

**American Society for Radiation Oncology (ASTRO)  
Brachytherapy Model Policy**

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**Indications and Limitations of Coverage and/or Medical Necessity**

This Model Policy<sup>1</sup> addresses coverage for sealed-source Brachytherapy. It does not cover radioimmunotherapy or infusional/oral radionuclide therapy. There is a separate ASTRO model policy that specifically addresses Microspheres Hepatic Brachytherapy.

Radiation oncology consists of two primary treatment modalities: external beam radiation therapy (EBRT) and brachytherapy. Brachytherapy is a type of radiation therapy that utilizes natural or manufactured radioactive isotopes or radionuclides that are temporarily or permanently implanted in or near the tumor or target tissue to treat malignancies or certain benign conditions. Brachytherapy is based upon the principle that radiation dose decreases rapidly with distance from source of radiation. Therefore, brachytherapy allows the delivery of a high dose of radiation to a well-defined target while the dose of radiation to adjacent normal structures is relatively low. Brachytherapy may be indicated as a primary or adjunctive therapy in a variety of tumors.

The brachytherapy dose rate is determined by the intensity of the radioactive source. Brachytherapy dose rate is described as LDR (low dose rate), HDR (high dose rate) and PDR (pulsed dose rate).

- LDR: In a temporary LDR implant, the radiation dose is delivered continuously over one to several days in a hospital setting, with the patient managed under radiation safety precautions with limits to nursing and visitor time in order to protect them from low-level radiation exposure. A permanent LDR implant uses permanently implanted sources, and can be performed as either an ambulatory or in-patient procedure. The permanent implant continuously delivers radiation as the isotope decays.
- HDR: is performed by using a remote afterloading device to transport the radioactive source(s) to the target. HDR allows the dose to be delivered in minutes. It is often given in a series of multiple fractions and can be performed either on an outpatient or inpatient basis.
- Pulsed Dose Rate (PDR) Brachytherapy: Uses sources of intermediate strength and delivers a series of doses on a 1-2 hourly schedule over a 1-2 day treatment period. It is also a form of HDR remote afterloading.

Brachytherapy is further described by the means the radioactive material is placed into or onto the tumor or target tissue.

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<sup>1</sup> ASTRO Model Policies were developed as a means to efficiently communicate what ASTRO believes to be correct coverage policies for radiation oncology services. The ASTRO Model Policies do not serve as clinical guidelines and they are subject to periodic review and revision without notice. The ASTRO Model Policies may be reproduced and distributed, without modification, for noncommercial purposes.

- Interstitial application – sources are inserted directly into a tumor/target tissue. Example – brachytherapy to the prostate, breast, head and neck, choroid of eye, lung/pleura, brain
- Intracavitary (also called intraluminal) application – sources are inserted into a body cavity. Example - vagina, uterus, bronchus, esophagus
- Surface application – sources are placed directly on an external tumor/target surface. Example – eye (conjunctiva), skin, breast.

Electronic brachytherapy (EBT) devices were approved by the FDA via the 510(k) mechanism with reference to predicate devices that provided high dose rate (HDR) brachytherapy. Commercially available EBT devices closely resemble the size and shape of commercially available HDR brachytherapy devices and replicate the radiation dose distribution administered with HDR brachytherapy devices. CPT code 0182T, which is used to describe electronic brachytherapy, is a Category III, emerging technology code and published literature establishing the clinical equivalence to HDR is evolving.

The process of care for brachytherapy consists of a series of steps including:

- insertion of non-radioactive applicators, catheters, or needles that receive or transmit the radioactive material into the patient’s body followed by later loading of temporary radioactive material, or insertion of permanently implanted radioactive seeds whose intensity decays over time;
- image acquisition to support the treatment planning for brachytherapy dose calculation;
- computerized dosimetry that provides tumor and normal tissue doses.

The exact sequence of events depends upon the selected applicator and dose rate delivery format. The choice of applicators and the actual placement of the catheter or needle may be performed by the radiation oncologist alone, or in collaboration with another physician (e.g. gynecologist, urologist, pulmonologist).

### **Indications for Brachytherapy**

Brachytherapy may be used independently as the sole treatment modality or as an adjunctive treatment in combination with external beam therapy and other modalities such as surgery or chemotherapy. LDR and HDR procedures may be given with intent to cure, palliate, or to obtain local control (either cure or palliation). Both may be given in conjunction with a course of external beam radiation therapy, or as single modalities.

Brachytherapy may be performed concomitantly with surgical resection or in conjunction with procedures such as endoscopy or angioplasty, which are required to achieve access to the site of the disease.

Brachytherapy is indicated for the following disease sites:

- Brain and nervous system cancer
- Eye tumors, e.g. ocular melanoma, choroidal metastasis
- Head and Neck
- Breast cancer
- Intravascular/intracoronary stenting

- Lung cancer
- GI cancer
- Gynecologic cancer
- Prostate cancer
- Skin cancer
- Soft tissue sarcoma

Brachytherapy is also indicated in certain clinical scenarios:

- Retreatment of previously treated areas
- As a boost to external treatment

This list of indications is not exhaustive and while brachytherapy is not indicated in the routine management for other cancers, brachytherapy is often a reasonable and necessary treatment for other sites. There is no definitive list of “approved sites” nor is it possible to preclude some cancers solely on the basis of the primary site of origin.

### CPT/HCPCS Codes

Many of the CPT codes in the radiation oncology section can be used for both external beam radiation therapy (EBRT) and brachytherapy, while others are specific to one modality or the other. The CPT codes listed below are used in brachytherapy treatment. Please refer to the AMA CPT book for a description of the following codes, and refer to the ASTRO/ACR Guide to Radiation Oncology Coding for more detailed coding guidance.

<b>Electronic Brachytherapy</b>
The following Category III code should be used for electronic brachytherapy.
0182T

<b>Surgical Procedure Codes</b>
The following codes are surgical procedure codes used for placement of brachytherapy applicators including catheters or needles or markers in various sites.
0190T
19296
19297
19298
20555
31627
31643
32553
41019
43241
49411
55875
55876
55920
57155

57156
55860

<b>Procedure Guidance and Volume Study Codes</b>
The following imaging codes may be used during the brachytherapy course of treatment.
76000
76001
76872
76873
76950
76965
77002
77012
77014
77021

<b>Clinical Treatment Planning</b>
The following codes may be used for therapeutic radiology treatment planning.
77261-77263

<b>Simulation, Medical Radiation Physics, Dosimetry, Treatment Devices and Other Special Services</b>
The following codes may be used for the phase of care in which the radiation oncology team develops dosimetry, treatment devices, isodose plans and other special services during the brachytherapy course of treatment.
77280-77295
77300
77326
77327
77328
77331
77332
77333
77334
77336
77370
77470

<b>Treatment Infusion of Radioisotope</b>
The following code may be used for intravenous infusion of an unsealed source by a radiation oncologist.
77750

<b>LDR Treatment Delivery</b>
The following procedure codes may be used for LDR brachytherapy delivery.

