Neoplasms of the Colon and of the Rectum

2016 Focus
- Anatomy
- SS 2000
- AJCC TNM
- MPH Rules

CDC & Florida DOH Attribution

“We acknowledge the Centers for Disease Control and Prevention, for its support of the Florida Cancer Data System, and the printing and distribution of the materials for the 2015-2016 FCDS Webcast Series under cooperative agreement DP003872-03 awarded to the Florida Department of Health. The findings and conclusions in this series are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention”.

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Presentation Outline

• Introduction to Neoplasms of the Colon & Rectum
• Anatomy of the Colon and the Rectum
• Diagnostic Workup and Tests
• Critical Colo/Rectal MPH Rules
• 2016 - New Use of “c” and “p” Prefix
• 2016 - New T, N, M Category Codes
• Anatomic Staging (AJCC TNM / SS2000)
• Text Documentation
• Staging Practice
• Questions

http://safetyca.info

Presentation Outline

• What we will not be discussing today – not enuf time.
  • Risk Factors
  • Signs & Symptoms
  • Screening Guidelines
  • Details of Colo/Rectal MPH Rules
  • Every Histologic Type of Colo/Rectal Cancer
  • AJCC TNM General Instructions and Rules
  • Conflicts between MPH Rules and TNM Chapters
  • Site Specific Factors Not Required for Staging
  • Biologic, Molecular, Single or Multi-Gene Testing
  • NCCN or Other Treatment Guidelines
Introduction

- 1 in every 20 persons will develop colon or rectal cancer in their lifetime.
- Colorectal cancer is the #3 cause of cancer deaths in the U.S.
- Colorectal cancer often begins as a benign growth: a polyp.
- Adenomas are a type of polyp and are benign tumors of the tissue lining the colon or rectum.
- Most adenomas are benign.
- However, some adenomas have the potential to develop into cancer over the long term.
- When removed early, polyps are prevented from developing into malignant cancer.
Anatomy

Colon and Rectum

ACS Colorectal Cancer Facts & Figures 2014-2016 and http://fcrc-archives.org
Rectosigmoid and Rectum

Female Anatomy

Male Anatomy

http://www.uptodate.com

Rectum – Anorectum – Anus

Peritoneal reflection

http://www.analcancerinfo.ucsf.edu
**Colonoscopy Measurements**

Distance from Anal Verge (approximations only)
Adapted from AJCC Cancer Staging Manual

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**Polyps and Colon Cancer**

- **95-98% of colon cancers - adenocarcinoma**
  - Most originate in polyps or adenomas
  - But, only 10% of adenomas develop into cancers

- **Types of adenoma**
  - Tubular
  - Villous
  - Tubulo-villous

- **Process takes up to 10 years**

- **De Novo Cancers – mucinous, signet ring**
  - >10% of all colon ca are mucinous (>50% mucin production)
  - <1% of all colon ca are signet ring cell (>50% signet rings)
Polyps and Colon Cancer

