American Cancer Society®

Committee on Health and Committee on Commerce and Consumer Protection

Hawaii Joint Legislative Informational Briefing on ACS Colorectal Cancer Guidelines

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American Cancer Society®

2008 CONSENSUS GUIDELINES ON THE EARLY DETECTION OF COLORECTAL CANCER AND ADENOMATOUS POLYPS

AMERICAN CANCER SOCIETY

U.S. MULTISOCIETY TASK FORCE ON COLORECTAL CANCER

AMERICAN COLLEGE OF RADIOLOGY

ectal Cancer Facts

- Colorectal Cancer is the 3rd most common cancer in the U.S.
- Colorectal Cancer is the 2rd leading cause of cancer death among men and women.
- Deaths from colorectal cancer account for 786,000 years of premature mortality in the U.S.

izations

- American Cancer Society
- American College of Radiology
- U. S. Multi-Society Task Force on Colorectal Cancer
  - American Gastroenterological Association
  - American College of Gastroenterology
  - American Society of Gastrointestinal Endoscopists
  - American College of Physicians

ectal Cancer Screening lines: Process

- Expert panel representing multiple organizations: American Cancer Society, U.S. Multi-Society Task Force (mostly GI orgs.) and the American College of Radiology
- Also in regular communication with U.S. Preventive Services Task Force
- Multi-organizational consensus guidelines reduce confusion among health professionals and public, but achieving consensus is a challenge (turf, conflicts of interest, different approaches to evidence, and different organizational approvals process)

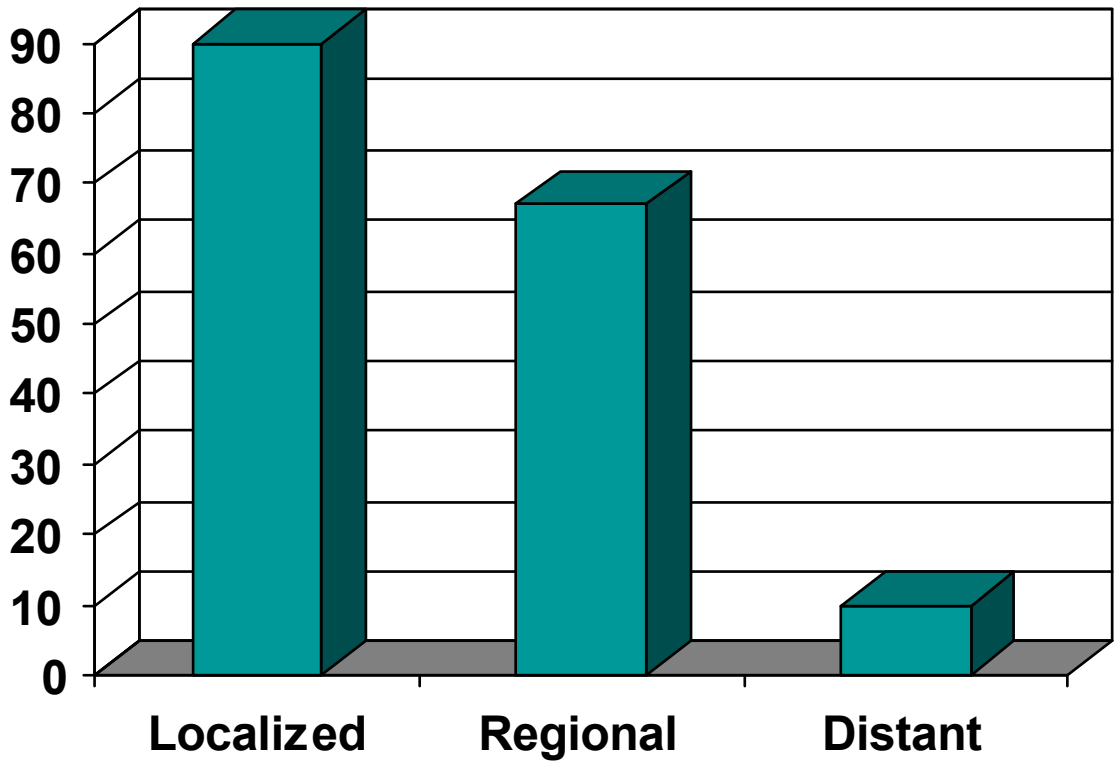
It is worth the effort, but it takes longer

its of Screening

- **Cancer Prevention**
  - Removal of pre-cancerous polyps *prevent* cancer (unique aspect of colon cancer screening)
- **Improved survival**
  - Early detection markedly improves chances of long term survival

Early Detection Improves Survival

FIVE-YEAR RELATIVE SURVIVAL RATES FOR CRC CANCER BY STAGE AT DIAGNOSIS, 1995-2000



Screening Recommendations

- **Guidelines emphasize *options* because:**
- Individuals differ in their preferences among these choices
- Physicians vary in their ability or readiness to refer patients to all options equally
- Access is uneven geographically, and in terms of insurance coverage

Detection & Screening Rates

- **Only 38% of cancers are currently diagnosed in the earliest, most treatable stage**
- **Less than half of adults age 50 and older are up-to-date for colorectal cancer screening**

ectal Cancer: Who is at Risk ?

- **Average Risk**
- **All adults 50 years and older**
- **Increased / High Risk**
- ***Personal history*** **of inflammatory bowel disease, adenomatous polyps or colon cancer**
- ***Family history*** **of adenomatous polyps, colon cancer, other conditions (FAP, HNPCC)**

ectal Cancer Screening lines: Evidence Review

Reassessed evidence for tests in two broad categories:

1. Tests that are more likely to detect both cancer and premalignant polyps

   Flexible sigmoidoscopy, colonoscopy, double contrast barium enema, CT colonography (also known as virtual colonoscopy)

2. Tests that are primarily effective at finding cancer early

   Fecal (stool) tests include: guaiac-based and immunochemical-based fecal occult blood tests (gFOBT & FIT), and stool DNA test (sDNA)

ectal Cancer Screening
lines: Evidence Review

- New recommendations provide information on quality issues related to each form of testing.
- An overriding goal of this update is to provide a practical guideline for physicians and the public to assist with informed decision making related to colorectal cancer screening.

ctal Cancer Screening Guidelines: New

Groups screening tests into two categories:

- Those that detect cancer and precancerous polyps*
- Those that primarily detect cancer

*It is the strong opinion of the American Cancer Society CRC Advisory Group that *colon cancer prevention* should be the primary goal of colorectal cancer screening. Exams that are designed to detect both early cancer and precancerous polyps should be encouraged if resources are available and patients are willing to undergo an invasive test.

ctal Cancer Screening Guidelines: Else is New?

- Two new tests recommended:
  - stool DNA (sDNA) and
  - computerized tomographic colonography (CTC) ï sometimes refered to as virtual colonoscopy
- Establishes a sensitivity threshold for recommended tests
- Delineates important quality-related factors for each form of testing

lorectal Cancer Screeni ng
nes

Adults age 50 and older	
Tests That Detect Adenomatous Polyps and Cancer	
	Flexible sigmoidoscopy (FSIG) every 5 years , or
	Colonoscopy every 10 years , or
	Double contrast barium enema (DCBE) every 5 years , or
	CT colonography (CTC) every 5 years
Tests That Primarily Detect Cancer	
	Annual guaiac-based fecal occult blood test (gFOBT) with high test sensitivity for cancer, or
	Annual fecal immunochemical test (FIT) with high test sensitivity for cancer, or
	Stool DNA test (sDNA), with high sensitivity for cancer, interval uncertain

ectal Cancer Guidelines ï Options Emphasized

- Guidelines continue to emphasize *options* because:
  - Individuals dif fer in their pref erences for one test or another
  - Primary care physicians have dif fered in their ability to offer, explain, or ref er patients to all options equally
  - Access is uneven geographically, and in terms of test charges and insurance coverage
  - Uncertainty exists about performance of different screening methods with regard to benefits, harms, and costs

ectal Cancer Guidelines ï Options Emphasized

- Guidelines continue to emphasize *options* because:
  - The uptake of screening for colorectal cancer has been disappointingly slow.
  - Given the evidence for a range of preferences and variable access, there has been collective agreement that options would enhance uptake.
  - ñThe best test is the one you get that is *done well*.ò

COST/BENEFIT OF CANCER PREVENTION AND EARLY DETECTION IN THE WORKSITE

TWO STUDIES ON THE COST OF CANCER

THE LEWIN STUDY
THE MILLIMAN USA STUDY

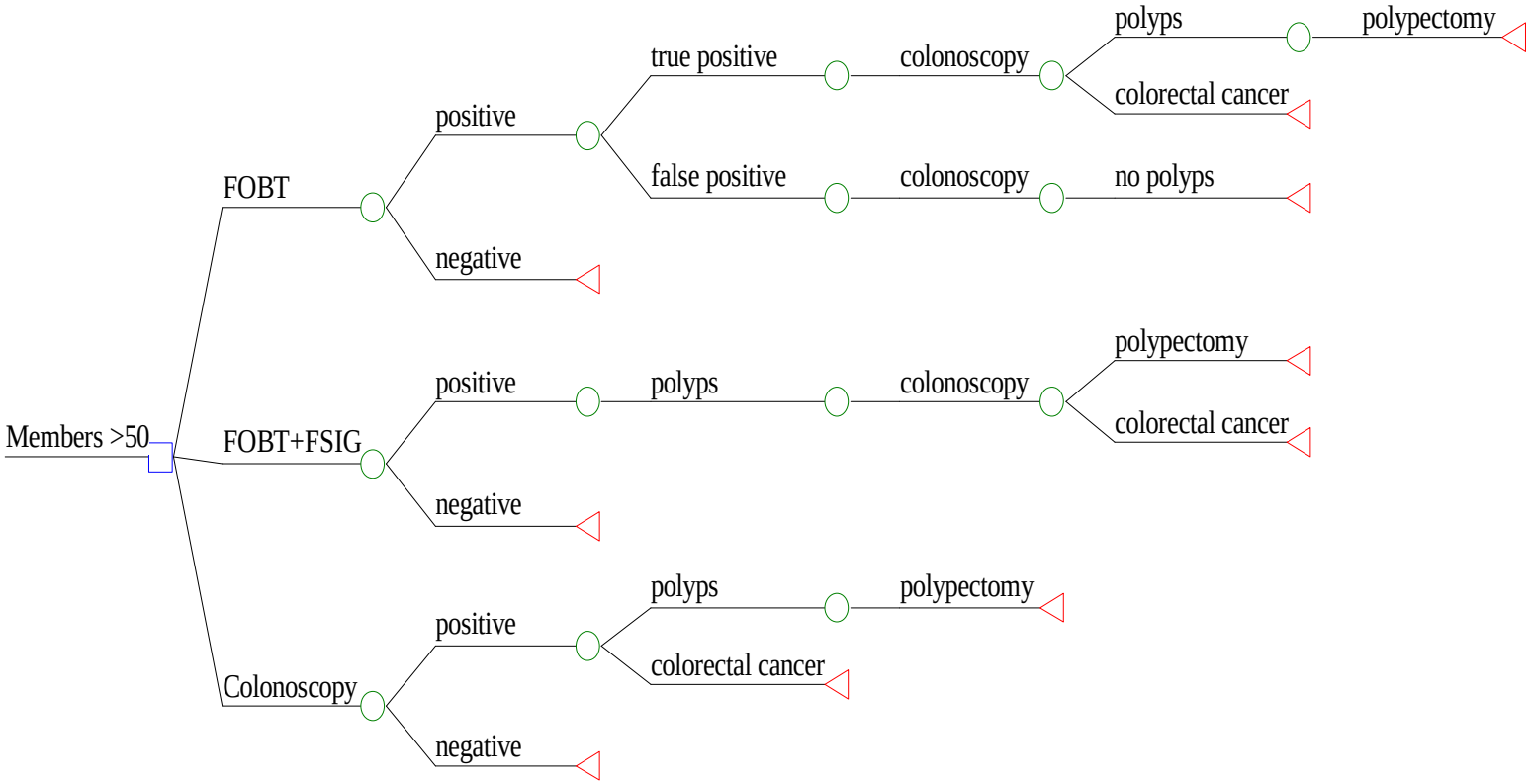
mics of Cancer Control

- Costs of prevention / early detection
  - Medical cost
- Costs of people with cancer
  - Medical cost
  - Disability and death benefits
- Hard ROI for prevention/ early detection in the worksite
  - Medical cost
  - Disability and death benefits
- Full ROI
  - Productivity gains
  - Improved health

ewin Group: r Prevention is Low Cost

- The ACS/Lewin Group determined costs for three different colorectal cancer screening strategies.
- Costs were measured using real life scenarios, such as:
  - Current screening rates
  - Real plan demographics
  - Up front costs medical costs
  - Downstream costs, such as complications and treatment
- Assumptions came from current national private insurance costs and peer-reviewed journals
- Results for any particular insurer can vary depending on:
  - Insurance plan demographics
  - Compliance rates
  - Reimbursement rates

Case (Using CBO Methods): Colorectal Cancer Screening Decision Tree



ts:
Short Term Costs of Colorectal Cancer Screening

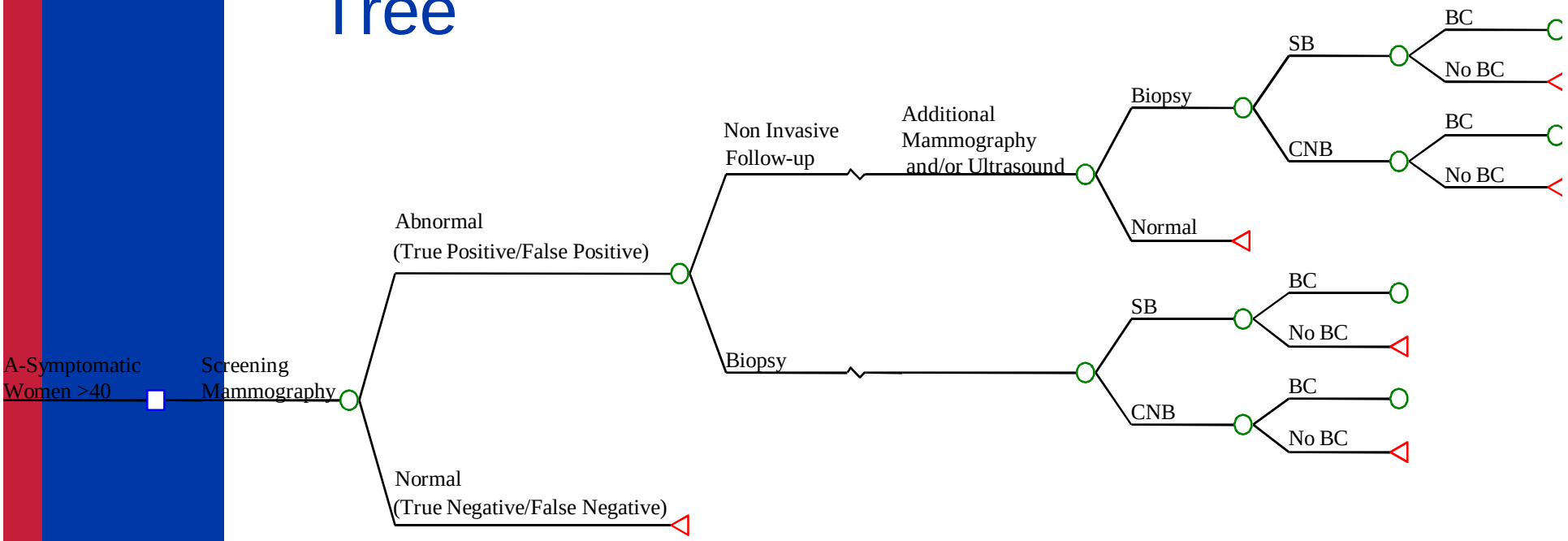
ANNUAL FOBT/FLEX SIG	
Per Member Per Month Costs	$.66
COLONOSCOPY@10 years	
Per Member Per Month Costs	$.55

COLONOSCOPY IS A LESS COSTLY SCREENING STRATEGY THAN ANNUAL FOBT/FLEX SIG EVERY 5 YEARS BY 11 CENTS PMPM.

