

# Computed tomographic colonography (virtual colonoscopy)

## 1 Guidance

1.1 Current evidence on the safety and efficacy of computed tomographic colonography (virtual colonoscopy) appears adequate to support the use of this procedure provided that the normal arrangements are in place for consent, audit and clinical governance.

## 2 The procedure

### 2.1 Indications

2.1.1 Computed tomographic (CT) colonography is used to examine the colon and rectum to detect abnormalities such as polyps and cancer. Polyps may be adenomatous (which have the potential to become malignant) or completely benign.

2.1.2 Colorectal cancer is the second most common cancer in women and the third most common cancer in men in the UK. Symptoms include blood in the stool, change in bowel habit, abdominal pain and unexplained weight loss. In addition to its use as a diagnostic test in symptomatic patients, CT colonography may be used in asymptomatic patients with a high risk of developing colorectal cancer.

2.1.3 Conventional colonoscopy and double-contrast barium enema are the main methods currently used for examining the colon.

### 2.2 Outline of the procedure

2.2.1 CT colonography involves using a CT scanner to produce two- and three-dimensional images of the entire colon and rectum. CT colonography is less invasive than conventional colonoscopy.

2.2.2 CT colonography is usually performed on an empty bowel although 'faecal tagging' may be used, which eliminates the need for a cathartic bowel preparation. Faecal tagging requires the patient to ingest an iodinated contrast agent with meals approximately 48 hours before the scan. Sedation is not usually required for CT colonography. The colon is distended by insufflation with air or carbon dioxide via a small rectal tube. Antispasmodic agents and/or contrast agents may be administered intravenously before the scan. The images are manipulated and interpreted by a radiologist.

### 2.3 Efficacy

2.3.1 A meta-analysis of data from 14 studies with a total of 1324 patients reported the sensitivity and specificity of CT colonography for the detection of polyps, using conventional colonoscopy as the reference standard. The pooled per-patient sensitivity for polyps 10 mm or larger was 88% (95% confidence interval [CI], 84–93%), for polyps 6–9 mm it was 84% (95% CI, 80–89%), and for polyps 5 mm or smaller it was 65% (95% CI, 57–73%). The pooled per-polyp sensitivity for polyps 10 mm or larger was 81% (95% CI, 76–85%), for polyps 6–9 mm it was 62% (95% CI, 58–67%), and for polyps 5 mm or smaller it was 43% (95% CI, 39–47%). The overall specificity for the detection of polyps 10 mm or larger was 95% (95% CI, 94–97%).

2.3.2 A study involving 1233 asymptomatic adults reported that the per-patient sensitivity for polyps 10 mm or larger was 94% (95% CI, 83–99%) for CT colonography and 88% (95% CI, 75–95%) for

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### This guidance is written in the following context:

This guidance represents the view of the Institute which was arrived at after careful consideration of the available evidence. Health professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of health professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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This guidance is endorsed by NHS QIS for implementation by NHSScotland

conventional colonoscopy. The per-patient sensitivity for polyps 6 mm or larger was 89% (95% CI, 83–93%) for CT colonography and 92% (95% CI, 87–96%) for conventional colonoscopy. A study of 615 patients reported per-patient sensitivities of 55% (95% CI, 40–70%) for polyps 10 mm or larger and 39% (95% CI, 30–48%) for polyps 6 mm or larger. Another study of 614 patients reported that CT colonography was significantly more sensitive than barium enema but less sensitive than colonoscopy. A study of 203 patients that used faecal tagging reported an overall per-patient sensitivity of 90% (95% CI, 86–94%). For more details, refer to the Sources of evidence (see below).

- 2.3.3 The Specialist Advisors noted that the procedure may fail to detect small or flat lesions, but commented that this was also the case with other diagnostic techniques.

## 2.4 Safety

- 2.4.1 No significant complications were reported in the studies. Two studies reported on the level of discomfort felt by patients during the procedure. One study reported that 1% (9/696) of patients experienced 'extreme' or 'severe' discomfort during CT colonography, compared with 4% (25/696) for colonoscopy. In the same study, less than 1% (4/617) of patients had 'extreme' or 'severe' discomfort during CT colonography compared with 29% (181/617) during a barium enema ( $p < 0.001$ ). A second study reported that 54% (546/1005) of patients found CT colonography to be more uncomfortable than conventional colonoscopy, but this may have been affected by the fact that patients were sedated for the conventional colonoscopy but not for the CT colonography. In the same study, CT colonography was reported to be more acceptable in terms of convenience than conventional colonoscopy in 68% (686/1005) of patients.
- 2.4.2 In one study, 72% (357/494) of patients were reported to prefer CT colonography to conventional colonoscopy, and 97% (518/534) preferred CT colonography to double-contrast barium enema. For more details, refer to the Sources of evidence.

- 2.4.3 The Specialist Advisors noted that the potential complications are similar to those associated with other techniques, and include bowel perforation and reaction to the intravenous contrast medium.

## 2.5 Other comments

- 2.5.1 It was noted that this is a rapidly evolving technology, dependent on the type of equipment used and the training and experience of the operator.
- 2.5.2 It was noted that patient selection was important; this is an alternative procedure to barium enema, and is particularly useful in frail and elderly patients as a diagnostic tool to detect tumours.

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## Information for the public

NICE has produced information describing its guidance on this procedure for patients, carers and those with a wider interest in healthcare. It explains the nature of the procedure and the decision made, and has been written with patient consent in mind. This information is available from [www.nice.org.uk/IPG129publicinfo](http://www.nice.org.uk/IPG129publicinfo)

## Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the following document.

*Interventional procedure overview of computed tomographic colonography (virtual colonoscopy)*, August 2004

Available from [www.nice.org.uk/ip208overview](http://www.nice.org.uk/ip208overview)

## Ordering information

Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0880. *Information for the public* can be obtained by quoting reference number N0881.

The distribution list for this guidance is available at [www.nice.org.uk/IPG129distributionlist](http://www.nice.org.uk/IPG129distributionlist)

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