UNDERSTANDING COLORECTAL CANCER
CLINICAL PRESENTATION, DIAGNOSIS AND STAGING

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Beckman Coulter, Inc.
OBJECTIVES

› Describe the importance of colorectal cancer in terms of incidence and deaths, and the basis of disease
› Recognize the stages of colorectal cancer progression
› Outline the current screening guidelines for colorectal cancer
› Summarize the current treatment options for colorectal cancer
The lifetime probability of developing CRC is about 1 in 20 for men and women.
Trends in Cancer Death Rates* Among Males, US, 1930-2012

*Age-adjusted to the 2000 US standard population.

NOTE: Due to International Classification of Diseases coding changes, numerator information for colorectal and lung cancers has changed over time.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2015.
Trends in Cancer Death Rates* Among Females, US, 1930-2012

*Age-adjusted to the 2000 US standard population. †Uterus includes uterine corpus and uterine cervix combined. ‡Includes intrahepatic bile duct.

NOTE: Due to International Classification of Diseases coding changes, numerator information for colorectal, lung, and uterine cancers has changed over time.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention.
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>All sites</td>
<td>49</td>
<td>55</td>
<td>69</td>
</tr>
<tr>
<td>Breast (female)</td>
<td>75</td>
<td>84</td>
<td>91</td>
</tr>
<tr>
<td>Colorectum</td>
<td>50</td>
<td>60</td>
<td>66</td>
</tr>
<tr>
<td>Leukemia</td>
<td>34</td>
<td>43</td>
<td>62</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>12</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Melanoma of the skin</td>
<td>82</td>
<td>88</td>
<td>93</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>47</td>
<td>51</td>
<td>72</td>
</tr>
<tr>
<td>Ovary</td>
<td>36</td>
<td>38</td>
<td>46</td>
</tr>
<tr>
<td>Pancreas</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Prostate</td>
<td>68</td>
<td>83</td>
<td>99</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>72</td>
<td>79</td>
<td>79</td>
</tr>
</tbody>
</table>

Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2015.
ANATOMY AND DISEASE PROGRESSION
ANATOMY OF THE GASTROINTESTINAL TRACT

- The colon is a part of the GI (gastrointestinal) tract where food is processed to produce energy and rid the body of waste.
- The small intestine is where nutrients are broken down and absorbed.
- The small intestine joins the colon (large intestine), a muscular tube about 5 feet long.

http://www.cancer.org/docroot/CRI/content/CRI_2_2_1X_What_is_colon_and_rectum_cancer_10.asp?sitearea=
ANATOMY OF THE COLON AND RECTUM

- The colon has four sections: ascending, transverse, descending, and sigmoid colon.
- The first part of the colon absorbs water and nutrients from food and serves as a storage for waste.
- Waste then travels through the rectum (the last six inches of the digestive system) and then exits through the anus.

http://www.cancer.org/docroot/CRI/content/CRI_2_2_1X_What_is_colon_and_rectum_cancer_10.asp?sitearea=
COLORECTAL CANCER ORIGIN

http://images.healthcentersonline.com/digestive/images/article/ColorectalCancer.jpg
POLYP TO CANCER PROGRESSION

A. Sessile polyp     B. Pedunculated polyp     C. Colon cancer

Over 95% of colon and rectal cancers are adenocarcinomas (cancers that begin in cells that make and release mucous and other fluids). These cells line the inside of the colon and rectum.

http://www.colon-cancer.biz/images/coloncancerr.jpg
**COLORECTAL CANCER**

- Each section of the colon has several layers of tissue.
- Cancer begins in the inner layer and can grow through some or all of the tissue layers.
- Cancer that begins in different sections of the colon may cause different symptoms.

http://www.cancer.org/docroot/CRI/content/CRI_2_4_3X_How_is_colon_and_rectum_cancer_staged.asp?sitearea=
CANCER PROGRESSION

