

Medical Policy



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Title: Intensity Modulated Radiotherapy (IMRT)

See also: Stereotactic Radiosurgery and Stereotactic Radiotherapy Body

PRE-DETERMINATION of services for FEP is required effective January 1, 2010.

http://www.bcbsks.com/CustomService/Forms/pdf/15-17_predeterm_request_frm.pdf

Professional

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DESCRIPTION

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

OBJECTIVE

The objective of this policy is to evaluate whether use of intensity-modulated radiotherapy improves health outcomes when used to treat certain cancers.

BACKGROUND

For certain stages of many cancers, randomized controlled trials have shown that postoperative RT improves outcomes for operable patients. Adding radiation to chemotherapy also improves outcomes for those with inoperable tumors that have not metastasized beyond regional lymph nodes.

Radiotherapy Techniques

Conventional External-Beam Radiation Therapy

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*.

Three-Dimensional Conformal Radiotherapy

Treatment planning evolved by using 3-dimensional 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 *3-dimensional conformal radiation therapy (3D-CRT)*.

Intensity-Modulated Radiotherapy

Intensity-modulated radiotherapy (IMRT), which uses computer software, CT images, and magnetic resonance imaging (MRI), offers better conformality than 3D-CRT as it is able to modulate the intensity of the overlapping radiation beams projected on the target and to use 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 beams 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 development has produced advanced techniques that may further improve RT treatment by improving dose distribution. These techniques are considered variations of IMRT. Volumetric modulated arc therapy (VMAT) delivers radiation from a continuous rotation of the radiation source. The principal advantage of VMAT 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 more precisely deliver RT to the target volume.

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 1 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.

Investigators are exploring an active breathing control device combined with moderately deep inspiration breath-holding techniques to improve conformality and dose distributions during IMRT for breast cancer.¹ Techniques presently being studied with other tumors (eg, lung cancer)² either gate beam delivery to the patient's respiratory movement or continuously monitor tumor (by in-room imaging) or marker (internal or surface) positions to aim radiation more accurately at the target. The impact of these techniques on outcomes of 3D-CRT or IMRT for breast cancer is unknown. However, it appears likely that respiratory motion alters the dose distributions actually delivered while treating patients from those predicted by plans based on static CT scans, or measured by dosimetry using stationary (nonbreathing) targets.

Note the evidence for the following abdominal and pelvic cancers has not yet been reviewed and is beyond the scope of this document: bladder, kidney, ureter, and esophageal cancer and sarcoma.

REGULATORY STATUS

In general, IMRT systems include intensity modulators, which control, block, or filter the intensity of radiation; and, RT planning systems, which plan the radiation dose to be delivered.

A number of intensity modulators have received marketing clearance through the U.S. Food and Drug Administration (FDA) 510(k) process. Intensity modulators include the Innocure Intensity Modulating Radiation Therapy Compensators (Innocure) and decimal tissue compensator (Southeastern Radiation Products) cleared in 2006. FDA product code: IXI. Intensity modulators may be added to standard linear accelerators to deliver IMRT when used with proper treatment planning systems.

A number of devices for use in intensity-modulated radiotherapy, including several linear accelerators and multileaf collimators, have been cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process. Examples of approved devices and systems are the NOMOS Slit Collimator (BEAK™; NOMOS Corp.), the Peacock™ System (NOMOS Corp.), the Varian Multileaf Collimator with dynamic arc therapy feature (Varian Oncology Systems), the Saturne Multileaf Collimator (GE Medical Systems), the Mitsubishi 120 Leaf Multileaf Collimator (Mitsubishi Electronics America), the Stryker Leibinger Motorized Micro Multileaf Collimator (Stryker Leibinger), the Mini Multileaf Collimator, model KMI (MRC Systems GMBH), and the Preference® IMRT Treatment Planning Module (Northwest Medical Physics Equipment).

RT planning systems have also been cleared for marketing by FDA through the 510(k) process. These include the Prowess Panther™ (Prowess) in 2003, TiGRT (LinaTech) in 2009, the RayDose (RaySearch Laboratories) in 2008, and the eIMRT Calculator (Standard Imaging). FDA product code: MUJ.

Fully integrated IMRT systems are also available. These devices are customizable and support all stages of IMRT delivery, including planning, treatment delivery, and health record management. One such device to receive FDA 510(k) clearance is the Varian IMRT system (Varian Medical Systems). FDA product code: IYE.

POLICY

- I. IMRT is considered **medically necessary** for the following indications:
 - A. Prostate cancer for dose escalation >75 Gy of the prostate and for postoperative radiation of the prostate to a dose of at least 6300 cGy.
 - B. Head and neck cancer, with the exception of patients with early stage laryngeal cancer (stage I and II).
 - C. Cancer involving the CNS.

