POLICY NUMBER UM XRT_2002	SUBJECT Brachytherapy-Oncology Applications		DEPT/PROGRAM UM Dept	PAGE 1 OF 7
DATES COMMITTEE REVIEWED 06/30/14, 06/16/15, 09/09/15, 09/05/17, 11/14/18, 12/11/19	APPROVAL DATE December 11, 2019	EFFECTIVE DATE December 11, 2019	COMMITTEE APPROVAL DATES (latest version listed last) 06/30/14, 06/16/15, 09/09/15, 09/05/17, 11/14/18, 12/11/19	
PRIMARY BUSINESS OWNER: UM APPROVED BY: Dr. Andrew Hertler		COMMITTEE/BOARD APPROVAL Utilization Management Committee		
URAC STANDARDS HUM 1		NCQA STANDARDS UM 2	ADDITIONAL AREAS OF IMPACT	
CMS REQUIREMENTS	STATE/FEDERAL REQUIREMENTS		APPLICABLE LINES OF BUSINESS All	

I. PURPOSE

The purpose of this policy is to provide general information applicable to the review and appropriateness of Brachytherapy services.

II. BACKGROUND

Brachytherapy: Is a type of radiation therapy that utilizes radioactive isotopes for treatment of malignancies or benign conditions by means of radioactive source placed directly on the target surface, into a body cavity (intracavitary), within the body tissues (interstitial) or near the tumor or target tissue

III. DEFINITIONS

Intracavitary brachytherapy: is performed by placement of applicators directly in a tumor or body cavity. The applicator is loaded with a radioactive isotope (e.g., radium, cesium, iridium).

Interstitial brachytherapy is performed by placement of applicators directly within body tissues. Interstitial brachytherapy is also performed with needles, ribbons, or wires containing radioactive materials. Brachytherapy that requires penetration of the skin or surgery for applicator insertion is considered interstitial. Surface application brachytherapy involves the application of radioactive materials that are placed directly on the skin or other external target surface. Some radioactive materials may be left in place permanently (low dose rate or LDR) or temporarily (high dose rate or HDR).

IV. POLICY

Medicare- for Medicare and Medicare Advantage enrollees, the coverage policies of CMS (Centers for Medicare and Medicaid Services) may take precedence over Company's guidelines.

Brachytherapy **meets the definition** of Medical Necessity **for the following indications:**

1. **<u>Breast Cancer</u>**

   Local boost irradiation is appropriate in individuals treated with breast conserving surgery and whole breast external beam radiation therapy when the following criteria are met:
   a. High Risk patients defined as age < 50 and High-grade disease
   b. Negative margins to tumor bed

   Accelerated partial breast irradiation (APBI) as an alternative to whole breast irradiation utilizing Brachytherapy ALL of the following criteria are met:
   a. Age 45 years or greater AND
   b. Negative margins of 2 mm AND
   c. Negative lymph nodes AND
   d. Tumor size less than 3 CM

2. Selective internal radiation therapy (SIRT), using radioactive Yttrium-90 (90Y) microspheres is indicated when the following criteria are met:
    a. Unresectable and/or medically inoperable primary liver malignancies ***OR***
    b. Unresectable liver only or liver dominant metastases from neuroendocrine tumors (i carcinoids, pancreatic islet cell tumors, endocrine tumor) ***OR***
    c. Unresectable primary hepatocellular carcinoma (HCC) ***OR***
    d. Unresectable metastatic liver tumors from primary colorectal cancer ***AND***
    e. The tumor burden is liver dominant ***AND***
    f. Eastern Cooperative Oncology Group (ECOG) performance status should be 0 or 1
    g. Life expectancy should be at least 3 months
3. Gynecological Cancers when the following criteria are met:

    Cervical

    a. HDR Boost up to 5 treatments ***OR***
    b. Post –Operative boost after External Beam Radiation Therapy (EBRT)

