This tool addresses common symptoms and symptom complexes. Requests for patients with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or patient’s Primary Care Physician (PCP) may provide additional insight.

RADIATION ONCOLOGY GUIDELINES

Version 3.0 Effective: 02-16-2015

MedSolutions, Inc. Clinical Decision Support Tool for Radiation Oncology

This version incorporates MSI accepted revisions prior to 12/31/2014

Common symptoms and symptom complexes are addressed by this tool. Requests for patients with atypical clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician may provide additional insight.

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<td>intensity modulated radiation therapy</td>
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<tr>
<td>CRT</td>
<td>conformal radiation therapy or 3-dimensional radiation therapy or 3-dimensional conformal radiation therapy</td>
</tr>
<tr>
<td>2DRT</td>
<td>2-dimensional radiation therapy or conventional radiation therapy</td>
</tr>
<tr>
<td>PBT</td>
<td>proton beam therapy</td>
</tr>
<tr>
<td>HDR</td>
<td>high dose rate brachytherapy</td>
</tr>
<tr>
<td>LDR</td>
<td>low dose rate brachytherapy</td>
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<tr>
<td>EBRT</td>
<td>external beam radiation therapy</td>
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<td>SRS</td>
<td>stereotactic radiosurgery</td>
</tr>
<tr>
<td>SBRT</td>
<td>stereotactic body radiation therapy</td>
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<tr>
<td>MLC</td>
<td>multileaf collimator</td>
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<tr>
<td>IORT</td>
<td>intraoperative radiation therapy</td>
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<td>IGRT</td>
<td>Image Guided Radiotherapy</td>
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RO PREFACE-1~Guideline Development and General Use

MedSolutions, Inc. (MSI) has developed and maintains evidence-based, proprietary clinical guidelines to evaluate radiation oncology procedures. MSI reserves the right to update the guidelines periodically and conducts a formal review of the clinical guidelines annually. These guidelines have incorporated well known and widely accepted criteria and standards including those from medical societies such as the American Society for Radiation Oncology (ASTRO), the Choose Wisely campaign’s recommendations, the American College of Radiation Oncology (ACRO), and the National Comprehensive Cancer Network (NCCN) current peer-reviewed medical literature.

Additional contributions from panels of renowned subject matter experts and community physicians have been incorporated.

MedSolutions’ guidelines are updated annually as well as on an ad hoc basis if new technology or new uses of existing technology emerge. Medsolutions’ guidelines are also informed by health plan specific policies. To promote transparency, the current version of these guidelines is always available for review on the MedSolutions website (www.medsolutions.com).

Medsolutions Guidelines sources:
- nationally accepted guidelines and consensus statements published by specialty societies and organizations (e.g., Choose Wisely, NCCN, ASTRO Guidelines, etc.)
- published peer reviewed evidence-based clinical data
- health plan medical policies (see RO-Preface-2 for more details)
- practicing physicians from academic and community-based centers

These clinical guidelines are not intended to replace good medical judgment but rather to augment medical decision-making pertaining to the selection of the most clinically appropriate procedure for a patient’s medical condition. These guidelines are written to describe appropriate general management of defined medical conditions; however, these guidelines may not be applicable in all clinical presentations of a defined medical condition, and physician judgment may then override the management recommended by these guidelines.

The health care provider retains final authority and responsibility on all decision making related to patient care.
PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-2~Benefits, Coverage Policies and Eligibility

Benefits, coverage policies, and eligibility issues pertaining to each Health Plan (payor) may take precedence over MedSolutions’ guidelines. Providers are urged to obtain current written instructions, clinical policy bulletins and all other requirements directly from each payor. Current information can often be found via the individual payor’s website.

**Medicare Coverage Policies**

For Medicare and Medicare Advantage enrollees, National Coverage Determinations (NCDs), the coverage policies of CMS (Centers for Medicare and Medicaid Services), may take precedence over MedSolutions’ guidelines.

Regional Medicare Administrative Contractors (MACs) process Medicare claims within their jurisdictions and establish and maintain additional policy information through Local Coverage Determination (LCDs). LCDs, where available and active, may take precedence over MedSolutions’ guidelines.

Providers are encouraged to submit MAC documentation for specific requests, particularly when LCD policy may take precedence over Medsolutions Guidelines.

**Investigational and/or Experimental Studies**

Certain forms of advanced imaging or radiotherapy described in these guidelines are considered investigational and/or experimental by various payors, and their coverage policies may take precedence over MedSolutions’ guidelines.

**Clinical and Research Trials**

Similar to investigational and experimental studies, clinical trial imaging and therapy requests will be evaluated to determine whether they meet Health Plan and MedSolutions’ evidence-based guidelines. Providers are encouraged to review the current medical/clinical coverage policies for each payor.

Medsolutions guidelines incorporate state and federal legislation in the review of advanced imaging and radiotherapy requests.
PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-3~Clinical Information

MSI guidelines use a medical evidence-based approach to determine what procedures are appropriate, following submission by a provider for a course of radiotherapy. MSI guidelines pertain to the patient’s overall health needs and not to any specific treatment equipment or technique.

Providers should request specific procedures after an initial patient consultation, at which time the physician should have developed an overall treatment plan that may include a course of radiation therapy. Consultation provides current oncologic clinical information which may include signs and symptoms, history, physical examination findings, staging information, imaging and pathology reports. Such information is necessary for determining the medical necessity of radiation therapy requests. Clinical information provided to MSI must be sufficient to establish a clinical basis for each of the requested procedures.

Additionally, each non-clinical (technical or ancillary) procedure and amount requested must be relevant to the radiotherapy requested and supported by the submitted documentation.

RO PREFACE-4~Copyright and Trademark Information

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RO PREFACE-5~Allowable Number of Treatments/Fractions

Representations in these guidelines concerning allowable number of fractions are intended to be an allowable maximum for most indications discussed. It is understood that in most circumstances of curative treatment, a conventional fractionation of 1.8–2.0 Gy daily is utilized for external beam radiotherapy unless otherwise stated in these guidelines. In most cases of palliative treatment, larger external beam dose fractions given in fewer fractions would be expected to expedite symptom relief and are consistent with national guidelines such as ASTRO’s Choose Wisely.

Allowable fractionation for stereotactic radiotherapy and brachytherapy can vary widely according to disease site and treatment modality, and additional detail is provided within the pertinent disease and modality sections of these guidelines.

Exceptions to the allowable number of treatment fractions are uncommon. Such requests are reviewed on a case by case basis, and require complete supporting documentation to be submitted.

Personnel responsible for coding and/or billing are reminded that treating facilities and professionals may only code/bill for procedures actually performed, rather than for procedures authorized.

RO PREFACE-6~Radiation Treatment Modalities

Radiation therapy broadly includes External Beam Radiation Therapy (EBRT), Brachytherapy, Stereotactic Radiotherapy and Brachytherapy alone or combined with EBRT for select cases.

- EBRT includes Intensity Modulated Radiation Therapy (IMRT), Conformal 3D Radiation Therapy (CRT) and 2D Radiation Therapy (2DRT) modalities.
- Brachytherapy includes High Dose Rate (HDR) and Low Dose Rate (LDR) modalities for interstitial, intracavity or intraluminal means of treatment delivery.
- Stereotactic Radiotherapy includes Stereotactic Radiosurgery (SRS) and Stereotactic Body Radiation Therapy (SBRT) modalities.

Regarding CRT and 2DRT: For the purposes of these guidelines, the terms "Conformal Radiation Therapy" and "3D Therapy" are interchangeable, since the allowable treatment planning and delivery codes for these procedures are interchangeable. Likewise, "2D Radiation Therapy" and “Conventional Radiation Therapy” are interchangeable, since the allowable treatment planning and delivery codes for these procedures are interchangeable. Though treatment delivery codes for both CRT and 2DRT are common to both forms of external beam therapy, each form of external beam therapy reports different treatment planning codes.

Regarding IMRT: This sophisticated modality of highly conformal external beam therapy may be indicated for cases where there is clinical need to treat a target volume.
such that any of the following conditions are met.
  o Clinically meaningful dose homogeneity is achieved.
  o Treatment area is adjacent to previously irradiated fields.
  o Dose tolerances of surrounding tissue can be maintained.

IMRT procedure requests must meet the requirements of the published CPT language for simple or complex IMRT delivery (CPT®77385 or CPT®77386 respectively). Beginning Jan 1, 2015 IGRT is bundled into the delivery code for IMRT and is not billable as a separate procedure. Teletherapy and brachytherapy are the codes that did change.

**Regarding SRS and SBRT:**

  o SRS utilizes linear accelerators (including TomoTherapy® and Cyberknife®) as well as cobalt based Gamma Knife for treatment delivery.
  o SBRT only utilizes linear accelerators for treatment delivery.
### PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

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PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-7~CODING GUIDELINES for Specific Procedures

RO PREFACE-7.1 Special Treatment Procedure

Definition: CPT® 77470 – Special treatment procedure (i.e., total body irradiation, hemibody radiation, per oral or endocavitary irradiation).

- A special treatment procedure would be generally reported in addition to clinical treatment planning and is reported only once per course of therapy.
- The medical record must specifically reflect the additional time and effort to justify coding a special treatment procedure in addition to clinical treatment planning.
- A consultation note, treatment prescription and other medical chart documentation typically support coding a special treatment procedure. Providers must submit a unique separate note highlighting the requirements of 77470 being met if there is not documentation otherwise clearly provided for elsewhere within the submitted case documents.
- The use of IGRT does not justify reporting of special treatment procedures.
- The sole use of check boxes for documentation support is not sufficient. A special treatment procedure should never be “automatically” requested or billed. A special treatment procedure must be billed on the date documented in the patient medical record.
- The professional and technical components of CPT® 77470 must be reported on the same date of service.
- It is expected that CPT® 77470 special treatment procedure will be used infrequently relative to the overall radiotherapy treatment population.

Specific clinical and coding guidance: the following represents common but not a comprehensive set of clinical scenarios where a special treatment procedure should not be reported routinely.

- Providers should not report this procedure for administering hormone therapy, amifostine or other non-chemotherapy or non-cytotoxic chemotherapy agents in absence of concurrent chemoradiotherapy.
- Providers should not report this procedure in the setting of sequential chemoradiotherapy (i.e., chemotherapy precedes or follows but does not overlap radiotherapy administration).
- Providers should not report this procedure only on the basis that the patient has another, concurrent medical diagnosis (i.e., diabetes, COPD, hypertension, among others) that may impact the patient’s tolerance to radiotherapy.
- Providers should not report this procedure to indicate a modification of a course of treatment that would otherwise be described through reporting of other services (i.e., simulation, dosimetry, quality assurance, etc.)
References
1. CPT® Assistant, Winter 1991
2. CPT® Assistant, October 1997
3. The ASTRO/ACR Guide to Radiation Oncology Coding 2010
PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-7~CODING GUIDELINES for Specific Procedures

RO PREFACE-7.2 Basic Radiation Dosimetry Calculation

**Definition: CPT® 77300** – Basic radiation dosimetry calculation, central axis depth dose calculation, TDF, NSD, gap calculation, off axis factor, tissue inhomogeneity factors, calculation of nonionizing radiation surface and depth dose, as required during course of treatment, only when prescribed by the treating physician.

