

## Image-Guided Radiation Therapy (IGRT)

**Note:** For Medicare members/enrollees, to ensure consistency with the Medicare National Coverage Determinations (NCD) and Local Coverage Determinations (LCD), all applicable NCDs, LCDs, and Medicare Coverage Articles should be reviewed prior to applying the criteria set forth in this clinical policy. Please refer to the CMS website at <http://www.cms.gov> for additional information.

**Note:** For Medicaid members/enrollees, circumstances when state Medicaid coverage provisions conflict with the coverage provisions within this clinical policy, state Medicaid coverage provisions take precedence. Please refer to the state Medicaid manual for any coverage provisions pertaining to this clinical policy.

### DISCUSSION

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Image-guided radiation therapy (IGRT) is a type of intensity modulated radiation therapy (IMRT), that uses imaging scans not only for treatment planning before radiation therapy sessions but also during radiation therapy sessions.<sup>1</sup> Dedicated devices for fraction-by-fraction imaging and guidance within the treatment room have enabled clinicians to pursue highly conformal dose distributions, higher dose prescriptions, and shorter fractionation schedules. Capitalizing on IGRT-enabled accuracy and precision requires a strong link between IGRT practices and planning target volume (PTV) design. This is essential to deliver and maintain high-quality and safe radiation therapy.<sup>2</sup>

IGRT is the use of frequent imaging during a course of radiation therapy for the purpose of improving the precision and accuracy of the delivery of radiation treatment.<sup>3</sup> In IGRT, machines that deliver radiation, such as a linear accelerator (for X-ray or photon) or cyclotron/synchrotron (for proton), are equipped with special imaging technology that allow the physician to image the tumor immediately before or even during the time radiation is delivered, while the patient is positioned on the treatment table.<sup>3</sup>

Using specialized computer software, these images are compared to the reference images taken during simulation. Any necessary adjustments are made to the patient's position and/or radiation beams to more precisely target radiation at the tumor and avoid healthy surrounding tissue.<sup>3</sup>

Computed tomography (CT), magnetic resonance imaging (MRI), ultrasound (US) and x-ray imaging may be used for IGRT by visualizing bony or soft-tissue anatomy. Other methods for IGRT use markers placed on the patient's body surface or implanted within the patient's body.<sup>3</sup>

IGRT is often used in conjunction with intensity-modulated radiation therapy (IMRT), proton beam therapy, stereotactic radiosurgery, or stereotactic body radiotherapy (SBRT). These therapies are advanced modes of high-precision radiotherapy that use computer-controlled X-ray accelerators to deliver precise radiation doses to a malignant tumor or specific areas within the tumor.<sup>3</sup>

To help align and target the radiation equipment, some IGRT procedures may use fiducial markers, ultrasound, MRI, X-ray images of bone structure, CT scan, 3D body surface mapping, electromagnetic transponders, or colored ink tattoos on the skin.<sup>2</sup> When patients are treated in the prone position and standard skin marks are not able to be utilized, IGRT is considered medically necessary to ensure accurate treatment delivery.<sup>2</sup>

Deep inspiration breath hold (DIBH) is a form of image-guided radiation therapy technique where the patient takes a deep breath and then holds it for a period of time while radiation therapy is administered.<sup>4</sup> IGRT using deep inspiratory breath hold is considered medically necessary when treating left-sided breast cancer to improve sparing of the heart.<sup>4</sup>

IGRT may be considered necessary when increased accuracy is required for treatment delivery or routine portal verification methods are not sufficient. Examples of such instances include, but are not limited to, the use of significantly reduced treatment planning margins, retreatment or matching to previous radiation fields, and excessive patient target motion. IGRT is typically not necessary in the treatment of bone metastases.<sup>2</sup>

One IGRT CPT code is allowed per external beam radiation treatment delivery.<sup>5</sup> If multiple forms of IGRT are performed during a radiation fraction, each form is not separately billable.<sup>5</sup> Furthermore, IGRT and port films are not allowed to be billed on the same date of service. Do not bill IGRT with radiosurgery, as they are already bundled in the treatment delivery codes.<sup>5</sup>