    Uterine/Endometrial
    a. Post –Operative boost to vaginal cuff ***AND***
    b. Age > 60 ***AND***
    c. Stage 1B Grade 3, ***OR***
    d. Stage 1C Grade 1 or 2 with Lymphvascular invasion ***OR***
    e. Lower Uterine involvement ***OR***
    f. Stage II Grade 1, Grade 2, Grade 3 ***OR***
    g. Stage IIIA Grade 1, Grade 2, Grade 3 ***OR***
    h. Stage IIIB Grade 1, Grade 2, Grade 3 ***OR***
    i. Stage IIIC1 positive pelvic with negative para-aortic nodes
4. Para-aortic lymph node radiation treatment with pelvic external beam photon radiation therapy with or without brachytherapy is medically necessary for either of the following:
    a. Stage IIIC1 (involvement of only pelvic nodes)
    b. Stage IIIC2 (involvement of para-aortic lymph nodes with or without pelvic nodes) documented at surgery or by image-guided biopsy
5. As a monotherapy for:
    a. Stage IA Grade 1, Grade 2, Grade 3 disease with all on any of the following adverse features:
        i. Age <60,
        ii. Lymphvascular invasion,
        iii. Lower Uterine involvement ***OR***
        iv. Stage IA Grade 2, Grade 3 without adverse risk factors ***OR***
        v. Stage IB Grade 1, Grade 2, Grade 3 ***OR***
        vi. Stage II Grade 1, Grade 2
6. **Vaginal cancer**

Following external beam therapy as a boost or as primary therapy for early stage disease

7. **Head and Neck Cancer**
    a. Low Dose Rate (LDR) or High Dose Rate (HDR) brachytherapy is medically necessary in select cases of epithelial tumors of the head and neck region. In appropriate early cases, it is medically necessary as monotherapy. In more advanced cases, it may be substituted for one phase of 3DCRT or IMRT

    b. Brachytherapy for head and neck malignancies should be performed only by Radiation Oncologists specifically trained in its use.

8. **Prostate Cancer**
    a. Low-risk disease which is defined as: tumor stage ≤ T2a, low Gleason score ≤6, serum PSA <10ng/mL, and a prostate volume 80 cc or less

        i. Permanent low dose rate (LDR) brachytherapy as monotherapy in 1 treatment **OR**

        ii. Brachytherapy using high-dose rate (HDR) as monotherapy in 2 treatments

    b. Intermediate-risk disease which is defined as: tumor stage T2b-T2c or Gleason score of 7, or serum PSA of 10-20ng/mL, a prostate volume 80 cc or less and treatment involves one of the following:

        i. Brachytherapy using permanent trans-perineal implantation of radioactive seeds in low dose rate (LDR) as monotherapy in 1 treatment; ***OR***

        ii. Brachytherapy using high-dose rate (HDR) as monotherapy in 2 treatments; ***OR***

        iii. In conjunction with 26-28 fractions of Intensity modulated radiotherapy (IMRT) and 1 treatment either LDR or HDR Brachytherapy.

9. **Soft tissue sarcomas:**
    a. For positive margins or margins less than 5mm

        i. As primary monotherapy or as a boost to External Beam Radiation Therapy (EBRT).

10. **Exceptions**
    All other indications not listed above may be considered experimental or investigational, as there may be insufficient evidence to support conclusions regarding the effect of on health outcomes. Indications not listed will be evaluated on a case by case basis at the clinical reviewer level.

V. PROCEDURE

The following documentation is necessary for reviewing a Brachytherapy request:

1. Completed radiation therapy request form
2. Attending Physician's consult or progress note
3. Radiation treatment plan and/or Dose Volume Histogram (DVH) if applicable
4. Pathology and pertinent lab values if applicable

