

AJCC Cancer Staging 8th Edition

Prostate –Chapter 58

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AJCC

American Joint Committee on Cancer

Validating science. Improving patient care.

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Purpose

At an international and national level, **staging** is a cohesive approach to the classification of cancer and provides a method of clearly conveying clinical experience to others without ambiguity.

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Principles of Cancer Staging

- The *extent* or **stage** of cancer at the time of diagnosis is the key factor that defines prognosis and is a critical element in determining appropriate treatment based on the experience and outcomes of groups of previous patients with similar stage.
- Accurate staging is necessary to:
 - evaluate the results of treatments and clinical trials,
 - facilitate the exchange and comparison of information across treatment centers and within and between cancer specific registries
 - serve as a basis for clinical and translational cancer research

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Common Language

- AJCC TNM staging is the common language of cancer
- Allows for worldwide consistency
- Essential for accurate communication

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American Joint Committee on Cancer

- AJCC established in 1959
- Formulate and publish systems of classification of cancer, including staging and end-results reporting
- Goal: Create acceptable tools to be used by the medical profession for selecting-
 - the most effective treatment
 - determining prognosis
 - continuing evaluation of cancer control measures.

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American Joint Committee on Cancer

- The AJCC is composed of 18 member organizations, and its activities are administered by the American College of Surgeons.
- Mandatory requirement that the American College of Surgeons accredited hospitals use AJCC TNM as major language for cancer reporting

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Manual for Staging of Cancer (1977), American Joint Committee for Cancer Staging & End Result Reporting, 1st Edition

“Philosophy of staging by the TNM system”:

“It is intended to provide a way by which designation the state of a cancer at various points in time can be readily communicated to others to assist in decisions regarding treatment and to be a factor in judgment as to prognosis. Ultimately, it provides a mechanism for comparing like or unlike groups of cases, particularly in regard to the results of different therapeutic procedures”

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Reasons for Assigning Stage

- Discuss case with multidisciplinary cancer care team
 - Primary care physician – Surgeon – Radiologist – Pathologist – Medical Oncologist – Radiation Oncologist- Endocrinologist
- Choose appropriate diagnostic workup and treatment – Guidelines include T, N, M, and stage group criteria
- Analyze treatment results for recurrence and survival
- Data analysis of various factors stratified by stage

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Classifications

- Stage may be defined at several time points in the care of the cancer patient.
- Time points are termed classifications and are based on the continuum of evaluation
 - Clinical (cTNM)
 - Pathological (pTNM)
 - Post therapy (ycTNM or ypTNM)
 - Recurrence (rTNM)
 - Autopsy (aTNM)
- The staging classifications have a different purpose and therefore can be different. Do not go back and change the clinical staging based on pathologic staging information.

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Stage Group Tables

- Patients with similar prognosis TNM are grouped into prognostic stage groups, commonly referred to as stage groups. Stage groups are defined for each classification (clinical and pathological)
- Subcategories: T1a, T1b
- Specific notations: TX (no information, unknown or can't be assessed) This term should be minimized
- No MX. There is no pM0. Should be labelled cM0.
- Stage 0 is used to denote carcinoma in situ

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Structure

- AJCC and Union of International Cancer Control (UICC) periodically modify the system in response to newly acquired clinical and pathological data and improved understanding of cancer biology and other factors affecting prognosis.
- Revision cycles are historically every 5-7 years
- Content Harmonization Core was developed for the 8th edition. Goal was to standardize terms and concepts and overall rules

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AJCC 8th Edition

- Evidence-based medicine approach
 - 18 expert panels
 - 420 contributors
 - 181 institutions, 22 countries, 6 continents
 - Expanded editorial board supported by 7 AJCC core committees
 - Content harmonization, precision medicine, statistics, imaging, data collection, professional organization and corporate relationships
- Collaborative authorship

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AJCC 8th Edition

- Published October 6, 2016
- **Effective for all cases diagnosed on or after January 1, 2018**