FOR THE MAJORITY OF INSURERS WHO ARE ALREADY COVERING ANNUAL FOBT/FLEX SIG, COLONOSCOPY SCREENING COVERAGE CAN BE ADDED FOR LITTLE OR NO COST.

IN ORDER TO ENSURE THAT THESE COSTS, WHICH ARE INTUITIVELY LOW, ARE AFFORDABLE FOR INSURERS, IT WAS NECESSARY TO COMPARE THIS DATA WITH A HIGH VOLUME SCREENING TEST ALREADY COVERED BY INSURERS

Comparison Mammography Screening Decision Tree



ANNUAL SCREENING MAMMOGRAPHY $.75 PMPM

FOBT/FLEX SIG@5 YEARS $.66 PMPM

COLONOSCOPY SCREENING@10 YEARS $.55 PMPM

ACS/Milliman USA Study: Investment in prevention and early detection makes financial sense

- Milliman USA looked at health claims and disability data from large employers and health plans
  - Millions of lives
  - Typical family/age/gender mix
  - Nationwide
- Standard methodology (same as developing insurance company premium rates)
- Results for any particular employer can vary
  - Reimbursement may vary by ï 25% to +50%
  - Compliance may be 10-15% higher or lower depending on demographics and screening type

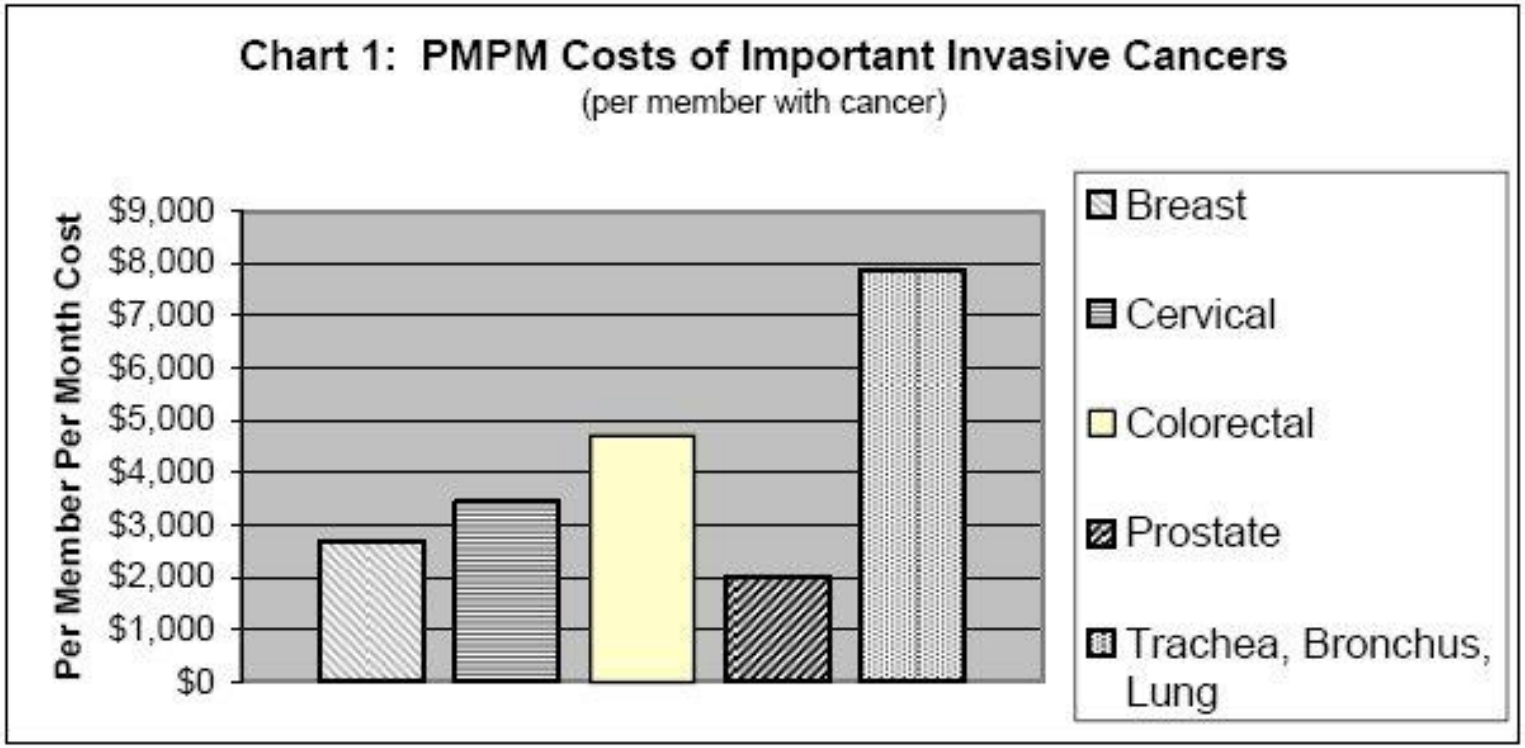
: Detection Costs Compared with Total Average Premium Rates of $288-$312 PMPM for HMO or PPO

Per-member-per-month costs of cancer screening strategies†	Current Compliance	Cost of Increasing Compliance to 100%	100% Compliance
	$4.55	$2.95	$7.50

15% ADMINISTRATION, $10 OV COPAY, $50 OUTPATIENT COPAY

† STRATEGIES INCLUDE SCREENING FOR COLORECTAL, PROSTATE, BREAST AND CERVICAL CANCERS

PLE DIAGNOSED WITH LATE STAGE CANCER ARE VERY COSTLY TO A TYPICAL EMPLOYER



Cancer Prevention and Early Detection is Low Cost

- The medical expense of achieving 100% compliance with ACS or USPSTF guidelines for breast, cervical, and colorectal cancer screening is relatively low.

ost of Peopl e with Cancer is High. Cancer is expensive for employers

- The medical costs of people with cancer are high on an individual and aggregate basis, and additional employer costs include *lost productivity, short-and long-term disability, and life insurance.*

ment in Prevention and Early Detection Makes Financial Sense.

- Across a broad population, savings in medical and non-medical benefits costs from early detection of breast, cervical and colorectal cancer essentially equals the costs of screening coverage in health insurance plans.

usion: Major Leadership Opportunity for Policy Makers and Business

- Use actuarial facts to make wise benefit decisions
- Collective Public/Private policy action works for cancer prevention and early detection
- A level benefit playing field eliminates negative incentives, and returns the greatest investment to productivity and reduced costs

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THANK YOU!

Colorectal Cancer Facts & Figures 2008-2010

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Acknowledgments

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Preface

The American Cancer Society estimates that in 2008 about 148,810 people will be diagnosed with colorectal cancer and that about 49,960 people will die of the disease. Colorectal cancer is the third most commonly diagnosed cancer and the third leading cause of cancer death in both men and women in the US. The great majority of these cancers and deaths could be prevented by applying existing knowledge about cancer prevention and by increasing the use of established screening tests. In the past several years, there has been unprecedented progress in reducing colorectal cancer incidence and death rates in most US population groups; this progress has come about largely through the prevention and early detection of colorectal cancer through screening. Even more progress is possible by increasing access to and utilization of colorectal cancer screening tests; currently, only half of people aged 50 or older, for whom screening is recommended, have received the recommended tests.

Screening can prevent many cases of colorectal cancer because most colorectal cancers develop from adenomatous polyps. Polyps are noncancerous growths in the colon and rectum. Detecting polyps through screening and removing them can actually prevent cancer from occurring. Furthermore, being screened at the recommended frequency improves the chance that colorectal cancer will be detected at an earlier stage, when it is more likely to be cured by surgery alone, the surgical procedure is less extensive, and the recovery is much faster.

In addition to following recommended screening guidelines, people can reduce the risk of developing or dying from colorectal cancer through regular physical activity and maintaining a healthy body weight.

The American Cancer Society has identified colorectal cancer as a major priority because the application of existing knowledge has such great potential to prevent cancer, save lives, and diminish suffering. The Society recently collaborated with the US Multi-Society Task Force on Colorectal Cancer and the American College of Radiology to release the first-ever joint consensus guidelines for colorectal cancer screening for average-risk adults and has been working on a number of fronts to increase awareness and access to colorectal cancer screening. (The US Preventive Services Task Force has also recently updated its recommendations for colorectal cancer screening. For information on these guidelines, please see www.ahrq.gov/clinic/uspstf/uspscolo.htm.) This second edition of *Colorectal Cancer Facts & Figures* is part of the Society's effort to motivate the public and medical communities to prevent the tragic and unnecessary suffering caused by colorectal cancer. It is intended to provide basic information about colorectal cancer to the general public, the media, and health professionals. More detailed information on many topics related to colorectal cancer is available on the American Cancer Society's Web site at www.cancer.org.

What is colorectal cancer?

Colorectal cancer is cancer that develops in the colon or the rectum (Figure 1). The colon and rectum are parts of the digestive system, which is also called the gastrointestinal, or GI, system. The digestive system processes food for energy and rids the body of solid waste (fecal matter or stool).

After food is chewed and swallowed, it travels through the **esophagus** to the stomach. There it is partially broken down and sent to the **small intestine**, where digestion continues and most of the nutrients are absorbed. The word "small" refers to the diameter of the small intestine, which is smaller than that of the large intestine. The small intestine is actually the longest part of the digestive system – about 20 feet in length. Cancer occurs infrequently in the small intestine.

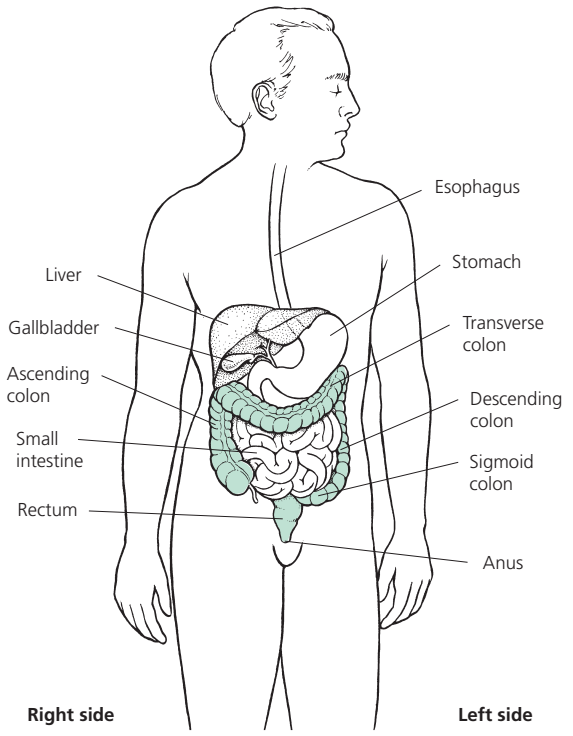
The small intestine joins the large intestine in the lower right abdomen. (The small and large intestine are sometimes called the small and large bowel). The first and longest part of the large intestine is the **colon**, a muscular tube about 5 feet long. Water and mineral nutrients are absorbed from the food matter in the colon. Waste (feces) left from this process passes into the **rectum**, the final 6 inches of the large intestine, and is then expelled from the anus.

The colon has 4 sections:

- The first section is called the **ascending colon**. It begins where the small intestine attaches to the colon and extends upward on the right side of a person's abdomen.
- The second section is called the **transverse colon** because it crosses the body from the right to the left side.
- The third section, the **descending colon**, continues downward on the left side.
- The fourth section is known as the **sigmoid colon** because of its "S" shape. The sigmoid colon joins the rectum, which in turn joins the anus.

Colorectal cancer usually develops slowly over a period of many years. Before a true cancer develops, it usually begins as a noncancerous polyp, which may eventually change into cancer. A polyp is a growth of tissue that develops on the lining of the colon or rectum. Certain kinds of polyps, called **adenomatous polyps** or **adenomas**, are most likely to become cancers, although most adenomas do not become cancerous. More than half of all individuals will eventually develop one or more adenomas.[1]

Figure 1. Diagram of Colon and Rectum



About 96% of colorectal cancers are adenocarcinomas, which evolve from glandular tissue.[2] The great majority of colon and rectum cancers arise from an adenomatous polyp, which is visible through a scope or on an x-ray. The information on early detection in this document is most relevant to this type of cancer.

Once cancer forms in the large intestine, in time it can grow through the lining and into the wall of the colon or rectum. Cancers that have invaded the wall can also penetrate blood vessels or lymph vessels, which are thin channels that carry away cellular waste and fluid. Cancer cells typically spread first into nearby lymph nodes, which are bean-shaped structures that help fight infections. Cancerous cells can also be carried in blood vessels to the liver or lungs, or can spread in the abdominal cavity to other areas, such as the ovary. The process through which cancer cells travel to distant parts of the body through blood or lymphatic vessels is called **metastasis**.

The extent to which a colorectal cancer has spread is described as its stage. Tumors that have not yet begun to invade the wall of the colon or rectum are called carcinomas in situ, and are not counted in cancer

statistics. More than one system is used for the staging of cancer. In this document, we will describe colorectal cancer stages as:

Local: Cancers that have grown into the wall of the colon and rectum, but have not extended through the wall to invade nearby tissues

Regional: Cancers that have spread through the wall of the colon or rectum and have invaded nearby tissue, or that have spread to nearby lymph nodes

Distant: Cancers that have spread to other parts of the body, such as the liver or lung

How many cases and deaths are estimated to occur in 2008?

Colorectal cancer is the third most commonly diagnosed cancer and the third leading cause of cancer death in both men and women in the US, with about 148,810 new cases and 49,960 deaths expected in 2008.[3] About 72% of cases arise in the colon and about 28% in the rectum.

Who gets colorectal cancer?

Anyone can get colorectal cancer. The lifetime risk of being diagnosed with cancer of the colon or rectum is 5.5% for men and 5.1% for women in the US. Although 20%-25% of colorectal cancer cases occur among individuals with a family history of colorectal cancer or a predisposing illness, about 75% of cases occur in people without these risk factors.[4]

Age

Incidence and death rates for colorectal cancer increase with age. Overall, 91% of new cases and 94% of deaths occur in individuals 50 and older. The incidence rate of colorectal cancer is more than 14 times higher in adults 50 years and older than in those younger than 50.[5]

Sex

Overall, colorectal cancer incidence and mortality rates are 35% higher in men than in women (Table 1). The reasons why risk is higher for men than for women are not completely understood, but may reflect higher frequency of abdominal obesity, smoking, and drinking in men, as well as hormonal differences.

