

# Multimodal Imaging for Dose Planning and its Benefit: the Paradigm of Head & Neck Tumours.

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**Abstract**—The ultimate goal of any radiotherapy treatment is to eradicate the disease without inflicting damages to the normal tissues surrounding the tumours, which could be responsible for late treatment morbidity. To achieve this objective, the first step is to precisely select and delineate the target volumes to which a given dose will be prescribed. This step requires the use of multimodal images from clinical examination to anatomic and molecular images. Imaging examination will be used not only to delineate the boundaries of the tumour volume, but also to assess tumour heterogeneity and possibly to guide an heterogeneous dose prescription, i.e. the so-called “dose painting” approach. Last, re-imaging the patient during treatment to assess the variation of the tumour volume during radiotherapy may also be done in the framework of adaptive treatment. Over the last decade, a lot of information have been gathered on the use of multimodal imaging for dose planning and have identified both the promises and the technical difficulties. During the lecture, the speaker will review the state-of-the-art of multi imaging for the treatment using head and neck tumour as a paradigm. He will emphasise on what should be considered as routine practice and what should still be viewed as research questions.