Colorectal Cancer Screening and Diagnosis

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Objectives

- Discuss who needs colorectal cancer screening and what types are available.
- Explain follow-up needed based on results.
- Discuss treatment modalities for colorectal cancer.

What is Cancer?

- Cancer is a word used for diseases in which abnormal cells divide or proliferate without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems.
- There are more than 100 different types of cancer.
- Cancer types can be grouped into broader categories. The main categories of cancer include:
  - **Carcinoma** - cancer that begins in the skin or in tissues that line or cover internal organs. There are a number of subtypes of carcinoma, including adenocarcinoma, carcinoma, squamous, and transitional cell carcinoma.

Others:

- **Sarcoma** - cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue.
- **Leukemia** - cancer that starts in blood-forming tissue such as the bone marrow and causes large numbers of abnormal blood cells to be produced and enter the blood.
- **Lymphoma and myeloma** - cancers that begin in the cells of the immune system.
- **Central nervous system cancers** - cancers that begin in the tissues of the brain and spinal cord.

Source: National Cancer Institution at the National Institutes of Health, http://www.cancer.gov/cancertopics/ca+ncerlibrary/what-is-cancer

Colon and Rectal Cancer Statistics

- Estimated new cases and deaths from colon and rectal cancer in the United States in 2014:
  - New cases: 96,830 (colon); 40,000 (rectal)
  - Deaths: 50,310 (colon and rectal combined)

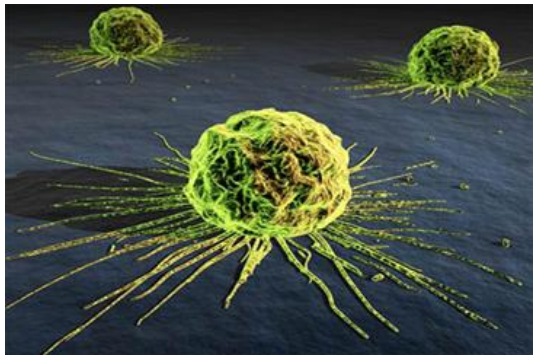
- Colorectal Cancer (CRC) is the third most common cancer affecting both males and females in the US.
  - 70% arising from the colon

- CRC is the second leading cause of cancer death.
  - Accounts for approximately 9% of cancer deaths
  - Accounts for approximately 3% of total deaths

Sources: http://www.cancer.gov/cancertopics/pdq/treatment/colon and rectal/HealthProfessional, http://uptodate.com/contents/tests-for-screening -for-colorectal-cancer

Colon and Rectal Cancer Statistics, cont.

- Approximately 1 in 3 people who are diagnosed with CRC die of this disease.
- 20% of CRC occurs in patients with specific risk factors, such as h/o inflammatory bowel disease or family history of CRC.



Source: Department of Veterans Affairs: VHA Directive 1015, December 30, 2014, Colorectal Cancer Screening

Cancer Statistics in the VA

- Approximately 40,000 incident cancer cases are reported in VA Central Cancer Registry (VACCR) annually. (In 2007, approximately 5 million Veterans received care in the VA healthcare system, making it one of the leading US providers of healthcare.)
- Approximately 3% of U.S. cancer diagnoses are made in the VA annually
- The five most frequently diagnosed cancers among VA cancer patients were: prostate (31.8%), lung/bronchus (18.8%), colon/rectum (8.6%), urinary bladder (3.6%) and skin melanomas (3.4%).
- VA patients were diagnosed at an earlier stage of disease for the three most commonly diagnosed cancers-prostate, lung/bronchus and colon/rectum- compared to the U.S. male cancer population.

Sources: NIH Public Access: Zullig, L., Jackson, G. ,et al. (2012), Cancer incidence among patients of the united states veterans affairs (VA) healthcare system. Mil Med.2012 June; 177(60): 693-701.
Department of Veterans Affairs: VHA Directive 1015, December 30, 2014, Colorectal Cancer Screening

Colon and Rectal Cancer Statistics in the VA

- In 2007, digestive system cancers accounted for 17.6% of all cancers in both sexes
  - 127 cases of small intestine (0.3%)
  - 2384 cases of colon cancer (6%)
  - 1037 rectal cancer (2.6%)
- Total: 3548 cases of colorectal cancer in 2007 Veterans Affairs patients (8.9%)