Race/ethnicity

- Colorectal cancer incidence and mortality rates are highest in African American men and women (Table 1).[5] Among African Americans, incidence rates are more than 20% higher and mortality rates are about 45% higher than those in whites.
- Prior to 1989, incidence rates were predominantly higher in white men than in African American men and were similar for women of both races. Since that time, incidence rates have been higher for African Americans than whites in both men and women (Figure 2).[6] This crossover may reflect racial differences in the trends in the prevalence of risk factors for colorectal cancer and/or greater access to and utilization of recommended screening tests by whites, resulting in detection and removal of precancerous polyps.
- Since the early 1980s, there has been increasing divergence in mortality trends between whites and African Americans (Figure 2). Before 1980, colorectal cancer mortality rates were lower in African American men than white men and similar among women of both races; however, since the early 1980s, mortality rates have been higher in African American men and women. The gap in mortality has widened over time so that in 2005 rates were about 48% higher in

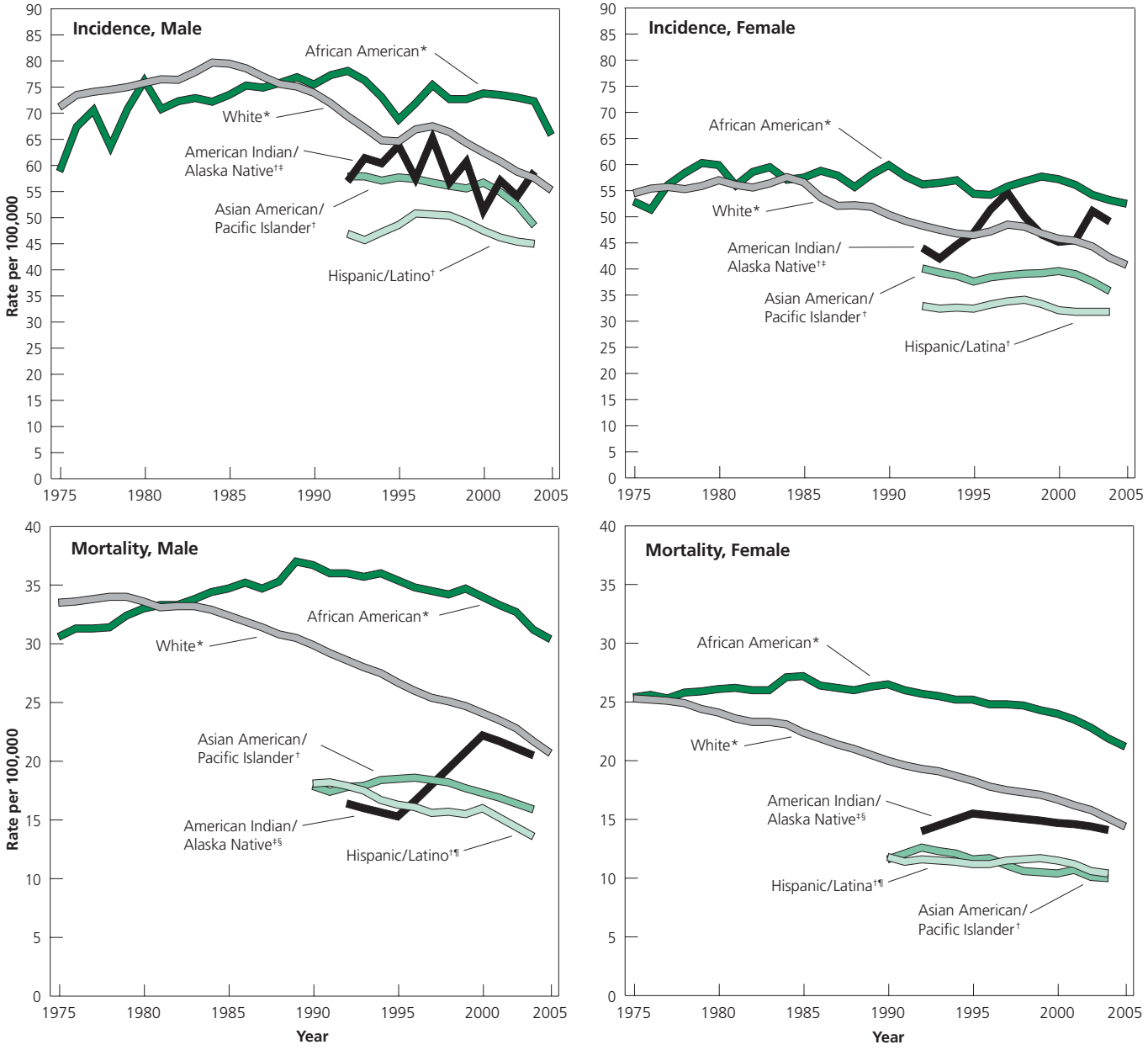
Table 1. Colorectal Cancer Incidence and Mortality Rates* by Race/Ethnicity and Sex, 2001-2005

	Incidence		Mortality	
Race/Ethnicity	Male	Female	Male	Female
African American	71.2	54.5	31.8	22.4
White	58.9	43.2	22.1	15.3
Asian American/Pacific Islander	48.0	35.4	14.4	10.2
Hispanic/Latino	47.3	32.8	16.5	10.8
American Indian/Alaska Native†	46.0	41.2	20.5	14.2
All persons	59.2	43.8	22.7	15.9

*Per 100,000, age-adjusted to the 2000 US Standard Population. †Incidence data based on the Contract Health Service Delivery Area (CHSDA).
Source: Surveillance, Epidemiology, and End Results (SEER) Program.[15]

African American men and women than in whites. This trend occurred during a period of substantial improvement in early detection and treatment for colorectal cancer. Several studies have documented that African American patients are more likely to be diagnosed after the disease has spread beyond the colon. In addition, African Americans with colorectal cancer are less likely than white patients to receive recommended surgical treatment and adjuvant therapy.[7]

Figure 2. Trends in Colorectal Cancer Incidence and Mortality Rates by Race/Ethnicity and Sex, 1975-2005



Rates are per 100,000 and age-adjusted to the 2000 US standard population. *Rates are 2-year moving averages. †Rates are 3-year moving averages. ‡Rates are based on Contract Health Service Delivery Areas (CHSDA), 624 counties comprising 54% of the US American Indian/Alaska Native population. §American Indian/Alaska Native mortality rates are averaged over time intervals 1990-1992, 1993-1995, 1996-2000, and 2001-2005. ¶Hispanic mortality rates exclude deaths from Connecticut, Maine, Maryland, Minnesota, New Hampshire, New York, North Dakota, Oklahoma, and Vermont due to incomplete data.

Sources: Incidence – Surveillance, Epidemiology, and End Results (SEER) Program[6,8]; Mortality – National Center for Health Statistics.[9]

- Incidence rates among Asian Americans/Pacific Islanders, Hispanics/Latinos, and American Indians/Alaska Natives are lower than those among whites.[8] Mortality rates are also lower, suggesting that differences in risk factors rather than access to screening or treatment may play an important role.[9]

Are there geographic differences in colorectal cancer?

Colorectal cancer rates in the US vary widely by geographic area for many reasons. Contributing factors include regional variations in risk factors and access to appropriate screening and treatment, which are influenced by socioeconomic factors, legislative policies, and proximity to medical services. For example, the prevalence of obesity – one of the established risk factors for colorectal cancer – ranges from 18% in Colorado to 32% in Mississippi.[10]

Table 2 shows colorectal cancer incidence and death rates per 100,000 for white and African American men and women by state. Compared to whites, African Americans have much larger state variations in both incidence and mortality. Among African American men, incidence rates range from 38.2 (per 100,000) in Rhode Island to 84.6 in Iowa; mortality rates range from 21.3 in Minnesota to 41.9 in Oklahoma.

Colorectal cancer mortality rates among whites generally tend to be lower in Western states, with the exception of Nevada, and higher in some Southern and many Midwestern states (Figure 3).[9] These patterns appear similar for African Americans in states for which there are sufficient data. However, as noted previously, colorectal cancer mortality rates are substantially higher among African Americans compared to whites; the highest age-adjusted state mortality rate among African American men is 41.9 (per 100,000) compared to 26.9 among white men.

How has the occurrence of colorectal cancer changed over time?

- Overall, colorectal cancer incidence rates have been declining rapidly in both men and women since 1998.[3] These decreases may reflect detection and removal of precancerous polyps.[11] They may also reflect the increased use of menopausal hormone therapy in women until 2002 and use of anti-inflammatory drugs, both of which appear to reduce the risk of colorectal cancer.[12-14]
- Over the past 10 years, incidence rates among males have been on the decline in every racial/ethnic population, with significant decreases in whites, African Americans, Hispanics, and Asian Americans/Pacific Islanders; among females, incidence rates have declined significantly in whites, African Americans, and Asian Americans/Pacific Islanders and stabilized in American Indians/Alaska Natives and Hispanics (Figure 2).[15]
- Over the past decade, mortality rates have steadily decreased among men and women of every racial/ethnic population with the exception of American Indians/Alaska Natives, in which rates have remained stable (Figure 2).[15]

Stage distribution and cancer survival

- Compared to whites, all other racial/ethnic groups are less likely to be diagnosed with colorectal cancer at the localized stage, when treatment is more successful (Table 3).
- Overall, only 40% of colorectal cancer patients diagnosed between 1996 and 2004 had localized-stage disease, for which the 5-year relative survival rate is 90%; 5-year survival rates for patients diagnosed at the regional and distant stage are 68% and 11%, respectively (Figure 4).[15]
- Between the mid-1970s and 1996-2004, the 5-year relative survival rate for colorectal cancer increased from 51% to 65%. A significant advance in colorectal cancer treatment in the late 1980s was the introduction of 5-fluoroucil-based adjuvant chemotherapy for resectable (operable) stage III colon cancer, which reduced mortality by as much as 30%.[16]
- After accounting for differences in age and stage of diagnosis, African American men and women and American Indian/Alaska Native women have a greater probability of dying from colorectal cancer once they are diagnosed compared to non-Hispanic whites (Table 4). Factors that may contribute to disparities in survival by race and ethnicity include differences in access to early detection, timely and high-quality treatment and supportive care, and comorbidities (other illnesses).[17] Studies have found that African Americans are less likely than whites to receive recommended surgery, adjuvant chemotherapy, and

Table 2. Colorectal Cancer Incidence and Mortality Rates* by Race, Sex, and State, 2001-2005

	White				African American			
	Male		Female		Male		Female	
	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality
Alabama	60.7	21.7	40.1	13.8	68.4	34.2	48.8	20.8
Alaska	56.5	18.5	37.6	12.9	†	†	†	†
Arizona‡	--	19.6	--	13.7	--	27.1	--	19.7
Arkansas	58.1	24.0	42.3	15.9	67.8	34.8	52.3	24.8
California	53.8	19.8	39.5	14.2	64.4	29.6	51.0	23.0
Colorado	51.4	20.0	40.8	15.0	45.8	24.7	40.8	20.6
Connecticut	65.4	20.8	47.4	15.2	61.1	24.5	52.5	20.0
Delaware	61.2	23.0	45.1	16.2	68.6	32.5	49.5	21.1
Dist. of Columbia‡	--	17.1	--	9.8	--	33.0	--	22.1
Florida	57.2	19.7	42.5	13.6	62.3	28.6	49.9	20.3
Georgia	58.2	21.0	39.7	13.7	69.6	30.1	52.5	22.7
Hawaii	60.2	20.3	43.2	12.3	†	†	†	†
Idaho	52.2	18.1	38.5	13.5	†	†	†	†
Illinois	66.9	24.8	46.8	16.3	78.2	36.7	59.8	25.4
Indiana	63.6	25.2	46.4	16.6	73.3	35.2	57.0	23.6
Iowa	67.0	23.6	50.3	16.5	84.6	38.5	52.8	†
Kansas‡	--	21.9	--	15.8	--	36.3	--	26.4
Kentucky	69.8	26.3	50.6	18.3	81.2	33.2	65.5	30.3
Louisiana	68.3	26.2	45.4	15.6	77.4	36.9	57.4	25.1
Maine	67.5	22.8	49.0	16.9	†	†	†	†
Maryland‡	--	22.8	--	15.6	--	32.1	--	22.6
Massachusetts	68.0	23.5	48.5	16.5	55.1	23.6	41.1	18.9
Michigan	58.7	21.5	43.9	15.2	78.0	31.8	57.4	21.8
Minnesota	57.1	19.8	42.5	14.6	56.8	21.3	37.0	20.6
Mississippi‡	--	23.1	--	14.9	--	33.0	--	25.5
Missouri	64.0	23.8	45.3	16.2	75.8	32.8	57.0	23.6
Montana	54.4	20.1	40.7	13.6	†	†	†	†
Nebraska	68.0	23.2	47.4	16.9	69.7	39.1	54.0	21.2
Nevada	57.2	25.1	43.2	16.8	62.1	28.1	46.5	20.2
New Hampshire	61.0	23.2	46.3	16.1	†	†	†	†
New Jersey	68.2	24.8	49.6	17.7	74.3	30.8	54.3	22.7
New Mexico	52.2	20.8	36.2	14.0	†	†	33.8	†
New York	63.9	23.1	47.2	16.4	60.5	26.3	46.7	18.4
North Carolina‡	--	20.8	--	14.3	--	30.0	--	21.3
North Dakota	68.1	22.0	43.9	16.2	†	†	†	†
Ohio‡	--	24.2	--	17.0	--	34.6	--	23.7
Oklahoma	61.6	23.7	43.9	15.6	67.6	41.9	50.5	23.5
Oregon	53.3	21.0	40.8	15.1	45.2	†	49.8	†
Pennsylvania	67.7	25.1	48.9	16.9	73.7	31.3	52.9	22.6
Rhode Island	69.1	23.4	47.3	17.1	38.2	†	36.6	†
South Carolina	60.2	21.3	42.1	14.3	74.9	33.4	52.6	21.1
South Dakota	62.9	22.9	45.9	15.6	†	†	†	†
Tennessee‡	--	23.5	--	15.3	--	38.7	--	26.5
Texas	58.0	21.0	38.9	13.9	75.7	35.7	55.5	24.0
Utah	46.6	15.9	34.5	11.8	†	†	†	†
Vermont‡	--	23.2	--	16.6	--	†	--	†
Virginia‡	--	21.9	--	14.4	--	33.4	--	22.6
Washington	54.0	19.9	40.9	14.4	57.3	22.8	44.7	22.0
West Virginia	71.1	26.9	51.3	18.6	58.1	35.5	68.0	29.9
Wisconsin‡	--	21.7	--	14.9	--	32.4	--	18.4
Wyoming	48.8	19.7	43.5	17.3	†	†	†	†

*Rates are per 100,000 and age adjusted to the 2000 US standard population. †Fewer than 25 cases or deaths. ‡This state's registry did not submit incidence data to the North American Association of Central Cancer Registries (NAACCR) for 2001-2005.

Source: Incidence – NAACCR, 2008. Mortality – US Mortality Data 1960-2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2008.

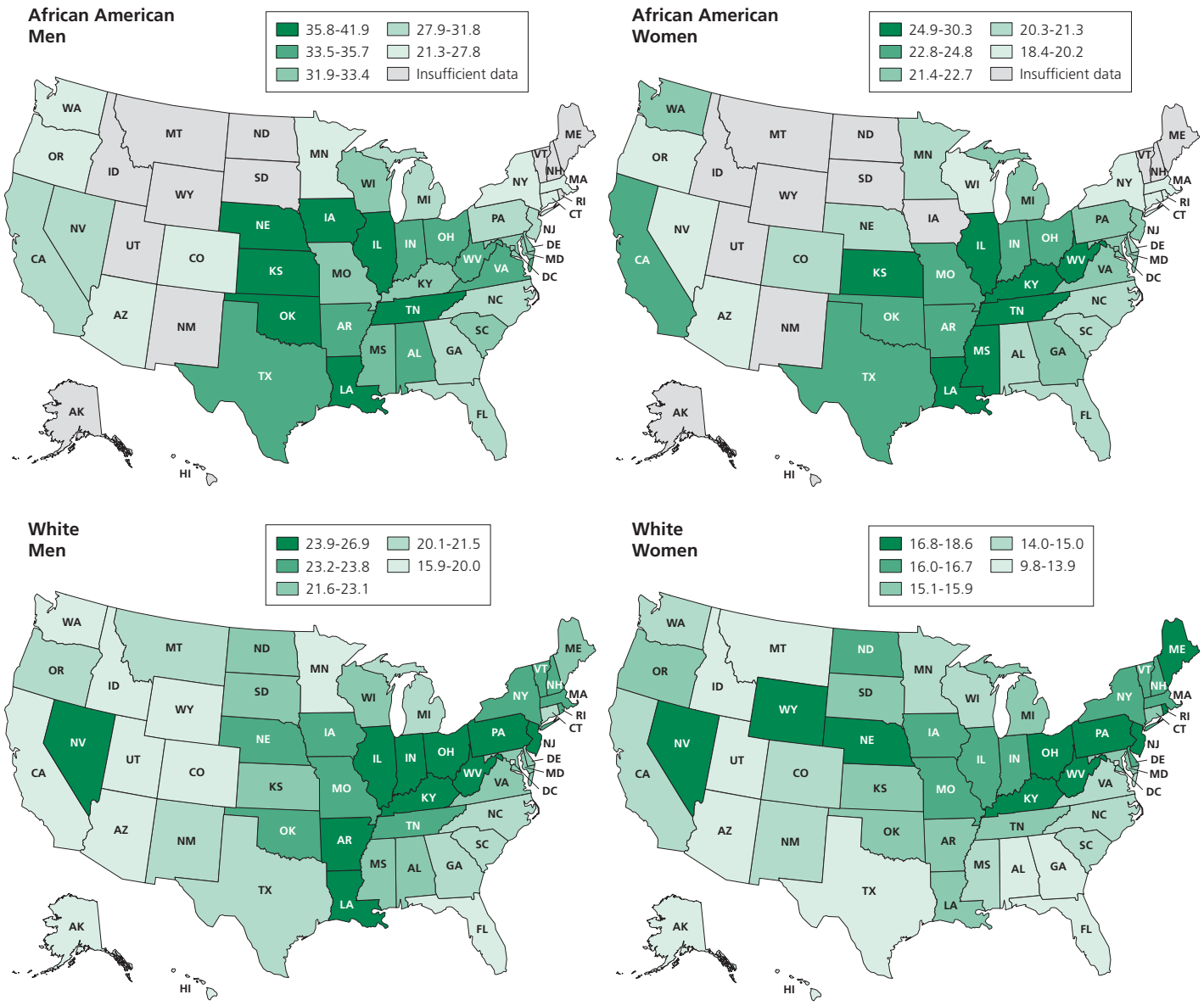
radiation treatments after a cancer diagnosis.[18] Racial disparities in survival between African American and white colorectal cancer patients are greatly diminished after accounting for differences in treatment and socioeconomic factors.[19]

- Survival disparities exist within, as well as between, racial and ethnic groups for many of the same reasons listed above. For example, among African Americans, the five-year relative survival rate for colorectal cancer is 30% higher among patients who are privately insured compared to those without health insurance (Figure 5).[20]

What are the known risk factors for colorectal cancer?