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AJCC 8th Edition

- **Bridge from a Population Based to a More Personalized Approach**
 - require integration of a wide variety of information based on patient history and physical examination findings supplemented by imaging, intraoperative findings, and pathologic data
- **What's New?**
 - Data Element Review Form and Levels of Evidence
 - Precision Medicine Core with relevant genomic markers
 - Chapter Templates
 - New Chapter Headings
 - Tabular format for TNM Definitions and Stage Groups



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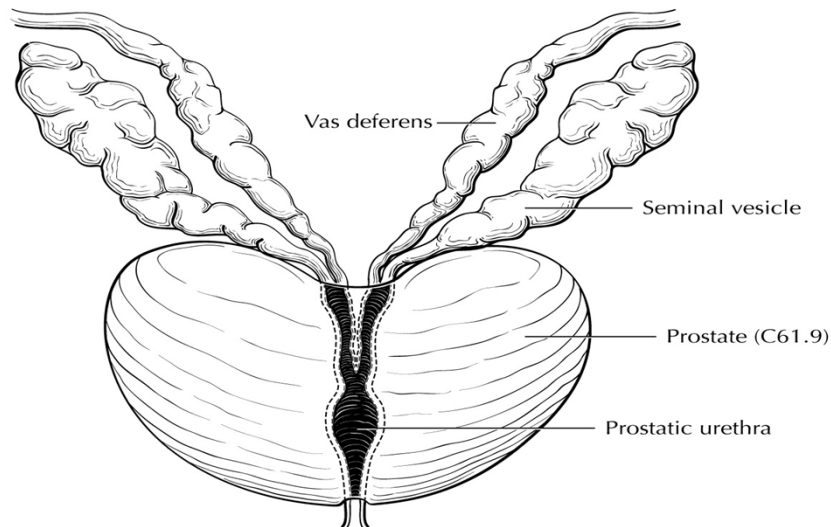
Chapter Outline Templates

- Chapter Summary- (ICD-0-3 Topography codes and WHO Histology codes)
- Introduction- general information
- Anatomy
- Rules for Classification (Clinical and Pathologic)
- Prognostic Factors
- Risk Assessment Models
- Recommendations for clinical trial stratification

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AJCC 8th Edition Prostate-Chapter 58



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Prostate Cancer- Chapter 58-Summary of Changes

- Definition of Primary Tumor (T): Pathological organ-confined disease (after radical prostatectomy) is **now all pT2** and *not subdivided into pT2a, pT2b, or pT2c*
- Histologic Grade (G): The Gleason score (2014 criteria) and the **Grade Group (1-5)** should both be reported.
- AJCC Prognostic Stage Groups: **Stage III** includes select organ-confined disease tumors based on prostate-specific antigen (PSA) and Gleason/Grade Group status.

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Prostate Cancer- Chapter 58-**Pathological** Stage

- Pathological Stage is defined after a radical prostatectomy
- The old 7th Edition AJCC divided pathologic stage T2 into three groups: pT2a, pT2b, and pT2c.
- **The new 8th Edition AJCC has all organ-confined post surgical cases as pT2**
- **Tumor detected in apex/distal margin is pT2**
- There is no pT1 category
- Clinical staging, however, *retains* the three tier system (cT2a, cT2b, cT2c)
- pT3a: unilateral or bilateral extraprostatic extension
- pT3b: tumor invading the seminal vesicle(s)
- Margin status is technically NOT part of current AJCC staging


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AJCC Prostate 8th Edition **Pathologic** Staging

Pathological T (pT)

T Category	T Criteria
T2	Organ confined 
T3	Extraprostatic extension
T3a	Extraprostatic extension (unilateral or bilateral) or microscopic invasion of bladder neck
T3b	Tumor invades seminal vesicle(s)
T4	Tumor is fixed or invades adjacent structures other than seminal vesicles such as external sphincter, rectum, bladder, levator muscles, and/or pelvic wall

