# Colorectal Cancer Treatment

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# Introduction

- **Scope of the problem**
- **Screening protocols**
- **General approach to treatment**
- **Future issues / directions**

# Terminology

- **Adjuvant Chemotherapy: Chemotherapy used in addition to surgery**
- **Neoadjuvant Therapy: Chemotherapy and / or radiation therapy administered before planned surgery**
- **Localized disease: Cancer involving colon / rectum. Local lymph nodes included**
- **Metastatic Disease: Distant organ or lymph nodes**

# Epidemiology

- **Fourth most common cancer (after breast, lung and prostate)**
- **Incidence: 40.1 per 100,000 / year.**
- **Number of deaths: 14.8 per 100,000 / year**
- **Prevalence: In 2014, there were an estimated 1,317,247 people living with colorectal cancer in the United States.**
- **Lifetime Risk: Approximately 4.3 %**

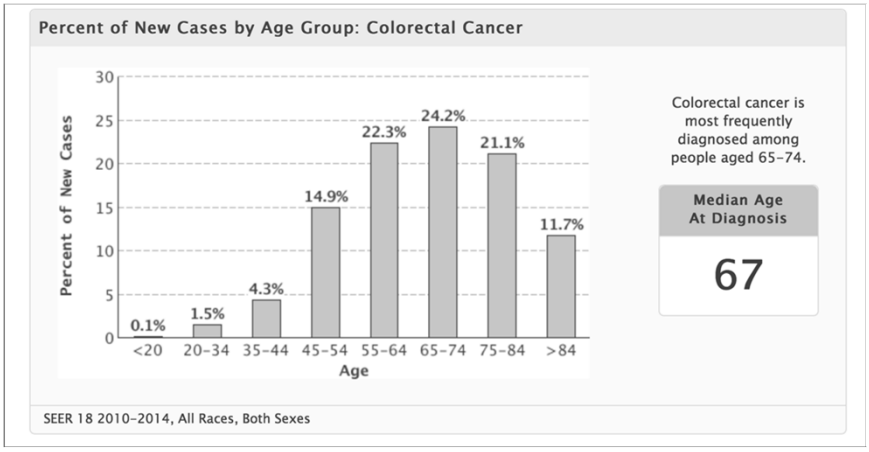
# Epidemiology

| | Common Types of Cancer | Estimated New Cases 2017 | Estimated Deaths 2017 |
|---|---|---|---|
| 1. | Breast Cancer (Female) | 252,710 | 40,610 |
| 2. | Lung and Bronchus Cancer | 222,500 | 155,870 |
| 3. | Prostate Cancer | 161,360 | 26,730 |
| 4. | Colorectal Cancer | 135,430 | 50,260 |
| 5. | Melanoma of the Skin | 87,110 | 9,730 |
| 6. | Bladder Cancer | 79,030 | 16,870 |
| 7. | Non-Hodgkin Lymphoma | 72,240 | 20,140 |
| 8. | Kidney and Renal Pelvis Cancer | 63,990 | 14,400 |
| 9. | Leukemia | 62,130 | 24,500 |
| 10. | Uterine Cancer | 61,380 | 10,920 |
| | – | – | – |
| | **Cancer of Any Site** | **1,688,780** | **600,920** |

In 2017, it is estimated that there will be 1,688,780 new cases of cancer of any site and an estimated 600,920 people will die of this disease.

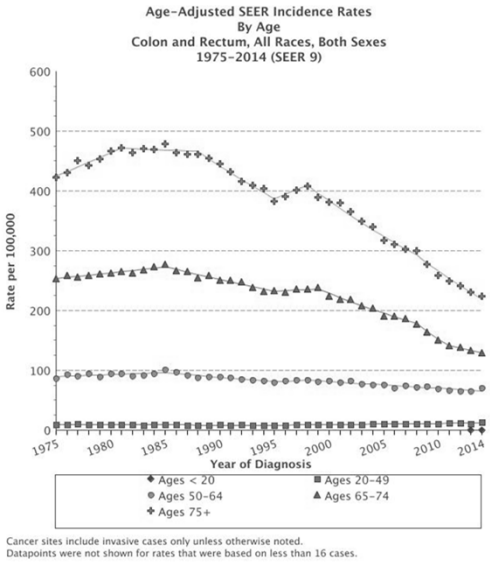
**source: (SEER) Program of the National Cancer Institute**

# Epidemiology




**source: (SEER) Program of the National Cancer Institute**

# Epidemiology




**source: (SEER) Program of the National Cancer Institute**

# Risk Factors for Colorectal Cancer

- **Major Risk Factors**
  - **Genetic predisposition**
    - **FAP**
    - **Lynch**
  - **Inflammatory bowel disease**
    - **Ulcerative colitis**
    - **Crohn's disease**
  - **Personal or family history of colon cancer or adenomas**
- **Minor Risk Factors**
  - **History of abdominal radiation therapy**
  - **African American Race**
  - **Acromegaly**
  - **Transplantation**
  - **Alcohol and Tobacco consumption**
  - **Cholecystectomy**

## Protective Factors

- Active Lifestyle
- Dietary factors?
  - Fiber
  - Folic Acid
  - Vit B 6
  - Calcium and dairy products
  - Vitamin D
  - Magnesium
  - Garlic
- Medications
  - NSAIDS and Aspirin
  - HRT?
  - Statins
  - ACE inhibitors?
  - Bisphosphonates?
  - Anti-oxidants

## Aspirin / NSAIDS Chemoprevention

- 20-40% risk reduction in average risk patients
- High dose aspirin (600 mg/day) may be recommended for HNPCC patients
- The US Multi Society Preventative Task Force has recommended aspirin to all those with at least a 10 percent risk of cardiovascular events
- Not currently recommended for average risk patient without cardiovascular risks

# The New England Journal of Medicine

**Statin Use and Reduced Cancer-Related Mortality Sune F. Nielsen, Ph.D., Børge G. Nordestgaard, M.D., D.M.Sc. and Stig E. Bojesen, M.D., Ph.D., D.M.Sc.- N Engl J Med 2012; 367:1792-1802**


