

## Medical Policy



An Independent Licensee of the  
Blue Cross and Blue Shield Association

### **Title: Intensity Modulated Radiation Therapy (IMRT)**

*See also: Stereotactic Radiosurgery and Radiotherapy medical policy*

#### **Professional**

Original Effective Date: January 1, 2002

Revision Date(s): January 30, 2009

Current Effective Date: January 30, 2009

#### **Institutional**

Original Effective Date: March 2, 2009

Revision Date(s):

Current Effective Date: March 2, 2009

**PRE-DETERMINATION of services is not required, but is highly recommended.**

[http://www.bcbsks.com/CustomerService/Forms/pdf/15-17\\_predeterm\\_request\\_frm.pdf](http://www.bcbsks.com/CustomerService/Forms/pdf/15-17_predeterm_request_frm.pdf)

### **DESCRIPTION**

Intensity modulated radiation therapy (IMRT) refers to a technique of conformal radiation planning and delivery, in which non-uniform intensity beams produce unique radiation dose distributions that are designed to better target the lesion with better sparing of surrounding normal tissue than with conventional radiation therapy, thereby limiting side effects. IMRT also allows for dose escalation, when clinically appropriate, which can improve local control of a tumor.

Multiple studies have generated 3-dimensional conformal radiation therapy (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, 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 conventional external beam radiation therapy (EBRT) or 3D-CRT. This may increase late effects of radiation therapy. In addition, since breast and lung 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 which will require direct comparative data on outcomes for separate groups of similar patients treated with each method.

### **POLICY**

- A. IMRT of the prostate is considered **medically necessary** in patients with non-metastatic prostate cancer for dose escalation >75 Gy and for post operative radiation of the prostate to a dose of at least 6300 cGy.
- B. IMRT is considered **medically necessary** in the treatment of patients with head and neck cancer, with the exception of patients with early stage larynx cancer (stage I and II).
- C. IMRT is considered **medically necessary** in patients with CNS lesions.
- D. IMRT is considered **medically necessary** for treatment of anal cancers.
- E. IMRT may also be **medically necessary** for other radiosensitive tumors where critical structures cannot be adequately protected with standard 3D conformal radiotherapy. Medical necessity for the use of IMRT for these other indications will be considered individually and will require supporting records from the treating radiation oncologist including the dose volume histograms documenting the need for IMRT as opposed to conventional radiation therapy.

The American Society for Therapeutic Radiology and Oncology (ASTRO) has a model policy which describes the indications for IMRT:

"IMRT is not a replacement therapy for conventional or three-dimensional conformal radiation therapy methods. IMRT is considered reasonable and necessary in instances where sparing the surrounding normal tissue is of added benefit and *at least one* of the following conditions is met:

1. The target volume is in close proximity to critical structures that must be protected.
2. The volume of interest must be covered with narrow margins to adequately protect immediately adjacent structures.
3. An immediately adjacent area has been previously irradiated and abutting portals must be established with high precision.
4. The target volume is concave or convex, and critical normal tissues are within or around that convexity or concavity.
5. Dose escalation is planned to deliver radiation doses in excess of those commonly utilized for similar tumor with conventional treatments."

- F. Other applications of IMRT are considered **not medically necessary**.

**DOCUMENTATION**

As recommended by ASTRO, documentation in the patient's medical records must support:

1. The reasonable and necessary requirements as outlined in the Policy section.
2. The prescription must define the dose to the target and the dose constraints to the nearby critical structures.
3. A note of medical necessity for IMRT, by the treating physician.
4. Signed IMRT inverse plan that meets prescribed dose constraints for the planning target volume (PTV) and surrounding normal tissue.
5. The target verification methodology must include the following:
  - a. Documentation of the clinical treatment volume (CTV) and the planning target volume (PTV).
  - b. Documentation of immobilization and patient positioning.
6. Independent basic dose calculations of monitor units have been performed for each beam before the patient's first treatment.
7. Documentation of fluence distributions (re-computed and measured in a phantom or dosimetry measuring device) is required.
8. Identification of structures that transverse high-and low-dose regions created by respiration is indicated. Voluntary breath-holding alone is not a satisfactory solution for accounting for organ motion.

