

## Corporate Medical Policy

# Intensity Modulated Radiation Therapy (IMRT) of Head and Neck

<b>File Name:</b>	intensity_modulated_radiation_therapy_imrt_of_head_and_neck
<b>Origination:</b>	11/2009
<b>Last CAP Review:</b>	8/2011
<b>Next CAP Review:</b>	8/2012
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### Description of Procedure or Service

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#### Radiation Therapy

For certain stages of certain cancers, postoperative radiation therapy improves outcomes for many patients. Adding radiation to chemotherapy also improves outcomes for those with inoperable tumors that have not metastasized beyond regional lymph nodes. Over the past several decades, methods to plan and deliver radiation therapy 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 radiation therapy (CRT).

Treatment planning evolved by using 3-dimensional images, usually from computed tomography (CT) scans, to delineate the tumor, its boundaries with adjacent normal tissue, and organs at risk for radiation damage. Radiation oncologists used these images, displayed from a “beam’s-eye view,” to shape each of several beams with compensators, blocks, or wedges to conform to the patient’s tumor geometry perpendicular to the beam’s axis. 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. However, “forward” planning used a trial and error process to select treatment parameters including the number of beams and the intensity, shape, and incident axis of each. The radiation oncologist modified one or more parameters and re-calculated dose distributions, if analysis predicted underdosing for part of the tumor or overdosing of nearby normal tissue. Furthermore, because beams had uniform cross-sectional intensity wherever they bypassed shaping devices, it was difficult to match certain geometries, in particular concave surfaces. Collectively, these methods are termed 3-dimensional conformal radiation therapy (3D-CRT).

In the mid-1990s, 3D conformal methods were further developed to permit beam delivery with non-uniform cross-sectional intensity. This technique often relies on a device (a multi-leaf collimator, MLC) situated between the beam source and patient that moves along an arc around the patient. As it moves, a computer varies aperture size independently and continuously for each leaf. Thus, MLCs divide beams into narrow “beamlets,” with intensities that range from zero to 100% of the incident beam. With an alternative, termed tomotherapy, a small radiation portal emitting a single narrow beam moves spirally around the patient, with intensity varying as it moves. Each method (MLC-based or tomotherapy) is coupled to a computer algorithm 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

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image of the tumor and surrounding tissues and organs at risk, computer software optimizes the location and shape of beam ports, and beam and beamlet intensities, to achieve the treatment plan's goals. Collectively, these methods are termed intensity-modulated radiation therapy (IMRT).

Multiple studies have generated 3D-CRT and IMRT treatment plans from the same scans, then compared predicted dose distributions within the target and in adjacent organs at risk. Results of such planning studies show that IMRT improves on 3D-CRT with respect to conformality to, and dose homogeneity within, the target. Dosimetry using stationary targets generally confirms these predictions. Thus, radiation oncologists hypothesized that IMRT may improve treatment outcomes compared with those of 3D-CRT by one or more of the following mechanisms.

Increased conformality may permit escalated tumor doses without increasing normal tissue toxicity, and may thus improve local tumor control. Better dose homogeneity within the target may also improve local tumor control by avoiding underdosing (cold spots) within the tumor and may decrease toxicity by avoiding overdosing (hot spots). Finally, enhanced conformality for standard doses may reduce dose outside the target volume and thus decrease toxicity.

However, IMRT aims radiation at the tumor from many more directions, and thus subjects more normal tissue to low-dose radiation than occurs with CRT or 3D-CRT. This method may increase late effects of radiation therapy. In addition, because most tumors move as patients breathe, dosimetry with stationary targets may not accurately reflect doses delivered within target volumes and adjacent tissues in patients. Furthermore, treatment planning and delivery are more complex, time consuming, and labor intensive for IMRT than for 3D-CRT. Thus, clinical studies must test whether IMRT improves tumor control or reduces acute and late toxicities, when compared with 3D-CRT. Testing this hypothesis requires direct comparative data on outcomes for separate groups of similar patients treated with each method.

## Head and Neck Tumors

Head and neck cancers account for about 3% to 5% of cancer cases in the United States. The generally accepted definition of head and neck cancers includes cancers arising in 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. Cancers generally not considered as head and neck cancers include uveal and choroidal melanoma, cutaneous tumors of the head and neck, esophageal cancer, tracheal cancer, cancer of the central nervous system and cancer of the thyroid gland.

