Colorectal Cancer
Diagnosis, Treatment and Screening

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50% of men and 33% of women will be diagnosed with some type of cancer in their lifetime

25% of all deaths in the US are due to cancer

67% of all cancer deaths are the result of preventable causes
Colon & Rectal Cancer

* 2nd leading cause of cancer death
* 4th most common cancer overall (men – skin, prostate, lung / Women – skin, breast, lung)
* ~143,000 new cases annually
* ~50,000 deaths annually
* Lifetime risk is 1 in 20 (5%)
Rectal Cancer ≠ Colon Cancer

- Different anatomy
- Different function
- Different approach
  - Rectal Cancer
    - Possible preoperative treatment with chemo and radiation
- Different work-up
  - Rectal Cancer
    - Need for endorectal ultrasound
- Different surgery
  - Rectal Cancer
    - Permanent or temporary bags/stomas
Objectives

- Review current screening guidelines
- Know the difference in colon vs. rectal cancer
- Understand the pathology results from the colonoscopy, as well as presenting signs and symptoms
- Know the pre operative work up and treatment options
- Re-Review current screening guidelines
Age-Specific (Crude) SEER Incidence Rates
By Cancer Site
All Ages, All Races, Both Sexes
2000-2010

Cancer sites include invasive cases only unless otherwise noted.
Rates are per 100,000.
Incidence source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey and Georgia excluding ATL/IRG).
Datapoints were not shown for rates that were based on less than 16 cases.
General Screening Guidelines

- Starts at age 50 – for those at average risk
- Fecal Occult Blood Test - annually
- Colonoscopy – every 10 years  OR
- Flexible sigmoidoscopy – every 5 years  OR
- Double-contrast barium enema – every 5 years  OR
- CT Colonography/Virtual colonoscopy – every 5 years
**Colon Cancers**
Symptomatology & Progression

* Early Stage
  * No symptoms
  * Vague Abdominal Pain
  * Change in BMs/Flatus
  * Sporadic Rectal Bleeding
  * Anemia

* Late Stage
  * Worsening Abdominal Pain
  * Constipation/Diarrhea
  * Obstructive symptoms (nausea/vomiting)
  * Weakness
  * Weight Loss
Rectal Cancers
Symptomatology & Progression

* Early Stage
  * No symptoms
  * Vague Abdominal Pain
  * Change in BMs/Flatus
  * Sporadic Rectal Bleeding
  * Anemia

* Late Stage
  * Change in BMs
  * Constant Rectal Bleeding
  * Urgency
  * Loss of Bowel control
  * Pain: Pelvic / Rectal
  * Thinner stool
Colonoscopy (60 in.)

Goals

- Complete inspection of a clean & “prepped” colon
- Biopsy mass
- Identify, remove, & biopsy other masses or polyps
- Rule out obstructing tumor
Polyps and Cancers
How things progress

* Colorectal cancers begin as a polyp
* 25% of adults over the age of 50 have polyps
* 5-10% of polyps become cancers within 20 years
Polyps

- Adenomatous polyps are considered precancerous
- These are 67% of all polyps
- Rate of colon adenomas increases with age (25% at 50, and 50% at 80)
Predictive factors of Polyps

- Histology – villous***, tubulovillous**, tubular*
- Morphology – sessile vs. pedunculated
- Size - >2 cm = 20% - 50% risk
- Number
- Dysplasia or risk of transformation – low grade 6% vs. high grade 35%
Treatment for Colon Cancer

* Surgery

* Chemotherapy

  • Radiation therapy*
**Pre-Treatment Evaluation**

* Medical History & Family History
  * Assess health risks
  * Determine if a surgical candidate
  * Hereditary factors
  * Polyposis syndromes
  * Guides recommendations
**Labs**

* Carcinoembryonic antigen lever (CEA)
* CBC
* Chemisty
* Coags

* Consider EKG
CT Scan
Chest/Abdomen/Pelvis

- Evaluate for metastatic disease
- Evaluate Pelvic Lymph Nodes
- Evaluate disease extent for surgery planning
- Establish baseline
Metastatic Colorectal Cancer

Special Cases for Surgery

- Large liver metastasis
  - Symptomatic
  - Will grow “out of bounds”

- Large obstructing tumor
  - Risk of Perforation (!!)
  - Symptomatic
Colon Cancer Treatment
Primary Tumor

- Local Disease
  Gold Standard
  Surgical Resection
  If Node Positive Disease

- Metastatic (non-obstructive) Disease
  Gold Standard
  Chemotherapy
Types of Colon Cancer Surgeries

Right Hemicolecotomy  Left Hemicolecotomy  Sigmoidectomy
### Laparoscopic vs. Open Colectomy

