Virtual colonoscopy – CT colonography

Clinical Policy ID: CCP.1525

Recent review date: 5/2025

Next review date: 9/2026

Policy contains: colonography, colonoscopy

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Coverage policy

Virtual colonoscopy, also known as computed tomography (CT) colonography, is clinically proven and, therefore, may be medically necessary for screening colorectal cancer in asymptomatic members who are either (American Cancer Society, 2024; American College of Gastroenterology [Shaukat, 2021]; National Comprehensive Cancer Network, 2024; Patel, 2022):

- At average risk for developing colorectal cancer.
    - Average risk is defined as: no personal history of adenoma, sessile serrated polyps/sessile serrated lesions, colorectal cancer, inflammatory bowel disease, high-risk colorectal cancer genetic syndromes, cystic fibrosis, or childhood cancer; and no family history of confirmed advanced adenoma, advanced sessile serrated polyps/sessile serrated lesions in first-degree relatives, or colorectal cancer (National Comprehensive Cancer Network, 2024).
- At increased risk for developing colorectal cancer, and colonoscopy is contraindicated or refused (American College of Radiology, 2024; Shaukat, 2021).

- Increased risk is defined as: a personal history of colorectal cancer or certain types of polyps, inflammatory bowel disease, or radiation to the abdomen or pelvic area; a strong family history of colorectal cancer or certain types of polyps; or a known family history of a hereditary colorectal cancer syndrome (American Cancer Society, 2024).

If either criterion is met, screening virtual colonoscopy/CT colonography can be performed every five years beginning at age 45 and up to age 75, and selectively offered from ages 76 to 85, if the member and provider elect, after taking into account member's overall health and prior screening history (Shaukat, 2021; U.S. Preventive Services Task Force, 2021).

In members with a family history of colorectal cancer or adenomatous polyps, colorectal cancer screening may be initiated at age 40 or 10 years before the youngest affected relative, whichever is earlier, and then resume average-risk screening recommendations for those with colorectal cancer or advanced polyp in one first-degree relative (blood related sibling, parent, or child) at age ≥ 60 years (Shaukat, 2021).

Limitations

Contraindications to, or conditions that require caution in performing, virtual colonoscopy/CT colonography include, but are not limited to (American College of Radiology, 2024):

- Symptomatic acute colitis.
- Acute diarrhea.
- Recent acute diverticulitis.
- Recent colorectal surgery.
- Symptomatic colon-containing abdominal wall hernia.
- Recent deep colonoscopic biopsy or polypectomy/mucosectomy.
- Known or suspected colonic perforation.
- Symptomatic or high-grade small bowel obstruction.
- Current or potential pregnancy.

Alternative covered services

- Stool and blood-based tests (e.g., fecal immunochemical, multitarget stool DNA, or septin 9).
- Direct visualization tests (e.g., colonoscopy or flexible sigmoidoscopy).

Background

Colorectal cancer is the third leading cause of cancer deaths in the United States. In 2024, an estimated 152,810 new cases were diagnosed and 53,010 deaths from colorectal cancer occurred in the United States. Seventy-seven percent of cases occur in individuals aged 55 years and older, and approximately 15% of cases occur in individuals aged 45 to 54 years. Age and family history are the main risk factors for the disease (National Cancer Institute, 2024).

Screening reduces mortality from colorectal cancer. Colonoscopy is considered the preferred procedure for colorectal cancer screening for its ability to directly assess precancerous polyps and malignancies in the colon, which can often be removed during the same procedure. Greater use of the procedure for early detection constitutes a major factor in the decline of about 50% in age-adjusted U.S. colorectal cancer incidence and mortality since 1985 (National Cancer Institute, 2024).

Colonoscopy is recommended every ten years beginning at age 45 for persons at average risk for colorectal cancer. Persons with a documented risk factor may be screened earlier. Screening is not recommended in persons older than age 85 (Kumar, 2024).

Overall, 72% of adults are up to date with colorectal cancer screening. Alternative means of cancer screening have been developed to improve screening compliance. These methods include fecal immunochemical testing, fecal occult blood testing, flexible sigmoidoscopy, stool DNA testing, and virtual colonoscopy/CT colonography (U.S. Centers for Disease Control and Prevention, 2024).

