, all respectively. No acute grade 3 GI toxicity occurred and acute grade 3 GU events were 4.8%. Late grade 3 GU toxicity events were 3.4% and GI toxicity events were 1.4%. No grade 4 or 5 acute or late adverse events were reported.

Demanes et al reported in 2011 on a prospective case series of 298 patients with previously untreated low- to intermediate-risk localized prostate cancer (median PSA, 6.0 ng/mL) treated with HDR brachytherapy as monotherapy between 1996 and 2005, using 2 treatment protocols. A total of 42 Gy in 6 fractions of 7 Gy were delivered using computed tomography images for treatment planning in 1 protocol; the other treatment planning used a total of 38 Gy delivered in 4 fractions of 9.5 Gy with ultrasound images. At 8-year follow-up, outcomes included 99% local control, 97% biochemical control (using the Phoenix definition of PSA nadir + 2), 99% distant metastasis-free survival, 99% cause-specific survival, and 95% OS. Grade 2 urinary frequency or urgency was transient in 10% of patients, whereas grade 3 urinary retention was experienced in 3% of patients. GI toxicity was reported as less than 1%.

The 6-fraction protocol described in Demanes (2011) was evaluated in 448 previously untreated men with low- to intermediate-risk localized prostate cancer patients; findings were reported by Hauswald et al (2016). Median follow-up was 78 months (range, 3-216 months). Actuarial 10-year OS was 76.7% (95% CI, 69.9% to 82.2%) and actuarial 10-year BPFS was 97.8% (95% CI, 95.5% to 98.9%) The incidence of grade 3 or 4 GU toxicity during follow-up was 4.9%. No grade 3 or 4 GI toxicity occurred.

**HDR Brachytherapy as Salvage Treatment**

Data on HDR brachytherapy as salvage treatment after failed prior radiotherapy are limited; there are no RCTs or nonrandomized comparative studies. Several case series reporting survival outcomes have been published and are described next.

In 2016, Wojcieszek et al reported retrospectively on 83 men with locally recurrent prostate cancer who were treated with salvage HDR brachytherapy (30 Gy in 3
fractions of 10 Gy each). Median follow-up was 41 months. OS rates were 93% at 3 years and 86% at 5 years. Biochemical disease-free survival was 76% at 3 years and 67% at 5 years. The most common adverse event was GU toxicity. Acute grade 2 GU toxicity occurred in 29 (33%) men and acute grade 3 GU toxicity in 1 (1%) man. Comparable rates for late GU toxicity were 32 (39%) for grade 2 and 11 (13%) for grade 3. No grade 4 toxicities were reported.

In 2013, Chen et al reported on a retrospective analysis of 52 men with locally recurrent prostate cancer treated with salvage HDR brachytherapy (36 Gy in 6 fractions). Median follow-up was 59.6 months. Median survival was not yet reached, but estimated 5-year OS was 92% (95% CI, 80% to 97%) and 5-year biochemical control using the Phoenix definition was 51% (95% CI, 34% to 66%). Acute GI tract events of grade 2 or higher did not occur. Late grade 2 GI events occurred in 4%. Acute grade 3 GU toxicity occurred in 2%. Late grade 3 GU toxicity occurred in 2%.

**Ongoing and Unpublished Clinical Trials**
Some currently unpublished trials that might influence this review are listed in Table 1.

**Table 1. Summary of Key Trials**

<table>
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<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
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<td>NCT00913939</td>
<td>HDR Brachytherapy</td>
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<td>May 2017</td>
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<tr>
<td>NCT01839994</td>
<td>Phase III Clinical Trial on Conventionally Fractionated Conformal Radiotherapy (CF-CRT) Versus CF-CRT Combined With High-dose-rate Brachytherapy or Stereotactic Body Radiotherapy for Intermediate and High-risk Prostate Cancer</td>
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<td>Dec 2018</td>
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<tr>
<td>NCT00936390</td>
<td>A Phase III Prospective Randomized Trial of Dose-Escalated Radiotherapy With or Without Short-Term Androgen Deprivation Therapy for Patients With Intermediate-Risk Prostate Cancer</td>
<td>1520</td>
<td>Dec 2020</td>
</tr>
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NCT: national clinical trial.

**Summary of Evidence**
For individuals who have localized prostate cancer who receive HDR temporary brachytherapy plus external beam radiotherapy (EBRT), the evidence includes 2 randomized controlled trials (RCTs) that compared HDR brachytherapy with surgery (eg, radical prostatectomy [RP]) or EBRT alone, plus nonrandomized comparative studies. Relevant outcomes are overall survival, disease-specific survival, and treatment-related morbidity. The evidence has shown similar overall survival and treatment-related morbidity in RCTs comparing HDR brachytherapy plus EBRT to RP. Limitations of the RCT evidence include some heterogeneity in patient populations and treatment protocols. The evidence is sufficient to determine quantitatively that the technology results in a meaningful improvement in the net health outcome.
For individuals who have localized prostate cancer who receive HDR temporary brachytherapy as monotherapy, the evidence includes large observational studies and systematic reviews. Relevant outcomes are overall survival, disease-specific survival, and treatment-related morbidity. The similarity in survival and adverse event rates achieved across studies, plus indirect comparison of outcomes of RCTs using HDR brachytherapy with or without EBRT, has suggested that the beneficial effects of HDR brachytherapy alone are real and sustainable. Limitations of the evidence include some heterogeneity in patient populations and treatment protocols, as well as when the studies were conducted—generally encompassing the period 1993 to 2005—since which treatment protocols and patient selection criteria have evolved. The evidence is sufficient to determine quantitatively that the technology results in a meaningful improvement in the net health outcome.