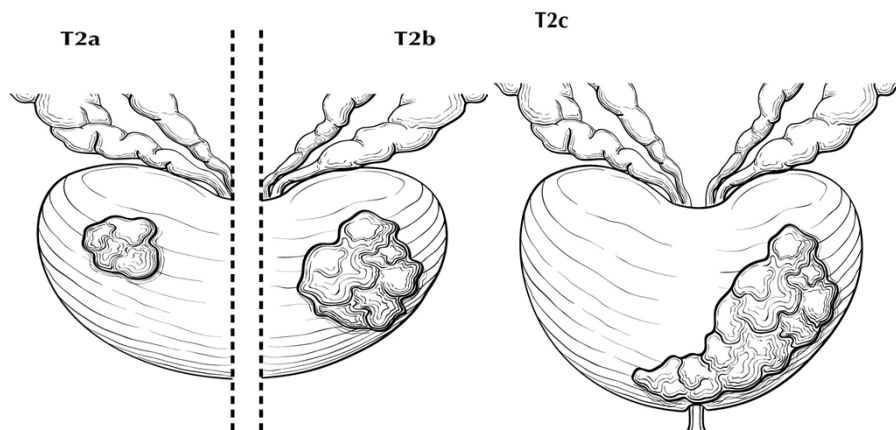
Note: There is no pathological T1 classification.

Note: Positive surgical margin should be indicated by an R1 descriptor, indicating residual microscopic disease.

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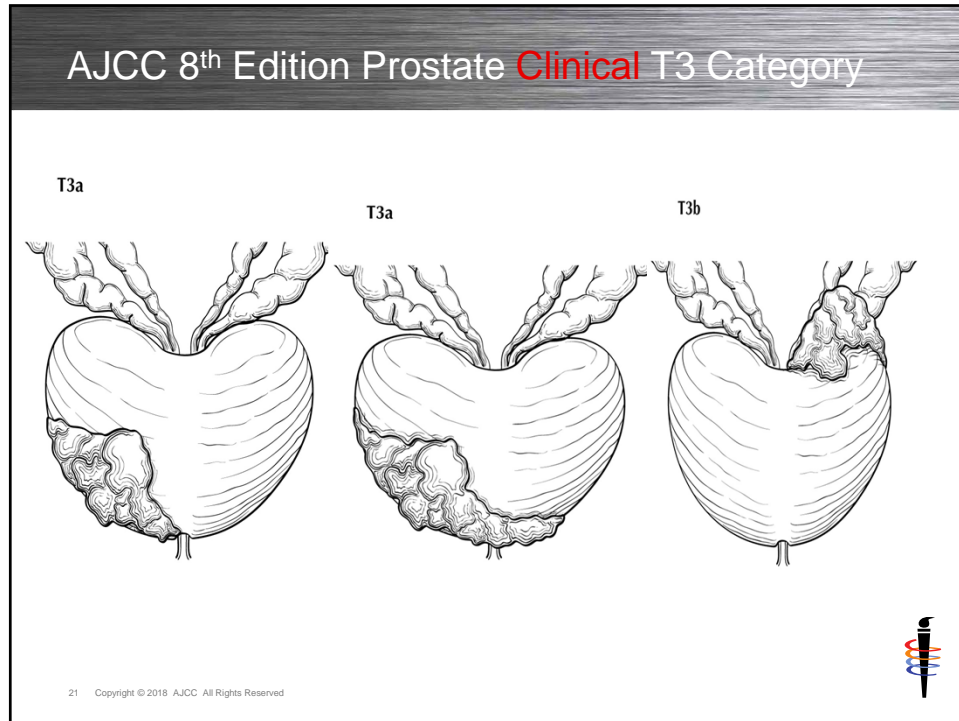
AJCC 8th Edition Prostate: **Clinical** T2 Category



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Prostate Cancer- Chapter 58-Histological **Grade Group**