Dosimetry is the mathematical calculation of the radiation dose distribution within a tumor site or a given treatment volume. This calculation may be performed by hand or computer, and by a medical physicist, dosimetrist or radiation therapist. There is both a professional and technical component for basic dosimetry services.

One unit of basic dosimetry is appropriately billed for each unique MU calculation.

- This code is typically billed once per port for standard external beam.
- There is no separate charge for a tissue inhomogeneity calculation.
- Multiple control points are not charged as separate units of basic dosimetry when the fields are merged into a single MU calculation.
- Mirror image calculations (ie, same MU and/or same prescription point depth) completed for a pair of opposed ports are billed as one unit.
- Only calculations used for patient treatment should be billed; any calculations retained in the record and not used should be clearly notated as “not used.”

*Specific clinical and coding guidance:* the following represents common but not a comprehensive set of clinical scenarios where basic dosimetry calculations may or may not be routinely reported.

Basic dosimetry calculations are appropriately repeated during a course of radiation therapy when:

- There are changes in the patient’s weight or girth.
- There are new treatment targets.
- The tumor volume or conformation has changed significantly.
- A medically necessary boost field will be created that is different in size and shape from the original plan.

Basic dosimetry calculations may be reported for IMRT, SRS or SBRT treatments but not for teletherapy CPT® 77306, CPT® 77307 (2D) or brachytherapy CPT® 77316, CPT® 77317 or CPT® 77318 isodose plans.

- Calculations are appropriately reported at a frequency of one unit per gantry angle, arc or path, unless considered inclusive of the dosimetry plan by the payor.

Many payors have payment policies that “cap” the allowable number of basic dosimetry calculations during a course of treatment. Written payor policies and guidelines take precedence over MSI guidelines.
References

1. CPT® Assistant, Fall 91:14
2. CPT® Assistant, Oct 97:3
3. CPT® Assistant, Dec 08:9
4. CPT® Assistant, Nov 09:3
5. CPT® Changes: An Insider’s View 2002
6. The ASTRO/ACR Guide to Radiation Oncology Coding 2010
**PREFACE TO THE RADIATION ONCOLOGY GUIDELINES**

**RO PREFACE-7~CODING GUIDELINES for Specific Procedures**

**RO PREFACE-7.3 Special Physics Consultation**

**Definition:** CPT® 77370 – Special medical radiation physics consultation

This code is reported when the radiation oncologist requests medical physics assistance, analysis and/or explanation for a specific problem or concern. It is expected that a qualified medical physicist, upon consultation request, will spend considerable time and effort on behalf of a specific patient.

The medical physicist will provide a customized written report to the radiation oncologist referable to the specific problem being analyzed.

- This report should not be a “cloned note” or completed “template.” It is a distinct document created by the medical physicist for a patient-specific problem or concern.
- Generally, only one such report will be required for a course of therapy.
- The radiation oncologist is then expected to review the report and use its findings to appropriately design or modify the current treatment plan.
- A dose summary prepared for informational purposes – but not used for patient treatment – is not considered a special physics consultation for purposes of reporting this service.

**Specific clinical and coding guidance:** the following represents common but not a comprehensive set of clinical scenarios where special physics consultation *may not* be routinely reported:

- for any complex treatment, such as brachytherapy (ie. Tandem and ovoids or cylinder), IMRT, SBRT or SRS planning procedures, or
- for quality assurance and verification of any treatment plan.

**Specific clinical and coding guidance:** the following represents common but not a comprehensive set of clinical scenarios where special physics consultation *may* be routinely reported:

- analysis of the effects of previous courses of radiation therapy with calculation of cumulative radiation dose to critical organs
- computation of dose to the fetus of a pregnant patient undergoing radiation therapy
- treatment plan development for multiple targets with abutting or overlapping fields and treated simultaneously
- analysis and recommendations for transplanted organ protection
- special brachytherapy devices developed by a qualified medical physicist to treat a particular patient (for example, unique custom templates)
- unique circumstances that require greater than normal physics consultation effort, when supported by submitted provider documentation
References

1. CPT® Assistant, Fall 91:14
2. CPT® Assistant, Oct 97:4
3. CPT® Assistant, May 09:8
4. Clinical Examples in radiology Summer 08:12
5. CPT® Changes: An Insider’s View 2002
6. The ASTRO/ACR Guide to Radiation Oncology Coding 2010
PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-7~CODING GUIDELINES for Specific Procedures

RO PREFACE-7.4 MLC (Multi-Leaf Collimator) Treatment Device

Requesting providers should use the appropriate level of complexity.

Non-IMRT
- Multi-leaf collimator (MLC) devices can either be simple (CPT®77332), intermediate (CPT®77333), or complex (CPT®77334).
- This code set is appropriately used to report MLC devices for non-IMRT therapy.

IMRT
- MLCs may be used to construct a beam-modulating device for an IMRT treatment plan and may be reported once per IMRT plan using CPT®77338.
- CPT®77338 may not be reported for physical compensator based IMRT (use CPT®77334).
- Cases requiring cone down fields using IMRT are permitted to bill a second CPT®77338 when such requests are supported by documentation (see RO PREFACE-7.6)

References
1. CPT® Changes: An Insider’s View 2010
PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-7~CODING GUIDELINES for Specific Procedures

RO PREFACE-7.5 Procedure Codes

Providers may reference a complete summary of code changes for 2015 in the Appendix: RADIATION ONCOLOGY PROGRAM 2015 Code Update. CLICK HERE

Image Guided Radiotherapy (IGRT) CPT®77387

Providers are reminded that IGRT procedures are included in all the 2015 IMRT and SBRT delivery codes. IGRT can be requested when field sizes are small, with close margins (PTV) being used to minimize normal tissue exposure, and when daily visualization is necessary to ensure optimal accuracy. For example, where a small peripheral lung tumor is being treated with a “postage stamp” type field using 3D, IGRT would be considered a covered request.

Intensity Modulated Radiotherapy (IMRT) Complexity

Providers requesting IMRT should use the appropriate level of complexity as defined by the criteria below. Note that all guidance and tracking (IGRT) is included regardless of number or format used (Calypso, ultrasound, kV, MV, etc.):

- **Simple** (CPT®77385): Any of the following: prostate, breast, and all sites using physical compensator-based IMRT (Note for 2015, Category III code 0073T is no longer reported)
- **Complex** (CPT®77386): Includes all other sites, non-physical compensator based IMRT

Conventional Radiotherapy Complexity (2D, 3D)

Providers requesting conventional treatment delivery should use the appropriate level of complexity as defined by the criteria below:

- **Simple** (CPT®77402): Radiation treatment delivery, >1MeV; and all of the following criteria are met: single treatment area, one or two ports and two or fewer simple blocks
- **Intermediate Treatment Delivery** (CPT®77407): Radiation treatment delivery, >1MeV; and any of the following criteria are met (and none of the complex criteria are met): two separate treatment areas, three or more ports on a single treatment area, or three or more simple blocks
- **Complex** (CPT®77412): Radiation treatment delivery, >1MeV; and any of the following criteria are met: three or more separate treatment areas, custom blocking, tangential ports, wedges, rotational beam, field in field or other tissue compensation that does not meet IMRT guidelines, or use of electron beam
Brachytherapy and 2DRT

The 2015 isodose plan codes below, used for brachytherapy and 2DRT, *include* basic dosimetry calculations; CPT®77300 should not be reported with these codes.

- **Isodose Plan, Simple** (CPT®77316): calculations made from 1 to 4 sources or remote afterloading device 1 channel
- **Isodose Plan, Intermediate** (CPT®77317): calculations made from 5 to 10 sources or remote afterloading device 2 to 12 channels
- **Isodose Plan, Complex** (CPT®77318): calculations made from over 10 sources or remote afterloading device over 12 channels

**IMRT CPT®77301**

Requests for multiple IMRT plans (CPT®77301) as a result of complex treatment planning will not be considered for approval unless *all* of the following occur:

- an additional CT simulation with new images are acquired
- both normal tissue target volumes and a tumor volume are redrawn
- the clinical case supports such re-simulation due to significant changes in tumor volume and/or patient habitus

**Respiratory Motion (CPT®77293)**

This code represents the physician work and other resources involved in obtaining a respiratory correlated or ‘4-D’ CT simulation study for conformal treatment planning. This code must be billed with either code CPT®77295 or CPT®77301 on the same date of service, although the work may take place over multiple days. The work involved may include physicians, therapists, dosimetrists and physicists and has both a professional and a technical component. The work is performed in both the simulator and dosimetry. Thus, the work is part of the simulation and isodose planning process, not part of treatment delivery. Therefore, requests for CPT®77293 should never be requested for the purposes of reporting use of IGRT.
PREFACE TO THE RADIATION ONCOLOGY GUIDELINES

RO PREFACE-7~CODING GUIDELINES for Specific Procedures

RO PREFACE-7.6 Treatment Planning and Case Complexity

As stated earlier in the guidelines, the lowest case complexity to achieve satisfactory clinical target coverage while reasonably minimizing normal tissue toxicity is preferred. Many cases will require cone down(s) or boost(s), however, this does not necessarily support the use of additional treatment plans or repeat CT simulation.

For example, after completing EBRT for breast, a boost to the tumor bed using electrons or photons may be used; however, neither will support the use of an additional plan and billing of CPT®77295 or CPT®77301. The target is small and normal tissue tolerance can be determined from the previously acquired simulation imaging. Isodose or electron calculations for the boost are permitted however.

Similarly, for prostate cancer cases, a single plan may be utilized for cone downs involving pelvic, seminal vesicle and prostate targets. The subsequent cone down target(s) following pelvic radiotherapy (i.e., seminal vesicles, prostate) are typically unchanged, and therefore, no repeat CT simulation will be covered. Multiple devices may however be charged for the unique MLC fields used during the cone down, when supported by appropriate documentation.

Palliative cases should typically require a single modality. Palliative cases should also treat multiple targets within a given site on the same day whenever possible. For example, a patient with multiple brain mets should receive SRS to all sites for each treatment delivery request. Sequential treatment that extends the number of treatment days typically provides no clinical benefit but substantially increases overall treatment cost.
RO-1.0 General Considerations
This guideline covers malignant and benign tumors of the brain and spinal cord in addition to other non-neoplastic conditions of the central nervous system for which radiation therapy may be indicated.

Radiation therapy modalities used to treat tumors and other non-neoplastic conditions of the central nervous system most commonly include EBRT and SRS.

RO-1.1 Non-Neoplastic Conditions
Common non-neoplastic conditions responsive to radiotherapy include intracranial arteriovenous malformations (AVM), cerebral aneurysms, hemangiomas and trigeminal neuralgia.

Stereotactic Radiosurgery
SRS is appropriate for any of these conditions, provided that the target(s) is/are small and for a single fraction.

RO-1.2 Low Grade Malignant and Benign Brain Tumors
CRT and IMRT are indicated for any of these malignant or benign conditions, and stereotactic therapy may be prescribed for selected benign lesions.

