

Colorectal Cancer



<https://www.uclahealth.org/physiciansupdate/campaign-aims-to-boost-rates-of-colon-cancer-screening>

Overview

- History
- Anatomy and Function
- Colorectal Cancer - Overview
 - Term Classification, Causes
- Signs and Symptoms
- Diagnosis
- Treatment
- Risk Factors and Prevention

Awareness Ribbon and Month

- March
- Dark blue



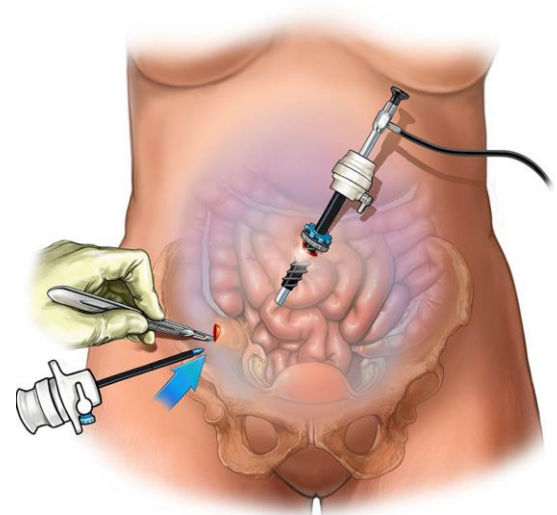
Colorectal
Cancer

History

- 1739 – Jean Faget
 - First rectal resection
 - Fatal outcome
- 1793 – F. Duret
 - First colon stoma after rectal resection
 - Patient lived another 45 years
- 1879 – „Hartmann Surgery“
 - No anal canal resection
 - Discovery: patients recovered much faster
- 1991 – „Jacobs Laparoscopy“
 - Laparoscopical rectal resection

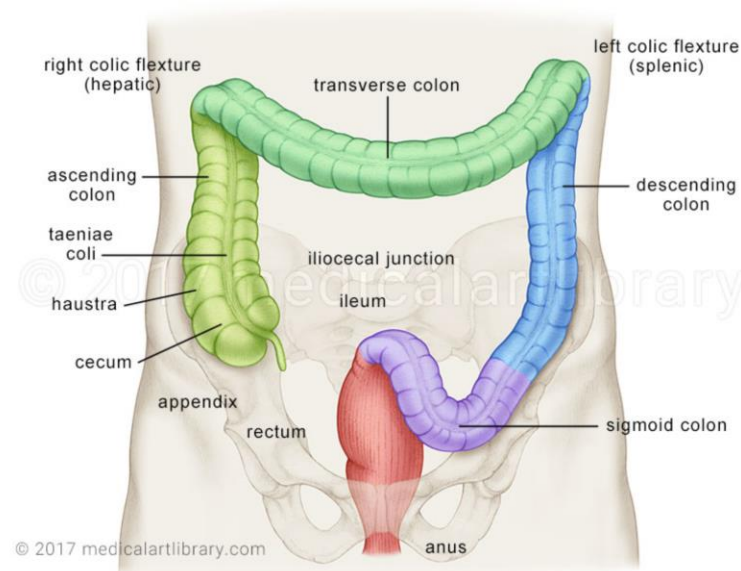


<https://www.apotheken-umschau.de/Darm/Stoma---was-bedeutet-das-549821.html>



<https://www.healthdirect.gov.au/laparoscopy>

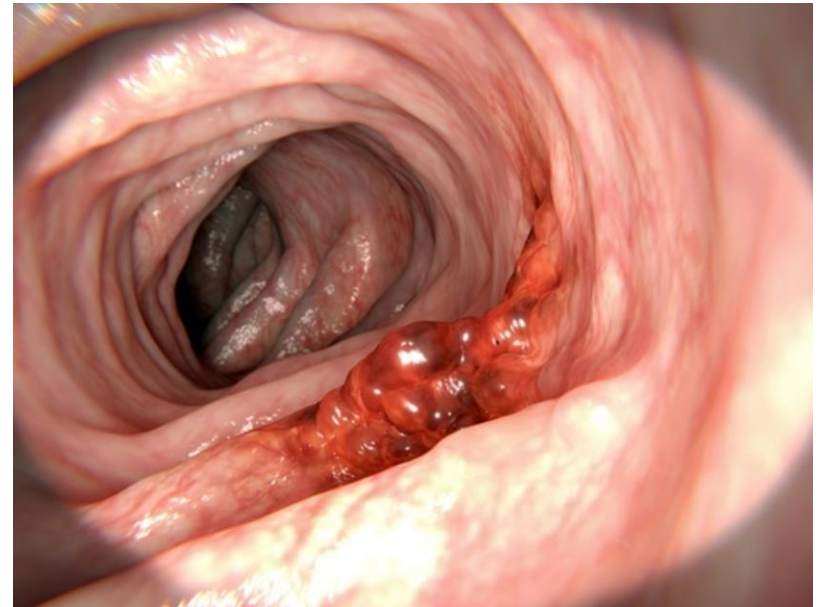
Anatomy and Function



- Large intestine (~1.8m)
 - Cecum
 - **Colon**
 - **Rectum**
 - Anal canal
- Peristalsis
 - Bowel movement
 - Get rid of food left over after nutrients are removed

