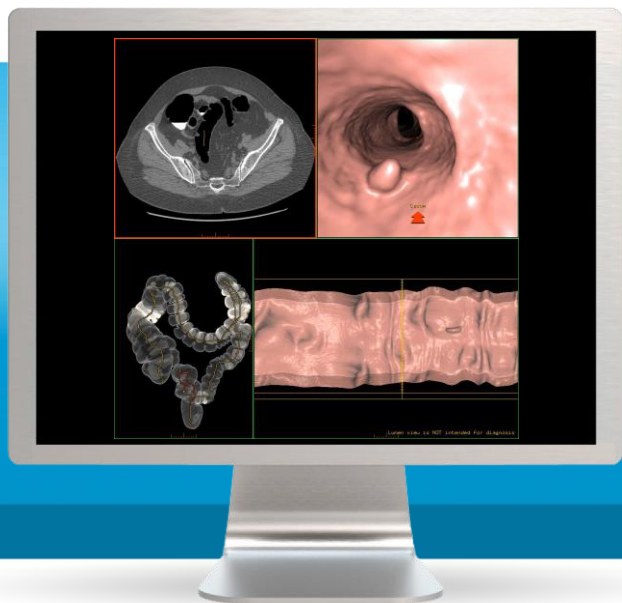# GE Healthcare

Colon VCAR EC

## A comprehensive reading workflow solution for colonic lesion detection.

Colorectal cancer is a major health concern for both men and women. Recent studies conclude that early detection of colonic polyps can reduce the mortality rate of colon cancer. You need a protocol that lets you quickly and accurately detect and report results of CT colon scans; a program that optimizes your workflow and improves your reading productivity.

Overview

Colon VCAR EC gives you a comprehensive reading workflow solution for detecting colonic lesions with flexibility and efficient performance. With it you can visualize anatomy that would otherwise be obscured by tagged fluid. Plus digital contrast agent filter highlights potentially suspicious regions.

What's new

- The program allows you to read and problem solve in 2D, 3D, or 360 degree dissection views.
- Prone/Supine polyp linking provides quick navigation between datasets.
- Digital Contrast Agent (DCA) provides automatic visualization of shapes characteristic of polyps.
- Electronic Cleansing (EC) subtracts tagged stool and fluid, making it easier to identify lesions.
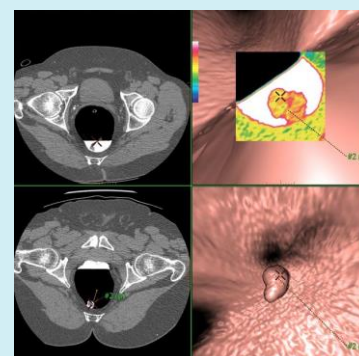
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Features
- Prone and supine synchronized reviewing for problem solving.
- You synchronize prone and supine navigation based on polyp bookmark location and distance from center line.
- Provides you with quick, easy to use polyp and center line measurement tools for complete reporting.
- You can leverage any combination of synchronized 2D, 3D, and 360 views.
- Dissection views make primary reading and problem solving more efficient.
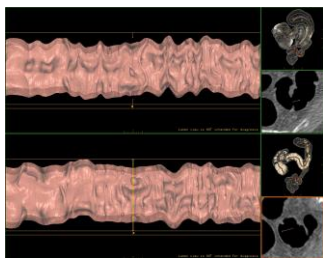
- You can vary navigation speed.
- Lets you track entire colon from rectum to cecum for thorough, precise exams.
- You are provided with unrestricted viewing angles of all colon surfaces.
- You can apply color to bookmarked lesions for better visualization.
- The program allows you to assess luminal, mural and extracolonic anatomy and pelvic structures.
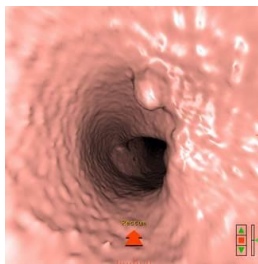
- A selection of application-specific tools ensures ease of use and thorough exams.
- Your workflow benefits from fast, interactive electronic patient reporting.