77761-77763 Intracavitary
77776-77778 Interstitial

<b>HDR Treatment Delivery</b>
The following procedure codes may be used for HDR radiation treatment delivery. Selection of the correct code is based on the number of channels.
77785-77787

<b>Surface Applicator Treatment Delivery</b>
The following code may be used when performing surface application brachytherapy.
77789

<b>Supervision and Handling, Loading of Radiation Sources</b>
The following code may be used for the supervision, handling and loading of radioelements for manual loading LDR brachytherapy.
77790

<b>Unlisted Procedure Code</b>
The following code may be used for brachytherapy procedures that are not correctly described by any of the currently available codes.
77799

### ICD-9 Codes that Support Medical Necessity

ICD-9-CM code listings may cover a range and include truncated codes. It is the provider's responsibility to avoid truncated codes by selecting a code(s) carried out to the highest level of specificity and selected from the ICD-9-CM code book appropriate to the year in which the claim is submitted.

It is not enough to link the procedure code to a correct, payable ICD-9-CM diagnosis code. The diagnosis or clinical suspicion must be present for the procedure to be paid.

ICD-9 Code(s)	Diagnosis
<b>140.0 through 149.9, inclusive</b>	Head & Neck cancer, multiple primary sites
<b>150.0 through 159.9, inclusive</b>	Digestive organs and peritoneum
<b>160.0 through 165.9, inclusive</b>	Respiratory and intrathoracic organs
<b>170.0 through 170.9, inclusive</b>	Bone
<b>171-173.9, inclusive, 198.2</b>	Connective tissue and skin
<b>174-175.9, inclusive 198.81, 233.0</b>	Breast
<b>179 through 184.9, inclusive</b>	Gynecological
<b>185 through 189.9, inclusive</b>	Genitourinary organs
<b>190.0 through 199.1, inclusive</b>	Other and unspecified sites
<b>200.0-208.9, inclusive</b>	Lymphatic and hematopoietic
<b>235.0 through 237.72, inclusive, 237.9, 238.0- 238.9, inclusive</b>	Neoplasms of uncertain behavior
<b>320 through 349.9, inclusive</b>	Nervous System
<b>372.40- 372.45, inclusive</b>	Pterygium

## **General Information**

- The physician's professional component for the brachytherapy procedure includes patient supervision and management during the brachytherapy procedure; for brachytherapy codes that have a 90 day global period, it includes discharge day management and follow up care for the global period.
- When E/M services are performed on the same day as brachytherapy, a -25 modifier should accompany the E/M consultation code to reflect that a separate E/M service was provided on the same day.

## **Documentation requirements:**

- Documentation supporting the medical necessity of these services, such as ICD-9-CM codes, must be submitted with each claim.
- The treatment goal (curative, palliative or tumor control) must be documented in the medical record.
- The record must contain documentation of the patient's informed consent to treatment.
- A written, signed and dated prescription or treatment plan designed by the radiation oncologist must be on file. The prescription must include all of the following information: designation of the treatment site, designation of the isotope, designation of the number of source positions, and the planned dose to selected points described during dosimetry.
- Given the multiplicity of services that are inherent in brachytherapy, it is essential that the medical records reflect each service in a clear linear and temporally logical form. Flow charts, where helpful, are recommended. All procedures should be documented with a procedural note. A treatment summary should be prepared.
- Since HDR treatments are typically given as a series (often twice daily, over a period of days or weeks) they should be individually documented.

## **REFERENCES**

### **General**

1. American College of Radiology (ACR) Standard for the Performance of High-Dose-Rate Brachytherapy, 2000
2. ACR Standard for the Performance of Low-Dose-Rate Brachytherapy, 2000
3. ACR Standard for the Performance of Brachytherapy Physics: Manually-Loaded Temporary Implants, 2000
4. ACR Standard for the Performance of Brachytherapy Physics: Remotely-Loaded HDR Sources, 2000
5. ACR Standard for Transperineal Permanent Brachytherapy of Prostate Cancer, 2000
6. Nori D, Bains M, Hilaris BS, et al. New intraoperative brachytherapy techniques for positive or close surgical margins. *J Surg Oncol.* 1989; 42(1):54-59.

## **Bladder**

1. Scher HI, Shipley WU, Herr HW. Cancer of the bladder. In: Cancer: Principles and Practice of Oncology. 5th ed. VT DeVita Jr, S Hellman, SA Rosenberg, eds. Philadelphia, PA: Lippincott-Raven; 1997:1315.

## **Brain**

1. Chan TA, Weingart JD, Parisi M, et al. Treatment of recurrent glioblastoma multiforme with GliaSite brachytherapy. *Int J Radiat Oncol Biol Phys.* 2005; 62:1133-1139.
2. Gabayan AJ, Green SB, Sanan A, et al. GliaSite brachytherapy for treatment of recurrent malignant gliomas: A retrospective multi-institutional analysis. *Neurosurgery* 2006;58(4):701-709
3. McDermott MW, Snee PK, Gutin PH. Interstitial brachytherapy for malignant brain tumors. *Semin Surg Oncol.* 1998; 14(1):79-87.
4. Rogers LR, Rock JP, Sillis AK, et al. Results of a phased II trial of the GliaSite radiation therapy system for the treatment of newly diagnosed, resected single brain metastases. *J Neurosurg.* 2006; 105(3):375-384.
5. Sneed PK, McDermott MW, Gutin PH. Interstitial brachytherapy procedures for brain tumors. *Semin Surg Oncol.* 1997; 13(3):157-166.
6. Welsh J, Sanan A, Gabayan AJ, et al. GliaSite brachytherapy boost as part of initial treatment of glioblastoma multiforme: A retrospective multi-institutional pilot study. *Int J Radiat Oncol Biol Phys.* 2007; 68(1):159-165.
7. Wernicke AG, Sherr DL, Schwartz TH, et al. Feasibility and safety of GliaSite brachytherapy in treatment of CNS tumors following neurosurgical resection. *J Can Res Ther.* 2010; 6:65-74.

