

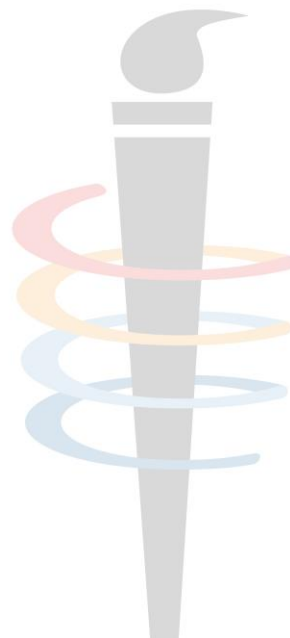
# AJCC Brain & Spinal Cord Version 9 Cancer Staging System

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## Version 9 Format



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# Protocol Format

- AJCC updated to protocol format
  - **Same information** as previous AJCC chapters, 3 key pieces:
    1. **Staging report format** is key information for managing physician to document
    2. **Explanatory notes** provide guidance
    3. **Supplemental** information available
- Why change
  - Easier for users to **find what they need ... just when they need it**
  - Users wanted a synoptic styled report format
  - Synoptic proven to **increase accurate and complete** documentation

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# Using Protocol Format

- 1. Staging report format**
  - Provides all of the key information
  - Includes new items
    - Modalities used for staging
    - Clinical staging and workup
    - Pathological staging and workup
    - Staging Rules with Common Staging Scenarios
- 2. Explanatory notes**
  - Provide the **same details** found in previous AJCC chapters
  - Includes **images** for primary site, nodal map, and T N M categories
- 3. Supplemental information includes general staging rules**

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# NEW Features – Clinical Staging and Workup Table

DIAGNOSTIC WORKUP	DESCRIPTION	SPECIFIC CONTRIBUTION TO PROGNOSIS
<b>Clinical exam</b>		
Neurologic examination	Assesses functional status	Worse performance status may be associated with worse prognosis
Skin exam	Assesses potential familial syndrome involving CNS and skin	May provide evidence of genetic syndrome
Ophthalmological exam, slit lamp exam	Assesses involvement of vitreous by neoplastic cells and evidence of familial syndrome	Used for staging for CNS lymphoma and diagnostically for some genetic syndromes
Biopsy	Microscopic confirmation and assessment of prognostic factors	Histopathologic type including histology, immunophenotype, and molecular profile is one of the most clinically meaningful prognostic factors
	Histologic type— according to the WHO classification of tumors whenever possible	Informs prognosis and treatment
	Histologic grade— WHO grade applied when possible	Informs prognosis and treatment
	Molecular features	Genetic studies are often performed to
<b>Imaging</b>		
Spine MRI in embryonal tumors, germ cell tumors, ependymoma, lymphoma and solitary fibrous tumor	MRI of spinal cord to assess for metastatic disease	Metastases beyond the primary tumor site indicate a more aggressive course and worse prognosis
<b>Laboratory studies</b>		
Cerebrospinal fluid (CSF) cytology in embryonal tumors, germ cell tumors and lymphoma	Lumbar puncture to assess CSF for malignant cells distant from primary tumor	Presence of metastatic cells associated with worse prognosis
Serum and lumbar CSF beta-human chorionic gonadotropin (β-HCG) and alpha-fetoprotein (AFP)	Serum and CSF tumor markers	Elevation of β-HCG and AFP confirms that tumor is non-germinoma germ cell tumor, with more aggressive course and worse prognosis

- Contains following elements
  - Common diagnostic workup
  - Description of the evaluation
  - How it contributes to TNM category for staging or prognosis

- List of workup options, **not** list of required workup

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# NEW Features – Pathological Staging and Workup