13

http://hopkinscoloncancercenter.org

Polyps and Colon Cancer

14

HYPERPLASTIC POLYP – NO CA

SMALL REACTIVE POLYP

NOT PRE-CANCEROUS

http://www.pathology.pitt.edu/lectures/gi/colon-a/14.htm
Polyps and Colon Cancer

TUBULAR ADENOMA
OFTEN BENIGN
>10% MAY CONTAIN a NON-INVASIVE or INVASIVE CANCER

POLYP REMOVAL WILL PREVENT COLON CANCER

http://www.pathology.pitt.edu/lectures/gi/colon-a/16.htm

Polyps and Colon Cancer

http://hopkinscoloncancercenter.org
Polyps and Colon Cancer

http://www.pathology.pitt.edu/lectures/gi/colon-a/17.htm

SESSILE VILLOUS and TUBULO-VILLOUS ADENOMA
MORE OFTEN CONTAIN INVASIVE CANCER
POLYP REMOVAL MAY NOT REMOVE ALL CANCER

Layers of Colon Wall

Intramucosal Colon Cancer

Source: http://www.slideshare.net/giaffa/petruzziello

“Non-Peritonealized” Surface

- The serosa acts as barrier for tumors that begin on inside surface of the colon and invade down into the mucosa and through the wall of the colon (the serosa).
- Some colon surfaces have no serosa at the exterior surface (around the hollow organ)
- When there is no serosa – you lose a natural barrier that helps contain the colon cancer
- Non-Peritonealized Surfaces in Colon-Rectum:
  - Rectum – no serosa in rectum below peritoneal reflection
  - Descending Colon – no serosa covering posterior surfaces
  - Ascending Colon – no serosa covering posterior surfaces
“Non-Peritonealized” Surface

No Serosa Here

Surgical Resection

DEFINITIONS OF COMMON COLORECTAL RESECTIONS

The extent of colorectal resection depends on the location of the tumor, any underlying condition (eg, inflammatory bowel disease, hereditary syndrome), and the vascular supply to the colorectum.

Definitions of common colorectal resections are as follows:1

A through C: Resection
A through D: Ascending colectomy
A through F: Right hemicolectomy
A through G: Extended right hemicolectomy
E through H: Transverse colectomy
G through L: Left hemicolectomy
F through I: Extended left hemicolectomy
J through K: Sigmoid colectomy
A through J: Subtotal colectomy
A through K: Total colectomy
K through L: Low anterior resection with sphincter preservation
K through L: Abdominoperineal resection without sphincter preservation

Lymphatics of Colon / Rectum

AJCC Image - The regional lymph nodes of the colon and rectum are colored by anatomic location.

Modified AJCC Image - The regional lymph nodes of the colon and rectum are colored by anatomic location.
“Tumor Deposits”

- **Definition**
  - Separate tumor nodules or tumor deposits of malignant cells in perirectal or pericolic fat with no evidence of lymph node tissue
  - Found in primary lymphatic drainage area
- **Other names**
  - Peri-tumoral deposits, satellite nodules, discontinuous extramural extension, or malignant tumor foci
- **N1c** = Specific TNM “N” Code for tumor nodule or deposit(s) in the subserosa, mesentery, or non-peritonealized pericolic or perirectal tissues without regional nodal metastasis.

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“Tumor Deposits”

- **Mesenteric**
- **Pericolonic**
- **Perirectal**
- **Subserosa**
- **All Regional Lymph Nodes Negative**
- **Deposits + LNs**
- **N1c** = Tumor deposit(s) in the subserosa, mesentery, or nonperitonealized pericolic or perirectal tissues without regional nodal metastasis.
Metastatic Sites

- Lung
- Liver
- Lymph Nodes
- Seeding in peritoneum
- Seeding of small intestine
- Seeding of other segments of colon

Critical MPH Rules

- 2017 MPH Rules Update
- New MPH Database
- Text Only Rules
- Stay Tuned
# Multiple Primary Rules

## Unknown Number
- M1. Unknown whether single or multiple tumors = single

## One Tumor
- M2. Single tumor = single

## Multiple Tumors
- M3. Adenoca in adenomatous polyposis coli in one or multiple segments = single

## Multiple Tumors, continued
- M4. Different topography = multiple
- M5. Diagnosis dates > 1 year apart = multiple
- M6. Invasive after in situ > 60 days = multiple
- M7. Frank adenocarcinoma and malignant tumor in a polyp = single
- M8. Non-specific and specific histology = single
- M9. Multiple polyps (all malignant) = single
- M10. Histology different = multiple
- M11. All other scenarios = single

Source: AFritz and Associates, LLC
New Histologic Terms and Code

- Glandular intraepithelial neoplasia, high grade
- Glandular intraepithelial neoplasia, grade III
- Flat intraepithelial neoplasia, high grade