- Cancer occurs when cells grow and divide without regulation and order (Stage 0, I, and IIA)

- Metastasis occurs when cancer cells break away from a tumor and spread to other parts of the body via the blood or lymph system (Stage IIB, III, and IV)
**STAGING - AMERICAN JOINT COMMITTEE ON CANCER SYSTEM (AJCC/TNM)**

Staging is an indicator of survival

**Stage grouping:** From least advanced (stage 0) to most advanced (stage IV) stage of colorectal cancer

<table>
<thead>
<tr>
<th>Stage</th>
<th>TNM Category</th>
<th>Survival Rate</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0:</td>
<td>Tis, N0, M0</td>
<td></td>
<td>The earliest stage. Has not grown beyond inner layer (mucosa) of colon or rectum.</td>
</tr>
<tr>
<td>Stage I:</td>
<td>T1, N0, M0</td>
<td>93%</td>
<td>Has grown into submucosa (T1) or muscularis propria (T2)</td>
</tr>
<tr>
<td></td>
<td>T2, N0, M0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage IIA:</td>
<td>T3, N0, M0</td>
<td>85%</td>
<td>II A: Has spread into subserosa (T3).</td>
</tr>
<tr>
<td>Stage IIB:</td>
<td>T4, N0, M0</td>
<td>72%</td>
<td>II B: Has grown into other nearby tissues or organs (T4).</td>
</tr>
<tr>
<td>Stage IIIA:</td>
<td>T1-T2, N1, M0</td>
<td>83%</td>
<td>III A: Has grown into submucosa (T1) or into muscularis propria (T2) and has spread to 1-3 nearby lymph nodes (N1)</td>
</tr>
<tr>
<td>Stage IIIB:</td>
<td>T3-T4, N1, M0</td>
<td>64%</td>
<td>III B: Has spread into subserosa (T3) or into nearby tissues or organs (T4), and has spread to 1-3 nearby lymph nodes (N1)</td>
</tr>
<tr>
<td>Stage IIIC:</td>
<td>Any T, N2, M0</td>
<td>44%</td>
<td>III C: Any stage of T, but has spread to 4 or more nearby lymph nodes (N2).</td>
</tr>
<tr>
<td>Stage IV:</td>
<td>Any T, Any N, M1</td>
<td>8%</td>
<td>Any T or N, and has spread to distant sites such as liver, lung, peritoneum (membrane lining abdominal cavity), or ovaries (M1).</td>
</tr>
</tbody>
</table>
SYMPTOMS OF COLORECTAL CANCER

› Early colon cancer usually presents with **no symptoms**. Symptoms appear with more advanced disease.

› Symptoms include:
  • a change in bowel habits (diarrhea, constipation, or narrowing of the stool for more than a few days)
  • a constant urgency of needing to have a bowel movement
  • bleeding from the rectum or blood in the stool (the stool often looks normal)
  • cramping or steady stomach pain
  • weakness and fatigue or anemia
  • unexplained weight loss

A polyp as seen during colonoscopy
# RISK FACTORS

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>9 out of 10 cases are over 50 years old</td>
</tr>
<tr>
<td>History of polyps</td>
<td>↑ risk if large size, high frequency, or specific types</td>
</tr>
<tr>
<td>History of bowel disease</td>
<td>Ulcerative colitis and Crohn’s disease (IBDs) ↑ risk</td>
</tr>
<tr>
<td>Certain hereditary family syndromes</td>
<td>Having a family history of familial adenomatous polyposis or hereditary nonpolyposis colon cancer (Lynch Syndrome) ↑ risk</td>
</tr>
<tr>
<td>Family history (excluding syndromes)</td>
<td>Close relatives with colon cancer ↑ risk esp. if before 60 years (degree of relatedness and # of affected relatives is important)</td>
</tr>
<tr>
<td>Other cancers and their treatments</td>
<td>Testicular cancer survivors ↑ risk</td>
</tr>
<tr>
<td>Race</td>
<td>African Americans are at ↑ risk</td>
</tr>
<tr>
<td>Ethnic background</td>
<td>Ashkenazi Jew descent ↑ risk due to specific genetic factors</td>
</tr>
</tbody>
</table>
# RISK FACTORS (CONT’D)