**CODING**

**The following codes for treatment and procedures applicable to this policy are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.**

**CPT/HCPCS**

77300	Basic radiation dosimetry calculation, central axis depth dose calculation, TDF, NSD, gap calculation, off axis factor, tissue inhomogeneity factors, calculation of non-ionizing radiation surface and depth dose, as required during course of treatment, only when prescribed by the treating physician
77301	Intensity modulated radiotherapy plan, including dose-volume histograms for target and critical structure partial tolerance specifications
77332	Treatment devices, design and construction; simple (simple block, simple bolus)
77333	Treatment devices, design and construction; intermediate (multiple blocks, stents, bite blocks, special bolus)
77334	Treatment devices, design and construction; complex (irregular blocks, special shields, compensators, wedges, molds or casts)
77418	Intensity modulated treatment delivery, single or multiple fields/arcs, via narrow spatially and temporally modulated beams, binary, dynamic MLC, per treatment session
0073T	Compensator-based beam modulation treatment delivery of inverse planned treatment using three or more high resolution (milled or cast) compensator convergent beam modulated fields, per treatment session

**DIAGNOSIS**

140.0-149.9	Malignant neoplasm of lip, oral cavity, and pharynx
154.2-154.3	Malignant neoplasm of anus
160.0-160.9	Malignant neoplasm of nasal cavities, middle ear, and accessory sinuses
161.0-161.9	Malignant neoplasm of larynx
170.0-170.1	Malignant neoplasm of bones of skull and face, mandible
171.0	Malignant neoplasm of connective and other soft tissue of head, face, and neck
172.0-172.4	Malignant melanoma of lip, eyelid, ear and external auditory canal, other and unspecified parts of face, scalp and neck
173.0-173.4	Other malignant neoplasm of skin of lip, eyelid, ear and external auditory canal, other and unspecified parts of face, scalp and neck
185	Malignant neoplasm of prostate
190.0-190.9	Malignant neoplasm of eye
191.0-191.9	Malignant neoplasm of brain
192.0-192.9	Malignant neoplasm of other and unspecified parts of nervous system
193	Malignant neoplasm of thyroid gland
194.1-194.5	Malignant neoplasm of parathyroid, pituitary, pineal gland, carotid body
195.0	Malignant neoplasm of other and ill-defined sites-head, face, neck
196.0	Malignant neoplasm of lymph nodes of head, face and neck
198.3	Secondary malignant neoplasm of brain and spinal cord
200.01	Reticulosarcoma involving lymph nodes of head, face, and neck
200.11	Lymphosarcoma involving lymph nodes of head, face, and neck
225.0-225.9	Benign neoplasm of brain and other parts of nervous system
227.1-227.6	Benign neoplasm of parathyroid gland, pituitary gland and craniopharyngeal duct (pouch), pineal gland, carotid body, aortic body and other paraganglia
236.5	Neoplasm of uncertain behavior of genitourinary organs-prostate
237.0	Neoplasm of uncertain behavior of pituitary gland and craniopharyngeal duct
237.1	Neoplasm of uncertain behavior of pineal gland
237.5	Neoplasm of uncertain behavior of endocrine glands and nervous system-brain and spinal cord
237.6	Neoplasm of uncertain behavior of meninges
336.9	Unspecified disease of the spinal cord
747.81	Other specified anomalies of cerebrovascular system
And other diagnosis codes upon meeting the criteria outlined in Policy section item E.	

