

EFFECTIVE DATE: 02|15|2016
POLICY LAST UPDATED: 09|15|2021

OVERVIEW

Radiotherapy (RT) is an integral component in the treatment of head and neck cancers. Intensity-modulated radiotherapy (IMRT) has been proposed as a method of RT that allows adequate RT to the tumor minimizing the radiation dose to surrounding normal tissues and critical structures.

MEDICAL CRITERIA

Medicare Advantage Plans and Commercial Products

Intensity-modulated radiotherapy may be considered medically necessary for the treatment of head and neck cancers when the criteria below is met.

- Tumor is in close proximity to organs at risk (esophagus, salivary glands, and spinal cord), when these organs may be particularly vulnerable to complications from radiation toxicity, and;
- When 3-dimensional conformal radiation therapy (3D-CRT) planning is not able to meet dose volume constraints for normal tissue tolerance.

Intensity-modulated radiotherapy may be considered medically necessary for the treatment of thyroid cancers when the criteria below is met;

- For anaplastic thyroid carcinoma, or for
- Thyroid tumors that are located near critical structures such as the salivary glands or spinal cord, similar to the situation for head and neck cancers.

PRIOR AUTHORIZATION

Prior authorization is required for Medicare Advantage Plans and recommended for Commercial Products via the online tool for participating providers. See the Related Policies section.

POLICY STATEMENT

Medicare Advantage Plans and Commercial Products

Intensity-modulated radiotherapy may be considered medically necessary for the treatment of head and neck cancers for the treatment of thyroid cancers when the criteria above is met.

Intensity-modulated radiotherapy is not covered for Medicare Advantage Plans and not medically necessary for Commercial Products for the treatment of thyroid cancers not noted above as evidence is insufficient to determine the effects of the technology on health outcomes.

COVERAGE

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage, or Subscriber Agreement for applicable radiology benefits/coverage.

BACKGROUND

Head and Neck Cancers

This evidence review focuses on cancers affecting the oral cavity and lip, larynx, hypopharynx, oropharynx, nasopharynx, paranasal sinuses and nasal cavity, salivary glands, and occult primaries in the head and neck region.

Radiotherapy Techniques

Conventional External Beam Radiotherapy

Methods to plan and deliver radiotherapy (RT) have evolved in ways that permit more precise targeting of tumors with complex geometries. Most early trials used 2-dimensional treatment planning based on flat images and radiation beams with cross-sections of uniform intensity that were sequentially aimed at the tumor along 2 or 3 intersecting axes. Collectively, these methods are termed conventional external-beam radiotherapy.

Three-Dimensional Conformal Radiation

Treatment planning evolved by using 3D images, usually from computed tomography (CT) scans, to delineate the boundaries of the tumor and discriminate tumor tissue from adjacent normal tissue and nearby organs at risk for radiation damage. Computer algorithms were developed to estimate cumulative radiation dose delivered to each volume of interest by summing the contribution from each shaped beam. Methods also were developed to position the patient and the radiation portal reproducibly for each fraction and immobilize the patient, thus maintaining consistent beam axes across treatment sessions. Collectively, these methods are termed 3D-CRT.

Intensity-Modulated Radiotherapy

Intensity-modulated radiotherapy (IMRT), which uses computer software and CT and magnetic resonance imaging images, offers better conformality than 3D-CRT because it modulates the intensity of the overlapping radiation beams projected on the target and uses multiple shaped treatment fields. Treatment planning and delivery are more complex, time-consuming, and labor-intensive for IMRT than for 3D-CRT. The technique uses a multileaf collimator [MLC]), which, when coupled with a computer algorithm, allows for “inverse” treatment planning. The radiation oncologist delineates the target on each slice of a CT scan and specifies the target’s prescribed radiation dose, acceptable limits of dose heterogeneity within the target volume, adjacent normal tissue volumes to avoid, and acceptable dose limits within the normal tissues. Based on these parameters and a digitally reconstructed radiographic image of the tumor, surrounding tissues, and organs at risk, computer software optimizes the location, shape, and intensities of the beam ports to achieve the treatment plan’s goals.