CRC – Overview

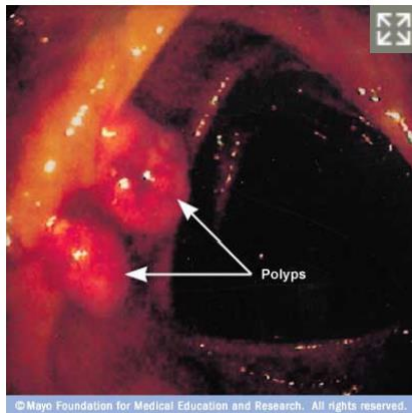
- **Localization frequency**
 - 50% rectum
 - 30% sigmoid colon
- **Origin of CRC**
 - benign polyps (90%)
 - Could take years
 - Lifestyle factors



<https://www.news-medical.net/health/Colorectal-Cancer-Pathogenesis.aspx>

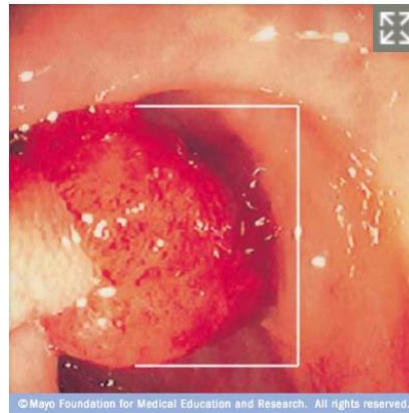
Term Classifications

- **Polyp**
 - small clump of cells that forms on the lining of the colon
- **Adenoma**
 - glandular proliferation
- **Tumor**
 - too fast cell growth
- **Carcinoma**
 - cancer type developing from epithelial cells (malignant tumor)



Small polyps

<https://www.mayoclinic.org/diseases-conditions/colon-polyps/symptoms-causes/syc-20352875>