Virtual colonoscopy/CT colonography is a noninvasive imaging procedure that uses low-dose computed tomography to generate three-dimensional images of the colon and rectum. Advantages include greater comfort to the patient and no need for sedation or anesthesia. It requires less time to complete and return to normal activities than colonoscopy, and avoids the unwillingness that some patients have with colonoscopy. Unlike endoscopic approaches, virtual colonoscopy may reveal extracolonic findings (RadiologyInfo.org, 2024).

The major limitation with virtual colonoscopy/CT colonography is its inability to detect small and flat polyps as effectively, thus, requires more frequent procedures than colonoscopy, usually every five years. The procedure requires bowel preparation. If abnormalities are detected, a colonoscopy and additional bowel preparation are needed to perform tissue sampling and polyp removal. Virtual colonoscopy/CT colonography also exposes the patient to a small amount of radiation. Radiation-free magnetic resonance imaging is available but less often employed (RadiologyInfo.org, 2024).

Findings

Guidelines

Several professional organizations have issued guidelines for screening colorectal cancer. There is general agreement on the need to screen average risk populations ages 50 to 75 using several available screening methods. There is disagreement on when to start screening, reflecting some uncertainty in the ability to assess the benefits and harms for screening for colorectal cancer in adults aged 45 to 49 years. The decision to screen after age 75 should be individualized. Most guidelines include CT colonography as a first-line screening option.

Few guidelines addressed CT colonography in individuals considered at increased risk for colorectal cancer, as colonoscopy is the preferred surveillance method. However, in such cases, CT colonography may be considered when a colonoscopy is contraindicated or refused, or when anesthesia presents an elevated risk to the patient.

The U.S. Preventive Services Task Force recommends colorectal cancer screening beginning at age 45, and ending sometime between ages 76 and 85, depending on patient health status. The Task Force recommendation lists tests used for screening, including CT colonography. Without recommending which method should be preferred, the Task Force does specify the frequency for each (five years for CT colonography). It notes CT colonography may reveal extracolonic findings needing further workup, which could lead to potential benefits or risks (U.S. Preventive Services Task Force, 2021).

The U.S. Multi Society Task Force on Colorectal Cancer (Patel, 2022) and the American Cancer Society (2024) support screening with CT colonography every five years starting at age 45 through age 75 for average-risk persons. The decision to screen patients between ages 76 and 85 remains individualized based on the balance of benefits and harms and individual patient clinical factors and preferences. Individuals ages 86 and older should not be offered colorectal cancer screening.

The National Comprehensive Cancer Network supports CT colonography for average-risk persons age 45 and older every five years if polyps are not found, and every three years if one to two lesions of 6 to 9 millimeters are detected; if more than three lesions 6 to 9 millimeters are detected, colonoscopy is supported. Average risk is defined as: no personal history of adenoma, sessile serrated polyps/sessile serrated lesions, colorectal cancer, inflammatory bowel disease, high-risk colorectal cancer genetic syndromes, cystic fibrosis, or childhood cancer; and no family history of confirmed advanced adenoma, advanced sessile serrated polyps/sessile serrated

lesions in first-degree relatives, or colorectal cancer. Screening colonoscopy is recommended for individuals at high risk for colorectal cancer (National Comprehensive Cancer Network, 2024).

The American College of Gastroenterology issued a strong recommendation for initiating colorectal cancer screening at age 50 and a conditional recommendation for starting at age 45, for average-risk persons. After age 75, screening should be an individual choice. The recommended primary screening modalities are colonoscopy and fecal immunochemical tests, with consideration of others, including CT colonography (every five years), for patients unable or unwilling to undergo primary colonoscopy and fecal immunochemical tests. In patients with a family history of colorectal cancer or adenomatous polyps, colorectal cancer screening may be initiated at age 40 or 10 years before the youngest affected relative, whichever is earlier, and then resume average-risk screening recommendations for individuals with colorectal cancer or advanced polyp in one first-degree relative at age ≥ 60 years. The guideline addressed fecal immunochemical testing as the only alternative to colonoscopy supported by evidence from randomized controlled trials in the setting of increased risk of colorectal cancer (Shaukat, 2021).