Stereotactic Radiosurgery/Radiotherapy
SRS (1 fraction) or Fractionated Stereotactic Radiotherapy (up to 5 fractions) is considered appropriate for the following benign neoplastic indications when the target is ≤ 4 cm:
- acoustic neuroma
- meningioma: either recurrent after prior resection, grossly residual after current resection attempt or inoperable
- pituitary adenoma, pinealoma, or craniopharyngioma

CRT or IMRT
CRT or IMRT can be authorized up to 33 fractions for meningioma, either recurrent after prior resection, grossly residual after current resection attempt or inoperable.

CRT or IMRT can be authorized up to 30 fractions for the following indications:
- low grade malignant glioma: recurrent after prior resection, grossly residual after current resection attempt or inoperable
- pituitary adenoma, pinealoma, or craniopharyngioma
**RO-1.3 High Grade Malignant Brain Tumors**

Stereotactic therapy is not indicated for previously untreated cases. For cases that have recurred following EBRT and retain good performance status, stereotactic therapies may be indicated to impair further disease progression.

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<tr>
<td>For high grade glioma, including anaplastic astrocytoma, anaplastic oligodendroglioma and glioblastoma multiforme, authorization may include up to 34 total fractions.</td>
</tr>
<tr>
<td>For high grade ependymoma and medulloblastoma, authorizations may be include the following:</td>
</tr>
<tr>
<td>o Two separate, concurrent courses (for whole brain and spinal cord, respectively) of CRT up to 20 fractions for a total dose of 36 Gy followed by:</td>
</tr>
<tr>
<td>o Up to an additional 15 boost fractions of either CRT or IMRT to the site of original intracranial disease to a total dose of 63 Gy.</td>
</tr>
<tr>
<td>o If gross spinal cord disease were noted at presentation, then an additional 5 boost fractions of either CRT or IMRT for a total dose of 45 Gy to site(s) of spinal disease may be allowed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stereotactic Radiosurgery/Radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRS (1 fraction) and Fractionated Stereotactic Radiotherapy (up to 5 fractions) are each considered appropriate for high grade malignant tumors only in the setting of small volume (≤ 4 cm maximum diameter) recurrent disease when surgical resection is not feasible.</td>
</tr>
</tbody>
</table>

**Lymphoma of the central nervous system** is considered separately from other high grade malignant brain tumors. Elderly patients without history of immunocompromise achieving complete response following chemotherapy may be observed and treated with radiotherapy at progression. All other patients may be treated immediately following chemotherapy. Total prescribed dose for these cases is commonly 30 – 45 Gy. IMRT is not required as the total prescription dose does not exceed tolerance doses of normal intracranial structures.

<table>
<thead>
<tr>
<th>2DRT or CRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorization may include up to 25 fractions.</td>
</tr>
</tbody>
</table>
References

5. *Int J Radiat Oncol Biol Phys* 2004;60:853-860
**RO-1.4 Metastatic Disease to the Brain**

*For patients never previously treated with radiotherapy for metastatic brain disease:*

In general, patients presenting with more than four brain metastases are most appropriately treated with whole brain irradiation alone, given the dosimetric restrictions of treating such patients stereotactically and overall poor prognosis. Commonly, schedules of 30.0 Gy in 10 fractions and 35.0–37.5 Gy in 14–15 fractions are prescribed for these cases.

Patients presenting with a single brain metastasis appear to benefit from aggressive local treatment of the lesion. Whole brain irradiation alone results in suboptimal disease control for this patient group but may be offered in the setting of poor performance status and/or widely uncontrolled extracranial disease.

Patients presenting with 2–4 brain metastases represent a more heterogeneous cohort with respect to technical and prognostic factors impacting decisions for modality selection. Additionally, prospective data to guide clinical decision-making is limited in this setting. In general, these patients may be treated with whole brain irradiation. A subset of these patients with control of extracranial disease, at least good overall performance status and limited intracranial tumor volume may be considered for stereotactic radiosurgery alone or with external beam radiotherapy.

*For patients previously treated with radiotherapy for metastatic brain disease:*

Patients previously treated with whole brain radiotherapy may be considered for SRS when extracranial disease is controlled, or when such treatment may reduce acute neurological deficits in patients with poor prognosis.

Patients previously treated with stereotactic and other partial brain therapies may be treated with whole brain irradiation. Highly selected patients previously treated with whole brain therapy presenting with significant neurologic symptoms and poor short-term prognosis may be considered for whole brain re-irradiation.

<table>
<thead>
<tr>
<th>Stereotactic Radiosurgery/Radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRS (1 fraction) and Fractionated Stereotactic Radiotherapy (up to 5 fractions), either as a monotherapy or as a boost therapy, can be authorized in patients with all of the following:</td>
</tr>
<tr>
<td>○ One to four metastatic brain lesions with no one lesion measuring greater than 4 cm, and/or the total volume of lesions &lt; 34 cc, and</td>
</tr>
<tr>
<td>○ Controlled systemic disease, and KPS &gt; 70</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2DRT and CRT Whole Brain Irradiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2DRT and CRT up to 15 fractions may be authorized for all other cases of brain metastases where whole brain irradiation is prescribed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CRT and IMRT Partial Brain Irradiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ CRT or IMRT for non-stereotactic boost of four or fewer lesions following whole brain irradiation can be authorized for up to 10 fractions.</td>
</tr>
<tr>
<td>○ CRT or IMRT for partial brain irradiation of relapsed disease following prior whole brain irradiation can be authorized for up to 20 fractions.</td>
</tr>
</tbody>
</table>
References

5. JAMA 1998;280:1485-1489
6. NEJM 1990;322:494-500
RO-2.0 General Considerations
Radiotherapy is used in the adjuvant setting in the management of breast cancer in order to sterilize residual microscopic disease remaining in the breast parenchyma, musculoskeletal chest wall, skin of the chest wall and/or regional lymphatics following surgery. The appropriate target volume selected for treatment varies according to the extent of surgery and disease. In rare cases, radiotherapy may be used in the definitive setting for technically or medically inoperable patients or may be used in the neoadjuvant setting for locally advanced cases in order augment disease response to chemotherapy and facilitate subsequent resection.

RO-2.1 Post-Lumpectomy Radiotherapy
This group of patients has been surgically treated with the intent of preserving breast parenchyma for the purpose of optimizing cosmetic outcome following cancer treatment. Patients with primary tumors small enough to permit local resection with negative margins and achieve an acceptable cosmetic outcome are considered appropriate for breast conservation surgical therapy. Other breast conserving surgical procedures include quadrantectomy and partial mastectomy.

For patients treated with lumpectomy, adjuvant whole breast irradiation using conventional fractionation is indicated to reduce the risk of local disease recurrence. Additional clinical and technical considerations include the following:

- Selected patients may be considered appropriate for hypofractionated radiotherapy if the following factors are present: age $\geq 50$ years, pathologic stage T1-2N0 disease, no chemotherapy and low ($\pm 7\%$) dose inhomogeneity in the central axis plane (see ASTRO Choosing Wisely #1).

- Hypofractionated “short course” whole breast radiotherapy is typically 42.5 Gy delivered in 16 fractions, with boost optional. This treatment technique has long term data showing equivalence to standard fractionation.

- A boost to the lumpectomy cavity may be indicated to enhance local disease control rates. Boost may follow either conventionally fractionated or hypofractionated radiotherapy to the whole breast. Patients with high risk factors for local failure following surgery and adjuvant whole breast irradiation – including age $< 50$ years, close or positive surgical margins or node-positive disease – are particularly benefited by boost therapy. Electron beam radiotherapy is most commonly utilized to deliver a boost dose, although tangential (i.e. mini tangents) and other photon beam arrangements may be used instead for deep-seated surgical cavities. Brachytherapy boosts – LDR, HDR or IORT.
(Mammosite®, Axxent®, etc.) are not considered medically necessary when megavoltage electron and photon alternatives are available.

- **Specific clinical and coding guidance:** When performing a breast boost to the surgical bed, either a teletherapy isodose planning request (with bundled dose calculation, CPT® 77306 or CPT® 77307) or CPT® 77321 special teletherapy port plan, may be used depending on the modality (photons, electrons) selected.

- Concurrent treatment of the regional lymphatics is indicated for selected patients. Although controversy remains as to precise selection criteria for nodal radiotherapy, a general consensus of high-risk factors for regional disease recurrence may include the following: ≥ 4 pathologically axillary positive lymph nodes, extracapsular nodal disease extension and/or no pathologic assessment of axillary nodal status.

- Although controversial, adjuvant radiotherapy may be omitted for selected elderly patients (age > 70, favorable tumor characteristics, and minimal tumor size) with significant medical comorbidities who are surgically treated with lumpectomy for favorable, early-stage breast cancer.

Considerations for IMRT will include review of the following factors in making determinations:

- Breast size: patients with large intact breast volumes for who adequate dose homogeneity cannot be achieved with CRT techniques may be considered for IMRT.

- Proximity of cardiac structures (for left-sided disease only): patients with history of cardiac disease and/or cardiotoxic systemic therapy and inadequate dose sparing with CRT techniques may be considered for IMRT.

- Prior radiotherapy to an adjacent or overlapping treatment site: such patients are considered appropriate for IMRT.

- IMRT should not be routinely used to treat whole breast as part of breast conservation therapy (see ASTRO Choosing Wisely #5).

Selected early stage patients treated with lumpectomy may be offered accelerated partial breast irradiation (APBI) in lieu of whole breast irradiation, delivered in 10 fractions over a 5 day period (twice per day). APBI is a more recent strategy in the adjuvant radiotherapy of breast cancer and intends to deliver a dose of radiation to a defined margin of breast tissue surrounding the lumpectomy cavity after surgery. The entire breast parenchyma is not the intended target with this approach. APBI may be delivered using EBRT or brachytherapy, although HDR is most commonly used and is more established.

Preferable patient criteria for APBI include:

- age > 50 years,
- unifocal invasive ductal cancer < 2 cm in greatest dimension,
- no positive adenopathy, negative surgical margins,
- estrogen receptor positivity and no EIC or LCIS.
Other newer brachytherapy modalities such as electronic brachytherapy (Axxent®), non-invasive image guided brachytherapy (Accubost®) and intraoperative radiotherapy (IORT) are more recent applications for breast cancer and are considered investigational for the purposes of this guideline. Payor policy may supersede MedSolutions’ guidelines.

<table>
<thead>
<tr>
<th>CRT or IMRT Whole Breast Irradiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 28 fractions for whole-breast +/- regional nodal treatment (where clinically indicated) and an additional 8 fractions for boost treatment are allowed. The boost fractions may be either CRT or electron beam radiotherapy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accelerated Partial Breast Irradiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDR brachytherapy: up to 10 fractions are allowed</td>
</tr>
</tbody>
</table>

**RO-2.2 Post-Mastectomy Radiotherapy**

For selected patients treated surgically with mastectomy, adjuvant chest wall irradiation using a conventional treatment schedule is indicated in order to reduce the risks of locoregional disease recurrence and cancer-specific mortality. Mastectomy patients generally thought to benefit from adjuvant radiotherapy include those with pathologic findings such as primary tumor invasion of skin and/or chest wall structures and/or involvement of ≥ 4 axillary lymph nodes. Patients with pathologic TisNX, TisN0, T1N0, or T2N0 following mastectomy are generally not considered likely to benefit from adjuvant radiotherapy.

