



# CT COLONOGRAPHY







## Summary

In 2004 when presenting the NCI Executive Committee the ACRIN proposal to conduct the National CT Colonography Trial (6664), a case was made that publicly accessible image data sharing would offer a valuable research asset to a wide image processing research community. Adding to the many merits of that proposal, the data-sharing component was strongly endorsed. ACRIN completed the trial expeditiously and its results were published in NEJM in fall 2008 to wide interest. ACRIN has graciously allowed the wider research community access to a portion of the data from that trial here on TCIA, including spreadsheets identifying positive and negative polyp cases. The complete ACRIN 6664 protocol description can be found at <http://www.acrin.org/TabID/151/Default.aspx>.

### Data Access

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Click the **Download** button to save a ".tcia" manifest file to your computer, which you must open with the [NBIA Data Retriever](#). Click the **Search** button to open our Data Portal, where you can browse the data collection and/or download a subset of its contents.

Data Type	Download all or Query/Filter
Images (DICOM, 462.6GB)	 
DICOM Metadata Digest (CSV)	
Polyp Descriptions - Large 10mm (XLS)	
Polyp Descriptions - 6 to 9mm (XLS)	
Polyp Descriptions - No polyp found (XLS)	

Click the Versions tab for more info about data releases.

### Third Party Analyses of this Dataset

TCIA encourages the community to [publish your analyses of our datasets](#). Below is a list of such third party analyses published using this Collection:

- [Image Data Used in the Simulations of "The Role of Image Compression Standards in Medical Imaging: Current Status and Future Trends"](#)

### Detailed Description

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Collection Statistics	
Modalities	CT
Number of Participants	825
Number of Studies	836
Number of Series	3,451
Number of Images	941,771
Image Size (GB)	462.6

There are presently 825 cases in this collection with XLS sheets that provide polyp descriptions and their location within the colon segments. To link the XLS polyp tables with the DICOM image studies in TCIA you should understand that some cases in the TCIA are identified by long numbers with the last 4 digits after the last decimal point (e.g.: NCIA study number "1.3.6.1.4.1.9328.50.4.0040" referred to as case "40"). In addition there are a fewer number of additional positive cases that begin their identification number with 'CTC' (e.g.: CTC-5401799343)

Three related XLS spreadsheets are in this release.

1. [TCIA CTC large 10 mm polyps.xls](#) - Contains the case numbers for 35 cases (out of the 825 total TCIA cases) where at least one 10mm or larger size polyp was found. Individual cases may have several (up to 20) polyps of different sizes listed on a particular XLS row as "LESION 1.x, 2.x,3.x etc. – see "feature key" below).
2. [TCIA CTC 6 to 9 mm polyps.xls](#) - Contains 69 cases with smaller size polyps.
3. [TCIA CTC no polyp found.xls](#) - Contains 243 cases that were recorded as free of polyps by both CTC and optical techniques.

Thus in this CT Colonography collection you will be able to download the prone and supine DICOM images from OC same-day validated 243 negative cases, 69 cases with 6 to 9 mm polyps, and 35 cases which have at least one > 10 mm polyp and their histological type. Below is the key for deciphering the features in the spreadsheet.



***WARNING: NCI cannot assure archive users of error-free validity of the XL polyp location data since NCI did not itself perform the clinical study or its analysis.***

You will note that two XLS files with positive findings have multiple columns descriptors of individual polyp lesions listed as in the table below. The meaning of the colored columns labeled "LESION 1.1...1.2...1.3...1.4, etc" is explained in the attached key-code ".tiff" file entitled "Polyp description key table.tiff"). Some CT scan slice numbers where the polyps were found are provided, but unfortunately the table may not have complete slice number information – you'll just have to do the best you can with the data NCI was given.

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### Citations & Data Usage Policy

#### **Citations & Data Usage Policy**

Users of this data must abide by the [Creative Commons Attribution 3.0 Unported License](#) under which it has been published. Attribution should include references to the following citations:

##### **Data Citation**

Smith K, Clark K, Bennett W, Nolan T, Kirby J, Wolfsberger M, Moulton J, Vendt B, Freymann J. (2015). Data From CT\_COLONOGRAPHY. The Cancer Imaging Archive. <https://doi.org/10.7937/K9/TCIA.2015.NWTESAY1>