There are many known factors that increase or decrease the risk of colorectal cancer; some of these factors are modifiable and others are not (Table 5). A family history

Figure 3. Colorectal Cancer Death Rates* by State, Race, and Sex, US, 2001-2005



*Per 100,000 and age adjusted to the 2000 US Standard Population. **Note:** Statistic not displayed for states with fewer than 20 deaths.
Source: National Center for Health Statistics.

of colorectal cancer and a personal history of colorectal cancer, colorectal polyps, or chronic inflammatory bowel disease are major non-modifiable risk factors for colorectal cancer. The American Cancer Society and other organizations recommend that some people at increased or high risk for colorectal cancer because of these conditions begin screening at an earlier age.[21] For more information on recommended colorectal cancer screening for individuals with these risk factors, please see page 14. Major modifiable risk factors that have been associated with an increased risk of colorectal cancer in epidemiologic studies include physical inactivity, obesity, and high consumption of red or processed meats.

Table 3. Stage Distribution (%) of Colorectal Cancer by Race/Ethnicity, 1996-2004

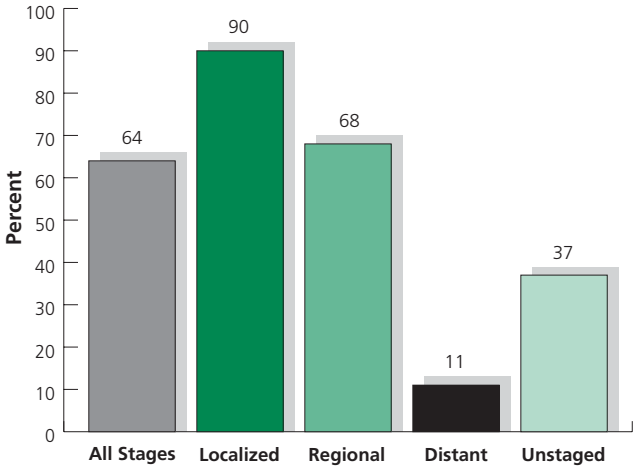
Race/Ethnicity	Local	Regional	Distant	Unstaged
Non-Hispanic white	41	36	18	6
Hispanic white	37	36	20	6
African American	36	34	23	7
American Indian/Alaska Native	36	38	23	3
Asian American/Pacific Islander	39	39	18	4

Source: Surveillance, Epidemiology, and End Results (SEER) Program.[5]

Heredity and medical history

- People who have a first-degree relative (parent, sibling, or offspring) who has had colorectal cancer have about twice the risk of developing the disease compared to individuals with no family history.[22,23] The risk increases even further if the relative was diagnosed at a young age or if there is more than one affected relative.[22] About 20% of all colorectal cancer patients have a close relative who has been diagnosed with the disease.[4]
- About 5%-10% of patients with colorectal cancer have an inherited genetic alteration that causes the cancer.[4] One such disorder is familial adenomatous polyposis (FAP); a second is hereditary nonpolyposis colorectal cancer (HNPCC), also known as Lynch syndrome.
- Accurate identification of families with a history of colorectal cancer and/or a genetic abnormality that causes colorectal cancer is important so testing can begin at an early age.

Figure 4. Five-Year Relative Survival Rates for Colorectal Cancer by Stage at Diagnosis, 1996-2004



Source: Surveillance, Epidemiology, and End Results (SEER) Program.[15]

A personal history of colorectal cancer, colorectal polyps, or chronic inflammatory bowel disease

- People who have had colorectal cancer are more likely to develop new cancers in other areas of the colon and rectum, even if the first cancer has been completely removed. The risk of a second cancer is much greater if the first cancer was diagnosed at age 60 or younger.
- People who have had one or more adenomatous polyps have an increased risk of colorectal cancer. This is especially true if the polyps were large or if there was more than one.[1]
- People who have a chronic inflammatory bowel disease of significant duration and involving the entire bowel have an increased risk of developing colorectal cancer.[24] This includes conditions such as ulcerative colitis and Crohn disease, in which the colon is inflamed over a long period of time.

Other risk factors

Physical inactivity

Studies consistently report that regular physical activity is associated with a lower risk of colon cancer.[25,26] Based on these studies and on other health benefits of regular physical activity, the American Cancer Society

Table 4. Five-Year Colorectal Cancer-Specific Survival and Relative Risk of Death by Race/Ethnicity and Sex

	Cause-Specific Survival* (%)		Adjusted Relative Risk† (95% CI) of Death	
Race/Ethnicity	**Male**	**Female**	**Male**	**Female**
Non-Hispanic white	63	63	1.00	1.00
Hispanic white	60	63	1.05 (0.99-1.11)	1.05 (0.99-1.11)
African American	53	55	1.26 (1.20-1.32)	1.18 (1.13-1.23)
Asian American/Pacific Islander	66	68	0.95 (0.90-1.00)	0.90 (0.85-0.96)
American Indian/Alaska Native	56	57	1.14 (0.95-1.35)	1.38 (1.16-1.64)

*Cause-specific survival is the probability of not dying from colorectal cancer within 5 years after diagnosis. It does not account for stage and age at diagnosis. Patients were diagnosed from 1996-2004. **Source**: Ries LAG et al.[5]

†Relative risk estimates that controlled for age and tumor stage at diagnosis were calculated to compare probability of death from colorectal cancer within 5 years after diagnosis between racial/ethnic groups; 95% confidence intervals represent the range in which we are 95% confident the true value falls. Wider confidence intervals generally reflect smaller sample sizes. Patients were diagnosed from 1992-2000. **Source:** Jemal et al.[18]

recommends engaging in at least moderate activity for 30 minutes or more on 5 or more days per week. Forty-five to 60 minutes of intentional physical activity is preferable. Epidemiologic studies find that:

- High levels of physical activity may decrease the risk of colon cancer among men and women by as much as 50%.[27]
- According to most studies, the more physical activity people engage in, the lower their risk of colon cancer. In men and women, both recreational and occupational physical activity decrease risk.[25,28]
- Sedentary people who become active later in life can also reduce their risk.[29]
- Even moderate physical activities, such as brisk walking or stair climbing, are associated with lower risk of colon cancer.[27]

Overweight and obesity

Being overweight or obese is associated with higher risk of colorectal cancer in men and women, with stronger associations more consistently observed in men than in women.[30] Overweight and obesity increase risk of colorectal cancer even when physical activity is accounted for.[31,32] Abdominal obesity (measured by waist size) may be a more important risk factor for colon cancer than overall obesity in both men and women.[33-35]

Diabetes

Many studies have found an association between diabetes and increased risk of colorectal cancer in both men and women.[36,37] Adult onset (Type 2) diabetes, the most common type of diabetes, and colorectal cancer share similar risk factors, including physical inactivity and obesity. However, a positive association between diabetes and colorectal cancer has been found in studies that accounted for physical activity, body mass index, and waist circumference.[38]

Diet

Studies of the relationship between diet and colorectal cancer suggest that following the Society's nutritional recommendations (eat a variety of vegetables and fruits, choose most foods from plant sources, and limit intake of red and processed meats) and consuming the recommended levels of calcium will help reduce the risk of developing colorectal cancer and other major diseases.[39,40] Epidemiologic studies find that:

- People whose diets include a high amount of red and processed meat are at increased risk of colorectal cancer. Several studies, including one by the American Cancer Society, have found that high consumption of red and/or processed meat increases the risk of both colon and rectal cancer.[41,42]
- Consumption of milk and calcium probably decreases the risk of developing colorectal cancer.[39,40,43]
- The relationship between vegetable, fruit, and fiber consumption and colorectal cancer is not completely clear. Some studies find no relationship, while others suggest that consumption of fruits and vegetables may protect against colorectal cancer.[27,44] Some studies suggest that people with very low fruit and vegetable intakes are at higher risk of developing colorectal cancer.[45,46] There are numerous reasons to eat a diet rich in a variety of fruits, vegetables, and enriched whole grains in addition to reducing the risk of colorectal cancer, including decreased risk of cardiovascular disease.[47]
- Vitamin D may lower the risk of developing colorectal cancer, but study results have been inconsistent.[39,40]

Table 5. Summary of Selected Risk Factors for Colorectal Cancer

		Relative Risk*
Factors that increase risk		
Heredity and medical history		
• Family history		
1 first-degree relative[23]		2.2
> 1 first-degree relative[23]		4
Relative with diagnosis before age 45[22]		3.9
• Inflammatory bowel disease[24]		
Crohn disease	colon	2.6
Ulcerative colitis	colon	2.8
Ulcerative colitis	rectum	1.9
Other factors		
• Obesity (per 5-unit increase in BMI)[30]		
Men	colon	1.3
	rectum	1.1
Women	colon	1.1
• Alcohol consumption[55]		1.1
• Red meat consumption[41]		1.3
• Diabetes[37]		1.3
• Processed meat consumption[41]		1.2
Factors that decrease risk		
• Milk consumption (<70 vs. >250 g/day)[43]		0.9
• Calcium (includes supplements)[43]		0.8
• Physical activity (colon)[25]		
Men		0.8
Women		0.7

*Relative risk compares the risk of disease among people with a particular exposure to the risk among people without that exposure. If the relative risk is more than 1.0, then risk is higher among exposed than unexposed persons. Relative risks less than 1.0 reflect an inverse association between a risk factor and a disease, or a protective effect.

BMI=Body mass index, calculated as weight in kilograms divided by height in meteres squared.

- High garlic consumption may be associated with a reduced risk of colorectal cancer.[39]

Smoking

There is consistent evidence that smoking increases the development of adenomatous polyps (precursor lesions for colorectal cancer), particularly more aggressive adenomas.[48] Some studies suggest that long-term tobacco smoking increases the risk of colorectal cancer, with associations stronger for rectal than for colon cancer.[49-52] However, neither the International Agency for Research on Cancer nor the Surgeon General has classified smoking as a cause of colorectal cancer.[53,54]

Alcohol intake

Colorectal cancer has been linked to moderate use of alcohol (30 grams, or about two drinks per day).[55]

Medications and dietary supplements

Accumulating research suggests that aspirin-like drugs, postmenopausal hormones, multivitamins containing folic acid, and calcium supplements may help prevent colorectal cancer.

- **Aspirin:** Extensive evidence suggests that regular use of aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDS) is associated with lower risk of colorectal cancer.[56] Because of the potential side effects of stomach ulcers from traditional NSAIDs or of heart attacks from selective COX-2 inhibitors, the American Cancer Society does not currently recommend use of these drugs for cancer prevention. However, people who are taking aspirin (usually one

Current Recommendations for the Prevention of Colorectal Cancer

Screening tests that detect and remove adenomatous polyps are the most reliable method of preventing colorectal cancer. Other approaches to reduce risk are specified in the current American Cancer Society recommendations for nutrition and physical activity.[40]

1. Get screened regularly.

2. Maintain a healthy weight throughout life.

3. Adopt a physically active lifestyle.

4. Consume a healthy diet with an emphasis on plant sources.

- Choose foods and beverages in amounts that help achieve and maintain a healthy weight.
- Eat 5 or more servings of a variety of vegetables and fruits each day.
- Choose whole grains in preference to processed (refined) grains.
- Limit your consumption of processed and red meats.

5. If you drink alcoholic beverages, limit consumption.

baby aspirin daily) to prevent heart attacks, or NSAIDs for chronic arthritis, may lower their risk of colorectal cancer as a side benefit.

- **Postmenopausal hormones:** There is substantial evidence that women who use postmenopausal hormones have lower rates of colorectal cancer than those who do not. This effect is seen especially in women who currently or have recently used postmenopausal hormones.[57] However, use of postmenopausal hormones increases risk for breast cancer and cardiovascular disease.[13]
- **Dietary supplements:** Food is the best source of vitamins and minerals; however, several studies have reported that calcium intake, including that from supplements, is associated with a reduced risk of precancerous polyps and colorectal cancer.[43] Recommended calcium levels are 1,000 mg/day for people aged 19 to 50 and 1,200 mg/day for those older than 50 years. [40]

At present, the American Cancer Society does not recommend any medications or supplements to prevent colorectal cancer because of uncertainties about their effectiveness, appropriate dose, and potential toxicity.

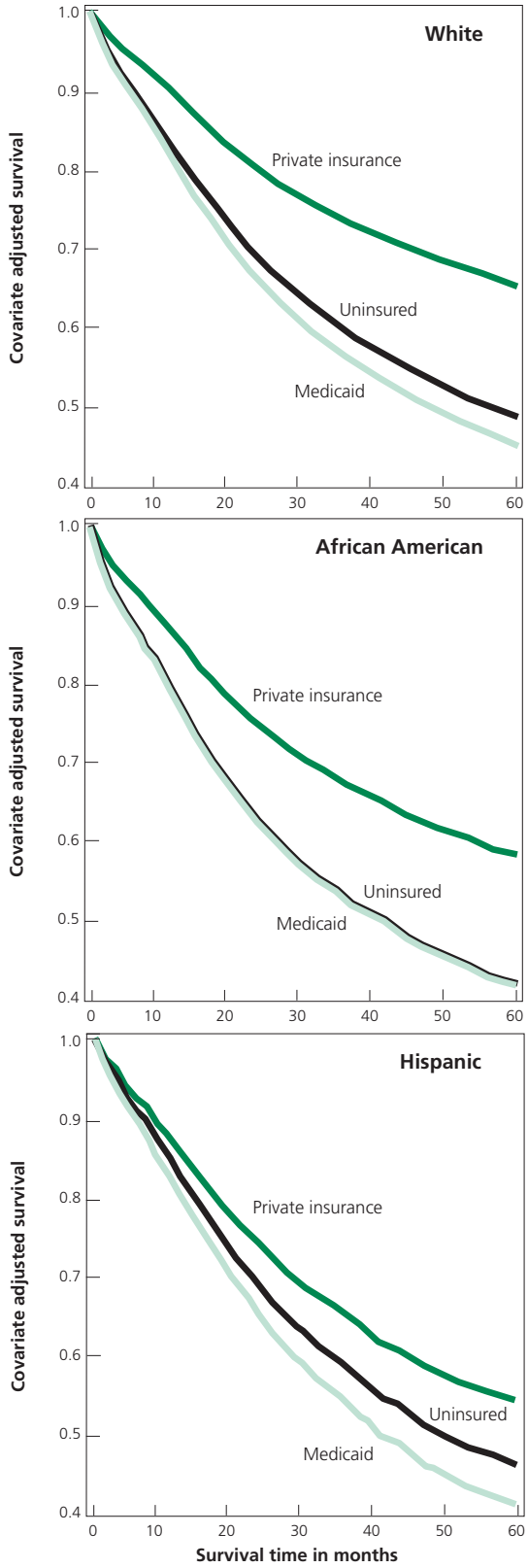
Colorectal cancer screening

The goal of screening for colorectal cancer is the detection and removal of adenomatous polyps, which can decrease the incidence of colorectal cancer, and the diagnosis of early-stage cancers. Screening reduces mortality both by decreasing incidence and by detecting cancers at earlier, more treatable stages.[21]

Recommended options for colorectal cancer screening

For more than two decades, the American Cancer Society and other organizations have independently developed and promoted colorectal cancer screening guidelines. Recently, the American Cancer Society, the American College of Radiology, and the US Multi-Society Task Force on Colorectal Cancer (a consortium representing the American College of Gastroenterology, the American Society of Gastrointestinal Endoscopy, the American Gastroenterological Association, and representation from the American College of Physicians) all collaborated on updated consensus guidelines that were released in March 2008.[21] The leadership of these organizations believes that a single set of jointly developed and promoted recommendations will highlight their importance and promote evidence-

Figure 5. Colorectal Cancer Survival by Race/Ethnicity and Insurance Status



*Patients diagnosed from 1999-2000; excluded from the analysis: unknown stage; race/ethnicity other than white, African American, or Hispanic; missing information on stage, age, race/ethnicity, or Zip code.

