AJCC Cancer Staging 8th Edition

Colon and Rectal Cancer Staging Update Webinar

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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 a 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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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 cased diagnosed on or after January 1, 2018

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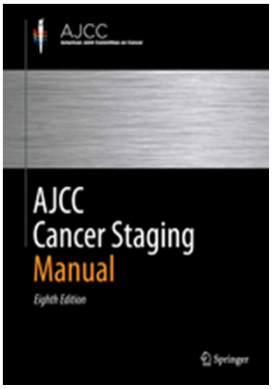
AJCC 8th Edition

- 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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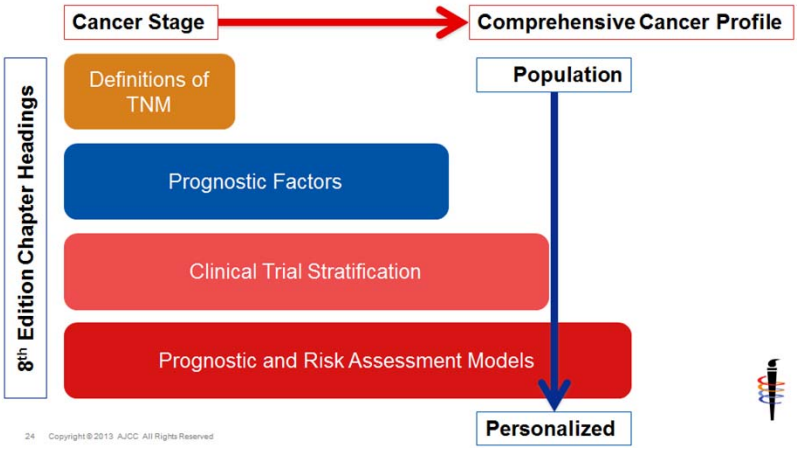
AJCC Vision

...and Where It Fits in the 8th Edition:



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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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New Feature: Evidence Based Approach

- Levels of evidence defined by EBM & Statistics core for key information ensure transparency
- Changes to stage definitions based on data - no changes to stage definition based on level 4 evidence
- Data sources for stage definition changes and 8E content
  - *NCDB*
  - *SEER*
  - *Multi-institutional databases*
  - *International databases (Lung, Melanoma, Esophagus…)*
  - *Publications*

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New Features: Precision Medicine Vision

- Prognostic factors
  - –Required for prognostic stage grouping
  - –Recommended for clinical care
  - –Emerging factors (online only)
- Risk Assessment Models for select cancer sites
- Recommendations for Clinical Trial Stratification

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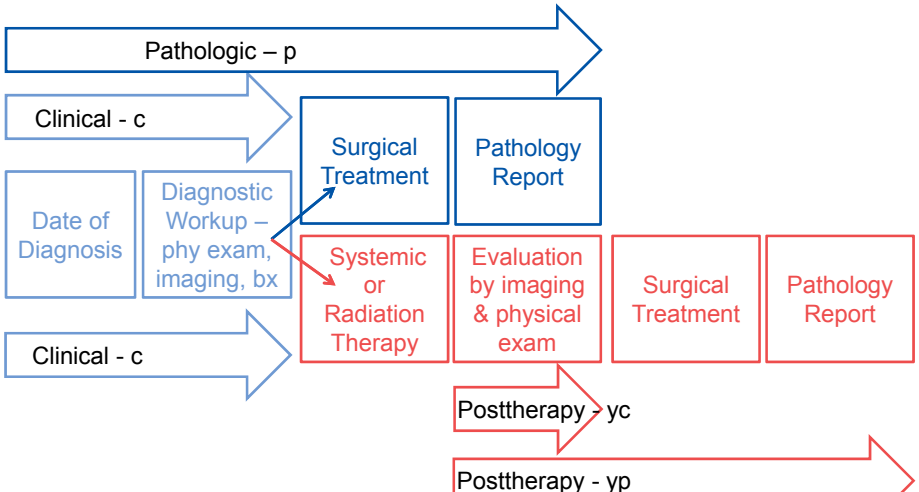
Stage Classifications



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AJCC 8th Edition Staging

1-Page Guide Available on AJCC Website

AJCC 8th Edition Staging: 1-Page Guide

KEY TERMINOLOGY

- Classifications
  - Describes points in time of care of cancer patient
  - Criteria: timeframe & specific medical assessments/practices
- Categories
  - T, N, M
  - Any non-anatomic factors needed to assign stage group
- Stage group
  - Easily communicated summary of categories
  - Groups patients with similar prognosis
- Assigning stage
  - AJCC stage assigned by managing physician
  - Based on data from all relevant sources