**BACKGROUND A reduction in the availability of cholesterol may limit the cellular proliferation required for cancer growth and metastasis. We tested the hypothesis that statin use begun before a cancer diagnosis is associated with reduced cancer-related mortality.**

**METHODS We assessed mortality among patients from the entire Danish population who had received a diagnosis of cancer between 1995 and 2007, with follow-up until December 31, 2009. Among patients 40 years of age or older, 18,721 had used statins regularly before the cancer diagnosis and 277,204 had never used statins.**

**RESULTS Multivariable-adjusted hazard ratios for statin users, as compared with patients who had never used statins, were 0.85 (95% confidence interval [CI], 0.83 to 0.87) for death from any cause and 0.85 (95% CI, 0.82 to 0.87) for death from cancer. Adjusted hazard ratios for death from any cause according to the defined daily statin dose (the assumed average maintenance dose per day) were 0.82 (95% CI, 0.81 to 0.85) for a dose of 0.01 to 0.75 defined daily dose per day, 0.87 (95% CI, 0.83 to 0.89) for 0.76 to 1.50 defined daily dose per day, and 0.87 (95% CI, 0.81 to 0.91) for higher than 1.50 defined daily dose per day; the corresponding hazard ratios for death from cancer were 0.83 (95% CI, 0.81 to 0.86), 0.87 (95% CI, 0.83 to 0.91), and 0.87 (95% CI, 0.81 to 0.92). The reduced cancer-related mortality among statin users as compared with those who had never used statins was observed for each of 13 cancer types.**

**CONCLUSIONS Statin use in patients with cancer is associated with reduced cancer-related mortality. This suggests a need for trials of statins in patients with cancer.**


# Plos One

**Lack of Effect of Lowering LDL Cholesterol on Cancer: Meta-Analysis of Individual Data from 175,000 People in 27 Randomised Trials of Statin Therapy - https://doi.org/10.1371/journal.pone.0029849 Cholesterol Treatment Trialists' (CTT) Collaboration**


**Abstract**

**Background**
Statin therapy reduces the risk of occlusive vascular events, but uncertainty remains about potential effects on cancer. We sought to provide a detailed assessment of any effects on cancer of lowering LDL cholesterol (LDL-C) with a statin using individual patient records from 175,000 patients in 27 large-scale statin trials.

**Methods and Findings**
Individual records of 134,537 participants in 22 randomised trials of statin versus control (median duration 4.8 years) and 39,612 participants in 5 trials of more intensive versus less intensive statin therapy (median duration 5.1 years) were obtained. Reducing LDL-C with a statin for about 5 years had no effect on newly diagnosed cancer or on death from such cancers in either the trials of statin versus control (cancer incidence: 3755 [1.4% per year [py]] versus 3738 [1.4% py], RR 1.00 [95% CI 0.96-1.05]; cancer mortality: 1365 [0.5% py] versus 1358 [0.5% py], RR 1.00 [95% CI 0.93–1.08]) or in the trials of more versus less statin (cancer incidence: 1466 [1.6% py] vs 1472 [1.6% py], RR 1.00 [95% CI 0.93–1.07]; cancer mortality: 447 [0.5% py] versus 481 [0.5% py], RR 0.93 [95% CI 0.82–1.06]). Moreover, there was no evidence of any effect of reducing LDL-C with statin therapy on cancer incidence or mortality at any of 23 individual categories of sites, with increasing years of treatment, for any individual statin, or in any given subgroup. In particular, among individuals with low baseline LDL-C (<2 mmol/L), there was no evidence that further LDL-C reduction (from about 1.7 to 1.3 mmol/L) increased cancer risk (381 [1.6% py] versus 408 [1.7% py]; RR 0.92 [99% CI 0.76–1.10]).

**Conclusions**
In 27 randomised trials, a median of five years of statin therapy had no effect on the incidence of, or mortality from, any type of cancer (or the aggregate of all cancer).

# Screening

## Colon Cancer – Prevention

- Prevention is better than cure, specially for colon cancer
- Screening rates: ~ 60%
- Colonoscopy most commonly used modality: 61%
- Over 20% cancers are metastatic at time of diagnosis
- Screening rates higher in patients with insurance, higher income and education levels

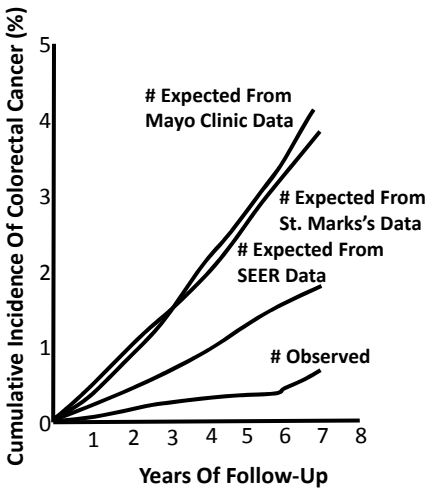
# The New England Journal of Medicine

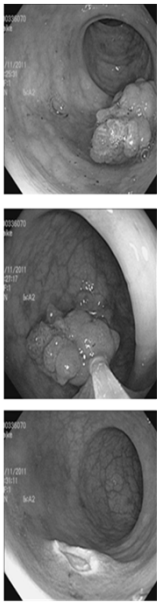
## Prevention of Colorectal Cancer by Colonoscopic Polypectomy

**Sidney J. Winawer, Ann G. Zauber, May Nah Ho, Michael J. O'Brien, Leonard S. Gottlieb, Stephen S. Sternberg, Jerome D. Waye, Melvin Schapiro, John H. Bond, Joel F. Panish, Frederick Ackroyd, Moshe Shike, Robert C. Kurtz, Lynn Hornsby-Lewis, Hans Gerdes, and Edward T. Stewart the National Polyp Study Workgroup**