- Group 1: Gleason ≤ 6
- Group 2: Gleason $3+4=7$
- Group 3: Gleason $4+3=7$
- Group 4: Gleason 8
- Group 5: Gleason 9 or 10
- Grade group is prognostic for PSA recurrence and prostate cancer mortality (AJCC Level of Evidence: I)

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AJCC 8th Edition Prostate: Histologic Grade Groups

Definition of Histologic Grade Group (G)

Recently, the Gleason system has been compressed into so-called Grade Groups.⁴⁸

<i>Grade Group</i>	<i>Gleason Score</i>	<i>Gleason Pattern</i>
1	≤ 6	≤ 3+3
2	7	3+4
3	7	4+3
4	8	4+4, 3+5, 5+3
5	9 or 10	4+5, 5+4, or 5+5

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Prostate Cancer- Chapter 58-AJCC Prognostic Group

III

- Organ-confined primary tumor and/or
- Gleason Grade Group 5 (Gleason 4+5 or 5+4 or 5+5)
- PSA >20

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AJCC 8th Edition Prostate: Prognostic Stage Groups

AJCC Prognostic Stage Groups

When T is...	And N is...	And M is...	And PSA is...	And Grade Group is...	Then the stage group is...
cT1a-c, cT2a	NO	M0	< 10	1	I
pT2	NO	M0	< 10	1	I
cT1a-c, cT2a, pT2	NO	M0	≥ 10 < 20	1	IIA
cT2b-c	NO	M0	< 20	1	IIA
T1-2	NO	M0	< 20	2	IIB
T1-2	NO	M0	< 20	3	IIC
T1-2	NO	M0	< 20	4	IIC
T1-2	NO	M0	≥ 20	1-4	IIIA
T3-4	NO	M0	Any	1-4	IIIB
When T is...	And N is...	And M is...	And PSA is...	And Grade Group is...	Then the stage group is...
Any T	NO	M0	Any	5	IIIC
Any T	N1	M0	Any	Any	IVA
Any T	Any N	M1	Any	Any	IVB

Note: When either PSA or Grade Group is not available, grouping should be determined by T category and/or either PSA or Grade Group as available.

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Prostate Cancer- Chapter 58-Clinical T Category

- In the 8th Edition, clinical T-category should still be based only on the digital rectal examination (DRE) findings.
- Neither imaging information or tumor laterally information from the prostate biopsy should be used for clinical T category.
- A tumor that is found in one or both sides by needle biopsy, but is not palpable is classified as T1c
- Clinical T category should always reflect DRE findings only
- Although imaging, particularly multi-parametric prostate MRI, has improved, imaging should NOT be used for T-category assessment.

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AJCC 8th Edition Clinical T Category

Clinical T (cT)

<i>T Category</i>	<i>T Criteria</i>
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
T1	Clinically inapparent tumor that is not palpable
T1a	Tumor incidental histologic finding in 5% or less of tissue resected
T1b	Tumor incidental histologic finding in more than 5% of tissue resected
T1c	Tumor identified by needle biopsy found in one or both sides, but not palpable
T2	Tumor is palpable and confined within prostate
T2a	Tumor involves one-half of one side or less
T2b	Tumor involves more than one-half of one side but not both sides
T2c	Tumor involves both sides
T3	Extraprostatic tumor that is not fixed or does not invade adjacent structures
T3a	Extraprostatic extension (unilateral or bilateral)
T3b	Tumor invades seminal vesicle(s)
T4	Tumor is fixed or invades adjacent structures other than seminal vesicles such as external sphincter, rectum, bladder, levator muscles, and/or pelvic wall

