Colon and Rectal Cancers
FCDS 2013-2014 Educational Webcast Series
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Outline

- Overview – Incidence/Mortality/Survival
- Risk Factors – Signs and Symptoms
- Anatomy of the Colon and Rectum
- Screening Recommendations
- Multiple Primary Rules
- Histology Coding Rules
- Genetic and Biologic Tumor Markers
- Staging – Summary Stage, TNM, CSv02.04
- Treatment Planning / Coding Treatment
- NCCN Treatment Guidelines
- Text Documentation

Overview – Incidence/Mortality/Survival
1 out of every 20 persons in the U.S. will develop colon or rectal cancer in their lifetime (est. 5%).

Colorectal cancer is the #2 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.


Incidence and Mortality

Table 1: Colorectal Cancer Incidence and Mortality Rates* by Race/Ethnicity, 2003-2007

Source: ACS Colorectal Cancer Facts and Figures 2011-2013
Incidence and Mortality

Source: ACS Colorectal Cancer Facts and Figures 2011-2013

Incidence and Mortality

Source: ACS Colorectal Cancer Facts and Figures 2011-2013

Cancer Death Rates* Among Men, US, 1930-2009

*Age adjusted to the 2000 US standard population.
National Center for Health Statistics, Centers for Disease Control and Prevention.
Incidence and Mortality
Estimated Number of 2013 Florida New Cancer Cases and Deaths

New Cases
➢ 10,290 Colon/Rectum Combined

Deaths
➢ 3,640 Colon/Rectum Combined

ACS Cancer Facts & Figures 2013

Survival
Five-year Relative Survival Rates* (%) by Stage at Diagnosis, 2002-2008

American Cancer Society, Surveillance Research 2013
Observed Survival by AJCC Stage

<table>
<thead>
<tr>
<th>AJCC Stage</th>
<th>5-year Observed Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>74%</td>
</tr>
<tr>
<td>IIA</td>
<td>67%</td>
</tr>
<tr>
<td>IIB</td>
<td>59%</td>
</tr>
<tr>
<td>IIC</td>
<td>37%</td>
</tr>
<tr>
<td>IIIA</td>
<td>73%*</td>
</tr>
<tr>
<td>IIIB</td>
<td>46%*</td>
</tr>
<tr>
<td>IIIC</td>
<td>28%</td>
</tr>
<tr>
<td>IV</td>
<td>6%</td>
</tr>
</tbody>
</table>

*In this study, survival was better for some stage III cancers than for some stage II cancers. The reasons for this are not clear.

Trends in Five-year Relative Cancer Survival Rates (%), 1975-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All sites</td>
<td>49</td>
<td>56</td>
<td>68</td>
</tr>
<tr>
<td>Breast (female)</td>
<td>75</td>
<td>84</td>
<td>90</td>
</tr>
<tr>
<td>Colon</td>
<td>31</td>
<td>51</td>
<td>60</td>
</tr>
<tr>
<td>Leukemia</td>
<td>34</td>
<td>43</td>
<td>58</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>12</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Melanoma</td>
<td>82</td>
<td>88</td>
<td>93</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>47</td>
<td>51</td>
<td>71</td>
</tr>
<tr>
<td>Ovary</td>
<td>36</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>Pancreas</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Prostate</td>
<td>68</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Rectum</td>
<td>48</td>
<td>58</td>
<td>68</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>73</td>
<td>79</td>
<td>80</td>
</tr>
</tbody>
</table>


RISK FACTORS

Hot Dogs Cause Butt Cancer
Processed meats increase colorectal cancer risk. PCRM.org
### Table 6. Summary of Major Risk Factors for Colorectal Cancer