For individuals who have treatment-resistant or recurrent prostate cancer who receive HDR temporary brachytherapy as salvage treatment with or without EBRT, the evidence includes case series. Relevant outcomes are overall survival, disease-specific survival, and treatment-related morbidity. Only 2 cases series have reported survival outcomes; no comparative studies have been published. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Supplemental Information**

**Clinical Input Received From Physician Specialty Societies and Academic Medical Centers**

While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process, through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

In response to requests, input was received from 2 physician specialty societies (4 reviews) and 2 academic medical centers while this policy was under review in 2009. There was generally strong support for use of HDR (as monotherapy and with EBRT) as a treatment option for prostate cancer.

**Practice Guidelines and Position Statements**

**National Comprehensive Cancer Network**

The National Comprehensive Cancer Network guidelines (v.3.2016) for the treatment of prostate cancer indicate HDR brachytherapy alone or combined with EBRT (40-50 Gray [Gy]) may be used instead of low-dose rate brachytherapy to increase the dose of radiation for intermediate- to high-risk patients. Boost regimens commonly used include 9.5 to 11.5 Gy × 2 fractions, 5.5 to 7.5 Gy × 3 fractions, and 4.0 to 6.0 Gy × 4 fractions. For HDR brachytherapy alone, 13.5 × 2 fractions is commonly used. HDR brachytherapy may also be considered to treat local recurrence after EBRT or primary brachytherapy. HDR dosages for recurrence...
range from 9 to 12 Gy × 2 fractions, depending on the primary radiation dosage delivered.

**American Brachytherapy Society**

The American Brachytherapy Society (ABS) Prostate High-Dose Rate Task Group suggests patients selected for monotherapy should be at clinical stage T1b to T2b with Gleason scores of 7 or less, and/or PSA levels of 10 ng/mL or less.\textsuperscript{18,19} For HDR boost, ABS patient selection criteria include: patients with high-risk features such as T3 or T4, Gleason scores of 7 to 10, and/or PSA levels greater than 10 ng/mL, or patients with bulky T1 to T2b tumor. ABS recommends HDR brachytherapy with or without EBRT for various risk levels of localized prostate cancer especially for intermediate- or high-risk patients as a boost with EBRT. ABS guidelines also note that HDR brachytherapy is contraindicated in patients who have a preexisting rectal fistula, are unable to tolerate anesthesia, and/or have no proof of malignancy. HDR monotherapy is considered investigational for high-risk patients by ABS. HDR monotherapy as salvage treatment is only recommended for use in specialty centers or institutional review board–approved protocols.

**American College of Radiology**

American College of Radiology (ACR) Appropriateness Criteria for HDR brachytherapy for prostate cancer were issued in 2014.\textsuperscript{20} ACR indicated HDR monotherapy, HDR with EBRT, and HDR as salvage treatment may be appropriate treatment options.

**U.S. Preventive Services Task Force Recommendations**

Not applicable.

**Medicare National Coverage**

There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

References


Billing Coding/Physician Documentation Information

**55875** Transperineal placement of needles or catheters into prostate for interstitial radionuclide application, with or without cystoscopy

**76873** Ultrasound, transrectal; prostate volume study for brachytherapy treatment planning (separate procedure)

**77316** Brachytherapy isodose plan; simple (calculation[s] made from 1 to 4 sources, or remote afterloading brachytherapy, 1 channel), includes basic dosimetry calculation(s)

**77317** Brachytherapy isodose plan; intermediate (calculation[s] made from 5 to 10 sources, or remote afterloading brachytherapy, 2-12 channels), includes basic dosimetry calculation(s)

**77318** Brachytherapy isodose plan; complex (calculation[s] made from over 10
sources, or remote afterloading brachytherapy, over 12 channels),
includes basic dosimetry calculation(s)

77778 Interstitial radiation source application, complex, includes supervision, handling, loading of radiation source, when performed

77770 Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 1 channel

77771 Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 2-12 channels

77772 Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; over 12 channels

77790 Supervision, handling, loading of radiation source

C1717 Brachytherapy source, nonstranded, high dose rate iridium-192, per source

Q3001 Radioelements for brachytherapy, any type, each

**ICD-10 Codes:**

C61 Malignant neoplasm of prostate

**Additional Policy Key Words**

N/A

**Policy Implementation/Update Information**

4/1/2016 New Policy; considered medically necessary when criteria is met.

4/1/17 No policy statement changes.

State and Federal mandates and health plan contract language, including specific provisions/exclusions, take precedence over Medical Policy and must be considered first in determining eligibility for coverage. The medical policies contained herein are for informational purposes. The medical policies do not constitute medical advice or medical care. Treating health care providers are independent contractors and are neither employees nor agents Blue KC and are solely responsible for diagnosis, treatment and medical advice. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, photocopying, or otherwise, without permission from Blue KC.