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CLINICAL STAGING CLASSIFICATION RULES

General: clinical classification	T category	N category	M category
From date of diagnosis until definitive treatment, or within 4 months	Hx, symptoms, physical exam, labs, imaging, endoscopy, Bx, surg exp	Physical exam, imaging, FNA/core needle bx, excisional bx, sentinel node bx	Clinical history, physical exam, imaging, FNA/biopsy

- Rationale
  - Diagnostic bx of primary/nodes/distant mets = clinical classification
  - Pathology exam of resected tissue is not pathological staging
  - cN even if based on lymph node bx
  - Clinical M category is
    - cM if based on history, physical exam and imaging
    - pM1 if based on biopsy proven involvement

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PATHOLOGICAL STAGING CLASSIFICATION RULES

General: pathological classification	T category	N category	M category
Clinical stage, op findings, path report resected specimen	Must meet definitive surgical treatment	Microscopic assessment of 1 node required, include imaging & dx bx	History, physical exam, imaging, FNA/biopsy, resection

- Rationale
  - Include all findings even if not microscopically proven
  - Pathological staging based on synthesis of all info
    - Not solely on resected specimen pathology report
    - Pathologist cannot assign final stage
  - Pathological M category is
    - cM if based on physical exam and imaging
    - pM1 if based on bx proven involvement, “pM0” NOT a valid category

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POST NEOADJUVANT THERAPY STAGING CLASSIFICATION RULES

- yc Clinical
  - Includes physical exam and imaging assessment
  - *After* neoadjuvant systemic/radiation therapy
- yp Pathological
  - Includes all information from yc staging,
  - Surgeon's operative findings and
  - Pathology report from resected specimen

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8th Edition Chapter 20

20. Colon and Rectum

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Chapter Summary

Cancers Staged Using This Staging System

Adenocarcinomas, high-grade neuroendocrine carcinomas, and squamous carcinomas of the colon and rectum are covered by this staging system.

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Cancers Not Staged Using This Staging System

These histopathologic types of cancer…	*Are staged according to the classification for…*	*And can be found in chapter…*
Appendiceal carcinomas	Appendix—carcinoma	19
Anal carcinomas	Anus	21
Well-differentiated neuroendocrine tumors (carcinoids)	Well-differentiated neuroendocrine tumors of the colon and rectum	33

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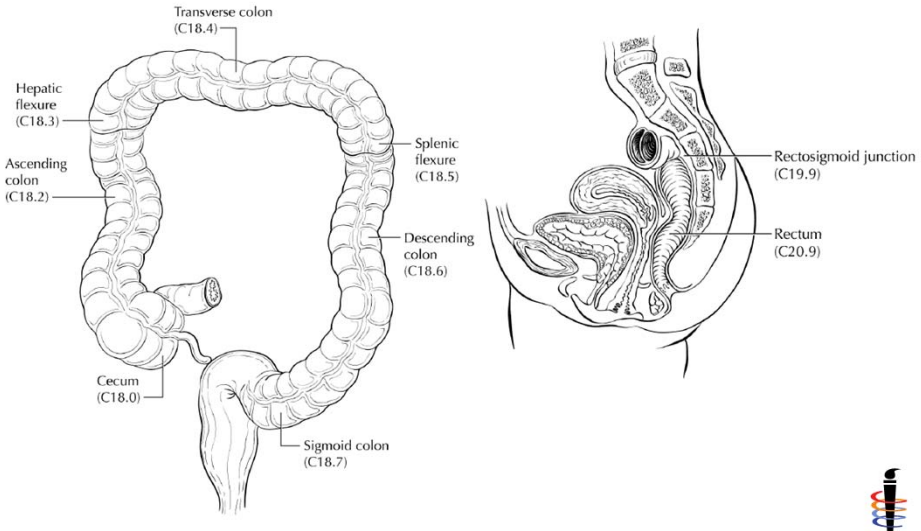
Anatomic Subsites Colon and Rectum