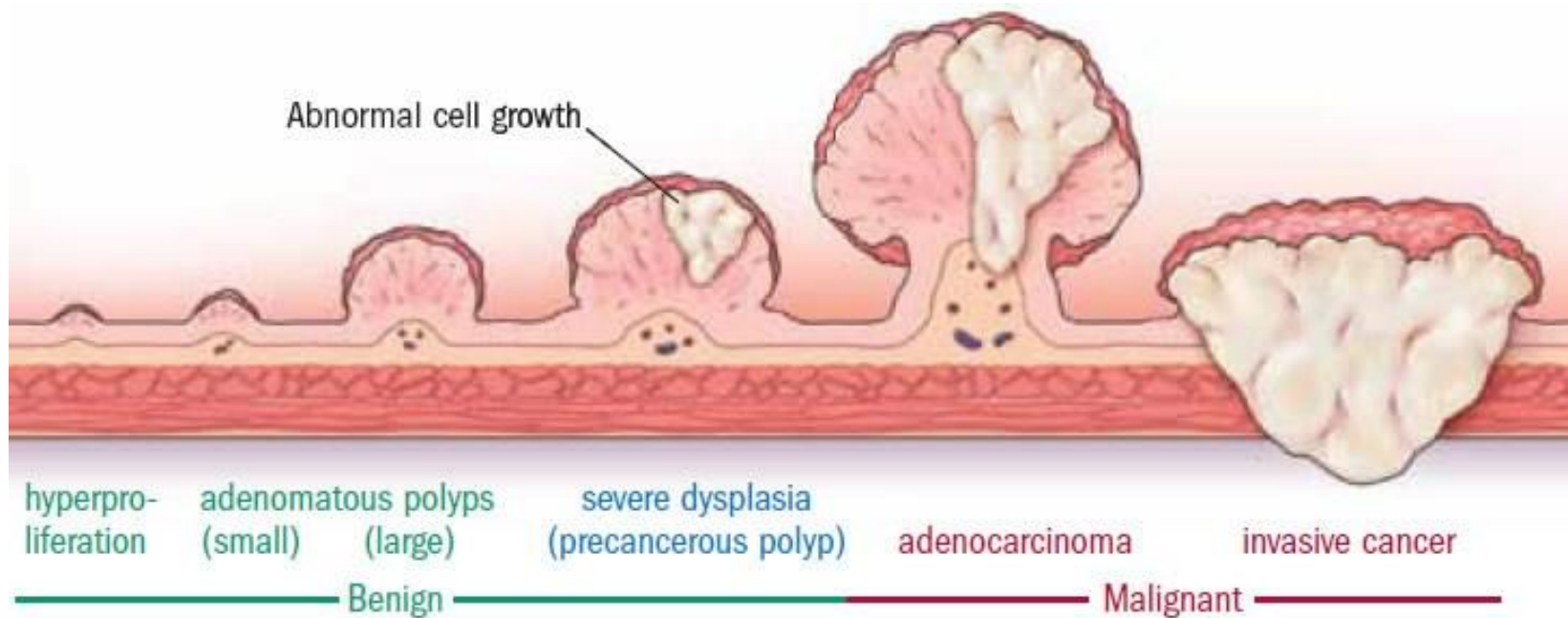


Large polyp



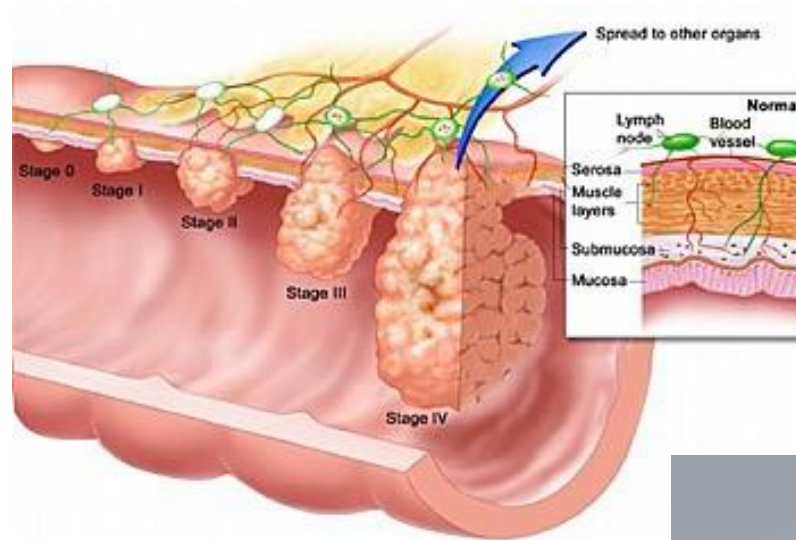
Colon cancer

Adenoma-Carcinoma-Sequence

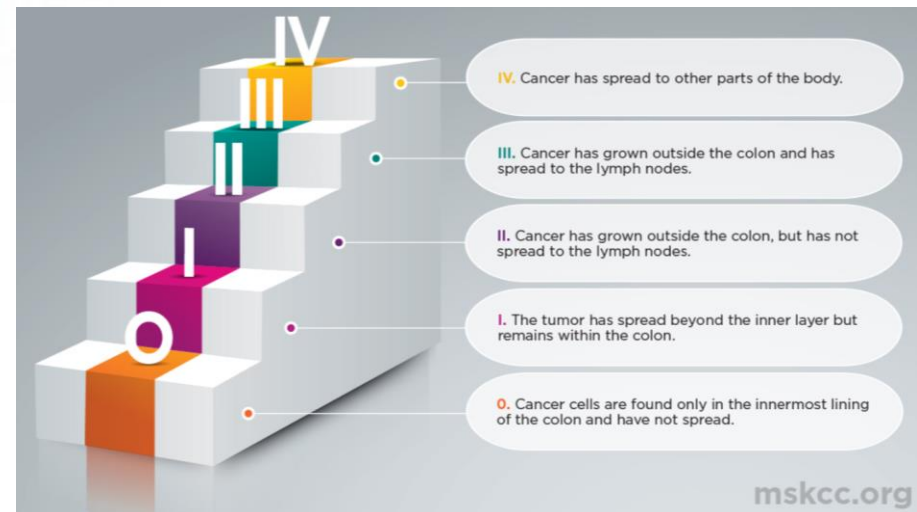


<https://www.health.harvard.edu/diseases-and-conditions/they-found-colon-polyps-now-what>