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diet</strong></td>
<td>High in fat, especially animal fat, red meats and processed meats ↑ risk</td>
</tr>
<tr>
<td><strong>Lack of exercise</strong></td>
<td>↑ risk</td>
</tr>
<tr>
<td><strong>Overweight</strong></td>
<td>↑ risk of incidence and death</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td>-↓ risk of incidence and death -30-40% more likely to die of colorectal cancer</td>
</tr>
<tr>
<td><strong>Alcohol</strong></td>
<td>Heavy use of alcohol ↑ risk</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td>30% ↑ risk of incidence and ↑ death rate</td>
</tr>
<tr>
<td><strong>Night shift work</strong></td>
<td>More research is needed but over time may ↑ risk</td>
</tr>
</tbody>
</table>
CRC SCREENING GUIDELINES
AMERICAN CANCER SOCIETY (ACS), US MULTI-SOCIETY TASK FORCE ON COLORECTAL CANCER (USMSTF) AND THE AMERICAN COLLEGE OF RADIOLOGY (ACR)

- Average-risk adult should start screening at age 50

<table>
<thead>
<tr>
<th>Test</th>
<th>Time interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible sigmoidoscopy</td>
<td>5 years</td>
</tr>
<tr>
<td>Optical colonoscopy</td>
<td>10 years</td>
</tr>
<tr>
<td>Double-contrast barium enema</td>
<td>5 years</td>
</tr>
<tr>
<td>CT colonography</td>
<td>5 years</td>
</tr>
<tr>
<td>Fecal occult blood test (guaiac or immunochemical based)</td>
<td>Annual</td>
</tr>
<tr>
<td>Stool DNA test</td>
<td>3 years</td>
</tr>
</tbody>
</table>

*Ann Intern Med 2012;156:378-386*
CRC SCREENING BARRIERS

35% of population eligible for screening in the US have remained unscreened

› Cost and lack of access to health care
› Physician variability regarding screening recommendations
› Poor communication of the benefits of screening and the risks of not getting screened
› Personal barriers
  • Fear, embarrassment, distrust of the medical community
Q: Is a Doctor’s Recommendation Really That Useful?

Aren’t we bucking human nature with this one?
STRATEGIES TO INCREASE CRC SCREENING

› Prompt one-on-one discussion about the potentially life-saving importance of screening
› Remove financial barriers to screening
› Help patients navigate through the healthcare system
› Use educational prompts to educate the community about Colonoscopy and other forms of screening
## FACTORS THAT MAY REDUCE RISK

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Regular screening can prevent colon cancer completely (it usually takes 10-15 years from the time of the first abnormal cells until cancer develops). Screening can detect polyps and allow for removal before becoming cancerous, or early detection of cancer with a better prognosis.</td>
</tr>
<tr>
<td><strong>Diet and Exercise</strong></td>
<td>Fruits, vegetables, whole grains, minimal high-fat foods and 30-60 minutes of exercise 5 times per week help ↓ risk</td>
</tr>
<tr>
<td><strong>Vitamins, calcium w/D, magnesium</strong></td>
<td>Aid in ↓ risk</td>
</tr>
<tr>
<td><strong>NSAIDs (Non-steroidal anti-inflammatory drugs)</strong></td>
<td>20-50% ↓ risk of colorectal cancer and adenomatous polyps; however, NSAIDs can cause serious or life threatening implications on the GI tract and other organs</td>
</tr>
<tr>
<td><strong>Female Hormones</strong></td>
<td>HRT (hormone replacement therapy) may ↓ risk esp. amongst long term users, but if cancer develops, it may be more aggressive. HRT ↓ risk of osteoporosis, but may ↑ risk heart disease, blood clots, breast and uterine cancers</td>
</tr>
</tbody>
</table>
SCREENING OPTIONS: FECAL OCCULT BLOOD TEST

› Stool Blood Test (FOBT or FIT): Used to find small amounts of blood in the stool. If found further testing should be done.

http://www.owenmed.com/hemoccult.jpg

BLEEDING PATTERNS

- Stool Blood Test (FOBT or FIT): Used to find small amounts of blood in the stool. If found further testing should be done.