N Engl J Med 1993; 329:1977-198

**BACKGROUND**
**The current practice of removing adenomatous polyps of the colon and rectum is based on the belief that this will prevent colorectal cancer. To address the hypothesis that colonoscopic polypectomy reduces the incidence of colorectal cancer, we analyzed the results of the National Polyp Study with reference to other published results.**
**METHODS**
**The study cohort consisted of 1418 patients who had a complete colonoscopy during which one or more adenomas of the colon or rectum were removed. The patients subsequently underwent periodic colonoscopy during an average follow-up of 5.9 years, and the incidence of colorectal cancer was ascertained. The incidence rate of colorectal cancer was compared with that in three reference groups, including two cohorts in which colonic polyps were not removed and one general-population registry, after adjustment for sex, age, and polyp size.**
**RESULTS**
**Ninety-seven percent of the patients were followed clinically for a total of 8401 person-years, and 80 percent returned for one or more of their scheduled colonoscopies. Five asymptomatic early-stage colorectal cancers (malignant polyps) were detected by colonoscopy (three at three years, one at six years, and one at seven years). No symptomatic cancers were detected. The numbers of colorectal cancers expected on the basis of the rates in the three reference groups were 48.3, 43.4, and 20.7, for reductions in the incidence of colorectal cancer of 90, 88, and 76 percent, respectively (P<0.001).**
**CONCLUSIONS**
**Colonoscopic polypectomy resulted in a lower-than-expected incidence of colorectal cancer. These results support the view that colorectal adenomas progress to adenocarcinomas, as well as the current practice of searching for and removing adenomatous polyps to prevent colorectal cancer.**



## US Multisociety Task Force Screening Recommendations

- Average Risk
  - Start 50 yrs (45 yrs for African American)
  - Repeat every 10 yrs
  - Screening beneficial up to 86 years of age if not previously screened
  - Patients with previously negative screening, stop at 75 or when life expectancy less than 10 years
- First degree relative, < 60 years with cancer / advanced adenoma or two first degree relatives at any age:
  - Start at age 40 or 10 years younger than age of diagnosis of relative
  - Repeat every 5 years
- First degree relative, > 60 years with cancer or advanced adenoma
  - Same as average risk starting at age 40.

## US Multisociety Task Force Screening Recommendations

- First degree relative, > 60 years with cancer or advanced adenoma
  - Same as average risk starting at age 40.
- FAP:
  - Annual exam starting 12 years
- HNPCC:
  - Start 22-25 years, every 1-2 yrs

# US Multisociety Task Force Screening Recommendations

- **Personal History of Cancer**
  - **3-6 months after surgery in case of obstructive cancer**
  - **1 year**
  - **3 year**
  - **Every 5 years**
- **1-2 subcentimeter polyps**
  - **5 years**
- **3 or more polyps**
  - **3 years followed by 5 years if normal**
- **Advanced adenoma (>1cm, High grade dysplasia, villous)**
  - **3 years, repeat in 5 years if normal**
- **Numerous adenomas or piecemeal removal of large sessile polyp**
  - **Use clinical judgment**

CME

## Colorectal Cancer Screening: Recommendations for Physicians and Patients from the U.S. Multi-Society Task Force on Colorectal Cancer

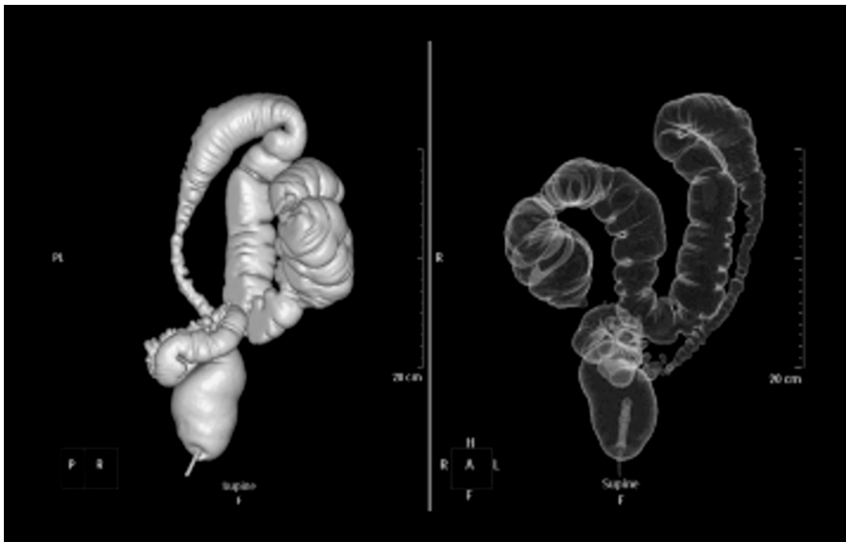
*Am J Gastroenterol* 2017; 112:1016–1030; doi:10.1038/ajg.2017.174; published online 6 June 2017

Douglas K. Rex, MD[1], C. Richard Boland, MD[2], Jason A. Dominitz, MD, MHS[3], Francis M. Giardiello, MD[4], David A. Johnson, MD[5], Tonya Kaltenbach, MD[6], Theodore R. Levin, MD[7], David Lieberman, MD[8] and Douglas J. Robertson, MD, MPH[9]

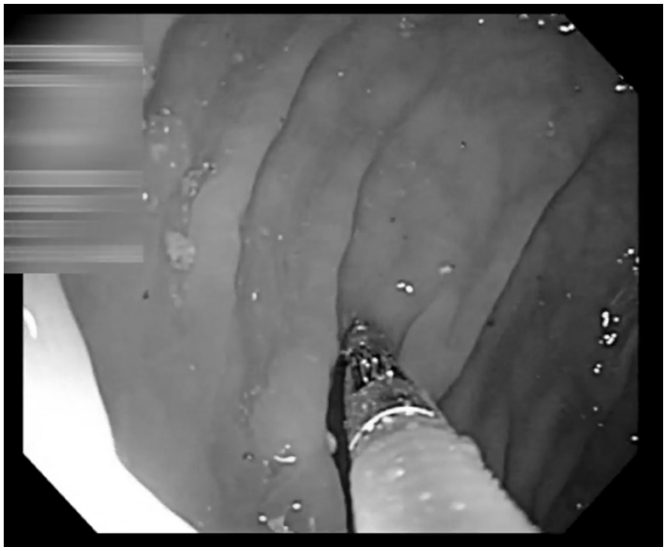
Table 4: Multi-Society Task Force ranking of current colorectal cancer screening tests

| **Tier 1** |
|---|
| Colonoscopy every 10 years |
| Annual fecal immunochemical test |
| **Tier 2** |
| CT colonography every 5 years |
| FIT-fecal DNA every 3 years |
| Flexible sigmoidoscopy every 10 years (or every 5 years) |
| **Tier 3** |
| Capsule colonoscopy every 5 years |
| Available tests not currently recommended |
| Septin 9 |