- D. Carcinoma of the anus or vulva.
- E. Anaplastic thyroid cancer.
- F. Carcinoma of the cervix.
- G. Whole pelvic radiotherapy for gynecologic malignancies.
- H. Pediatric tumors (eg, Ewing's sarcoma, Wilms' tumor).
- I. Breast cancer, when at least one of the following is met:
 - 1. Heart—3D results in $\geq 25\%$ of heart receiving $\geq 30\text{Gy}$;
OR
 - 2. Lung—3D results in $\geq 30\%$ of ipsilateral lung receiving $\geq 20\text{ Gy}$, OR
3D results in $\geq 20\%$ of combined lung volume receiving $\geq 20\text{Gy}$;
OR
 - 3. Skin / Soft Tissue—3D results in $\geq 5\%$ of intended breast receiving $\geq 7\%$
of prescribed dose
OR
Medial lesion where 3D results in $\geq 10\%$ of contralateral breast receiving
 $\geq 10\text{Gy}$.
- J. Esophagus, Stomach, Pancreas, Hepatobiliary Tract, Rectum, Colon, Small Bowel, when at least one of the following is met:
 - 1. Heart—3D result in $\geq 50\%$ of heart receiving $\geq 30\text{ Gy}$,
OR
 - 2. Lung—3D results in $\geq 30\%$ of combined lung volume receiving $\geq 20\%$
Gy,
OR
Mean lung dose $\geq 20\text{ Gy}$;
OR
 - 3. Spinal Cord—3D result in any portion of the spinal cord receiving a dose
above 45 Gy ;
OR
 - 4. Liver—3D results in $\geq 60\%$ of liver volume receiving $\geq 30\text{ Gy}$,
OR
Mean liver dose $\geq 32\text{ Gy}$;
OR
 - 5. Kidney—3D results in $\geq 33\%$ of combined kidney volume receiving $\geq 20\text{ Gy}$
(two functional kidneys are present);
OR
For one functioning kidney or kidney transplant, IMRT provides a lower
dose than achievable with 3D;
OR

6. Small Intestine—3D results in ≥ 195 cc of small intestine receiving ≥ 45 Gy;
OR
 7. Stomach—3D results in $\geq 10\%$ of stomach receiving ≥ 45 Gy
OR
5% receiving ≥ 50 Gy;
OR
 8. Femoral head—3D results in a femoral head receiving ≥ 45 Gy.
- K. Lung, when at least one of the following is met:
1. Heart—3D results in $\geq 50\%$ of heart receiving ≥ 30 Gy;
OR
 2. Lung—3D result in $\geq 30\%$ of non-cancerous combined lung volume receiving ≥ 20 Gy
- L. Lymphomas or Sarcomas of Retroperitoneum, Chest Wall and Thorax, when at least one of the following is met:
1. Heart—3D results in $\geq 50\%$ of heart receiving ≥ 30 Gy;
OR
 2. Lung—3D results in $\geq 30\%$ of combined lung volume receiving ≥ 20 Gy
OR
Mean lung dose of ≥ 20 Gy;
OR
 3. Spinal cord—3D results in any portion of the spinal cord receiving a dose above 45 Gy
OR
 4. Liver—3D results in 60% of liver volume receiving ≥ 30 Gy
OR
Mean liver dose ≥ 32 Gy;
OR
 5. Femoral head—3D results in a femoral head receiving ≥ 45 Gy;
OR
 6. Small intestine—3D results in ≥ 195 cc of small intestine receiving ≥ 45 Gy;
OR
 7. Stomach—3D results in $\geq 10\%$ of stomach receiving ≥ 45 Gy
OR
5% receiving ≥ 50 Gy;
OR
 8. Rectosigmoid—3D results in $\geq 60\%$ of rectosigmoid area receiving ≥ 30 Gy;
OR
 9. Bladder—3D results in $\geq 35\%$ of bladder receiving ≥ 45 Gy;
OR

10. Kidney—3D results in 33% of combined kidney volume receiving ≥ 20 Gy (two functional kidneys are present)
OR
 For one functioning kidney or kidney transplant IMRT provides a lower dose than achievable with 3D.
- M. Sarcomas of the Extremities, when at least one of the following is met:
1. Head / Neck—IMRT covered if head and neck structures would receive any radiation via 3D;
OR
 2. Femur—3D results in $\geq 50\%$ of contiguous femur cortex receiving ≥ 50 Gy
- N. Individuals who require repeat irradiation of a field that has received prior irradiation.
- O. 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 3-D dose volume histogram documenting the need for IMRT.

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

"IMRT is considered reasonable and necessary in instances where sparing the surrounding normal tissue is of added benefit to the patient. Examples of reasons why IMRT might be advantageous include the following:

1. The target volume is in close proximity to one or more critical structures and a steep dose gradient outside the target must be achieved and avoid exceeding the tolerance dose to the critical structure(s).
2. A decrease in the amount of dose inhomogeneity in a large treatment volume is required to avoid an excessive dose "hotspot" within the treated volume to avoid excessive early or late normal tissue toxicity.
3. A non-IMRT technique would substantially increase the probability of clinically meaningful normal tissue toxicity.
4. The same or an immediately adjacent area has been previously irradiated, and the dose distribution within the patient must be sculpted to avoid exceeding the cumulative tolerance dose of nearby normal tissue."