Source: National Cancer Database.

based practice. The new joint guidelines draw a distinction between screening tests that primarily detect cancer and those tests that are more likely to detect both cancer and adenomatous polyps. The updated recommendations emphasize that cancer prevention should be the primary goal of colorectal cancer screening. To achieve this goal, exams that are designed to detect both early cancer and precancerous polyps should be encouraged if resources are available and patients are willing to undergo an invasive test. The higher likelihood of polyp detection with the use of these tests substantially increases opportunities for removal of polyps and the associated prevention of colorectal cancer.

The following options are recommended for colorectal cancer screening in men and women aged 50 and older at average risk (summarized in Table 6):

Tests that are more likely to detect both adenomatous polyps and cancer

Flexible sigmoidoscopy: A slender, flexible, hollow, lighted tube is inserted through the rectum into the colon by a trained examiner to view the inside of the rectum and the lower portion of the colon (sigmoid colon). The sigmoidoscope is about 2 feet long (60 cm) and can visualize clearly the lower one-third of the colon.[21] Simple bowel cleansing, usually with enemas, is necessary to prepare the colon, and the procedure is typically performed without sedation. If there is a polyp or tumor present, the patient is referred for a colonoscopy so that the colon can be examined further. Sigmoidoscopy, followed by colonoscopy if a polyp or tumor is found, can identify 70% to 80% of individuals with colorectal cancer and is associated with a 60% to 80% reduction in colorectal cancer mortality for the area of the colon within its reach.[58-60]

Colonoscopy: Like sigmoidoscopy, this procedure allows for direct visual examination of the colon and rectum. A colonoscope is similar to the sigmoidoscope, but it is a much longer, more complex instrument, allowing the doctor to view the entire colon and remove polyps if present. Before undergoing a colonoscopy, patients are instructed to take special laxative agents to completely cleanse the colon. Sedation is usually provided during the examination to minimize discomfort.[21] If a polyp is found, the physician may remove it by passing a wire loop through the colonoscope to cut the polyp from the wall of the colon using an electric current. Findings from the National Polyp Study suggest that periodic colonoscopy could prevent 76% to 90% of colon cancers.[61,62] Studies show that this method is the most sensitive for the detection of colorectal cancer or adenomatous polyps.[63] Colorectal cancer screening by colonoscopy has a number of advantages: it is highly sensitive; examines the entire colon; and allows for screening, diagnosis, and removal of polyps in a single visit. Colonoscopy also has the longest rescreening interval of all forms of testing; if normal, the exam does not need to be repeated for 10 years. However, colonoscopy also has a higher risk of complications than other forms of testing, including bowel tears or bleeding, especially when a polyp is removed.[21]

Barium enema with air contrast (DCBE): This procedure, which allows complete radiological examination of the colon, is also called a double-contrast barium enema.[21] Barium sulfate is introduced into the colon through the rectum and is allowed to spread throughout to partially fill and open the colon. Air is then inroduced to expand the colon and increase the quality of x-rays that are taken. This method is less sensitive than colonoscopy for visualizing small polyps or cancers. If a polyp or other abnormality is seen, the patient should be referred for a colonoscopy so that the colon can be examined further. There has been a decline in the use of DCBE for colorectal cancer screening that is expected to continue due to a number of factors, including the increased availability of colonoscopy, changing patient and physician preferences, and smaller numbers of radiologists adequately trained to perform this procedure.[21]

Computed tomographic colonography (CTC): Also referred to as virtual colonoscopy, this imaging procedure was introduced in the 1990s and results in detailed, cross-sectional, 2- or 3-dimensional views of the entire colon and rectum with the use of a special x-ray machine linked to a computer.[21] A small, flexible tube is inserted into the rectum in order to allow air or carbon dioxide to open the colon; then the patient passes through the CT scanner, which creates multiple images of the interior colon. Although a full bowel cleansing is necessary for a successful examination, CTC does not require sedation, is less invasive than other screening techniques, requires no recovery time, and typically takes approximately 10 to 15 minutes to complete. Patients with polyps or other abnormal results are referred for colonoscopy, sometimes on the same day in order to alleviate the necessity of a

Table 6. Considerations When Deciding with Your Doctor Which Test is Right for You

Test	Benefits	Performance & Complexity*	Limitations	Test Time Interval	Cost Range
Flexible Sigmoidoscopy	• Fairly quick • Few complications • Minimal bowel preparation • Minimal discomfort • Does not require sedation or a specialist	*Performance* High for lower one-third of the colon *Complexity* Intermediate	• Views only lower one-third of colon • Cannot remove large polyps • Small risk of infection or bowel tear • Slightly more effective when combined with annual fecal occult blood testing • Colonoscopy needed if abnormalities are detected	5 years	Intermediate: $150-$300
Colonoscopy	• Examines entire colon • Can biopsy and remove polyps • Can diagnose other diseases • Required for abnormal results from all other tests	*Performance* Highest *Complexity* Highest	• Can miss some polyps and cancers • Full bowel preparation needed • Can be expensive • Sedation of some kind usually needed, necessitating a chaperone • Patient may miss a day of work • Highest risk of bowel tears or infections, compared to other tests	10 years	High: at least $1,000 in most settings
Double Contrast Barium Enema	• Can usually view entire colon • Few complications • No sedation needed	*Performance* High *Complexity* High	• Can miss some small polyps and cancers • Full bowel preparation needed • Some false positive test results • Cannot remove polyps • Exposure to low-dose radiation • Colonoscopy necessary if abnormalities are detected	5 years	Intermediate: $300-$400
Computed Tomographic Colonography	• Examines entire colon • Fairly quick • Few complications • No sedation needed • Noninvasive	*Performance* High *Complexity* Intermediate	• Can miss some polyps and cancers • Full bowel preparation needed • Cannot remove polyps • Exposure to low-dose radiation • Colonoscopy necessary if abnormalities are detected	5 years	High: at least $1,000 in most settings; not paid for by most insurance
Fecal Occult Blood Test	• No bowel preparation • Sampling is done at home • Low cost • Noninvasive	*Performance* Intermediate for cancer *Complexity* Lowest	• Requires multiple stool samples • Will miss most polyps and some cancers • May produce false-positive test results • Pre-test dietary limitations • Slightly more effective when combined with a flexible sigmoidoscopy every 5 years • Colonoscopy necessary if abnormalities are detected	Annual	Low: under $30
Stool DNA Test	• No bowel preparation • Sampling is done at home • Requires only a single stool sample • Noninvasive	*Performance* Intermediate for cancer *Complexity* Low	• Will miss most polyps and some cancers • High cost compared to other stool tests • New technology with uncertain interval between testing • Colonoscopy necessary if abnormalities are detected	Uncertain	Intermediate: $350; not paid for by most insurance

*Complexity involves patient preparation, inconvenience, facilities and equipment needed, and patient discomfort.

second bowel preparation. Studies have shown that CTC detects about 96% of invasive colorectal cancer and has similar sensitivity compared with colonoscopy for large polyps.[21]

Tests that are primarily effective at detecting cancer

Some precancerous polyps may be detected by these tests, providing an opportunity to remove them and prevent colorectal cancer, but the opportunity for

prevention is both limited and incidental and cannot be the primary goal of colorectal cancer screening with these tests.

Fecal occult blood test (FOBT): Cancerous tumors and some large polyps bleed intermittently into the intestine. The FOBT can detect very small quantities of blood in stool. The FOBT test kit is obtained from a health care provider for use at home. Bleeding from colorectal cancer may be intermittent or undetectable, so accurate test results require annual testing that consists of collecting 2 to 3 samples (depending on the product) from consecutive bowel movements. There are two types of FOBT available – guaiac-based tests and immunochemical-based tests. For guaiac-based FOBT (gFOBT), individuals are instructed to avoid nonsteroidal anti-inflammatory drugs, vitamin C, citrus juices, and red meat for 3 days prior to the test. Typically, six samples from three consecutive bowel movements are collected by smearing the stool sample thinly on a special card.[21] The second type of stool blood test is the fecal immunochemical test (FIT). This test may be more convenient for some individuals because it does not require special dietary restrictions and may require fewer stool samples to be collected. Upon completing either of these tests, patients return the kit to their doctor or to a laboratory for evaluation. Patients who have a positive gFOBT or FIT are referred for a colonoscopy to rule out the presence of polyps or cancer. Studies have shown that periodic use of this screening method reduces the risk of death from colorectal cancer by 15% to 33%.[21] In addition, FOBT has also been shown to decrease by 20% the incidence of colorectal cancer by detecting large polyps, resulting in their subsequent removal by colonoscopy.[64]

Stool DNA (sDNA) test: This new method of screening is the result of increasing knowledge regarding the molecular properties of cancer. Cancerous tumors and large polyps shed cells that contain altered DNA into the large bowel. The sDNA test detects these gene mutations in stool samples. Like FOBT, a test kit is obtained from a health care provider for specimen collection at home. Although only a one-time collection is necessary, adequate evaluation requires the entire stool specimen (30 g minimum). Collection kits are designed to facilitate ease of collection and mailing, and include a specially designed cooling pack necessary for temperature control during shipping. Patients with a positive test result are referred for a colonoscopy. One study found that the sDNA test currently available detects 52% of prevalent colorectal cancers.[21] Based on current evidence, the appropriate time interval for repeat testing is uncertain.[21]

Any of the 6 recommended options is useful in screening for colorectal cancer in average-risk adults. Each of these tests has strengths and limitations related to accuracy, potential for prevention, costs, and risks (Table 6). Positive results from any other option should be followed with a colonoscopy for more complete diagnostic evaluation. When choosing a screening test, patients should be given information about each test and should engage in a shared decision-making process with the doctor based on the patient's health, medical history, and personal preference.

Often during the course of an exam in a physician's office, a single stool sample is also collected and placed on an FOBT card for further examination. The office-based, single-sample FOBT is not a recommended screening test for colorectal cancer because this test performs poorly in its ability to detect the disease. In one large study, this form of testing detected only 5% of precancerous polyps and cancers that were revealed by subsequent colonoscopy.[21]

"Toilet bowl tests" consisting of strips of paper to be dropped into the toilet water with your stool are sold in drugstores and other retail outlets, and are often promoted as a type of fecal occult blood test. These tests have not been evaluated in the types of rigorous clinical studies done on the guaiac-based FOBT and the FIT, and are not recommended for colorectal cancer screening by the American Cancer Society or any other major medical organization.

Individuals at high risk for colorectal cancer

Some people who are at increased risk of colorectal cancer because of family history or certain medical conditions (see page 8) should begin colorectal cancer screening before age 50. Colonoscopy is the only recommended screening method for individuals in these increased and high-risk groups. Recommendations regarding age to initiate screening and rescreening intervals may differ based on individual circumstances, so individuals with these risk factors should discuss screening with their health care provider. For additional information on colorectal cancer screening in high-risk individuals, see Levin et al.[21]

Table 7. Colorectal Cancer Screening Among Adults Aged 50 and Older, NHIS 2005

Characteristic	% Fecal Occult Blood Test*	% Sigmoidoscopy or Colonoscopy†	% Combined Endoscopy/FOBT‡
Gender			
Male	12.7	44.6	48.2
Female	11.7	42.0	45.8
Age (years)			
50-64	10.6	37.7	41.8
65 and older	13.8	49.5	52.7
Race/Ethnicity			
White (non-Hispanic)	12.6	45.8	49.5
African American (non-Hispanic)	10.3	36.9	40.1
Hispanic/Latino	9.4	28.3	31.9
American Indian/Alaska Native§	5.8	31.7	34.4
Asian#	10.8	28.3	33.8
Education (years)			
11 or fewer	8.9	32.4	35.0
12	11.2	39.9	44.0
13 to 15	13.8	46.3	50.5
16 or more	15.3	53.7	57.3
Health Insurance Coverage			
Yes	3.1	45.0	48.8
No	12.7	13.1	14.9
Immigration			
Born in US	12.5	44.7	48.5
Born in US Territory	12.8	43.4	48.1
In US less than 10 years	2.6	13.6	15.7
In US 10 years or more	9.1	31.3	34.0
Total	12.1	43.1	46.8

Percentages are age-adjusted to the 2000 US standard population.

*A home fecal occult blood test within the past year. †A sigmoidoscopy within the past 5 years or a colonoscopy within the past 10 years. ‡Either a fecal occult blood test within the past year, sigmoidoscopy within the past 5 years or a colonoscopy within the past 10 years. §Estimates should be interpreted with caution because of the small samples sizes. #Does not include Native Hawaiians or other Pacific Islanders.

Source: National Health Interview Survey Public Use Data File 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

Use of screening for colorectal cancer

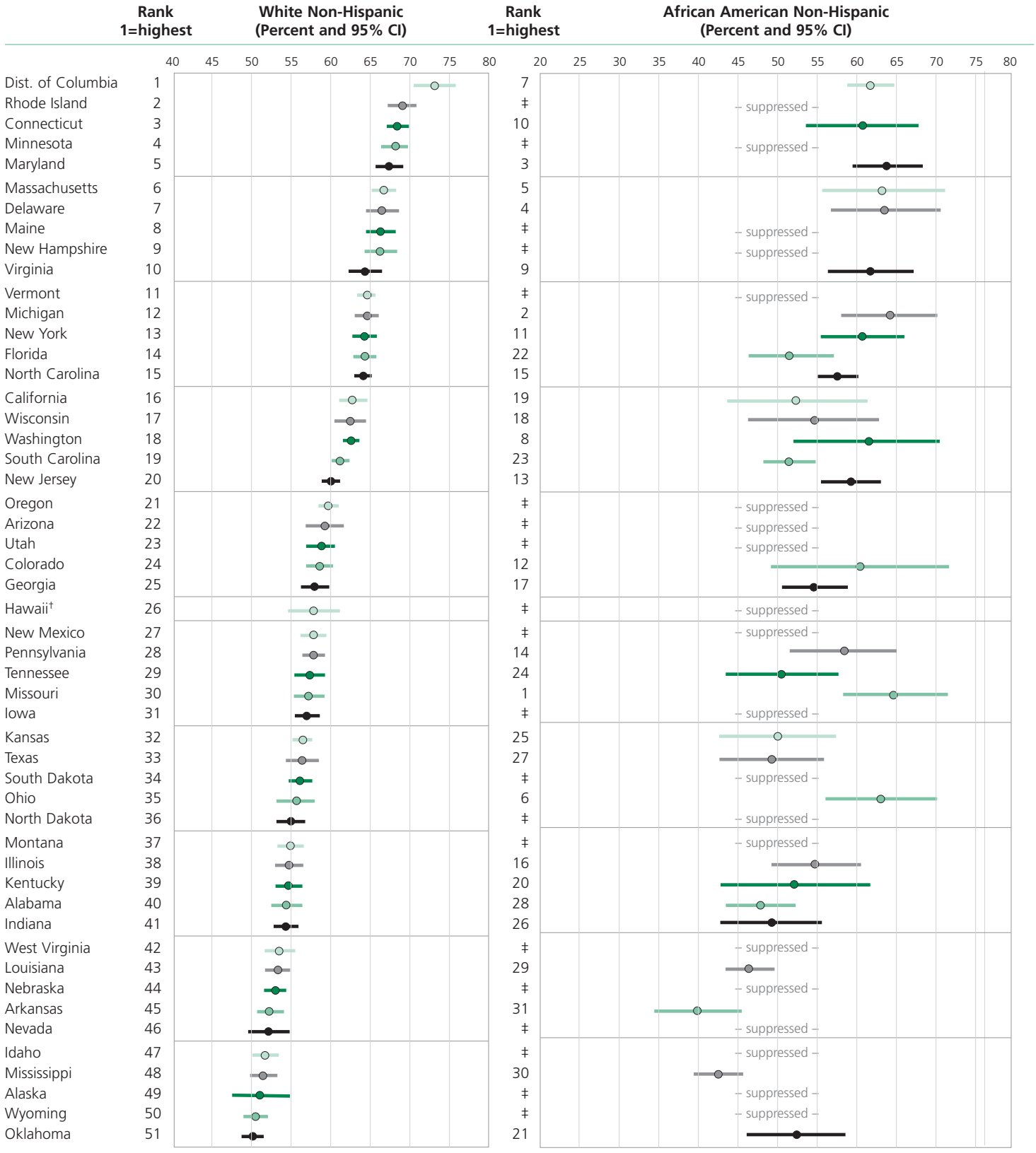
Prevalence of colorectal cancer screening

Despite the evidence supporting the effectiveness of colorectal screening and the availability of various screening tests, half of the US population aged 50 and older has not been tested.[65] According to 2005 estimates of colorectal cancer screening from the National Health Interview Survey, 12.1% of adults aged 50 and older used a FOBT at home in the past year; 43.1% had an endoscopy test (either flexible sigmoidoscopy within the past 5 years or colonoscopy within the past 10 years); and 46.8% had either FOBT in the past year, sigmoidoscopy in the past 5 years, or colonoscopy in the past 10 years.[10,66] The prevalence rates are lower among people aged 50-64 and especially lower among individuals who are non-white, have fewer years of education, lack health insurance coverage, and are recent immigrants (Table 7).