Stages of CRC

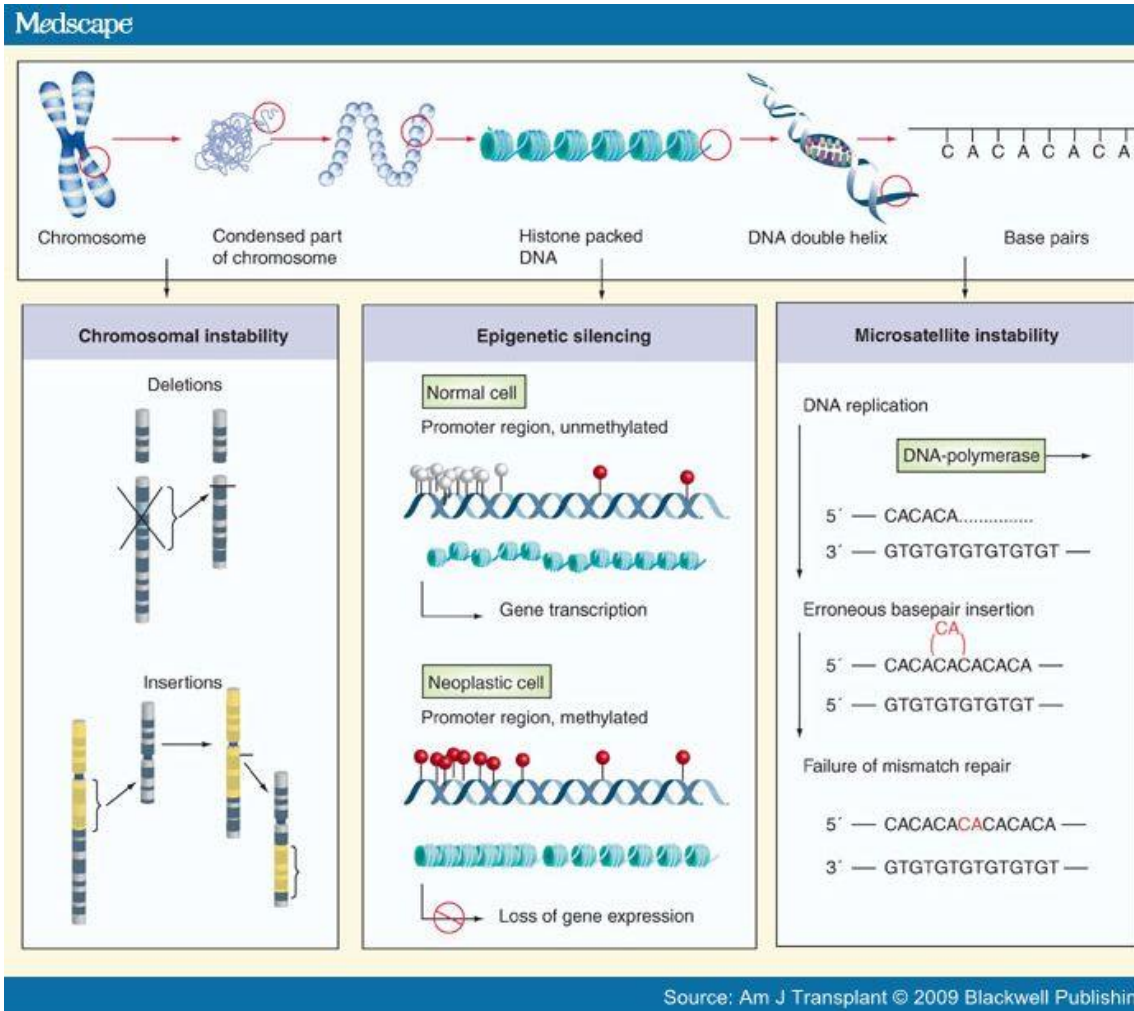


<https://healthykcmag.com/colorectal-cancer-awareness-month/>



<https://www.mskcc.org/cancer-care/types/colon/diagnosis/stages>

Cause: Gene Mutations



CIN (Chromosomal INstability)

- Mutations in genes causing duplication or deletion of entire chromosomes

Epigenetic Silencing

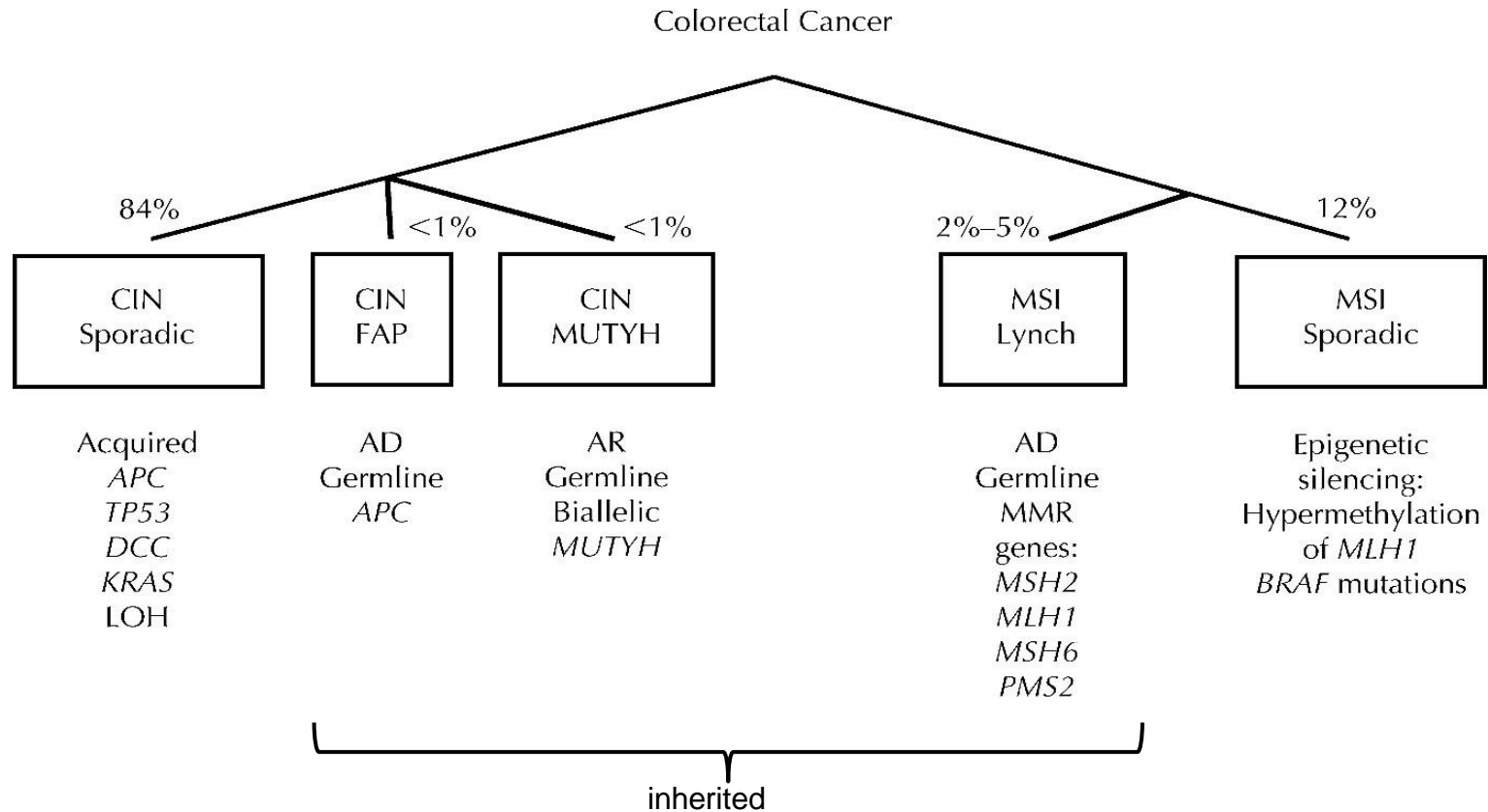
- „Hypermethylation“
- Epigenetic inactivation of genes (by methylating the genes' promoter region)