## DEFINITIONS

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- **Deep inspiration breath hold (DIBH)** - A form of image-guided radiation therapy technique where the patient takes a deep breath and then holds it for a period of time while radiation therapy is administered.
- **External beam radiation therapy (EBRT)** - External radiation (or external beam radiation) is the most common type of radiation therapy used for cancer treatment. A machine is used to aim high-energy rays (or beams) from outside the body into the tumor.
- **Fractions** - A way of dividing a total dose of radiation into separate doses to be administered over a period of time.
- **Gray (Gy)** - One of the two units used to measure the amount of radiation absorbed by an object or person, known as the absorbed dose. One gray (Gy) is the international system of units (SI) equivalent of 100 rads, which is equal to an absorbed dose of 1 Joule/kilogram.
- **Image-guided radiation therapy (IGRT)** - Image-guided radiation therapy (IGRT) is the use of imaging during radiation therapy to improve the precision and accuracy of treatment delivery. IGRT is used to treat tumors in areas of the body that move, such as the lungs. Radiation therapy machines are equipped with imaging technology to allow your doctor to image the tumor before and during treatment. By comparing these images to the reference images taken during simulation, the patient's position and/or the radiation beams may be adjusted to more precisely target the radiation dose to the tumor. To help align and target the radiation equipment, some IGRT procedures may use fiducial markers, ultrasound, MRI, X-ray images of bone structure, CT scan, 3D body surface mapping, electromagnetic transponders, or colored ink tattoos on the skin.
- **Intensity-modulated radiotherapy (IMRT)** - Intensity-modulated radiation therapy (IMRT) is an advanced mode of high-precision radiotherapy that uses computer-controlled linear accelerators to deliver precise radiation doses to a malignant tumor or specific areas within the tumor. IMRT allows the radiation dose to conform more precisely to the three-dimensional shape of the tumor by controlling the intensity of the radiation beam in multiple small volumes. IMRT also allows higher radiation doses to be focused to regions within the tumor while minimizing the dose to surrounding normal critical structures.
- **National Comprehensive Cancer Network® (NCCN)** - An alliance of 32 leading cancer centers devoted to patient care, research, and education. The NCCN guidelines are utilized for Radiation Therapy and Medical Oncology standards. NCCN consensus clinical standards are periodically updated and NantHealth, Inc. reviews these and updates its policies within a timely manner.
- **Three dimensional conformal radiation therapy (3D-CRT)** - A procedure that uses a computer to create a three dimensional picture of the tumor. This allows doctors to give the highest possible dose of radiation to the tumor, while sparing the normal tissue as much as possible.

**POLICY**

Please see all related anatomical policies that include Image-Guided Radiation Therapy as a treatment for dosing parameters and medical necessity.

- Anal Cancer
- Bladder Cancer
- Bone Cancer, Primary
- Breast Cancer
- Central Nervous System Cancers
- Esophageal and Gastric Cancer
- Gynecological Cancer
- Head and Neck Cancer
- Liver and Biliary Tract Cancers
- Lung Cancer
- Lymphoma
- Pancreatic Cancer
- Prostate Cancer
- Soft Tissue Sarcoma

**REFERENCES**

1. External Beam Radiation Therapy for Cancer. National Cancer Institute. <https://www.cancer.gov/about-cancer/treatment/types/radiation-therapy/external-beam>. Accessed May 24, 2022.
2. Jaffray, DA, Langen, KM, Mageras, G, et al. Assuring Safety and Quality in Image Guided Delivery of Radiation Therapy. *Practical Radiation Oncology*. 2013.
3. Image-guided radiation therapy (IGRT). RadiologyInfo.org. <https://www.radiologyinfo.org/en/info/igrt>. Accessed May 24, 2022.
4. Bergom C, Currey A, Desai N, Tai A, Stauss JB. Deep Inspiration Breath Hold: Techniques and Advantages for Cardiac Sparing During Breast Cancer Irradiation. *Frontiers in Oncology*. 2018;8.
5. Intensity modulated radiation therapy (IMRT). ASTRO Model Policies. <https://www.astro.org/ASTRO/media/ASTRO/Daily%20Practice/PDFs/IMRTMP.pdf>. Accessed May 24, 2022.
6. Dictionary of Cancer Terms. National Cancer Institute. [https://www.cancer.gov/publications/dictionaries/cancer- terms/](https://www.cancer.gov/publications/dictionaries/cancer-terms/). Accessed May 24, 2022.

**CODING [ICD-10, HCPCS]\***

\*Procedure codes appearing in medical policy documents are only included as a general reference. This list may not be all-inclusive and is subject to updates. In addition, codes listed are not a guarantee of payment. CPT codes are available through the AMA.

Code	Description
0C00-D49	Neoplasms
C15.3 - C15.9	Malignant neoplasm esophagus
C16.0 - C16.9	Malignant neoplasm stomach
C22.0	Hepatocellular carcinoma
C22.1	Cholangiocarcinoma
C24.0	Malignant neoplasm extrahepatic bile ducts

