



# Head-Neck-PET-CT

## Summary

This collection contains FDG-PET/CT and radiotherapy planning CT imaging data of 298 patients from four different institutions in Québec with histologically proven head-and-neck cancer (H&N). All patients had pre-treatment FDG-PET/CT scans between April 2006 and November 2014, and within a median of 18 days (range: 6-66) before treatment. Dates in the TCIA images have been changed in the interest of de-identification; the same change was applied across all images, preserving the time intervals between serial scans. These patients were all part of a study described in further detail (treatment, image scanning protocols, etc.) in the publication:

### Publication Citation

Vallières, M. *et al.* Radiomics strategies for risk assessment of tumour failure in head-and-neck cancer. *Sci Rep* **7**, 10117 (2017). doi: [10.1038/s41598-017-10371-5](https://doi.org/10.1038/s41598-017-10371-5)

**Note:** *Subsequent to publishing this manuscript it was discovered images from two patients included in the analysis had errors and should not be used in future studies. Therefore these have not been included in this TCIA data set, leaving 298 patients of the original 300 analyzed.*

In the original study, 93 of the 300 patients (31 %), the radiotherapy contours were directly drawn on the CT of the FDG-PET/CT scan by expert radiation oncologists and thereafter used for treatment planning. For 207 of the 300 patients (69 %), the radiotherapy contours were drawn on a different CT scan dedicated to treatment planning and were propagated/resampled to the FDG-PET/CT scan reference frame using intensity-based free-form deformable registration with the software MIM<sup>®</sup> (MIM software Inc., Cleveland, OH).

Patients with recurrent H&N cancer or with metastases at presentation, and patients receiving palliative treatment were excluded from the study. From the 300 patients, 48 received radiation alone (16 %) and 252 received chemotherapy (84 %) with curative intent as part of treatment management. The median follow-up period of all patients was 43 months (range: 6-112). Patients that did not develop a locoregional recurrence or distant metastases during the follow-up period and that had a follow-up time smaller than 24 months were also excluded from the study. During the follow-up period, 45 patients developed a locoregional recurrence (15 %), 40 patients developed distant metastases (13 %) and 56 patients died (19 %).

We analyzed the FDG-PET and CT images of the 300 patients from four different cohorts for the risk assessment of locoregional recurrences (LR) and distant metastases in H&N cancer. Prediction models combining radiomic and clinical variables were constructed via random forests and imbalance-adjustment strategies using two of the four cohorts. Independent validation of the prediction and prognostic performance of the models was carried out on the other two cohorts (LR: AUC = 0.69 and CI = 0.67; DM: AUC = 0.86 and CI = 0.88). Furthermore, the results obtained via Kaplan-Meier analysis demonstrated the potential of radiomics for assessing the risk of specific tumour outcomes using multiple stratification groups.

Please contact [contact the TCIA Helpdesk](#) for scientific or other inquiries about this dataset.

## Acknowledgements



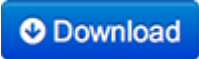


We would like to acknowledge the individuals and institutions that have provided data for this collection:

- **McGill University, Montreal, Canada** - Special thanks to **Martin Vallières** of the Medical Physics Unit

### Data Access

## Data Access

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 and Radiation Therapy Structures (DICOM, 72.5 GB)	 
Clinical Data (XLS)	
Names of GTV contours (XLS)	
Source Code (web)	

Click the Versions tab for more info about data releases.

### Detailed Description

## Detailed Description

Collection Statistics	
Modalities	PET /CT, CT, RT
Number of Participants	298/300
Number of Studies	504

Number of Series	2661
Number of Images	123,271
Images Size (GB)	72.5

We hope the available data and source code will facilitate the standardization and reproducibility of methods in the *radiomics* community.

- **Clinical Data** – This spreadsheet includes patient information, histopathological type, tumour grade, outcome follow-up information (metastases, survival), etc.
- **Names of GTV contours** -- This spreadsheet contains all the names of the "GTV primary" and "GTV lymph nodes" structures (as found in the associated RTstruct files) used in the publication of (Vallières *et al.*, *Sci Rep* 7, 2017). Names of different structures are separated by commas in a given entry of the spreadsheet.
- **Source Code** – All software code implemented in this work is freely shared under the GNU General Public License at:<https://github.com/mvallieres/radiomics>.

**Note:** the images contain no private-vendor DICOM tags.

#### Citations & Data Usage Policy

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Users of this data must abide by the [TCIA Data Usage Policy](#) and the [Creative Commons Attribution 3.0 Unported License](#) under which it has been published.

Attribution should include references to the following citations:

#### **i** Data Citation

Martin Vallières, Emily Kay-Rivest, Léo Jean Perrin, Xavier Liem, Christophe Furstoss, Nader Khaouam, Phuc Félix Nguyen-Tan, Chang-Shu Wang, Khalil Sultanem. (2017). Data from Head-Neck-PET-CT. The Cancer Imaging Archive. doi: [10.7937/K9/TCIA.2017.8oje5q00](https://doi.org/10.7937/K9/TCIA.2017.8oje5q00)

#### **i** Publication Citation

Vallières, M. et al. Radiomics strategies for risk assessment of tumour failure in head-and-neck cancer. *Sci Rep* 7, 10117 (2017). doi:[10.1038/s41598-017-10371-5](https://doi.org/10.1038/s41598-017-10371-5)

#### **i** 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. ([paper](#))

## Other Publications Using This Data

TCIA maintains [a list of publications](#) which leverage our data including this dataset. If you have another publication you'd like to add please [contact the TCIA Helpdesk](#).




### Versions

#### **Version 2 (Current): Updated 2018/06/07**

Data Type	Download all or Query/Filter
Images (DICOM, 72.5 GB) NB: 298 of 300 subjects	  (Requires the <a href="#">NBIA Data Retriever</a> .)
Clinical Data (XLS)	
Names of GTV contours (XLS)	
Source Code (web)	

Added 250 total DICOM series to 162 total subjects that had been missing.

#### **Version 1: Updated 2017/11/30**

Data Type	Download all or Query/Filter
Images (DICOM, 58.1 GB) NB: 298 of 300 subjects	
Clinical Data (XLS)	
Names of GTV contours (XLS)	
Source Code (web)	