2020, Apr. 2020 Release CP:Procedures

Subset: Proton Beam Radiotherapy (PBRT) (1, 2, 3, 4, 5)

Requested Service: Proton Beam Radiotherapy (PBRT)

Age: Age ≥ 18

Patient:	Name:	DOB:	ID #:	GROUP #:
	Sex (circle): M / F	Height:	Weight:	
Provider/PCP:	Name:	Fax #:	Phone #:	
	NPI/ID #:	Signature:		Date:
Servicing:	Vendor/Facility:		Phone #:	
	Diagnosis/ICD:	Service Date:	Authorization: / / to / /	

ICD-10:

CPT®:

INSTRUCTIONS: Choose one of the following options and continue to the appropriate section

- ▢ 10. Chondrosarcoma by biopsy
- ▢ 20. Chordoma by biopsy
- ▢ 30. Ependymoma by biopsy
- ▢ 40. Glioma by biopsy
- ▢ 50. Head and neck tumor by biopsy
- ▢ 60. Hepatocellular cancer (HCC) by imaging
- ▢ 70. Intracranial arteriovenous malformation (AVM) by imaging
- ▢ 80. Intrahepatic cholangiocarcinoma by biopsy
- ▢ 90. Medulloblastoma by biopsy
- ▢ 100. Prostate cancer by biopsy
- ▢ 110. Retroperitoneal sarcoma by biopsy
- ▢ 120. Uveal melanoma by ophthalmic examination or imaging

▢ 10. Chondrosarcoma by biopsy

Chondrosarcoma by biopsy (continued...)

1. Choose one:
   - ▢ A) Cranial [6]
   - ▢ B) Extracranial [7]
   - ▢ C) Metastatic disease
   - ▢ D) Other clinical information (add comment)

   • If option A selected, then the rule is satisfied; you may stop here **(Outpatient)**
   • If option B selected, then go to question 2
   • If option C selected, then go to question 4
   • No other options lead to the requested service

2. Choose one: [8]
   - ▢ A) Low-grade and intracompartmental [9]
   - ▢ B) High-grade (grade II or grade III) [10]
   - ▢ C) Clear cell [10]
   - ▢ D) Extracompartmental [10]
   - ▢ E) Other clinical information (add comment)

   • If option A, B, C or D selected, then go to question 3
   • No other options lead to the requested service

3. Choose one: [11]
   - ▢ A) Residual localized tumor after resection
   - ▢ B) Unresectable tumor
   - ▢ C) Other clinical information (add comment)

   • If option A or B selected, then the rule is satisfied; you may stop here **(Outpatient)**
   • No other options lead to the requested service

4. Choose one: [12]
   - ▢ A) Oligometastatic disease
   - ▢ B) Symptomatic widespread disease
   - ▢ C) Other clinical information (add comment)

   • If option A or B selected, then the rule is satisfied; you may stop here **(Outpatient)**
   • No other options lead to the requested service

▢ 20. Chordoma by biopsy

1. Tumor type, Choose one: [13]
   - ▢ A) Sacrococcygeal and mobile spine [14]
   - ▢ B) Skull base [15]
   - ▢ C) Other clinical information (add comment)

   • If option A or B selected, then go to question 2
   • No other options lead to the requested service

2. Choose one:
   - ▢ A) Residual localized tumor after resection [16]
   - ▢ B) Unresectable tumor [17]
   - ▢ C) Other clinical information (add comment)

   • If option A or B selected, then go to question 3
   • No other options lead to the requested service

Chordoma by biopsy (continued...)

3. Distant metastasis
   - ▢ A) Yes
   - ▢ B) No

   • If option No selected, then the rule is satisfied; you may stop here **(Outpatient)**
   • No other options lead to the requested service

▢ 30. Ependymoma by biopsy

1. Choose one:
   - ▢ A) Intracranial
   - ▢ B) Spinal
   - ▢ C) Other clinical information (add comment)

   • If option A or B selected, then go to question 2
   • No other options lead to the requested service

2. Gross total or subtotal resection performed [18]
   - ▢ A) Yes
   - ▢ B) No

   • If option Yes selected, then go to question 3
   • No other options lead to the requested service

3. Choose all that apply: [19]
   - ▢ A) Brain or spine metastasis by MRI
   - ▢ B) Cerebrospinal fluid (CSF) cytology positive
   - ▢ C) Other clinical information (add comment)

   • If 1 or more options A or B selected and option C not selected, then the rule is satisfied; you may stop here **(Outpatient)**
   • No other options lead to the requested service

▢ 40. Glioma by biopsy

There are no questions for the requested service

▢ 50. Head and neck tumor by biopsy

1. Choose one: [20]
   - ▢ A) Mucosal melanoma [21]
   - ▢ B) Nasopharyngeal cancer [22]
   - ▢ C) Paranasal sinus cancer [23]
   - ▢ D) Salivary gland cancer [24]
   - ▢ E) None of the above, more choices

   • If option A selected, then go to question 2
   • If option B selected, then go to question 5
   • If option C selected, then go to question 4
   • If option D selected, then go to question 9
   • If option E selected, then go to question 16

Head and neck tumor by biopsy (continued...)