<b>Code</b>	<b>Description</b>
C34.00 – C34.92	Malignant neoplasm of bronchus and lung
C40-C41	Malignant neoplasm of bone and articular cartilage
C50.1	Central portion of breast
C50.2	Upper-inner quadrant of breast
C50.3	Lower-inner quadrant of breast
C50.4	Upper-outer quadrant of breast
C50.5	Lower-outer quadrant of breast
C50.6	Axillary tail of breast
C50.8	Overlapping lesion of breast
C61	Malignant neoplasm Prostate
C67.0	Malignant neoplasm of trigone of bladder
C67.1	Malignant neoplasm of dome of bladder
C67.2	Malignant neoplasm of lateral wall of bladder
C67.3	Malignant neoplasm of anterior wall of bladder
C67.4	Malignant neoplasm of posterior wall of bladder
C67.5	Malignant neoplasm of bladder neck
C67.6	Malignant neoplasm of ureteric orifice
C67.7	Malignant neoplasm of urachus
C67.8	Malignant neoplasm of overlapping sites of bladder
C67.9	Malignant neoplasm of bladder, unspecified
C69.20 – C69.22	Retinoblastoma
C71.0 – C71.9	Malignant neoplasm brain
C72.0	Spinal tumors
C78.00 – C78.02	Secondary malignant neoplasm of lung
C78.7	Secondary malignancy, liver
C79	Secondary malignant neoplasm of other and unspecified sites
C79.31 – C79.49	Secondary malignant neoplasm brain and spinal cord
C79.5	Secondary malignant neoplasm of bone and bone marrow
C81.02	Nodular lymphocyte predominant Hodgkin lymphoma, intrathoracic lymph nodes
C81.12	Nodular sclerosis Hodgkin lymphoma, intrathoracic lymph nodes
C81.22	Mixed cellularity Hodgkin lymphoma, intrathoracic lymph nodes
C81.32	Lymphocyte depleted Hodgkin lymphoma, intrathoracic lymph nodes
C81.42	Lymphocyte-rich Hodgkin lymphoma, intrathoracic lymph nodes
C81.72	Other Hodgkin lymphoma, intrathoracic lymph nodes
C81.92	Hodgkin lymphoma, unspecified, intrathoracic lymph nodes

<b>Code</b>	<b>Description</b>
C82.02	Follicular lymphoma grade I, intrathoracic lymph nodes
C82.12	Follicular lymphoma grade II, intrathoracic lymph nodes
C82.22	Follicular lymphoma grade III, unspecified, intrathoracic lymph nodes
C82.32	Follicular lymphoma grade IIIa, intrathoracic lymph nodes
C82.42	Follicular lymphoma grade IIIb, intrathoracic lymph nodes
C82.52	Diffuse follicle center lymphoma, intrathoracic lymph nodes
C82.62	Cutaneous follicle center lymphoma, intrathoracic lymph nodes
C82.82	Other types of follicular lymphoma, intrathoracic lymph nodes
C82.92	Follicular lymphoma, unspecified, intrathoracic lymph nodes
C83.02	Small cell B-cell lymphoma, intrathoracic lymph nodes
C83.12	Mantle cell lymphoma, intrathoracic lymph nodes
C83.3	Primary CNS Lymphoma
C83.32	Diffuse large B-cell lymphoma, intrathoracic lymph nodes
C83.52	Lymphoblastic (diffuse) lymphoma, intrathoracic lymph nodes
C83.72	Burkitt lymphoma, intrathoracic lymph nodes
C83.82	Other non-follicular lymphoma, intrathoracic lymph nodes
C83.92	Non-follicular (diffuse) lymphoma, unspecified, intrathoracic lymph nodes
C84.02	Mycosis fungoides, intrathoracic lymph nodes
C84.42	Peripheral T-cell lymphoma, not classified, intrathoracic lymph nodes
C84.62	Anaplastic large cell lymphoma, ALK-positive, intrathoracic lymph nodes
C84.72	Anaplastic large cell lymphoma, ALK-negative, intrathoracic lymph nodes
C84.92	Mature T/NK-cell lymphomas, unspecified, intrathoracic lymph nodes
C84.A2	Cutaneous T-cell lymphoma, unspecified, intrathoracic lymph nodes
C84.Z2	Other mature T/NK-cell lymphomas, intrathoracic lymph nodes
C85.12	Unspecified B-cell lymphoma, intrathoracic lymph nodes
C85.22	Mediastinal (thymic) large B-cell lymphoma, intrathoracic lymph nodes
C85.82	Other specified types of non-Hodgkin lymphoma, intrathoracic lymph nodes
C85.92	Non-Hodgkin lymphoma, unspecified, intrathoracic lymph nodes
D00.1	Carcinoma in-situ, esophagus
D02.20 – D02.22	Carcinoma in situ bronchus and lung
D33.0 – D33.2	Benign brain lesions
Z92.3	Personal history of irradiation
Z51.5	Encounter for palliative care

**REVISION AND REVIEW HISTORY**

No.	Description	Metadata
1	Original Effective Date:	5/2022
2	Policy Review Dates:	5/24/2022, 6/2/2022, 7/20/2022
3	Policy Revision Dates:	5/24/2022, 6/2/2022, 7/20/2022
4	Department Owner:	Medical Affairs
5	NH Advisory Committee Approval Dates:	5/25/2022, 6/2/2022
6	Revision Changes:	