

# USE OF PET/CT IN RADIOTHERAPY

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**Introduction:** PET/CT is an imaging technique, which combines PET (positron emission tomography), which depicts how organs and tissues in the body are functioning at a metabolic level, and CT (computed tomography), which enables exact localisation of the visible processes in the body simultaneously. At the Institute of Oncology in Ljubljana PET/CT has been used for preparation for radiotherapy purposes with head and neck tumours, pulmonary and gastrointestinal patients.



Figure 1: PET/CT (CT the first ring, PET the second ring)

**Purpose:** The presentation of the preparation protocol for patients with head and neck tumours, using PET/CT.

**Methods:** At the Division of Radiotherapy patients are fitted with a radiation mask, then they are directed to the Department of Nuclear Medicine. One hour before the tests the radiopharmaceutical ( $^{18}\text{F}$ -FDG) is applied to the patient. Before the test the patient must have an IV catheter inserted for the application of the contrast agent. The correct position of the PET/CT table is set with the Couch Top table for the purposes of radiotherapy. The lasers must be turned on to position the patient. The same pads and accessories are used as during radiation. The patient lies in the same position as during a regular preparation on a CT simulator. Colour and lead markers are used to mark the starting laser points on the plastic mask. CT is used to scan the entire head area to bifurcation. After the CT scan the PET test is carried out.

**Conclusion:** Both in Slovenia and abroad PET/CT has proven to be very helpful in locating tumours as well as in precise drawing of target volumes for the purposes of planning radiotherapy.

## Literature:

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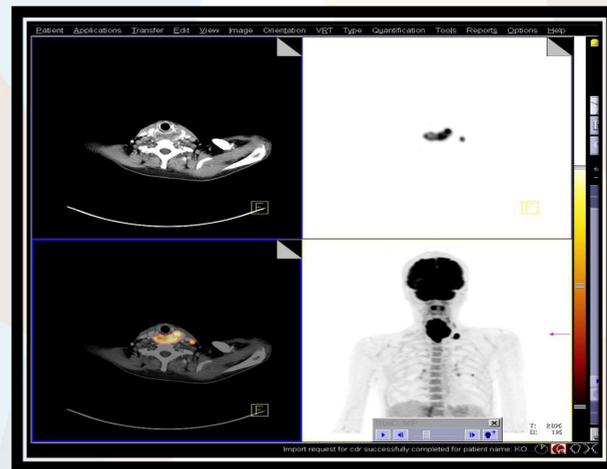


Figure 2: Top left a CT image and bottom left a fused PET/CT image (a lesion is outlined in orange)

**Results:** Institute of Oncology in Ljubljana started to use the PET/CT in 2013 as help in planning for radiation. In this time the PET/CT machine has been used to prepare more than 60 patients.



Figure 3: GTV from PET/CT scan copied to CT image