MSI (MicroSatellite Instability)

- Mutations in mismatch-repair (MMR-) genes leading to mutations in microsatellite DNA sequences

<https://img.medscapestatic.com/article/703/573/703573-fig5.jpg>

Cause: Gene Mutations



<https://www.archivesofpathology.org/doi/full/10.1043/2010-0613-RAIR.1>

Example MSI: Sporadic vs. Lynch Syndrome

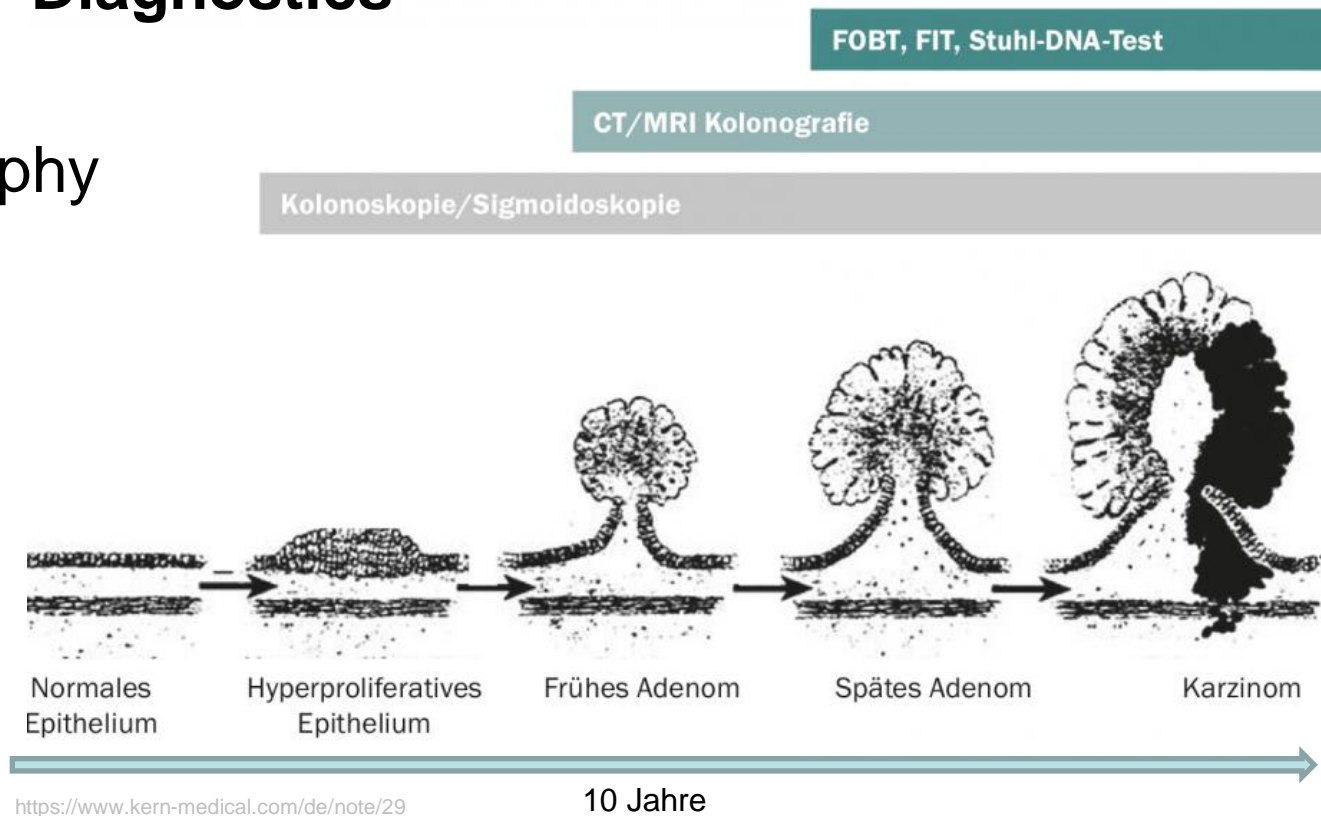
- Sporadic (12%)
 - Tendency: older patients
 - Epigenetic silencing (MLH1)
 - BRAF↑
- Lynch Syndrome (2-5%)
 - Germline mutation in one of the mismatch repair (MMR) genes
 - 90%: MLH1 or MSH2
 - No BRAF mutation