IMRT for prostate cancer, IMRT for cancer of the breast and lung, and IMRT for abdominal and pelvic cancers are considered in separate policies.

**\*\*\*Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.**

## Policy

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**BCBSNC will provide coverage for Intensity Modulated Radiation Therapy (IMRT) of the head and neck when determined to be medically necessary because the medical criteria and guidelines shown below are met.**

## Benefits Application

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This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

# Intensity Modulated Radiation Therapy (IMRT) of Head and Neck

## When Intensity-Modulated Radiation Therapy (IMRT) of the head and neck is covered

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Intensity Modulated Radiation Therapy (IMRT) may be considered medically necessary for the treatment of head and neck cancers.

## When Intensity-Modulated Radiation Therapy (IMRT) of the head and neck is not covered

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Intensity modulated radiation therapy (IMRT) is considered **investigational** for the treatment of thyroid cancers.

## Policy Guidelines

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The 2010 National Comprehensive Cancer Network (NCCN) guidelines on head and neck cancers comment that IMRT is the preferred technique for cancers of the oropharynx and nasopharynx and that the application of IMRT to other sites, e.g., oral cavity, hypopharynx, is evolving and may be used at the discretion of the treating physicians. IMRT is not mentioned in the v.1.2010 version of the NCCN guidelines for thyroid cancer.

In general, the evidence to assess the role of IMRT in the treatment of cancers of the head and neck suggests that IMRT provides tumor control rates comparable to existing radiotherapy techniques. In addition, while results are not uniform across all studies, the majority of the studies show a marked improvement in the rate of late xerostomia, a clinically significant complication of radiation therapy and a complication that leads to decreased quality of life for patients. Thus, based on the published literature that provides data on outcomes of treatment, IMRT is a radiation therapy technique that can be used in the treatment of head and neck cancers. Its use in this clinical application may be considered medically necessary.

There are limited data on use of IMRT for thyroid cancer. The published literature consists of small case series with limited comparison among techniques for delivering radiation therapy. Thus, use of IMRT for thyroid cancer is considered investigational because the impact on health outcomes is not known.

## Billing/Coding/Physician Documentation Information

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This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at [www.bcbsnc.com](http://www.bcbsnc.com). They are listed in the Category Search on the Medical Policy search page.

*Applicable codes: 77301, 77338, 77418, 0073T*

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

# Intensity Modulated Radiation Therapy (IMRT) of Head and Neck

## Scientific Background and Reference Sources

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National Comprehensive Cancer Network. Head and Neck Cancers. Clinical practice guidelines in oncology, v.2.2008. Available at: [http://www.nccn.org/professionals/physician\\_gls/PDF/head-and-neck.pdf](http://www.nccn.org/professionals/physician_gls/PDF/head-and-neck.pdf).

BCBSA Medical Policy Reference Manual [Electronic Version]. 8.01.48, 4/24/09

Specialty Matched Consultant Advisory Panel 5/2010

National Comprehensive Cancer Network. Head and Neck Cancers. Clinical practice guidelines in oncology, v.2.2010. Available at: [http://www.nccn.org/professionals/physician\\_gls/PDF/head-and-neck.pdf](http://www.nccn.org/professionals/physician_gls/PDF/head-and-neck.pdf).

BCBSA Medical Policy Reference Manual [Electronic Version]. 8.01.48, 10/8/10

Specialty Matched Consultant Advisory Panel 8/2011

## Policy Implementation/Update Information

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- 12/21/09 New policy issued. Intensity Modulated Radiation Therapy (IMRT) may be considered medically necessary for the treatment of head and neck cancers. Notification given 12/21/09. Effective date 3/30/10. (adn)
- 6/22/10 Specialty Matched Consultant Advisory Panel 5/24/10. No changes in policy statement. Medical Policy number removed. (lpr)
- 8/3/10 Under Description Section, Head and Neck Tumors: added cancer of the central nervous system and cancer of the thyroid gland to the statement of cancers that are not generally considered as head and neck cancers. This addition per Senior Medical Director. No changes to policy statement. (lpr)
- 9/30/11 Under "Not Covered" section added " Intensity modulated radiation therapy (IMRT) is considered **investigational** for the treatment of thyroid cancers." References added. Specialty Matched Consultant Advisory Panel review meeting 8/31/2011. (lpr)

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Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.