2. Choose one:
   - ▢ A) ≥ Stage 3 and ≤ Stage 4a [25]
   - ▢ B) ≥ Stage 4b [26]
   - ▢ C) Other clinical information (add comment)

> • If option A selected, then go to question 3
> • If option B selected, then go to question 4
> • No other options lead to the requested service

3. Choose all that apply:
   - ▢ A) Post surgical resection
   - ▢ B) Intensity modulated radiotherapy (IMRT) not feasible [27]
   - ▢ C) Other clinical information (add comment)

> • If the number of options selected is 2, then the rule is satisfied; you may stop here **(Outpatient)**
> • No other options lead to the requested service

4. Intensity modulated radiation therapy (IMRT) feasible [27]
   - ▢ A) Yes
   - ▢ B) No

> • If option No selected, then the rule is satisfied; you may stop here **(Outpatient)**
> • No other options lead to the requested service

5. Choose one: [28]
   - ▢ A) T1
   - ▢ B) T2
   - ▢ C) T3
   - ▢ D) T4
   - ▢ E) Other clinical information (add comment)

> • If option A selected, then go to question 6
> • If option B, C or D selected, then go to question 8
> • No other options lead to the requested service

6. Choose one:
   - ▢ A) No nodal involvement
   - ▢ B) ≥ N1 and ≤ N3
   - ▢ C) Other clinical information (add comment)

> • If option A selected, then go to question 7
> • If option B selected, then go to question 8
> • No other options lead to the requested service

7. Distant metastasis
   - ▢ A) Yes
   - ▢ B) No

> • If option No selected, then go to question 4
> • If option Yes selected, then go to question 8

Head and neck tumor by biopsy (continued...)

8. Chemotherapy planned
   - ▢ A) Yes
   - ▢ B) No

   • If option Yes selected, then go to question 4
   • No other options lead to the requested service

9. Choose one: [29, 30]
   - ▢ A) T1 or T2
   - ▢ B) T3
   - ▢ C) T4a
   - ▢ D) T4b
   - ▢ E) Other clinical information (add comment)

   • If option A selected, then go to question 10
   • If option B or C selected, then go to question 13
   • If option D selected, then go to question 4
   • No other options lead to the requested service

10. Post complete surgical resection
    - ▢ A) Yes
    - ▢ B) No

    • If option Yes selected, then go to question 11
    • No other options lead to the requested service

11. Choose one: [31]
    - ▢ A) Low-grade
    - ▢ B) Intermediate-grade
    - ▢ C) High-grade
    - ▢ D) Adenoid cystic carcinoma
    - ▢ E) Other clinical information (add comment)

    • If option A selected, then go to question 12
    • If option B, C or D selected, then go to question 4
    • No other options lead to the requested service

12. Tumor spillage or perineural invasion [32]
    - ▢ A) Yes
    - ▢ B) No

    • If option Yes selected, then go to question 4
    • No other options lead to the requested service

13. Choose one: [33]
    - ▢ A) Primary tumor resected
    - ▢ B) Tumor unresectable
    - ▢ C) Other clinical information (add comment)

    • If option A selected, then go to question 14
    • If option B selected, then go to question 4
    • No other options lead to the requested service

Head and neck tumor by biopsy (continued...)

14. Choose one:
- ▢ A) Completely resected
- ▢ B) Incompletely resected (gross residual tumor)
- ▢ C) Other clinical information (add comment)

> • If option A selected, then go to question 4
> • If option B selected, then go to question 15
> • No other options lead to the requested service

15. Choose all that apply: [34]
- ▢ A) Residual localized tumor and further resection not feasible
- ▢ B) Intensity modulated radiation therapy (IMRT) not feasible [27]
- ▢ C) Other clinical information (add comment)

> • If the number of options selected is 2, then the rule is satisfied; you may stop here **(Outpatient)**
> • No other options lead to the requested service

16. Choose all that apply: [35]
- ▢ A) T4b disease
- ▢ B) Metastatic disease
- ▢ C) Recurrent persistent disease
- ▢ D) Unresectable nodal disease
- ▢ E) Unfit for surgery
- ▢ F) Other clinical information (add comment)

> • If 1 or more options A, B, C, D or E selected and option F not selected, then go to question 4
> • No other options lead to the requested service

▢ 60. Hepatocellular cancer (HCC) by imaging

1. Choose all that apply: [36]
- ▢ A) Ineligible for liver transplant
- ▢ B) No extrahepatic disease
- ▢ C) No metastatic disease
- ▢ D) Unresectable or inoperable
- ▢ E) Other clinical information (add comment)

> • If the number of options selected is 4, then the rule is satisfied; you may stop here **(Outpatient)**
> • No other options lead to the requested service

▢ 70. Intracranial arteriovenous malformation (AVM) by imaging

1. Candidate for surgical excision or embolization or standard stereotactic radiosurgery [37, 38, 39, 40]
- ▢ A) Yes
- ▢ B) No

> • If option No selected, then the rule is satisfied; you may stop here **(Outpatient)**
> • No other options lead to the requested service

▢ 80. Intrahepatic cholangiocarcinoma by biopsy

Intrahepatic cholangiocarcinoma by biopsy (continued...)