<table>
<thead>
<tr>
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<th>Open Colectomy</th>
<th>Lap Colectomy</th>
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<tr>
<td>Hospital Stay</td>
<td>6.4</td>
<td>5.6</td>
</tr>
<tr>
<td>IV Narcotics</td>
<td>4.0</td>
<td>3.2</td>
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<tr>
<td>Oral Narcotics</td>
<td>2.2</td>
<td>1.9</td>
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- Decreased post op pain
- Decreased hospital stay
- Faster return to regular diet, bowel function and activity
- Better cosmetic effect
- *Oncologically equivalent in experienced hands*
Rectal Cancer

* Tumor Location – above the peritoneal reflection
* Up to ~14 cm from the anal verge
Pre-Treatment Evaluation - Rectal

* Medical History & Family History
  * Assess health risks
  * Determine if a surgical candidate
  * Hereditary factors
  * Polyposis syndromes
  * Guides recommendations

* Digital rectal exam*
  * Determine location
  * Determine size
  * Determine mobility/fixation
  * Judge sphincter tone
Rectal Pre-Treatment Planning

- **Digital rectal exam** -
  - Determine size
  - Determine location
  - Determine mobility/fixation
  - Judge sphincter tone

- Rigid proctoscopy
- Flexible Sigmoidoscopy
- Endorectal ultrasound
Proctoscopy (25 cm)

Why?

- Visualize in clinic
- Best modality to determine distance between tumor & anus
- Needs to be performed pre-treatment!!

Allows for surgery planning
Flexible Sigmoidoscopy
(20 in.)

- Clinic procedure
- Well tolerated
- No sedation needed
- Identifies tumors out of a proctoscope’s reach

Allows for surgery planning
Endorectal Ultrasound (EUS)

- Used for *Rectal* Cancer staging
  - Performed with a Flex Sig or Colonoscopy

- Determines treatment
  - Pre-op chemoradiation vs. Surgery

- Assess tumor penetration & lymph node status
Rectal Cancer treatment
Determined by CT scan and EUS

Tumor below or just into the colon wall and Rectal lymph nodes negative

\[ \downarrow \]

Surgery

Tumor thru the colon wall and/or Rectal lymph nodes positive

\[ \downarrow \]

Preoperative chemoradiation Surgery

Postoperative chemotherapy
Rectal Cancer Planning

* T1 or T2, and N0 → surgery
* Tx, N1 → pre operative chemo/XRT, then surgery, then post operative chemo
* T3 or T4, NX → pre operative chemo/XRT, then surgery, then post operative chemo
Pro vs. Con for Radiation

Pro!

* Decreased tumor size, and increase chance for sphincter preservation
* Decrease local failure rate due to better local control
* Less future bowel dysfunction
* Chance for complete response

Con!

* ~20% of rectal cancers will be over-staged preoperatively, leading to potential unnecessary radiation exposure
Complete Response

Before Chemoradiation

After Chemoradiation
Types of Rectal Cancer Surgeries

- Low Anterior Resection
- Proctectomy
- Coloanal Anastomosis
- APR
Stomas
Goals of Surgery

* 5 – 10 cm surgical margin
* Minimum of 12 regional lymph nodes retrieved and assessed
* Removal of any suspicious lymph nodes outside the direct surgical field
Colorectal Cancer Staging

- **TNM staging**
- **T** = Primary Tumor
- **N** = Regional Lymph Nodes
- **M** = Distant Metastasis

- **Web Site:**
  [http://www.cancerstaging.org/staging/posters/colon8.5x11.pdf](http://www.cancerstaging.org/staging/posters/colon8.5x11.pdf)
\textbf{T} = \text{Bowel Wall Layers}

- \text{TX} – cannot assess primary tumor
- \text{T} 0 – no evidence of tumor
- \text{T} is – Carcinoma in situ, intraepithelial or into lamina propria
- \text{T} 1 – tumor invades submucosa
- \text{T} 2 – Tumor invades M. propria
- \text{T} 3 – Thru the M. propria into the preicolorectal tissue
- \text{T} 4 – directly invades or is adherent to another organ/structure
N = Lymph Nodes (LN
s)

- N X – cannot assess
- N 0 – no regional LNs
- N 1 – one to three LNs
- N 1 - A, B, C...
- N 2 – four or more LNs
- N 2 – A, B
$M = \text{Metastasis}$

- $M_0$ – no distant mets
- $M_1$ – Distant mets
- $M_{1A}$ – mets confined to one organ or site
- $M_{1B}$ – mets in more than one organs or site
To Chemo or not to Chemo..