System Requirements
- AW Workstation
- AW Server

Indications for Use
Colon VCAR EC is a CT, non-invasive, image analysis software package that allows the visualization of 2D, 3D and dissected medical image data of the colon derived from DICOM 3.0 compliant CT scans. ColonVCAR is designed to aid the physician in evaluating the lumen and internal wall of the colon to confirm the presence or absence of colonic lesions (e.g. polyps). It provides functionality for 2D/3D rendering, bookmarking of suspected lesions, synchronized viewing of the 2D, 3D and 360 dissection views for data sets acquired in any position, and an object oriented endoluminal display. In comparison to Colonoscopy, this tool has an advantage of depth penetration due to its 3D presentation capability.

It is intended for use by clinicians to process, render, review, archive, print and distribute colon image studies.

The Colon VCAR DCA (Digital Contrast Agent) module is an automated highlight feature for the visual identification of spherical structures within the colon and is intended to be used as concurrent reading device. Digital Contrast Agent is a 3D filter that produces images that highlight spherical anatomical regions, such as polyps, and/or stool. Colon VCAR uses color to display these highlighted spheres. Images are made available to the physician to aid in characterization of potential polyps and thus, the patient management care decision process.
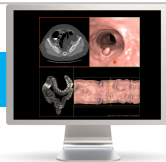
Regulatory Compliance
This product complies with the European CE marking regulation following Medical Devices Directive: Directive 93/42/EEC.

This product has not been approved for sale in the United States by the United States Food and Drug Administration (FDA).

GE imagination at work

Colon VCAR EC

## Features Detail

Electronic Cleansing

Electronic Cleansing, accessible in both 2D and 3D review, subtracts tagged stool and fluid from the generated data making it easier to identify lesions that may be visible in only one view.

Tagged material is identified based on Hounsfield units. Processing tasks such as Auto Segmentation, 3D flythrough, and Dissection also take advantage of tagged material subtraction.

Auto Segmentation shows the tagged material while 3D flythrough enables quick anatomy visualization without the tagged material. With this method, the tagged material is removed yet shown in a different color at an adjustable opacity level.

Similarly, the tagged material can be removed from the dissection view as seen in the images below.
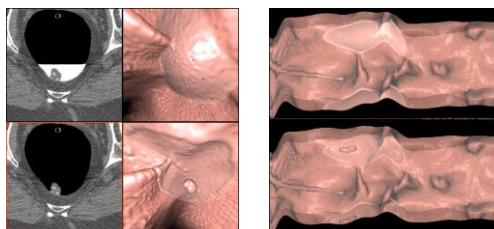
User Interface

The Colon VCAR EC user interface has been optimized to facilitate fast, accurate examination of the colon's full extent. It provides seamless integration between automatic and manual interactions for a level of flexibility designed to reduce reading times.

Simultaneous, Indexed Viewing

The program can display both prone and supine views, which can be manually synchronized for simultaneous and indexed viewing. During review, you can "Lock to Target" with a single button click to quickly problem solve during the primary read. And you are able to bookmark locations of suspected polyps.

360-degree Dissection

This powerful tool provides a 360-degree view of the entire internal large bowel simultaneously displayed in supine and prone positions. This ability speeds viewing and analysis.

This feature lets you leverage all available views: 2D, 3D, and 360-degree dissection during the primary read. For more traditional reading methods, a 2D, 3D, or Dissection view can be laid out and reserved for primary reading with reference to other views for problem solving.