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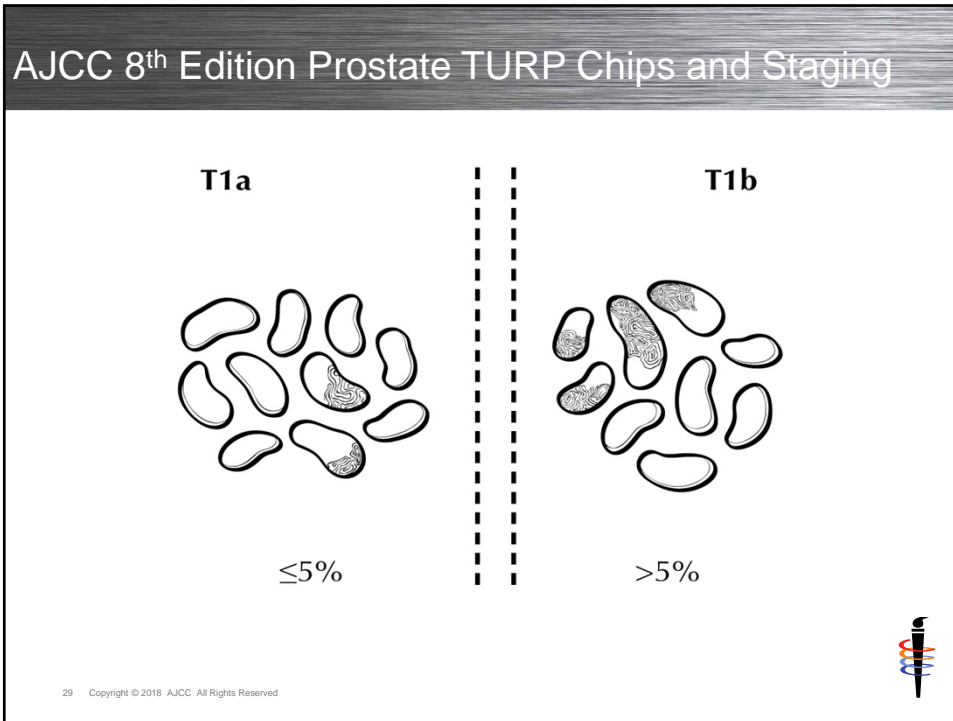
Prostate Cancer- Chapter 58-T Category Prostate Imaging

- Imaging one day could potentially improve clinical staging accuracy of the prostate.
- However, inter-observer reproducibility, issues with patient selection, and contradictory results have limited the utility of imaging in clinical T staging.
- Imaging can not replace the DRE as clinical t category standard
- For local T category assignment, no imaging test is required
- Transrectal ultrasound (TRUS)- not accurate for T-staging
- Magnetic resonance imaging (MRI)- not consistently accurate in staging the primary tumor.

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Prostate Cancer- Chapter 58-PSA

- Prostate-specific Antigen (PSA) blood test
- Protein produced by cells of the prostate gland
- The KEY tumor marker for screening and management
- The higher the PSA, the greater the risk of diagnosis and mortality of prostate cancer
- PSA < 10: “low” or “low risk”
- PSA 10-20: “intermediate” or “Intermediate risk”
- PSA > 20: “High” or “High Risk”
- PSA > 100: without clinical metastases is associated with much poorer survival (AJCC Level of Evidence: I)

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AJCC 8th Edition Prostate: Use of PSA Levels

Definition of Prostate-Specific Antigen (PSA)

PSA values are used to assign this category.

PSA values
<10
≥10<20
≥20
Any value

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Prostate Cancer- Chapter 58-Risk Assessment Models

- AJCC Precision Medicine Core (PMC) developed and published criteria for eval of prognostic tool quality (Chapter 4)
- PMC eval of prostate cancer prog models/tools Jan2011-Dec2015; N=15 tools identified and evaluated; full list @ www.cancerstaging.org
- 13/15 were rejected.
- Only 1/7 models in localized disease met 11 of 14 criteria (Eggerer et al J. Urol 185: 869, 2011; RP 15 yr mortality)
- 2/6 models for metastatic disease met all criteria: Halabi/Duke Nomogram 1st and 2nd editions

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Prognostic Tools for Prostate Cancer

TABLE 58.1. Prognostic tools for prostate cancer that met all AJCC quality criteria.