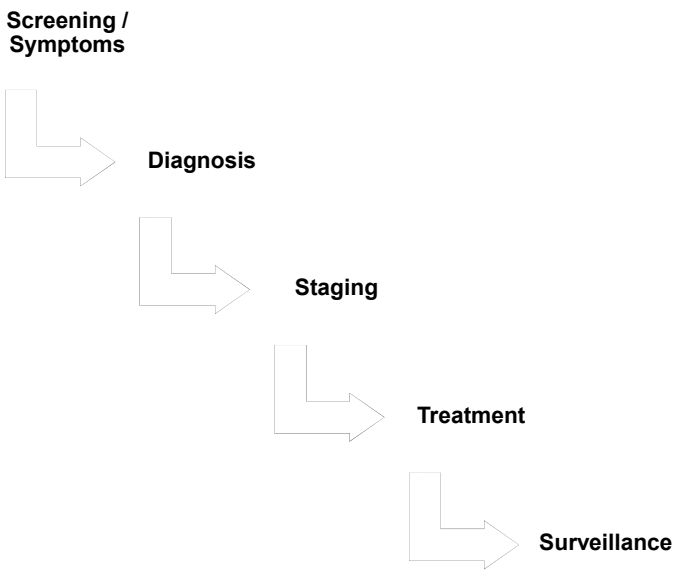
# Video




# Video



## Approach to a patient with colorectal cancer




# Clinical Presentation

- Change in bowel habits
- Blood per rectum
- Iron deficiency anemia
- Abdominal pain
- Bowel Obstruction / Perforation

# Staging

- Baseline labs including LFTs
- CT scan of Abdomen AND Chest
- CEA level
- PET scan ?
- Liver US / MRI in cases where hepatic mets are suspected
- Transrectal US or Pelvic MRI for rectal cancer staging

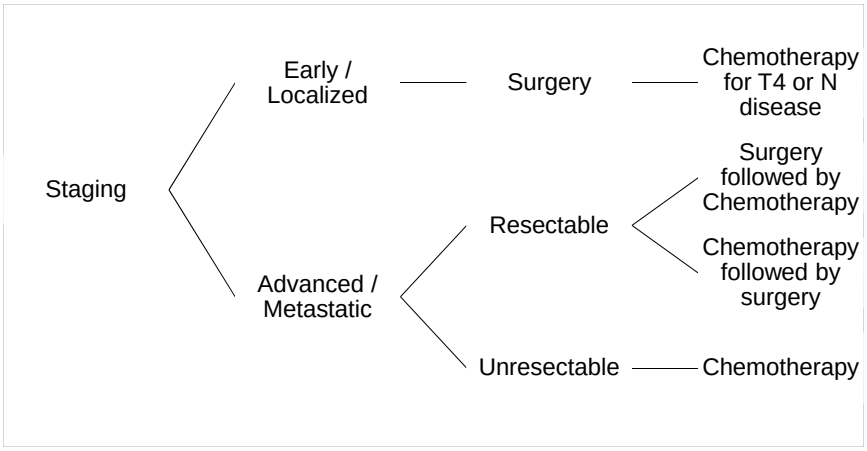
# AJCC TNM Classification

- Primary Tumor (T)
  - Tis Carcinoma in situ: intraepithelial or invasion of lamina propria
  - T1 Invading submucosa
  - T2 Invading muscularis propria
  - T3 Invading through the muscularis propria into pericolorectal tissues
  - T4a Penetrates to the surface of the visceral peritoneum
  - T4b Directly invades or is adherent to other organs or structures
- Regional Lymph Nodes (N)4
  - N1 Metastasis in 1–3 regional lymph nodes
    - N1a Metastasis in one regional lymph node
    - N1b Metastasis in 2–3 regional lymph nodes
    - N1c Tumor deposit(s) in the subserosa, mesentery, or nonperitonealized pericolic or perirectal tissues without regional nodal metastasis
  - N2 Metastasis in 4 or more regional lymph nodes
    - N2a Metastasis in 4–6 regional lymph nodes
    - N2b Metastasis in 7 or more regional lymph nodes
- Distant Metastasis (M)
  - M1a Metastasis confined to one site
  - M1b Metastases in more than one organ/site or the peritoneum