Sources: NIH Public Access: Zullig, L., Jackson, G. ,et al. (2012), Cancer incidence among patients of the united states veterans affairs (VA) healthcare system. Mil Med.2012 June; 177(60): 693-701.
Department of Veterans Affairs: VHA Directive 1015, December 30, 2014, Colorectal Cancer Screening

CRC Screening Modalities

- Stool-based
  - **Guaiac based FOBT (gFOBT)** uses a series of 3 cards to test separate stool samples for occult blood. Identifies hemoglobin by presence of peroxidase reaction, turns the guaiac impregnated paper blue.
    - Dietary restrictions for 7 days prior. Large doses of vitamin C >250mg daily can make false negative. Oral iron does not affect results.
    - Not good for detection of polyps, which usually do not bleed. Sensitivity for advanced adenomas is substantially less than for cancers.
    - Must workup false positive results.
  - **Sensitive gFOBT-** did not make the ≥50% as individual tests
    - High sensitivity gFOBT consists of tests that have been shown to detect a majority of existing CRC asymptomatic patients.
    - Generally ≥50%
    - VA prefers ≥70%

Sources: http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer
uptodate.com, Doubeni, C. Tests for screening for colorectal cancer: Stool tests, radiologic imaging and endoscopy
http://vaww.prevention.va.gov/colorectal_Cancer_Screening.asp

CRC Screening Modalities, cont.

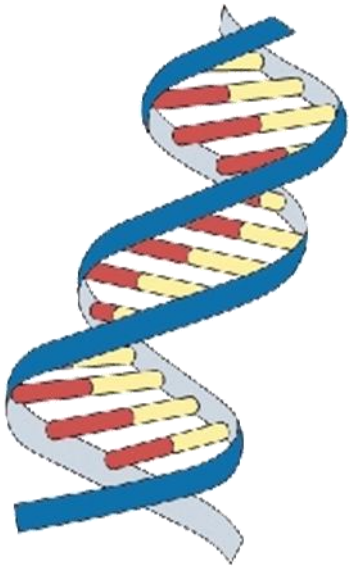
- Stool-based
  - **Fecal Immunochemical Testing (iFOBT/FIT)** uses immunochemical testing for human globin, a specific protein in human hemoglobin. Do not detect upper GI bleeding (globin is digested in transit) or foods with peroxidase activity
    - Use of iFOBT/FIT eliminates the need for dietary restrictions.
    - Depending on brand can require 1-3 stool samples.

- ALL positive stool based tests should be followed by a diagnostic colonoscopy if medically appropriate (even ones from DRE)

Sources: http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer
uptodate.com, Doubeni, C. Tests for screening for colorectal cancer: Stool tests, radiologic imaging and endoscopy

CRC Screening Modalities, cont.

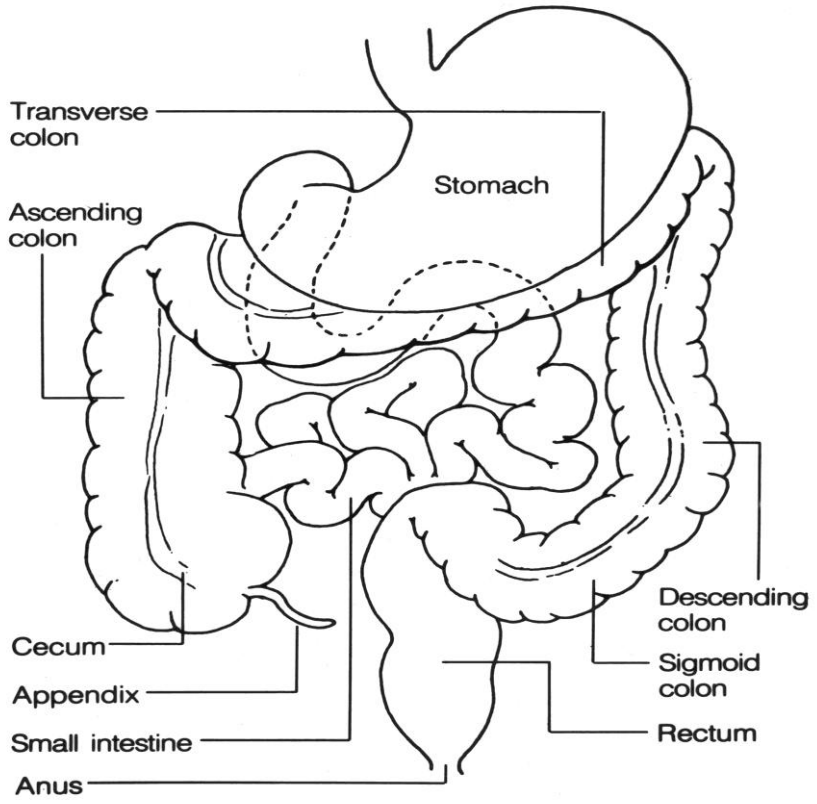
- Stool-based
  - **Fecal DNA Tests**
    - Colorectal neoplasms shed DNA within the stool and can be isolated and tested for presence of mutations and genetic changes that can be acquired during carcinogenesis.
    - First generation in 2012
    - Newer version, Cologuard combines DNA testing and testing for HGB
    - What to do with false positives?
      - In one study of average risk patients nearly 10% had negative colonoscopies and positive stool DNA test
    - Frequency between tests is not known (~Q3 years)
    - Not currently in screening guidelines for US Preventative Services Task Force (USPSTF)