<table>
<thead>
<tr>
<th>Factor</th>
<th>Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factors That Increase Risk</strong></td>
<td></td>
</tr>
<tr>
<td>Family history</td>
<td>2.2</td>
</tr>
<tr>
<td>First-degree relative/relative with diagnosis before age 45</td>
<td>4.8</td>
</tr>
<tr>
<td>Inflammatory bowel disease</td>
<td>3.3</td>
</tr>
<tr>
<td>Ulcerative colitis</td>
<td>2.4</td>
</tr>
<tr>
<td>Tobacco</td>
<td>1.4</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.2</td>
</tr>
<tr>
<td>Other factors</td>
<td></td>
</tr>
<tr>
<td>Dietary</td>
<td>1.2</td>
</tr>
<tr>
<td>Red meat consumption</td>
<td>1.2</td>
</tr>
<tr>
<td>Processed meat consumption</td>
<td>1.2</td>
</tr>
<tr>
<td>Smoking</td>
<td>1.2</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Factors That Decrease Risk</strong></td>
<td></td>
</tr>
<tr>
<td>Physical activity/collection</td>
<td>0.8</td>
</tr>
<tr>
<td>Fruits</td>
<td>0.7</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.4</td>
</tr>
<tr>
<td>sleeve consumption</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*Note: Risk ratio compares the risk of disease among people with a particular risk factor to people without that factor. Values of factors are usually multiplied by comparing logged risk with logged exposure. If the relative risk is greater than 1.0, that risk is higher among exposed than nonexposed persons. Values less than 1.0 indicate a protective effect.*

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### Prevention

Current Recommendations for the Prevention of Colorectal Cancer

1. Get screened regularly.
2. Maintain a healthy weight throughout life.
3. Adopt a physically active lifestyle.
4. Consume a healthy diet with an emphasis on plant sources, specifically:
   - Choose foods and beverages in amounts that help achieve and maintain a healthy weight.
   - Eat 4 to 6 servings of a variety of vegetables and fruits each day.
   - Choose whole grains in preference to processed (refined) grains.
5. Limit your consumption of processed and red meats.
6. If you drink alcoholic beverages, limit consumption.

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### SIGNS AND SYMPTOMS
Signs and Symptoms

- Change in bowel habits
- Blood in the stool or in the toilet after a bowel movement (bright red or dark black)
- Change in shape of stool
- Diarrhea, constipation, or feeling that the bowel does not empty completely > 1 week
- Acute obstruction and/or perforation
- General abdominal discomfort (frequent gas pains, bloating, fullness, or cramps)
- Weight loss with no known reason
- Weakness / Fatigue
- Anemia

SCREENING

Colorectal Cancer Screening Guidelines*

Beginning at age 50, men and women should follow one of the following examination schedules:

<table>
<thead>
<tr>
<th>Test</th>
<th>Time interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal occult blood test</td>
<td>Annual</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy</td>
<td>5 yrs</td>
</tr>
<tr>
<td>Double contrast barium enema</td>
<td>5 yrs</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>10 yrs</td>
</tr>
<tr>
<td>CT Colonography</td>
<td>5 yrs</td>
</tr>
</tbody>
</table>

*For people at average risk, individuals at higher risk should talk with a doctor about a different testing schedule.
Screening Recommendation Details

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Age Range</th>
<th>Start Age</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOBT/FIT</td>
<td>Men and women, ages 50+</td>
<td>50 years</td>
<td>Every year</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>Men and women, ages 50+</td>
<td>50 years</td>
<td>Every 10 years</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy (FSG)</td>
<td>Men and women, ages 50+</td>
<td>50 years</td>
<td>Every 5 years, starting at age 50</td>
</tr>
<tr>
<td>CT colonography</td>
<td>Men and women, ages 50+</td>
<td>50 years</td>
<td>Every 5 years, starting at age 46</td>
</tr>
</tbody>
</table>

Screening High Risk Populations

- Individuals at High Risk Include:
  - Family History – 1st degree relative
  - Family History – more than 1 relative
  - Family History – relative with dx < age 45
  - Personal History – Inflammatory bowel disease
  - Ulcerative Colitis
  - Personal History – Diabetes

- Screening should begin before age 50

- Colonoscopy is recommended screening method

- Discuss your personal risk and routine screening schedule with your personal healthcare provider

Choosing the Right Test

- **Do You Have:**
  - Family history of colorectal cancer or polyps?
    - Yes
      - Colonoscopy
      - Provider and patient collaborate to decide if testing should be started outside age 50.
    - No
      - FOBT/FIT
  - Younger than 50 years?
    - Yes
      - FOBT/FIT
      - Colonoscopy
  - Older than 76 years?
    - Yes
      - Colonoscopy
      - Provider and patient decide if testing is needed
    - No
    - FOBT/FIT

Choosing the Right Test

**FOBT/FIT**
- Reduces death from colorectal cancer
- Safe, available, and easy to complete
- Done on your own at home and returned
- Finds cancer early by looking for blood in the stool
- Finds small cancers early when they are still small

**Colonoscopy**
- Reduces death from colorectal cancer
- Can prevent cancer by removing polyps or abnormal growths in the lining of the colon
- Can examine entire colon
- Can remove polyps
- Can detect cancer early
- Done every 10 years if no polyps are found

**Things to consider**
- May produce positive test results, even when no polyps or cancer are in the colon
- More likely to find colorectal cancer than FOBT
- Person finding abnormal stools is less likely to contact stool samples on a test kit

*Source: National Health Interview Survey, National Center for Health Statistics, Centers for Disease Control and Prevention.

