

# Low-Dose Rate Brachytherapy

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### Technology In Brief

#### What Is It:

- Low-dose rate brachytherapy (LDR-B) involves the permanent placement of small radioactive “seeds” which irradiate the entire tumor from within while minimizing radiation exposure to surrounding healthy tissue

#### How Does it Work:

- Typically, a computer generated plan is used to calculate the optimal seed placement configuration and dose distribution
- Following the planning phase, needles are inserted under ultrasound guidance into the tumor site, through which the seeds are deposited and immediately begin delivering radiation

#### Adoption Status:

- LDR-B has become a widely-accepted first-line treatment for early-stage prostate cancer; obsolescence risk is low

#### FDA Status:

- Major contemporary products received approval in early 2000s

#### Major Vendors:

- IsoRay Medical, Inc.; MDS Nordion; Oncura Brachytherapy; Theragenics Corporation

#### Competing Products:

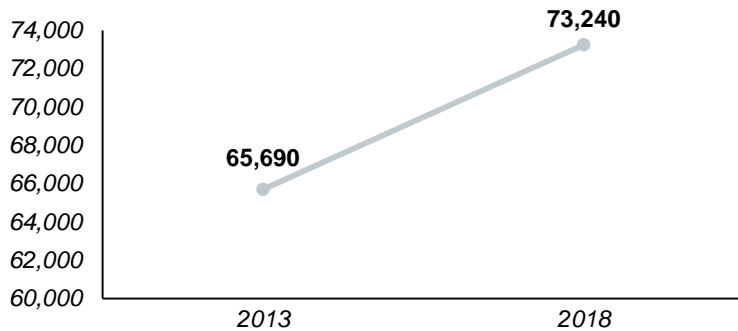
- External Beam Radiation Therapy, surgery, HDR brachytherapy

Consideration	Service Line Strategy Advisor’s Take
<b>Clinical</b>	<ul style="list-style-type: none"> <li>• Primarily utilized for treatment of prostate cancer; some experience with lung, head and neck, breast, cervix and liver sites; also used to treat resected brain metastases</li> </ul>
<b>Reimbursement</b>	<ul style="list-style-type: none"> <li>• In 2013, Medicare reimbursement for LDR brachytherapy with Cesium decreased by 9.4 percent, Palladium decreased by 0.1 percent, and Iodine rose 4.4 percent</li> </ul>
<b>Cost</b>	<ul style="list-style-type: none"> <li>• Ultrasound upgrade ~\$13K</li> <li>• Treatment planning system ~\$25K</li> <li>• Ancillary equipment ~\$61K</li> <li>• Seeds ~\$4.2K/case</li> </ul>
<b>Payer Coverage</b>	<ul style="list-style-type: none"> <li>• LDR-B considered longstanding clinically proven RT modality; widely covered by public and private payers</li> </ul>
<b>Market Potential</b>	<ul style="list-style-type: none"> <li>• Widespread awareness of the benefits of LDR-B has been driven by the broad marketing efforts of LDR-B seed manufacturers, as well as institutions providing LDR-B treatments, largely within the realm of prostate cancer</li> <li>• The emergence of new isotopes with shorter half-lives, such as Cesium-131, continues to boost the appeal of LDR brachytherapy</li> </ul>
<b>Operational Needs</b>	<ul style="list-style-type: none"> <li>• Performed as an outpatient procedure</li> <li>• LDR implant procedures do not require a large amount of space or a shielded unit and can be performed in a surgical day unit, ultrasound exam room, or in any available sterile environment</li> </ul>
<b>Impact in Accountable Care</b>	<ul style="list-style-type: none"> <li>• Unlikely to be affected by accountable care imperatives, as radiation therapy is expected to remain a mainstay oncology treatment modality</li> </ul>
<b>Competitive Take</b>	<ul style="list-style-type: none"> <li>• Although often used in concert with surgery, many patients and clinicians prefer LDR brachytherapy due to its minimally invasive nature, short treatment time, and superior dose conformality as compared to external beam RT</li> </ul>
<b>Position on the Adoption Curve</b>	<ul style="list-style-type: none"> <li>• Conservative</li> </ul>

# LDR-B Utilization Depends Largely on Patient, Physician Preference

## Market & Financial Overview

### National Outpatient Market Estimates

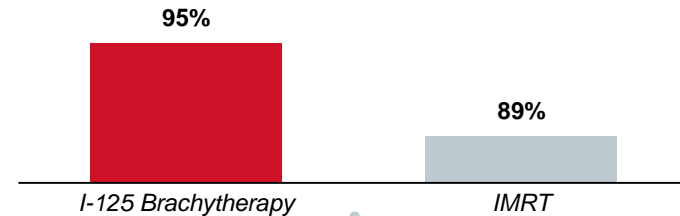


### Reimbursement Rates

	2013 Final Rate	2014 Final Rate
LDR Iodine	\$10,758	\$10,161
LDR Palladium	\$13,057	\$10,161
LDR Cesium	\$8,821	\$11,121

## Clinical Considerations

### LDR Brachytherapy with I-125 Versus IMRT 7-year PSA Relapse-Free Survival Rate<sup>1</sup> n = 729 Low-Risk Prostate Cancer Patients; p < 0.01



- Effective clinical outcomes have established LDR-B as a standard of care for early-stage prostate cancer; a majority of oncology programs offer the technology
- Clinical evidence demonstrates roughly equivalent outcomes between LDR, HDR brachytherapy
- Recent evidence suggests LDR-B may be more effective than IMRT for low-risk prostate cancer patients



### Keys for Investment Success

- Beyond patient self-referrals – which drive a great deal of utilization – enfranchisement of urologists, head and neck specialists, and gynecologic oncologists is key to ensuring that LDR-B is effectively positioned among an institution's array of existing treatment options
- Establish core staff required for a LDR program such as physicist, radiation oncologist and/or dedicated specialists – such as a urologist – as well as a dedicated nurse

<sup>1</sup>Zelevsky et al., "Comparison of Tumor Control and Toxicity Outcomes of High-dose Intensity-Modulated Radiotherapy and Brachytherapy for Patients With Favorable Risk Prostate," Urology, 2011, 77; 986-990