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Clinical Staging

Systemic

Chest/Abd/Pelvis

- CT
- MRI
- PET/CT

Tumor Extent

- Rectal MRI
- EUS
- EUS/ FNA

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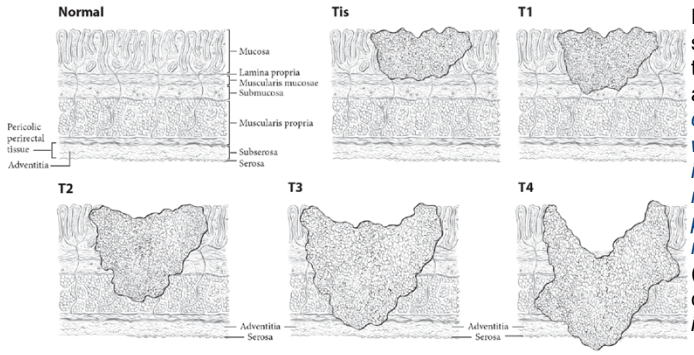
Definition of Primary Tumor (T)



High-grade dysplasia should not be assigned to the Tis category…**Tis** is assigned to *lesions confined to the mucosa in which cancer cells invade into the lamina propria and may involve but not penetrate through the muscularis mucosa.* (These lesions are more correctly termed *intramucosal carcinoma*.)

…not peritonealized (e.g., posterior aspects of the ascending and descending colon, lower portion of the rectum), the **T4a** category is not applicable.

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N Classification

N1			N2	
N1a	N1b	N1c	N2a	N2b
1 +ve	2-3 +ve	discrete tumor nodules within the lymph drainage area of the primary carcinoma without identifiable lymph node tissue or identifiable vascular or neural structure (LVI)	4-6 +ve	≥7 +ve

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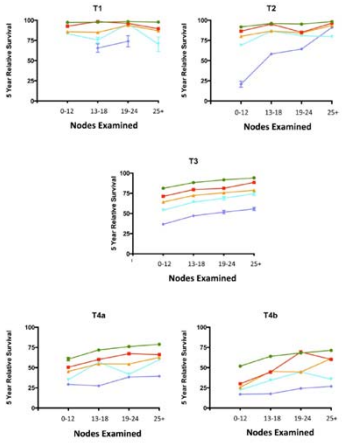
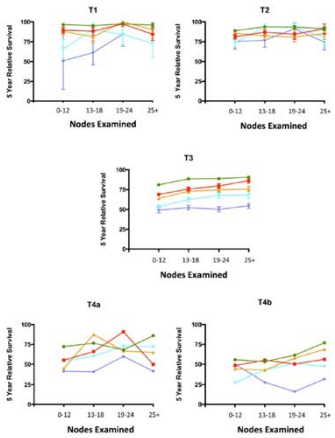
Prognostic Impact of Number Lymph Nodes

Colon



Rectum



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Definition of Distant Metastasis

M Category	*M Criteria*
M0	No distant metastasis by imaging, etc.; no evidence of tumor in distant sites or organs (This category is not assigned by pathologists.)
M1	Metastasis to one or more distant sites or organs or peritoneal metastasis is identified
M1a	Metastasis to one site or organ is identified without peritoneal metastasis
M1b	Metastasis to two or more sites or organs is identified without peritoneal metastasis
M1c	***Metastasis to the peritoneal surface is identified alone or with other site or organ metastases***

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AJCC Prognostic Stage Groups

When T is…	And N is…	And M is…	Then the stage group is…
Tis	N0	M0	0
T1, T2	N0	M0	I
T3	N0	M0	IIA
T4a	N0	M0	IIB
T4b	N0	M0	IIC
T1–T2	N1/N1c	M0	IIIA
T1	N2a	M0	IIIA
T3–T4a	N1/N1c	M0	IIIB
T2–T3	N2a	M0	IIIB
T1–T2	N2b	M0	IIIB
T4a	N2a	M0	IIIC
T3–T4a	N2b	M0	IIIC
T4b	N1–N2	M0	IIIC
Any T	Any N	M1a	IVA
Any T	Any N	M1b	IVB
Any T	Any N	M1c	IVC

	T Category					
N Category	*Tis*	*T1*	*T2*	*T3*	*T4a*	*T4b*
N0	0	I	I	IIA	IIB	IIC
N1a	N/A	IIIA	IIIA	IIIB	IIIB	IIIC
N1b	N/A	IIIA	IIIA	IIIB	IIIB	IIIC
N1c	N/A	IIIA	IIIA	IIIB	IIIB	IIIC
N2a	N/A	IIIA	IIIB	IIIB	IIIC	IIIC
N2b	N/A	IIIB	IIIB	IIIC	IIIC	IIIC
M1a	N/A	IVA				
M1b	N/A	IVB				
M1c	N/A	IVC				