Signs and Symptoms

- Problem: No obvious early symptoms → Screening!
- Change in bowel habits
- Blood in stool or rectal bleeding
- Abdominal pain
- Fatigue
- Fever
- Ileus
- Unexplained weight loss
- Pallor and anemia

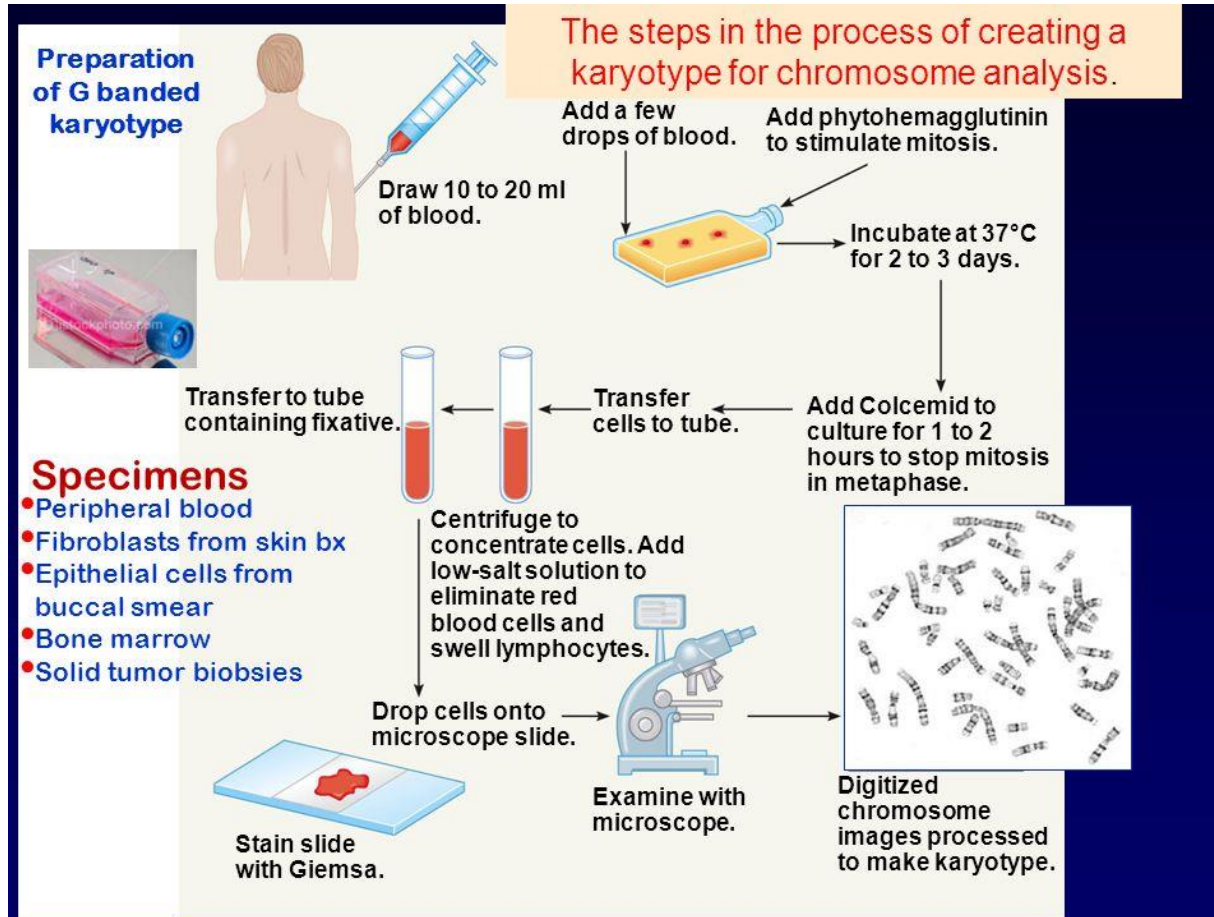
Diagnosis

- Colonoscopy + Biopsy (most sensitive and accurate)
- **Molecular Diagnostics**
- CT / MR colonography
- FOBT
 - gFOBT
 - iFOBT
- Ultrasound



Molecular Diagnostics

Chromosomal Instability (CIN):