Sources: http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer
uptodate.com, Doubeni, C. Tests for screening for colorectal cancer: Stool tests, radiologic imaging and endoscopy

Colon Imaging and Direct Visualization

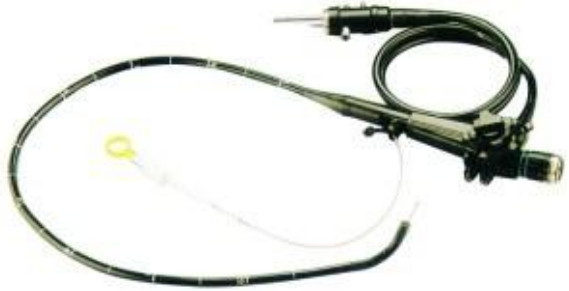
- Sigmoidoscopy
- Colonoscopy
- Computer tomographic colonography (CTC)
- Capsule endoscopy
- Double contrast barium enema



Direct Visualization

- **Colonoscopy**
  - Allows visualization of inner lining of rectum and the entire colon.
  - Requires a bowel prep.
  - Conscious sedation and sometimes full anesthesia is used.
- **Sigmoidoscopy**
  - Similar to colonoscopy with shorter scope.
  - Requires bowel prep.

- Both include complications of bleeding and perforation.



Colon Imaging, cont.

- **Computer Tomographic Colonography (CTC)-**multiple CT images to make 2-3D images of bowel
  - Consider if failed scope where operator did not reach the cecum (estimated at 1-15% of colonoscopies)
  - Consider if there is a contraindication to screening colonoscopy, but a good portion of these patients will require a diagnostic colonoscopy if suspicious lesions are seen.
- **Double Contrast Barium Enema (DCBE)-**involves coating the lower intestinal mucosa with barium then inserting air through rectal catheter to distend colon, multiple radiographs taken
  - Requires bowel prep
  - No sedation
  - Detects only ~ ½ of adenomas >1 cm and 39% of all polyps, may miss 14-22% of CRC
  - Can cause cramping
  - Requires colonoscopy for abnormal findings
- **Capsule Endoscopy-**capsule study with two sided camera
  - Requires bowel prep
  - Low sensitivity of polyp detection
  - Requires colonoscopy for abnormal findings

Sources: http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer
uptodate.com, Doubeni, C. Tests for screening for colorectal cancer: Stool tests, radiologic imaging and endoscopy

Graph Summary: Screening Tests

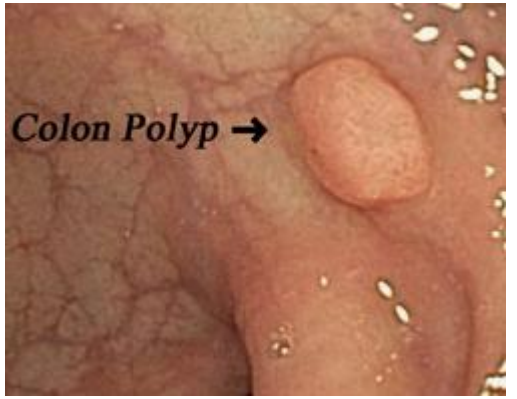
Screening Test	Test Performance (sensitivity)	Complexity	Potential Effectiveness	Screening Test Risk
Fecal occult blood test	Intermediate for cancers, low for polyps	Lowest	Lowest	Lowest
Fecal immunochemical test for hemoglobin	Intermediate for cancers, low for polyps	Low	Low	Lowest
Flexible sigmoidoscopy	High for up to half of the colon	Intermediate	Intermediate	Intermediate
FOBT+ flex. Sig.	Same as flex. Sig. and FOBT	Intermediate	Intermediate	Intermediate
Colonoscopy	Highest	Highest	Highest	Highest
Computer tomographic colonography	High (similar to colonoscopy)	High	High	Low