Post-mastectomy radiotherapy is usually comprehensive and includes treatment of the musculoskeletal chest wall, chest wall skin and regional lymphatics (axillary, supraclavicular). EBRT is the standard radiotherapy modality technically indicated to treat these volumes.

<table>
<thead>
<tr>
<th>CRT or IMRT Chest Wall Irradiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 28 fractions for whole-breast +/- regional nodal treatment and, for select cases, an additional 6 fractions for boost treatment are allowed. The boost fractions are typically expected to be delivered with electron beam radiotherapy only.</td>
</tr>
</tbody>
</table>

**References**

5. Int J Radiat Oncol Biol Phys 2010;Jul 15
7. START trial, 2013 The Lancet Oncology, Vol. 14 No. 11 pp 1086-1094)
RO-3.0 General Considerations
This disease group largely consists of non-small cell (NSCLC) and small cell lung cancers (SCLC) and also includes less common malignancies such as mesotheliomas and thymomas.

Radiotherapy has multiple applications in the management of non-small cell and small cell lung cancers, depending on disease histology, stage and integration of other modalities into the overall course of care for the given patient. Broadly speaking, radiotherapy utilization for lung cancer may be categorized accordingly:

- definitive radiotherapy for early-stage disease or solitary pulmonary nodule
- definitive radiotherapy for locoregionally advanced, non-metastatic non-small cell lung carcinoma
- definitive radiotherapy for limited stage small cell lung carcinoma
- neoadjuvant or adjuvant radiotherapy for locoregionally confined non-small cell lung carcinoma
- prophylactic cranial irradiation (PCI) for selected extensive stage small cell (ES-SCLC) carcinoma patients and all limited stage small cell carcinoma patients (LS-SCLC)

RO-3.1 Definitive Radiotherapy of Early-Stage NSCLC
Surgery is the preferred definitive treatment modality for early stage non-small cell lung cancer but may be contraindicated by patient medical comorbidities or patient choice. According to Choosing Wisely recommendation #7 for radiation oncology, do not offer radiation therapy for patients who have resected NSCLC negative margins NO-1 disease (http://www.choosingwisely.org/doctor-patient-lists/american-society-for-radiation-oncology/). If medically inoperable, then EBRT or SBRT may be considered. Such patients should radiographically demonstrate a single focus of disease. Most patients should undergo assessment for mediastinal adenopathy prior to definitive parenchymal only radiotherapy.

- For tumors < 5 cm, SBRT is the preferred radiotherapy modality.
- For tumors > 5 cm, EBRT is the preferred modality normal lung tissue toxicity. SBRT regimen may vary depending on tumor location (i.e. central, peripheral, or adjacent to rib). Use of combined EBRT and boost SBRT for borderline large tumors is considered investigational and not supported in this guideline.

| CRT or IMRT | Up to 37 fractions are approved. |
| SBRT       | Up to 5 fractions are approved.  |
**RO-3.2 Definitive Radiotherapy of Locoregionally Advanced NSCLC**

CRT is expected to produce appropriate dosimetry for the majority of NSCLC cases. Patient and disease criteria for which IMRT may be considered include the following:

- Superior sulcus involvement
- Invasion of vertebral body, paraspinal disease involvement
- Bilateral mediastinal involvement
- Immediately adjacent or overlapping prior radiotherapy fields

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
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<tbody>
<tr>
<td>Up to 37 fractions for definitive treatment may be approved.</td>
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</tbody>
</table>

**RO-3.3 Definitive Radiotherapy of Limited Stage SCLC**

For limited stage small cell lung cancer, combined radiotherapy and chemotherapy represents the standard of care.

<table>
<thead>
<tr>
<th>CRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 37 fractions for definitive treatment may be approved.</td>
</tr>
</tbody>
</table>

**RO-3.4 Neoadjuvant or Adjuvant Radiotherapy for Locoregionally Confined NSCLC**

Selected patients with stage III non-small cell disease may be treated with radiotherapy either (1) neoadjvantly in order to cytoreduce borderline resectable disease and facilitate subsequent resection or (2) adjuvantly following surgery to treat grossly residual tumor and/or thoracic sites thought to be at high risk for harboring microscopically residual disease.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
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</thead>
<tbody>
<tr>
<td>For neoadjuvant radiotherapy: up to 28 fractions are approved.</td>
</tr>
<tr>
<td>For adjuvant radiotherapy with negative margins and no grossly residual disease: up to 28 fractions are approved.</td>
</tr>
<tr>
<td>For adjuvant radiotherapy with positive margins and/or grossly residual disease: up to 39 fractions are approved.</td>
</tr>
</tbody>
</table>
**RO-3.5 Prophylactic Cranial Irradiation (PCI) for SCLC**

Patients with limited stage SCLC and extensive stage SCLC may be considered for PCI. Extensive stage patients receiving PCI should have controlled extracranial disease. EBRT is directed to the entire brain and is delivered following completion of chemotherapy. Given the low doses commonly prescribed in this setting, IMRT is not considered necessary.

<table>
<thead>
<tr>
<th>2DRT or CRT</th>
</tr>
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<tbody>
<tr>
<td>Up to 10 fractions are approved.</td>
</tr>
</tbody>
</table>

**RO-3.6 Other Thoracic Cancers**

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
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</thead>
<tbody>
<tr>
<td>Up to 30 fractions are approved.</td>
</tr>
</tbody>
</table>

**RO-3.7 Palliative Chest Radiotherapy**

For patients receiving palliative chest radiotherapy, up to 15 fractions may be approved using 2D or CRT.

**References**

1. *Lung Cancer* 2010;69(2):133-140
9. *Int J Radiat Oncol Biol Phys* 2009;75(3 suppl):S3
RO-4~LYMPHOMA

RO-4.0 General Considerations
This disease group includes Hodgkins’ and non-Hodgkins’ lymphoma. Radiotherapy is commonly used in stages I – II intermediate grade non-Hodgkins’ lymphoma and Hodgkin’s disease as a consolidative treatment following chemotherapy to initial sites of disease presentation. For early-stage, low-grade non-Hodgkins’ lymphoma and highly favorable cases of Hodgkins’ disease, radiotherapy may be used alone as a definitive treatment.

RO-4.1 Hodgkins’ Disease
EBRT is commonly prescribed for patients with stages I – II disease following chemotherapy, and all sites of initial disease presentation are treated to the cytoreduced volume. Selected patients presenting with bulky stages III – IV disease may be offered consolidative radiotherapy to initial sites of bulky involvement. Total doses are similar to those used for stages I – II bulky disease and titrated according to chemotherapy response.

Selected patients with highly favorable disease may be treated with EBRT alone. In absence of chemotherapy, initial field doses of 30–36 Gy and boost field doses of 40 Gy and higher may be prescribed.

Given the low doses used and concern for secondary tumor induction in these commonly younger patients, simple CRT field arrangements are preferred over IMRT.

<table>
<thead>
<tr>
<th>2DRT or CRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>For non-bulky disease following complete response to chemotherapy: up to 17 fractions.</td>
</tr>
<tr>
<td>For bulky disease following complete response to chemotherapy: up to 20 fractions.</td>
</tr>
<tr>
<td>For suboptimal response to chemotherapy or treatment with EBRT alone: up to 25 fractions.</td>
</tr>
</tbody>
</table>
**RO-4.2 Non-Hodgkins’ Lymphoma**

Use of radiotherapy in the management of follicular low grade lymphoma is highly individualized. Stages I – II disease may be treated with EBRT alone or with consolidative EBRT to initial disease sites following systemic therapy. Dosing is commonly 20 – 36 Gy using conventional fractionation.

MALTomas of the stomach and other sites is commonly treated with EBRT alone to doses of 30 – 36 Gy.

Mantle cell lymphoma, diffuse large cell B-cell lymphoma and peripheral T-cell lymphoma are commonly treated with chemotherapy followed by consolidative EBRT for stages I – II disease. Chemotherapy alone is more commonly used in the management of advanced stage lymphomas. Radiation doses used in this setting are commonly 36 – 45 Gy with higher doses prescribed for suboptimal chemotherapy response.

Appropriate EBRT techniques for non-Hodgkins’ lymphoma include 2DRT and CRT. Electron beam radiotherapy may be used for primary skin lymphomas and other superficial target volumes.

Primary CNS lymphoma may be treated definitively with radiotherapy, and dose typically ranges from 25-45 Gy depending on a variety of factors. 2DRT or CRT techniques are sufficient for most cases given the lower total dose used and preference to minimize integral dose.

<table>
<thead>
<tr>
<th>2DRT or CRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>For low grade lymphomas and MALTomas: up to 20 fractions is allowed.</td>
</tr>
<tr>
<td>For other, more aggressive lymphomas: up to 25 fractions is allowed.</td>
</tr>
</tbody>
</table>

**Radioimmunotherapy:** including Zevalin and Bexxar, may be indicated for the following:
- CD20 positive newly diagnosed low grade B-cell lymphomas
- relapsed low grade B-cell lymphomas refractory to Rituxan
- transformed B-cell lymphomas
- CD20-positive, intermediate-grade non-Hodgkin’s lymphoma following full-course CHOP-based chemotherapy

**References**
2. *Cancer* 1993;71(7):2342-2350
10. *Cancer* 2010;116:3815-3824
RO-5~BONE METASTASIS

RO-5.1 General Considerations
Multiple radiotherapy modalities are available in this setting, including EBRT, SBRT and radiopharmaceutical therapy.

RO-5.1 EBRT
Multiple prospective studies have evaluated a wide range of EBRT dose-fractionation schedules for these patients, and protracted fractionation (i.e., > 10 fractions) treatment courses have largely been found to no more effective than shorter courses in the degree and durability of pain palliation. This is supported by ASTRO’s recommendation to Choosing Wisely (recommendation #3) states: Don’t routinely use extended fractionation schemes (>10 fractions) for palliation of bone metastases. Patients with poor overall performance status may be treated with very short course treatment schedules (i.e., 5 fractions or fewer, or one fraction of 8 Gy), whereas selected favorable patients with multiple bone metastases may be considered for longer treatment courses (i.e., up to 15 fractions).

In most cases, 2DRT is appropriate for treatment delivery due to the lower doses commonly delivered in this setting. CRT and IMRT will be considered for the following case types:
- Immediately adjacent or overlapping radiotherapy treatment fields have been previously delivered for the patient
- Only a single bone metastasis is identified by technetium or sodium fluoride-based whole-body skeletal imaging for a patient with otherwise good or excellent performance status
- Patients with a significant extraosseous component of disease where conformal treatment may limit normal tissue toxicity

<table>
<thead>
<tr>
<th>EBRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10 fractions is allowed using 2DRT.</td>
</tr>
</tbody>
</table>

RO-5.2 SBRT
SBRT should not, per the ASTRO Task Force, be used as the primary treatment of vertebral bone lesions causing spinal cord compression. SBRT may be offered to patients with recurrent spinal disease following a prior course of EBRT where pain and/or clinical or radiographic evidence of spinal cord encroachment are present. SBRT is particularly useful in this setting to administer meaningful radiation dose while maintaining adequate sparing of the spinal cord. SBRT is not indicated for recurrent bone metastases involving non-spinal skeletal sites.

