

## **Proposal: Project and Master Thesis 2017**

(For students in Biophysics and Medical Technology)

### **Radiation therapy of cervical cancer: Optimisation of treatment plans with simultaneous integrated boost**

Fractionated radiation therapy (both external and brachytherapy) is used for treatment of advanced cervical cancer. The external radiation shall include gross tumor volume and suspected microscopic tumor extension. If there is local nodal metastasis, a higher dose (boost) should be given to these locations.

Traditionally the external radiation is given sequentially with radiation of the whole target volume in the first fractions, and the extra dose to the boost volumes in the following fractions.

The use of advanced radiation delivery techniques in external radiation therapy allows generating treatment plans with highly conformal dose distribution to the target volume thus reducing the dose to surrounding healthy tissues. Treatment plans with different doses to distinct parts of the irradiated volume can be used to give the boost simultaneously with the radiation of the actual whole volume (simultaneous integrated boost (SIB)).

For radiation of cervical cancer the target volume is very complex, and introducing simultaneous integrated boost increases the complexity of the calculations.

The actual work will focus on optimization of SIB plans for cervical cancer. This includes testing of different objectives and constraints implemented in the dose calculations for a patient group treated at St. Olavs Hospital.

The aim of the study is to propose a robust strategy for input to the calculation that can be a good start for the process of optimizing SIB treatment plans for cervical cancer patients.

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