AJCC Stage Introduction and General Rules

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* AJCC Cancer Staging Manual, Seventh Edition

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Introduction

- **AJCC and Union International for Cancer Control (UICC)**
  - Most clinically useful staging system
  - Tumor, Nodes, Metastasis (TNM)
    - Anatomic factors (extent/size, nodes involved, distant spread)
    - Some non-anatomic and a few site specific anatomic prognostic factors that are separate from the T, N and M
  - Includes selected or common cancer sites and histologies
  - Revision cycle 6-8 years
General Rules for AJCC 7th Edition

- Review of the general rules
  - Clinical and pathologic
  - T, N, M
- Examples
- Stage Grouping
- Stage Timing Rules
- Summary

General Rules for AJCC 7th Edition

- All cases should be microscopically confirmed
  - Can stage them clinically
  - Do not include in analysis
- Does not include pediatric or CNS cancers
- Criteria for defining anatomic extent of disease are:
  - Specific for tumors of different sites
  - Histology

General Rules

Site specific chapter rules take priority over the general rules!

CAUTION
AJCC TNM Categories

- **Describe the three significant events of a cancer**
  - Local tumor growth (T)
  - Spread to regional lymph nodes (N)
  - Metastasis (M)

**Clinical Stage:**
Disease as it appears before definitive therapy

- cTcNcM or cTcNpM

**Pathologic Stage:**
Based on clinical stage, operative findings, and examination of surgical resection

- pTpNpM or pTpNcM

**Pure Clinical and Pathologic Stage “Mixes”**

- **In situ**
  - pTis cN0 cM0

- **Others**
  - cT cN pM1
  - pT pN cM0

*May be used to define both clinical and pathologic stages.*

**General Rules -- clinical T (cT)**

- **Size and/or**
- **Local extension**
- **cT determined**
  - Physical exam, symptoms
  - Imaging
  - Endoscopy
  - Biopsy of primary site
  - Surgical exploration without a resection
  - Other relevant examinations
General Rules – pathologic T (pT)

- Size and/or
- Local extension
- pT category determination
  - Based on all clinical information and
  - Surgical resection or
  - Biopsy confirms the highest T category
  - Pathology
- Assigned before any systemic or radiation therapy

General Rules—clinical N (cN)

- Clinical assessment
- Path exam of single (or multiple) lymph node(s) 
  *without tumor resection is a cN (cT = cN)*
- Tumor nodule in nodal area with smooth contours
- Direct extension of primary into nodal area
General Rules—pathologic N (pN)

- Pathological assessment of regional lymph nodes
- At least one node must be pathologically examined
  - Should be the recommended minimal number in each site
  - Can still be pN if the recommended number is not examined
  - Can be determined by sentinel biopsy for some sites
- Biopsy of the highest N category is a pN
- pT is required to assign a pN
  - pT any microscopic evaluation of nodes = pN
  - cT and a sentinel node biopsy = cN
- ITC (only) = pN0 in most sites

General Rules -- X

- Used when information is unknown
- Tx and Nx usually preclude stage assignment
  - May be appropriate
  - Do not over use
  - X may = to Any T, Any N in some chapters
- Mx has been eliminated
  - Clinical M0 unless there is clinical or pathologic evidence of mets.

General Rules – clinical M (cM)

- cM only requires history and physical examination
- Imaging of distant sites is not required for cM0
- Infer status as cM0 unless known cM1
- CTCs or circulating DTCs only = cM0
- cM0 can be part of path stage with pT and pN
  - pT, pN and cM0 = pathologic stage I
- pM1 can be stage grouped as clinical and pathologic Stage IV
  - cT1, cN1 and pM1 = Stage IV pathologic and clinical
General Rules—pathologic M (pM)

- Pathological M requires a positive biopsy for metastasis
- pM0 is only used at autopsy
- Stage group may include either cM0 or cM1 or pM1
  - pTNM = pT, pN and cM or pM
- CTCs or DTCs (only) from biopsy = cM0

General Rules

- Nonanatomic (and a few anatomic) factors
  - Some are required for specific sites
  - Clearly defined in each chapter
  - Collected separately from T, N and M
  - Used to assign the stage group
    - Gastrointestinal stromal tumors
    - Prostate
    - Melanoma
    - A few others
General Rules

- TNM Stage Groupings
  - Stage groups
    - Similar prognosis
    - Classified with Roman numerals
      - I-IV with increasing severity
  - Stage 0 – denotes carcinoma in situ (confirmed by pathology)
  - Stage I – smaller and less invasive with negative nodes
  - Stage II through III – increasing tumor or nodal extent
  - Stage IV – distant metastasis at diagnosis

TNM Staging Classification

- Clinical
- Pathologic
- Recurrent
- Post treatment
- Autopsy

Timing Rules

- AJCC 7th ed. has 2 defined timing rules
  - Clinical
  - Pathologic
- ALWAYS based on:
  - Information at time of initial diagnosis
  - First course of treatment
- Look for:
  - Dates
  - Evidence of recurrence or progression
  - Neoadjuvant therapy
  - First course versus subsequent treatment
  - Changes in treatment plan or additional treatment added
What is the Basis of the Information?

**Clinical**
- Diagnostic work-up (imaging, biopsies, physical exam, etc.)
- Information available prior to the start of treatment
- Used to make treatment decisions
- Available on almost all cases

**Pathologic**
- All clinical findings (biopsy, imaging, operative findings from exploratory, etc.)
- Information available from the operative findings during resection and pathologic examination of tissues
- Determine adjuvant therapy and estimate prognosis
- Available less frequently than clinical

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**Stage**

- **Clinical Stage**
  - Part of the work-up
    - Biopsy
    - Exploratory surgery
    - Imaging, etc.