CATEGORY	SPECIMEN	PATHOLOGIST	MANAGING PHYSICIAN
General Information		<ul style="list-style-type: none"> <li>• Assessment of prognostic factors is based on surgical resection <b>specimen</b>, as well as intraoperative findings, neuroimaging findings, biopsy results and clinical evaluation up to the point of definitive surgical treatment, if available</li> <li>• Diagnosis should reflect the integration of both histologic</li> </ul>	<ul style="list-style-type: none"> <li>• Assessment of prognosis for the <b>patient</b> requires use of information from all biopsy results from the clinical evaluation up to and including definitive surgical treatment</li> <li>• Requires information from clinical assessment, imaging studies, intraoperative findings and other diagnostic or staging procedures relevant to diagnosis, prognosis, and treatment</li> </ul>
<b>Medulloblastoma Only</b>			
Histolog	cM0	Not assigned by pathologist	When no clinical or pathologic evidence of metastatic disease, assign cM0
	cM1	Not assigned by pathologist	Signs/symptoms of distant metastasis, and/or imaging findings, assign cM1
	cM1b	Not assigned by pathologist	Signs/symptoms of distant metastasis for intracranial spread beyond primary site
	cM1c	Not assigned by pathologist	Signs/symptoms of distant metastasis for gross spinal subarachnoid seeding on MRI
Molecul features	cM1d	Not assigned by pathologist	Signs/symptoms of distant metastasis outside CNS (bone marrow, lungs)
	pM1	Pathologic confirmation of metastatic disease by any method	<ul style="list-style-type: none"> <li>• Do not use pMX or pM0</li> <li>• pM1 includes all clinically confirmed metastasis if at least one metastatic site is confirmed microscopically</li> </ul>
	pM1a	CSF cytology	<ul style="list-style-type: none"> <li>• Requires pathological assessment of CSF metastasis</li> <li>• Tumor cells in CSF cytology</li> <li>• pM1 includes all clinically confirmed metastasis if at least one metastatic site is confirmed microscopically</li> </ul>
	pM1b	Biopsy or resection of	<ul style="list-style-type: none"> <li>• Intracranial spread beyond primary site</li> <li>• pM1 includes all clinically confirmed</li> </ul>

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- Demonstrates role of pathologist in assessing resection **specimen**
- Demonstrates role of managing physician in assigning TNM categories and stage to **patient**

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# NEW Features – Staging Rules for Brain & Spinal Cord

## Medulloblastoma Only



### Common staging scenario:

#### 1) Medulloblastoma treated with surgical resection

The most common scenario is that the patient has a diagnostic workup with imaging for a brain tumor. The **clinical staging M category (A in figure above)** is assigned based on the assessment of distant metastasis. If there are no distant metastasis identified, cM0 is assigned. If distant metastasis is identified by physical signs, symptoms, or imaging, then cM1 is assigned, including the subcategory based on type and extent of spread. If there is microscopic confirmation of distant metastasis, then pM1 is assigned, including the subcategory based on type and extent of dissemination. The assignment of cM or pM is based on the method of assessment during that classification time frame. The patient then undergoes surgical resection. The pathologist assigns pM on the pathology report based on any resected or biopsied specimens with distant metastasis, and does not assign the pM category if the specimen does not contain metastatic disease. The managing physician then assigns the **pathological staging M category (B in figure above)** for the patient in the medical record based on the clinical stage M category, the operative findings, and the results of any resected or

- Graphic of
  - Appropriate AJCC stage classification
  - Based on treatment choice
- Staging scenarios describe information used to assign AJCC stage classification

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## Key Changes in Brain & Spinal Cord Staging



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## WHO Classification of Tumours

- **WHO Classification of Tumours of Central Nervous System, 5<sup>th</sup> Edition, 2021**
  - Pure histologic diagnoses for some tumor types
  - Integrated diagnoses for other tumor types
- **Integrated diagnoses**
  - Incorporate histologic and integral molecular parameters
  - Used when similar histologic findings have different biological and clinical features
  - Classifying genetic parameters assessment by
    - Immunohistochemistry
    - Fluorescence in situ hybridization
- **Histopathologic type table**
  - Arranged by main tumor type and subtypes
  - Contain benign, borderline, and malignant behaviors