II. Other applications of IMRT are considered **not medically necessary**.

DOCUMENTATION

As recommended by ASTRO, the IMRT treatment record must support:

1. The reasonable and necessary requirements as outlined in the Policy section.
2. The prescription which defines the goals and requirements of the treatment plan, including the specific dose constraints to the target and 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. Documentation supporting identification of structures that transverse high- and low-dose regions created by respiration is indicated when billing for respiratory motion management stimulation.

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) |
| 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 |
| 77386 | Intensity modulated radiation treatment delivery (IMRT), includes guidance and tracking, when performed; complex |
| G6015 | Intensity modulated treatment delivery, single or multiple fields/arcs, via narrow spatially and temporally modulated beams, binary, dynamic MLC, per treatment session |

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

- The following CPT codes are used for simple and complex IMRT delivery: 77385, 77386.
- The following codes may be used for IMRT: G6015, G6016.
- Code 77301 remains valid.
- The following CPT code may also be used: 77338.

ICD-10 Diagnoses

C00.0	Malignant neoplasm of external upper lip
C00.1	Malignant neoplasm of external lower lip
C00.3	Malignant neoplasm of upper lip, inner aspect
C00.4	Malignant neoplasm of lower lip, inner aspect
C00.8	Malignant neoplasm of overlapping sites of lip
C01	Malignant neoplasm of base of tongue
C02.0	Malignant neoplasm of dorsal surface of tongue
C02.1	Malignant neoplasm of border of tongue
C02.2	Malignant neoplasm of ventral surface of tongue
C02.3	Malignant neoplasm of anterior two-thirds of tongue, part unspecified
C02.4	Malignant neoplasm of lingual tonsil
C02.8	Malignant neoplasm of overlapping sites of tongue
C03.0	Malignant neoplasm of upper gum
C03.1	Malignant neoplasm of lower gum
C04.0	Malignant neoplasm of anterior floor of mouth
C04.1	Malignant neoplasm of lateral floor of mouth
C04.8	Malignant neoplasm of overlapping sites of floor of mouth
C05.0	Malignant neoplasm of hard palate
C05.1	Malignant neoplasm of soft palate
C05.2	Malignant neoplasm of uvula
C05.8	Malignant neoplasm of overlapping sites of palate
C06.0	Malignant neoplasm of cheek mucosa
C06.1	Malignant neoplasm of vestibule of mouth
C06.2	Malignant neoplasm of retromolar area
C06.89	Malignant neoplasm of overlapping sites of other parts of mouth
C07	Malignant neoplasm of parotid gland
C08.0	Malignant neoplasm of submandibular gland
C08.1	Malignant neoplasm of sublingual gland
C08.9	Malignant neoplasm of major salivary gland, unspecified
C09.0	Malignant neoplasm of tonsillar fossa
C09.1	Malignant neoplasm of tonsillar pillar (anterior) (posterior)
C09.8	Malignant neoplasm of overlapping sites of tonsil
C10.0	Malignant neoplasm of vallecula
C10.1	Malignant neoplasm of anterior surface of epiglottis
C10.2	Malignant neoplasm of lateral wall of oropharynx
C10.3	Malignant neoplasm of posterior wall of oropharynx
C10.4	Malignant neoplasm of branchial cleft
C10.8	Malignant neoplasm of overlapping sites of oropharynx
C11.0	Malignant neoplasm of superior wall of nasopharynx

- C11.1 Malignant neoplasm of posterior wall of nasopharynx
- C11.2 Malignant neoplasm of lateral wall of nasopharynx
- C11.3 Malignant neoplasm of anterior wall of nasopharynx
- C11.8 Malignant neoplasm of overlapping sites of nasopharynx
- C12 Malignant neoplasm of pyriform sinus
- C13.0 Malignant neoplasm of postcricoid region
- C13.1 Malignant neoplasm of aryepiglottic fold, hypopharyngeal aspect
- C13.2 Malignant neoplasm of posterior wall of hypopharynx
- C13.8 Malignant neoplasm of overlapping sites of hypopharynx
- C14.0 Malignant neoplasm of pharynx, unspecified
- C14.2 Malignant neoplasm of Waldeyer's ring
- C14.8 Malignant neoplasm of overlapping sites of lip, oral cavity and pharynx
- C21.0 Malignant neoplasm of anus, unspecified
- C21.1 Malignant neoplasm of anal canal
- C30.0 Malignant neoplasm of nasal cavity
- C30.1 Malignant neoplasm of middle ear
- C31.0 Malignant neoplasm of maxillary sinus
- C31.1 Malignant neoplasm of ethmoidal sinus
- C31.2 Malignant neoplasm of frontal sinus
- C31.3 Malignant neoplasm of sphenoid sinus
- C31.8 Malignant neoplasm of overlapping sites of accessory sinuses
- C32.0 Malignant neoplasm of glottis
- C32.1 Malignant neoplasm of supraglottis
- C32.2 Malignant neoplasm of subglottis
- C32.3 Malignant neoplasm of laryngeal cartilage
- C32.8 Malignant neoplasm of overlapping sites of larynx
- C41.0 Malignant neoplasm of bones of skull and face
- C41.1 Malignant neoplasm of mandible
- C43.0 Malignant melanoma of lip
- C43.111 Malignant melanoma of right upper eyelid, including canthus
- C43.112 Malignant melanoma of right lower eyelid, including canthus
- C43.121 Malignant melanoma of left upper eyelid, including canthus
- C43.122 Malignant melanoma of left lower eyelid, including canthus
- C43.21 Malignant melanoma of right ear and external auricular canal
- C43.22 Malignant melanoma of left ear and external auricular canal
- C43.31 Malignant melanoma of nose
- C43.39 Malignant melanoma of other parts of face
- C43.4 Malignant melanoma of scalp and neck
- C44.00 Unspecified malignant neoplasm of skin of lip
- C44.01 Basal cell carcinoma of skin of lip
- C44.02 Squamous cell carcinoma of skin of lip
- C44.09 Other specified malignant neoplasm of skin of lip
- C44.1021 Unspecified malignant neoplasm of skin of right upper eyelid, including canthus
- C44.1022 Unspecified malignant neoplasm of skin of right lower eyelid, including canthus
- C44.1091 Unspecified malignant neoplasm of skin of left upper eyelid, including canthus
- C44.1092 Unspecified malignant neoplasm of skin of left lower eyelid, including canthus
- C44.1121 Basal cell carcinoma of skin of right upper eyelid, including canthus
- C44.1122 Basal cell carcinoma of skin of right lower eyelid, including canthus
- C44.1191 Basal cell carcinoma of skin of left upper eyelid, including canthus