Trends in the Prevalence of Fecal Occult Blood Test* by Health Insurance Status, US, 2000-2010

- **2000**: 13%
- **2008**: 18%
- **2010**: 17%

*Uninsured: 16.3%
Insured: 9.9%
Total: 13.4%

Fecal occult blood test in the past year among adults aged 50 years or older; estimates age-adjusted to the 2000 US standard population.
Source: National Health Interview Survey, National Center for Health Statistics, Centers for Disease Control and Prevention.

Flexible Sigmoidoscopy or Colonoscopy Prevalence* by Race/Ethnicity and Health Insurance Status, US, 2010

- **Non-Hispanic white**: 59%
- **Non-Hispanic black**: 76%
- **Hispanic**: 61%
- **Asian**: 61%

*Prevalence of colorectal cancer screening procedures within the past year among adults aged 50 years or older; estimates age-adjusted to the 2000 US standard population.
Source: National Health Interview Survey, National Center for Health Statistics, Centers for Disease Control and Prevention.
Who Gets Routine Colorectal Cancer Screening Among U.S. Adults Age 50+

<table>
<thead>
<tr>
<th>Gender</th>
<th>U.S.</th>
<th>Recommended</th>
<th>Eligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>81.9</td>
<td>50.6</td>
<td>54.9</td>
</tr>
<tr>
<td>Women</td>
<td>55.7</td>
<td>48.6</td>
<td>52.7</td>
</tr>
</tbody>
</table>

23 Million Adults Never Screened

- People less likely to get tested are: Hispanics, people aged 50–64, men, American Indians or Alaska Natives, and those who don’t live in a city.

- People with lower education and income are less likely to get tested.

- About 2 of every 3 adults who have never been tested for colorectal cancer actually have a regular doctor and health insurance that could pay for the test.

- Many people do not know they need to be tested and are not notified when it is time to be tested.
Anatomy

Colon and Rectum

The Large Intestine

Adapted from Thibodeau
Rectosigmoid and Rectum

Rectum – Anorectum – Anus

Colonoscopy Measurements

Source: www.analcancerinfo.ucsf.edu

Adapted from AJCC Cancer Staging Manual
Some colon surfaces have no serosa at the exterior surface (around the hollow organ).

The serosa acts as a barrier for tumors that begin on the inside surface of the colon and invade down into the mucosa and through the wall of the colon (the serosa).

When there is no serosa — you lose a natural barrier that helps contain the colon cancer.

Non-Peritonealized Surfaces in Colon-Rectum:
- Entire Rectum — no serosa on any surface
- Descending Colon — no serosa covering posterior surfaces
- Ascending Colon — no serosa covering posterior surfaces

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)

http://hopkinscoloncancercenter.org

http://www.pathology.pitt.edu/lectures/gi/colon-a/14.htm
Lymphatics of Colon / Rectum

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

“Tumor Deposits”

Tumor deposit. Discrete but of tumor found in the peri- or perirectal fat or in adjacent inflammatory (mesocolic) fat away from the leading edge of the tumor and showing no evidence of residual lymph node tissue but within the lymph drainage area of the primary carcinoma are considered to be peritumoral deposits or satellite nodules, and their number should be recorded in the site-specific Prognostic Markers on the staging form as Tumor Deposits (TD).
"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.

Observed Survival by AJCC Stage

<table>
<thead>
<tr>
<th>AJCC TNM Stage</th>
<th>5-year Observed Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIA</td>
<td>74%</td>
</tr>
<tr>
<td>IIB</td>
<td>67%</td>
</tr>
<tr>
<td>IIC</td>
<td>59%</td>
</tr>
<tr>
<td>IIIA</td>
<td>37%</td>
</tr>
<tr>
<td>IIIB</td>
<td>57%</td>
</tr>
<tr>
<td>IIIC</td>
<td>48%</td>
</tr>
<tr>
<td>IV</td>
<td>28%</td>
</tr>
</tbody>
</table>

*In this study, survival was better for some stage III cancers than for some stage II cancers. The reasons for this are not clear.