<table>
<thead>
<tr>
<th>SBRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5 fractions is allowed.</td>
</tr>
</tbody>
</table>
**RO-5.3 Radiopharmaceutical Therapy**

Radiopharmaceutical therapy may be used in the setting of diffuse and symptomatic bone metastasis not amenable to palliation with limited EBRT fields.

- **Strontium-89** and **Samarium-153** are injectable agents indicated for patients with diffuse and symptomatic bone metastases secondary to prostate and breast cancer only for which treatment with local field external beam radiotherapy is not clinically practical. Prescribing physicians are advised to verify each patient considered for such therapy has adequate bone marrow reserves as per the manufacturers’ guidelines prior to ordering the agent for injection.

- **Radium-223** is an injectable agent indicated for patients with bone metastases secondary to prostate cancer only and with good or excellent performance status.

<table>
<thead>
<tr>
<th><strong>Strontium-89 or Samarium-153</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Only 1 injection is allowed.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Radium-223</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The following general clinical requirements are necessary prior to approval of the agent (more specific criteria are evaluated during the authorization process):</td>
</tr>
<tr>
<td>o castrate-resistant disease with at least 2 skeletal metastases on imaging and no lung, liver or brain metastases (lymph node only metastasis is allowed)</td>
</tr>
<tr>
<td>o symptomatic disease with radiographic or biochemical evidence of disease progression</td>
</tr>
<tr>
<td>o adequate hematologic, liver and renal function:</td>
</tr>
<tr>
<td>o no recent chemotherapy (within 4 weeks of request)</td>
</tr>
<tr>
<td>o no prior hemibody radiotherapy</td>
</tr>
</tbody>
</table>

A series of 6 monthly injections is allowed per the patient’s lifetime.

**References**

2. *Int J Radiat Oncol Biol Phys* 2009;75:1501-1510
4. *J Neurosurg Spine* 2011;14:151-166
RO-6.0 General Considerations

Tumor sites included in this group are esophageal, gastric, pancreatic, hepatic and biliary system cancer. With rare exception, EBRT is the sole radiation treatment modality used in the management of these tumors. EBRT may be used adjuvantly following attempt at curative resection or definitively for medically or technically inoperable cancers, often in conjunction with chemotherapy. SBRT may be considered for a few uncommon clinical scenarios:

- For definitive treatment of small and medically inoperable hepatocellular carcinoma
- For salvage of local recurrence of previous treated pancreatic cancer

RO-6.1 Esophageal and Gastric Cancers

Patients undergoing curative resection of esophageal and gastric cancers are often candidates for adjuvant chemoradiotherapy due to the high rate of locoregional and distant disease recurrence. Post-operative radiotherapy doses of 45.0 – 50.4 Gy are commonly prescribed to address microscopic disease risk in the primary surgical bed and draining lymphatics.

Patients with technically or medically unresectable disease without evidence of distant metastases may be considered for definitive chemoradiotherapy. Either CRT or IMRT is indicated to deliver higher radiation doses to achieve local disease control while limiting exposure to surrounding radiosensitive organs, including the heart, liver, small bowel, spinal cord and kidneys.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>For postoperative radiotherapy: up to 28 fractions is allowed.</td>
</tr>
<tr>
<td>For definitive radiotherapy for unresectable disease: up to 30 fractions is allowed.</td>
</tr>
</tbody>
</table>

Reference


RO-6.2 Pancreatic Cancer and Extrahepatic Cholangiocarcinoma

Whether delivered with neoadjuvant, adjuvant or definitive intent, IMRT offers improved dosimetry that may help to spare the multiple radiosensitive organs and structures of the upper abdomen, including kidneys, small bowel and spinal cord. Palliative patients (with unresectable or metastatic disease) may receive 3DRT.
SBRT for definitive treatment is considered investigational. However, SBRT may be offered for highly selected cases demonstrating all of the following:
  - local recurrence or persistent disease after prior attempt at curative surgery or radiotherapy
  - tumor ≤ 5 cm
  - no radiographic evidence of distant metastasis

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>For adjuvant radiotherapy following curative resection: up to 28 fractions is allowed.</td>
</tr>
<tr>
<td>For definitive radiotherapy for unresectable disease: up to 34 fractions is allowed.</td>
</tr>
<tr>
<td>SBRT</td>
</tr>
<tr>
<td>Up to 5 fractions is allowed.</td>
</tr>
</tbody>
</table>

**Reference**

1. *Int J Radiat Oncol Biol Phys* 2010 Sep 22 Abstract

**RO-6.3 Hepatocellular Carcinoma and Intrahepatic Cholangiocarcinoma**

If used, radiotherapy is commonly offered for patients with localized but unresectable disease. Either CRT or IMRT is an appropriate radiation therapy modality in this setting where tumor is surrounded by multiple critical radiosensitive structures and where high radiation doses are needed to establish local disease control. SBRT may be considered for patients with medically unresectable and solitary hepatocellular carcinoma ≤ 5 cm.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 35 fractions is allowed.</td>
</tr>
<tr>
<td>SBRT</td>
</tr>
<tr>
<td>Up to 5 fractions is allowed.</td>
</tr>
</tbody>
</table>

**Radioactive Yttrium-90 Microspheres**

Yttrium-90 Microspheres use is permitted in accordance with FDA approved guidelines for unresectable liver metastases or hepatocellular carcinoma.

**Reference**

RO-7.0 General Considerations

The management of localized prostate cancer is controversial with regard to both the selection of treatment modality between surgery and radiotherapy and the need for treatment versus surveillance for early stage disease. ASTRO recommends that the management of low-risk prostate cancer management should not be initiated without discussing active surveillance (Choosing Wisely #2).

For the purposes of selecting an appropriate treatment, several multi-tiered risk systems have been proposed. Each roughly assigns a risk level according to clinical stage, Gleason score and serum PSA at presentation.

- **Low risk disease** may include patients with clinical stage T1 – T2a disease, Gleason score of 5 – 6 and presenting PSA of < 10 ng/ml. These patients are often recommended monotherapy such as prostatectomy, external beam radiotherapy or brachytherapy alone. Select patients with anticipated survival of < 10 years may be offered active surveillance in lieu of definitive treatment.

- **Intermediate risk disease** may include patients with clinical stage T2b – T3 disease, Gleason score of 7 or presenting PSA of 10 – 20 ng/ml. These patients are often recommended prostatectomy, combined hormonal deprivation therapy and external beam radiotherapy or combined external beam radiotherapy and brachytherapy. Unless the patient’s overall performance status is chronically poor, active surveillance may not be recommended for this more advanced disease group.

- **High risk disease** may include patients with clinical stage T3 – T4 disease, Gleason score > 7 or presenting PSA of > 20 ng/ml. These patients are often recommended combined hormonal deprivation therapy and external beam radiotherapy. Select patients with small volume, high risk disease may be offered prostatectomy instead.

Among radiotherapy modalities, EBRT, HDR brachytherapy and LDR brachytherapy represent standard treatment options. SBRT (e.g. Cyberknife®) is considered an investigational therapy within the context of these guidelines but may be supported as a standard of care by a given payor’s medical policy and therefore authorized.

**RO-7.1 EBRT**

IMRT and CRT are both considered appropriate EBRT modalities for localized prostate cancer. Total prescribed doses vary according to treatment intent, for example definitive versus salvage, and whether brachytherapy boost is planned.

Combined EBRT and brachytherapy may be offered for patients with at least intermediate risk disease as defined by the criteria below. Combined modality therapy is
not considered medically necessary for low-risk prostate cancer. Criteria for combined therapy include all of the following:
  o Pre-treatment prostate specific antigen (PSA) < 20 ng/ml
  o Gleason’s score 7 or greater in multiple biopsy cores

Adjuvant or salvage EBRT is indicated following definitive prostatectomy for any of the following pathologic findings:
  o Seminal vesicle involvement
  o Positive surgical margin
  o Extracapsular disease extension
  o Detectable or rising postoperative PSA

Proton beam therapy has not demonstrated any disease or toxicity advantage over CRT or IMRT in a controlled study and is considered investigational. ASTRO’s recommendation (Choosing Wisely #4) state: Don’t routinely recommend proton beam therapy for prostate cancer outside of a prospective clinical trial or registry. Most payors also recognize proton treatment for prostate cancer as investigational. Payors may allow treatment when patients are enrolled on a national registry or national clinical trial. For additional details, please refer to section RO-8 Proton Beam Radiotherapy.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>For definitive radiotherapy of intact prostate cancer: up to 45 fractions allowed.</td>
</tr>
<tr>
<td>For definitive radiotherapy of intact prostate cancer when combined with brachytherapy: up to 28 fractions allowed.</td>
</tr>
<tr>
<td>For adjuvant radiotherapy following definitive prostatectomy with high-risk pathologic features: up to 38 fractions allowed.</td>
</tr>
<tr>
<td>For adjuvant radiotherapy following definitive prostatectomy where there is gross residual disease, higher doses would be appropriate, up to 39 fractions</td>
</tr>
<tr>
<td>For salvage radiotherapy of local recurrence following prior definitive prostatectomy: up to 40 fractions allowed.</td>
</tr>
</tbody>
</table>

References
3. JAMA 2008;299(23):2760-2769
4. JAMA 2006;296(19):2329-2335
**RO-7.2 Brachytherapy**

Either LDR or HDR brachytherapy as monotherapy is appropriate in the management of localized prostate cancer. LDR seed implant is always administered as a single operative procedure, whereas HDR may be administered with catheter placements and is typically delivered in several fractions over multiple days. Combined EBRT and brachytherapy is appropriate for at least intermediate risk disease but is considered medically not necessary for low risk disease.

<table>
<thead>
<tr>
<th>LDR or HDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>As monotherapy: up to 6 HDR fractions or 1 LDR fraction allowed.</td>
</tr>
<tr>
<td>As boost therapy: up to 4 HDR fractions or 1 LDR fraction allowed.</td>
</tr>
</tbody>
</table>

**References**

RO-8.0 General Considerations

All requests for PBT will be sent for Medical Director review.

Clinical trial coverage for proton beam therapy is solely at the discretion of the payors. If no payor policy exists, MedSolutions policy will be used which follows Medicare policy and ASTRO guidelines regarding use of proton therapy, and as further described below.

ASTRO recommendation (Choosing Wisely #4): Don’t routinely recommend proton beam therapy for prostate cancer outside of a prospective clinical trial or registry.

Approved requests for PBT as a substitution for stereotactic radiosurgery will be authorized for the same fraction number as the stereotactic course but will substitute “CPT®77525” for the treatment delivery code.

RO-8.1 Specific Disease Considerations

Prostate Cancer

PBT is considered not medically necessary for localized prostate cancer.