- C44.1192 Basal cell carcinoma of skin of left lower eyelid, including canthus
- C44.1221 Squamous cell carcinoma of skin of right upper eyelid, including canthus
- C44.1222 Squamous cell carcinoma of skin of right lower eyelid, including canthus
- C44.1291 Squamous cell carcinoma of skin of left upper eyelid, including canthus
- C44.1292 Squamous cell carcinoma of skin of left lower eyelid, including canthus
- C44.1321 Sebaceous cell carcinoma of skin of right upper eyelid, including canthus
- C44.1322 Sebaceous cell carcinoma of skin of right lower eyelid, including canthus
- C44.1391 Sebaceous cell carcinoma of skin of left upper eyelid, including canthus
- C44.1392 Sebaceous cell carcinoma of skin of left upper eyelid, including canthus
- C44.1921 Other specified malignant neoplasm of skin of right upper eyelid, including canthus
- C44.1922 Other specified malignant neoplasm of skin of right lower eyelid, including canthus
- C44.1991 Other specified malignant neoplasm of skin of left upper eyelid, including canthus
- C44.1992 Other specified malignant neoplasm of skin of left lower eyelid, including canthus
- C44.202 Unspecified malignant neoplasm of skin of right ear and external auricular canal
- C44.209 Unspecified malignant neoplasm of skin of left ear and external auricular canal
- C44.212 Basal cell carcinoma of skin of right ear and external auricular canal
- C44.219 Basal cell carcinoma of skin of left ear and external auricular canal
- C44.222 Squamous cell carcinoma of skin of right ear and external auricular canal
- C44.229 Squamous cell carcinoma of skin of left ear and external auricular canal
- C44.292 Other specified malignant neoplasm of skin of right ear and external auricular canal
- C44.299 Other specified malignant neoplasm of skin of left ear and external auricular canal
- C44.301 Unspecified malignant neoplasm of skin of nose
- C44.309 Unspecified malignant neoplasm of skin of other parts of face
- C44.311 Basal cell carcinoma of skin of nose
- C44.319 Basal cell carcinoma of skin of other parts of face
- C44.321 Squamous cell carcinoma of skin of nose
- C44.329 Squamous cell carcinoma of skin of other parts of face
- C44.391 Other specified malignant neoplasm of skin of nose
- C44.399 Other specified malignant neoplasm of skin of other parts of face
- C44.40 Unspecified malignant neoplasm of skin of scalp and neck
- C44.41 Basal cell carcinoma of skin of scalp and neck
- C44.42 Squamous cell carcinoma of skin of scalp and neck
- C44.49 Other specified malignant neoplasm of skin of scalp and neck
- C47.0 Malignant neoplasm of peripheral nerves of head, face and neck
- C49.0 Malignant neoplasm of connective and soft tissue of head, face and neck
- C51.0 Malignant neoplasm of labium majus
- C51.1 Malignant neoplasm of labium minus
- C51.2 Malignant neoplasm of clitoris
- C51.8 Malignant neoplasm of overlapping sites of vulva
- C51.9 Malignant neoplasm of vulva, unspecified
- C52 Malignant neoplasm of vagina
- C53.0 Malignant neoplasm of endocervix
- C53.1 Malignant neoplasm of exocervix
- C53.8 Malignant neoplasm of overlapping sites of cervix uteri
- C53.9 Malignant neoplasm of cervix uteri, unspecified
- C54.0 Malignant neoplasm of isthmus uteri