Metastatic Sites

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

www.colorectalsurgeon.com
MPH Rules
Terms and Definitions

- 2014-2015 Updates
- New MPH Database
- Text Only Rules
- Stay Tuned
MPH Rules

Multiple Primary Rules

- 2014-2015 Updates
- 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. Adenocarcinoma in adenomatous polyposis coli in one or multiple segments = single

Source: AFritz and Associates, LLC

Multiple Primary Rules

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 Primary or Recurrence?
- C18.9 historical colon with new primary
- Extent of previous resection
  - Polypectomy only?
  - Segmental resection?
  - Hemicolectomy?
- Circumferential resection margin
- What is “recurrence” in anastomosis?

MPH Rules
Histology Coding Rules
- 2014-2015 Updates
- New MPH Database
- Text Only Rules
- Stay Tuned

Histopathology Review
- 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)
New Histologic Terms and Code

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

- 8148/2 – new ICD-O-3 Code for 2015

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

Mucinous and Signet Ring Cell

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

- Signet ring cell carcinoma (8490)
  Code when
  ◦ Final diagnosis is signet ring cell OR
  ◦ Documentation says > 50% signet ring cell
  ◦ May use microscopic section of path report
  ◦ “…with signet ring cells” ≠ signet ring cell CA

Colorectal NETs and GISTs

- NET – Neuroendocrine Tumor
  ◦ Carcinoid Tumor – 2015 ALL are reportable
  ◦ Neuroendocrine Carcinoma
  ◦ Mitotic Count Matters
  ◦ Serum Chromogranin A (CgA)
  ◦ Urinary 5-Hydroxyindoleacetic Acid (5-HIAA)

- GIST – Gastrointestinal Stromal Tumor
  ◦ Tumor Size Matters
  ◦ Mitotic Count Matters
  ◦ KIT (CD117) Mutation
  ◦ PDGFRA (CD140A) Mutation
Histology Coding Rules

Single tumor

- H1. If no tissue, code physician’s statement
- H2. If no primary tissue, code metastasis
- H3. Adenocarcinoma, NOS vs. intestinal type adenocarcinoma
- H4. 8210, 8261, or 8263 when carcinoma is in a polyp
- H5. Mucinous or signet ring cell > 50% of tumor
- H6. Adenocarcinoma, NOS when mucinous or signet ring cell < 50% of tumor
- H7. 8255 combined mucinous and signet ring

Source: AFritz and Associates, LLC

Histology Coding Rules

Single tumor, continued

- H8. 8240 carcinoid when combined neuroendocrine and carcinoid
- H9. 8244 composite carcinoid when combined adenocarcinoid
- H10. 8245 adenocarcinoid when diagnosis is exactly “adenocarcinoid”
- H11. Single histology
- H12. Invasive if both invasive and in situ
- H13. Most specific term
- H14. Higher code

Source: AFritz and Associates, LLC

Histology Coding Rules

Multiple tumors abstracted as a single primary

- H15. If no tissue, code physician’s statement
- H16. If no primary tissue, code metastasis
- H17. 8220 Familial polyposis
- H18. 8263 - carcinoma is tubulo-villous adenoma
- H19. 8221 when < 100 polyps
- H20. Most invasive tumor
- H21. 8210, 8261, or 8263 - carcinoma in a polyp
- H22. Single histology
- H23. Most specific term
- H24. Higher code

Source: AFritz and Associates, LLC
Microsatellite Instability

- What is MSI?
  - Genetic test using PCR (polymerase chain reaction) looking for DNA repair errors and HNPCC features
- What does positive result indicate?
  - MSI predicts response to chemotherapy
  - MSI may indicate patient's overall prognosis
  - MSI-H (highly positive MSI test) may be related to development of HNPCC or Lynch Syndrome
- Who should get tested?
  - Patient under age 50 with colon cancer
  - Patient under age 50 with rectal cancer
  - Patient with other HNPCC-associated tumors
  - Patient with family history of colon/rectal cancer

Mismatch Repair Proteins

- Can include one or more:
  - MLH1
  - MSH2
  - MSH6
  - PMS2
  - EPCAM

KRAS Mutation

- What is KRAS wild-type?
- What is KRAS mutation?
- When is KRAS testing done?
- What does positive result mean?
- What about BRAF V600E Mutation?
I8q Loss of Heterozygosity