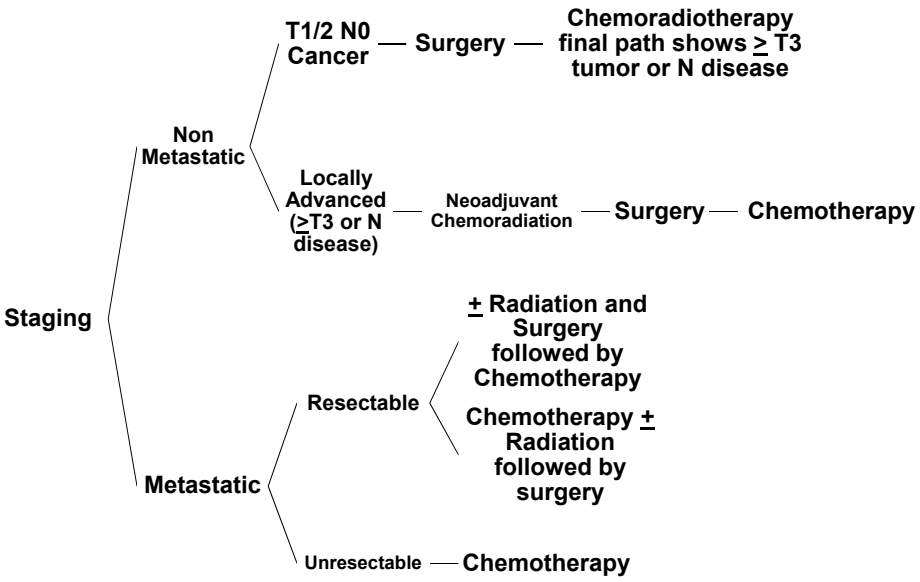
| ANATOMIC STAGE/PROGNOSTIC GROUPS | | | | | |
|---|---|---|---|---|---|
| Stage | T | N | M | Dukes* | MAC* |
| 0 | Tis | N0 | M0 | – | – |
| I | T1 | N0 | M0 | A | A |
| | T2 | N0 | M0 | A | B1 |
| IIA | T3 | N0 | M0 | B | B2 |
| IIB | T4a | N0 | M0 | B | B2 |
| IIC | T4b | N0 | M0 | B | B3 |
| IIIA | T1–T2 | N1/N1c | M0 | C | C1 |
| | T1 | N2a | M0 | C | C1 |
| IIIB | T3–T4a | N1/N1c | M0 | C | C2 |
| | T2–T3 | N2a | M0 | C | C1/C2 |
| | T1–T2 | N2b | M0 | C | C1 |
| IIIC | T4a | N2a | M0 | C | C2 |
| | T3–T4a | N2b | M0 | C | C2 |
| | T4b | N1–N2 | M0 | C | C3 |
| IVA | Any T | Any N | M1a | – | – |
| IVB | Any T | Any N | M1b | – | – |

NOTE: cTNM is the clinical classification, pTNM is the pathologic classification. The y prefix is used for those cancers that are classified after neoadjuvant pretreatment (for example, ypTNM). Patients who have a complete pathologic response are ypT0N0cM0 that may be similar to Stage Group 0 or I. The r prefix is to be used for those cancers that have recurred after a disease-free interval (rTNM).
* Dukes B is a composite of better (T3 N0 M0) and worse (T4 N0 M0) prognostic groups, as is Dukes C (any TN1 M0 and Any T N2 M0). MAC is the modified Astler-Coller classification.

## Simplified Treatment Overview – Colon Cancer



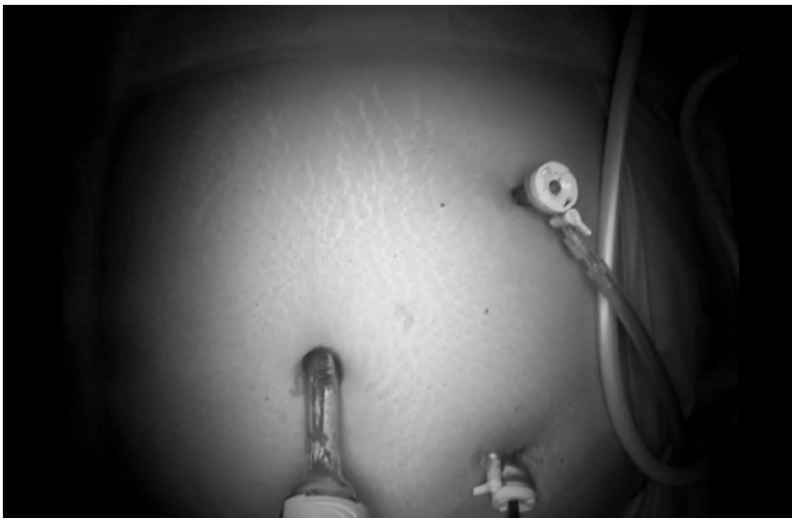
## Simplified Treatment Overview – Rectal Cancer




# Surgical Intervention

- Involves resection of tumor AND regional lymph nodes
- Colon Cancer: Partial Colectomy
  - Left
  - Right
  - sigmoid
- Rectal Cancer:
  - Low Anterior Resection
  - Abdominoperineal Resection
  - Local Excision
- Metastatectomy:
  - Hepatectomy
  - Pneumonectomy

# Video



# Laparoscopic vs open surgery?

## The New England Journal of Medicine

**A Comparison of Laparoscopically Assisted and Open Colectomy for Colon Cancer**

N Engl J Med 2004;350:2050-9.

**Excerpt from Table 2. Surgical, Pathological, and Postoperative Data.**

| Variable | Open Colectomy (N=428) | Laparoscopically Assisted Colectomy (N=435) | P Value |
|---|---|---|---|
| **Duration of surgery — min** | | | <0.001 |
| Median | 95 | 150 | |
| Range | 27–435 | 35–450 | |
| **Duration of use of oral analgesics — days** | | | 0.02 |
| Median | 2 | 1 | |
| Interquartile range | 1–3 | 1–2 | |
| **Duration of use of parenteral narcotics — days** | | | <0.001 |
| Median | 4 | 3 | |
| Interquartile range | 3–5 | 2–4 | |
| **Duration of hospitalization — days** | | | <0.001 |
| Median | 6 | 5 | |
| Interquartile range | 5–7 | 4–6 | |

# Laparoscopic vs Open Surgery – Colon Cancer

- **COST Trial: (Clinical Outcomes of Surgical Therapy)**
  - **US, Multicenter**
  - **872 patients were randomized**
  - **Median follow up of seven years**
  - **No differences in 5 yr disease free or overall survival**
- **COLOR Trial: (Colon cancer Laparoscopic or Open Resection)**
  - **European, multicenter**
  - **1248 patients were randomized**
  - **Recently reported 10 yr follow up of 329 Dutch patients**
  - **Similar 10 yr overall and disease free survival**

# Laparoscopic vs Open Surgery – Colon Cancer

- **CLASSIC Trial: (Conventional versus Laparoscopically Assisted resection In Colorectal cancer)**
  - **UK, Multicenter**
  - **794 patients randomized 2:1 to lap and open**
  - **Median follow up: 62.9 months**
  - **No differences in overall or disease free survival**