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## WHO Classification of Tumours

- **WHO Grade**
  - Grading provides a malignancy scale for a wide variety of neoplasms
  - Based on natural history, not expected clinical course following therapy
- **WHO Grades – new system uses Arabic numerals**
  - 1: circumscribed, low proliferative potential
  - 2: infiltrative in nature with high likelihood of recurrence
  - 3: demonstrate histologic evidence of malignancy
  - 4: histologically malignant, aggressive clinical course, propensity for spread
- **Table of WHO Grades**
  - Includes tumor group and tumor type
  - Identifies which WHO Grade(s) may apply
  - Identifies which tumors WHO does not currently grade

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## M Category Staging for Medulloblastoma

- **Medulloblastomas**
  - Unusual among brain tumors
  - Propensity to disseminate within CNS and metastasize to distant sites
- **AJCC M category for medulloblastoma**
  - Based on Modified Chang system
  - M category is prognostic
  - Stratify patients for therapy into high-risk or standard-risk groups
- **M1 subcategories stratified by**
  - Tumor cells in CSF
  - Intracranial spread beyond primary site
  - Gross spinal subarachnoid seeding
  - Metastasis outside CNS (bone marrow, lung)

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## M Category Staging for Medulloblastoma

- **M category based on method of assessment**
- **Clinical staging M category**
  - Occurs within timeframe of diagnostic workup
  - cM0 for no distant metastasis
  - cM1 for clinical exam and imaging during workup
  - pM1 for microscopic evidence during workup
- **Pathological staging M category**
  - Used when surgical treatment is performed
  - Pathological M category consists of clinical stage info, operative findings, and resected specimen pathology report
  - cM0 for no distant metastasis
  - cM1 for clinical exam and imaging evidence only
  - pM1 for microscopic evidence

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## Prognostic Tumor Characteristics

- **Prognostic tumor characteristics**
  - Documented for these tumors
  - To aid in diagnosis and prognosis
  
- **Documentation on**
  - Diagnostic markers for diffuse gliomas
  - Prognostic factors for diffuse gliomas
  - Prognostic markers for meningioma
  - Diagnostic and prognostic markers of embryonal tumors
  - Diagnostic and prognostic markers for ependymomas

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## Principles of Neuro-Oncology

- **Principles of Neuro-Oncology**
  - Provides information on main types of treatment
  
- **Surgery**
  - Provides histologic confirmation
  - Tissue for classification and investigation of pertinent biological markers
  - Newer techniques for intraoperative tumor detection and removal
  
- **Radiation Oncology**
  - Cornerstone of CNS tumor management
  - Reaches non-invasively into eloquent and deep parenchymal tissue
  - Discussion of planning and treatment techniques
  
- **Chemotherapy and other forms of systemic therapy**
  - Discussion of challenges unique to CNS such as blood-brain barrier to drugs
  - Benefit based on tumor type

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## New Staging & Workup Tables, Scenarios

- **Clinical Staging and Workup**
  - Algorithm of investigation and procedures used to determine prognosis and M category for medulloblastoma
- **Pathological Staging and Workup**
  - Demonstrates how resection information contributes to prognosis and M category for medulloblastoma
- **Staging Rules for Brain & Spinal Cord Medulloblastoma**
  - Staging graphic showing common scenario
  - Common staging scenario provided
    - Treated with surgical resection
      - Clinical staging M category: diagnostic workup
      - Pathological staging M category: after resection using diagnostic workup, op findings, and pathology report

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## Access to Version 9 Protocol



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## Access to Version 9 Brain & Spinal Cord Protocol

- **Kindle on Amazon**
  - Purchase as ebook or paperback
  - Free software to enable reading on PC, MAC, tablet, and phone
  - Individual ownership of ebook content, not to be shared
  
- **Facility may purchase Kindle ebook for staff**
  - Group purchase allowed
  - Purchaser emails links for users to download AJCC ebook
  
