CT colonography for screening of patients at increased risk for colorectal cancer: accuracy, patient acceptance and radiation issues
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Appendix
Appendix

CT colonography at the AMC: Current bowel preparation, scan protocol and review method (October 2004)

Indication
In the AMC CT colonography in daily practice is performed in patients that cannot undergo conventional colonoscopy due to technical difficulties (tortuous, long colons) or constricting colorectal cancers, or in patients who refuse colonoscopy.

Bowel preparation
Prior to the CT colonography procedure the patient has to undergo the following bowel preparation:

The day before CT colonography- Normal breakfast, normal lunch, no vegetables and nuts. After lunch no solid food, only liquid meals (for example yoghurt) until start of the use of polyethylene glycol electrolyte solution (KleanPrep; Helsinn Birex Pharmaceuticals, Dublin, Ireland) at 19:00.

1. 17:00 two tablets of 5 mg dulcolax (bisacodyl, Boehringer-Ingelheim, Ingelheim, Germany) with approximately 1.5 liter of water.

2. 19:00 One liter of KleanPrep bowel preparation.

3. 20:30 One liter of KleanPrep bowel preparation.

The day of CT colonography- No solid or liquid food.

1. 7:00 One liter of KleanPrep bowel preparation with 120 ml of amidotrizoic acid (Gastrografin; Schering, Weesp, the Netherlands).

2. 8:00 One liter of KleanPrep bowel preparation with 120 ml of amidotrizoic acid.

Subsequently, the CT colonography is performed at 12:00.
Scan protocol

A technician performs the CT colonography procedure first in the supine and subsequently in the prone position on an Mx8000 multislice scanner (Philips Medical Systems, Best, the Netherlands), as explained below:

1. Insertion of thin rectal tube (flexible balloon-tipped catheter, 24 Ch) in the left decubitus position, and the balloon is filled with tepid water.

2. The patient is positioned in supine position.

3. Intravenous injection of 20 mg butyl scopolamine bromide (Buscopan, Boehringer-Ingelheim, Ingelheim, Germany) or, if butyl scopolamine bromide is contraindicated 1 mg glucagon hydrochloride (Glucagen; Novo-Nordisk A/S, Bagsvaerd, Denmark) for reduction of bowel spasms.


5. A preview image is obtained to define the scan area.

6. The patient is scanned in the supine position with the following scan parameters:
   - mAs (mA * rotation time/pitch) 50 (average sized)/70 (large patients; circumference ≥102.5 cm)
   - kV 120
   - collimation 4 * 2.5 mm
   - Effective slice width 3.2 mm
   - Beam pitch 1.25
   - Rotation time 0.75 s
   - Reconstruction filter: C (medium sharp)
   - Reconstruction interval 1.6 mm
   - Effective dose †: 5.8 mSv
   - Scan time: approximately 22 s

†, measured half way between the lowest rib and the iliac crest. ‡, note: for supine and prone scan combined, calculated for the 50 mAs protocol for a medium-sized patient.
7. After the supine scan, the patient turns over on the scanner table.

8. Extra carbon dioxide insufflation in the prone position.

9. The balloon of the rectal catheter is emptied.

10. Prone scanning with the same scan parameters.

The examination is finished.

Review of CT images
After defining a path through the colon images semi-automatically, the data are reviewed primarily 3D (with 2D for problem solving), and subsequently the axial CT images are reviewed. This is performed on an EasyVision workstation (Philips Medical System, Best, the Netherlands).