<i>Approved Prognostic Tool</i>	<i>Web Address</i>	<i>Factors Included in the Model</i>
Metastatic castration-resistant prostate cancer ⁴³	https://www.cancer.duke.edu/Nomogram/firstlinechemotherapy.html	ECOG performance status, site of metastases, PSA, hemoglobin, albumin, alkaline phosphatase, LDH > 1 ULN, opioid analgesic use
Metastatic castration-resistant prostate cancer treated with second-line chemotherapy ³⁹	https://www.cancer.duke.edu/Nomogram/secondlinechemotherapy.html	ECOG performance status, visceral disease, progression on docetaxel, duration on hormone, measurable disease, pain, PSA, hemoglobin, alkaline phosphatase

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Prostate Cancer- Chapter 58-Clinical Trial Stratification

- Primary Tumor: T-category, Serum PSA, Grade Group (1-5) with Gleason score, Number and percentage of positive biopsy regions (i.e. biopsy “cores”)
- Regional Lymph Nodes/Distant Metastases: performance status, M0 versus M1 category; Extranodal extension of cancer, M1b (bone) versus M1c (lung, liver, brain, with or without bone)

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AJCC 8th Edition Prostate Clinical Nodal Staging

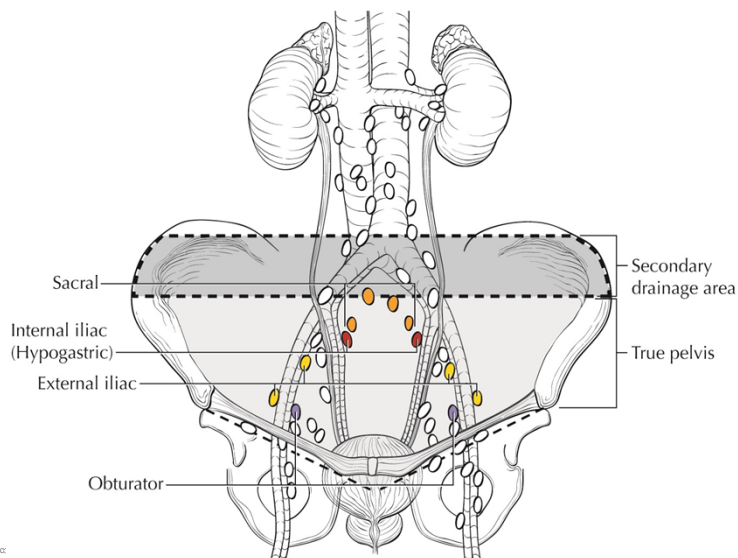
Definition of Regional Lymph Node (N)

<i>N Category</i>	<i>N Criteria</i>
NX	Regional lymph nodes cannot be assessed
N0	No positive regional nodes
N1	Metastases in regional node(s)

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AJCC 8th Edition Prostate Pelvic Anatomy and Nodal Disease: "Regional Nodes" **Shaded area in the dotted-line rectangular area is consider M1a and NOT N+ disease**



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AJCC 8th Edition Prostate Metastases Staging

Definition of Distant Metastasis (M)

<i>M Category</i>	<i>M Criteria</i>
M0	No distant metastasis

<i>M Category</i>	<i>M Criteria</i>
M1	Distant metastasis
M1a	Nonregional lymph node(s) 
M1b	Bone(s)
M1c	Other site(s) with or without bone disease
Note: When more than one site of metastasis is present, the most advanced category is used. M1c is most advanced.	