Increased conformality may permit escalated tumor doses without increasing normal tissue toxicity and thus may improve local tumor control, with decreased exposure to surrounding, normal tissues, potentially reducing acute and late radiation toxicities. Better dose homogeneity within the target may also improve local tumor control by avoiding underdosing within the tumor and may decrease toxicity by avoiding overdosing.

Technologic developments have produced advanced techniques that may further improve RT treatment by improving dose distribution. These techniques are considered variations of IMRT. Volumetric modulated arc therapy delivers radiation from a continuously rotating radiation source. The principal advantage of volumetric modulated arc therapy is greater efficiency in treatment delivery time, reducing radiation exposure and improving target radiation delivery due to less patient motion. Image-guided RT involves the incorporation of imaging before and/or during treatment to deliver RT to the target volume more precisely.

IMRT methods to plan and deliver RT are not uniform. IMRT may use beams that remain on as MLCs move around the patient (dynamic MLC), or that are off during movement and turn on once the MLC reaches prespecified positions (“step and shoot” technique). A third alternative uses a very narrow single beam that moves spirally around the patient (tomotherapy). Each method uses different computer algorithms to plan treatment and yields somewhat different dose distributions in and outside the target. Patient position can alter target shape and thus affect treatment plans. Treatment plans are usually based on a single imaging scan, a static 3D-CT image. Current methods seek to reduce positional uncertainty for tumors and adjacent normal tissues by various techniques. Patient immobilization cradles and skin or bony markers are used to minimize day-to-day variability in patient positioning. In addition, many tumors have irregular edges that preclude drawing tight margins on CT scan slices when radiation oncologists contour the tumor volume. It is unknown

whether omitting some tumor cells or including some normal cells in the resulting target affects outcomes of IMRT.

CODING

Medicare Advantage Plans and Commercial Products

A4648 Tissue marker, implantable, any type, each (Note: This code is not separately reimbursed for institutional providers.)

Note: To ensure correct pricing of HCPC code **A4648** for the Calypso 4D localization system, the procedure/clinical notes and the invoice must be submitted.

The following codes are covered for Medicare Advantage Plans and Commercial Products when the criteria above is met:

Intensity-modulated radiation therapy

- 77301** Intensity modulated radiotherapy plan, including dose-volume histograms for target and critical structure partial tolerance specifications
- 77338** Multi-leaf collimator (MLC) device(s) for intensity modulated radiation therapy (IMRT), design and construction per IMRT plan
- 77385** Intensity modulated radiation treatment delivery (IMRT), includes guidance and tracking, when performed; simple (Institutional providers)
- 77386** Intensity modulated radiation treatment delivery (IMRT), includes guidance and tracking, when performed; complex (Institutional providers)
- G6015** Intensity modulated treatment delivery, single or multiple fields/arcs, via narrow spatially and temporally modulated beams, binary, dynamic MLC, per treatment session: (Professional providers)
- G6016** Compensator-based beam modulation treatment delivery of inverse planned treatment using 3 or more high resolution (milled or cast) compensator, convergent beam modulated fields, per treatment session: (Professional providers)

RELATED POLICIES

Preauthorization via Web-Based Tool for Procedures
Intensity Modulated Radiotherapy: Abdomen and Pelvis
Intensity Modulated Radiotherapy: Central Nervous System
Intensity Modulated Radiotherapy: Breast and Lung
Intensity Modulated Radiotherapy: Prostate

PUBLISHED

[Provider Update, November 2021](#)

Provider Update, January 2021

Provider Update, October 2019

Provider Update, November/December 2018

Provider Update, October 2017

REFERENCES

1. Veldeman L, Madani I, Hulstaert F, et al. Evidence behind use of intensity-modulated radiotherapy: a systematic review of comparative clinical studies. *The lancet oncology*. Apr 2008;9(4):367-375. PMID 18374290
2. Pow EH, Kwong DL, McMillan AS, et al. Xerostomia and quality of life after intensity-modulated radiotherapy vs. conventional radiotherapy for early-stage nasopharyngeal carcinoma: initial report on a randomized controlled clinical trial. *Int J Radiat Oncol Biol Phys*. Nov 15 2006;66(4):981-991. PMID 17145528
3. Samson DM RT, Rothenberg BM, et al. Comparative effectiveness and safety of radiotherapy treatments for head and neck cancer. *Comparative Effectiveness Review No. 20*. (Prepared by Blue Cross and

Blue Shield Association Technology Evaluation Center Evidence-based Practice Center under Contract from the Agency for Healthcare Research and Quality.) May 2010. <http://www.effectivehealthcare.ahrq.gov/ehc/products/19/447/CER20%20HeadandNeck.pdf>. Accessed April, 2015.