Joystick Navigation

Colon VCAR EC lets you adjust the speed and direction of a flythrough simply by using the mouse. Flythroughs can also be set on autopilot for hands-off reviewing. Additionally, a single mouse click lets you lock onto a region of interest and fly around the target anomaly.
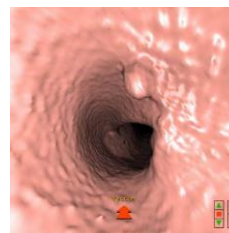

Computer Aided Reading

Colon VCAR EC's Contrast Agent (DCA), a 3D filter, highlights spherical anatomy such as polyps in color. The resulting images facilitate the characterization of potential polyps.
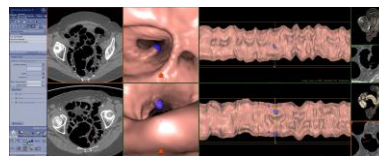
Virtual Biopsy

Problem solving while 3D reading is facilitated by the Virtual biopsy tool, which allows you to view areas in the navigator in color-coded or black/white scales. Different densities, determined by Hounsfield units, can be displayed using the color scale.

GE imagination at work
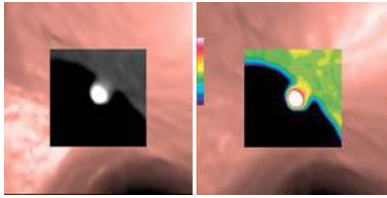
Auto-Segmentation

Colon VCAR EC quickly performs the time-intensive task of colon segmentation for both prone and supine data sets. All you do is select the protocol.

The program automatically defines a luminal centerline in both prone and supine positions. This can be applied to a high percentage of cases, depending on the level of insufflation and collapse.

Semi-automatic and manual segmentation modes are also available. Semi-automatic segmentation provides complementary, and often necessary, assistance in cases when the colon is collapsed and operator intervention is required. This mode is typically used to connect colon segments around a collapse to form a single centerline. Manual segmentation is typically used to extend the centerline to the end of the cecum for completeness. Manual editing is also available to refine automatic tracking if needed.

Dissection (centerline) Contouring Verification

Using a color mapping technique, Dissection Contouring Verification outlines colon anatomy included in the centerline trace. You can review verification in any orthogonal plane.
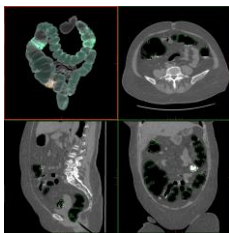
Automatic High Resolution Flythrough

Real time 512-marix resolution automatic flythrough enhances navigational image quality, and provides operational flexibility, functionality, and simplicity. Anatomy remains sharp with minimal pixilation. Steering remains centered as you navigate through the colon. You can specify your navigation speed, and 3D navigation is correlated with 2D and 360-degree Dissection views for rapid synchronized referencing in primary or secondary reading.
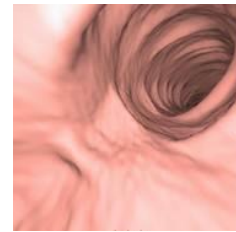
512 matrix resolution

Save State

This feature gives you the ability to save any centerline edits, bookmarks, and colored polyps for later reloading. It is also convenient for quick recall during consultation or exam review.

Prone/Supine Polyp Linking

After bookmarking a polyp in prone and supine datasets, the program provides you with the capability to match and label them for easy tracking. This gives you the ability to read registered prone/supine datasets for a one pass read.

Synchronized Prone/Supine 3D Dissection View Navigation

Once prone/supine polyp linkage is made, the program co-registers and links the datasets and polyps, letting you visualize opposing anatomy for a synchronized review.

Small Bowel Extraction

This feature quickly segments the small bowel, giving you an unobstructed view of the large intestine.


Analysis Mode

The program's Analysis Mode provides a variety of tools to help streamline your workflow:
- Lock Mode lets you target and possible lesion and stay locked on it at all times.
- Synchronized display can be customized to show two oblique images, axial, sagittal, coronal, volume rendered and/or 3D views within the colon in a Lock mode. Leveraging multiple synchronized planes and views in a problem-solving mode may enhance your reading productivity.