VI. APPROVAL AUTHORITY

1. Review – Utilization Management Department
2. Final Approval – Utilization Management Committee

VII. ATTACHMENTS

None

VIII. REFERENCES

1. Arthur DW, Vicini FA, Kuske RR, et al. Accelerated partial breast irradiation: an updated report from the American Brachytherapy Society. Brachytherapy 2003; 2(2):124-130.
2. Aumont-le Guilcher MA, Prevost B, Sunyach MP, et al. High-Dose-Rate Brachytherapy for Non-Small-Cell Lung Carcinoma: A Retrospective Study of 226 Patients. Int J Radiat Oncol Biol Phys. 2010; 79(4):1112-1116.
3. Bellon JR, Katz A, Taghian A. Hematology/Oncology of North America. Radiation therapy for breast cancer. Hematol Oncol Clin North Am. 2006; 20(2):239-257.
4. Benitez PR, Chen PY, Vicini FA, et al. Partial breast irradiation in breast conserving therapy by way of interstitial brachytherapy. Am J Surg. 2004; 188(4):355-364.
5. Benitez PR, Keisch ME, Vicini F, et al. Five-year results: the initial clinical trial of MammoSite balloon brachytherapy for partial breast irradiation in early-stage breast cancer. Am J Surg. 2007; 194(4):456-462.
6. Bradley KA, Petereit DG. Radiation therapy for gynecologic malignancies. Hematol Oncol Clin N Am. 2006; 20(2):347-361.
7. Cuttino LW, Keisch M, Jenrette, JM, et al. Multi-institutional experience using the MammoSite radiation therapy system in the treatment of early-stage breast cancer: 2-year results. Int J Radiat Oncol Biol Phys. 2008; 71(1):107-114.
8. Dagnault A, Ebacher A, Vigneault E, Boucher S. Retrospective study of 81 patients treated with brachytherapy for endobronchial primary tumor or metastasis. Brachytherapy. 2010; 9(3)243-247.
9. D'Amico AV, Moran BJ, Braccioforte MH, et al. Risk of death from prostate cancer after brachytherapy alone or with radiation, androgen suppression therapy, or both in men with high-risk disease. J Clin Oncol. 2009; 27(24):3923-3928.
10. Demanes DJ, Brandt D, Schour L, Hill DR. Excellent results from high dose rate brachytherapy and external beam for prostate cancer are not improved by androgen deprivation. Am J Clin Oncol. 2009; 32(4):342-347.
11. Dickler A, Puthawala MY, Thropay JP, et al. Prospective multi-center trial utilizing electronic brachytherapy for the treatment of endometrial cancer. Radiat Oncol. 2010; 5:67.
12. Dooley WC, Thropay JP, Schreiber, GJ, et al. Use of electronic brachytherapy to deliver postsurgical adjuvant radiation therapy for endometrial cancer: a retrospective multicenter study. Onco Targets Ther. 2010; 3:197-203.
13. Dziewirski W, Rutkowski P, Nowecki ZI, et al. Surgery combined with intraoperative brachytherapy in the treatment of retroperitoneal sarcomas. Ann Surg Oncol. 2006; 13(2):245-252.
14. Finger PT, Chin KJ, Duvall G; Palladium-103 for Choroidal Melanoma Study Group. Palladium-103 ophthalmic plaque radiation therapy for choroidal melanoma: 400 treated patients. Ophthalmology. 2009; 116(4):790-796.
15. Frobe A, Jones G, Jasik B, et al. Intraluminal brachytherapy in the management of squamous carcinoma of the esophagus. Dis Esophagus. 2009; 22(6):513-518.
16. Galale RM, Martinez A, Mate T, et al. Long-term outcome by risk factors using conformal high-dose-rate brachytherapy (HDR-BT) boost with or without neoadjuvant androgen suppression for localized prostate cancer. Int J Radiat Oncol Biol Phys. 2004; 58(4):1048-1055.
17. Hoskin PJ, Motohashi K, Bownes P, et al. High dose rate brachytherapy in combination with external beam radiotherapy in the radical treatment of prostate cancer: initial results of a randomised phase three trial. Radiother Oncol. 2007; 84(2):114-120.
18. Hoskin PJ, Rojas AM, Bownes PJ, et al. Randomised trial of external beam radiotherapy alone or combined with high-dose-rate brachytherapy boost for localised prostate cancer. Radiother Oncol. 2012; 103(2):217-222.
19. Keisch M, Vicini F, Kuske R 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.
20. Kestin LL, Martinez AA, Stromberg JS et al. Matched-pair analysis of conformal high-dose-rate brachytherapy boost versus external-beam radiation therapy alone for locally advanced prostate cancer. J Clin Oncol. 2000; 18(15):2869-2880.
21. Khan AJ, Vicini FA, Beitsch P, et al. Local control, toxicity, and cosmesis in women >70 years enrolled in the

American Society of Breast Surgeons accelerated partial breast irradiation registry trial. Int J Radiat Oncol Biol Phys. 2012; 84(2):323-330.