- 8148/2 – Use Code for GI Tract in 2017

- All low grade intraepithelial neoplasia = /0
- All grade I or grade II intraepithelial neoplasia = /0

Mucinous and Signet Ring Cell

- Mucinous adenocarcinoma (8480)
  Code when
  o Final diagnosis is mucinous OR
  o Documentation says > 50% mucinous
    ▪ May use microscopic section of path report

- Signet ring cell carcinoma (8490)
  Code when
  o Final diagnosis is signet ring cell OR
  o Documentation says > 50% signet ring cell
    ▪ May use microscopic section of path report

  o “...with signet ring cells” ≠ signet ring cell CA
Colorectal NETs and GISTs

- NETs and GISTs are specific types of stroma/connective tissue tumors that affect the endocrine and neuroendocrine system.

- The endocrine system works alongside of the nervous system to form the control systems of the body. The nervous system provides a very fast and narrowly targeted system to turn on specific glands and muscles throughout the body. The endocrine system, on the other hand, is much slower acting, but has very widespread, long lasting, and powerful effects. Hormones are distributed by glands through the bloodstream to the entire body, affecting any cell with a receptor for a particular hormone. Most hormones affect cells in several organs or throughout the entire body, leading to many diverse and powerful responses.

- Because they effect the endocrine/neuroendocrine system – both NETs and GISTs impact or disrupt the body’s hormone functions.

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Colorectal NETs and GISTs

- NETs in the GI Tract develop in neuroendocrine cells of the connective tissues in and around the GI Tract and may grow inward or outward.
  - Neuroendocrine Carcinoma Low Grade/High Grade
  - Carcinoid Tumor – 2015 ALL are reportable/malignant

- NETs in the GI Tract stimulate hormone-producing endocrine cells resulting in the overproduction of vasoactive peptide hormones and causing symptoms of - “carcinoid syndrome” – skin flushing, fatty diarrhea, bronchospasms, and “dumping” syndrome.
Colorectal NETs and GISTs

- GISTs make up only about 1% of all GI Tract neoplasms
- GISTs in the GI Tract develop in the stroma or muscle layer of the walls of the GI Tract from the esophagus down to the rectum and grow outward.
- Location, Size, and Mitotic Index are Key Indicators
- GIST do not cause symptoms in early stages. Symptoms can include nausea, vomiting, weight loss, pain, and bleeding. Early tumors are usually incidental findings.
- GIST do not effect hormone function, production or release.
- GIST do effect regulation of peristalsis – pushing materials down the digestive tract.
- When no primary is stated, the site is GI Tract, NOS.

Colon and Rectal Cancer Staging

ACS/AJCC Cancer Staging Poster, 7th ed
Purpose of Staging
Biochemical Tumor Markers
Molecular Tumor Markers
Genetic Mutations/Variations
Risk Stratification

Localized Stage

Regional Stages
A. Direct extension
B. To regional lymph nodes
C. Combination of A and B

Source: SEER Summary Staging Manual 2000
“c” and “p” and “yp”

- Clinical (c)

- Clinical Stage is determined before any type of definitive therapy is started. Clinical stage is used as a guide to determine what the first steps should be to establish the diagnosis of colon or rectal cancer; and to decide upon the approach and intent of 1st course of treatment – should 1st treatment include polypectomy, segmental resection, hemi or total colectomy, surgical bypass with or without -ostomy, neoadjuvant (pre-operative) chemo and/or radiation, or palliative care.

- Clinical Stage – includes the patient’s medical history, physical exam, sigmoidoscopy, and colonoscopy with biopsy to establish/confirm the diagnosis. Examinations to demonstrate the presence or absence of extrarectal or extracolonic metastasis may include radiographic films, CT of abdomen, pelvis and/or chest, MRI, and PET or PET/CT scans. Endoscopic Ultrasound (EUS) may be used to assess preoperative pelvic extent of disease in addition to CT, MRI, and/or PET scans.