## **Breast**

1. Accelerated Partial Breast Irradiation: Techniques and Clinical Implementation. (Eds) David Wazer MD, Douglas W Arthur MD, Frank Vicini MD, Springer-Verlag 2006
2. Arthur D. Accelerated partial breast irradiation: a change in treatment paradigm for early stage breast cancer. *J Surg Oncol.* 2003; 84(4):185-191.
3. Arthur DW, Koo D, Zwicker RD, et al. Partial breast brachytherapy after lumpectomy: low-dose-rate and high-dose-rate experience. *Int J Radiat Oncol Biol Phys.* 2003; 56(3):681-689.
4. Arthur DW, Vicini FA. Accelerated Partial Breast Irradiation as a part of Breast Conservation Therapy. *J Clin Onc.* 2005; 23(8):1726-1735.
5. Arthur DW, Vicini FA, Kuske RR, et al. Accelerated partial breast irradiation: an updated report from the American Brachytherapy Society. *Brachytherapy.* 2002; 1(4):184-190.
6. ASTRO/ACR Guide to Radiation Oncology Coding 2010.
7. ACR-ASTRO Practice Guideline for the Performance of High-Dose-Rate Brachytherapy Revised 2010
8. ACR-ASTRO Practice Guideline for the Performance of Low-Dose-Rate Brachytherapy Revised 2010
9. Brenner, DJ; Huang, Y; Hall, EJ. Fractionated High Dose-Rate Versus Low Dose-Rate Regimens for Intracavitary Brachytherapy of the Cervix: Equivalent Regimens for Combined Brachytherapy and External Irradiation, *Int J Radiation Oncology Biol Phys.*

- 1991; 21(6): 1415-1423.
10. Chen PY, Vicini FA, Benitez P, et al. Long-term cosmetic results and toxicity after accelerated partial-breast irradiation: a method of radiation delivery by interstitial brachytherapy for the treatment of early-stage breast carcinoma. *Cancer*. 2006; 106(5):991-999.
  11. Cheng, BS; Nagalingam, S; Komanduri, MA; et al. Dosimetric Considerations of Stereotactic Brain Implants, *Int J Radiation Oncology Biol Phys*. 1989; 17(4): 887-891.
  12. Consensus statement for Accelerated Partial Breast Irradiation; the American Society of Breast Surgeons.
  13. Goyal S, Vicini F, Beitsch PD, et al. Ductal carcinoma in situ treated with breast-conserving surgery and accelerated partial breast irradiation: comparison of the Mammosite registry trial with intergroup study E5194. *Cancer*. 2011; 117(6):1149-1155.
  14. Haffty BG, Vicini FA, Beitsch P, et al. Timing of Chemotherapy after MammoSite radiation therapy system breast brachytherapy: Analysis of the American Society of Breast Surgeons MammoSite breast brachytherapy registry trial. *Int J Radiat Oncol Biol Phys*. 2008; 72(5):1441-1448.
  15. Harper JL, Watkins JM, Zauls AJ. Six-year experience: Long-term disease control outcomes for partial breast irradiation using MammoSite balloon brachytherapy. *Am J Surg*. 2010; 199(2):204-209.
  16. Keisch M, Vicini F, Kuske RR. Two-year outcome with the Mammosite breast brachytherapy applicator: factors associated with optimal cosmetic results when performing partial breast irradiation. *Int J Radiat Oncol Biol Phys*. 2003; 57(2) (Supplement 1):s315.
  17. Keisch M, Vicini F, Kuske RR, et al. Initial clinical experience with the MammoSite breast brachytherapy applicator in women with early-stage breast cancer treated with breast-conserving therapy. *Int J Radiat Oncol Biol Phys*. 2003; 55(2):289-293.
  18. Khan AJ, Vicini F, Beitsch P, et al. Local control, toxicity, and cosmesis in women younger than 50 enrolled onto the American Society of Breast Surgeons MammoSite Radiation Therapy System registry trial. *Ann Surg Oncol*. 2009; 16(6):1612-8.
  19. King TA, Bolton JS, Kuske RR, et al. Long-term results of wide-field brachytherapy as the sole method of radiation therapy after segmental mastectomy for T<sub>is,1,2</sub> breast cancer. *Am J Surg*. 2000; 180:299-304.
  20. Lawenda BD, Taghian AG, Kachnic LA, et al. Dose-volume analysis of radiotherapy for T1N0 invasive breast cancer treated by local excision and partial breast irradiation by low-dose-rate interstitial implant. *Int J Radiat Oncol Biol Phys*. 2003; 56(3):671-680.
  21. McHaffie DR, Patel RR, Adkison JB, et al. Outcomes After Accelerated Partial Breast Irradiation in Patients with ASTRO Consensus Statement Cautionary Features. *Int J Radiat Oncol Biol Phys*. 2011; 81(1): 46-51.
  22. Nag S, Kuske RR, Vicini F, et al. The American Brachytherapy Society recommendations for brachytherapy for carcinoma of the breast. *Oncology* 2001; 15(2): 195-205.
  23. National Comprehensive Cancer Network<sup>®</sup> (NCCN). NCCN GUIDELINES<sup>™</sup> Clinical Guidelines in Oncology<sup>™</sup>. © National Comprehensive Cancer Network, Inc 2010, All Rights Reserved. Breast Cancer. V.2.2010. Accessed August 2010. Available at URL address: [http://www.nccn.org/professionals/physician\\_gls/PDF/breast.pdf](http://www.nccn.org/professionals/physician_gls/PDF/breast.pdf)
  24. Nori, D; Allison, R; Kaplan, B; et al. High Dose-Rate Intraluminal Irradiation in Bronchogenic Carcinoma, *Chest*. 1993; 104(4): 1006-1011.
  25. Ott OJ, Hildebrandt G, Potter R, et al. Accelerated partial breast irradiation with multi-