Other Gene Testing

### ESTIMATED RISK FOR COLON CANCER BY SYNDROME

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Gene(s)</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAP (sporadic)</td>
<td>APC</td>
<td>90% by age 45</td>
</tr>
<tr>
<td>Familial adenomatous polyposis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attenuated FAP</td>
<td>APC</td>
<td>69% by age 80</td>
</tr>
<tr>
<td>Lynch (HNPCC)</td>
<td>MLH1, MSH2, MSH6</td>
<td>40% to 60% by age 75</td>
</tr>
<tr>
<td>PTEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUTYH-associated polyposis</td>
<td>MUTYH</td>
<td>30% to 53%</td>
</tr>
<tr>
<td>Peutz-Jeghers</td>
<td>STK11</td>
<td>39% by age 70</td>
</tr>
<tr>
<td>Juvenile polyposis</td>
<td>BMPR1A, SMAD4</td>
<td>15% to 60% by age 60</td>
</tr>
</tbody>
</table>

http://www.ambrygen.com

- APC Mutation
- PIK3CA Mutation
- PTEN Mutation
- TFAP2E – fluorouracil resistance

- Multi-parameter Gene Expression Testing
- Protein Expression Assay
- DNA Microarrays
CS Tumor Size

### CS Tumor Size (polyp)

- Size of polyp is not size of tumor
- Tumor usually only fills part of a polyp
- Do not code size of polyp unless polyp is replaced by tumor
- Pathology report may not give size of tumor within the polyp – may be microscopic focus or may be measurable tumor in the polyp
In situ

Minimal invasive

Invasive

Source: American Journal of Transplant 2008
CS Extension

T1

Mucosa
P(pericryptal tissue
Adenitia

Tumor invades submucosa

AJCC Cancer Staging Atlas – Chapter 14

CS Extension

T2

Adenitia
Serosa

Tumor invades muscularis propria

AJCC Cancer Staging Atlas – Chapter 14
Tumor invades through the muscularis propria into peri-colorectal tissues

AJCC Cancer Staging Atlas – Chapter 14
Circumferential resection margin. T4a (left side) has perforated the visceral peritoneum.

Tumor penetrates to the surface of the visceral peritoneum.

Tumor perforates visceral peritoneum (shown with gross bowel perforation through the tumor)
Tumor directly invades or is adherent to other organs or structures, illustrated here with extension into an adjacent loop of small bowel.

AJCC Cancer Staging Atlas – Chapter 14
CS Extension

Tumor directly invades or is adherent to other organs or structures (such as the sacrum shown here)

CS Lymph Nodes

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

CS Lymph Nodes

The regional lymph nodes of the colon and rectum are colored by anatomic location.
CS Lymph Nodes

N1a is defined as metastasis in one regional lymph node. N1b is defined as metastasis in 2 to 3 regional lymph nodes.
CS Lymph Nodes

N2a is defined as metastasis in 4 to 6 regional lymph nodes.
N2b is defined as metastasis in seven or more regional lymph nodes.

CS Lymph Nodes

N2b showing nodal masses in more than 7 regional lymph nodes.

CS Mets

M1a disease is defined as distant metastasis confined to one organ or site (e.g., liver, lung, ovary, nonregional node).
In this case, involvement is outside the regional nodes of the primary tumor.
### Treatment – Early Stage

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Non-Invasive Polyp</th>
<th>Non-Invasive Sessile</th>
<th>KRAS Wild Type</th>
<th>T1, N0</th>
<th>T2, N0</th>
</tr>
</thead>
<tbody>
<tr>
<td>NeoAdjv Chemo</td>
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<tr>
<td>Polypectomy</td>
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<tr>
<td>Resection w/nodes</td>
<td></td>
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<tr>
<td>Capecitabine (KRAS Wild)</td>
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<tr>
<td>Panitumumab (KRAS Wild)</td>
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</table>

*NeoAdjv Chemo: Neoadjuvant Chemotherapy, NeoAdjv XRT: Neoadjuvant XRT, NeoAdjv Other: Neoadjuvant Other, Polypectomy, Resection w/nodes: Sessile, Capecitabine (KRAS Wild): Capecitabine for KRAS Wild Type, Panitumumab (KRAS Wild): Panitumumab for KRAS Wild Type.*
Chemotherapy and BRM

- Chemotherapy alone, or in combination with radiation, is given before or after surgery to most patients whose cancer has penetrated the bowel wall deeply or spread to lymph nodes.