C54.1	Malignant neoplasm of endometrium
C54.2	Malignant neoplasm of myometrium
C54.3	Malignant neoplasm of fundus uteri
C54.8	Malignant neoplasm of overlapping sites of corpus uteri
C54.9	Malignant neoplasm of corpus uteri, unspecified
C56.1	Malignant neoplasm of right ovary
C56.2	Malignant neoplasm of left ovary
C57.01	Malignant neoplasm of right fallopian tube
C57.02	Malignant neoplasm of left fallopian tube
C57.11	Malignant neoplasm of right broad ligament
C57.12	Malignant neoplasm of left broad ligament
C57.21	Malignant neoplasm of right round ligament
C57.22	Malignant neoplasm of left round ligament
C57.3	Malignant neoplasm of parametrium
C57.4	Malignant neoplasm of uterine adnexa, unspecified
C57.7	Malignant neoplasm of other specified female genital organs
C57.8	Malignant neoplasm of overlapping sites of female genital organs
C58	Malignant neoplasm of placenta
C61	Malignant neoplasm of prostate
C69.01	Malignant neoplasm of right conjunctiva
C69.02	Malignant neoplasm of left conjunctiva
C69.11	Malignant neoplasm of right cornea
C69.12	Malignant neoplasm of left cornea
C69.21	Malignant neoplasm of right retina
C69.22	Malignant neoplasm of left retina
C69.31	Malignant neoplasm of right choroid
C69.32	Malignant neoplasm of left choroid
C69.41	Malignant neoplasm of right ciliary body
C69.42	Malignant neoplasm of left ciliary body
C69.51	Malignant neoplasm of right lacrimal gland and duct
C69.52	Malignant neoplasm of left lacrimal gland and duct
C69.61	Malignant neoplasm of right orbit
C69.62	Malignant neoplasm of left orbit
C69.81	Malignant neoplasm of overlapping sites of right eye and adnexa
C69.82	Malignant neoplasm of overlapping sites of left eye and adnexa
C69.91	Malignant neoplasm of unspecified site of right eye
C69.92	Malignant neoplasm of unspecified site of left eye
C70.0	Malignant neoplasm of cerebral meninges
C70.1	Malignant neoplasm of spinal meninges
C70.9	Malignant neoplasm of meninges, unspecified
C71.0	Malignant neoplasm of cerebrum, except lobes and ventricles
C71.1	Malignant neoplasm of frontal lobe
C71.2	Malignant neoplasm of temporal lobe
C71.3	Malignant neoplasm of parietal lobe
C71.4	Malignant neoplasm of occipital lobe
C71.5	Malignant neoplasm of cerebral ventricle
C71.6	Malignant neoplasm of cerebellum
C71.7	Malignant neoplasm of brain stem
C71.8	Malignant neoplasm of overlapping sites of brain

C72.0	Malignant neoplasm of spinal cord
C72.1	Malignant neoplasm of cauda equina
C72.21	Malignant neoplasm of right olfactory nerve
C72.22	Malignant neoplasm of left olfactory nerve
C72.31	Malignant neoplasm of right optic nerve
C72.32	Malignant neoplasm of left optic nerve
C72.41	Malignant neoplasm of right acoustic nerve
C72.42	Malignant neoplasm of left acoustic nerve
C72.59	Malignant neoplasm of other cranial nerves
C73	Malignant neoplasm of thyroid gland
C75.0	Malignant neoplasm of parathyroid gland
C75.1	Malignant neoplasm of pituitary gland
C75.2	Malignant neoplasm of craniopharyngeal duct
C75.3	Malignant neoplasm of pineal gland
C75.4	Malignant neoplasm of carotid body
C76.0	Malignant neoplasm of head, face and neck
C77.0	Secondary and unspecified malignant neoplasm of lymph nodes of head, face and neck
C79.31	Secondary malignant neoplasm of brain
C79.61	Secondary malignant neoplasm of right ovary
C79.62	Secondary malignant neoplasm of left ovary
C79.82	Secondary malignant neoplasm of genital organs
C79.89	Secondary malignant neoplasm of other specified sites
C83.31	Diffuse large B-cell lymphoma, lymph nodes of head, face, and neck
C83.51	Lymphoblastic (diffuse) lymphoma, lymph nodes of head, face, and neck
D03.0	Melanoma in situ of lip
D03.111	Melanoma in situ of right upper eyelid, including canthus
D03.112	Melanoma in situ of right lower eyelid, including canthus
D03.121	Melanoma in situ of left upper eyelid, including canthus
D03.122	Melanoma in situ of left lower eyelid, including canthus
D03.21	Melanoma in situ of right ear and external auricular canal
D03.22	Melanoma in situ of left ear and external auricular canal
D03.39	Melanoma in situ of other parts of face
D03.4	Melanoma in situ of scalp and neck
D32.0	Benign neoplasm of cerebral meninges
D32.1	Benign neoplasm of spinal meninges
D32.9	Benign neoplasm of meninges, unspecified
D33.0	Benign neoplasm of brain, supratentorial
D33.1	Benign neoplasm of brain, infratentorial
D33.3	Benign neoplasm of cranial nerves
D33.4	Benign neoplasm of spinal cord
D33.7	Benign neoplasm of other specified parts of central nervous system
D35.1	Benign neoplasm of parathyroid gland
D35.2	Benign neoplasm of pituitary gland
D35.3	Benign neoplasm of craniopharyngeal duct
D35.4	Benign neoplasm of pineal gland
D35.5	Benign neoplasm of carotid body
D35.6	Benign neoplasm of aortic body and other paraganglia
D39.11	Neoplasm of uncertain behavior of right ovary