1. Choose one:
   - ▢ A) Metastatic disease
   - ▢ B) Unresectable or inoperable [41]
   - ▢ C) Other clinical information (add comment)

• If option A or B selected, then the rule is satisfied; you may stop here **(Outpatient)**
• No other options lead to the requested service

▢ 90. Medulloblastoma by biopsy

1. Choose all that apply: [42, 43]
   - ▢ A) < 1.5 cm^2 residual disease
   - ▢ B) ≥ 1.5 cm^2 residual disease or unresectable tumor
   - ▢ C) Disseminated disease within or outside neuroaxis
   - ▢ D) Large cell or anaplastic medulloblastoma
   - ▢ E) Other clinical information (add comment)

• If the number of options selected is 1 and option A selected, then go to question 2
• If 1 or more options A, B, C or D selected and option E not selected, then go to question 3
• No other options lead to the requested service

2. Choose all that apply:
   - ▢ A) No evidence of metastasis
   - ▢ B) Classic or desmoplastic histology
   - ▢ C) Other clinical information (add comment)

• If the number of options selected is 2 and option C not selected, then the rule is satisfied; you may stop here **(Outpatient)**
• No other options lead to the requested service

3. Adjuvant chemotherapy planned
   - ▢ A) Yes
   - ▢ B) No

• If option Yes selected, then the rule is satisfied; you may stop here **(Outpatient)**
• No other options lead to the requested service

▢ 100. Prostate cancer by biopsy

1. Choose one: [44, 45, 46, 47, 48, 49, 50]
   - ▢ A) Very low-risk
   - ▢ B) Low-risk
   - ▢ C) Intermediate-risk
   - ▢ D) High-risk
   - ▢ E) Very high-risk
   - ▢ F) Other clinical information (add comment)

• If option A selected, then go to question 2
• If option B selected, then go to question 3
• If option C selected, then go to question 4
• If option D or E selected, then go to question 5
• No other options lead to the requested service

Prostate cancer by biopsy (continued...)

2. Life expectancy ≥ 20 years (51)
   - ▢ A) Yes
   - ▢ B) No

   • If option Yes selected, then the rule is satisfied; you may stop here Ltd 2nd **(Outpatient)** (52, 53)
   • No other options lead to the requested service

3. Life expectancy ≥ 10 years (54)
   - ▢ A) Yes
   - ▢ B) No

   • If option Yes selected, then the rule is satisfied; you may stop here Ltd 2nd **(Outpatient)** (52, 53)
   • No other options lead to the requested service

4. Life expectancy ≥ 5 years (55)
   - ▢ A) Yes
   - ▢ B) No

   • If option Yes selected, then the rule is satisfied; you may stop here Ltd 2nd **(Outpatient)** (52, 53)
   • No other options lead to the requested service

5. Life expectancy > 5 years (56)
   - ▢ A) Yes
   - ▢ B) No

   • If option Yes selected, then the rule is satisfied; you may stop here Ltd 2nd **(Outpatient)** (52, 53)
   • No other options lead to the requested service

▢ 110. Retroperitoneal sarcoma by biopsy

There are no questions for the requested service

▢ 120. Uveal melanoma by ophthalmic examination or imaging

1. Distant metastasis (57, 58)
   - ▢ A) Yes
   - ▢ B) No

   • If option No selected, then the rule is satisfied; you may stop here **(Outpatient)**
   • No other options lead to the requested service

Reference

Ltd - This requested service is designated as 'Limited Evidence' in this clinical scenario. Criteria cannot be met.

2nd - Secondary review required. Criteria cannot be met.

Off-label - Use of a drug for an indication not approved by the U.S. Food and Drug Administration (FDA).

Notes:

1:
I/O Setting: Outpatient

2:
Although proton beam radiotherapy (PBRT) is utilized worldwide to treat a variety of cancers, the clinical superiority of PBRT over conventional radiotherapy (e.g., intensity modulated radiotherapy, conventional radiotherapy with photons) remains to be proven in most clinical scenarios. Studies remain primarily under powered or inadequately designed. PBRT remains controversial for many diagnoses secondary to the lack of high-quality evidence in relation to the high-cost of treatment (Verma et al., Cancer 2016, 122: 1483-501; Wang, Med Devices (Auckl) 2015, 8: 439-46).

3:
Proton beam radiotherapy (PBRT) is a type of external beam radiation therapy that uses positively charged subatomic particles to create ionizing cellular damage, to destroy tumor cells. Proton beam radiotherapy (PBRT) is preferred to conventional radiotherapy as it deposits energy at precise depths to the last millimeter of its trajectory. This results in a sharp, localized peak in the dose, called the Braggs peak, which reduces scatter and the amount of radiation delivered to non-targeted, adjacent, healthy tissue (Widder et al., Int J Radiat Oncol Biol Phys 2016, 95: 30-6).

4:
These criteria include the following procedures:
Charged Particle Radiation Therapy
Charged Particle Radiotherapy
Proton Beam Radiation Therapy
Proton Radiation Therapy

5:
InterQual® Procedures criteria are derived from the systematic, continuous review and critical appraisal of the most current evidence-based literature and include input from our independent panel of clinical experts. To generate the most appropriate recommendations, a comprehensive literature review of the clinical evidence was conducted. Sources searched included PubMed, Agency for Healthcare Research and Quality (AHRQ) Comparative Effectiveness Reviews, the Cochrane Library, Choosing Wisely, Centers for Medicare & Medicaid Services (CMS) National Coverage Determinations, the National Institute of Health and Care Excellence (NICE), and the National Guideline Clearinghouse. Other medical literature databases, medical content providers, data sources, regulatory body websites, and specialty society resources may also have been used. Relevant studies were assessed for risk of bias following principles described in the Cochrane Handbook. The resulting evidence was assessed for consistency, directness, precision, effect size, and publication bias. Observational trials were also evaluated for the presence of a dose-response gradient and the likely effect of plausible confounders.