3. Ratko TA, Douglas GW, de Souza JA, et al. Radiotherapy treatments for head and neck cancer update. Comparative Effectiveness Review No. 144. (Prepared by Blue Cross and Blue Shield Association Evidencebased Practice Center under Contract from the Agency for Healthcare Research and Quality.) December 2014. <http://effectivehealthcare.ahrq.gov/ehc/products/569/2018/head-neck-cancer-update-report-141208.pdf>.
4. Marta GN, Silva V, de Andrade Carvalho H, et al. Intensity-modulated radiation therapy for head and neck cancer: systematic review and meta-analysis. *Radiother Oncol*. Jan 2014;110(1):9-15. PMID 24332675
5. Kouloulis V, Thalassinou S, Platoni K, et al. The treatment outcome and radiation-induced toxicity for patients with head and neck carcinoma in the IMRT era: a systematic review with dosimetric and clinical parameters. *Biomed Res Int*. 2013;2013:401261. PMID 24228247
6. Tribius S, Bergelt C. Intensity-modulated radiotherapy versus conventional and 3D conformal radiotherapy in patients with head and neck cancer: Is there a worthwhile quality of life gain? *Cancer Treat Rev*. Nov 2011;37(7):511-519. PMID 21324605
7. Scott-Brown M, Miah A, Harrington K, et al. Evidence-based review: quality of life following head and neck intensity-modulated radiotherapy. *Radiother Oncol*. Nov 2010;97(2):249-257. PMID 20817284
8. Staffurth J. A review of the clinical evidence for intensity-modulated radiotherapy. *Clin Oncol (R Coll Radiol)*. Oct 2010;22(8):643-657. PMID 20673708
10. Nutting CM, Morden JP, Harrington KJ, et al. Parotid-sparing intensity modulated versus conventional radiotherapy in head and neck cancer (PARSPORT): a phase 3 multicentre randomised controlled trial. *Lancet Oncol*. Feb 2011;12(2):127-136. PMID 21236730
9. Vergeer MR, Doornaert PA, Rietveld DH, et al. Intensity-modulated radiotherapy reduces radiation-induced morbidity and improves health-related quality of life: results of a nonrandomized prospective study using a standardized follow-up program. *Int J Radiat Oncol Biol Phys*. May 1 2009;74(1):1-8. PMID 19111400
10. Hoppe BS, Wolden SL, Zelefsky MJ, et al. Postoperative intensity-modulated radiation therapy for cancers of the paranasal sinuses, nasal cavity, and lacrimal glands: technique, early outcomes, and toxicity. *Head Neck* Jul 2008;30(7):925-932. PMID 18302261
11. Rusthoven KE, Raben D, Ballonoff A, et al. Effect of radiation techniques in treatment of oropharynx cancer. *Laryngoscope*. Apr 2008;118(4):635-639. PMID 18176348
12. Bhatia A, Rao A, Ang KK, et al. Anaplastic thyroid cancer: Clinical outcomes with conformal radiotherapy. *Head Neck*. Jul 2010;32(7):829-836. PMID 19885924
13. Schwartz DL, Lobo MJ, Ang KK, et al. Postoperative external beam radiotherapy for differentiated thyroid cancer: outcomes and morbidity with conformal treatment. *Int J Radiat Oncol Biol Phys*. Jul 15 2009;74(4):1083-1091. PMID 19095376
14. Hartford AC, Galvin JM, Beyer DC, et al. American College of Radiology (ACR) and American Society for Radiation Oncology (ASTRO) Practice Guideline for Intensity-modulated Radiation Therapy (IMRT). *Am J Clin Oncol*. Dec 2012, last amended in 2014;35(6):612-617. PMID 23165357

