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## Workshop endobronchial brachytherapy

# Simulation and planning



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### 1. Introduction

The function of medical physicist is 3d treatment planning in endobronchial brachytherapy. This process consists in determining delivery parameters such as time and position of the source in order to treat CTV preserving normal tissue and OARs. In our hospital, this technique is performed with high dose rate source (iridium 192).

### 2. Material and method

After placing a flexible plastic catheter in the patient, scan CT is performed, slice thickness is 3 mm. The scan used is Picker PQS helical scanner (Philips Medical Systems). Before acquiring CT images, radiopaque guide is placed inside the catheter. This guide allows us to locate catheter in the virtual simulation. These CT images are transferred to planning

system Oncentra release 4.1 (Nucletron). Here, Target volume and organs at risk are drawn on CT slices by radiation oncologist and neumologist.

The first step in the planning is to building the catheter. Next step, activate the points where the source will stop. These stops are usually separated 2.5 cm. It is important at this point to have an accurate measurement of the offset distance between the tip of the catheter and the first dwell position available.

After, we prescribe and optimize on points generated on the target dose. The histogram and isodoses curves are evaluated by the radiation oncologist.

Finally, when the plan is approved, it is transferred and delivered by nucletron microselectron afterloader system.

Treatment typically lasts 2–5 min, depending on the dose delivered and the source activity. After treatment is complete, the radioactive source is automatically withdrawn and the catheter is removed.