The fecal material passing through the colon and against the anomaly ‘could’ result in bleeding

Site and amount of bleeding will affect the location of the blood in the fecal material
There is variable quantity of bleeding from day to day in patients…and the blood products present in the faeces are often unequally distributed.

…volume and periodicity of such bleeding is highly variable…

Faecal Occult Blood Tests: Choice, Usage and Clinical Applications; G. Young
“For the stool blood tests (FIT), the take-home, multiple-sample should be used”

“The fecal immunochemical test has some of the same drawbacks as conventional FOBT, such as an inability to detect a tumor that is not bleeding.”

American Cancer Society www.cancer.org
Clinical Significance of Multiple Day Testing


“The sensitivity and specificity were calculated to be 58% and 96% for a single day method, 89% and 95% for a 2-day method, and 100% and 94% for a 3-day method, respectively, indicating a significant difference in the sensitivity between a single day method and a 2-day as well as a 3-day method (p < 0.05), and in the specificity among the 3 testing methods (p < 0.001).”
WHY FOBT & COLORECTAL CANCER SCREENING?

› Colorectal Cancer (CRC) is very deadly
› FOBT saves lives through early detection
› FOBT has been proven through clinical studies to reduce incidence by 20% and mortality up to 33%*
› 41 million Americans (nearly half >50 years old) need CRC screening
› FOBTs are a cost effective and accessible means for CRC screening

*The effect of fecal occult-blood screening on the incidence of colorectal cancer, J. S. Mandel, 2000
WHY ICT?

† Immunochemical FOBT (ICT) has major advantages over traditional Guaiac FOBT

<table>
<thead>
<tr>
<th>Immunochemical Advantage</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>No diet or medication restrictions</td>
<td>Better patient compliance</td>
</tr>
<tr>
<td>Increased specificity with high sensitivity</td>
<td>Fewer false-positives for CRC</td>
</tr>
<tr>
<td>Specific to lower GI bleeding</td>
<td>Ideal CRC screening product</td>
</tr>
<tr>
<td>New CPT codes = 82274 (QW) and G0328(QW)*</td>
<td>ICT Reimbursement = $21.74 (2017)*</td>
</tr>
<tr>
<td></td>
<td>FOB Reimbursement = $4.46 (2017)*</td>
</tr>
</tbody>
</table>

*Exemplar CPT and reimbursement provided. Refer to regional CMS fee schedule for relevant/current CPT codes and reimbursements.
That's not quite the stool sample we had in mind.
SCREENING: FLEXIBLE SIGMOIDOSCOPY

› A sigmoidoscope, a slender, lighted tube the thickness of a finger, is placed into lower part of colon through rectum.
› It allows physician to look at inside of rectum and lower third of colon for cancer or polyps.
› Is uncomfortable but not painful. Preparation consists of an enema to clean out lower colon.
› If small polyp found then will be removed. If adenoma polyp or cancer found, then colonoscopy will be done to look at the entire colon.

SCREENING: BARIUM ENEMA

- A chalky substance is used to partially fill and open up the colon.
- Air is then pumped in which causes the colon to expand and allows clear x-rays to be taken.
- If an area looks abnormal then a colonoscopy will be done.