- Adjuvant chemotherapy (anticancer drugs in addition to surgery or radiation) for colon cancer in otherwise healthy patients 70 years of age and older is equally effective as in younger patients; toxicity in older patients can be limited if certain drugs (e.g., oxaliplatin) are avoided.
### Colorectal Chemo Regimens

#### CHEMOTHERAPY FOR ADVANCED OR METASTATIC DISEASE - CHEMOTHERAPY REGIMENS (PAGE 6 of 6)

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Dosage</th>
<th>Administration</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Cachexia</td>
<td>300 mg/m²</td>
<td>IV over 3 hours</td>
<td>daily</td>
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<tr>
<td>Etoposide</td>
<td>100 mg/m²</td>
<td>IV over 3 hours</td>
<td>daily</td>
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<tr>
<td>Ifosfamide</td>
<td>1500 mg/m²</td>
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<tr>
<td>Methotrexate</td>
<td>10 mg/m²</td>
<td>IV over 3 hours</td>
<td>weekly</td>
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</table>

#### IMPORTANT NOTE REGARDING LEUCOVORIN (DEMOXAN) TO BE USED AS:

- **TOXICITY ASSESSMENT:**
  - Monitor for nausea, vomiting, diarrhea, and other gastrointestinal side effects.
  - Supportive care with antiemetics and hydration as needed.

- **ADVERSE REACTIONS:**
  - Monitor for hematologic and non-hematologic effects.
  - Monitor for renal function.

- **INTERACTIONS:**
  - Monitor for drug-drug interactions, particularly with myelosuppressive agents.

- **DOSAGE MODIFICATIONS:**
  - Adjust dose based on patient's renal function.
  - Monitor for cumulative myelosuppression.

- **CONTRAINdications:**
  - Avoid in patients with severe renal impairment.

- **PRECAUTIONS:**
  - Monitor for fever, chills, and other signs of infection.
  - Monitor for cardiac function.

- **PREGNANCY:**
  - Category D.
  - Use only if the potential benefit justifies the potential risk to the fetus.

- **NURSING MOTHERS:**
  - Avoid breastfeeding during chemotherapy.

- **EDUCATION:**
  - Inform patient of potential side effects and appropriate follow-up.

- **PATIENT RESOURCES:**
  - Provide patient education materials on chemotherapy and side effects.

- **SUMMARY:**
  - Close follow-up is necessary to monitor for adverse effects.
  - Early detection and management of side effects are crucial.

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12/12/2013
Oral Chemotherapy

Capecitabine

Brand Name: Xeloda®

Treatment - Advanced Stage

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T4, N0</th>
<th>N1-2-any T</th>
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<th>M1-any T/N</th>
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<td>Consider</td>
<td>Consider</td>
<td>Consider</td>
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</table>

Chemotherapy and BRM

• Several targeted therapies are approved by the FDA to treat metastatic colorectal cancer:
  - Bevacizumab (Avastin) and zivafibercept (Zaltrap) block the growth of blood vessels to the tumor,
  - Cetuximab (Erbitux) and panitumumab (Vectibix) block the effects of hormone-like factors that promote cancer growth.
Chemotherapy and BRM

- Stivarga® (regorafenib) is an oral multi-kinase inhibitor that blocks several enzymes that promote cancer growth.
- Rx advanced colorectal CA

http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm321271.htm

Use SEER®Rx to Code Agents

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)

Rectal Cancer

Version 2.2014
NCCN.org
Neoadjuvant Therapy

- Colon – seldom used except for locally advanced tumors to shrink size of primary tumor mass or to reduce size of metastasis that are deemed resectable.

- Rectum – used for all stages > T2

- Chemo plus or minus XRT to tumor
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  - AJCC Cancer Staging Atlas, 2nd edition
  - AJCC Cancer Staging Handbook, 7th edition
  - Collaborative Stage Data Collection System
- SEER Summary Staging Manual 2000
  - [www.medicinenet.com/colon_cancer](http://www.medicinenet.com/colon_cancer)
- CDC Vital Signs, November 2013
- USPSTF [www.uspreventiveservicestaskforce](http://www.uspreventiveservicestaskforce)
- NCCN Treatment Guidelines – [www.nccn.org](http://www.nccn.org)