- catheter brachytherapy: Local control, side effects and cosmetic outcome for 274 patients. Results of the German-Austrian multi-centre trial. *Radiother Oncol*. 2007; 82(3):281-286.
26. Polgar C, Major T, Fodor J, et al., High-dose-rate brachytherapy alone versus whole breast radiotherapy with or without tumor bed boost after breast-conserving surgery: seven-year results of a comparative study. *Int J Radiat Oncol Biol Phys*. 2004; 60(4):1173-1181.
  27. Polgar C, Strnad V, Major T. Brachytherapy for partial breast irradiation: the European experience. *Semin Radiat Oncol*. 2005; 15(2):116-122.
  28. Polgar C, Sulyok Z, Fodor J, et al. Sole brachytherapy of the tumor bed after conservative surgery for T1 breast cancer: five-year results of a phase I-II study and initial findings of a randomized phase III trial. *J Surg Oncol*. 2002; 80(3):121-128; discussion 129.
  29. Scanderbeg D, Yashar C, White G, et al. Evaluation of three APBI techniques under NSABP B-39 guidelines. *J Appl Clin Med Phys* 2009; 11(1):3021.
  30. Shaitelman SF, Vicini FA, Beitsch P, et al. . Five-year outcome of patients classified using the American Society for Radiation Oncology consensus statement guidelines for the application of accelerated partial breast irradiation: an analysis of patients treated on the American Society of Breast Surgeons MammoSite Registry Trial. *Cancer*. 2010; 116(20):4677-4685.
  31. Smith BD, Arthur DW, Buchholz TA, et al. Accelerated partial breast irradiation consensus statement from the American Society for Radiation Oncology (ASTRO). *J Am Coll Surg*. 2009; 209(2):269-277.
  32. Strnad V, Hildebrandt G, Potter R, et al. Accelerated partial breast irradiation: 5-year results of the German-Austrian multicenter phase II trial using interstitial multicatheter brachytherapy alone after breast-conserving surgery. *Int J Radiat Oncol Biol Phys*. 2011;80(1):17-24.
  33. Strnad V, Ott O, Potter R, et al. Interstitial brachytherapy alone after breast conserving surgery: interim results of a German-Austrian multicenter phase II trial. *Brachytherapy*. 2004; 3(3):115-119.
  34. Vicini FA, Antonucci JV, Wallace M, et al. Long-term efficacy and patterns of failure after accelerated partial breast irradiation: a molecular assay-based clonality evaluation. *Int J Radiat Oncol Biol Phys*. 2007; 68(2):341-346.
  35. Vicini F, Arthur D, Wazer D, et al. Limitations of the American Society of Therapeutic Radiology and Oncology Consensus Panel guidelines on the use of accelerated partial breast irradiation. *Int J Radiat Oncol Biol Phys*. 2011; 79(4):977-984.
  36. Vicini FA, Arthur DW. Breast Brachytherapy: North American Experience. *Seminars of Radiation Oncology*. 2005; 15(2):108-15.
  37. Vicini F, Beitsch P, Quiet C, et al. Five-Year Analysis of Treatment Efficacy and Cosmesis by the American Society of Breast Surgeons Mammosite Breast Brachytherapy Registry Trial in Patients Treated with Accelerated Partial Breast Irradiation. *Int J Radiat Oncol Biol Phys*. 2011; 79(3): 808-817.
  38. Vicini F, Beitsch PD, Quiet CA, et al. Three-year analysis of treatment efficacy, cosmesis, and toxicity by the American Society of Breast Surgeons MammoSite Breast Brachytherapy Registry Trial in patients treated with accelerated partial breast irradiation (APBI). *Cancer*. 2008; 112(4):758-766.
  39. Vicini FA, Kestin L, Chen P, et al. Limited-field radiation therapy in the management of early-stage breast cancer. *J Natl Cancer Inst* 2003; 95(16):1205-1210.

40. Wazer D, Berle L, Graham R, et al. Preliminary results of a phase I/II study of HDR brachytherapy alone for T1/T2 breast cancer. *Int J Radiat Oncol Biol Phys.* 2002; 53(4):889-897.
41. Wazer DE, Lowther D, Boyle T, et al. Clinically evident fat necrosis in women treated with high-dose-rate brachytherapy alone for early-stage breast cancer. *Int J Radiat Oncol Biol Phys.* 2001; 50(1):107-111.
42. Yashar C, Scanderbeg D, Kuske R, et al. Initial Clinical Experience With the Strut-Adjusted Volume Implant (SAVI) Breast Brachytherapy Device for Accelerated Partial-Breast Irradiation (APBI): First 100 Patients With More Than 1 Year of Follow-Up. *Int J Radiat Oncol Biol Phys.* 2011; 80(3): 765-770.

## **Cervix**

1. Demanes DJ, Rodriguez RR, Bendre DD, et al. High Dose Rate Transperineal Interstitial Brachytherapy for Cervical Cancer: High Pelvic Control and Low Complication Rates. *Int J Radiat Oncol Biol Phys.* 1999; 45;11:105-112
2. Erickson B, Eifel P, Moughan J, et al. Patterns of brachytherapy practice for patients with carcinoma of the cervix (1996 – 1999): a patterns of care study. *Int J Radiat Biol Phys.* 2005; 63(4):1083-1092.
3. Lertsanguansinchai P, Lertbutsayanukul C, Shotelersuk K, et al. Phase III randomized trial comparing LDR and HDR brachytherapy in treatment of cervical carcinoma. *Int J Radiat Oncol Biol Phys.* 2004; 59(5):1424-1431.
4. Nag S, Chao C, Erickson B, et al. The American Brachytherapy Society recommendations for low-dose-rate brachytherapy for carcinoma of the cervix. *Int J Radiat Oncol Biol Phys.* 2002; 52(1):33-48.
5. Nag S, Erickson B, Thomadsen B, et al. The American Brachytherapy Society Recommendations for High-Dose-Rate Brachytherapy for Carcinoma of the Cervix. *Int J Radiat Oncol Biol Phys.* 2000; 48(1):201-211
6. Shakespeare TP, Lim KH, Lee KM, et al. American Brachytherapy Society. Phase II study of the American Brachytherapy Society guidelines for the use of high-dose rate brachytherapy in the treatment of cervical carcinoma: Is 45-50.4 Gy radiochemotherapy plus 31.8 Gy in six fractions high-dose rate brachytherapy tolerable? *Int J Gynecol Cancer* 2006; 16(1):277-282.
7. Toita T, Kato S, Niibe Y, et al. Prospective Multi-Institutional Study of Definitive Radiotherapy With High-Dose-Rate Intracavitary Brachytherapy in Patients With Nonbulky (<4-cm) Stage I and II Uterine Cervical Cancer (JAROG0401/JROSG04-2). *Int J Radiat Oncol Biol Phys.* 2011 Apr 4. [Epub ahead of print]
8. Viani GA, Manta GB, Stefano EJ, et al. Brachytherapy for cervix cancer: Low-dose rate or high-dose rate brachytherapy - a meta-analysis of clinical trials. *J Exp Clin Cancer Res.* 2009; 28:47.
9. Viswanathan AN, Cormack R, Rawal B, et al. Increasing brachytherapy dose predicts survival for interstitial and tandem-based radiation for stage IIIB cervical cancer. *Int J Gynecol Cancer.* 2009; 19(8): 1402-1406.
10. Viswanathan AN, Creutzberg CL, Craighead P, et al. International Brachytherapy Practice Patterns: A Survey of the Gynecologic Cancer Intergroup (GCIG). *Int J Radiat Oncol Biol Phys.* 2010; epub, Dec 22.