6:
Cranial chondrosarcoma tumors are typically slow growing and occur off axis, as opposed to chordoma tumors. Surgical intervention with adjuvant radiation treatment provide superior results over surgery alone. Proton beam radiotherapy is considered the most effective form of radiation treatment, due to ability to target the tumor with higher dose radiation and minimize exposure to critical organs (Noel and Gondi, Chin Clin Oncol 2016, 5: 51).

7:
Extracranial lesions tend to be found in the axial skeleton, pelvis, or long bones. Optimal treatment includes surgical excision with wide margins (ESMO Guidelines Working Group, Ann Oncol 2014, 25 Suppl 3: iii113-23).

8:
The histology of chondrosarcoma is based on the speed of growth, percentage of atypical cells, and the probability of metastasis. Applying a grade assignment, however may be difficult. Additional information to consider when determining treatment options include size, location, and radiologic findings. Most tumors are low-grade, well differentiated, and, although locally aggressive, tend not to metastasize. High-grade tumors have moderate to poor cell differentiation, are more likely to metastasize, and are typically resistant to radiation or chemotherapy (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer

(Version 1.2019). 2018; ESMO Guidelines Working Group, Ann Oncol 2014, 25 Suppl 3: iii113-23).

9:
Tumor location may have a significant impact on the course of treatment. Low-grade intracompartmental lesions (i. e., confined within the cortex of the bone) are typically managed with maximal tumor excision to achieve negative margins. This option has a higher overall survival rate. However, if the tumor is not fully resectable proton beam radiotherapy may be utilized to decrease the local recurrence rate (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018; ESMO Guidelines Working Group, Ann Oncol 2014, 25 Suppl 3: iii113-23).

10:
High-grade chondrosarcomas, clear cell lesions, or extracompartmental tumors (i.e., extensions beyond the bone cortex) are more likely to metastasize. Primary treatment includes wide excision to achieve negative margins. Wide excision may be accomplished by limb-sparing resection or amputation (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018; ESMO Guidelines Working Group, Ann Oncol 2014, 25 Suppl 3: iii113-23).

11:
Proton beam radiotherapy may be considered for any gross residual disease or those lesions which are unresectable (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018; ESMO Guidelines Working Group, Ann Oncol 2014, 25 Suppl 3: iii113-23).

12:
Metastatic high-grade chondrosarcoma and inoperable, locally advanced tumors have a poor prognosis due to resistance to conventional treatments, such as radiation and chemotherapy (ESMO Guidelines Working Group, Ann Oncol 2014, 25 Suppl 3: iii113-23).

13:
Proton beam radiotherapy (PBRT) in combination with surgery, has been shown to improve disease-free survival and local control in patients with residual disease. For patients with an unresectable lesion, or who are unable to tolerate surgery, PBRT may be the only curative option (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018).

14:
Proton beam radiotherapy delivers targeted doses to the tumor bed, while minimizing the damage to structures of the spine (e.g., sacral nerve roots) that are typically sensitive to radiation (Pennicooke et al., Spine (Phila Pa 1976) 2016, 41 Suppl 20: S186-s92).

15:
The principle goal for the use of proton beam radiotherapy (PBRT) in treating skull base chordoma tumors is to reduce the dose of radiation delivered to the brainstem and allow for safe dose escalation to the primary tumor to improve overall tumor control and survival. This therapy is appropriate treatment for unresectable lesions, or residual tumor following resection (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018; Deraniyagala et al., J Neurol Surg B Skull Base 2014, 75: 53-7).

16:
The combination of surgery and radiation treatment for spinal, sacral and skull based lesions improves overall survival and local control. Skull based chordomas have a high rate of recurrence due to the likelihood of residual tumor. These tumors are also highly radio-resistant, requiring increased doses of radiation for effective treatment (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018; Frisch and Timmermann, Clin Oncol (R Coll Radiol) 2017, 29: 500-6).

17:
Regardless of tumor location, proton beam radiotherapy is the primary option for an unresectable chordoma or when a patient is not a candidate for surgery (National Comprehensive Cancer Network. The NCCN Clinical Practice Guidelines in Oncology, Bone Cancer (Version 1.2019). 2018).

18:
Gross total or subtotal resection are recommended as maximal resection is associated with improved survival. Following resection, MRI of the brain within 24 to 72 hours or of the spine in 2 to 3 weeks is recommended to determine the need for adjuvant treatment (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, central nervous system cancers (Version 2.2018). 2018).

19:
MRI is used to assess for droplet metastases in the craniospinal area opposite the primary tumor (i.e., brain MRI for spinal ependymoma, spine MRI for an intracranial tumor). This information, along with determination of the extent of remaining primary tumor, and cerebrospinal fluid cytology is used to evaluate the need for additional treatment. If metastasis is present and craniospinal irradiation is needed, proton beam radiotherapy is recommended to decrease toxicity (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, central nervous system cancers (Version 2.2018). 2018).