According to an American College of Radiology (2024) practice parameter, CT colonography without intravenous contrast is usually appropriate for screening individuals age 45 to 75 years considered average or moderate risk for developing colorectal cancer, for those considered average, elevated, or high risk after an incomplete colonoscopy, and for those who are unable to tolerate colonoscopy.

In contrast, an American College of Physicians guidance statement recommends screening average-risk patients from ages 50 to 75, not age 45. The College does not recommend CT colonography as a screening option because of a lack of evidence of effectiveness (Qaseem, 2023).

The American Association of Family Physicians supports colorectal cancer screening in all patients from ages 50 to 75, and in selected patients after 75. The choice of screening modality, including CT colonography, should be based on a shared decision-making discussion of benefits and harms between patient and provider (American Association of Family Physicians, 2021).

Evidence review

Current evidence suggests CT colonography with bowel preparation can accurately and safely detect adenomas at least 6 millimeters in size, with detection rates comparable to those of other screening methods. Detection of flat and serrated lesions is limited. Potential harms associated with CT colonography were cumulative exposure to low-dose ionizing radiation and detection of extracolonic findings that may require follow-up (which may also be a benefit), although the true harms of these effects could not be determined. Potentially serious adverse events such as perforations from over-sufflation and serious bleeds were reported infrequently in earlier studies but were less commonly seen in studies reflecting current practice.

There is insufficient evidence from prospective studies to determine the effectiveness or comparative effectiveness of CT colonography as a screening modality. Important unanswered questions are the number of detected polyps that would have progressed to invasive cancer and the number of individuals harmed by the screening process.

A systematic review prepared for the U.S. Preventive Services Task Force included nine studies (n = 6,497) that found the sensitivity of CT colonography with bowel preparation to detect adenomas larger than 6 millimeters was 86%, similar to that of colonoscopy (89%). Approximately 1.3% to 11.4% of examinations have extracolonic findings that are potentially important requiring diagnostic follow-up. The authors found no prospective studies evaluating the effectiveness of screening CT colonography on cancer incidence or mortality (Lin, 2021).

A meta-analysis of 125 studies included 27 (n = 33,493) of CT colonography. Compared with multitarget stool DNA (3.4%) and fecal immunochemical testing (2.0%), CT colonography had a detection rate of advanced

neoplasia of 6.0%. Authors state that CT colonography “represents the most effective and efficient noninvasive screening test for colorectal cancer prevention and detection” (Pickhardt, 2021).

A systematic review of 19 articles (n = 11,540) determined CT colonography sensitivity and specificity to be 80% and 89% to detect polyps at least 6 millimeters in size; the same figures were 87% and 97% for polyps of at least 10 millimeters (Yu, 2017). Comparable figures in another large review of 14 studies (n = 3,578) were 87% and 90% for polyps over 6 millimeters, and 91% and 98% for polyps over 10 millimeters (Bai, 2020).

A systematic review/meta-analysis of 23 studies found similar sensitivity/specificity rate for diagnosing colorectal cancer for magnetic resonance colonography (97%/92%) and CT colonography (96%/100%) (Sun, 2018).

A systematic review/meta-analysis of 48 studies (n = 113,546) found the prevalence of synchronous colorectal cancer for persons undergoing virtual colonoscopy/CT colonography was higher than that in individuals who underwent other tests (5.7% and 3.9%), *P* =.004) (Flor, 2018).

A systematic review/meta-analysis of 12 studies (n = 19,867) observed that three years after CT colonography, 643 were diagnosed with colorectal cancer. Another 29 colorectal cancers were subsequently diagnosed post-imaging, mostly from perceptual errors. Authors conclude CT colonography does not lead to an excess of post-test cancers relative to colonoscopy within three to five years, and the low five-year post-imaging rate supports a five-year screening interval (Obaro, 2018).

In 2024, no new policy research was found and no policy changes were warranted.

In 2025, we updated the references and modified the coverage criteria to align with guideline recommendations for screening populations at average risk and at increased risk for colorectal cancer.

References

On April 7, 2025, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “colonography” and “colonoscopy.” We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

4/2023: initial review date and clinical policy effective date: 5/2023

4/2024: Policy references updated.

4/2025: Policy references updated. Coverage modified.