## **Colon and Rectum**

1. Cohen AM, Minsky BD, Schilsky RL. Cancer of the rectum. In: *Cancer: Principles and Practice of Oncology*. 5th ed. VT DeVita Jr, S Hellman, SA Rosenberg, eds. Philadelphia, PA: Lippincott-Raven; 1997:1228-1229.
2. Corner C, Bryant L, Chapman C, et al. . High-dose-rate afterloading intraluminal brachytherapy for advanced inoperable rectal carcinoma. *Brachytherapy*. 2010; 9(1):66-70.
3. Grimard L, Stern H, Spaans JN. Brachytherapy and local excision for sphincter preservation in T1 and T2 rectal cancer. *Int J Radiat Oncol Biol Phys*. 2009; 74(3):803-809.
4. Shank B, Cunningham JD, Kelsen, DP. Cancer of the anal region. In: *Cancer: Principles and Practice of Oncology*. 5th ed. VT DeVita Jr, S Hellman, SA Rosenberg, eds. Philadelphia, PA: Lippincott-Raven; 1997:1244-1245.

## **Esophagus**

1. Gaspar LE, Nag S, Herskovic A, et al. American Brachytherapy Society (ABS) consensus guidelines for brachytherapy of esophageal cancer. Clinical Research Committee, American Brachytherapy Society, Philadelphia, PA. *Int J Radiat Oncol Biol Phys*. 1997; 38(1):127-132.
2. Ishikawa H, Nonaka T, Sakurai H, et al. Usefulness of intraluminal brachytherapy combined with external beam radiation therapy for submucosal esophageal cancer: long-term follow-up results. *Int J Radiat Oncol Biol Phys*. 2010; 76(2):452-459.
3. Nemoto K, Yamada S, Nishio M, et al. Results of radiation therapy for superficial esophageal cancer using the standard radiotherapy method recommended by the Japanese Society of Therapeutic Radiology and Oncology (JASTRO) Study Group, *Anticancer Res* 26 (2006), 26(2B) 1507–1512.
4. Sai H, Mitsumori M, Araki N, et al. Long-term results of definitive radiotherapy for stage I esophageal cancer. *Int J Radiat Oncol Biol Phys*. 2005; 62(5): 1339–1344.
5. Tamaki T, Ishikawa H, Takahashi T, et al. Comparison of efficacy and safety of low-dose-rate vs. high-dose-rate intraluminal brachytherapy boost in patients with superficial esophageal cancer. *Brachytherapy*. 2011 Jun 21. [Epub ahead of print]

## **Endometrium**

1. Coon D, Beriwal S, Heron DE, et al. High-dose-rate Rotte "Y" applicator brachytherapy for definitive treatment of medically inoperable endometrial cancer: 10-year results. *Int J Radiat Oncol Biol Phys*. 2008;71(3):779-783.
2. Hasbini, A., Haie-Meder C., Morice P, et al. (2002). Outcome after salvage radiotherapy (brachytherapy +/- external) in patients with a vaginal recurrence from endometrial carcinomas. *Radiother Oncol*. 2002; 65(1): 23-28.
3. Ieso PD, Mullassery V, Shrimali R, et al. Image-guided vulvovaginal interstitial brachytherapy in the treatment of primary and recurrent gynecological malignancies. *Brachytherapy*. 2011 Oct 11. [Epub ahead of print]

4. Jhingran, A., Burke T. W., Eifel PJ, Definitive radiotherapy for patients with isolated vaginal recurrence of endometrial carcinoma after hysterectomy. *Int J Radiat Oncol Biol Phys.* 2003 56(5): 1366-1372.
5. Lin, L. L., P. W. Grigsby, Powell MA, et al. Definitive radiotherapy in the management of isolated vaginal recurrences of endometrial cancer. *Int J Radiat Oncol Biol Phys.* 2005; 63(2): 500-504.
6. Nag S, Erickson B, Parikh S, et al. The American Brachytherapy Society Recommendations for High-Dose-Rate Brachytherapy for Carcinoma of the Endometrium. *Int J Radiat Oncol Biol Phys.* 2000;48(3):779-790
7. Nag S, Orton C, Peterit D, et al. The American Brachytherapy Society recommendations for high-dose-rate brachytherapy for carcinoma of the endometrium. *Int J Radiat Oncol Biol Phys.* 2000;48:779-790.
8. Nag, S., Yacoub S., et al. Interstitial brachytherapy for salvage treatment of vaginal recurrences in previously unirradiated endometrial cancer patients. *Int J Radiat Oncol Biol Phys.* 2002; 54(4): 1153-1159.
9. Nout RA, Smit V, Putter H, et al. Vaginal brachytherapy versus pelvic external beam radiotherapy for patients with endometrial cancer of high-intermediate risk (PORTEC-2): An open-label, non-inferiority, randomised trial. *Lancet.* 2010; 375(9717):816-823.
10. Patel MK, Cote ML, Ali-Fehmi, et al. Trends in the Utilization of Adjuvant Vaginal Cuff Brachytherapy and/or External Beam Radiation Treatment in Stage I and II Endometrial Cancer: A Surveillance, Epidemiology, and End-Results Study. *Int J Radiat Biol Phys.* 2011 Oct 17. [Epub ahead of print]
11. Small, W Jr., Beriwal, S, Demanes, DJ et al. The American Brachytherapy Society Recommendations for Adjuvant Vaginal Cuff Brachytherapy after Hysterectomy. In Press, Brachytherapy, 2011.
12. Small W Jr, Erickson B, Kwakwa F, An American Brachytherapy Society survey regarding the practice patterns of post-operative irradiation for endometrial cancer. *Int J Radiol Oncol Biol Phys.* 2005;63(5):1502-1507.
13. Sorbe BG, Smeds AC. Postoperative vaginal irradiation with high dose rate afterloading technique in endometrial carcinoma stage I. *Int J Radiat Oncol Biol Phys.* 1990;18(2):305-314.