A cancer of the ascending colon. Tumor appears as oval shadow at left over right pelvic bone
SCREENING: CT COLONOGRAPHY OR "VIRTUAL COLONOSCOPY"

› Air is pumped into the colon in order for it to expand followed by a CT scan which takes hundreds of images of the lower abdomen

› Bowel prep is needed but procedure is completely non-invasive and no sedation is needed

› Is not recommended if you have a history of colorectal cancer, Chron’s disease, or ulcerative colitis

› If abnormalities found then follow-up with colonoscopy
A colonoscope, a long, flexible, lighted tube about the thickness of a finger, is inserted through the rectum up into the colon.

- Allows physician to see the entire colon.
- Bowel prep of strong laxatives to clean out colon, and the day of the procedure an enema will be given.
- Procedure lasts ~15-30 minutes and patient is under mild sedation.
- Early cancers can be removed by colonoscope during colonoscopy.

http://www.cadth.ca/media/healthupdate/Issue6/hta_update_mr-colonography2.jpg
# Screening Guidelines, Advantages, and Disadvantages

<table>
<thead>
<tr>
<th>Screening</th>
<th>Guidelines</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal Occult Blood Test (FOBT)</td>
<td>Annually starting at age 50</td>
<td>- Cost effective</td>
<td>- False-positive/false-negative results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Noninvasive</td>
<td>- Dietary restrictions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Can be done at home</td>
<td>- Duration of testing period</td>
</tr>
<tr>
<td>Flexible Sigmoidoscopy (FS)</td>
<td>Every 5 years starting at age 50</td>
<td>- Cost effective</td>
<td>- Examines only portion of colon (additional screening may be done)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Can be done w/o sedation</td>
<td>- Discomfort for patient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Performed in clinic</td>
<td>- Bowel cleansing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Any polyps can be biopsied</td>
<td></td>
</tr>
<tr>
<td>* Colonoscopy (preferred method b/c polyps can be biopsied and removed)</td>
<td>Every 10 yrs starting at age 50</td>
<td>- Patient sedated</td>
<td>- Bowel cleansing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Outpatient screening</td>
<td>- Sedation may be a problem for some</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Views entire colon and rectum</td>
<td>- Cost if uninsured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Polyps can be removed and biopsied</td>
<td>- Risk of perforation</td>
</tr>
<tr>
<td>CT Colonography a.k.a. “Virtual Colonoscopy”</td>
<td>Every 5 yrs starting at age 50</td>
<td>- Relatively noninvasive</td>
<td>- Small polyps may go undetected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No sedation needed</td>
<td>- Bowel cleansing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Can show 2- or 3-D imagery</td>
<td>- Cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- If polyps found, colonoscopy required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Exposure to radiation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Patient discomfort</td>
</tr>
</tbody>
</table>

*American Cancer Society Recommendation*
COLORECTAL CANCER

TREATMENT
TREATMENT OPTIONS

Depending on the stage, 2 or 3 different treatment types may be combined.

- Colon surgery
- Rectal surgery
- Radiation therapy
- Chemotherapy
- Immunotherapy

http://recong2.com/system/files/erbitux_avastin.png
TREATMENT-COLON SURGERY

› Main treatment for colon cancer.
› Patient is given laxatives and enema.
› General anesthesia is required.
› The cancerous tissue and a length of normal tissue on either side of the cancer, as well as the nearby lymph nodes are removed.
› The remaining sections of the colon are then reattached.
› A temporary colostomy (colon is attached to the abdominal wall and fecal matter drains into a bag) may be needed. Very rarely is a permanent colostomy needed.

Several methods for removing or destroying rectal cancers

Local resection for those with stage I rectal cancer. Cutting through all layers of the rectum to remove invasive cancers and some surrounding normal rectal tissue.