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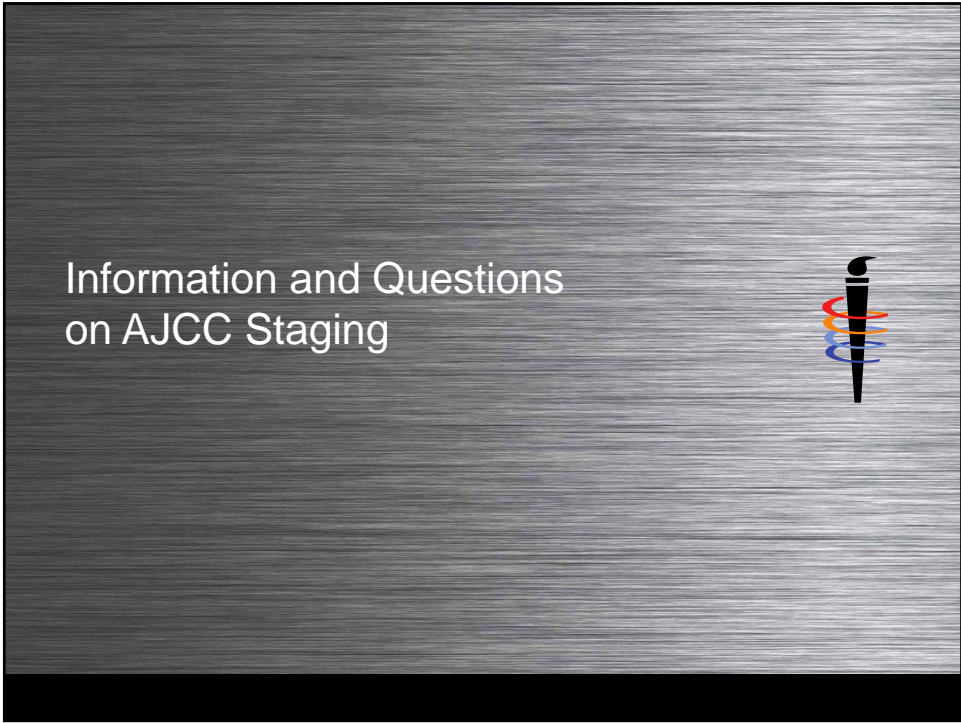
Assigning Stage: The Role of the Managing Physician

- Staging requires the collaborative effort of many professionals, including the managing physician, pathologist, radiologist, cancer registrar and others
- While the pathologist and the radiologist provide important staging information, and may provide important T-, N-, and/or M-related information, stage is defined ultimately from the synthesis of an array of patient history and physical examination findings supplemented by imaging and pathology data
- Only the managing physician can assign the patient's stage, since only (s) he routinely has access to all of the pertinent information from the physical exam, imaging studies, biopsies, diagnostic procedures, surgical findings, and pathology reports

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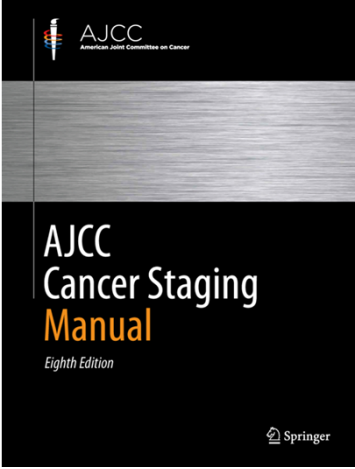


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AJCC Web site

- <https://cancerstaging.org>
- Ordering information
 - Cancerstaging.net
- General information
 - Education
 - Articles
 - Updates



The image shows the front cover of the 'AJCC Cancer Staging Manual, Eighth Edition'. The cover is black with a white horizontal band across the middle. The AJCC logo is in the top left corner. The title 'AJCC Cancer Staging Manual' is prominently displayed in white and orange, with 'Eighth Edition' in smaller white text below it. The Springer logo is in the bottom right corner. A small version of the pen nib logo is in the bottom right corner of the slide.

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CAnswer Forum

- Submit questions to AJCC Forum
 - NEW 8th Edition Forum *COMING SOON*
 - 7th Edition Forum will remain
 - Located within CAnswer Forum
 - Provides information for all
 - Allows tracking for educational purposes
- <http://cancerbulletin.facs.org/forums/>



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Thank you-Questions?
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