Colon Cancer

Is colon cancer a function of race or genetics?
Colon Cancer

- What is colon cancer?
- What genes are associated with colon cancer?
- What external factors contribute to colon cancer?
- What is done to diagnose colon cancer?
- What is done to treat colon cancer?
- What novel techniques have been developed to diagnose/treat colon cancer?
Colon Cancer

• Which novel drug is better and why?
• Is colon cancer a function of race or genetics?
Causes

- Polyp
- Nonpolyploid lesion
- Genetic
  - Familial Adenomatous Polyposis (FAP)
  - Hereditary Nonpolyposis Colorectal Cancer (HNPCC aka Lynch Syndrome)
Types of Polyps

Polyps
- Pedunculated polyp
- Sessile polyp
- Elevated nonpolyp
- Depressed nonpolyp

Nonpolyps
- Flat nonpolyp
Genetic Causes

• DNA Methyltransferase 1 (DMNT1)
  – Elevated expression of this gene is associated with the progression of colon cancer
  – Hypomethylation plays a causal role in tumor formation
• Birt-Hogg-Dube (BHD)
  – Development of colonic polyps
Risk Factors

- Obesity
- Old Age
- Alcoholism
- Sedentary Lifestyle
- Poor Diet
- African American heritage
- Inflammatory intestinal conditions

- REMEMBER: The ethical issues question...
Signs of Colon Cancer

• Change in bowel habits
• Blood in the stool
• Feeling that bowels don’t empty
• Stool more narrow than usual

• Frequent gas pain, bloating, and cramping
• Weight loss for no known reason
• Feeling very tired
• Vomiting
Diagnosing Colon Cancer

- Colonoscopy
- Blood test
- X-ray
- CT scan
- Fecal Occult Blood Test
Novel Diagnosis

• Noninvasive, accurate blood test
  – Tests for SYNE1 and FOXE1 genes
Treatment

• Surgery
  – early stage v invasive v advanced

• Chemotherapy
  – Used if cancer has spread beyond the wall of the colon

• Radiation
  – Especially used to treat rectal cancer

• Targeted Drug Therapy
  – Targets specific defects that allow cancer cells to proliferate (advanced cancer)
GINA

• What?
  – Act designed to prohibit the improper use of genetic information in health insurance and employment
  – Allows projects like GenBank to get data for researchs
  – Goes into effect Dec 7, 2009
GINA

• Why?
  – Does lifestyle or genetic makeup contribute more to colon cancer?
  – Which groups are more likely to get culturally influenced colon cancer and which are more likely to get the one caused by genetic mutations?
The Great Debate

- Colon cancer is the third leading cause of death in African Americans
  - AA are less likely to be screened for colon cancer
  - Lifestyle plays a huge role
- The SNPs are extremely common in Canadians
- People who are genetically predisposed to having colon cancer should not be afraid to be tested under penalty of the insurance companies

<table>
<thead>
<tr>
<th></th>
<th>People with HNPCC</th>
<th>The General Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent who will develop colon cancer</td>
<td>80*</td>
<td>4</td>
</tr>
<tr>
<td>Average age that colon cancer develops</td>
<td>44</td>
<td>65</td>
</tr>
</tbody>
</table>

*Without early and regular screening

Who is more AT RISK TO THE INSURANCE COMPANY?
Sources

- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2661544/
- http://www.ptei.org/
- http://www.technologyreview.com/biomedicine/23500/?nlid=2365
- http://www.cancer.org/docroot/nws/content/nws_1_1x_colorectal_cancer_rates_higher_in_african_americans.asp
- http://www.cancer.gov/cancertopics/pdq/treatment/colon/Patient/page1
- http://en.wikipedia.org/wiki/Genetic_Information_Nondiscrimination_Act