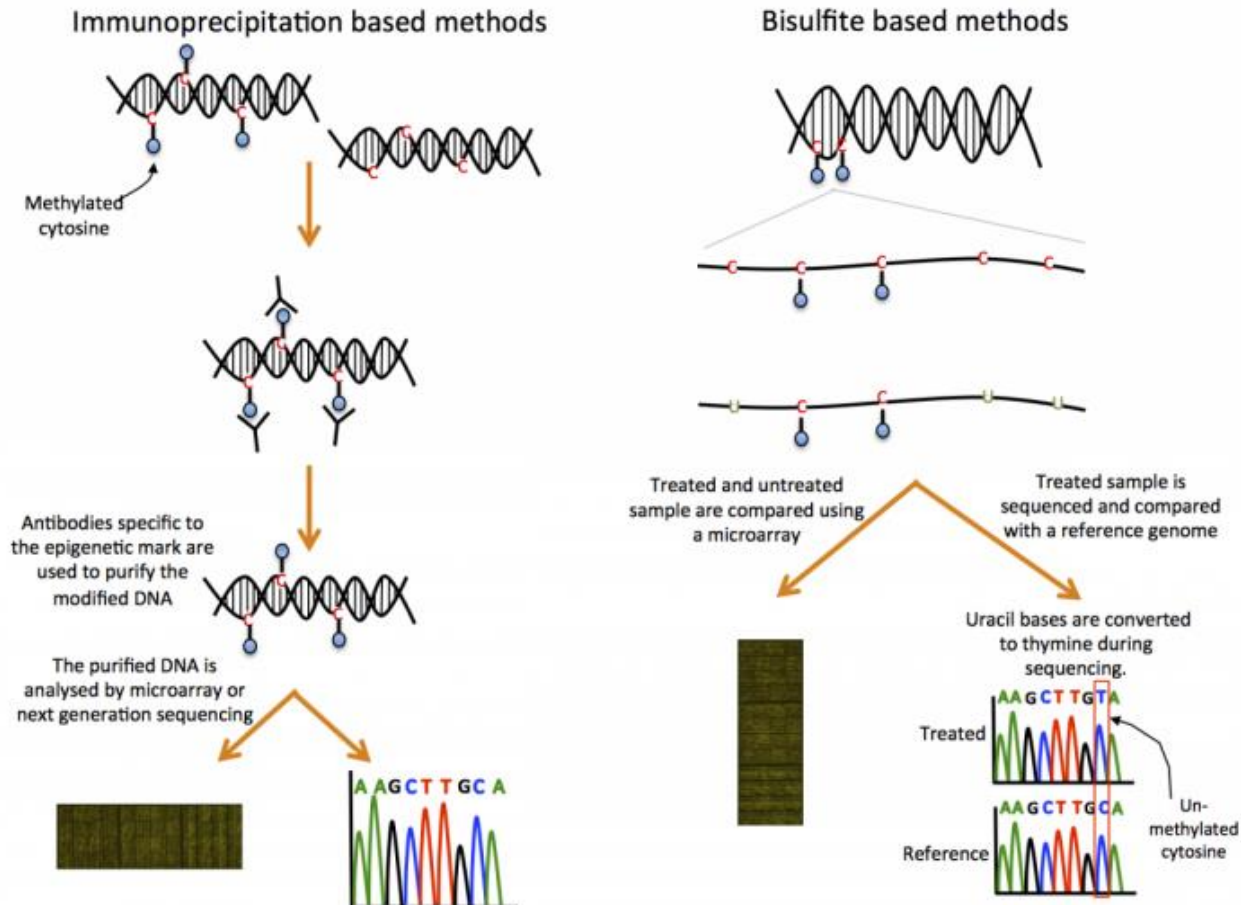
<http://slideplayer.com/slide/7861654/>

Microsatellite Instability (MSI):

- PCR
- Sequencing Techniques

Molecular Diagnostics

Epigenetic Silencing (DNA Methylation):



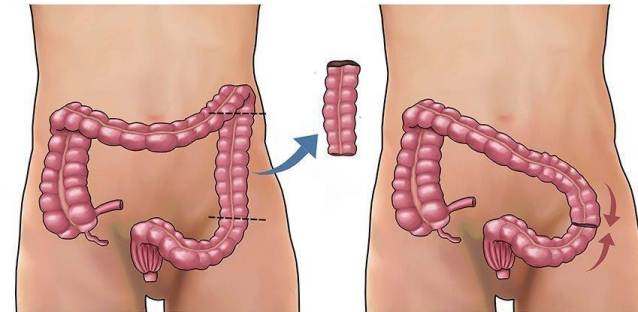
<https://www.ebi.ac.uk/training/online/course/functional-genomics-ii-common-technologies-and-data-analysis-methods/epigenetic-modifications>

Treatment



<http://www.gastrointestinalatlas.com/murrasaca/images/polypectomia.gif>

Loop resection



<https://www.healthtravellersworldwide.com/treatments/colectomy/>

Colectomy



<https://www.nbcnews.com/health/health-news/chemo-obsolete-not-long-shot-cancer-experts-say-n885811>