22. 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(is, 1,2) breast cancer. Am J Surg. 2000; 180(4):299-304.
23. Koukourakis G, Kelekis N, Armonis V, Kouloulias V. Brachytherapy for prostate cancer: a systematic review. Adv Urol. 2009:327945.
24. Lawton CA, Yan Y, Lee WR, et al. Long-term results of an RTOG Phase II trial (00-19) of external-beam radiation therapy combined with permanent source brachytherapy for intermediate-risk clinically localized adenocarcinoma of the prostate. Int J Radiat Oncol Biol Phys. 2012; 82(5):e795-e801.
25. Martinez A, Gonzalez J, Spencer W, et al. Conformal high dose rate brachytherapy improves biochemical control and causes specific survival in patients with prostate cancer and poor prognostic factors. J Urol. 2003; 169(3):974-980.
26. Mehta VK, Algan O, Griem KL, et al. Experience with an electronic brachytherapy technique for intracavitary accelerated partial breast irradiation. Am J Clin Oncol. 2010; 33(4):327-335.
27. Melia M, Moy CS, Reynolds SM, et al.; Collaborative Ocular Melanoma Study-Quality of Life Study Group. 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.
28. Nelson JC, Beitsch PD, Vicini FA, et al. Four-year clinical update from the American Society of Breast Surgeons Mammosite brachytherapy trial. Am J Surg. 2009; 198(1):83-91.
29. Patel RR, Arthur DW. Hematology/Oncology of North America. The emergence of advanced brachytherapy techniques for common malignancies. Hematol Oncol Clin North Am. 2006; 20(1):97-118.
30. Polgar C, Fodor J, Major T, et al. Breast-conserving treatment with partial or whole breast irradiation for low-risk invasive breast carcinoma: 5-year results of a randomized trial. Int J Radiat Oncol Biol Phys. 2007; 69(3):694-705.
31. Polgar C, Major T, Fodor J, et al. Accelerated partial-breast irradiation using high-dose-rate interstitial brachytherapy: 12-year update of a prospective clinical study. Radiother Oncol. 2010; 94(3):274-279.
32. 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.
33. Polgar C, Van Limbergen E, Potter R, et al.; GEC-ESTRO breast cancer working group. Patient selection for accelerated partial-breast irradiation (APBI) after breast-conserving surgery: recommendations of the Groupe Europeen de Curietherapie-European Society for Therapeutic Radiology and Oncology (GEC-ESTRO) breast cancer working group based on clinical evidence (2009). Radiother Oncol. 2010; 94(3):264-273.
34. Rivard MJ, Davis SD, DeWerd LA, et al. Calculated and measured brachytherapy dosimetry parameters in water for the Xoft Axxent X-Ray Source: an electronic brachytherapy source. Med Phys. 2006 (11):4020-4032.
35. Shah C et al: .Outcome after ipsilateral breast tumor recurrence in patients who receive accelerated partial breast irradiation. Cancer. 2012, 118(17):4126-4131.
36. Shinohara ET, Guo M, Mitra N, Metz JM. Brachytherapy in the treatment of cholangiocarcinoma. Int J Rad Oncol Biol Phys. 2010; 78(3):722-728.
37. Smith GL, Xu Y, Buchholz TA, et al. Association between treatment with brachytherapy vs whole-breast irradiation and subsequent mastectomy, complications, and survival among older women with invasive breast cancer. JAMA. 2012; 307(17):1827-1837.
38. Taira AV, Merrick GS, Galbreath RW, et al. Natural history of clinically staged low- and intermediate-risk prostate cancer treated with monotherapeutic permanent interstitial brachytherapy. Int J Radiat Oncol Biol Phys. 2010; 76(2):349-354.
39. Truong MT. Hematology/Oncology Clinics of North America. Current role of radiation therapy in the management of malignant brain tumors. Hematol Oncol Clin North Am. 2006; 20(2):431-453.
40. Ung YC, Yu E, Falkson C, et.al. The role of high-dose-rate brachytherapy in the palliation of symptoms in patients with non-small-cell lung cancer: a systematic review. Brachytherapy. 2006; 5(3):189-202.
41. Vicini F, Shah C, Wilkinson BJ, et al. Should ductal carcinoma-in-situ (DCIS) be removed from the ASTRO

Consensus Panel Cautionary Group for off-protocol use of accelerated partial breast irradiation (APBI)? A pooled analysis of outcomes for 300 patients with DCIS treated with APBI. Ann Surg Oncol. 2013; 20(4):1275-1281.