# Laparoscopic vs Open Surgery – Rectal Cancer

- **COLOR II (COlorectal cancer Laparoscopic or Open Resection)**
  - **European multicenter trial**
  - **2:1 randomization of 1044 patients with a solitary adenocarcinoma**
  - **Patients with T4 lesions or T3 lesions that were within 2 mm of the mesorectal fascia were excluded.**
  - **Similar rates of macroscopic completeness of resection (88 versus 92 percent) and positive (<2 mm) circumferential resection margin (10 versus 10 percent), the median distal margin (3 cm versus 3 cm)**
  - **28-day morbidity (40 versus 37 percent) and mortality (1 versus 2 percent) were also similar.**
  - **At three years, locoregional recurrence and survival were also similar between the two groups.**

# Laparoscopic vs Open Surgery – Rectal Cancer

- **COREAN**
  - **South Korean trial**
  - **340 patients with mid-to-low rectal cancer after preoperative chemoradiation**
  - **No significant differences in circumferential resection margin, macroscopic quality of the total mesorectal excision specimen, number of harvested lymph nodes, and perioperative morbidity.**
  - **At three years, the disease-free survival was similar for the open and laparoscopic surgery groups (72.5 versus 79.2 percent).**

# Laparoscopic vs Open Surgery – Rectal Cancer

- **ACOSOG Z6051**
  - **Designed to show noninferiority of the laparoscopic approach**
  - **486 patients with stage II or III rectal cancer within 12 cm of the anal verge**
  - **Primary endpoint: simultaneously achieving a >1 mm distal margin, a >1 mm circumferential radial margin, and an adequate total mesorectal excision.**
  - **Successful outcome occurred in 81.7 percent of laparoscopic resections and 86.9 percent of open resections.**
  - **Laparoscopic surgery failed to achieve the noninferiority criteria.**

# Laparoscopic vs Open Surgery – Rectal Cancer

- AlaCaRT (Australian Laparoscopic Cancer of the Rectum Trial)
  - Another noninferiority trial
  - 475 patients with T1 to T3 rectal cancer <15 cm from the anal verge
  - Primary endpoint: simultaneous achievement of a >1 mm distal margin, a >1 mm circumferential radial margin, and an adequate total mesorectal excision.
  - Successful resection was achieved in 82 percent of patients in the laparoscopic group versus 89 percent of patients in the open surgery group.
  - Laparoscopic surgery failed to achieve the noninferiority criteria.

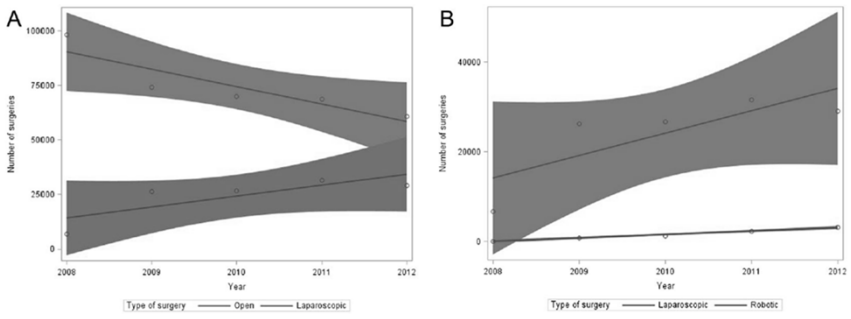
SCIENTIFIC REPORTS

OPEN

Received: 28 June 2016
Accepted: 7 April 2017
Published online: 17 May 2017

## Trends and Outcomes of Surgical Treatment for Colorectal Cancer between 2004 and 2012- an Analysis using National Inpatient Database

Meng-Tse Gabriel Lee[1], Chong-Chi Chiu[2,3], Chia-Chun Wang[4,5], Chia-Na Chang[6], Shih-Hao Lee[7], Matthew Lee[7], Tzu-Chun Hsu[1] & Chien-Chang Lee[1]



# Is Robotic Surgery Better?

JAMA | Original Investigation JAMA October 24/31, 2017 Volume 318, Number 16

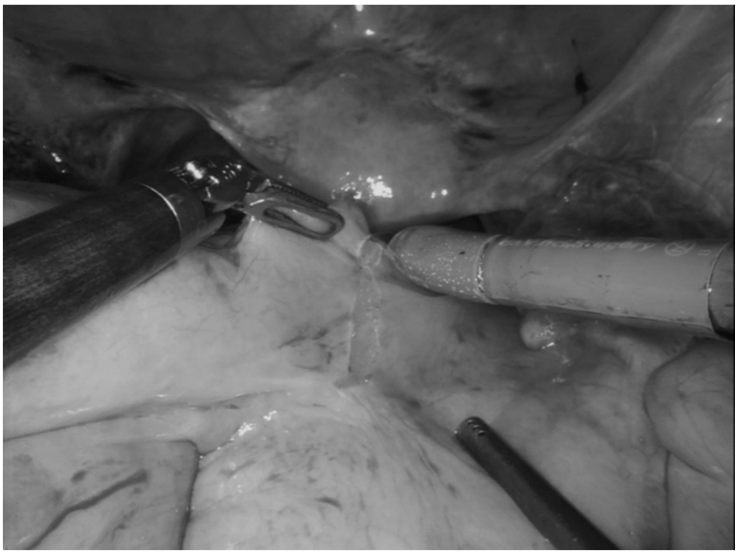
## Effect of Robotic-Assisted vs Conventional Laparoscopic Surgery on Risk of Conversion to Open Laparotomy Among Patients Undergoing Resection for Rectal Cancer

### The ROLARR Randomized Clinical Trial

David Jayne, MD; Alessio Pigazzi, PhD; Helen Marshall, MSc; Julie Croft, BSc; Neil Corrigan, MSc; Joanne Copeland, BSc; Phil Quirke, FMedSci; Nick West, PhD; Tero Rautio, PhD; Niels Thomassen, MD; Henry Tilney, MD; Mark Gudgeon, MS; Paolo Pietro Bianchi, MD; Richard Edlin, PhD; Claire Hulme, PhD; Julia Brown, MSc