D39.12	Neoplasm of uncertain behavior of left ovary
D39.8	Neoplasm of uncertain behavior of other specified female genital organs
D40.0	Neoplasm of uncertain behavior of prostate
D42.0	Neoplasm of uncertain behavior of cerebral meninges
D42.1	Neoplasm of uncertain behavior of spinal meninges
D43.0	Neoplasm of uncertain behavior of brain, supratentorial
D43.1	Neoplasm of uncertain behavior of brain, infratentorial
D43.4	Neoplasm of uncertain behavior of spinal cord
D44.3	Neoplasm of uncertain behavior of pituitary gland
D44.4	Neoplasm of uncertain behavior of craniopharyngeal duct
D44.5	Neoplasm of uncertain behavior of pineal gland

REVISIONS

01-30-2009	Policy first published on www.bcbsks.com .
	<p>In policy section:</p> <ul style="list-style-type: none"> ▪ Added the following indications: <ul style="list-style-type: none"> D. IMRT is considered medically necessary for treatment of <u>anal cancers</u>. 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. <p>The American Society for Therapeutic Radiology and Oncology (ASTRO) has a model policy which describes the indications for IMRT:</p>
	<p>“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:</p> <ol style="list-style-type: none"> 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.” <p>F. Other applications of IMRT are considered not medically necessary.</p> <ul style="list-style-type: none"> ▪ Added the following documentation information: DOCUMENTATION As recommended by ASTRO, documentation in the patient's medical records must support: <ol style="list-style-type: none"> 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:

	<ul style="list-style-type: none"> a. Documentation of the clinical treatment volume (CTV) and the planning target volume (PTV). b. Documentation of immobilization and patient positioning. <ul style="list-style-type: none"> 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.
	<p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Reflected the applicable CPT codes 77300, 77301, 77332, 77333, 77334, 77418, 0073T
01-01-2010	<p>In Coding Section:</p> <ul style="list-style-type: none"> ▪ Added CPT Code: 77388
10-11-2011	<p>In the Policy section:</p> <ul style="list-style-type: none"> ▪ Item D, removed "anal cancers" and added "squamous cell carcinoma of the anus." ▪ Added Item " E. IMRT is considered medically necessary in the treatment of individuals with anaplastic thyroid cancer." ▪ Added Item "F. IMRT is considered medically necessary in individuals with pediatric tumors (e.g., Ewing Sarcoma, Wilms' Tumor)." ▪ Added Item "G. IMRT is considered medically necessary in individuals who require repeat irradiation of a field that has received prior irradiation."
	Updated the Reference section.
07-13-2012	Updated the Description section.
	<p>In the Policy section:</p> <ul style="list-style-type: none"> ▪ Added the following indication: "F. Carcinoma of the cervix." ▪ Added the following indication: "G. Whole pelvic radiotherapy for gynecologic malignancies." ▪ In Item J, inserted "3-D" to read "radiation oncologist including the 3-D dose volume..." ▪ In Item J, changed "histograms" to "histogram" ▪ In Item J, removed "as opposed to conventional radiation therapy" from the end of paragraph.
	<p>In the Documentation section:</p> <ul style="list-style-type: none"> ▪ Revised the following language: "As recommended by ASTRO, documentation in the patient's medical records must support: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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.