- **Pathologic Stage**
  - Surgical treatment
  - All clinical findings unless proven otherwise
    - With tissue or without tissue (site specific)

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**EXAMPLE:** node positive at work up, during surgical treatment the node is considered benign
- cN+
- pN-

**EXAMPLE:** node positive at work up, not examined during surgical treatment, not mentioned, consider it node positive (from the clinical findings)
- cN+
- pN+
All information available BEFORE initiation of definitive treatment OR within four months of diagnosis in the absence of disease progression... whichever is shorter shorter shorter shorter as long as the cancer has not clearly progressed during that time frame.

Clinical Stage

- Includes any information obtained about the extent of cancer
  - Before definitive treatment such as
    - surgery
    - systemic or radiation therapy
    - active surveillance, or
    - palliative care
  - Within 4 months after the date of diagnosis

...whichever is shorter as long as the cancer has not clearly progressed during that time frame.
Clinical Stage

Clinical Stage Includes:

- All tests and exams
- Biopsy of lymph node
- Biopsy of sentinel nodes
- Biopsy of a metastatic site

- Assigned prior to start of any treatment
- Never changed due to subsequent information
- Ends when a decision is made not to treat

Clinical Stage

- Based on evidence acquired before treatment:
  - Physical exam
  - Imaging
  - Endoscopy
  - Biopsy
  - Exploratory surgery

- Used to determine appropriate treatment
- Work-up varies depending on type of cancer

Clinical Stage

- Common denominator for many sites
  - Lung
  - Advanced GI
  - Head & neck
  - Prostate
  - Others?
- Many cancer patients do not have a surgical resection
- Work-up varies depending on cancer type
Clinical Evaluation -- Example

• Primary Site: Oral Cavity
  – Visual inspection → mucosal involvement
  – Palpation → surrounding tissue involvement
  – Imaging → deep muscle and bone involvement

• Primary Site: Lung
  – Imaging → tumor size
  – Endoscopy → bronchus involvement
  – Exploratory thoracotomy → pleural space

Pathologic Stage

• More precise anatomic extent of disease
• More precise than clinical
• Used to:
  – Estimate prognosis
  – Determine need for adjuvant treatment
• Criteria for “pathologic” varies depending on the primary site

PATHOLOGIC Timing Rule

All information available through completion of surgery(ies) in the first course of treatment

OR

within four months of diagnosis in the absence of disease progression

Whichever is longer

AND NO NEOADJUVANT TREATMENT

Same as SS
Pathologic Stage

- Includes same diagnostic studies used for clinical stage
  - Supplemented by findings from surgical resection, and
  - Histologic examination of the removed tissues

- Pathological Timing
  - Through completion of definitive surgery
  - Or within 4 months

  Whichever is longer but no systemic or radiation initiated and no clear disease progression

What Information is Included?

- 2/10 Prostate biopsy consistent with Adenocarcinoma
- 3/01 Bone scan: Negative
- 3/15 Radiation to prostate

  First course of treatment has ended

- 6/01 Patient returns complaining of hip pain
- 6/04 Bone scan: metastatic disease from prostate cancer
  Stage = Local

Pathologic Stage

Pathologic stage can be assigned when:

- A complete resection of T and N
  OR
- Highest T and highest N microscopically proven
  OR
- M1 has been confirmed with a positive biopsy
General Rules -- pM Prostate Example

Prostate Stage
• Positive biopsy of rectal tissue = pT4 (highest T category)
• Biopsy of regional nodes = pN1
• Negative biopsy of Common Iliac node = cM0
OR
• Positive biopsy of Common Iliac node = pM1

Stage Group
• pT4, pN1, pM1 = Path Stage IV
• pT4, pN1, cM0 = Path Stage IV
• Any T, Any N, pM1 = Path Stage IV
• Prognostic factor = Any Gleason

Pathologic Evaluation

Path Report does not always = Pathologic Evaluation

Pathologic Evaluation Example

Primary Site: Oral Cavity
– Complete resection of the primary site
– Regional node dissection
– Pathologic examination of resected specimens

Primary Site: Lung
– Resection or pathological examination of the primary site
– Resection or pathological examination of regional node(s)
Stage Grouping

ANATOMIC STAGE/PROGNOSTIC GROUPS

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What Information is Included?

Based on information obtained during the workup for the INITIAL diagnosis and FIRST course of treatment

AJCC Stage

- **Clinical stage**
  - Pretreatment stage
  - Required by ACoS CoC for all cancer cases
  - Common denominator
  - Used for data analysis for patients that have post-treatment stage

- **Pathologic stage**
  - Uses all clinical information + surgical
  - Exam of tissue is required
  - More precise than clinical
General Rules Summary

- Microscopic confirmation required for TNM
- Timing rules for clinical and pathologic stage
  - Clinical data before tx or within 4 months whichever is shorter
  - Pathological data includes surgery, or within 4 months; whichever is longer
- Assign lower category when uncertain for T, N and M or unknown required prognostic factor
- Use T0 for unknown primary if there is a clinical suspicion of the site (suspicious of breast cancer)

NPCR Stage Requirements

- Clinical T, N, and M
  - All cases
- Pathologic T, N, and M
  - For qualifying cases
- Follow all rules to assign the stage group
  - Eliminate many "unknowns"
  - Accurate stage data

General Rules

- Nonanatomic Prognostic Factors
  - Collected separately from the T, N and M
  - Not available, assume lowest or least advanced factor
- Site Chapters
  - Definition of the groupings
  - Follow chapter rules for assigning stage group