- **Institutional access vendors**
  - Multiple vendors who supply ebooks to hospital libraries
  - EHR companies may include content in their software, staging tables or complete protocol

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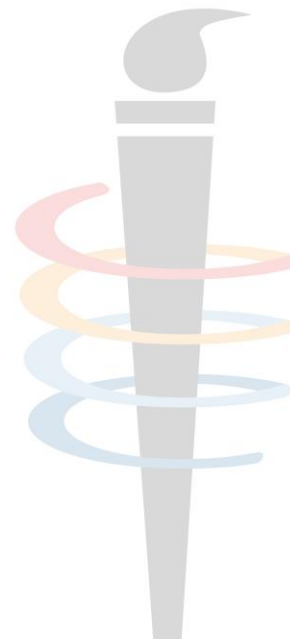
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## FAQ

- **AJCC has FAQ document on website**
  - Covers most common questions
  - Provides information and options for institutional purchases
  
- **Additional questions should be directed to [ajcc@facs.org](mailto:ajcc@facs.org)**

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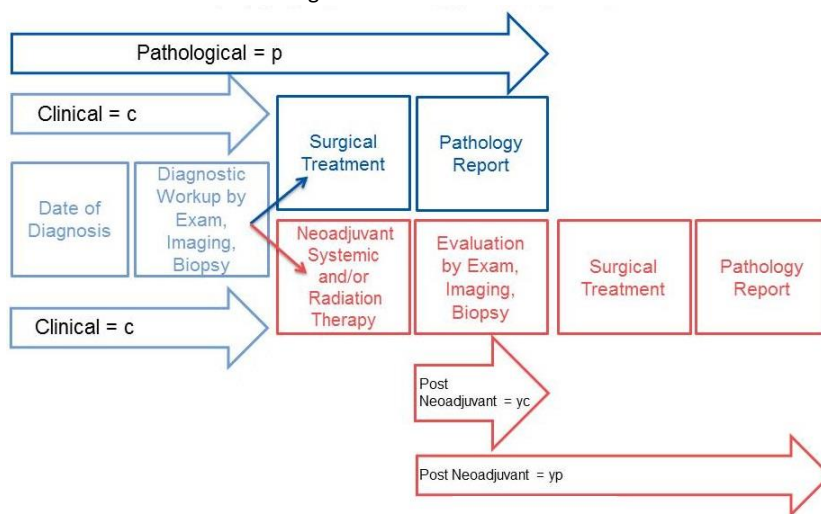
# Information and Questions on AJCC Staging

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## Timing is Everything

### AJCC Stage Classifications

Defining Time Frame and Criteria

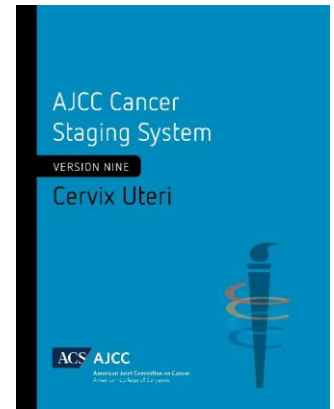
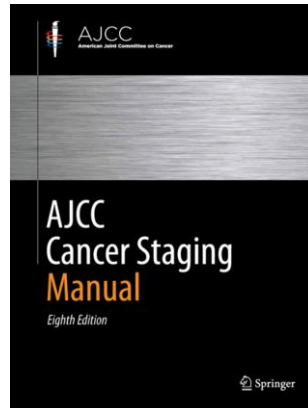


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## AJCC Web site

- <https://cancerstaging.org>
- <https://www.facs.org/quality-programs/cancer-programs/american-joint-committee-on-cancer/>
- General information
  - Overview
  - Version 9
  - Cancer Staging Systems
    - AJCC 8<sup>th</sup> edition Chapter 1: Principles of Cancer Staging
  - Cancer Staging Education
  - FAQ & Resources



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