Chemotherapy



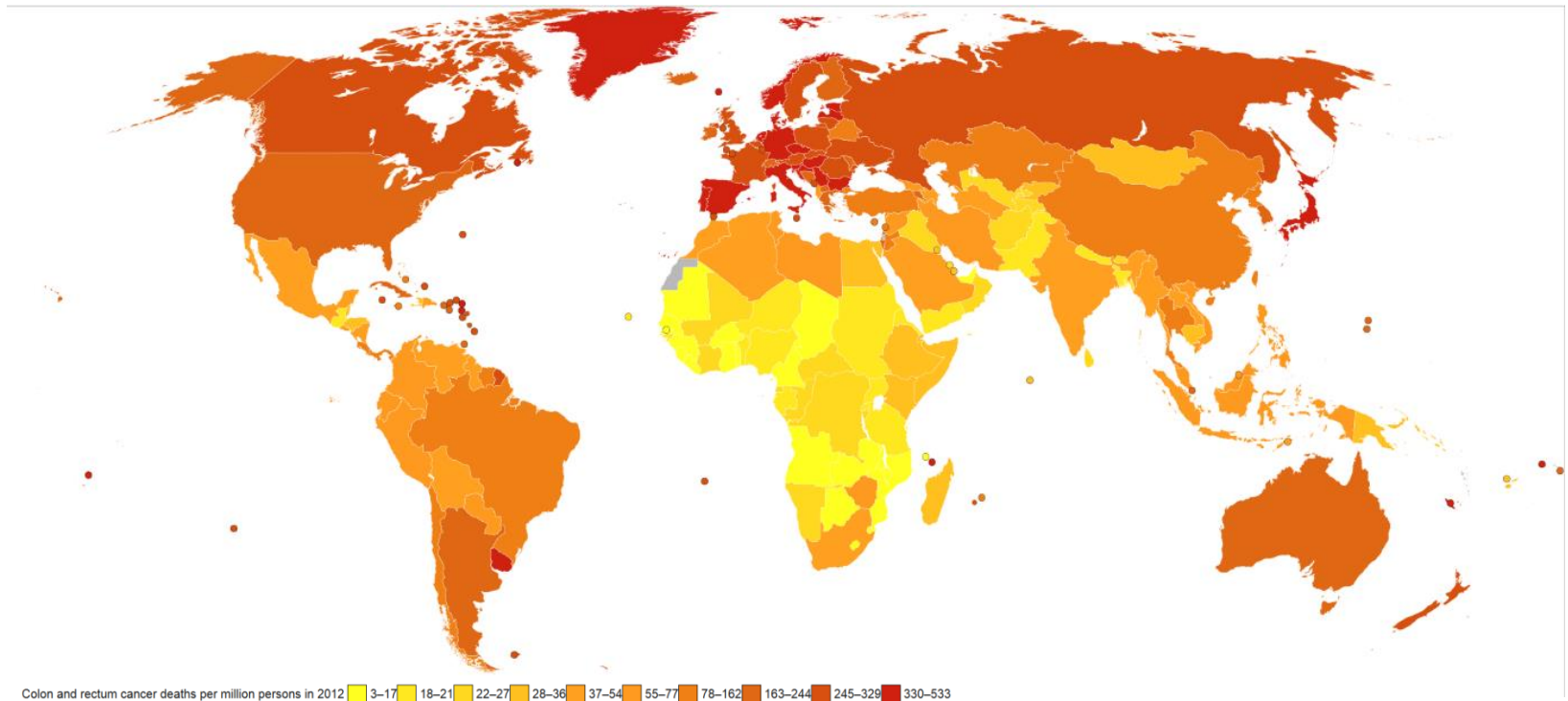
<https://www.amazon.in/Mintkraft-Yellow-Adhesive-Ionizing-Radiation/dp/B07BHGVBFB>

Radiation Therapy

Incidence and Mortality

Incidence men (Austria)	2.500
Incidence women (Austria)	1.800
Mortality (Austria)	2.150
Incidence (Germany)	60.000

Median age of disease: **75 years**

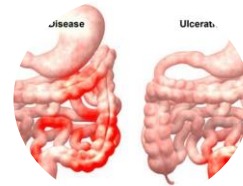


https://en.wikipedia.org/wiki/Colorectal_cancer

Risk Factors



Unhealthy Food



IBD*



Age



Obesity



Inheritance



Diabetes



Alcohol



Smoking

*Inflammatory Bowel Disease

Prevention



Healthy Diet



Supplements



Water



Exercise



No red meat



Screening



No alcohol



No smoking

**THANK YOU FOR YOUR ATTENTION,
YOU CAN CLAP NOW**



**IF YOU HAVE ANY QUESTIONS, PLEASE
ASK MY FRIEND GOOGLE**

Sources

- <https://medicalartlibrary.com/colon-anatomy/>
- <https://www.darmkrebs-in-der-familie.de/node/25>
- https://flexikon.doccheck.com/de/Kolorektales_Karzinom
- <https://www.healthline.com/health/polyps>
- <https://flexikon.doccheck.com/de/Adenom-Karzinom-Sequenz>
- <https://www.archivesofpathology.org/doi/full/10.1043/2010-0613-RAIR.1>
- <https://www.healthline.com/health/colorectal-cancer/stages-of-colon-cancer#symptoms>
- https://www.awmf.org/uploads/tx_szleitlinien/021-007OLk_S3_Kolorektales-Karzinom-KRK_2019-01.pdf
- <https://www.medizinische-genetik.de/index.php?id=crc-genetische-diagnostikc>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5971222/>