## Eye

1. Leonard KL, Gagne NL, Mignano JE, et al. A 17-year retrospective study of institutional results for eye plaque brachytherapy of uveal melanoma using (125)I, (103)Pd, and (131)Cs and historical perspective. *Brachytherapy.* 2011; 10(4): 331-339.
2. Melia M, Moy CS, Reynolds SM, et al. Quality of life after iodine 125 brachytherapy vs. enucleation for choroidal melanoma: 5-year results from the Collaborative Ocular Melanoma Study: COMS QOLS Report No. 3. *Arch Ophthalmol.* 2006; 124(2):226-238.
3. Sagoo MS, Shields CL, Mashayekhi A, et al. Plaque radiotherapy for juxtapapillary choroidal melanoma: tumor control in 650 consecutive cases. *Ophthalmology.* 2011;118(2):402-407.
4. Sahel JA, Steeves RA, Albert DM. Intraocular melanoma. In: *Cancer: Principles and Practice of Oncology.* 5th ed. VT DeVita Jr, S Hellman, SA Rosenberg, eds. Philadelphia, PA: Lippincott-Raven; 1997:2004-2005.

## Head and Neck

1. Puthawala A, Syed AM, Gamie S, et al. Interstitial low-dose-rate brachytherapy as a salvage treatment for recurrent head-and-neck cancers: long-term results, *Int J Radiat Oncol Biol Phys.* 2001; 51(2): 354-362
2. Bollet M, Lapeyre M, Marchal C, et al. Cervical lymph node relapses of head-and-neck squamous cell carcinoma: is brachytherapy a therapeutic option? *Int J Radiat Oncol Biol Phys.* 2001; 51(5), 1305-1312.
3. Gibbs IC, Le QT, Shah RD, et al. Long-term outcomes after external beam irradiation and brachytherapy boost for base-of-tongue cancers. *Int J Radiat Oncol Biol Phys.* 2003; 57(2), 489-494.
4. Han P, Hu K, Culliney B, et al. Concurrent chemoradiation followed by interstitial brachytherapy boost and neck dissection for T4 base of tongue cancer. *Int J Radiat Onco Biol Phys.* 2005; 63(s1):S358
5. Harrison LB, Weissberg JB. A technique for interstitial nasopharyngeal brachytherapy. *Int J Radiat Onco Biol Phys.* 1987; 13(3):451-453
6. Harrison LB, Zelefsky MJ, Pfister DG, et al. Detailed quality of life assessment in patients treated with primary radiotherapy for squamous cell cancer of the base of the tongue. *Head neck.* 1997 19:3 (169-175)
7. Hepel JT, Syed AMN, Puthawala A, et al. Salvage high-dose-rate (HDR) brachytherapy for recurrent head-and-neck cancer. *Int J Radiat Onco Biol Phys.* 2005; 62(5), 1444-1450.
8. Kakimoto N, Inoue T, Inoue T, et al. Results of low- and high-dose-rate interstitial brachytherapy for T3 mobile tongue cancer. *Radiotherapy & Oncology.* 2003; 68(2), 123-128.
9. Lapeyre M, Bollet MA, Racadot S, et al. Postoperative brachytherapy alone and combined postoperative radiotherapy and brachytherapy boost for squamous cell carcinoma of the oral cavity, with positive or close margins. *Head neck.* 2004; 26(3), 216-223.
10. Leung TW, Tung SY, Sze WK, et al. Salvage radiation therapy for locally recurrent nasopharyngeal carcinoma. *Int J Radiat Onco Biol Phys.* 2000; 48(5), 1331-1338.
11. Marsili H, Haie-Mède C, Sassa G, et al. Brachytherapy for T1-T2 floor-of-the-mouth cancers: the Gustave-Roussy Institute experience. *Int J Radiat Onco Biol Phys.* 2002; 52(5), 1257-1263.
12. Nag S, Cano ER, Demanes DJ, et al. The American Brachytherapy Society recommendations for high-dose-rate brachytherapy for head-and-neck carcinoma. *Int J Radiat Oncol Biol Phys.* 2001; 50(5):1190-1198.
13. Pellizzon ACA, Dos Santos Novaes PER, Conte Maia MA, et al. Interstitial high-dose-rate brachytherapy combined with cervical dissection on head and neck cancer. *Head neck.* 2005; 27(12), 1035-1041.
14. Sabbas AM, Kulidzhanov FG, Presser J, et al. HDR brachytherapy with surface applicators: technical considerations and dosimetry. *Technology in cancer research treatment.* 2004; 3(3), 259-267.
15. Spenser S, Harris J, Wheeler R, et al. Late effects of RTOG-9610: Re-irradiation and chemotherapy in patients with squamous cell cancer of the head and neck. *Int J Radiat Onco Biol Phys.* 2003; 57(2 Suppl):S307.
16. Strnad V, Geiger M, Lotter M, et al. The role of pulsed-dose-rate brachytherapy in previously irradiated head-and-neck cancer. *Brachytherapy.* 2002;1(3): 149-153

17. Strnad V, Melzner W, Geiger M, et al. Role of interstitial PDR brachytherapy in the treatment of oral and oropharyngeal cancer. A single-institute experience of 236 patients. *Strahlenther Onkol.* 2005; 181(12): 762-767.
18. Syed AM, Puthawala AA, Damore SJ, et al. Brachytherapy for primary and recurrent nasopharyngeal carcinoma: 20 years experience at Long Beach Memorial. *Int J Radiat Onco Biol Phys.* 2000; 47(5), 1311-1321.

### **Intracoronary**

1. Costa MA, Sabat M, van der Giessen WJ, et al. Late coronary occlusion after intracoronary brachytherapy. *Circulation.* 1999; 100(8):789-792.
2. Waksman R. Intracoronary brachytherapy in the Cath Lab. Physics dosimetry, technology and safety considerations. *Herz.* 1998; 23(6):401-406.