	<p>8. Identification of structures that transverse high-and low-dose regions created by respiration is indicated. Voluntary breath-holding alone is not a satisfactory solutionfor accounting for organ motion."</p>
	<p>In the Coding section:</p> <ul style="list-style-type: none"> ▪ Added the following Diagnosis codes: 180.0-180.9, 182.0-182.8, V10.40, V10.41
	<p>Updated Reference section.</p>
10-15-2012	<p>In the Policy section:</p> <ul style="list-style-type: none"> ▪ Added statement, "IMRT is considered medically necessary for the following indications:" to the beginning of the policy section. ▪ In Item A, removed "IMRT of the prostate is considered medically necessary in patients with non-metastatic..." and added "of the prostate" to read "Prostate cancer for dose escalation >75Gy of the prostate and for..." ▪ In Item B, removed, "IMRT is considered medically necessary in the treatment of patients with" to read "head and neck cancer, with the exception..." ▪ In item C, removed "IMRT is considered medically necessary in patients with CNS lesions" and added "Cancer involving the CNS" ▪ In Item D, removed IMRT is considered medically necessary for patients of squamous cell" and added "or vulva" to read "Carcinoma of the anus and vulva." ▪ In Item E, removed "IMRT is considered medically necessary in the treatment of individuals with" to read "Anaplastic thyroid cancer." ▪ In Item H, removed "IMRT is considered medically necessary in individuals with" to read "Pediatric tumors (e.g., Ewing Sarcoma, Wilms' Tumor)." ▪ Added Item I, "Breast cancer when at least one of the following is met: <ol style="list-style-type: none"> 1. Heart—3D results in $\geq 25\%$ of heart receiving $\geq 30\text{Gy}$; OR 2. Lung—3D results in $\geq 30\%$ of ipsilateral lung receiving $\geq 20\text{Gy}$, OR 3D results in $\geq 20\%$ of combined lung volume receiving $\geq 20\text{Gy}$; OR 3. Skin / Soft Tissue—3D results in $\geq 5\%$ of intended breast receiving $\geq 7\%$ of prescribed dose OR Medial lesion where 3D results in $\geq 10\%$ of contralateral breast receiving $\geq 10\text{Gy}$." ▪ Added Item J, "Esophagus, Stomach, Pancreas, Hepatobiliary Tract, Rectum, Colon, Small Bowel, when at least one of the following is met: <ol style="list-style-type: none"> 1. Heart—3D result in $\geq 50\%$ of heart receiving $\geq 30\text{Gy}$, OR 2. Lung—3D results in $\geq 30\%$ of combined lung volume receiving $\geq 20\% \text{Gy}$, OR Mean lung dose $\geq 20\text{Gy}$; OR 3. Spinal Cord—3D result in any portion of the spinal cord receiving a dose above 45Gy; OR 4. Liver—3D results in $\geq 60\%$ of liver volume receiving $\geq 30\text{Gy}$, OR Mean liver dose $\geq 32\text{Gy}$; OR 5. Kidney—3D results in $\geq 33\%$ of combined kidney volume receiving $\geq 20\text{Gy}$ (two functional kidneys are present); OR For one functioning kidney or kidney transplant, IMRT provides a lower dose than achievable with 3D; OR 6. Small Intestine—3D results in $\geq 195\text{cc}$ of small intestine receiving $\geq 45\text{Gy}$; OR 7. Stomach—3D results in $\geq 10\%$ of stomach receiving $\geq 45\text{Gy}$ OR 5% receiving $\geq 50\text{Gy}$; OR 8. Femoral head—3D results in a femoral head receiving $\geq 45\text{Gy}$." ▪ Added Item K, "Lung, when at least one of the following is met: <ol style="list-style-type: none"> 1. Heart—3D results in $\geq 50\%$ of heart receiving $\geq 30\text{Gy}$; OR 2. Lung—3D result in $\geq 30\%$ of non-cancerous combined lung volume receiving $\geq 20\text{Gy}$" ▪ Added Item L, "Lymphomas or Sarcomas of Retroperitoneum, Chest Wall and Thorax, when at least one of the following is met: <ol style="list-style-type: none"> 1. Heart—3D results in $\geq 50\%$ of heart receiving $\geq 30\text{Gy}$; OR

	<p>2. Lung—3D results in $\geq 30\%$ of combined lung volume receiving $\geq 20\text{Gy}$ OR Mean lung dose of $\geq 20\text{Gy}$; OR</p> <p>3. Spinal cord—3D results in any portion of the spinal cord receiving a dose above 45Gy OR</p> <p>4. Liver—3D results in 60% of liver volume receiving $\geq 30\text{Gy}$ OR Mean liver dose $\geq 32\text{Gy}$; OR</p> <p>5. Femoral head—3D results in a femoral head receiving $\geq 45\text{Gy}$ OR</p> <p>6. Small intestine—3D results in $\geq 195\text{cc}$ of small intestine receiving $\geq 45\text{Gy}$; OR</p> <p>7. Stomach—3D results in $\geq 10\%$ of stomach receiving $\geq 45\text{Gy}$ OR 5% receiving $\geq 50\text{Gy}$; OR</p> <p>8. Rectosigmoid—3D results in $\geq 60\%$ of rectosigmoid area receiving $\geq 30\text{Gy}$; OR</p> <p>9. Bladder—3D results in $\geq 35\%$ of bladder receiving $\geq 45\text{Gy}$; OR</p> <p>10. Kidney—3D results in 33% of combined kidney volume receiving $\geq 20\text{Gy}$ (two functional kidneys are present) OR</p> <p>For one functioning kidney or kidney transplant IMRT provides a lower dose than achievable with 3D."</p> <ul style="list-style-type: none"> ▪ Added Item M, "Sarcomas of the Extremities, when at least one of the following is met: <ul style="list-style-type: none"> 1. Head / Neck—IMRT covered if head and neck structures would receive any radiation via 3D; OR 2. Femur—3D results in $\geq 50\%$ of contiguous femur cortex receiving $\geq 50\text{Gy}$" ▪ In Item N, removed "IMRT is considered medically necessary in" to read "Individuals who require repeat irradiation..." ▪ In Item O, removed "IMRT may also be medically necessary for" to read "Other radiosensitive tumors where critical structures..."
	<p>In the Coding section:</p> <ul style="list-style-type: none"> ▪ Added Diagnosis codes: 174.0-174.9
12-11-2013	<p>Policy reviewed.</p> <p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Added ICD-10 Diagnosis codes. (<i>Effective October 1, 2014</i>) <p>Updated Reference section.</p>
01-01-2015	<p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Added CPT/HCPCS Codes: 77385, 77386, G6015, G6016 (Effective January 1, 2015) ▪ Deleted CPT Codes: 77418, 0073T (Effective January 1, 2015)
10-13-2015	<p>Updated Description section.</p> <p>In Policy section:</p> <ul style="list-style-type: none"> ▪ In Item O, updated ASTRO medical policy indications, removed "IMRT is not a replacement therapy for conventional or three-dimensional conformal radiation therapy methods.," "clinical," "and at least one of the following conditions is met," and added "to the patient. Examples of reasons why IMRT might be advantageous include the following," to read, "IMRT is considered reasonable and necessary in instances where sparing the surrounding normal tissue is of added clinical benefit to the patient. Examples of reasons why IMRT might be advantageous include the following:" ▪ In Item O 1, removed "that must be protected" and added "one or more" and "and a steep dose gradient outside the target must be achieved and avoid exceeding the tolerance dose to the critical structure(s)" to read, "The target volume is in close proximity to one or more critical structures and a steep dose gradient outside the target must be achieved and avoid exceeding the tolerance dose to the critical structure(s)." ▪ In Item O 2, removed previous language and added "A decrease in the amount of dose inhomogeneity in a large treatment volume is required to avoid an excessive