15. National Cancer Institute. PDQ® Carcinoma of Unknown Primary Treatment. Bethesda, MD. National Cancer Institute. Date last modified: 12/30/2014.
<http://www.cancer.gov/cancertopics/pdq/treatment/unknownprimary/HealthProfessional/page1/AllPages>. Accessed April, 2015.
16. National Cancer Institute. PDQ® Metastatic Squamous Neck Cancer with Occult Primary Treatment. Bethesda, MD. National Cancer Institute. Date last modified: 10/31/2014.
<http://www.cancer.gov/cancertopics/pdq/treatment/metastatic-squamousneck/HealthProfessional/page1/AllPages>. Accessed April, 2015.
25. National Cancer Institute. PDQ® Nasopharyngeal Cancer Treatment. Bethesda, MD. National Cancer Institute. Date last modified: 07/31/2014.
<http://www.cancer.gov/cancertopics/pdq/treatment/nasopharyngeal/HealthProfessional/page1/AllPages>. Accessed April, 2015.
17. National Cancer Institute. PDQ® Oral Complications of Chemotherapy and Head/Neck Radiation. Bethesda, MD. National Cancer Institute. Date last modified: 04/23/2014.
<http://www.cancer.gov/cancertopics/pdq/supportivecare/oralcomplications/HealthProfessional/page1/AllPages>. Accessed April, 2015.
18. National Comprehensive Cancer Network (NCCN). NCCN Clinical practice guidelines in oncology: Head and Neck Cancers. Version 2.2017. http://www.nccn.org/professionals/physician_gls/pdf/head-and-neck.pdf. Accessed June 9, 2017.
19. National Comprehensive Cancer Network (NCCN). NCCN Clinical practice guidelines in oncology: Thyroid Carcinoma. Version 2.2017. http://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf. Accessed June 9, 2017.
20. National Cancer Institute. Carcinoma of Unknown Primary Treatment (PDQ®)–Health Professional Version. 2015; <http://www.cancer.gov/cancertopics/pdq/treatment/unknownprimary/HealthProfessional/page1/AllPages>. Accessed June 9, 2017.
21. National Cancer Institute. Metastatic Squamous Neck Cancer With Occult Primary Treatment (PDQ®)–Health Professional Version. 2015; <http://www.cancer.gov/cancertopics/pdq/treatment/metastatic-squamousneck/HealthProfessional/page1/AllPages>. Accessed June 9, 2017.
22. National Cancer Institute. Nasopharyngeal Cancer Treatment (PDQ®)–Health Professional Version. 2015; <http://www.cancer.gov/cancertopics/pdq/treatment/nasopharyngeal/HealthProfessional/page1/AllPages>. Accessed June 9, 2017.
23. National Cancer Institute. Oral Complications of Chemotherapy and Head/Neck Radiation (PDQ®)–Health Professional Version. 2016; <http://www.cancer.gov/cancertopics/pdq/supportivecare/oralcomplications/HealthProfessional/page1/AllPages>. Accessed June 9, 2017.

[CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS](#)

This medical policy is made available to you for informational purposes only. It is not a guarantee of payment or a substitute for your medical judgment in the treatment of your patients. Benefits and eligibility are determined by the member's subscriber agreement or member certificate and/or the employer agreement, and those documents will supersede the provisions of this medical policy. For information on member-specific benefits, call the provider call center. If you provide services to a member which are determined to not be medically necessary (or in some cases medically necessary services which are non-covered benefits), you may not charge the member for the services unless you have informed the member and they have agreed in writing in advance to continue with the treatment at their own expense. Please refer to your participation agreement(s) for the applicable provisions. This policy is current at the time of publication; however, medical practices, technology, and knowledge are constantly changing. BCBSRI reserves the right to review and revise this policy for any reason and at any time, with or without notice. Blue Cross & Blue Shield of Rhode Island is an independent licensee of the Blue Cross and Blue Shield Association.