* YES! - Node positive (Stage 3 or higher)
* YES! - Distant metastasis (Stage 4)

* Gray areas....
* T3 or T4 with no lymph nodes
* Evaluate age, comorbidities, etc.
Recurrent Rectal Cancer

Primary Rectal Cancer

- Presentation
  - CEA Level
  - Abnormal Imaging
    - Mass in Pelvis
    - Increased Activity on PET
  - Pain
  - Change in BMs
  - Extra-intestinal Symptoms

- Need **ALL** Old Reports
  - OP Note(s)
  - Chemo summaries
  - Radiation summaries
  - Endoscopy Reports/Pictures
  - Clinic Note(s)
  - Pathology
    - Slides & Reports
  - Imaging: CTs/MRIs/PETs
    - Films & Reports
Pre-treatment Evaluation

* Medical history
  * Determine Operative risk
  * Surgical Candidacy

* Colonoscopy
  * Biopsy mass
  * ID, remove, & biopsy other masses/polyps
  * Rule out obstruction

* Rectal Exam & Procto
  * Determine location, size, mobility/fixation
  * Judge sphincter tone
  * Visualize in clinic
  * Surgery Planning
  * Performed pre-treatment!!
Pre-treatment Evaluation (cont.)

- Physical Exam
- Routine blood work
  - CEA: Baseline level

- CT scan
  - Rule out metastatic disease
  - Evaluate disease extent
  - Surgery planning
  - Baseline Evaluation

- MRI of Pelvis
  - Surgery Planning
  - Rule Out Adjacent Organ Involvement
Surgical Candidacy
How determined?

- Not a Surgical Candidate
  - Sciatic Nerve Involvement
  - Major Vessel Involvement
  - Bony Involvement
  - High Sacral Involvement
  - Metastatic Disease
  - Poor General Health
Prevention...

- Know screening recommendations
- Recommend diet and lifestyle changes – don’t be shy!
- Be aware of genetic predisposition
- Refer patients for colonoscopies
General Screening Guidelines

* Starts at age 50 – for those at average risk
* Fecal Occult Blood Test - annually
* Colonoscopy – every 10 years  OR
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Modifiable Risk Factors

- Obesity/Diet
- Smoking
- Heavy alcohol use
- Sedentary lifestyle
- Lifestyle related factors – type 2 diabetes...
Non-modifiable Risk Factors

* Type 2 Diabetes
* Age – 90% of colorectal cancers are in patients ≥50
* Personal history of polyps or colorectal cancer
* Ethnic background
* Personal history of inflammatory bowel disease (IBD)
* Family history of colorectal cancer or adenomatous polyps
* Genetic Syndromes
Inherited Syndromes

* Familial Adenomatous Polyposis (FAP) 1% of colorectal cancers (CRC),
* Hereditary Non-Polyposis Colon Cancer – (HNPCC) “Lynch” syndrome. 2% - 4% colorectal cancers.
* Turcot Syndrome – very rare
* Peutz-Jeghers Syndrome - very rare
* MUTYH-associated Polyposis
FAP vs. HNPCC

- Autosomal dominant
- 90% will develop CRC cancer by age 45
- Lifetime risk 100%
- 100s – 1000s of polyps
- Screening tests – abdominal US, colonoscopy, EGD, abdominal CT

- Usually MSH or MLH1 mutation
- 90% with a gene mutation will develop colorectal cancer
- Lifetime risk ~80%
- Criteria – 3 relatives with CRC, endometrial, brain, bile duct, ureter &/or renal pelvis. One 1\textsuperscript{st} degree. Two generations have cancer. At least 1 diagnosed before age 50 w/ CRC or endometrial.
High Risk Screening Guidelines

- **FAP** – age 10 – 12 (puberty), annual pan endoscopy, consider genetic testing. If genetic + refer for colectomy.
- **HNPCC** – age 20 – 25 or 10 years before youngest case – annual colonoscopy at age 40, consider genetic counseling
- **IBD** – 8 - 10 years after Dg; colonoscopy with random biopsies every 1 – 2 years
- **Personal history** – colonoscopy one year after surgery, and every 3-5 pending results
- **Family Hx; 1st degree relative Dg < 50** – age 40 or 10 years earlier than the family member’s age of Dg, then every 5 years.
Inflammatory Bowel Disease (IBD) Screening Guidelines

* Ulcerative Colitis (UC) and Crohn’s Disease – risk begins 8 years after onset of pancolitis, or 12-15 years after left sided colitis.
* Colonoscopy every 1-2 years with biopsies for dysplasia
* Referral to gastroenterologist with expertise for management
UC vs. Crohn’s

- Effects the colon
- Mucus-like diarrhea, often bloody
- Tenesmus is common
- Fistula common
- Typically stable weight

- Effects the mouth to the anus
- Porridge like stool, occasional steatorrhea
- Tenesmus is less common
- Seldom develop fistulae
- Weight loss
Other High Risk Guidelines

* If 1-2 small adenomatous polyps, low grade – repeat colonoscopy in 5-10 years
* If 3-10 adenomatous polyps, or 1 cm+, or any high grade dysplasia – repeat colonoscopy in 3 years
* If >10 adenomatous polyps – repeat colonoscopy within 3 years
* If piecemeal polypectomy of sessile polyp(s) – repeat in 2-6 months
Sources

* National Cancer Institute
* American Cancer Society
* The MD Anderson Surgical Oncology Handbook
* Clinical Cancer Research – 11/1/12, Volume 18
* American Joint Committee on Cancer
Questions