ASTRO recommendation (Choosing Wisely #4): Don’t routinely recommend proton beam therapy for prostate cancer outside of a prospective clinical trial or registry.

Lung and Upper Abdominal Cancers

PBT is not indicated for the treatment of lung, pancreatic and other tumor sites subject to respiratory movement.

Brain Tumors

PBT is considered not medically necessary for this disease group.

Ocular Melanoma

PBT is considered medically necessary for the management of this disease. Stereotactic PBT has been performed for this specific indication.

PBT has been utilized for several decades as an alternative to episcleral plaque brachytherapy for uveal melanoma with high rates of local disease control published.

Spinal and Base of Skull Chordoma and Chondrosarcoma

PBT is considered medically necessary in these settings.
PBT has been used adjuvantly and definitively for technically unresectable disease in order to deliver adequate radiation doses to target volumes proximal to brain and spinal cord. Long-term results on its use and efficacy have been published.

References
5. *Radiother Oncol* 2012;103:8-11
RO-9.0 General Considerations

Radiation therapy is a common treatment modality in the management of head and neck cancers, both as a curative modality and as an adjuvant treatment following surgery.

Fractionation can vary widely in head and neck radiotherapy. Conventional fractionation consists of daily fractions of 1.8 – 2.0 Gy (2.0 Gy daily is generally preferred, particularly in cases where radiotherapy is the sole curative modality). When combined with chemotherapy, standard fractionation is typically utilized. Dose may vary within a plan from 54 to 72 Gy (for example, CTV low risk vs. gross disease) depending on the modality used. Maximum plan dose varies with overall stage and fractionation schedule. Altered fractionation, typically used without chemotherapy, may consist of either:

- Twice-daily fractions throughout the course of treatment (ie, hyperfractionation to total doses of 75 – 81 Gy using 1.2 – 1.25 twice daily fractions); or
- Twice-daily fractions during the boost portion of treatment only (ie, concomitant boost accelerated therapy to a total dose of 72 Gy delivered over 6 weeks)

Although either IMRT or CRT may be used for most cases of head and neck cancer, IMRT is preferred in cases where treatment of the target volume with CRT may result in increased risks to the major salivary glands, temporal lobes, mandibles, auditory structures and optic structures as compared to IMRT.

Occult Primary Head and Neck Cancer

This designation refers to a squamous cell carcinoma presenting in cervical lymph node(s) and without evidence of either a primary disease site or distant disease, suggestive of an undetected primary site in the upper aerodigestive tract. This clinical diagnosis is potentially curative. Conversely, discovery of any other pathology, a positive radiographic finding below the neck, and/or a clinical finding or history suggesting another probable primary site suggests metastatic disease from a distant primary site. Metastatic disease is considered incurable, and therefore palliative therapy guidelines would apply. Requests for aggressive local control using higher curative dose radiotherapy will be sent for Medical Director review.

References

1. Lancet Oncol 2010; 11: 85-91
RO-9.1 Definitive Radiotherapy

CRT or IMRT is appropriate for all head neck primary tumors treated with definitive intent except for early stage glottis, early stage supraglottic and lip cancer, where non-IMRT techniques are more appropriate for these small and simple target volumes.

Conventional fractionation is appropriate for all stages of disease. Locally advanced disease is typically treated with concurrent chemoradiotherapy. Alternate fractionation schedules may be considered for advanced stage disease, particularly when chemotherapy is omitted.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Stage Disease may receive up to 74 Gy in 37 fractions using conventional fractionation. Early stage larynx T1-2N0 may receive up to 66 Gy at 2 Gy per fraction.</td>
</tr>
<tr>
<td><strong>Exception:</strong> for laryngeal cancers, the following dose schedules are appropriate and preferred in addition to standard fractionation as described above:</td>
</tr>
<tr>
<td>- Tis (carcinoma in situ): 56.25 – 58.5 Gy at 2.25 Gy per fraction</td>
</tr>
<tr>
<td>- T1 – 2, N0: 62.5 Gy at 2.5 Gy per fraction or 63 Gy at 2.25 Gy per fraction.</td>
</tr>
<tr>
<td>Late Stage Disease may receive up to 74 Gy in 37 fractions using conventional fractionation.</td>
</tr>
<tr>
<td><strong>Exception:</strong> for selected definitive cases treated with radiotherapy alone, doses up to ~81 Gy in 68 fractions using hyperfractionation and 72 Gy in 40 fractions using concomitant boost fractionation may be used instead.</td>
</tr>
</tbody>
</table>

References

1. *Radiother Oncol* 2007; 85: 156-70
2. *Ann Oncol* 2010; 21 Suppl 5:v184-6.: v184-v186
**RO-9.2 Adjuvant Radiotherapy**

Patients may require postoperative radiotherapy with any of the following risk factors for locoregional disease recurrence:
- close or positive margins
- pathologic N2-3 disease
- cartilage invasion
- nodal disease extracapsular extension (ECE)
- nodal disease involving levels IV or V
- pathologic T3 or T4 primary disease
- perineural (PNI) or lymphovascular invasion (LVSI)

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intermediate Risk</strong> patients with 1 above risk factor, excluding extracapsular extension should receive: 1.8 Gy fractions to a total dose of 57.6 Gy or 2 Gy fractions to a total dose of 60 Gy (maximum 32 fractions)</td>
</tr>
<tr>
<td><strong>High Risk</strong> patients with either 2 or more above risk factors or extracapsular extension: 1.8 Gy fractions to a total dose of 63 Gy or 2 Gy fractions to a total dose of 66 Gy (maximum 35 fractions)</td>
</tr>
</tbody>
</table>

The benefit of postoperative concurrent chemoradiotherapy over postoperative RT alone has been demonstrated primarily for patients with positive surgical margins and/or extracapsular extension (e.g. EORTC/RTOG trial data).

**RO-9.3 Brachytherapy**

Brachytherapy as a monotherapy is appropriate for certain early stage lip and oral cavity tumors. Brachytherapy as a boost is appropriate after external beam radiotherapy for technically implantable lip and oral cavity tumors; brachytherapy boost for nasopharyngeal tumors is also appropriate but using intracavitary techniques instead. External beam radiotherapy doses of 45–50 Gy using conventional fractionation are commonly used prior to brachytherapy boost. Brachytherapy dosing and fractionation may vary widely and are reviewed on a case-by-case basis. Oral cavity tumors with attachment to periosteum or with frank invasion of bone are contraindicated for brachytherapy given the high risk of osteoradionecrosis in this setting.

**References**
1. *Radiother Oncol* 2007; 85: 156-70
2. *Ann Oncol* 2010; 21 Suppl 5:v184-6.: v184-v186
4. *Int J Radiat Oncol Biol Phys* 2012; 84:1198
RO-10.1 General Considerations

This disease group includes endometrial/uterine, cervical, vaginal and vulvar cancers. Management considerations with radiotherapy are complex, owing to the variety of applicable radiotherapy modalities and treatment indications.

RO-10.2 Endometrial Cancer

Almost all cases of endometrial cancer requiring radiotherapy are in the adjuvant setting following curative surgery (see American Brachytherapy Society Guidelines).

Recommendations for adjuvant radiotherapy are based on the stage of disease and the absence or presence of adverse pathologic features. Adverse pathologic features indicating adjuvant treatment include the following:

- grade 2 or 3 disease
- myometrial invasion > 50%
- age > 60 years
- lymphovascular (LVSI) invasion
- large tumor size (> 4 cm)
- lower uterine segment (cervical) involvement

Low risk patients (those patients who have none of the above features, i.e. grade 1 or 2 with less than 50% myometrial invasion) should not receive adjuvant radiotherapy due to demonstrated minimal risk of recurrence versus surgery alone (see ASTRO Choosing Wisely #6). For all other early stage disease, EBRT or vaginal cylinder brachytherapy (typically HDR) alone appear to offer equivalent disease control outcomes.

Unusual histologies of endometrial malignancy include papillary serous adenocarcinoma, clear cell adenocarcinoma, endometrial stromal sarcoma, undifferentiated sarcoma and leiomyosarcoma), carcinosarcomas and malignant mixed mesodermal tumors. These tumors tend to be of higher grade and behave more aggressively than the more common endometrioid carcinomas. Post-operative radiotherapy is almost always indicated.

Uncommon medically inoperable cases may be treated with pelvic EBRT followed by HDR or LDR boost therapy.
**RO-10.2 Endometrial Cancer**

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 28 fractions allowed in the adjuvant setting.</td>
</tr>
<tr>
<td>Up to 35 fractions allowed in the definitive setting if brachytherapy cannot be performed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LDR or HDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5 HDR fractions or 1 LDR fraction allowed when used as a monotherapy in the adjuvant setting.</td>
</tr>
<tr>
<td>Up to 3 HDR fractions or 1 LDR fraction allowed when combined with EBRT in the adjuvant setting.</td>
</tr>
<tr>
<td>Up to 5 HDR fractions or 1 LDR fraction allowed when combined with EBRT in the definitive setting.</td>
</tr>
</tbody>
</table>

**RO-10.3 Cervix Cancer**

Postoperative radiotherapy may be considered for patients undergoing surgery as primary treatment. In these instances, pelvic EBRT should be delivered to a dose of 45 – 50.4 Gy. Postoperative EBRT is indicated in patients with the following adverse pathology: locoregional recurrence risk scenarios:

- 2 or more of the following risk factors (if negative margins and lymph nodes):
  - lymphovascular invasion, > 1/3 cervical stoma invasion, or tumor > 4 cm, or
  - Any one of the following risk factors: lymph node positivity or positive margin.

For cases considered for definitive radiotherapy, combined EBRT and brachytherapy (typically multiple fractions of tandem and ovoid HDR) represents the standard of care (see American Brachytherapy Society Guidelines). IMRT should not be used to deliver high dose treatment to the cervix as replacement for brachytherapy, as this has resulted in inferior outcomes. When clinically indicated for treatment, para-aortic fields should be treated concurrently with pelvic nodes using IMRT to minimize toxicity.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
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</thead>
<tbody>
<tr>
<td>Up to 28 fractions allowed in the adjuvant setting or definitive setting with planned brachytherapy boost.</td>
</tr>
<tr>
<td>Up to 39 fractions allowed in the definitive setting when brachytherapy cannot be delivered.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LDR or HDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDR boost as part of definitive treatment may be given using up to 2 implants.</td>
</tr>
<tr>
<td>HDR boost as part of definitive treatment may be given in a maximum of 5 fractions.</td>
</tr>
<tr>
<td>Up to 5 HDR fractions or 1 LDR fraction allowed when used as monotherapy adjuvantly.</td>
</tr>
<tr>
<td>Up to 3 HDR fractions or 1 LDR fraction allowed when combined with EBRT adjuvantly.</td>
</tr>
</tbody>
</table>
**RO-10.4 Vaginal Cancer**

Primary radiotherapy consists of external beam radiotherapy with or without brachytherapy boost. EBRT dose is typically 40–50 Gy with a brachytherapy boost or 65–70 Gy if EBRT is used alone. Brachytherapy alone may be considered for patients with early stage disease characteristics as follows:

- < 2 cm tumor size
- well differentiated pathology
- < 0.5 cm tumor thickness,
- well defined lesion borders
- no involvement of the rectovaginal septum

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
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</thead>
<tbody>
<tr>
<td>Up to 28 fractions allowed in the adjuvant setting or definitive setting with planned brachytherapy boost.</td>
</tr>
<tr>
<td>Up to 39 fractions allowed in the definitive setting when boost brachytherapy cannot be delivered.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LDR or HDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 3 HDR fractions and 1 LDR fraction allowed after pelvic EBRT.</td>
</tr>
<tr>
<td>Up to 5 HDR fractions and 2 LDR fractions allowed if brachytherapy is used as a monotherapy.</td>
</tr>
</tbody>
</table>

**RO-10.5 Vulvar Cancer**

CRT or IMRT can be used in the treatment of vulvar cancer. Following definitive surgery, it is customary to deliver a postoperative dose of 45–50.4 Gy to the pelvis with a boost dose to 60 Gy delivered to the inguinal bed when positive disease or extracapsular extension is noted at surgery. When the patient is being treated definitively with chemoradiation, boost to gross disease of up to 70 Gy with EBRT is allowed. Brachytherapy is not generally indicated in the management of vulvar cancer.