- Pathologic (p)

- Most cancers of the colon and many cancers of the rectum are pathologically staged following surgical exploration of the abdomen, cancer-directed surgical resection and pathologic examination of the resected specimen.

- Pathologic Stage is assigned following complete resection of the primary tumor and includes microscopic examination of the primary tumor, regional lymph nodes and/or other suspect tissues. Carcinoma in a polyp is classified according to the pT definitions adopted for colorectal carcinomas.

- Pathologic Stage is used to guide stage-specific adjuvant therapy decisions and to estimate prognosis.

- Pathologic Stage includes all information in the clinical setting PLUS all information obtained from surgical reports and pathology reports related to the extent of cancer spread through the completion of definitive surgery performed as a part of the 1st course of treatment or within 4 months of initial diagnosis of cancer in the absence of disease progression.
“c” and “p” and “yp”

- Post Neoadjuvant Treatment (yp)

- Post Neoadjuvant Treatment Stage is assigned following a prescribed “course” of neoadjuvant therapy (chemo, biologics, radiation, etc.). The standard of care for most rectal cancers is pre-surgical (neoadjuvant) therapy with chemo and/or radiation prior to any surgical resection.

- Post Neoadjuvant Treatment Stage includes microscopic examination of the primary, regional lymph nodes and/or other suspect tissues.

- Response to Neoadjuvant Therapy is determined by comparison of pre-treatment Clinical Stage to post-treatment Pathologic Stage and is qualified by the presence or absence of cancer in the primary tumor, regional lymph nodes, etc. or T, N, or M Category Differences.
  - Pathologically Confirmed Complete Response (CR)
  - Pathologically Confirmed Partial Response (PR)
  - Pathologically Confirmed No Response (NRL)

2016 Prefix Requirements / Physician Stage

- 2016 Requirements for “c” and “p” prefix use
  - Now must include “c” or “p” prefix for each T, N, M Category
  - New Codes for T, N, and M will be available in software soon
  - Use of Allowable Codes will be Strictly Enforced in 2016>
  - Clinical Stage now includes cT, pTis, cN and either c or pM
  - Pathologic Stage now includes pT, pN and either c or pM
  - Convert Roman Numerals (I, II, III) to Arabic (1, 2, 3)

- Physician Stage can be difficult to qualify as it may be a mixed clinical and pathologic stage, especially when the AJCC Stage is provided per history. Always check the Physician Stage to validate use of prefix and the correct T, N, and M Category Codes that best reflect the case.
AJCC Self Instruction - Updates

AJCC T, N, and M Category Options for Registry Data Items in 2016

Darcia M. Gross, RHIT, CTR

AJCC American Joint Committee on Cancer
Validating science. Improving patient care.

https://cancerstaging.org/CSE/Registrar/Pages/AJCC-Curriculum.aspx

AJCC Self Instruction - Updates

In Situ Neoplasm

- CIS definition
  - Has not involved any structures in primary organ that
  - Allows tumor cells to spread to regional nodes or distant sites

- CIS exception to stage group guidelines
  - Clinical stage
    - pTis cN0 cM0 clinical stage 0
  - Pathologic stage
    - pTis cN0 cM0 pathologic stage 0

- Caution for pathologic stage
  - Cannot use CIS rule in isolation
  - Must also meet pathologic stage resection criteria
    - Avoids sampling error when resection might show invasion
    - Example: TURB

https://cancerstaging.org/CSE/Registrar/Pages/AJCC-Curriculum.aspx
2016 New Category Code Format - EXAMPLE

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Deleted codes: A [Ta], IS [Tis], ISPU [Tisp], ISPD [Tispd]
Added codes: pA [pTa], pS [pTis], pSU [pTisp], pSD [pTispd]

NAACCR 2016 Implementation Guidelines (NAACCRv16)