Many stage I and most stage II and III are removed by either low anterior (LA) resection or abdominoperineal (AP) resection

LA resection—For cancers near upper part of rectum, colon is reattached to the lower part of the rectum and waste elimination is normal

AP resection—for cancers in the lower part of rectum, the cancerous tissue as well as the anus is removed and a permanent colostomy is necessary

Photocoagulation (heating the rectal tumor with a laser beam aimed through the anus) is an option for relieving or preventing rectal blockage in patients with stage IV cancer

http://www.mfi.ku.dk/ppaulev/chapter22/images/22-22.jpg
TREATMENT-RADIATION THERAPY

› Treatment with high energy rays (such as x-rays) to kill or shrink cancer cells
› May be external radiation (from outside of the body) or radioactive materials placed directly in the tumor (internal or implant radiation)
› Adjuvant treatment (after surgery)- radiation is given to kill small areas of the cancer that are hard to see
› Neoadjuvant treatment (before surgery)- radiation shrinks the tumor if the size or location of the tumor makes surgery difficult

http://www.dkimages.com/discover/previews/839/15012869.JPG
TREATMENT - RADIATION THERAPY

› External Radiation:
  • used for people with colon or rectal cancer
  • treatments given 5 days a week for several weeks
  • each treatment lasts a few minutes and is similar to having an x-ray taken
  • a different approach for some cases of rectal cancer involves the radiation aimed through the anus to reach the rectum

› Internal Radiation:
  • small pellets, or seeds, of radioactive material are placed next to or directly into the cancer
  • sometimes used in treatment of people with rectal cancer, especially the sick or elderly that would not be able to withstand surgery

TREATMENT-CHEMOTHERAPY

- The use of cancer-fighting drugs injected intravenously or orally
- Drugs enter the bloodstream and reach the entire body
- Is a useful treatment for metastasized cancers
- Chemo following surgery increases the survival rate for some stages
- Chemo helps relieve symptoms of advanced cancer
- Regional chemo: drugs are injected into the artery which leads to cancerous areas (may be fewer side effects)

http://www.leadershipmedica.com/scientifico/sciesett02/scientificaita/7ferrari/nanopores_7ferrfig2.gif
# TREATMENT - CHEMOTHERAPY

<table>
<thead>
<tr>
<th>Drug</th>
<th>Description</th>
</tr>
</thead>
</table>
| Fluorouracil – (5-FU) | -most common drug, usually given with other drugs, such as leucovorin, to help increase effectiveness  
-along with radiation therapy, 5-FU is given as a continuous infusion intravenously to increase radiation effectiveness  
-The de Gramont regimen:  
-5-FU is given continuously over 2 days with a rapid injection/day  
-leucovorin given each day over 2 hours  
-regiment given every other week  
-With colorectal metastases to liver, a hepatic artery infusion is given involving: 5-FU or floxuridine (FUDR) given directly into the artery which supplies blood to the liver |
| Irinotecan         | -treatment is called FOLFIRI: adds irinotecan to de Gramont 5-FU/leucovorin regimen  
-studies have shown a chance for excessive side effects when all three are combined |
| Oxaliplatin        | -treatment is called FOLFOX: it may be used in place of irinotecan in the de Gramont regimen |
| Capecitabine       | -drug is given orally  
-is changed to 5-FU once it reaches the tumor site  
-can be given instead of intravenous 5-FU  
-acts as if 5-FU being administered continuously |
TREATMENT-IMMUNOTHERAPY

› Use of natural substances produced by the immune system
› Substances may kill cancer cells, slow their growth, or activate patient’s immune system
› Antibodies are produced by the immune system to help fight infections
› Monoclonal antibodies (made in lab), attack cancer cells

• Bevacizumab: works by preventing growth of new blood vessels that supply tumor cells with blood, oxygen and nutrients needed to grow. Used with chemo as first line of treatment for patients with advanced or metastatic colon or rectal cancer.
• Cetuximab: works by binding to a special site on the cell surface which stops the cell’s growth and promotes cell death. Used alone or in combination with chemotherapy agent as a second line of treatment for patients with advanced or metastatic colon or rectal cancer whose disease is no longer responding to irinotecan, or who cannot take it
## THE CURRENT STATE OF COLORECTAL CANCER RESEARCH