**References**

1. www.CancerCenter.com
3. *Handbook of Evidence-Based Radiation Oncology*. 2nd Ed
5. *Handbook of Evidence-Based Radiation Oncology*. 2nd Ed.
15. J Clin Oncol. 2004 Apr 1; 22(7):1234-41
17. Clinical Radiation Oncology. 3rd Ed 2012, Chapter 45
18. Principles and Practice of Radiation Oncology. 3rd Ed. 1998, Chapter 63
19. Handbook of Evidence-Based Radiation Oncology. 2nd Ed.
21. Clinical Radiation Oncology. 3rd Ed 2012, Chapter 45
22. Principles and Practice of Radiation Oncology. 3rd Ed. 1998, Chapter 63
24. National Comprehensive
26. Clinical Radiation Oncology. 3rd Ed 2012, Chapter 45
31. Principles and Practice of Radiation Oncology. 3rd Ed. 1998, Chapter 62
32. Handbook of Evidence-Based Radiation Oncology. 2nd Ed.
34. Vaginal Cancer. In: Clinical Radiation Oncology 2nd Ed. 2007
35. Principles and Practice of Radiation Oncology. 3rd Ed. 1998
36. Handbook of Evidence-Based Radiation Oncology. 2nd Ed.
**RO-11.0 General Considerations**

Surgery is the primary treatment modality for sarcoma, however a multidisciplinary approach is generally recommended to facilitate anatomic and functional preservation. Treatment for resectable disease may include neoadjuvant, IORT and/or adjuvant radiation therapy.

All resected tumors with close or positive surgical margins should be considered for adjuvant radiation therapy due to high risk of local recurrence. Unresectable or medically inoperable sarcomas may be considered for definitive radiation therapy. Borderline resectable disease may be rendered technically resectable following a course of neoadjuvant radiotherapy.

Primary treatment for gastrointestinal stromal tumors (GISTs) is surgery +/- systemic therapy. Radiation therapy is not indicated in the adjuvant setting and is generally reserved for palliation of drug-resistant disease.

**RO-11.1 Soft Tissue Sarcoma**

Preoperative treatment is indicated for patients presenting with selected tumors with high likelihood of close or positive surgical margins in order to facilitate subsequent complete resection. Commonly, a dose of 45 – 50 Gy is prescribed in the neoadjuvant setting.

Intraoperative and postoperative treatment is indicated for patients following surgery of deep compartment tumors and selected large superficial compartment tumors. Intraoperative and/or postoperative radiotherapy using external beam therapy, IORT or brachytherapy may be necessary for cases with close or positive margins following neoadjuvant therapy and attempted resection. If surgical margins are positive, then boost doses up to 70 Gy are appropriate.

Patients deemed unresectable following preoperative therapy may require radiation dose escalation to 70 – 75 Gy.

Typically CRT is considered sufficient, but IMRT may also be considered appropriate for this disease group.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 35 fractions is allowed in the adjuvant setting with negative margins.</td>
</tr>
<tr>
<td>Up to 39 fractions is allowed in the adjuvant setting with positive margins.</td>
</tr>
<tr>
<td>Up to 42 fractions is allowed in the definitive setting for medically or technically inoperable disease.</td>
</tr>
<tr>
<td>Up to 28 fractions is allowed in the neoadjuvant setting.</td>
</tr>
</tbody>
</table>
**RO-11.2 Sarcoma of Bone**

These uncommon malignancies can often be treated using CRT.

- For Ewing’s sarcoma, a dose of 45 Gy in 25 fractions followed by a boost dose to 50 – 56 Gy is commonly used.
- For chondrosarcoma, a dose of 45 Gy in 25 fractions followed by a boost dose to 54 – 65 Gy is commonly used.
- For osteosarcoma, a dose of 45 Gy in 25 fractions followed by a boost dose to 54 – 70 Gy is commonly used.
Radiation therapy is used in the adjuvant and neoadjuvant settings for the management of rectal cancer. In the neoadjuvant setting, radiotherapy may allow for cytoreduction of tumor to permit sphincter-sparing surgery. In the adjuvant setting, radiotherapy addressed microscopic disease risk at the primary site and regional lymphatics. Tumors located below the peritoneal reflection and with T3N0 and greater pathologic stage are considered appropriate for adjuvant radiotherapy.

In almost all cases, EBRT is the sole radiotherapy modality used. Intraoperative radiotherapy boost may be necessary for treatment of selected cases following attempted resection with positive margins.

Among EBRT modalities, CRT is considered most appropriate for rectal cancer therapy. Typically bowel displacement technique allows for adequate small bowel tissue sparing. Patients with a history of bowel surgery or inability to tolerate a displacement technique may benefit from IMRT use.

Anal cancer of early stage may be treated with surgical resection alone. Advanced disease typically includes definitive chemoradiotherapy. CRT is typically utilized however patients with a history of bowel surgery or inability to tolerate a displacement technique may benefit from IMRT use.

<table>
<thead>
<tr>
<th>CRT or IMRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 30 fractions is allowed in the neoadjuvant setting or adjuvant setting with negative surgical margins</td>
</tr>
<tr>
<td>Up to 35 fractions is allowed in the adjuvant setting with positive surgical margins</td>
</tr>
<tr>
<td>Up to 39 fractions is allowed in the definitive setting for unresectable disease</td>
</tr>
</tbody>
</table>
RADIATION ONCOLOGY GUIDELINE REFERENCES

RO-1~CENTRAL NERVOUS SYSTEM

RO-1.1 Conditions not Associated with Tumors

RO-1.2 Benign Brain Tumors (including Pituitary)

RO-1.3 Malignant or High Grade Tumors

RO-1.4 Metastatic Disease

RO-2~BREAST CANCER

RO-2.1 External Beam Therapy

RO-2.2 Brachytherapy
RADIATION ONCOLOGY GUIDELINE REFERENCES

RO-3~LUNG AND OTHER THORACIC CANCERS

RO-3.0 General Considerations

RO-3.1 Small Cell Lung Cancer (SCLC)

RO-3.2 Non-Small Cell Lung Cancer (NSCLC)

RO-4~LYMPHOMA


**RO-5~BONE METASTASIS**

**RO-5.2 Radiation Therapy Techniques**

**RO-6~CANCERS of the UPPER GASTROINTESTINAL SYSTEM**

**RO-6.1 Primary Hepatic Tumors**

**RO-6.2 Gastric (Stomach) Cancer**

**RO-6.3 Pancreatic and Extra-Hepatic Biliary Tumors**

**RO-6.4 Treatment of Metastatic Disease in the Upper Abdomen and Liver**

**RO-7~PROSTATE CANCER**

**RO-7.0 General Considerations**

**RO-7.1 External Beam Therapy**


**RO-7.2 Brachytherapy**


**RO-10~HEAD and NECK CANCER**


Radiation Oncology Guidelines Version 3.0

RO-11~GYNECOLOGICAL CANCER

RO-11.1 Ovarian Cancer

- www.CancerCenter.com
- EK, Roach III M, Handbook of Evidence-Based Radiation Oncology, 2nd Ed.

ovariancancer.jhmi.edu/treatment.cfm

www.cancer.gov/cancertopics/treatment/ovarian


**RO-11.2 Endometrial Cancer**


- Hansen EK, Roach III M, Handbook of Evidence-Based Radiation Oncology 2nd Ed.


**RO-11.3 Cervix Cancer**


Radiation Oncology Guidelines Version 3.0

RO-11.4 Vaginal Cancer


- Perez CA, Brady LW. Principles and Practice of Radiation Oncology. 3rd Ed 1998, Philadelphia, PA.


RO-11.5 Vulvar Cancer


- Perez CA, Brady LW. Principles and Practice of Radiation Oncology. 3rd Ed 1998, Philadelphia, PA.


RO-12~SARCOMA


The American Medical Association (AMA) has established several 2015 code changes for radiation oncology. These changes include: (All code changes are effective 01/01/2015)

- All external beam treatment delivery codes have been rewritten.
- Codes for different levels of IMRT complexity have been created.
- A technology independent IGRT code has been created (which includes the previous Category III tracking code).
- IGRT has been bundled into IMRT delivery codes.
- Brachytherapy and Teletherapy planning codes have been revised and basic dosimetry calculations have been bundled into these codes.

### Nine codes traditionally used to report conventional radiation therapy treatment delivery have been deleted:

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>77403</td>
<td>Radiation treatment delivery, single treatment area, single port or parallel opposed ports, simple blocks or no blocks; 6-10 MeV</td>
</tr>
<tr>
<td>77404</td>
<td>; 11-19 MeV</td>
</tr>
<tr>
<td>77406</td>
<td>; 20 MeV or greater</td>
</tr>
<tr>
<td>77408</td>
<td>Radiation treatment delivery, 2 separate treatment areas, 3 or more ports on a single treatment area, use of multiple blocks; 6-10 MeV</td>
</tr>
<tr>
<td>77409</td>
<td>; 11-19 MeV</td>
</tr>
<tr>
<td>77411</td>
<td>; 20 MeV or greater</td>
</tr>
<tr>
<td>77413</td>
<td>Radiation treatment delivery, 3 or more separate treatment areas, custom blocking, tangential ports, wedges, rotational beam, compensators, electron beam; 6-10 MeV</td>
</tr>
<tr>
<td>77414</td>
<td>; 11-19 MeV</td>
</tr>
<tr>
<td>77416</td>
<td>; 20 MeV or greater</td>
</tr>
</tbody>
</table>

Conventional radiation therapy treatment delivery, performed with a megavoltage beam, is reported using the following three codes only. The code descriptors and criteria for reporting these codes have been revised:

- **Simple:** All of the following criteria are met (and none of the complex or intermediate criteria are met): single treatment area; one or two ports; and two or fewer simple blocks.
- **Intermediate:** Any of the following criteria are met (and none of the complex criteria are met): two separate treatment areas; three or more ports on a single treatment area; or three or more simple blocks.
- **Complex:** Any of the following criteria are met: three or more separate treatment areas; custom blocking; tangential ports; wedges; rotational beam; field-in-field or other tissue compensation that does not meet IMRT guidelines; or electron beam.