- The costs of the screening tests themselves, also an important characteristic, vary, but the costs of the screening strategies (lifetime programs of screening and follow-up of abnormal test results) are comparable. Complexity involves patient preparation, inconvenience, facilities and equipment needed, and patient discomfort.

Source: Data from joint multi-society guidelines , 2008. Adapted from Winawer, SW, Fletcher RH, Mille L, et al. AGA guidelines: Colorectal cancer screening: Clinical guidelines and rationale. Gastroenterology 1997; 112: 594.

Rationale for Screening

- Most colorectal cancers arise from adenomatous polyps that progress from small to large (>1 cm) polyps and then to dysplasia and cancer.
- The progression of adenoma to carcinoma is believed to take least 10 years (this is an estimate)
- Most colorectal polyps are: adenomatous or hyperplastic
- They cannot be differentiated at the time of colonoscopy, so all are removed
- Hyperplastic usually do not progress to cancer
- 2/3 of polyps are adenomas
- Adenomas are more common in men than women and increase with age



Sources: uptodate.com, Doubeni, C. Tests for screening for colorectal cancer: Stool tests, radiologic imaging and endoscopy
http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer

Veterans Health Administration (VHA) Recommendations

- VHA recommends screening for colorectal cancer in adults age 50-75
- Consider offering colorectal cancer screening in adults age 76-85 only if other considerations support providing screening for that individual patient.
- VHA recommends against screening for colorectal cancer in adults older than 85 yo

Source: http://vaww.prevention.va.gov/colorectal_Cancer_Screening.asp

Veterans Health Administration Recommendations

- Average Risk Recommendations
  - Fecal Occult blood Test (FOBT) annually with:
    - FDA approved guaiac based (gFOBT) or FDA approved fecal immunochemical testing (iFOBT/FIT)
  - Sigmoidoscopy every 5 years with or without mid-interval FOBT
  - Colonoscopy every 10 years

- Does not apply to people with h/o IBD or polyposis syndrome
- Does not apply to those who have already had a diagnosis of colorectal cancer or colorectal adenomas, these will be followed under a surveillance regimen, recommendations for screening are no longer applicable.

Source: http://vaww.prevention.va.gov/colorectal_Cancer_Screening.asp

Veterans Health Administration Recommendations

- Patients with a certain family history should have a colonoscopy at an earlier age:
  - 1st degree relatives (parent, sibling or child) with CRC diagnosed at age <60 or two+ 1st degree relatives diagnosed with CRC at any age
    - Screening begins at age 40 or 10 years younger than the earliest diagnosis in the family, whichever comes first (unless contra-indicated)
    - Continues at least every 5 years
  - 1st degree relatives with CRC diagnosed ≥60 years old, or two+ 2nd degree relatives (grandparents, aunts, uncles) diagnosed with CRC at any age
    - Screening begins at age 40
    - Continues as same interval as average risk
- These recommendations are in accordance with the American Cancer Society and American Gastroenterological Association (AGA).
  - http://www.cancer.org/cancer/colonandrectumcancer/moreinformation/colonandrectumcancerearlydetection/colorectal-cancer-early-detection-acs-recommendations
  - http://www.gastro.org/guidelines/2008/02/13/screening-for-early-detection

Source: http://vaww.prevention.va.gov/colorectal_Cancer_Screening.asp

2012 Recommendations for Surveillance and Screening Intervals with Baseline Average Risk

Baseline Colonoscopy: most advanced finding(s)	Recommended surveillance interval (y)	Quality of evidence supporting the recommendation	New evidence stronger than 2006
No polyps	10	Moderate	Yes
Small (<10mm hyperplastic polyps in the rectum or sigmoid	10	Moderate	No
1-2 small (<10mm) tubular adenomas	5-10	Moderate	Yes
3-10 tubular adenomas	3	Moderate	Yes
>10 adenomas	<3	Moderate	No
One or more tubular adenoma ≥10mm	3	High	Yes
One or more villous adenomas	3	Moderate	Yes
Adenoma with HGD	3	Moderate	No

- These recommendations are based on assuming a colonoscopy was complete and that all visible polyps were completely removed.