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
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</table>
| **Chemoprevention**      | - The use of natural or man-made chemicals to lower a person's risk of getting cancer  
- Researchers are testing the following substances to see whether there is a decrease in risk: fiber, minerals, vitamins, or drugs |
| **Genetics**             | - Researchers learning more about some of the DNA mutations that cause cancerous cells in the colon and rectum  
- The understanding of the mechanisms of the genes should lead to new drugs and treatments  
- The early phases of gene therapy trials are currently taking place |
| **Early detection**      | - Studies to look at how well current screening methods work and to explore new ways of educating the public about the importance of colorectal screening  
- <50% Americans over 50 get screened each year, we could prevent ~10,000 deaths/year |
| **Immunotherapy**        | - Treatments that boost a person's immune system to fight colorectal cancer more effectively are being tested in clinical trials |
| **Tumor Growth Factors** | - Have found natural substances in the body that promote cell growth (growth factors)  
- Some cancer cells grow rapidly because of increased response to growth factors compared to normal cells  
- New drugs that can spot these types of cells are being tested in clinical trials, which may prevent the cancer from growing so quickly |
35% of people eligible for screening in the US remain unscreened
• Some populations refuse colonoscopy and stool-based screening
• Epi proColon is a blood-based test that may help reach these individuals
• Developed in collaboration with ARUP Laboratories
• Detects methylated SEPT9 DNA associated with CRC
• “Positive” patients referred for colonoscopy
• Similar sensitivity to FIT, but poorer specificity, yet may be able to catch evaders
• Much more expensive than FIT
• Not widely accepted
March Is Colorectal Cancer Awareness Month

Among cancers that affect both men and women, colorectal cancer (cancer of the colon or rectum) is the second leading cause of cancer deaths in the United States. Every year, about 140,000 Americans are diagnosed with colorectal cancer, and more than 50,000 people die from it. But this disease is highly preventable, by getting screened beginning at age 50.

What You Can Do

- If you're aged 50 to 75, get screened for colorectal cancer regularly. Screening tests help prevent colorectal cancer by finding precancerous polyps (abnormal growths) so they can be removed. Screening also finds this cancer early, when treatment can be most effective.
- Be physically active.
- Maintain a healthy weight.
- Don't drink too much alcohol.
- Don't smoke.

Fast Facts

- Risk increases with age. More than 90% of colorectal cancers occur in people aged 50 and older.
- Precancerous polyps and colorectal cancer don't always cause symptoms, especially at first. You could have polyps or colorectal cancer and not know it. That is why having a screening test is so important. If you have symptoms, they may include—
  - Blood in or on the stool (bowel movement).
  - Stomach pain, aches, or cramps that do not go away.
  - Losing weight and you don't know why.
These symptoms may be caused by something other than cancer. If you have any of them, see your doctor.
EARLY DETECTION IS THE KEY

90% 5-YEAR SURVIVAL RATE IF FOUND AT THE LOCAL STAGE

40% DIAGNOSED AT AN EARLY STAGE PARTLY DUE TO LOW TESTING RATES

STAGES OF COLON CANCER

POLYP
Most colon cancers develop from these noncancerous growths.

IN SITU
Cancer has formed, but is not yet growing into the colon or rectum walls.

LOCAL
Cancer is growing in the colon or rectum walls; nearby tissue is unaffected.

REGIONAL
Growth is into tissue or lymph nodes, beyond the colon or rectum walls.

DISTANT
Cancer has spread to other parts of the body, such as the liver or lungs.

www.concer.org
SUMMARY

› Colorectal Cancer is a common, yet preventable disease that affects 140,000 individuals annually
› Colorectal Cancer mortality has declined over the past 3 decades largely due to increased screening
› Regular screening can help prevent colon cancer
› Early detection is the key to a better prognosis.
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THANK YOU

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