##### **Publication Citation**

Johnson, C. D., Chen, M.-H., Toledano, A. Y., Heiken, J. P., Dachman, A., Kuo, M. D., ... Limburg, P. J. (2008, September 18). Accuracy of CT Colonography for Detection of Large Adenomas and Cancers. *New England Journal of Medicine*. *New England Journal of Medicine (NEJM/MMS)*. <https://doi.org/10.1056/nejmoa0800996>

#### TCIA Citation

Clark K, Vendt B, Smith K, Freymann J, Kirby J, Koppel P, Moore S, Phillips S, Maffitt D, Pringle M, Tarbox L, Prior F. **The Cancer Imaging Archive (TCIA): Maintaining and Operating a Public Information Repository**, *Journal of Digital Imaging*, Volume 26, Number 6, December, 2013, pp 1045-1057. <https://doi.org/10.1007/s10278-013-9622-7>

## Other Publications Using This Data

TCIA maintains a list of publications which leverage these datasets.






1. Shakir, Hina; Deng, Yiming; Rasheed, Haroon; Khan, Tariq Mairaj Rasool. **Radiomics based likelihood functions for cancer diagnosis**. *Sci Rep* 2019 [link](#)
2. Gayathri, Devi K; Radhakrishnan, R; Rajamani, Kumar. **Segmentation of colon and removal of opacified fluid for virtual colonoscopy**. *Pattern Analysis and Applications* 2017 [link](#)
3. Lin, Anthony Y; Du, Peng; Dinning, Philip G; Arkwright, John W; Kamp, Jozef P; Cheng, Leo K; Bissett, Ian P; O'Grady, Gregory. **High-resolution anatomic correlation of cyclic motor patterns in the human colon: Evidence of a rectosigmoid brake**. *American Journal of Physiology-Gastrointestinal and Liver Physiology* 2017 [link](#)
4. Manjunath, KN; Siddalingaswamy, PC; Prabhu, GK. **Measurement of smaller colon polyp in CT colonography images using morphological image processing**. *International journal of computer assisted radiology and surgery* 2017 [link](#)
5. Alazmani, A; Hood, A; Jayne, D; Neville, A; Culmer, P. **Quantitative assessment of colorectal morphology: Implications for robotic colonoscopy** *Medical engineering & physics* 2016 [link](#)
6. Manjunath, KN; Siddalingaswamy, PC; Gopalakrishna Prabhu, K. **An improved method of colon segmentation in computed tomography colonography images using domain knowledge** *Journal of Medical Imaging and Health Informatics* 2016 [link](#)
7. Yahya-Zoubir, Bahia; Hamami, Latifa; Saadaoui, Llies; Ouared, Rafik. **Automatic 3D Mesh-Based Centerline Extraction from a Tubular Geometry Form**. *Information Technology And Control* 2016 [link](#)
8. Gayathri Devi, K; Radhakrishnan, R. **Automatic Segmentation of Colon in 3D CT Images and Removal of Opacified Fluid Using Cascade Feed Forward Neural Network**. *Computational and Mathematical Methods in Medicine* 2015 [link](#)

9. Manjunath, KN; Siddalingaswamy, PC; Prabhu, GK. **Automatic Electronic Cleansing in Computed Tomography Colonography Images using Domain Knowledge.** Asian Pacific Journal of Cancer Prevention 2015 [link](#)
10. Namías, R; D'Amato, JP; Del Fresno, M; Vénere, M. **Automatic rectum limit detection by anatomical markers correlation** Computerized Medical Imaging and Graphics 2014 [link](#)
11. Boone, Darren J; Halligan, Steve; Roth, Holger R; Hampshire, Tom E; Helbren, Emma; Slabaugh, Greg G; McQuillan, Justine; McClelland, Jamie R; Hu, Mingxing; Punwani, Shonit. **CT Colonography: External Clinical Validation of an Algorithm for Computer-assisted Prone and Supine Registration.** Radiology 2013 [link](#)
12. Roth, Holger R; Boone, Darren J; Halligan, Steve; Hampshire, Thomas E; McClelland, Jamie R; Hu, Mingxing; Punwani, Shonit; Taylor, Stuart; Hawkes, David J. **External clinical validation of prone and supine CT colonography registration.** 2012 [link](#)

If you have a publication you'd like to add please [contact the TCIA Helpdesk](#).

#### Versions

#### **Version 1 (Current): Updated 2013/11/15**

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Images (DICOM, 462.6GB)	<div style="text-align: center;">                 (Requires <a href="#">NBIA Data Retriever</a>.)         </div>
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