Sources: Data from joint multi-society guidelines 2008. Adapted from Winawer, SW, Fletcher RH, Mille L, et al. AGA guidelines: Colorectal cancer screening: Clinical guidelines and rationale. Gastroenterology 1997; 112: 594.
http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer

2012 Recommendations for Surveillance and Screening Intervals with Baseline Average Risk

- Serrated Polyposis Syndrome: WHO definition:
  - One of the following criteria:
    - At least 5 serrated polyps proximal sigmoid, with 2 or more ≥10mm
    - Any serrated polyps proximal to sigmoid and family history of serrated polyposis syndrome
    - > 20 serrated polyps of any size throughout the colon
  - Generally accepted that serrated polyps and HPS have increased malignant potential.
  - Paradigm shift in molecular basis of colorectal cancer in past 15 years.
- Right sided colon polyps are now changing to 5 year f/u , studies show that colonoscopy is less effective in preventing right sided (proximal) cancers than left sided (distal cancers)

Sources: http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer
Data from joint multi-society guidelines 2008. Adapted from Winawer, SW, Fletcher RH, Mille L, et al. AGA guidelines: Colorectal cancer screening: Clinical guidelines and rationale. Gastroenterology 1997; 112: 594.

Pathway Comparison

TRADITIONAL NEOPLASTIC PATHWAY

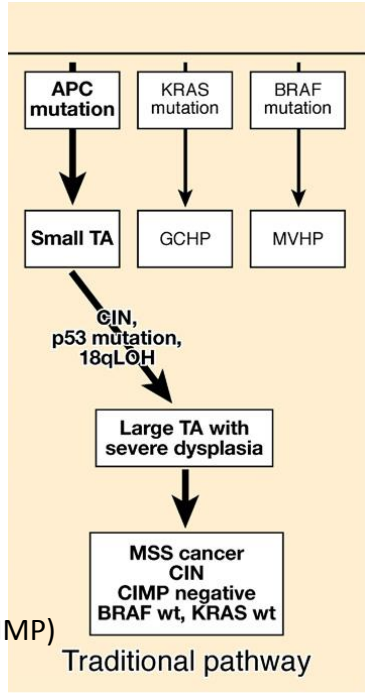
Tumor suppressor gene
Adenomatous polyposis coli

Oncogenes

Goblet cell HP polyp
Microvesicular HP polyp

Tumor suppressors

Microsatellite Stable (MSS)
Chromosomal Instability (CIN)
CpG Island methylator phenotype (CIMP)



SERRATED NEOPLASTIC PATHWAY

Proto-oncogene

Multivesicular HP polyp

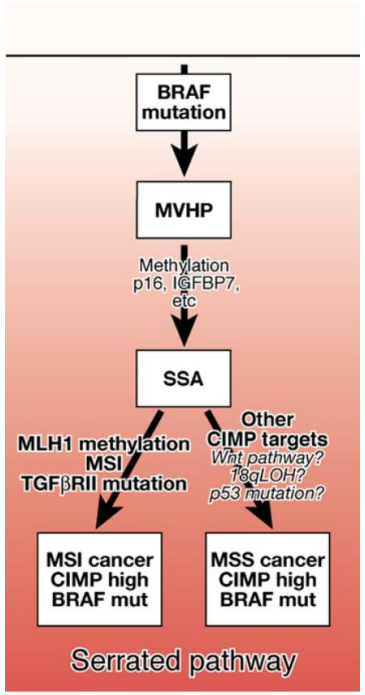
Tumor suppressor

Sessile Serrated Adenoma

Microsatellite Instability
*associated with HNPCC
CpG island methylator phenotype

Microsatellite Stability

CpG island methylator phenotype



Accounts for 70-80% of CRC

Leggett B, Whitehall V Gastroenterology. 2010 Jun; 138(6):2088-100

2012 Recommendations for Surveillance and Screening Intervals with Baseline Average Risk

Baseline Colonoscopy: most advanced finding(s)	Recommended surveillance interval (y)	Quality of evidence supporting the recommendation	New evidence stronger than 2006
Serrated lesions			N/A
Sessile serrated polyp(s) <10mm with no dysplasia	5	Low	
Sessile serrated polyp(s) ≥10mm	3	Low	N/A
OR			
Sessile serrated polyp with dysplasia			
OR			
Traditional serrated adenoma			
Serrated polyposis syndrome	1	Moderate	N/A

- These recommendations are based on assuming a colonoscopy was complete and that all visible polyps were completely removed.