The proportion of adults 50 and older who follow screening recommendations varies by state (Figures 6 and 7).[67,68]

- Among non-Hispanic whites 50 and older, the percentage of the population that has had a recent

Figure 6. Percent of Adults Aged 50 and Older Who Had a Recent Colorectal Cancer Screening Test* by Race and State, 2004, 2006



*Either a fecal occult blood test in the preceding year or a sigmoidoscopy or colonoscopy within the preceding 10 years. †Data is only for the year 2006, as this state did not participate in the 2004 BRFSS survey. ‡Sample size is insufficient (<100) to provide a stable estimate.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tapes 2004 and 2006, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005 and 2007.

test (either endoscopy or FOBT) ranges from 50.1% in Oklahoma to 73.4% in the District of Columbia.

- Among states with adequate data on colorectal cancer screening for non-Hispanic African Americans, the lowest rate of screening was in Arkansas (39.9%), and the highest was in Missouri (64.8%).
- No states meet the American Cancer Society's 2015 goal of 75% of adults older than 50 having a recent test.

Barriers to colorectal cancer screening

A number of studies have been conducted to try to understand why rates of screening for colorectal cancer are low. Several factors have been identified in these studies:

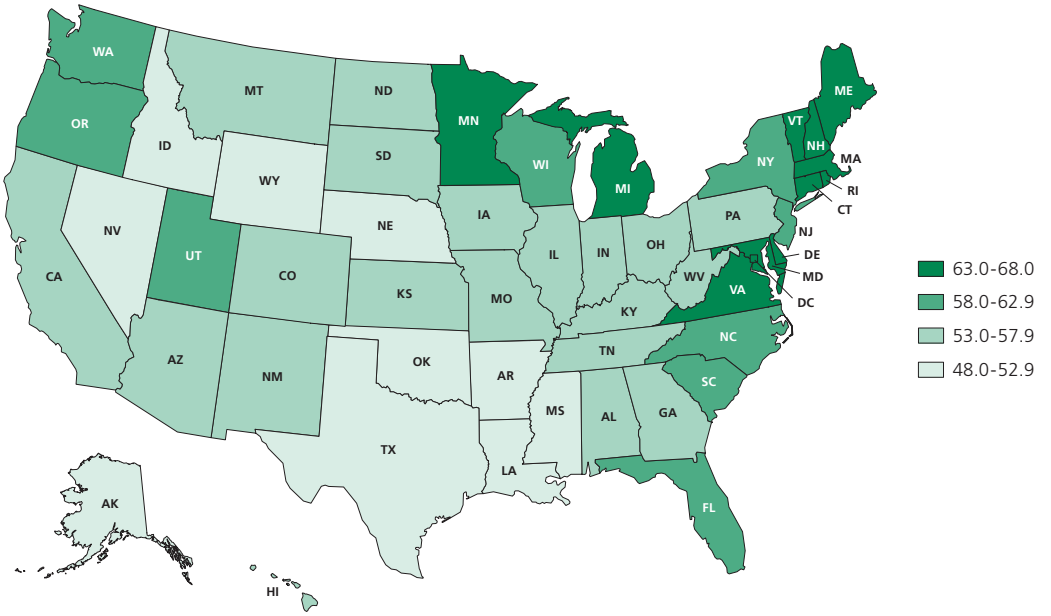
- Despite public education campaigns about colorectal cancer and screening, lack of knowledge about testing options, the importance of screening, and the treatability of colorectal cancer when it is detected early is common among individuals who have not been screened for colorectal cancer.[69-72] Other reasons cited by survey participants for not participating in colorectal cancer screening include lack of time, inconvenience, lack of interest, cost, fear of being diagnosed with cancer, embarrassment, and unpleasantness of the test.[72-74]
- Inadequate communication between health care providers and patients about colorectal cancer screening, including lack of a physician's recommendation for testing, is an important factor.[69,70,75,76] Several studies show that when providers do recommend colorectal cancer screening, their patients are more likely to get screened.[77-80]
- One study found that among individuals at high risk for colorectal cancer, African Americans were half as likely as whites to have undergone colonoscopy screening, even after accounting for differences in education, income, and health insurance status. The most common reason given for not being tested, both by African Americans and whites, was the lack of a physician's recommendation.[76]
- Factors that have been found to influence a health care provider's recommendations about colorectal cancer screening include attitudes and beliefs about the effectiveness of colorectal cancer screening tests, familiarity with screening guidelines, perception of patient preferences and adherence, lack of training to perform some tests, lack of referral sources for abnormal tests, and lack of adequate reminder systems within their practices.[70,72,81-84]
- Health insurance barriers that affect colorectal cancer screening include insurance status and coverage limitations. Many studies have demonstrated that people who are uninsured are substantially less likely to be screened for colorectal cancer (Figure 8).[17,80,85,86] Also, coverage of colorectal cancer screening tests by health insurance plans is highly variable, depending on the type of test and beneficiary risk status.[82] Currently, 26 states and the District of Columbia have enacted laws requiring private insurers to cover the full range of colorectal cancer screening tests for all individuals (Figure 9).

Strategies to increase utilization of colorectal cancer screening

Clinicians and health care systems can play a major role in increasing the utilization and quality of screening for colorectal cancer.[87] Implementing a diverse set of strategies can maximize the potential impact of interventions on improving cancer screening.

- **Physician office and health systems strategies:** Optimal strategies include the implementation of centralized or office-based systems, including computer-based reminder systems, to assist clinicians in counseling eligible patients about screening. The adoption of practice and organizational support systems to help manage referrals and follow up of cancer screening tests may also aid physicians in improving screening utilization.
- **Coverage for colorectal cancer screening by health insurance:** Health insurance coverage is an important determinant of access to preventive clinical services, including cancer screening. Improvements in colorectal cancer screening rates can be achieved by enacting legislation that provides for screening programs for the uninsured and medically underserved and that requires both public and private health insurers to cover all recommended options for colorectal cancer screening for everyone aged 50 years and older with reasonable copayment.
- **Educational initiatives for patients and providers:** Efforts to inform both clinicians and the public raise awareness and understanding of the importance of colorectal cancer screening in reducing cancer mortality. One resource that is available to aid primary care providers in improving patient screening rates is the online manual *How to Increase Colorectal Cancer*

Figure 7. Colorectal Cancer Screening* Prevalence (%) in Adults Aged 50 and Older, 2004, 2006



*A fecal occult blood test within the past year or a sigmoidoscopy or colonoscopy within the preceding 10 years; screening prevalence estimates do not distinguish between examinations for screening or diagnosis.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tapes 2004 and 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005 and 2007.

Screening Rates in Practice: A Primary Care Clinician's Evidence-Based Toolbox and Guide, produced by the American Cancer Society, Thomas Jefferson University, and the National Colorectal Cancer Roundtable and available at www.cancer.org/colonmd.

The signs of colorectal cancer

Early colorectal cancer often has no symptoms, which is why screening is so important. Most colorectal cancers begin as a polyp, a small growth in the wall of the colon. However, over time, some polyps grow and become malignant. As polyps grow, they can bleed or obstruct the intestine. See your doctor if you have any of these warning signs:

- Bleeding from the rectum
- Blood in the stool or in the toilet after having a bowel movement
- A change in the shape of the stool
- Cramping pain in the lower stomach
- A feeling of discomfort or an urge to have a bowel movement when there is no need to have one
- New onset of constipation
- Abnormal weight loss

Other conditions can cause these same symptoms. Individuals experiencing these symptoms should seek medical evaluation.

How is colorectal cancer treated?

Treatment decisions are made by the patient with his or her physician after considering the best treatments available for the stage and location of the cancer, as well as the risks and benefits associated with treatment.

Colon cancer

Most people with colon cancer will have some type of surgery. Adjuvant therapy (additional treatments) may also be used. Adjuvant chemotherapy (anticancer drugs in addition to surgery or radiation) for colon cancer is equally effective and does not appear to be more toxic in otherwise healthy patients aged 70 and older than in younger patients.

Carcinoma in situ

Surgery to remove the growth of abnormal cells may be accomplished by polypectomy or local excision through the colonoscope. Resection of a segment of the colon may be necessary if the tumor is too big to be removed by local excision.

Recent progress in policies and legislation related to colorectal cancer screening

- States have begun to address the problem of underutilization of colorectal cancer screening by passing legislation to ensure that private health insurance plans cover all of the testing methods available, including colonoscopy. To date, 26 states and the District of Columbia have passed such legislation (Figure 9).
- In July 2008, Congress passed The Medicare Improvements for Patients and Providers Act of 2008 (HR 6331). This legislation extends the availability of the "Welcome to Medicare" visit for those new to Medicare from six months to one year and eliminates the deductible for the visit, which provides a valuable opportunity for doctors and their patients to select cancer screening tests that are best for them. The bill also enables the US secretary of health and human services to approve new cancer prevention and early detection screening tests for Medicare coverage without first obtaining congressional approval. This will provide beneficiaries with increased access to the full range of available screening tests in a timely fashion.

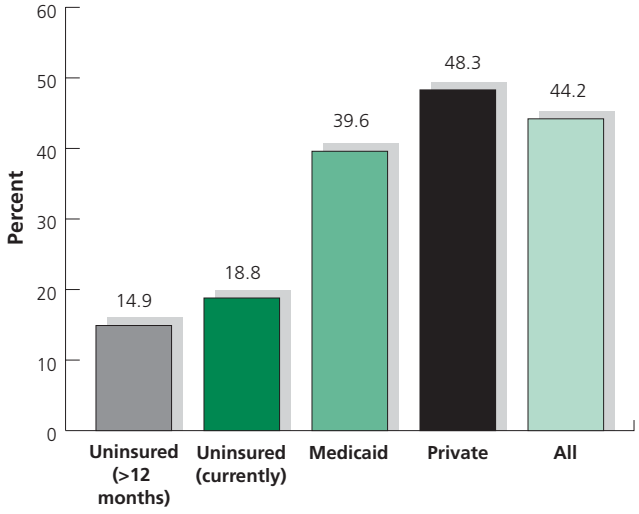
Localized stage

Surgical resection to remove the cancer, together with a length of colon on either side of the tumor and nearby lymph nodes, is the standard treatment.

Regional stage

If the cancer has not spread to nearby lymph nodes, surgical resection of the segment of colon containing the tumor may be the only treatment needed. If the doctor thinks the cancer is likely to come back (recur) because of its appearance under the microscope or because it is growing into other tissues, radiation therapy or chemotherapy may be recommended. If the cancer has spread to nearby lymph nodes, surgical resection of the segment of colon containing the tumor is the first treatment, usually followed by chemotherapy. Radiation therapy may be recommended if the cancer was growing into adjacent tissues.

Figure 8. Colorectal Cancer Screening* by Health Insurance Status in Adults Age 50-64, 2005



*Either a fecal occult blood test in the past year or an endoscopy in the past 10 years.

Source: National Health Interview Survey 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

Distant stage

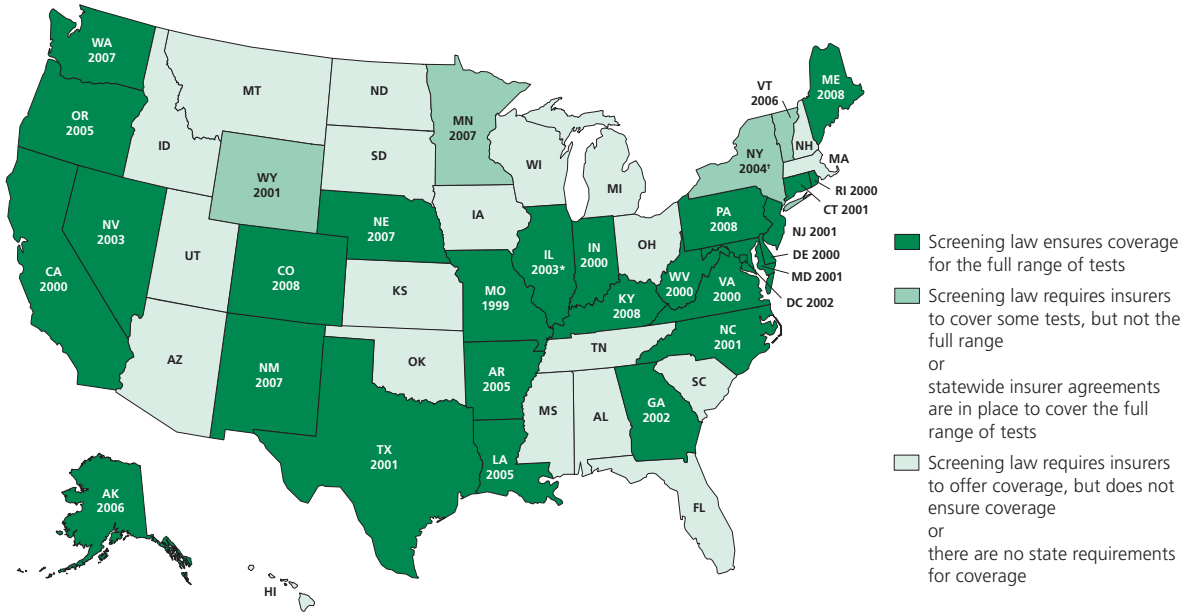
At this stage, the cancer has spread to distant organs and tissues, such as the liver, lungs, peritoneum, or ovaries. The goal of surgery (segmental resection or diverting colostomy) in this stage is usually to relieve or prevent blockage of the colon and to prevent other local complications. Surgical resection of metastases to the liver or lungs may also be recommended. Surgery is not recommended for all patients.

Chemotherapy, radiation, and biologically targeted therapies may be given alone or in combination to relieve symptoms and prolong survival. Three new targeted monoclonal antibody therapies were recently approved by the US Food and Drug Administration (FDA) to treat metastatic colorectal cancer. Bevacizumab (Avastin) blocks the growth of blood vessels to the tumor and both cetuximab (Erbitux) and panitumumab (Vectibix) block the effects of hormone-like factors that promote cancer cell growth.

Rectal cancer

Except for some patients with distant stage cancer, surgery to remove the rectal cancer is the main treat-

Figure 9. Colorectal Cancer Screening Coverage Legislation by State, June 2008



*In 2003, Illinois expanded its 1998 law to cover the full range. †The New York Health Plan Association, which serves 6 million New Yorkers, covers the full range of colorectal cancer screening tests as part of a voluntary collaborative with the American Cancer Society.

American Cancer Society Cancer Action Network℠ Policy

ment. Additional treatments, such as chemotherapy and radiation, may be used before and/or after surgery. These treatments are often used before surgery (neoadjuvant therapy) to shrink the tumor and decrease the risk of recurrence. They can also be used after surgery (adjuvant therapy) to prevent recurrence and metastasis.