- **471 patients were randomized**
- **Rate of conversion to open laparotomy: 8.1% vs 12.2%; P = .16**
- **CRM+ rate: 5.1% vs 6.3%; P = .56**
- **No difference in lymph node retrieval rates**
- **No difference in intraoperative complications, postoperative complications, plane of surgery, 30-day mortality, bladder dysfunction, and sexual dysfunction**
- **Health care costs: $13 668 vs $12 556; P = .02**
- **The mean operative time was 37.5 minutes longer in the robotic-assisted cases, 298.5 vs 261 minutes.**

# Video



# Chemotherapy

# Chemotherapy Regimens

- **FOLFOX: Folinic acid (Leucovorin), 5-Fluourouracil, Oxaliplatin**
- **CAPEOX: Capecitibine, Oxaliplatin**
- **FOLFIRI: Folinic acid (Leucovorin), 5-Fluourouracil, Irinotecan**
- **FOLFOXIRI: Folinic acid (Leucovorin), 5-Fluourouracil, Oxaliplatin, Irinotecan**

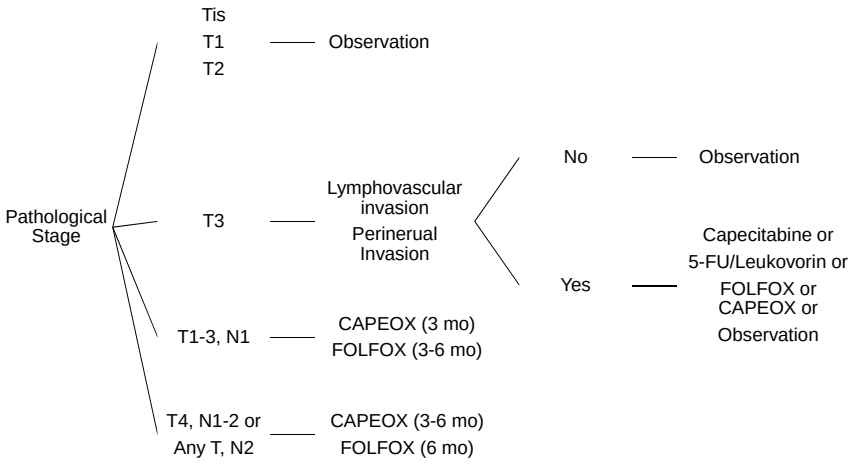
# Targeted Therapy in Colon Cancer

- **VEGF**
  - **Bevcizumab (Avastin)**
  - **Ramucirumab (Cyramza)**
  - **Ziv-afilbercept (Zaltrap)**
- **EGFR**
  - **Cetuximab (Erbitux)**
  - **Panitumumab (Vectibix)**
- **Kinase Inhibitors**
  - **Regorafenib (Stivarga)**

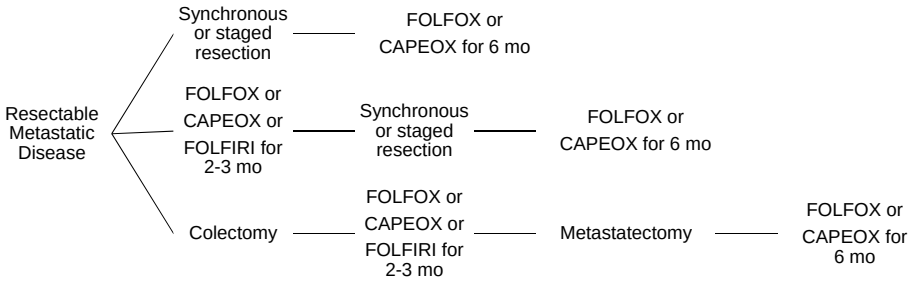
# Immune Checkpoint Inhibitors in Colon Cancer

- **Approved for tumors with Mismatch Repair Gene defects**
- **Target PD-1, a protein on T cells that normally helps keep these cells from attacking other cells in the body**
- **Pembrolizumab (Keytruda)**
- **Nivolumab (Opdivo)**

## Adjuvant (after surgery) Chemotherapy (NCCN Guidelines)

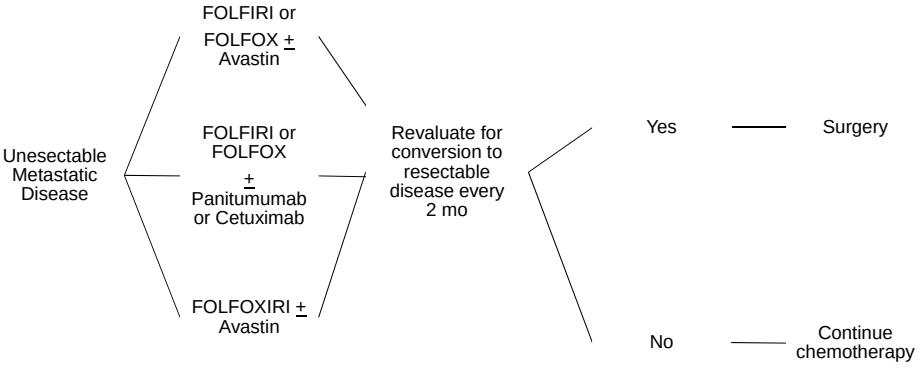


## Resectable Metastatic Disease (NCCN Guidelines)




## Unresectable Metastatic Disease (NCCN Guidelines)

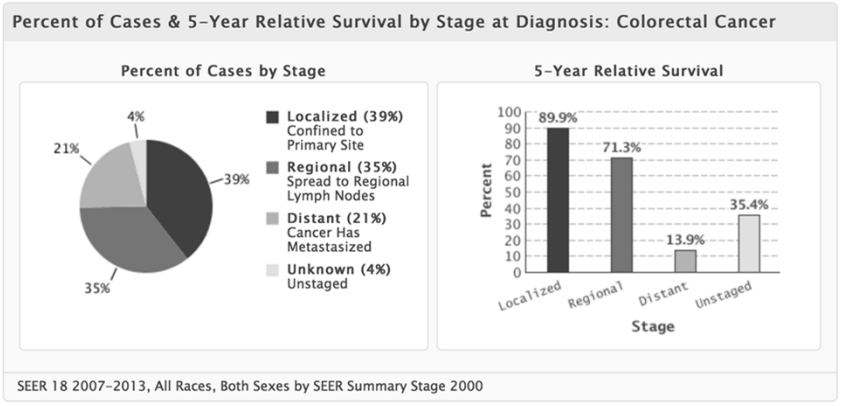
- Colon resection only for obstruction, bleeding or perforation