Sources: http://www.uptodate.com/contents/tests-for-screening-for-colorectal-cancer
Data from joint multi-society guidelines 2008. Adapted from Winawer, SW, Fletcher RH, Mille L, et al. AGA guidelines: Colorectal cancer screening: Clinical guidelines and rationale. Gastroenterology 1997; 112: 594.

Management of Carcinoma in a Polyp

- Majority of colon cancers arise from polyps (adenomas)
- Certain polyps can be effectively managed by endoscopic removal or polypectomy alone as long as the margins are clear.
  - These include:
    - Benign adenomas
    - Adenomas with severe dysplasia or carcinoma in-situ (non-invasive cancer)
    - Endoscopic resection is a favorable alternation to radical surgery in select favorable risk early stage cancers arising from a polyp.
- The presence of the following are considered higher-risk (more likely to have residual cancer or spread to lymph nodes) and should be considered for prompt radical surgery
  - Poorly differentiated histology
  - Lymphovascular invasion
  - Cancer at the resection or stalk margin
  - Invasion into the muscularis propria of the bowel (T2)
  - Invasive carcinoma arising in a sessile (flat) polyp with unfavorable features (ex. Lymphovascular invasion, poorly differentiated, penetration into lower third submucosa)

Source: http://www.uptodate.com/contents/overview-of-the-management-of-primary-colon-cancer

- Cancer predates the modern world and was documented by the Ancient Egyptians.

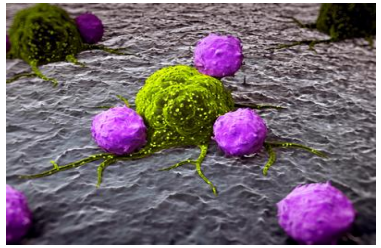
- There are many common misconceptions, myths and “old wives’ tales” regarding cancer.
  - Sugar, deodorant, etc.

- Known and probable carcinogens:
  - Complete list visit http://www.cancer.org/cancer/cancercauses/othercarcinogens/generalinformationaboutcarcinogens/known-and-probable-human-carcinogens

- It is poorly understood why exposures to known or probable carcinogens do not cause cancer in every case.

Staging of Solid Tumors

- **Solid Tumor-** abnormal mass of tissue that usually does not contain cysts or liquid areas. Solid tumors may be benign or malignant. Leukemias and other hematologic malignancies do not usually form solid tumors.
- Staging can be clinical or pathologic.
- Possible stages 0, I, II, III, IV (along with A and B for certain cancers)
  - Help to determine treatment and prognosis.
- Each stage is made of three parts T, N, M (grade is sometimes included for additional information).
  - T pertains to size and/or extent of primary tumor.
    - TX, T0, Tis, T1, T2, T3, T4
  - N pertains to number of lymph nodes involved (biopsy proven, clinically and on imaging).
    - NX, N1, N2, N3
  - M pertains to presence of metastasis or secondary tumors formed by cells from the primary tumor.
    - MX, M0, M1



Source: http://www.cancer.gov/cancertopics/factsheet/detection/staging

Basic Definition Review

- **Adjuvant-** post-op treatment with oral or IV systemic agents (or given after primary treatment)
- **Neo-adjuvant-** treatment oral or IV given before primary therapy or surgery.
- **Palliative treatment-** goal is to shrink the cancer, therefore improving or completely eliminating negative symptoms caused by the cancer for a period of time and helping to prolong survival.
- **Treatment "For Cure"-** intention is to completely eradicate the cancer (that this can likely be achieved).

  *Cure is a difficult term in oncology as it implies that you know it will never come back

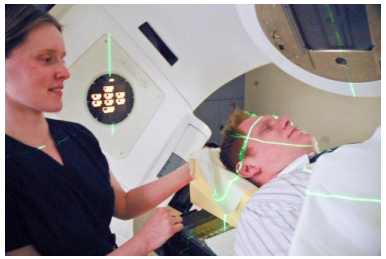
- **Benign-** non-cancerous tumors that are removed and usually do not recur. They also do not spread to other organs.
- **Malignant**- cancerous

Source: http://www.cancer.gov

Colon and Rectal Cancer Treatment

- Treatment determined by stage (including degree of penetration through the bowel wall), co-morbidities, age and molecular testing.