Carcinoma in situ

Removing or destroying the growth of abnormal cells is all that is needed. Treatment options include polypectomy, local excision, or full-thickness rectal resection. This resection may be carried out through the anus. No further treatment is needed.

Localized stage

At this stage, the cancer has grown through the first layer of the rectum into deeper layers but has not spread outside the rectal wall itself. Primary surgery is usually either low anterior resection or abdominoperineal resection, depending on exactly where the cancer is located within the rectum. Low anterior resection removes the cancer and a margin of uninvolved rectum through an abdominal incision. Abdominoperineal resection is used for cancers located closer to the anus and involves an abdominal incision, as well as an incision around the anus. This operation removes the anus and the sphincter muscle, so a permanent colostomy is required. Some small localized rectal cancers may be treated by removing them through the anus without an abdominal incision. No further treatment is needed. Patients who are not candidates for surgery may be treated with radiation therapy. This may mean endocavitary radiation therapy (aiming radiation through the anus) or brachytherapy (placing radioactive pellets directly into the cancer). Radiation therapy alone has not been proven to be as effective as surgery in treating rectal cancer.

Regional stage

If the cancer has grown through the wall of the rectum into nearby tissue but has not yet spread to the lymph nodes, it is usually treated by low anterior resection or abdominoperineal resection along with both chemotherapy and radiation therapy. Radiation and chemotherapy are often given together before surgery, with additional chemotherapy after surgery.

If the cancer has spread to nearby lymph nodes but not to other parts of the body, it is usually removed by low anterior resection or abdominoperineal resection. Radiation therapy will be given before or after surgery. Chemotherapy will usually be given after surgery, and may be given before surgery to shrink large tumors.

Distant stage

In this stage, the cancer has spread to distant organs and tissues, such as the liver or lung. Surgery, chemotherapy, and/or radiation therapy are used to relieve, delay, or prevent symptoms and to prolong life.

Colostomy

When a section of the colon or rectum is removed, the surgeon can usually connect the healthy parts, allowing the patient to eliminate waste normally. Sometimes, however, reconnection is not possible. In this case, the surgeon makes an opening (a stoma) in the abdomen for waste to leave the body. The operation to create the stoma is called a colostomy. A flat bag fits over the stoma to collect waste, and a special adhesive holds it in place.[88]

For patients with colon cancer, a permanent colostomy is rarely needed. Most patients who have a colostomy need it only until the colon or rectum heals from surgery. After healing takes place, usually in 6 to 8 weeks, the surgeon reconnects the parts of the intestine and closes the stoma. Approximately 1 in 8 people with rectal cancer require a permanent colostomy.[88]

A person with a stoma learns to care for it with help from doctors, nurses, and enterostomal therapists. Often, an enterostomal therapist will visit the patient before surgery to explain what to expect and how to care for the stoma after surgery. They will also talk about lifestyle issues, including emotional, physical, and sexual concerns, and can provide information about resources and support groups.[88]

Side effects of treatment for colorectal cancer

Surgery

- The time needed to heal after surgery is different for each person. Patients are often uncomfortable for the first few days. However, medicine can usually control the pain.
- It is common to feel weak or tired for some time after surgery.
- Surgery for colorectal cancer sometimes causes constipation or diarrhea. The health care team monitors the patient for signs of bleeding, infection, or other problems requiring immediate treatment.

Radiation therapy

- Side effects of radiation therapy for colorectal cancer include mild skin irritation, nausea, diarrhea, rectal irritation, the urge to defecate, bladder irritation, fatigue, or sexual problems. These often go away after treatments are completed.
- Some degree of rectal and/or bladder irritation may be a permanent side effect. This can lead to diarrhea and frequent urination. If a patient has these or other side effects, they should be discussed with his or her doctor. There may be ways to lessen them.

Chemotherapy

- Chemotherapy drugs kill cancer cells but also damage some normal cells. Doctors and other health care providers can help patients avoid or minimize side effects, which will depend on the type of drugs, the amount taken, and the length of treatment. Side effects of chemotherapy may include fatigue, nausea and vomiting, diarrhea, loss of appetite, loss of hair, hand and foot soreness, swelling and rashes, and mouth sores.
- Because chemotherapy can damage the blood-producing cells of the bone marrow, patients may experience low blood cell counts. This can increase the chances of infection (due to a shortage of white blood cells), bleeding, or bruising after minor cuts or injuries (due to a shortage of blood platelets).

Clinical trials

A clinical trial is a controlled experiment that is used to assess the safety and usefulness of prevention, screening, and treatment methods for human disease and health problems. Generally, patients receive either the state-of-the-art standard treatment or a new therapy that may offer improved survival and/or cause fewer side effects. Participation in clinical trials provides essential information on the effectiveness and risks of a new treatment. Patients can visit the American Cancer Society Clinical Trials Matching Service at http://clinicaltrials.cancer.org or call the American Cancer Society National Cancer Information Center at 1-800-ACS-2345 for help in finding a clinical trial suited to their medical situation and preferences. The Physician Data Query (PDQ) program of the National Cancer Institute (NCI) contains summaries of cancer clinical trials that are open for patient participation. Patients can obtain PDQ information by contacting the NCI Cancer Information Service at 1-800-4-CANCER or at www.nci.nih.gov/clinicaltrials. Patients should consult their personal doctors and cancer specialists for detailed information about appropriate treatment options.

- There are remedies for many of the temporary side effects of chemotherapy. For example, antiemetic drugs can prevent or reduce nausea and vomiting, and hematopoietic drugs can improve the levels of white and red blood cells. People receiving chemotherapy should talk with their doctor if they have any unrelieved side effects.
- Most side effects disappear once treatment is stopped. Hair grows back after treatment ends, though it may look different.

Listed below are three drugs most often used in the treatment of colorectal cancer and their common side effects.

5-Fluorouracil: Used before or after surgery for the treatment of metastatic (distant-stage) disease; commonly used with radiation

- Diarrhea
- Sores in the mouth and throat
- Difficulty swallowing
- Poor appetite
- Decreased blood cell production
- Pain, redness, and blistering in the palms of the hands and soles of the feet

Oxaliplatin: Used after surgery or for the treatment of metastatic disease

- Pain in hands/feet that worsens with exposure to cold
- Throat pain that worsens with cold foods or liquids
- Decreased sensation
- Decreased proprioception (the body's sense of movement and position)
- Nausea, vomiting
- Diarrhea
- Decreased blood cell production

Irinotecan: Most often used for metastatic disease

- Diarrhea (may be severe, requiring hospitalization if not managed appropriately)
- Nausea/vomiting
- Decreased blood cell production
- Mild hair loss

Pain

- Pain is an important concern among people with cancer and their caregivers. Pain may occur during or after treatment but should not be a constant feature after healing occurs. Individuals who are free from pain can sleep and eat better, enjoy the company of family and friends, and continue with work and hobbies.
- There are many different medicines and methods available to control cancer pain. The method of pain control used will depend on the source of the discomfort. Doctors routinely seek information and resources necessary to make individuals who have been diagnosed with cancer as comfortable as possible. If a patient experiences persistent pain and the doctor does not suggest treatment options, a pain specialist should be consulted. Pain specialists may be oncologists, anesthesiologists, neurologists, neurosurgeons, other doctors, nurses, or pharmacists. A pain control team may also include psychologists and social workers.
- For more information about cancer pain and how it can be relieved, visit the American Cancer Society's Web site at www.cancer.org/docroot/MIT/content/MIT_7_2x_Pain_Control_A_Guide_for_People_with_Cancer_and_Their_Families.asp.

Additional information can also be found in the special section of *Cancer Facts & Figures 2007*, available at www.cancer.org/downloads/STT/CAFF2007PWSecured.pdf.

What research is currently being done on colorectal cancer?

Colorectal cancer is an active area of scientific research; studies span the cancer continuum from prevention and early detection to treatment.

Prevention and early detection

- Chemoprevention is the use of natural or man-made chemicals to decrease the risk of developing cancer. Researchers are testing whether substances, such as fiber, minerals, vitamins, or drugs, can lower colorectal cancer risk.
- Studies are examining the effectiveness of current colorectal cancer screening methods, as well as new approaches to improve screening rates. Meanwhile,

research is being done on new tests that may be more accurate and/or more comfortable for patients.

Treatment

- Researchers have found natural substances in the body that promote cell growth. These are known as growth factors. Some cancer cells grow especially fast because they respond to growth factors more than normal cells do. There are new drugs that can reduce the effects of these growth factors in order to prevent cancer cells from growing so quickly. Adding one of these drugs to the treatment plan has helped some patients. Clinical trials are currently evaluating the effectiveness of the addition of these drugs to established chemotherapeutic regimens in prolonging patient survival.
- Treatments that boost the immune system's reaction to colorectal cancer are being tested in clinical trials. Many trials are also testing new combinations of chemotherapy drugs and the best ways to combine chemotherapy with radiation therapy or immunotherapy.
- Scientists are learning more about some of the changes in DNA that cause cells of the colon and rectum to become cancerous. Early phases of gene therapy trials are already under way.

What is the American Cancer Society doing about colorectal cancer?

Improvement in prevention, early detection, and treatment of colorectal cancer provides major, unrealized opportunities to save lives. Ultimately, prevention through changes in diet, physical activity, and body weight can have the largest impact on health in general, including reduced risk of colorectal cancer. In the near term, improvements in screening are more easily achieved. Of the 49,960 people expected to die of colorectal cancer in 2008, half could have been saved with recommended screening.[89] Despite the ability to prevent colorectal cancer in many cases, or reduce the risk of dying from the disease, too few Americans are getting tested.

To increase the number of people who get screened, the American Cancer Society has reached out to the public, health care professionals, and legislators. A colorectal cancer awareness campaign was created to remove public misconceptions about the disease and testing; to encourage physicians to proactively recommend regular screening to all age-appropriate patients; and to advocate for laws that improve access to screening and treatment, as well as addressing the needs of the medically underserved. Based on research about consumer attitudes and beliefs about colorectal cancer, the Society has developed key messages for men and women aged 50 and older and their health care providers:

Men and women aged 50 and older: Colorectal cancer can be prevented. Talk to your doctor about getting tested.

African American men and women aged 50 and older: African Americans are making progress in the fight against colorectal cancer, but there is more to be done to reduce disparities. Prevent colorectal cancer by getting tested.

Health care providers: Doctors and other health care providers play a critical role in ensuring their patients aged 50 and older are screened for colorectal cancer. Talk to your patients about getting regular colorectal cancer screenings.

To reach consumers with these messages, the Society:

- Uses national, regional, and local media to encourage consumers to talk with their doctors about colorectal cancer testing
- Encourages consumers to visit www.cancer.org/colon to learn more about colorectal cancer screening
- Builds collaborative nationwide and community relationships to reach specific populations

To reach physicians with these messages, the Society:

- Encourages health professionals to visit www.cancer.org/colonmd for tools and resources on how to talk to their patients about colorectal cancer testing and improve testing rates in their practice
- Builds collaborative relationships to facilitate regular communication between health care professionals and the patients they serve
- Collaborates with the Centers for Medicare & Medicaid Services (CMS) to develop messages about the importance of colorectal screening targeted at providers

The American Cancer Society Cancer Action Network℠ (ACS CAN), the nonprofit, nonpartisan advocacy partner of the American Cancer Society, is involved

in advocacy efforts at both the federal and state level that will increase access to quality colorectal cancer screening, treatment, and care for all adults. Listed below are some of the efforts the Society and ACS CAN are involved in:

- Strongly advocating at the state and federal levels for insurance coverage for colorectal cancer screening. Currently, 26 states and the District of Columbia have enacted legislation ensuring coverage for the full range of screening tests
- Supporting the Colorectal Cancer Prevention, Early Detection, and Treatment Act, which will establish a program administered by the Centers for Disease Control and Prevention (CDC) to provide grants for vital colorectal cancer screening and follow-up services to low-income, uninsured, and underinsured individuals aged 50-64 years, as well as those under 50 who are at high risk of developing colorectal cancer
- Advocating for federal funding to strengthen and further expand the scope of the CDC's Colorectal Cancer Screening, Education, & Outreach Program to promote colorectal cancer screening nationwide, to identify and eliminate certain clinical and consumer barriers to screening, and to further reduce colorectal cancer incidence and mortality rates
- Advancing initiatives to improve Medicare coverage of colorectal cancer screening, including supporting the elimination of copayment requirements for Medicare patients for colorectal cancer screening tests. Research has found that even relatively small copays can be a barrier to screening.

The National Colorectal Cancer Roundtable

In 1997, the American Cancer Society and Centers for Disease Control and Prevention convened the first meeting of the National Colorectal Cancer Roundtable (NCCRT), inviting potential partners to discuss strategies for educating medical providers and the public about the importance of colorectal cancer screening. The NCCRT has grown to a national coalition of more than 60 members, including public, private, and voluntary organizations, as well as national experts, whose mission is to reduce the toll of this disease by improving communication, coordination, and collaboration among health agencies, medical-professional organizations, and the public. The NCCRT taps into the expertise of its members to create tools, conduct studies, develop consensus on outreach, and support projects that can advance the community's work in this area. Many of these projects, such as the creation of the Blue Star universal symbol, the development of a colorectal cancer Clinician's Guide and Toolbox, and the development of a study to measure how increasing screening rates in individuals aged 50-64 years will decrease Medicare colorectal cancer costs and fill a key need among collaborating partners. Such initiatives enhance the efforts of each of the member organizations, and create a multiplier effect in the community's work against this disease.

Sources of Statistics

New cancer cases. The estimated numbers of new US cancer cases are projected using a spatio-temporal model based on incidence data from 41 states and the District of Columbia for the years 1995-2004 that met the North American Association of Central Cancer Registries' (NAACCR) high-quality data standard for incidence, which covers about 85% of the US population.

Incidence rates. Incidence rates are defined as the number of people per 100,000 who are diagnosed with cancer during a given time period. Incidence rates for the US were calculated using data on cancer cases collected by SEER and population data collected by the US Census Bureau. Incidence rates are age-adjusted to the 2000 US standard population.

Cancer deaths. The estimated numbers of US cancer deaths are calculated by fitting the numbers of cancer deaths for 1969 through 2005 to a statistical model that forecasts the numbers of deaths that are expected to occur in 2008.

Mortality rates. Mortality rates or death rates are defined as the number of people per 100,000 dying of a disease during a given year. Mortality rates are based on counts of cancer deaths compiled by the National Center for Health Statistics (NCHS) for 1930 through 2004 and population data from the US Census Bureau. Death rates are age-adjusted to the 2000 US standard population.

Survival. Five-year relative survival rates are presented for cancer patients diagnosed between 1996 and 2004 and followed through 2005. Relative survival rates are used to adjust for normal life expectancy (and events such as death from heart disease, accidents, and diseases of old age). Relative survival rates are not calculated for Hispanics/Latinos, Asian Americans/Pacific Islanders, and American Indians/Alaska Natives because reliable estimates of normal life expectancy are not available for these groups. Therefore, cause-specific survival rates are presented. Cause-specific survival rates are the probability of not dying of colorectal cancer within 5 years after diagnosis. Cause-specific survival does not account for stage and age at diagnosis. Relative risk estimates were calculated to compare probability of death from colorectal cancer within 5 years after diagnosis between racial/ethnic groups, taking age and tumor stage at diagnosis into account.

Screening. Prevalence of colorectal cancer screening among subgroups of US adults aged 50 and older was obtained from the National Health Interview Survey 2005, National Center for Health Statistics, Centers for Disease Control and Prevention (www.cdc.gov/nchs/nhis.htm). Prevalence data for colorectal cancer screening by state are from the Behavioral Risk Factor Surveillance System (BRFSS) public use data tapes 2004 and 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2007 (www.cdc.gov/nccdphp/brfss/). Because the BRFSS is a telephone survey, prevalence estimates are limited to those adults living in a household with a residential telephone line. Prevalence rates are age-adjusted to the 2000 US standard population.

Important note about estimated cases and deaths. The estimated new US cancer cases and deaths for the current year are model-based and may produce numbers that vary considerably from year to year. For this reason, we discourage the use of our estimates to track year-to-year changes in cancer. Incidence and mortality rates reported by SEER and NCHS are more informative statistics to use when tracking cancer incidence and mortality trends for the US. Rates from state cancer registries are useful for tracking local trends.