20:
Primary tumors that arise in the head and neck region require a high-level of expertise, as treatment is often very complex, and quality of life is a leading concern. Contributing factors that impact treatment include site of disease, stage and pathological findings. These tumors can affect an individual's physical characteristics, senses, and basic function. Advanced radiation technology, including proton beam radiotherapy, can offer clinical advantages by providing optimal dose distribution and target delineation that spare organs at risk (e.g., brain, eye and ear structures, cranial nerves) while optimizing local control and overall survival rates (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

21:
Mucosal melanoma is a highly aggressive, but rare neoplasm with a poor prognosis. It is most frequently found in the nasal and paranasal region. Oral lesions have a high incidence of metastases to the lymph nodes. Primary treatment for stage 3 to 4a includes surgery with postoperative radiation therapy (e.g., proton beam radiation therapy, intensity modulated radiotherapy). While surgical resection is not recommended for more advanced stages (i.e., 4b or greater), proton beam radiation therapy has been shown as a viable option. It preserves normal tissue and organs at risk (e.g., optic nerve, brain stem) while providing comparable outcomes for local control and 3-year overall survival when compared to conventional radiation therapy with photons (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018; Zenda et al., Radiother Oncol 2016, 118: 267-71).

22:
Nasopharyngeal carcinoma is a rare occurrence in the United States; however, it has a high incidence of metastases. Viral (i.e., Epstein-Barr virus), environmental, and hereditary (common in China) factors have been associated with its occurrence. Evidence indicates radiation therapy in conjunction with chemotherapy is the standard treatment for stages greater than T1. For stage T1, the need for adjuvant chemotherapy is determined by nodal involvement and distant metastasis (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

23:
Paranasal sinus tumors are typically asymptomatic until late in the disease process. Maxillary tumors are slightly more frequent in occurrence than ethmoid, but both types are rare. The most common histology for tumors occurring in the paranasal sinuses is squamous cell carcinoma; however, other histology (e.g., adenocarcinoma, melanoma) may be present. T staging remains the most reliable predictor of local control and overall survival (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

24:
Salivary gland tumors may vary in histology and have the potential to be widespread throughout the aerodigestive tract, including major and minor salivary glands. Staging and tumor location are used to determine treatment modalities. Surgical resection is the primary approach for definitive treatment, requiring careful planning to minimize facial nerve damage. The preferred interval for initiation of radiation treatment following resection is less than 6 weeks (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

25:
Staging for mucosal melanoma includes the location of the primary tumor, reginal lymph node involvement and presence of metastasis. At Stage 3, tumors are limited to the mucosa and immediate soft tissue, with no nodal involvement and no metastasis. Tumors that invade deep soft tissue, cartilage or bone are given stage 4a classification. The primary treatment is surgical resection with adjuvant radiation therapy to the primary site which has shown to improve outcomes related to lower recurrence rates (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018; Saigal et al., ISRN Oncol 2012, 2012: 785131).

26:
Mucosal melanoma that has progressed into the critical structures of the head and neck (e.g., brain, cranial nerves or carotid artery), spread to the regional lymph nodes or developed distal metastases is staged as 4b. If these lesions are not surgically resectable, primary radiation treatment is recommended (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

27:
Proton beam radiotherapy may be appropriate when intensity modulated radiotherapy cannot spare the dose constraints of the surrounding normal tissue (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

28:
Staging for nasopharyngeal cancer incorporates the extent of the primary tumor, lymph node involvement and presence of distant metastasis and is considered when determining treatment plan and prognosis. The T staging of the primary tumor is based on the degree in which the tumor has invaded other areas of the head and neck (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).
T0: No tumor identified, but Epstein-Barr virus-positive cervical node present
Tis: Carcinoma in situ
T1: Tumor confined to nasopharynx, or extension to oropharynx and/or nasal cavity without parapharyngeal involvement
T2: Tumor with extension to parapharyngeal space, and/or adjacent soft tissue
T3: Tumor infiltration of bony structures
T4: Tumor with intracranial invasion, involvement of cranial nerves, hypopharynx, orbit parotid gland, and/or extensive soft tissue infiltration beyond the lateral pterygoid muscle

29:
Surgical resection with follow-up chemotherapy or radiation is suggested for all salivary gland tumors, with the exception of very advanced local disease, while radiation alone is suggested for unresectable tumors. Salivary gland tumors with adverse characteristics (e.g., adenoid cystic carcinoma, neural invasion) warrant adjuvant radiation therapy due to the potential for recurrence (Schmitt et al., Oral Oncol 2017, 74: 40-8).

30:
Salivary gland tumors can be found in the major salivary glands (i.e., parotid, submandibular, sublingual) or one of the minor salivary glands (e.g., hard palate, aerodigestive tract). T staging includes location and extension of tumor. Tumor histology is also a major factor in determining prognosis (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).
T1: Tumor less than 2 cm without extraparynchymal extension, clinical or macroscopic evidence of invasion into soft tissue
T2: Tumor between 2 to 4 cm, without extraparynchymal extension
T3: Tumor greater than 4 cm and/or having extraparynchymal extension
T4a: Moderately advanced disease, tumor invades skin, mandible, ear canal and/or facial nerve
T4b: Very advanced disease with tumor invasion into the skull base and/or pterygoid plates and/or encases the carotid artery

31:
Primary treatment for T1 and T2 tumors includes surgical resection with pathology to confirm histology (e.g., adenocarcinoma, squamous carcinoma). If adenoid cystic carcinoma is confirmed, radiation is the recommended adjuvant therapy, due to the aggressive nature of this histology. Other adverse features, such as Intermediate and

high-grade tumors also warrant adjuvant radiation therapy (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

32:
For low grade salivary gland tumors, radiation therapy is considered appropriate if during resection there is tumor spillage or perineural invasion. These findings indicate potential for remaining tumor and increase the incidence of local recurrence (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