**REVISIONS**

01-30-2009	<p>Policy first published on <a href="http://www.bcbsks.com">www.bcbsks.com</a>.</p> <p>In policy section:</p> <ul style="list-style-type: none"> <li>▪ Added the following indications:</li> </ul> <p>D. IMRT is considered <b>medically necessary</b> for treatment of <u>anal cancers</u>.</p> <p>E. IMRT may also be <b>medically necessary</b> for other radiosensitive tumors where critical structures cannot be adequately protected with standard 3D conformal radiotherapy. Medical necessity for the use of IMRT for these other indications will be considered individually and will require supporting records from the treating radiation oncologist including the dose volume histograms documenting the need for IMRT as opposed to conventional radiation therapy. The American Society for Therapeutic Radiology and Oncology (ASTRO) has a model policy which describes the indications for IMRT:  “IMRT is not a replacement therapy for conventional or three-dimensional conformal radiation therapy methods. IMRT is considered reasonable and necessary in instances where sparing the surrounding normal tissue is of added benefit and <i>at least one</i> of the following conditions is met:</p> <ol style="list-style-type: none"> <li>1. The target volume is in close proximity to critical structures that must be protected.</li> <li>2. The volume of interest must be covered with narrow margins to adequately protect immediately adjacent structures.</li> <li>3. An immediately adjacent area has been previously irradiated and abutting portals must be established with high precision.</li> <li>4. The target volume is concave or convex, and critical normal tissues are within or around that convexity or concavity.</li> <li>5. Dose escalation is planned to deliver radiation doses in excess of those commonly utilized for similar tumor with conventional treatments.”</li> </ol> <p>F. Other applications of IMRT are considered <b>not medically necessary</b>.</p> <ul style="list-style-type: none"> <li>▪ Added the following documentation information:</li> </ul> <p><u>DOCUMENTATION</u></p> <p>As recommended by ASTRO, documentation in the patient's medical records must support:</p> <ol style="list-style-type: none"> <li>1. The reasonable and necessary requirements as outlined in the Policy section.</li> <li>2. The prescription must define the dose to the target and the dose constraints to the nearby critical structures.</li> <li>3. A note of medical necessity for IMRT, by the treating physician.</li> <li>4. Signed IMRT inverse plan that meets prescribed dose constraints for the planning target volume (PTV) and surrounding normal tissue.</li> <li>5. The target verification methodology must include the following: <ol style="list-style-type: none"> <li>a. Documentation of the clinical treatment volume (CTV) and the planning target volume (PTV).</li> <li>b. Documentation of immobilization and patient positioning.</li> </ol> </li> <li>6. Independent basic dose calculations of monitor units have been performed for each beam before the patient's first treatment.</li> <li>7. Documentation of fluence distributions (re-computed and measured in a phantom or dosimetry measuring device) is required.</li> <li>8. Identification of structures that transverse high-and low-dose regions created by respiration is indicated. Voluntary breath-holding alone is not a satisfactory solution for accounting for organ motion.</li> </ol>
------------	---

	<p>In Coding section:</p> <ul style="list-style-type: none"><li>▪ Reflected the applicable CPT codes 77300, 77301, 77332, 77333, 77334, 77418, 0073T</li></ul>
--	--

## **REFERENCES**

1. American College of Radiology (ACR). ACR Practice Guideline for Intensity Modulated Radiation Therapy. 2002 (Res. 17). ACR Practice Guideline. Reston, VA: ACR; effective January 1, 2003:705-710. Available at:  
[http://www.acr.org/s\\_acr/bin.asp?TrackID=&SID=1&DID=12234&CID=1075&VID=2&DOC=File.PDF](http://www.acr.org/s_acr/bin.asp?TrackID=&SID=1&DID=12234&CID=1075&VID=2&DOC=File.PDF)
2. American Society for Therapeutic Radiology and Oncology (ASTRO). The ASTRO/ACR Guide to Radiation Oncology Coding. 2007; Fairfax, VA. ASTRO; 2007. Available at:  
<http://www.astro.org/publications>.
3. Blue Cross Blue Shield Association. Special Report: Intensity Modulation Radiation Therapy for Cancer of the Breast or Lung. TEC Assessment, 2005; 20(13).
4. National Comprehensive Cancer Network (NCCN). Clinical guidelines in Oncology. Breast cancer v.2.2007. Rockledge, PA: NCCN; 2007. Available at  
[http://www.nccn.org/professionals/physician\\_gls/PDF/breast/pdf](http://www.nccn.org/professionals/physician_gls/PDF/breast/pdf).
5. Blue Cross and Blue Shield of Kansas Radiology Liaison Committee, February 2008.
6. American Society for Therapeutic Radiology and Oncology (ASTRO) Model Policy on Intensity Modulated Radiation Therapy (IMRT) 03-2007.
7. Blue Cross and Blue Shield of Kansas Radiology Liaison Committee, Consent Ballot, January 2009.