# Radiation Therapy

- Very little role in colon cancer
  - Used only for selected cases with invasion into surrounding organs
- Used as part of "neoadjuvant therapy" for locally advanced rectal cancer
  - Downstaging
  - Increased resectability
  - Improved sphincter preservation

# Prognosis and Survival




source: (SEER) Program of the National Cancer Institute

# Survival by Stage (American Cancer Society)

| Stage | Colon | Rectal |
|---|---|---|
| I | 92% | 87% |
| II A | 87% | 80% |
| II B | 63% | 49% |
| III A | 89% | 84% |
| III B | 69% | 71% |
| III C | 53% | 58% |
| IV | 11% | 12% |

## Surveillance (NCCN guidelines, simplified)

- **Stage I**
  - **Colonoscopy at 1, 3 and 5 years**
- **Stage II, III**
  - **History / Physical and CEA every 3-6 mos for 2yrs then every 6 months for 5yrs**
  - **CT chest, Abdomen / pelvis every 6-12 mos for 5yrs**
  - **Colonoscopy at 1, 3 and 5 years**
  - **PET is not indicated**
- **Stage IV**
  - **History / Physical and CEA every 3-6 mos for 2yrs then every 6 months for 5yrs**
  - **CT chest, Abdomen / pelvis every 3-6 mos for 2 yrs then 6-12 mos for 5yrs**
  - **Colonoscopy at 1, 3 and 5 years**

# Future Directions

**Organ preservation for clinical T2N0 distal rectal cancer using neoadjuvant chemoradiotherapy and local excision (ACOSOG Z6041): results of an open-label, single-arm, multi-institutional, phase 2 trial**

*Lancet Oncol* 2015; 16: 1537–46

*Julio Garcia-Aguilar, Lindsay A Renfro, Oliver S Chow, Qian Shi, Xiomara W Carrero, Patricio B Lynn, Charles R Thomas Jr, En... Chan, Peter A Cataldo, Jorge E Marcet, David S Medich, Craig S Johnson, Samuel C Oommen, Bruce G Wolff, Alessio Pigazzi, Shane M McNevin, Roger K Pons, Ronald Bleday*

- **79 eligible patients were recruited**
- **Median follow-up was 56 months**
- **Estimated 3-year disease-free survival for the intention-to-treat group was 88·2%**
- **Significant Complications:**
  - **29%) had grade 3 gastrointestinal adverse events**
  - **15% had grade 3-4 pain**
  - **15%) had grade 3-4 hematological adverse events**
  - **4% had grade 3-4 hemorrhage**
- **Authors recommended use in selected patients only**

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Volume 2, Issue 7, July 2017, Pages 501-513

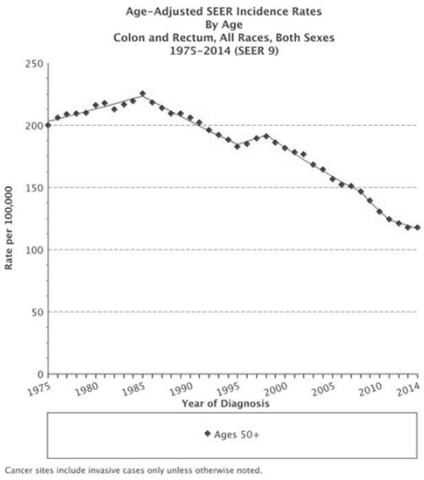
Articles

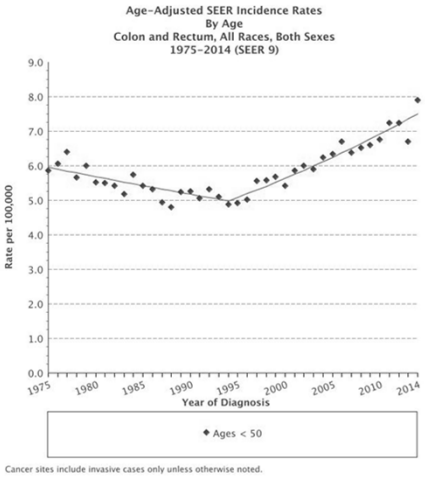
A watch-and-wait approach for locally advanced rectal cancer after a clinical complete response following neoadjuvant chemoradiation: a systematic review and meta-analysis

Fahima Dossa MD [a, b, c, d], Tyler R Chesney MD [a], Sergio A Acuna MD [b, c, d], Prof Nancy N Baxter PhD [a, b, c, d]

- **23 studies including 867 patients**
- **Median follow-up of 12-68 months**
- **Pooled 2-year local regrowth was 15·7%**
- **No significant difference with respect to non-regrowth recurrence or cancer-specific mortality**
- **No significant difference in overall survival**
- **Disease-free survival was better in the surgery group**

# Colorectal Cancer in Young Patients




**source: (SEER) Program of the National Cancer Institute**

## Case Discussions – which patients should be sent for a colonoscopic exam

- **54 y/o female, never had colonoscopy, presenting with bright red rectal blood on toilet paper only at defecation.**
- **62 y/o male, normal colonoscopy 2 years ago, with rectal bleeding at time of BMs.**
- **32 y/o male with rectal bleeding at defecation.**
- **43 y/o female, mother with colon cancer, presenting with anemia.**