AJCC Self Instruction - Updates

Explaining Blanks and X, Ambiguous Terminology and Support for AJCC Staging

Donna M. Gress, RHIT, CTR

https://cancerstaging.org/CSE/Registrar/Pages/AJCC-Curriculum.aspx
Colon and Rectal Cancer Staging

Staging Parameters

- Clinical (Pre-Tx) Stage is Critical for Rectal Cancers
- Primary Tumor Grade Important for NET/GIST
- Typical Colon/Rectal Cancers
  - Type of Adenoma
  - Primary Tumor Location
  - Intramucosal Spread (“T”)
  - Depth of Invasion into Wall (“T”)
  - Depth of Invasion thru Wall (“T”)
  - Number of Lymph Nodes Examined (“N”)
  - Number of Lymph Nodes Positive (“N”)
  - Extranodal Tumor Deposits (“N”)
  - Status of Resection Margins
  - Lymph-Vascular Invasion (LVI)
  - Metastatic Sites (“M”)

Source: National Cancer Institute
### Site-Specific Factors Required for Staging

**NO Site-Specific Factors Required for Staging**

Of Colon, Rectum, Anus or NET of GI Tract

![None of the above]

### T Category – tumor size and extension

- **Non-Invasive or In Situ (Tis)**
  - Intraepithelial – no invasion of glandular basement membrane
  - Intramucosal with extension into lamina propria
  - Intramucosal with no extension thru muscularis mucosae
  - Intramucosal with no extension into submucosa

- **Intramucosal with Extension into Submucosa (T1)**

- **Mixed Non-Invasive (In Situ) and Invasive – MPH Rule**

- **Invasive Only – Extension into/thru wall - critical**

- **The Primary Tumor Extends Beyond Colon Wall**
“T” Codes and Description

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<td>Tumor invades the subserosa or into nonperitonealized perirectal tissues</td>
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<td>Tumor penetrates to the surface of the visceral peritoneum</td>
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2016 Valid Codes for “T” Category

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NAACCR 2016 Implementation Guidelines (NAACCRv16)
2016 Valid Codes for “T” Category

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Added codes: p1SU [pT5su], p1SD [pT5sd]

NAACCR 2016 Implementation Guidelines (NAACCRv16)

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N Category - Regional Lymph Nodes

Modified AJCC Image - The regional lymph nodes of the colon and rectum are colored by anatomic location.
“N” Codes and Description

Regional lymph nodes (N)
- NX: Regional lymph nodes cannot be assessed
- N0: No regional nodal metastasis
- N1: Metastasis in one to three regional lymph nodes
- N1a: Metastasis in one regional lymph node
- N1b: Metastasis in 2–3 regional lymph nodes
- N1c: Tumor deposit(s) in the subserosa, mesentery, or nonperitonealized perirectal tissues without regional nodal metastasis
- N2: Metastasis in 4 or more regional lymph nodes
- N2a: Metastasis in 4–6 regional lymph nodes
- N2b: Metastasis in 7 or more regional lymph nodes

Counting Lymph Nodes Important for Colon
Lymph Node Dissection Should Include 10–14 Regional Lymph Nodes
No Criteria Yet for Isolated Tumor Cells in Lymph Node (pN0)
Special Category for Tumor Deposits (pN1c)

2016 Valid Codes for “N” Category

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NAACCR 2016 Implementation Guidelines (NAACCRv16)
2016 Valid Codes for “N” Category

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Added code: c0 [cN0]

M Category - Metastasis

www.colorectal-surgeon.com
“M” Codes and Description

Distant metastasis (M)
- M0: No distant metastasis
- M1: Distant metastasis
- M1a: Metastasis confined to 1 organ or site
- M1b: Metastasis in more than one organ/site or the peritoneum

2016 Valid Codes for “M” Category

NAACCR 2016 Implementation Guidelines (NAACCRv16)
Anatomic Stage/Prognostic Group