42. Vicini FA, Beitsch PD, Quiet CA, et al. First analysis of patient demographics, technical reproducibility, cosmesis, and early toxicity. Results of the American Society of Breast Surgeons MammoSite breast brachytherapy registry trial. Cancer. 2005; 104(6):1138-1148.
43. 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):1205-1211.
44. Vicini FA, Vargas C, Edmundson G, et al. The role of high dose rate brachytherapy in locally advanced prostate cancer. Semin Radiat Oncol. 2003; 13(2):98-108.
45. Wilkinson JB, Beitsch PD, Shah C, et al. Evaluation of Current Consensus Statement Recommendations for Accelerated Partial Breast Irradiation: A Pooled Analysis of William Beaumont Hospital and American Society of Breast Surgeon MammoSite Registry Trial Data. Int J Radiat Oncol Biol Phys. 2013; 85(5):1179-1185.
46. Zannis V, Beitsch P, Vicini F, et al. Descriptions and outcomes of insertion techniques of a breast brachytherapy balloon catheter in 1403 patients enrolled in the American Society of Breast Surgeons MammoSite breast brachytherapy registry trial. Am J Surg. 2005; 190(4):530-538.
47. American Brachytherapy Society. Breast Cancer. Available at:http://www.americanbrachytherapy.org/resources/brachyapps.cfm. Accessed on June 16, 2015.
48. American College of Radiology (ACR) and the American Society for Therapeutic Radiation and Oncology (ASTRO) Practice Guidelines & Technical Standards. Available at: http://www.acr.org/Quality-Safety/Standards-Guidelines/Practice-Guidelines-by- Modality/Radiation-Oncology Accessed on June 16, 2015.
    1. ACR–ASTRO Practice guideline for the performance of high-dose-rate brachytherapy (amended 2014)
    2. ACR–ASTRO Practice guideline for the performance of low-dose-rate brachytherapy (amended 2014)
    3. ACR–ASTRO Practice guideline for transperineal permanent brachytherapy of prostate cancer (amended 2014)
49. American Society of Breast Surgeons. Consensus statement for accelerated partial breast irradiation. Revised October 7, 2008. Available at: http://www.breastsurgeons.org/statements/APBI_statement_revised_100708.pdf. Accessed on June 16, 2015.
50. American Urological Association. Prostate Cancer. Reviewed and validated 2011. Available at:http://www.auanet.org/education/guidelines/prostate-cancer.cfm. Accessed on June 16, 2015.
51. Beriwal S, Demanes DJ, Erickson B, et al.; American Brachytherapy Society. American Brachytherapy Society consensus guidelines for interstitial brachytherapy for vaginal cancer. Brachytherapy. 2012; 11(1):68-75.
52. Blue Cross Blue Shield Association. Comparative evaluation of radiation treatments for clinically localized prostate cancer: an update. Health Technology Assessment. 2010; 24(9).
53. Blue Cross Blue Shield Association. Brachytherapy for accelerated partial breast irradiation after breast-conserving surgery for early stage breast cancer. TEC Assessment. 2002; 17(18).
54. Collaborative Ocular Melanoma Study (COMS) Group. The COMS randomized trial of iodine 125 brachytherapy for choroidal melanoma: Twelve-year mortality rate and prognostic factors: COMS report No.28. Arch Ophthalmol. 2006; 124(12):1684-1693.
55. Collaborative Ocular Melanoma Study Group.Incidence of cataract and outcomes after cataract surgery in the first 5 years after iodine 125 brachytherapy in the Collaborative Ocular Melanoma Study: COMS Report No. 27. Ophthalmology. 2007; 114(7):1363-1371.
56. Davis BJ, Horwitz EM, Lee WR, et al American Brachytherapy Society consensus guidelines for transrectal ultrasound-guided permanent prostate brachytherapy. Brachytherapy. 2012; 11:6-19.
57. A review of safety, quality management, and practice guidelines for high-dose-rate brachytherapy. PRO March-April 2014, v4, Issue 2, 65-70.
58. Erickson BA, Demanes DJ, Ibbott GS, et al. American Society for Radiation Oncology (ASTRO) and American College of Radiology (ACR) practice guideline for the performance of high-dose-rate brachytherapy. Int J