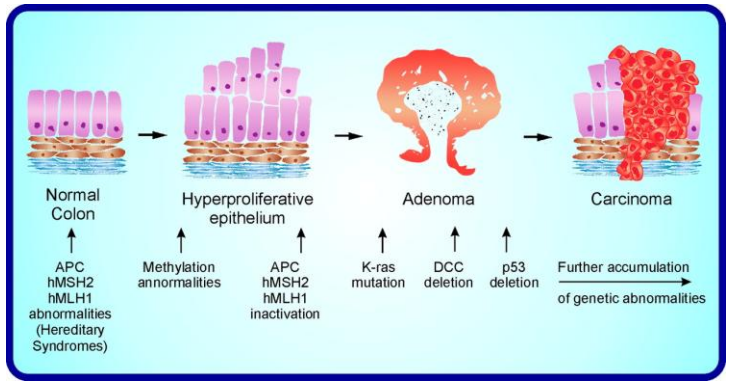
- Colon and Rectal Cancer:
  - Surgery is the only treatment needed for Tis, T1 and T2 tumors (N0, M0). This is followed by surveillance.
- Chemotherapy/Systemic therapy
- Radiation



Source: NCCN guidelines Version 2.2015, Colon Cancer. http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf,

Colon and Rectal Cancer

- Treatment determined by stage (including degree of penetration through the bowel wall), co-morbidities, age and molecular testing.
- Molecular testing:
  - RAS testing (KRAS and NRAS), BRAF testing an EGFR testing.
    - If KRAS (exon 2 or non-exon 2) mutation or NRAS mutation cannot use Erbitux (cetuximab) or Vectibix (panitumumab).
    - If KRAS mutant mCRC or if KRAS status is unknown can use Vectibix.
    - BRAF V600E appear to have a poorer prognosis.
    - If KRAS mutation negative or "wild type" and tumor has a protein called Epidermal Growth Factor Receptor (EGFR) can receive Erbitux in the setting of metastatic disease.



Source: NCCN guidelines Version 2.2015, Colon Cancer. http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf

Treatment for Colon and Rectal Cancer

- Common chemotherapy regimens in non-metastatic disease (pre and/or post-op):
  - FOLFOX, CapeOX, Xeloda (capecitabine)
    - Side effects vary from drug to drug
    - Xeloda (the oral version of IV 5-FU) can cause skin peeling and redness to the palms and soles of feet.
    - The “O” in the above regimens, Oxaliplatin, can cause cold sensitivity for several days after treatment.
- Targeted and/or additional agents to the above regimens in some settings:
  - Vectibix (panitumumab)
  - Erbitux (cetuximab)
  - Avastin (bevacizumab)
  - Strivarga (regorafenib)

Source: http://www.nlm.nih.gov/medlineplus/druginfo/meds

Treatment for Colon and Rectal Cancer, cont.

- **Vectibix (panitumumab)-** indicated for the treatment of patients with wild-type *KRAS* (exon 2 in codons 12 or 13) metastatic colorectal cancer (mCRC).
  - As first-line therapy in combination with FOLFOX
  - As monotherapy following disease progression after certain chemotherapy regimens
  - Vectbix mediated acne like rash is main side effect.
    - Prophylactic agents Minocycline and Cleocin-T gel
    - In most cases rash is associated with better response to treatment, although people without rash have also had treatment response.
    - Usually subsides within the first few months of initiation of treatment
- **Erbitux (cetuximab)-** indicated for metastatic disease. Only patients whose tumors have a *KRAS* mutation-negative gene or "wild-type," and have protein EGFR.
  - Can be used single agent or in combination with chemotherapy agents (also used with chemo or radiation for head and neck cancer).
  - Can also cause acne like rash, although not usually as severe as Vectibix.
  - BLACK BOX WARNING: Can have severe allergy with first dose-anaphylaxis (Second warning for heart attack in head and neck use).

Sources: http://www.nlm.nih.gov/medlineplus/druginfo/meds, http://www.vectibix.com/, http://www.erbitux.com/index.aspx

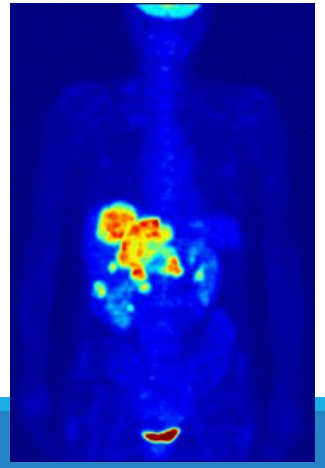
Treatment for Colon and Rectal Cancer, cont.