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Special Cases

- Recurrent Colorectal Cancer
  - r prefix
  - assign rTNM
  - Anatomically assigned to proximal segment of anastomosis unless it is small bowel
- Incidental Colorectal Cancer found at death
  - a prefix

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Prognostic Factors Recommended for Clinical Care—Registry Data Collection Variables

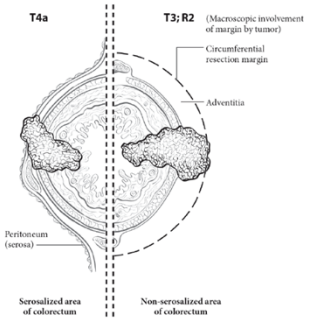
1. CEA
2. TRG
3. CRM (mm)
4. LVI
5. PNI
6. MSI
7. KRAS/NRAS
8. BRAF

TABLE 20.2. Modified Ryan scheme for tumor regression score

Description	*Tumor regression score*
No viable cancer cells (complete response)	0
Single cells or rare small groups of cancer cells (near-complete response)	1
Residual cancer with evident tumor regression, but more than single cells or rare small groups of cancer cells (partial response)	2
Extensive residual cancer with no evident tumor regression (poor or no response)	3

(Adapted from Ryan et al[11,12,60] with permission).

FIGURE 20.8. Depiction of T4a lesions and the importance of the circumferential margin.



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LVI

Lymphovascular Invasion (LVI)

Invasion of either small or large vessels by the primary tumor is an important poor prognostic factor. ***Small vessel invasion*** is involvement by tumor of thin-walled structures lined by endothelium, without an identifiable smooth muscle layer or elastic lamina. These thin-walled structures include lymphatics, capillaries, and postcapillary venules. ***Large vessel invasion*** is defined by tumor involving endothelium-lined spaces that have an elastic lamina and/or smooth muscle layer. Circumscribed tumor nodules surrounded by an elastic lamina on H&E or elastic stain also are considered venous invasion and may be extramural (beyond the muscularis propria) or intramural (submucosa or muscularis propria).

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Additional Factors for Further Evaluation?

- Colorectal Cancer
  - Tumor deposits and impact on stage when N1a-b or N2a-b
  - Total number of lymph nodes examined/Lymph node ratio
  - Detection of isolated tumor cells
    - Clusters of 10-20 tumor cells
  - Detection of micrometastasis
    - ≥ 0.2 mm
  - Extramural vascular invasion
  - Molecular subtypes, novel mutations
- Rectal cancer
  - Definition of regional lymph nodes
    - Internal iliac (N)
    - Obturator lymph nodes (M)

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Summary of Key Changes to 8th Edition Colon and Rectum

Change	Details of Change	Level of Evidence
Definition of Distant Metastasis (M)	Introduced M1c, which details peritoneal carcinomatosis as a poor prognostic factor	I
Definition of Regional Lymph Node (N)	Clarified the definition of tumor deposits	II
Additional Factors Recommended for Clinical Care	Lymphovascular invasion: reintroduced the L and V elements to better identify lymphatic and vessel invasion	I
Additional Factors Recommended for Clinical Care	Microsatellite instability (MSI): clarified the importance of MSI as a prognostic and predictive factor	I
Additional Factors Recommended for Clinical Care	Identified KRAS, NRAS, and BRAF mutations as critical prognostic factors that are also predictive	I and II

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AJCC Web site

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- General information
  - Education
  - Articles
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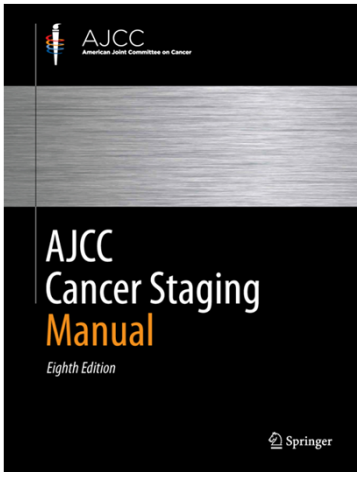

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CAnswer Forum

- 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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