	<p>dose "hotspot" within the treated volume to avoid excessive early or late normal tissue toxicity."</p> <ul style="list-style-type: none"> ▪ Added new Item O 3. ▪ In Item O 4 (previous Item O 3), removed, "and abutting portals must be established with high precision" and added "The same or" and "and the dose distribution within the patient must be sculpted to avoid exceeding the cumulative tolerance dose of nearby normal tissue" to read, "The same or an immediately adjacent area has been previously irradiated, and the dose distribution within the patient must be sculpted to avoid exceeding the cumulative tolerance dose of nearby normal tissue." ▪ Removed previous Items O 4 and 5. <p>Under "Documentation":</p> <ul style="list-style-type: none"> ▪ In Item 2, removed "defining the dose to the target and" and added "which defines the goals and requirements of the treatment plan," and "specific" to read, "The prescription which defines the goals and requirements of the treatment plan, including the specific dose constraints to the target and nearby critical structures." ▪ In Item 5, removed "including" and added "must include" to read, "The target verification methodology must include the following:" ▪ In Item 7, added "is required" to read, "Documentation of fluence distributions (re-computed and measured in a phantom or dosimetry measuring device) is required." <p>In Coding section:</p> <ul style="list-style-type: none"> ▪ In first bullet, removed "that specifically described IMRT:" and "(Intensity modulated treatment delivery, single or multiple fields/arcs, via narrow spatially and temporally modulated beams, binary, dynamic MLC, per treatment session)" and "(compensator-based beam modulated treatment delivery of inverse planned treatment using three or more high resolution (milled or cast) compensator convergent beam modulated fields, per treatment session), were," and added "was" to read, "Effective in 2015, code 77418 and 0073T were deleted and new codes for simple and complex IMRT delivery were created: 77385, 77386." <p>Updated References section.</p>
10-26-2016	<p>Updated Description section.</p> <p>In Policy section:</p> <ul style="list-style-type: none"> ▪ Under Documentation, removed "include" and added "support" to read, "As recommended by ASTRO, the IMRT treatment record must support:". ▪ Under Documentation Item 6, added "have been" to read, "Independent basic dose calculations of monitor units have been performed for each beam before the patient's first treatment." <p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Updated coding bullets. <p>Updated References section.</p>
03-15-2017	<p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Added ICD-10 codes: C51.0, C51.1, C51.2, C51.8, C51.9, C52, C53.0, C53.1, C53.8, C53.9, C54.0, C54.1, C54.2, C54.3, C54.8, C54.9, C56.1, C56.2, C57.01, C57.02, C57.11, C57.12, C57.21, C57.22, C57.3, C57.4, C57.7, C57.8, C58, C79.61, C79.62, C79.82, C79.89, D39.11, D39.12, D39.8.
08-15-2017	<p>Title changed from "Intensity Modulated Radiation Therapy (IMRT)."</p> <p>Updated Description section.</p> <p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Updated coding bullets. <p>Updated References.</p>
10-01-2018	<p>Updated Description section.</p> <p>In Coding section:</p> <ul style="list-style-type: none"> ▪ Removed ICD-9 codes.

	<ul style="list-style-type: none"> ▪ Added ICD-10 codes: C43.111, C43.112, C43.121, C43.122, C44.1021, C44.1022, C44.1091, C44.1092, C44.1121, C44.1122, C44.1191, C44.1192, C44.1221, C44.1222, C44.1291, C44.1292, C44.1321, C44.1322, C44.1391, C44.1392, C44.1921, C44.1922, C44.1991, C44.1992, D03.111, D03.112, D03.121, D03.122. ▪ Removed ICD-10 codes: C43.11, C43.12, C44.102, C44.109, C44.112, C44.119, C44.122, C44.129, C44.191, C44.192, C44.199, D03.11, D03.12.
	Updated References section.

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