Color Centerline Tracking

With Colon VCAR EC you can display a real-time 3D model of the colon with a defined centerline to quickly orient the location of the area you are viewing to the overall colon. This synchronization is always linked and available for quick reverence.
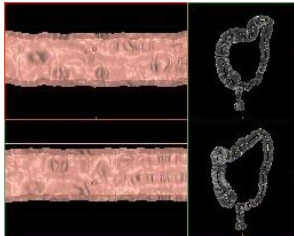
Patient Report*

Customizable, interactive reporting capability gives greater structure and flexibility in generating your reports. You can choose how many images to display per sheet, place your facility's logo, apply physician signatures, list patient demographics, and detail your comments and impressions. Export your report to CD, HTTP, or print it to paper.

The Quick Report panel gives you instant access to report input fields and provides access to automatic bookmark annotation on the colon map.

Measurement Tools

With Colon VCAR EC, you can measure polyp distance from distal rectum to polyp location in millimeters, perform 2D measurements, and obtain statistics of ROI in Hounsfield units.

Archive

You can define the number of images per polyp you want to archive to either a networked location or to magnetic optical disk.

Customizable Review and Analysis Layouts

Create layouts that match your reading style and save them as protocols for future recall. Viewports can be shaped into a variety of square or rectangular configurations.
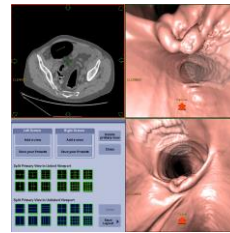

Five of the most popular protocol layouts are pre-built for quick loading. Choose from several dissection configurations:

- 360-dissection gives you convenience and productivity benefits.
- 120-dissection lets you read around distortions if necessary.
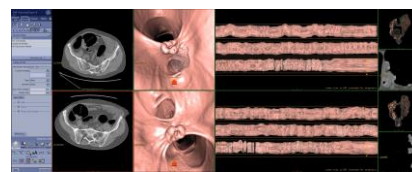
- Use the 2D read configuration if the exam has poor insufflation and multiple collapses. 2D can also be used for extracolonic review.
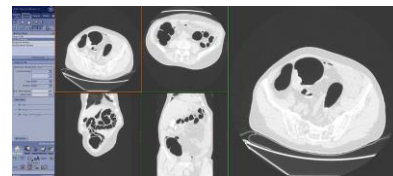
- Use the 3-series layout to load a prone, supine, and decubitus series in parallel to obtain a correlated view.
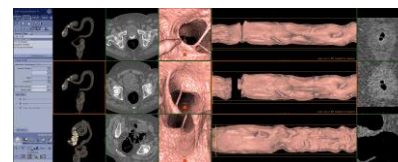
- You can also customize new layouts to suit your own readying style.
- If you work on a one-monitor Advantage Workstation, a single monitor display is also available.

Movie Generator

You can generate movie clips of the area of interest simply by defining the start and end locations with a mouse click. A cross-sectional movie will be generated. You can also generate lock-to-target movies. Movies can be saved as mpeg, avi, HTTP and saved to CD.

Entire Colon Movie

Generate a fly-through movie of the entire colon with one button click. Export the result as an mpeg or as screen captures to a PACS workstation for review or consultation.

Additional Features

- Automatic center line tracking
- SmartCursor™ for easier navigation
- Synchronized reformatted views
- Multiple correlations of anatomy with CT colonography
- Exploration of suspicious areas in primary 2D reformatted sections
- Primary 3D reformatted sections. Obliques, Navigator, Quick Virtual Dissection, and axial views are all correlated to the same anatomy of interest.
- Black/white or color display

Summary

Colon VCAR EC helps make colon evaluation a less traumatic procedure for patients. Preparation for the exam is less severe; the procedure is less time intensive and less expensive than optical colonoscopy. Moreover, the tools and features this program puts into your hands will streamline your workflow and potentially enable greater diagnostic confidence.

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*Report feature is only available on AW Workstation