### **Lung**

1. Fernando HC, Landreneau RJ, Mandrekar SJ, et al. The impact of adjuvant brachytherapy with sublobar resection on pulmonary function and dyspnea in high-risk operable patients: preliminary results from the ACOSOG Z4032 trial. *J Thorac Cardiovasc Surg.* 2011; 142(3): 554-562.
2. Fernando HC, Santos RS, Benfield JR, et al. Lobar and sublobar resection with and without brachytherapy for small stage IA non-small cell lung cancer. *J Thorac Cardiovasc Surg.* 2005; 129(2):261-267.
3. Lee W, Daly BD, DiPetrillo TA, et al. Limited resection for non-small cell lung cancer: observed local control with implantation of I-125 brachytherapy seeds. *Ann Thorac Surg.* 2003; 75(1):237-243.
4. Minna JD, Sekido, Y, Fong, K, et al. Cancer of the lung. In: *Cancer: Principles and Practice of Oncology.* 5th ed. VT DeVita Jr, S Hellman, SA Rosenberg, eds. Philadelphia, PA: Lippincott-Raven; 1997:882.
5. Raben A, Mychalczak B. Brachytherapy for non-small cell lung cancer and selected neoplasms of the chest. *Chest.* 1997;112(4 Suppl):276S-286S.
6. Santos R, Colonias A, Parda D, et al. Comparison between sublobar resection and I25iodine brachytherapy after sublobar resection in high-risk patients with stage I non-small cell lung cancer. *Surgery.* 2003; 134(4):691-697.
7. Schuchert MJ, Abbas G, Pennathur A, et al. Sublobar resection for early-stage lung cancer. *Semin Thorac Cardiovasc Surg.* 2010 Spring; 22(1):22-31.
8. Tselis N, Ferentinos K, Kolotas C, Schirren J, et al. Computed tomography-guided interstitial high-dose-rate brachytherapy in the local treatment of primary and secondary intrathoracic malignancies. *J Thorac Oncol.* 2011; 6(3):545-552.
9. Voynov G, Heron DE, Lin CJ, et al. Intraoperative (125)I Vicryl mesh brachytherapy after sublobar resection for high-risk stage I non-small cell lung cancer. *Brachytherapy.* 2005; 4(4):278-285.

## Prostate

1. Arvold ND, Chen MH, Moul JW, et al. Risk of death from prostate cancer after radical prostatectomy or brachytherapy in men with low or intermediate risk disease. *J Urol*. 2011; 186(1):91-96.
2. Corner C, Rojas AM, Bryant L, et al. A Phase II study of high-dose-rate afterloading brachytherapy as monotherapy for the treatment of localized prostate cancer. *Int J Radiat Oncol Biol Phys*. 2008; 72(2):441-446.
3. Crook J, Borg J, Evans A, et al. 10-year experience with I-125 prostate brachytherapy at the princess Margaret hospital: results for 1,100 patients. *Int J Radiat Oncol Biol Phys*. 2011; 80:1323-1329.
4. Demanes DJ, Martinez AA, Ghilezan M, et al. High-Dose-Rate Monotherapy: Safe and Effective Brachytherapy for Patients with Localized Prostate Cancer. *Int J Radiat Oncol Biol Phys*. 2011 Feb 10. [Epub ahead of print]
5. Deutsch I, Zelefsky MJ, Zhang Z, et al. Comparison of PSA relapse-free survival in patients treated with ultra-high-dose IMRT versus combination HDR brachytherapy and IMRT. *Brachytherapy* 2010; 9(4):313-318.
6. Keyes M, Spadinger I, Liu M, et al. Rectal toxicity and rectal dosimetry in low-dose-rate iodine-125 permanent prostate implants: A long-term study in 1006 patients. *Brachytherapy*. 2010; 9(Suppl 1): S79-S80.
7. Nag S, Beyer D, Friedland J, et al. American Brachytherapy Society (ABS) recommendations for transperineal permanent brachytherapy of prostate cancer. *Int J Radiat Oncol Biol Phys*. 1999; 44(4):789-799.
8. Rosenthal SA, Bittner NH, Beyer DC, et al. American Society for Radiation Oncology (ASTRO) and American College of Radiology (ACR) practice guideline for the transperineal permanent brachytherapy of prostate cancer. *Int J Radiat Oncol Biol Phys*. 2011; 79(2):335-341.
9. Stock RG, Stone NN. Current topics in the treatment of prostate cancer with low-dose-rate brachytherapy. *Urol Clin North Am*. 2010; 37(1):83-96.
10. Sylvester JE, Grimm PD, Blasko JC, et al. 15-Year biochemical relapse free survival in clinical Stage T1-T3 prostate cancer following combined external beam radiotherapy and brachytherapy; Seattle experience. *Int J Radiat Oncol Biol Phys*. 2007; 67(1):57-64.
11. Taira AV, Merrick GS, Butler WM, et al. Long-term outcome for clinically localized prostate cancer treated with permanent interstitial brachytherapy. *Int J Radiat Oncol Biol Phys*. 2011; 79(5):1336-1342.
12. Thompson A, Keyes M, Pickles T, et al. Evaluating the Phoenix definition of biochemical failure after (125)I prostate brachytherapy: Can PSA kinetics distinguish PSA failures from PSA bounces? *Int J Radiat Oncol Biol Phys*. 2010; 78(2):415-421.
13. Vicini FA, Kini VR, Edmundson G, et al. A comprehensive review of prostate cancer brachytherapy: Defining an optimal technique. *Int J Radiat Oncol Biol Phys*. 1999; 44(3):483-491.
14. Zelefsky MJ. PSA bounce versus biochemical failure following prostate brachytherapy. *Nat Clin Pract Urol*. 2006;3(11):578-579.
15. Zelefsky MJ, Chan H, Hunt M, et al. Long-term outcome of high dose intensity modulated radiation therapy for patients with clinically localized prostate cancer. *J Urol*. 2006; 176(4 pt 1): 1415-1419.

16. Zelefsky MJ, Yamada Y, Cohen GN, et al. Five-year outcome of intraoperative conformal permanent I-125 interstitial implantation for patients with clinically localized prostate cancer. *Int J Radiat Oncol Biol Phys.* 2007; 67(1): 65-70.
17. Zelefsky MJ, Yamada Y, Pei X, et al. Comparison of tumor control and toxicity outcomes of high-dose intensity-modulated radiotherapy and brachytherapy for patients with favorable risk prostate cancer. *Urology.* 2011; 77(4):986-990.