33:
For tumors classified as T3 or T4a, gross total surgical resection is the primary form of treatment, this proton beam radiotherapy requires careful planning depending on the extent of tumor invasion (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

34:
The primary goal with oncologic surgery is complete resection of the tumor with disease free margins, confirmed by pathology. This strategy is essential in decreasing the risk of local recurrence, as positive margins increase this risk. Close margins are defined as those with less than 5 mm distance between the resected tumor edge and the remaining tissue. If close or positive margins are present and not resectable, adjuvant therapy is recommended (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

35:
Very advanced head and neck cancers can include any newly diagnosed tumor with T4b staging, those found to have unresectable nodal involvement as well as metastatic disease. This category can also include patients with persistent or recurrent disease or those deemed unfit for surgery. Another consideration for this group when determining treatment options include the patient's functional status. When surgical resection is not an option for treatment, radiation therapy with or without chemotherapy can be used (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, head and neck cancers (Version 2.2018). 2018).

36:
Proton beam radiotherapy (PBRT) is appropriate in the treatment of unresectable hepatocellular carcinoma tumors that are not responsive to other forms of treatment (e.g., ablative techniques, arterial treatment) (National Comprehensive Cancer Network, The NCCN Clinical Practice Guidelines in Oncology: Hepatobiliary Cancers. 2019). A systematic review from 2017 concluded PBRT is equivalent to existing standards of care, with potential superiority to transarterial chemoembolization secondary to the decreased need for post-therapy hospitalization (Verma et al., J Gastrointest Oncol 2016, 7: 644-64).

37:
Several factors play a part in the determination of the treatment plan for an arteriovenous malformation. These include size, location, and presence of deep venous drainage. Microsurgery is the primary treatment option, with the goal of definitive cure by eliminating the nidus and shunt (Derdeyn et al., Stroke 2017, 48: e200-e24).

38:
An arteriovenous malformation consists of a tangled bundle of blood vessels with direct connection between the arteries and veins without an intervening capillary bed. This tangle, or nidus, results in dilated vessels that have potential to bypass brain tissue or rupture. Size is determined through advanced imaging. The minimum nidus size that would warrant intervention is > 3 cm (Derdeyn et al., Stroke 2017, 48: e200-e24).

39:
The Spetzler-Martin AVM Grading Scale takes three characteristics into account to determine the surgical risk associated with a defect. These include nidus size (i.e., 0 to > 6 cm), location related to eloquent brain structures (e.g., areas of sensorimotor, language, brain stem) and the deep venous drainage pattern (i.e., present or not), with points given for each element (Blomquist et al., Acta Oncol 2016, 55: 105-12).

40:
Surgical intervention is the preferred form of treatment to remove the risk of future rupture by obliterating the defect; however, this may not be optimal due to the invasive nature of surgery and the potential for neurological

side effects. Embolization can be a stand-alone form of treatment, or may be used in conjunction with surgery to effectively reduce the size of the nidus and reduce surgical risk. While stereotactic surgery is used as well, the delay in defect resolution and the potential for future rupture remains. Proton beam radiotherapy may deliver a specific radiation dose to the target with substantially lower dose to the surrounding brain tissue (Blomquist et al., Acta Oncol 2016, 55: 105-12).

41:
While surgical resection is the only curative option, proton beam radiotherapy is recommended for unresectable intrahepatic cholangiocarcinoma, showing improved local control rates and improved overall survival while reducing the impact to the surrounding liver tissue (National Comprehensive Cancer Network, The NCCN Clinical Practice Guidelines in Oncology: Hepatobiliary Cancers. 2019; Hong et al., J Clin Oncol 2016, 34: 460-8).

42:
Once surgery is complete, staging is determined based on tumor pathology and follow-up imaging, which is then used to identify the risk of recurrence. Proton beam radiation treatment can be appropriate to reduce the risk of toxicity when craniospinal irradiation is recommended. Adjuvant treatment with chemotherapy is recommended for patients with a medulloblastoma tumor that has been stratified with a high risk of recurrence (e.g., residual disease, large cell or anaplastic medulloblastoma, unresectable tumor, disseminated disease) (National Comprehensive Cancer Network, The NCCN clinical practice guidelines in oncology, central nervous system cancers (Version 2.2018). 2018).

43:
Craniospinal irradiation (CSI) with conventional radiation therapy may have significant acute and late side effects (e.g., weight loss, bone marrow suppression), which can influence quality of life and overall patient outcome. Proton beam radiotherapy has been shown to significantly reduce these side effects when utilized for CSI (Brown et al., Int J Radiat Oncol Biol Phys 2013, 86: 277-84).

44:
Comorbidity, tumor grade, and patient preference should be considered along with age when making treatment decisions (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2018). When a person's life expectancy is relatively long, however, localized prostate cancer can be a cause of morbidity and mortality. Active surveillance should be considered with the goal to delay treatment and side effects, but actively monitor and treat if cancer progresses (Loeb et al., Eur Urol 2015, 67: 233-8).

