

**Project Title**

Development of adaptive treatment techniques in head and neck radiotherapy

**Supervisor(s)**

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**Project Description**

Approximately 50% of cancer patients receive radiotherapy. It is a complex multi-disciplinary process involving clinicians, physicists and radiographers. The clinical challenge is to give a radiation dose to control the tumour while minimising dose to surrounding tissue, requiring extremely accurate treatment delivery.

This project will develop an adaptive technique for Head and Neck radiotherapy. Patients have a personalised treatment plan that is repeated over 30 daily treatment sessions. On treatment images are assessed qualitatively for anatomical changes (eg weight loss) that might change the dose received by the patient and require a replan.

The project will develop a quantitative method to account for anatomical changes, accurately calculate the dose received over the entire course of treatment and adapt the treatment plan if necessary, using software available in the department (Raystation) to perform image fusion and dose accumulation. The objective will be to determine if the adaptive technique would provide more accurate treatment delivery compared to the current qualitative technique.

The project offers the opportunity to work within the clinical radiotherapy department at Charing Cross Hospital, primarily in radiotherapy physics but also working with clinicians and radiographers. The department has established research links with Imperial and would expect project outcomes to be disseminated at conferences/in journals.