## **Sarcomas**

1. Brennan MF, Casper ES, Harrison LB. Soft tissue sarcoma. In: *Cancer: Principles and Practice of Oncology.* 5th ed. VT DeVita Jr, S Hellman, SA Rosenberg, eds. Philadelphia, PA: Lippincott-Raven; 1997:1762-1764.
2. Hilaris BS, Bodner WR, Mastoras CA. Role of brachytherapy in adult soft tissue sarcomas. *Semin Surg Oncol.* 1997; 13(3):196-203.
3. Nag S, Shasha D, Janjan N, et al. The American Brachytherapy Society recommendations for brachytherapy of soft tissue sarcomas. *Int J Radiat Oncol Biol Phys.* 2001; 49(4):1033-1043.
4. O'Sullivan B, Davis AM, Turcotte R, et al. Preoperative versus postoperative radiotherapy in soft-tissue sarcoma of the limbs: a randomised trial. *Lancet.* 2002; 359 (9325): 2235-2241
5. Pisters PW, Harrison LB, Leung DH, et al. Long-term results of a prospective randomized trial of adjuvant brachytherapy in soft tissue sarcoma. *J Clin Oncol.* 1996; 14(3):859-868.

## **Skin**

1. Alam M, Nanda S, Mittal BB, et al. The use of brachytherapy in the treatment of nonmelanoma skin cancer: A review. *J Am Acad Dermatol.* 2011; 65(2):377-88.
2. Somanchi B, Stanton A, Webb M, et al. Hand function after high dose rate brachytherapy for squamous cell carcinoma of the skin of the hand. *Clin Oncol (R Coll Radiol)* 2008; 20(9):691-697.
3. Bhatnagar A, Loper A. The Initial Experience of electronic brachytherapy for the treatment of non-melanoma skin cancer. *Radiation Oncology.* 2010; 5:87.
4. Conill C, Verger E, Marruecos J, et al. Low dose rate brachytherapy in lip carcinoma, *Clin Transl Oncol* 2004; 9(4):251-254.
5. Kohler-Brock A, Pragger W, Pohlmann S, et al. The Indications for and results of HDR afterloading therapy in diseases of the skin and mucosa with standardized surface applicators (The Leipzig Applicator), *Strahlenther Onkol* 1999; 175(4): 170-174.
6. Debois J. Cesium-137 brachytherapy for epithelioma of the skin of the nose: experience with 370 patients. *J Belge Radiol.* 1994; 77(1):1-4,
7. Guix B, Finestres F, Tello J, et al. Treatment of Skin Carcinomas of the Face by High Dose Rate Brachytherapy and Custom Made Surface Molds. *Int J Radiat Oncol Biol Phys.* 2000; 47(1); 95-102.
8. Lee JD, Park KK, Lee M, et al. Radionuclide therapy of skin cancers and Bowen's disease using a specially designed skin patch. *J Nucl Med.* 1997, 38(5):697-702.

9. Rio E, Bardet E, Ferron C, et al. Interstitial brachytherapy of periorificial skin carcinomas of the face: a retrospective study of 97 cases, *Int J Radiat Oncol Biol Phys.* 2005; 63(3):753-757.
10. Rudoltz M, Perkins R, Luthmann R, et al. High-dose-rate brachytherapy with a custom-surface mold to treat recurrent squamous cell carcinomas of the skin of the forearm. *J Am Acad Dermatol.* 1998; 38(6 Pt 1):1003-1005.
11. Sedda A, Rossi G, Cipriani C. et al. Dermatological high-dose-rate brachytherapy for the treatment of basal and squamous cell carcinoma, *Clin Exp Dermatol.* 2008; 33(6):745-749.
12. Svoboda V, Kovarik J, Morris F. High dose-rate microselectron molds in the treatment of skin tumors, *Int J Radiat Oncol Biol Phys.*1995; 31(4):967-972.

## **Vagina**

1. Beriwal S, Heron DE, Mogus R, et al. High-dose rate brachytherapy (HDRB) for primary or recurrent cancer in the vagina. *Radiat Oncol.* 2008 Feb 13;3:7.
2. Beriwal S, Rwigema JC, Higgins E, et al. 3D image-based HDR interstitial brachytherapy for vaginal cancer. *Brachytherapy.* 2011 Jun 10. [Epub ahead of print]
3. Dimopoulos JC, Schmid MP, Fidarova E, et al. Treatment of Locally Advanced Vaginal Cancer with Radiochemotherapy and Magnetic Resonance Image-guided Adaptive Brachytherapy: Dose-volume Parameters and First Clinical Results. *Int J Radiat Oncol Biol Phys.* 2011 Aug 24. [Epub ahead of print].
4. Frank SJ, Jhingran A, Levenback C, et al. Definitive radiation therapy for squamous cell carcinoma of the vagina. *Int J Radiat Oncol Biol Phys.* 2005;62(1):138–147.
5. Ieso PD, Mullassery V, Shrimali R, et al. Image-guided vulvovaginal interstitial brachytherapy in the treatment of primary and recurrent gynecological malignancies. *Brachytherapy.* 2011 Oct 11. [Epub ahead of print]
6. Jhingran A, Burke TW, Eifel PJ. Definitive radiotherapy for patients with isolated vaginal recurrence of endometrial carcinoma after hysterectomy. *Int J Radiat Oncol Biol Phys.* 2003;56(5):1366–1372.
7. Kushner DM, Fleming PA, Kennedy AW, et al. High dose rate (192)Ir afterloading brachytherapy for cancer of the vagina. *Br J Radiol.* 2003;76(910):719–725.
8. Lieskovsky YE, Demanes D. Combination high-dose Rate brachytherapy and external beam radiation therapy for the treatment of primary vaginal cancer: 5-year results. *Int J Radiat Oncol Biol Phys.* 2004;60(1):S308 [Abstract].
9. Nag S, Yacoub S, Copeland LJ, et al. Interstitial brachytherapy for salvage treatment of vaginal recurrences in previously unirradiated endometrial cancer patients. *Int J Radiat Oncol Biol Phys.* 2002;54(4):1153–1159.
10. Pai HH, Souhami L, Clark BG, et al. Isolated vaginal recurrences in endometrial carcinoma: treatment results using high-dose-rate intracavitary brachytherapy and external beam radiotherapy. *Gynecol Oncol.* 1997;66(2):300–307.
11. Patel MK, Cote ML, Ali-Fehmi, et al. Trends in the Utilization of Adjuvant Vaginal Cuff Brachytherapy and/or External Beam Radiation Treatment in Stage I and II Endometrial Cancer: A Surveillance, Epidemiology, and End-Results Study. *Int J Radiat Biol Phys.* 2011 Oct 17. [Epub ahead of print]

12. Petignat P, Jolicoeur M, Alobaid A, et al. Salvage treatment with high-dose-rate brachytherapy for isolated vaginal endometrial cancer recurrence. *Gynecol Oncol.* 2006;101(3):445–449.