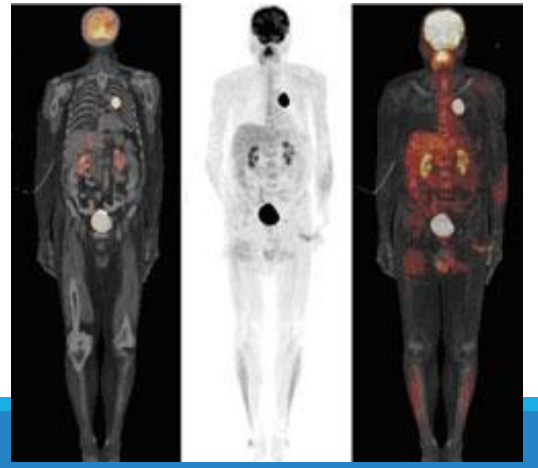
- **Avastin (bevacizumab)-** approved for metastatic disease
  - Can be used as monotherapy or in conjunction with chemotherapy.
  - acts as a tumor-starving or anti-angiogenic therapy. Avastin is designed to block a protein called vascular endothelial growth factor (VEGF). Normal cells make VEGF, but some cancer cells make too much VEGF. Blocking VEGF may prevent the growth of new blood vessels, including normal blood vessels and blood vessels that feed tumors.
  - Severe side effects and warnings include: GI perforation, bleeding, inhibited wound healing, organ damage, heart attack and stroke, proteinuria, fistulas, nervous system problems
- **Strivarga (regorafenib)-** approved for metastatic disease that has already failed certain chemotherapy regimens.
  - Taken orally at recommended dose of 160mg daily 3 weeks on and 1 week off (Can also be used to treat GIST (gastrointestinal stromal tumor)). Comes in 40mg tablets so that it can be dose reduced if needed.
  - Believed to interfere with blood supply and attaches to critical proteins within the cell to inhibit growth and proliferation.
  - Side effects include: hepatotoxicity, bleeding, rash, GI perforation, fistulas, wound healing problems

Sources: http://www.avastin.com/patient/about/how-avastin-works/mcrc, http://www.nlm.nih.gov/medlineplus/druginfo/meds, http://www.stivarga-us.com/about_stivarga.html

Extra Information, cont.

- Initial dosing, dose reduction, holding and re-initiation of treatment is based on package insert guidelines.
  - May take into account: height, weight, creatinine clearance, liver function, blood cell counts including absolute neutrophil count
- Common chemotherapy side effects (vary from drug to drug)
  - GI upset, hair loss, decreased blood cell counts, organ damage (liver and kidney most commonly), numbness and tingling, hair and nail changes, fatigue and anaphylaxis
- Pre-medications
  - Zofran (ondansetron), Phenergan (promethazine), Kytril (granisetron), Dexamethasone, Zantac (ranitidine), Pepcid (famotidine), Benadryl (diphenhydramine), Tylenol (acetaminophen), IVF and electrolyte support
- Follow up
  - Imaging-CT, PET, MRI, Bone Scan, and Metastatic Skeletal Survey.
  - Labs
  - H &P
  - NCCN guidelines

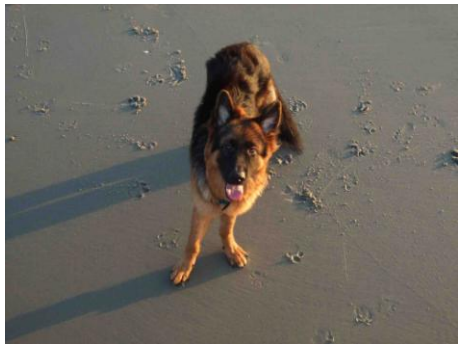




Palliative Treatment

- Careful consideration of patient wishes regarding treatment and long term goals
- Treatment dose is reduced based on clinical picture and to assist with tolerance
- Evaluation at each visit what is in the patient's best interest
- Realistic expectations based on diagnosis and extent of disease
- Sign and symptom management with supportive medications and palliative chemotherapies
- Family meetings and discussions in person and via telephone
- Hospice

That is all…



Questions?