Radiat Oncol Biol Phys. 2011; 79(3):641-6490

59. Nag S, Cano ER, Demanes DJ, et al.; American Brachythreapy Society. 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.
60. Nag S, Quivey JM, Earle JD, et al.; American Brachytherapy Society. The American Brachytherapy Society recommendations for brachytherapy of uveal melanomas. Int J Radiation Oncol Biol Phys. 2003; 56(2):544-555.
61. National Comprehensive Cancer Network® (NCCN). Clinical Practice Guidelines in Oncology™. © 2014 National Comprehensive Cancer Network, Inc. For additional information: http://www.nccn.org. Accessed on June 16, 2015.
    1. Basal Cell Skin Cancers. V1.2020. Revised October 24, 2019.
    2. Breast Cancer. V2.2019. Revised September 6, 2019.
    3. Head and Neck Cancers. V3.2019. Revised September 16, 2019.
    4. Hepatobiliary Cancer. V3.2019. Revised August 1, 2019.
    5. Non-Small Cell Lung Cancer. V.7.2019. Revised August 30, 2019.
    6. Penile Cancer. V2.2019. Revised May 13, 2019.
    7. Prostate Cancer. V4. 2019. Revised August 19, 2019.
    8. Soft Tissue Sarcoma. V4.2019. Revised September 12, 2019.
    9. Squamous Cell Skin Cancer V1.2019. Revised October 24, 2019.
    10. Uterine Neoplasms. V4.2019. Revised September 16, 2019.
62. Park CC, Yom SS, Podgorsak MB, et al; Electronic Brachytherapy Working Group. American Society for Therapeutic Radiology and Oncology (ASTRO) Emerging Technology Committee report on electronic brachytherapy. Int J Radiat Oncol Biol Phys. 2010; 76(4):963- 972.
63. Reveiz L, Rueda JR, Cardona AF. Palliative endobronchial brachytherapy for non-small cell lung cancer. Cochrane Database of Systematic Reviews 2012, Issue 12. Art. No.: CD004284.
64. Rosenthal SA, Bittner NH, Beyer DC, et al.; American Society for Radiation Oncology; American College of Radiology. 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.
65. 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.
66. Smith BJ, Arthur DW, Buchholz, 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.
67. U.S. Food and Drug Administration 510(k) Premarket Notification Database. Axxent Electronic Brachytherapy System. No. K050843. Rockville, MD: FDA. Available at:http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm. Accessed on June 16, 2015.
68. Wang X, Liu R, Ma B, et al. High dose rate versus low dose rate intracavity brachytherapy for locally advanced uterine cervix cancer. Cochrane Database Syst Rev. 2010; Issue 7. Art. No.:CD007563.
69. Yamada Y, Rogers L, Demanes DJ, et al.; American Brachytherapy Society. American Brachytherapy Society consensus guidelines for high- dose-rate prostate brachytherapy. Brachytherapy. 2012; 11(1):20-32.
70. SIR-Spheres® microspheres (Yttrium-90 Microspheres). Package insert. Sirtex Medical Inc. Wilmington MA. U.S. Food and Drug Administration (FDA). Updated January 23, 2003.
71. Yttrium-90 Microspheres: A Review of Emerging Clinical Indications. Liver Cancer Mar 2015, v4(1):6-15.
72. Saxena A, Bester L, Shan L, et al. A systematic review on the safety and efficacy of Yttrium-90 radioembolization for unresectable, chemorefractory colorectal cancer liver metastases. J Cancer Res Clin Oncol. 2014 Apr; 140(4):537-547.