NOTE: No Biologic or Molecular SSF Results Change the Stage Group

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<thead>
<tr>
<th>ANATOMIC STAGE/PROGNOSTIC GROUPS</th>
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Source: NCRA Informational Abstracts – Improving Text
Staging Practice

Case 1 – Case Vignette

- HISTORY: 59 year old African American female admitted following recent colonoscopy showing malignant appearing mass in ascending colon. Family History: Father had rectal cancer  Physical Exam is essentially WNL.
- CT CHEST/ABDOMEN: no abnormalities noted
- COLONOSCOPY per history showed malignant appearing mass in proximal ascending colon – unknown if biopsy was taken to confirm malignancy.
- CEA 0.6 – WNL
Case 2 – Case Vignette

- HISTORY: 64 year old white male admitted through the ER with severe abdominal pain.
- CT CHEST/ABD: extra-luminal gas right lower quadrant in area of cecum, suspect perforation of ascending colon
- PATHOLOGY Laparoscopic Ileocecectomy: poorly differentiated adenocarcinoma of cecum.; Maximum dimension: 4.4 cm, Microscopic tumor extension: penetrate serosal surface (visceral peritoneum) with perforation and direct invasion of distal ileum; LVI: present; One discontinuous extramural tumor deposit found in mesentery without nodal structure; Margins: free of tumor, nine lymph nodes negative for mets (0/9).

Case 3 – Case Vignette

- HISTORY: 57 year-old Hispanic female with biopsy-confirmed adenocarcinoma of the rectosigmoid.
- CT CHEST: few small (<1cm) nonspecific hilar lymph nodes noted in chest. Exam otherwise negative.
- COLONOSCOPY SPECIMEN: Tumor colon @ 15 cm biopsy: invasive well differentiated adenocarcinoma
- PATHOLOGY: Sigmoidectomy - 3.9 x 3.2 x 0.7 cm circumferential ulcerative lesion; invasive moderately differentiated colonic adenocarcinoma with extension into and through muscularis propria and focal transmural extension to serosal surface, margins free of tumor, 2/13 lymph nodes positive for metastatic carcinoma; discontinuous tumor deposits – present; liver wedge biopsy metastatic colonic adenocarcinoma
**Case 4 – Case Vignette**

- **HISTORY:** 61 yr old white female, lifelong smoker, with multiple medical problems including recent adenoma on routine screening colonoscopy. Physical exam - negative.
- **CT CHEST:** Negative
- **COLONOSCOPY:** Transverse colon polyp @ 110cm – high grade dysplasia with focal intramucosal well differentiated adenocarcinoma arising in an adenoma.

**PATHOLOGY:** laparoscopic transverse colectomy – Small residual component of tubulovillous adenoma w/ no evidence of residual carcinoma, no evidence to suggest invasion of lamina propria, 0/4 + pericolonic lns

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**Case 5 – Case Vignette**

- **HISTORY:** 57 year old obese white female with chronic constipation and bright red blood in stool. Rectal exam positive for mass low in rectum with fixation.
- **EUS:** large mass fixed to rectal wall with evidence of invasion into perirectal fat and partial lumen obstruction
- **RECTAL BX:** poorly differentiated adenocarcinoma

**Treatment Summary:** Patient was treated with pre-operative 5-FU with concurrent radiation therapy. Patient completed her short-course XRT but did not return for surgical resection and expired in home.
References

- Cancer Epidemiology, Oxford University Press
- American Cancer Society – [www.acs.org](http://www.acs.org)
  - Cancer Facts and Figures 2016
  - Colorectal Cancer Facts and Figures 2014-2016
- American Joint Committee on Cancer – [www.cancerstaging.org](http://www.cancerstaging.org)
  - Collaborative Stage Data Collection System v 02.05
- SEER Summary Staging Manual 2000
- [www.medicinenet.com/colon_cancer](http://www.medicinenet.com/colon_cancer)
- NCCN Treatment Guidelines – [www.nccn.org](http://www.nccn.org)

Questions