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Bringing It Home:
Announcements from the National Home Office

New National Vice President for Research

The American Cancer Society National Home Office announces the appointment of **Victor G. Vogel, MD, MHS,** as the **new national vice president for research.**

Victor G. Vogel, MD, MHS

Vogel will be joining the American Cancer Society in Atlanta, Georgia, by way of Pittsburgh, Pennsylvania, where he has served as professor of medicine and epidemiology and director of the Magee-Womens Hospital/University of Pittsburgh Cancer Institute Breast Program since January 1996. Prior to assuming that role, Vogel was associate professor of clinical cancer prevention and deputy chairman of the Department of Clinical Cancer Prevention at the University of Texas M. D. Anderson Cancer Center.

He is currently board-certified in internal medicine, medical oncology, and general preventive medicine/public health, and he is a fellow of the American Colleges of Medicine and Preventive Medicine. Distinguishing himself as a leading expert in breast cancer risk assessment and prevention, Vogel has written more than 100 articles, book chapters, and abstracts, and he edited the book *Management of Patients at High Risk for Breast Cancer* (Blackwell Science 2001). He is a member of numerous boards and committees, including the Data and Safety Monitoring Board for the Women's Health Initiative of the National Institutes of Health. He also serves as the national protocol chairman of the National Cancer Institute's STAR Trial (Study of Tamoxifen and Raloxifene).

Outside of his clinical expertise, Vogel is a member of the Flying Physicians Association and pilots his own Cirrus. Additionally, he participates with the Angel Flight Mid-Atlantic organization for patient flights. He is also a gifted author who writes for both medical journals as well as articles of general interest. Vogel and his wife participated in the Restoring Hope in New Orleans building project through their church for one week in both 2007 and 2008. ■

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Cancer roles differ

Collaborating with former American Cancer Society grantee **David K. Wellisch, PhD,** at the University of California, Los Angeles, and fellow intramural researcher **Rachel Spillers, BS,** Kim has analyzed how men and women differ in the ways in which they cope with the role of cancer patient and caregiver. The goal is to help develop interventions that provide what is most needed and draw on the strengths of each individual.

"I don't want caregivers to be selfish, but they should take care of themselves," Kim says. "Caregivers need caregivers."

Men and women come to the role of caregiving with very different expectations, perform their roles differently, and, interestingly, are treated differently by their family and friends. In one study, the team found that, in general, the caregiver role imposes less stress for husbands than it does for wives. The reasons are varied, but Kim notes that husbands get much more esteem from caregiving. Men are not typically caregivers, and when they take on that non-traditional role, it is a source of pride.

For women, by comparison, caregiving is expected, an obligation. Serving as a caregiver to a cancer patient seems more likely to be a source of stress among women.

Strong, silent type

The kinds of roles at which male and female caregivers excel seem to be shaped by their stereotypical roles in society. On those occasions when men experience more stress than women, it is when distraught women call upon their spouses to provide emotional support. Frequently, it is not a role that men relish, and some men find it taxing. In many relationships, Kim explains, men long have relied on their wives for emotional support, and a role reversal – when a wife is diagnosed with cancer – leaves them flatfooted. Additionally, as men age, they have not developed the relationships outside marriage that might provide additional support.

"For men, wives are their best friend," Kim says.

In response to such findings, the researchers recommended educational interventions directed toward helping men understand and deal with their wives' psychological adjustment to cancer. The target is not just husbands themselves; both partners could benefit from learning more about how to cope with a woman's cancer diagnosis, she says.

It takes two

A more complicated picture emerges when researchers look at a cancer patient and caregiver as a team. Kim, along with Spillers, and fellow intramural researcher **Tenbroeck G. Smith, MA,** studied the experience of 168 breast or prostate cancer patients and spouses participating in the Society's Study of Cancer Survivors-1 and National Quality of Life Survey for Caregivers.

Betty Ferrell, RN, PhD, FAAN
Research Scientist –
City of Hope National
Medical Center
Speaker at the 4th Biennial
Cancer Survivorship
Research Conference

"Research helps legitimize the importance of the role of caregivers and continued development of the research base will be helpful in further guiding clinical care and health policy."

While a person's own psychological distress was the most important influence on quality of life, the researchers found that a partner's distress also played a significant role. One of the most trying situations appeared when the woman reported poorer psychological adjustment than her husband. Consistent with previous research, Kim and her team documented that an emotional disconnect between spouses often left men unable to cope successfully with their wives' poorer emotional health regardless of whether the wife was a patient or caregiver.

In this situation, men tended to "somatize," that is, to express their psychological distress as physical aches and pains. The implication is that helping women adjust to their role as either patient or caregiver will not only help her, but also enhance the well-being of her husband.

"When dealing with their wives' emotional distress, men don't know what to do. They can get groceries or help move someone who is bedridden. But the emotional side – that's what a woman does," Kim explains.

In the long run, insight into the stress placed upon caregivers can help shape interventions that ultimately will benefit both the caregiver and the survivor.

"Our goal is to discover how to prevent health problems among caregivers, so that they themselves don't become ill," she says.

Society Follows Survivors, Caregivers in Ongoing, Long-term Studies

The American Cancer Society's Behavioral Research Center (BRC) was founded in 1995 to conduct research on the psychosocial aspects of cancer and share its expertise with other parts of the Society. A principal focus of the BRC today involves unique, long-range studies of both cancer survivors and caregivers.

The Studies of Cancer Survivors are longitudinal and cross-sectional analyses of adult cancer patients conducted up to 10 years after diagnosis. From the members in the longitudinal study, BRC researchers have identified family and friends close to the cancer survivor, and documented their needs in the National Quality of Life Survey for Caregivers.

Participants in the caregiver study will be followed years after the cancer diagnosis. The eight-year follow-up surveys are currently ongoing. A related survey, the Study of Informal Cancer Care: Longitudinal Assessments, focuses on the early phase of survivorship, from diagnosis until 18 months post-diagnosis.

Other significant projects undertaken by the BRC involve research on underserved populations, tobacco control, and multicultural health behavior. ■

Across the Country

Massachusetts

The American Cancer Society Cancer Action Network℠ (ACS CAN) New England Division held its inaugural Cancer Research Breakfast on June 23, 2008. Serving the dual purpose of calling attention to the stagnation of federal funding for cancer research and raising support for ACS CAN, the breakfast was a fantastic success, raising more than $150,000.

The event was held at Fenway Park, home of the Boston Red Sox, and was attended by nearly 250 leaders from Boston's business, educational, medical, and research communities. The list of extraordinary speakers and visitors included Dan Smith, president of ACS CAN; Deborah Cornwall, New England Division board member and event chair; Fereydoun Firouz, president and CEO of EMD Serono, the presenting sponsor of the breakfast; Robert A. Weinberg, American Cancer Society Research Professor of the Whitehead Institute for Biomedical Research; Peter Meade, managing director of Rasky Baerlein Strategic Communications; Don Gudaitis, CEO of the American Cancer Society New England Division; and Larry Lucchino, president and CEO of the Boston Red Sox.

The breakfast program included the presentation of a letter from Senator Edward M. Kennedy, conveying his admiration and support of the American Cancer Society and commenting on the importance of advocacy. Kennedy's letter was followed by a moving tribute to former American Cancer Society grantee **Judah Folkman, MD,** a medical scientist best known for his research on angiogenesis and vasculogenesis. His work led to founding a branch of cancer research called anti-angiogenesis therapy – a form of targeted therapy that uses drugs or other substances to stop tumors from making new blood vessels.

Concluding the event was the exciting news that the federal government had passed legislation providing the National Institutes of Health with an additional $150 million in funding for approximately 246 additional research grants in FY 2008. This encouraging news demonstrated that the voice of advocacy efforts like that of ACS CAN is making a difference.

The American Cancer Society Cancer Action Network, which is the nation's leading cancer advocacy organization, is the nonprofit, nonpartisan advocacy partner of the American Cancer Society. ■

Shop Talk:
News from the Society's Intramural Researchers

Epidemiology:

The Department of Epidemiology and Surveillance Research hosted a Peer Review Committee meeting on November 6-7 at the American Cancer Society National Home Office in Atlanta, Georgia. Their peer review, which is held every five years, brings together national experts to review the progress of feature intramural programs, including the development of Cancer Prevention Study-3 (CPS-3), the external collaborations on genetic cancer risks, and the numerous research and educational publications under way in the department.

A new study by American Cancer Society epidemiologists investigated the 10 to 15 percent of lung cancers that are caused by factors other than tobacco smoking, and finds that lung cancer death rates among never smokers are highest among men, African Americans, and Asians residing in Asia. The review analyzed data on lung cancer occurrence among lifelong nonsmokers in North America, Europe, and Asia and suggested that the death rates among never smokers have remained stable over the past several decades.

This study is featured in the September issue of PLoS Medicine, *a peer-reviewed, open-access journal published by the Public Library of Science.*

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Cancer Research Breakfast attendees included, from left to right: Dan Smith, president, ACS CAN; Don Gudaitis, CEO, New England Division; Robert A. Weinberg, PhD, American Cancer Society Research Professor at the Whitehead Institute for Biomedical Research Ludwig Center for Cancer Research, MIT Department of Biology; Paula Folkman; Peter Meade, breakfast master of ceremonies; David S. Rosenthal, MD, director of Health Services, Harvard University, and professor of Medicine, Harvard University School of Medicine.

Mary Hendrickson-Johnson Melanoma Professorship and MEN2 Thyroid Cancer Consortium

Melanoma is a serious and sometimes life-threatening cancer that accounts for almost 4 percent of cancer among men and women. The chance of getting melanoma increases as you get older, but people of any age can get the disease. In fact, melanoma is one of the most common cancers in young adults, with more than 50,000 people in the United States learning that they have melanoma each year. Notable people who have survived melanoma include former NFL quarterback Troy Aikman, newscaster Sam Donaldson, and Senator John McCain. Yet, even as many are able to survive this cancer, it continues to generate a considerable burden and more research is needed.

A different disease, multiple endocrine neoplasia (MEN), is mainly an inherited syndrome involving tumors in two or more endocrine tissues. Of the six described MEN syndromes, MEN2 is the most prevalent and is associated with high levels of the hormone calcitonin, with tumors of the thyroid, adrenal gland, and nervous tissue and mutations in the proto-oncogene RET. Similar to that of melanoma, MEN2 also generates a considerable burden to those affected.

While research has illuminated some aspects of MEN2, as well as melanoma, more research is needed. Thankfully, two generous donors have provided funds to be allotted specifically to the support of both melanoma and MEN2. It is with this support that the American Cancer Society is pleased to announce two separate initiatives, **the Mary Hendrickson-Johnson Melanoma Professorship** and the **MEN2 Thyroid Cancer Consortium.**

The **Mary Hendrickson-Johnson Melanoma Professorship** is an award targeting an outstanding midcareer investigator who has made a landmark contribution that has changed the direction of cancer research and who continues to provide leadership in the area of melanoma research. The award is $80,000 per year for five years and may be renewed for an additional five years. This year's recipient is Jeffrey A. Sosman, MD, from Vanderbilt University Medical Center, Nashville, Tennessee, located in the Mid-South Division. His professorship will begin January 1, 2009, and continue until December 31, 2013. Additional information about Sosman and his research will be provided in the next issue of *Progress.*

The **MEN2 Thyroid Cancer Consortium** is funded, in part, by the largest single gift ever received by the American Cancer Society solely for research – totaling $8.5 million. The consortium will consist of a single renowned senior scientist, who will be awarded the American Cancer Society MEN2 Thyroid Cancer Professorship and facilitate the interactions among the members of the program, consisting of approximately 12 outstanding beginning investigators and a single renowned senior scientist, all with complementary knowledge spanning both experimental and clinical expertise. Up to seven research scholar and/or mentored research scholar grants (awards available for five years and up to $135,000 per year), and up to five postdoctoral fellowships (maximum award of $44,000 per year available for three years) will be awarded. It is hoped that the consortium will combine the strengths of individual investigators to more thoroughly understand MEN2 and lead to the establishment of new research programs in this area.

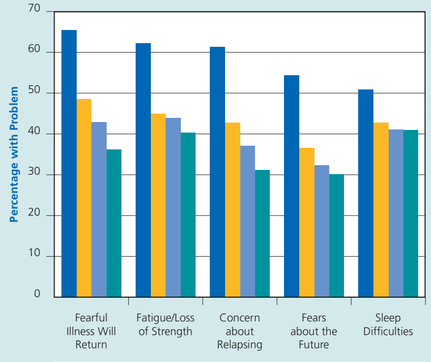
An announcement of recipients of all awards is forthcoming. ■

continued from page 4

Statistics & Evaluation Center:

Evaluations of key American Cancer Society patient service programs (Patient Navigator, Reach to Recovery® and Hope Lodge®) are under way. The first stage of qualitative assessments has been completed, and quantitative assessments of program outcomes will follow. Progress is continuing with the development and implementation of evaluations of several other Society national programs, including Look Good...Feel Better®, Cancer Survivors Network℠, Man To Man® and Let's Talk About It®.

American Cancer Society's Studies of Cancer Survivors "Top Five" Cancer-related Problems by Time since Diagnosis



Stein, K.D. (2008). The American Cancer Society's Studies of Cancer Survivors (SCS). Plenary presentation at the 4th Biennial Cancer Survivorship Research Conference: *Mapping the New Challenges.* Atlanta, GA.

These data portray the top five cancer-related problems reported by participants in the American Cancer Society Studies of Cancer Survivors, a nationwide survey of the quality-of-life of cancer survivors. For each problem, the percentage is highest among the one-year survivors, which may reflect persistent side effects of treatment. While problems are less prevalent among long-term survivors, they do not abate entirely and may continue to impact quality-of-life. Cancer-specific problems, such as fear of recurrence and concern about relapse, do appear to diminish over time. However, fatigue and sleep-related problems tend to be more stable.

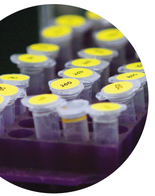
Funding Snapshot

American Cancer Society research and training grants currently in effect*:

975 Grants

$476,598,166

**As of September 17, 2008*



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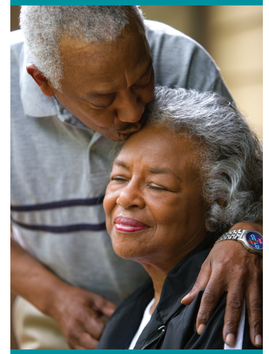

A Family That Cares: Society researchers highlight the season for caregivers

Behind the millions of people who have stood face to face with cancer stands a largely unseen, but crucial network of family, friends, and professionals that helps them through the journey. Ongoing research from the American Cancer Society shows how the rigors of cancer affect both caregivers and cancer patients and suggests how health care professionals can help improve the emotional well-being of both.

This summer, the American Cancer Society Behavioral Research Center partnered with the National Cancer Institute and the Lance Armstrong Foundation to host 460 guests at a 2½-day conference in Atlanta, Georgia, called "Cancer Survivorship Research: *Mapping the New Challenges.*" During the conference, key leaders shared ideas and research regarding quality-of-life issues and the role of caregivers – both novel but important subjects of investigation.

Among those speaking at the conference was **Youngmee Kim, PhD,** the American Cancer Society's director of family studies and associate professor in the Department of Psychology at the University of Miami. While explaining the importance of the focus on quality-of-life issues and the role of caregivers, Kim asserts, "Caregivers' level of psychological stress is often equal or greater than that of the patients themselves."

Youngmee Kim, PhD

If asked to describe a typical caregiver, people usually say the image that comes to mind is that of a woman, and they would be correct. The latest numbers available, from 2004, estimate that about 61 percent of caregivers are female. However, that figure also represents a significant increase in the proportion of male caregivers, which hovered around 25 percent in 1987. Kim and her colleagues have looked in depth at the differences in men and women as both caregiver and cancer patient with an eye toward learning how to ease the stress of both roles.

Kim's work relies primarily on the American Cancer Society's Studies of Cancer Survivors, which look at both longitudinal and cross-sectional portraits of cancer survivors. In addition, the data provide a way for researchers to branch out and look more closely at the needs of caregivers; these efforts are organized under the American Cancer Society's National Quality of Life Survey for Caregivers. (More about the Society's survivorship studies is on page 3.)

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