45:
Staging of prostate cancer is defined as (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2019). 2019). :
T0 No evidence of a primary tumor
T1 Tumor is not palpable or seen on imaging
T1a Tumor is ≤ 5% of biopsied tissue
T1b Tumor is > 5% of biopsied tissue
T1c Biopsy performed secondary to elevated PSA and tumor confirmed by biopsy
T2 Tumor is confined to prostate, including invasion into, but not extending beyond, the prostatic capsule
T2a Tumor is in one-half or less of a prostate lobe
T2b Tumor is in one lobe of the prostate
T2c Tumor is in both lobes of the prostate
T3 Tumor extends through the capsule of the prostate
T3a Extracapsular extension
T3b Seminal vesicle invasion by tumor
T4 Tumor involves adjacent structures other than seminal vesicles (e.g., pelvic wall, levator muscles, bladder)

46:
Multiple risk stratification systems have been developed to simplify the complex nature of determining tumor risk in prostate cancer. These systems establish parameters outlining tumor aggressiveness, tumor stage, and nodal involvement (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2019). 2019; Expert Panel on Urologic et al., J Am Coll Radiol 2017, 14: S245-S57; Sanda et al., Clinically Localized Prostate Cancer: AUA/ASTRO/SUO Guideline. 2017; Mottet et al., Eur Urol 2017, 71: 618-29). Guidelines primarily use the D'Amico Risk Stratification System, the American Urological Association Risk Stratification for Localized Prostate Cancer System and the National Comprehensive Cancer Network Risk

Stratification and Staging Workup to support treatment recommendations.

47:

Levels of risk are widely used both clinically and in literature to stratify the disease and its progression. InterQual® consultants agree that the National Comprehensive Cancer Network stratification that defines levels of risks grouped by clinical stage, Gleason score, Grade Group, PSA levels and the number of positive biopsy cores is the most detailed system and is therefore used in these criteria.

48:

National Comprehensive Cancer Network Risk Stratification and Staging Workup (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2019). 2019).

- Very Low-Risk

T1c AND
Gleason score ≤ 6/Grade Group 1 AND
PSA < 10ng/mL AND
Fewer than 3 prostate biopsy fragments/cores positive, ≤ 50% cancer in each fragment/core AND
PSA Density < 0.15ng/mL/g

- Low-Risk

T1-T2a AND
Gleason score ≤ 6/Grade Group 1 AND
PSA < 10ng/mL

- Favorable Intermediate-Risk

T2b-T2c OR
Gleason score 3+4=7/Grade Group 2 OR
PSA 10-20ng/mL AND
Percentage of positive biopsy cores < 50%

- Unfavorable Intermediate-Risk

T2b-T2c OR
Gleason score 3+4=7/Grade Group 2 or
Gleason score 4+3=7/Grade Group 3 OR
PSA 10-20ng/mL

- High-Risk

T3a OR
Gleason score 8/Grade Group 4 or
Gleason score 4+5=9/Grade Group 5 OR
PSA > 20ng/mL

- Very High-Risk

T3b-T4 OR
Primary Gleason pattern 5 OR
> 4 cores with Gleason score 8-10/Grade Group 4 or 5

49:

American Urological Association (AUA) / American Society for Radiation Oncology (ATRSO) / Society of Urological Oncology (SUO): Risk Stratification for Localized Prostate Cancer (Sanda et al., Clinically Localized Prostate Cancer: AUA/ASTRO/SUO Guideline. 2017).

- Very Low-Risk

PSA < 10 ng/mL AND
Grade Group 1 AND
T1-T2a AND
<34% prostate biopsy fragments/cores positive, ≤ 50% cancer in each fragment/core AND
PSA Density < 0.15 ng/ml/g

- Low-Risk

PSA < 10 ng/mL AND
Grade Group 1 AND
T1-T2a AND

- Intermediate-Risk

PSA 10-20ng/mL OR
Grade Group 2-3 OR

T2b-T2c
Favorable
PSA 10-20ng/mL and Grade Group 1 OR
PSA < 10 ng/mL and Grade Group 2
Unfavorable
Grade Group 2 and PSA 10-20 ng/mL OR
Grade Group 2 and T2b-T2c OR
Grade Group 3 and PSA < 20 ng/mL
- High-Risk

≥ T3a OR
PSA > 20ng/mL OR
Grade Group 4-5

50:
Factors that have an impact on life expectancy include age, current health (healthy with or without well managed comorbidities), short-term illness, chronic illness, ability to perform activities of daily living, and family history. The Social Security Administration Period Life table (www.ssa.gov/oact/STATS/table4c6.html) can be used to estimate an individual's current health status (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2019). 2019).

51:
For patients with very low-risk prostate cancer, only those with greater than 20 years life expectancy should explore definitive treatment options in addition to active surveillance. Due to the potential side effects of treatment, those with life expectancies less than 10 years are appropriate for observation (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2018).

52:
Recommendations are designated as "Limited Evidence" based on one or more of the following:

- Research to date has not demonstrated this intervention's equivalence or superiority to the current standard of care.
- The balance of benefits and harms does not clearly favor this intervention.
- The clinical utility of this intervention has not been clearly established.
- The evidence is mixed, unclear, or of low quality.
- This intervention is not standard of care.
- New technology is still being investigated.