The energy level of the megavoltage beam no longer defines the complexity level of the codes. The criteria for reporting the newly revised conventional radiation therapy treatment delivery codes are different from the energy-based system previously used and are described below:

- **Simple:** All of the following criteria are met (and none of the complex or intermediate criteria are met): single treatment area; one or two ports; and two or fewer simple blocks.
- **Intermediate:** Any of the following criteria are met (and none of the complex criteria are met): two separate treatment areas; three or more ports on a single treatment area; or three or more simple blocks.
- **Complex:** Any of the following criteria are met: three or more separate treatment areas; custom blocking; tangential ports; wedges; rotational beam; field-in-field or other tissue compensation that does not meet IMRT guidelines; or electron beam.
## Intensity Modulated Radiation Therapy (IMRT) Treatment Delivery Codes

**Code 77418** has been **deleted**:

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>77418</td>
<td>Intensity modulated treatment delivery, single or multiple fields/arcs, via narrow spatially and temporally modulated beams, binary, dynamic MLC, per treatment session</td>
</tr>
</tbody>
</table>

IMRT treatment delivery is now reported using **two new codes**:

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>77385</td>
<td>Intensity modulated treatment delivery (IMRT), includes guidance and tracking, when performed; <em>simple</em></td>
</tr>
<tr>
<td>77386</td>
<td>Intensity modulated treatment delivery (IMRT), includes guidance and tracking, when performed; <em>complex</em></td>
</tr>
</tbody>
</table>

Criteria for reporting the **new** IMRT delivery codes are:

- **Simple**: Any of the following: prostate, breast, and all sites using physical compensator-based IMRT.
- **Complex**: Includes all other sites if not using physical compensator-based IMRT.

**Compensator IMRT (0073T)** has been **deleted** and will now be reported using **77385**:

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0073T</td>
<td>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</td>
</tr>
</tbody>
</table>

*Guidance and tracking included in IMRT*

“The technical component (TC) of image guidance and tracking is now included in the IMRT delivery codes. When guidance and tracking are performed, the physician will only report the professional component (PC) of the new guidance and tracking code. Please note the complex conventional treatment delivery code (77412) now includes field-in-field techniques that are commonly used in treating breast cancer. This should not be confused with breast IMRT.”

*ASTRO www.astro.org Accessed: 09/18/2014*

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**NOTE:** The Health Insurance Portability and Accountability Act (HIPAA) transaction and code set rules require the use of the medical code set that is valid at the time the service is provided. There is no grace period given to implement these changes. **2015 changes are effective: 01/01/2015.**
Image Guided Radiation Therapy (IGRT) Codes

The following codes have been deleted: CPT®77421, CPT®76950 and 0197T. CPT®77014 should no longer be reported to describe the work associated with IGRT.

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>77421</td>
<td>Stereoscopic X-ray guidance for localization of target volume for the delivery of radiation therapy</td>
</tr>
<tr>
<td>76950</td>
<td>Ultrasonic guidance for placement of radiation therapy fields</td>
</tr>
<tr>
<td>0197T</td>
<td>Intra-fraction localization and tracking of target or patient motion during delivery of radiation therapy (e.g., 3D positional tracking, gating, 3D surface tracking), each fraction of treatment</td>
</tr>
</tbody>
</table>

All guidance and tracking will be reported with the following new code:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>77387</td>
<td>Guidance for localization of target volume for delivery of radiation treatment delivery, includes intrafraction tracking, when performed</td>
</tr>
</tbody>
</table>

77387 TC bundled into IMRT delivery codes*

The TC of 77387 has been bundled into the new IMRT delivery codes (77385 and 77386). To report the professional component (PC) of guidance and tracking with IMRT, use 77387 with modifier 26. IGRT was not bundled into the conventional radiation therapy treatment delivery codes. Continue to report the global (TC and PC) of 77387 if image guidance is performed during conventional radiation treatment delivery. As in the past, do not report the TC of 77387 with 77371, 77372 or 77373. These codes have the work associated with image guidance included in their definition.


Red font = Deleted  Blue font = New  ▲ and strikethrough text = Revised

NOTE: The Health Insurance Portability and Accountability Act (HIPAA) transaction and code set rules require the use of the medical code set that is valid at the time the service is provided. There is no grace period given to implement these changes. 2015 changes are effective: 01/01/2015.
### Teletherapy and Brachytherapy Isodose Planning Codes

Three teletherapy codes (CPT® 77305, CPT® 77310 and CPT® 77315) and three brachytherapy codes (CPT® 77326, CPT® 77327 and CPT® 77328) have been deleted.

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>77305</td>
<td><em>Teletherapy</em>, isodose plan; simple</td>
</tr>
<tr>
<td>77310</td>
<td><em>Teletherapy</em>, isodose plan; intermediate</td>
</tr>
<tr>
<td>77315</td>
<td><em>Teletherapy</em>, isodose plan; complex</td>
</tr>
<tr>
<td>77326</td>
<td>Brachytherapy isodose plan; simple</td>
</tr>
<tr>
<td>77327</td>
<td>Brachytherapy isodose plan; intermediate</td>
</tr>
<tr>
<td>77328</td>
<td>Brachytherapy isodose plan; complex</td>
</tr>
</tbody>
</table>

Five new codes will be used to report these services. All five of these codes include the work associated with the basic dosimetry calculation. **Do not report CPT® 77300 with these codes:**

<table>
<thead>
<tr>
<th>CPT®</th>
<th>AMA CODE DESCRIPTION/DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>77306</td>
<td><em>Teletherapy</em> isodose plan; simple (1 or 2 unmodified ports directed to a single area of interest), includes basic dosimetry calculations</td>
</tr>
<tr>
<td>77307</td>
<td><em>Teletherapy</em> isodose plan; complex (multiple treatment areas), includes basic dosimetry calculations</td>
</tr>
<tr>
<td>77316</td>
<td>Brachytherapy isodose plan; simple (calculation[s] made from 1 to 4 sources, or remote afterloading brachytherapy, 1 channel), includes basic dosimetry calculation(s)</td>
</tr>
<tr>
<td>77317</td>
<td>Brachytherapy isodose plan; intermediate (calculation[s] made from 5 to 10 sources, or remote afterloading brachytherapy, 2-12 channels), includes basic dosimetry calculation(s)</td>
</tr>
<tr>
<td>77318</td>
<td>Brachytherapy isodose plan; complex (calculation[s] made from over 10 sources, or remote afterloading brachytherapy, over 12 channels), includes basic dosimetry calculation(s)</td>
</tr>
</tbody>
</table>

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**NOTE:** The Health Insurance Portability and Accountability Act (HIPAA) transaction and code set rules require the use of the medical code set that is valid at the time the service is provided. There is no grace period given to implement these changes. **2015 changes are effective: 01/01/2015.**
CMS has established the following set of “G codes”, for 2015, to report those services represented by the corresponding deleted 2014 codes. These are mandatory for Medicare only and optional for all other payors. The purpose of these codes, as described in CMS-1612-FC, is to aid in the revaluing of these services for future Medicare reimbursement. Medicare is delaying the use of the revised radiation therapy code set until CY 2016 when they will then be able to include proposals in the proposed rule for their valuation. All payment policies applicable to the CY 2014 codes will apply to this set of ‘replacement’ G-codes. See list below:

<table>
<thead>
<tr>
<th>CY 2014 CPT®</th>
<th>CY 2015 HCPCS</th>
<th>Long Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>76950</td>
<td>G6001</td>
<td>Ultrasonic guidance for placement of radiation therapy fields</td>
</tr>
<tr>
<td>77421</td>
<td>G6002</td>
<td>Stereotactic X-ray guidance for localization of target volume for the delivery of radiation therapy</td>
</tr>
<tr>
<td>77402</td>
<td>G6003</td>
<td>Radiation treatment delivery, single treatment area, single port or parallel opposed ports, simple blocks or no blocks: up to 5MeV</td>
</tr>
<tr>
<td>77403</td>
<td>G6004</td>
<td>Radiation treatment delivery, single treatment area, single port or parallel opposed ports, simple blocks or no blocks: 6-10 MeV</td>
</tr>
<tr>
<td>77404</td>
<td>G6005</td>
<td>Radiation treatment delivery, single treatment area, single port or parallel opposed ports, simple blocks or no blocks: 11-19 MeV</td>
</tr>
<tr>
<td>77406</td>
<td>G6006</td>
<td>Radiation treatment delivery, single treatment area, single port or parallel opposed ports, simple blocks or no blocks: 20 MeV or greater</td>
</tr>
<tr>
<td>77407</td>
<td>G6007</td>
<td>Radiation treatment delivery, 2 separate treatment areas, 3 or more ports on a single treatment area, use of multiple blocks; up to 5MeV</td>
</tr>
<tr>
<td>77408</td>
<td>G6008</td>
<td>Radiation treatment delivery, 2 separate treatment areas, 3 or more ports on a single treatment area, use of multiple blocks; 6-10 MeV</td>
</tr>
<tr>
<td>77409</td>
<td>G6009</td>
<td>Radiation treatment delivery, 2 separate treatment areas, 3 or more ports on a single treatment area, use of multiple blocks; 11-19 MeV</td>
</tr>
<tr>
<td>77411</td>
<td>G6010</td>
<td>Radiation treatment delivery, 2 separate treatment areas, 3 or more ports on a single treatment area, use of multiple blocks; 20 MeV or greater</td>
</tr>
<tr>
<td>77412</td>
<td>G6011</td>
<td>Radiation treatment delivery, 3 or more separate treatment areas, custom blocking, tangential ports, wedges, rotational beam, compensators, electron beam; up to 5 MeV</td>
</tr>
<tr>
<td>77413</td>
<td>G6012</td>
<td>Radiation treatment delivery, 3 or more separate treatment areas, custom blocking, tangential ports, wedges, rotational beam, compensators, electron beam; 6-10 MeV</td>
</tr>
<tr>
<td>77414</td>
<td>G6013</td>
<td>Radiation treatment delivery, 3 or more separate treatment areas, custom blocking, tangential ports, wedges, rotational beam, compensators, electron beam; 11-19 MeV</td>
</tr>
<tr>
<td>77416</td>
<td>G6014</td>
<td>Radiation treatment delivery, 3 or more separate treatment areas, custom blocking, tangential ports, wedges, rotational beam, compensators, electron beam; 20 MeV or greater</td>
</tr>
<tr>
<td>77418</td>
<td>G6015</td>
<td>Intensity modulated treatment delivery, single or multiple fields/archs, via narrow spatially and temporally modulated beams, binary, dynamic MLC; per treatment session</td>
</tr>
<tr>
<td>0073T</td>
<td>G6016</td>
<td>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</td>
</tr>
<tr>
<td>0197T</td>
<td>G6017</td>
<td>Intra-fraction localization and tracking of target or patient motion during delivery of radiation therapy (eg, 3D positional tracking, gating, 3D surface tracking), each fraction of treatment</td>
</tr>
</tbody>
</table>

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