53:
Intensity modulated radiotherapy has become the standard form of treatment for prostate cancer over the last 10 years, with low toxicity and excellent efficacy. Given the characteristics of prostate cancer, outcomes of long term survival and cure rates take many years to be apparent. Current research has focused on measuring the most common side effects related to prostate treatment with radiation therapy to support the use of proton beam radiotherapy (PBRT). Current evidence indicates that PBRT and intensity modulated radiotherapy have very similar outcomes related to genitourinary and gastrointestinal toxicities (Bryant et al., Chin Clin Oncol 2016, 5: 55; Fang et al., Cancer 2015, 121: 1118-27; Hoppe et al., J Urol 2015, 193: 1089-91; Gray et al., Cancer 2013, 119: 1729-35; Yu et al., J Natl Cancer Inst 2013, 105: 25-32; Sheets et al., Jama 2012, 307: 1611-20). Further, research to date has not demonstrated this intervention's superiority to the current standard of care for progression-free survival or mortality (Bryant et al., Chin Clin Oncol 2016, 5: 55; Mendenhall et al., Int J Radiat Oncol Biol Phys 2014, 88: 596-602; Sheets et al., Jama 2012, 307: 1611-20). Relevant medical societies, including the American Urological Association, the American Society for Radiation Oncology, and the National Comprehensive Cancer Network, state that PBRT is comparable but not superior to conventional forms of radiation treatment. In a cost-effectiveness comparison based on Medicare reimbursement rates, evidence indicated that PBRT is costlier treatment with no significant differences in terms of gastrointestinal and genitourinary complications (Yu et al., J Natl Cancer Inst 2013, 105: 25-32). Despite these findings of no apparent superiority and greater cost, the quality of evidence for both toxicity and survival is low, as it is based primarily on observational research rather than randomized controlled trials. Current research trials are exploring this topic but have no published results currently. Therefore, requests for PBRT in patients with prostate cancer require secondary medical review.

54:

For men with low-risk prostate cancer, a life expectancy of 10 years or more, treatment options to explore include active surveillance, radiation or surgical intervention (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2018).

55:
Men with intermediate-risk prostate cancer and greater than 5 years life expectancy, may explore treatment options that include observation, external beam radiation therapy or brachytherapy. While those with a life expectancy of 10 years or more, can consider molecular tumor testing for additional prognostic information, as well as consider surgical intervention or active surveillance (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2018). The multi-society guideline on localized prostate cancer recommends observation for men with intermediate-risk and less than 5 years life expectancy (American Urological Association, Clinically Localized Prostate Cancer: AUA/ASTRO/SUO Guideline. 2017).

56:
For high-risk and very high-risk groups, men with greater than 5 years life expectancy are treated more aggressively with androgen deprivation therapy, radiation, chemotherapy or radical prostatectomy (National Comprehensive Cancer Network, The NCCN Clinical Practice Guideline in Oncology, Prostate Cancer (Version 4.2018).

57:
Proton beam radiotherapy (PBRT) is an appropriate treatment for uveal melanoma following initial diagnosis or intraocular or orbital recurrent disease. The decision for which therapy option to choose (e.g., laser ablation, enucleation of the eye, PBRT) is dependent on the size and location of the tumor (National Comprehensive Cancer Network, The NCCN Clinical Practice Guidelines in Oncology: Uveal Melanoma (Version 1.2018). 2018).

58:
Despite excellent local disease control rates, nearly half of patients with primary uveal melanoma will develop metastatic disease, with the liver being the most common site. Patients with advanced disease show more dismal outcomes with a median overall survival of 4 to 15 months (Yang et al., Ther Adv Med Oncol 2018, 10: 1758834018757175). Current evidence is insufficient to support aggressive intervention for treating metastatic uveal melanomas as these treatments have not proven to provide significant prolongation of survival compared with no treatment at all (Carvajal et al., Br J Ophthalmol 2017, 101: 38-44).

ICD-10-CM (circle all that apply): C06.9, C07, C08.0, C08.1, C08.9, C11.0, C11.1, C11.2, C11.3, C11.8, C11.9, C22.0, C22.1, C30.0, C31.0, C31.1, C31.2, C31.3, C31.8, C31.9, C40.20, C40.21, C40.22, C41.0, C41.1, C41.2, C41.3, C41.4, C41.9, C48.0, C61, C69.40, C69.41, C69.42, C71.0, C71.1, C71.2, C71.3, C71.4, C71.5, C71.6, C71.7, C71.8, C71.9, C77.0, C77.1, C77.2, C77.3, C77.4, C77.5, C77.8, C77.9, C78.00, C78.01, C78.02, C78.1, C78.2, C78.30, C78.39, C78.4, C78.5, C78.6, C78.7, C78.80, C78.89, C79.00, C79.01, C79.02, C79.10, C79.11, C79.19, C79.2, C79.31, C79.32, C79.40, C79.49, C79.51, C79.52, C79.60, C79.61, C79.62, C79.70, C79.71, C79.72, C79.81, C79.82, C79.89, C79.9, Q28.2, Other _____

ICD-10-PCS (circle all that apply): D0004ZZ, D0014ZZ, D0064ZZ, D7014ZZ, D7034ZZ, D7044ZZ, D7054ZZ, D7064ZZ, D7074ZZ, D7084ZZ, D8004ZZ, D9004ZZ, D9014ZZ, D9034ZZ, D9044ZZ, D9054ZZ, D9064ZZ, D9074ZZ, D9084ZZ, D9094ZZ, D90B4ZZ, D90D4ZZ, D90F4ZZ, DB064ZZ, DF004ZZ, DF014ZZ, DF024ZZ, DF034ZZ, DP004ZZ, DP024ZZ, DP034ZZ, DP044ZZ, DP054ZZ, DP064ZZ, DP074ZZ, DP084ZZ, DP094ZZ, DP0B4ZZ, DP0C4ZZ, DV004ZZ, DV014ZZ, DW014ZZ, DW034ZZ, DW064ZZ, Other _____

CPT® (circle all that apply): 77520, 77522, 77523, 77525, Other _____