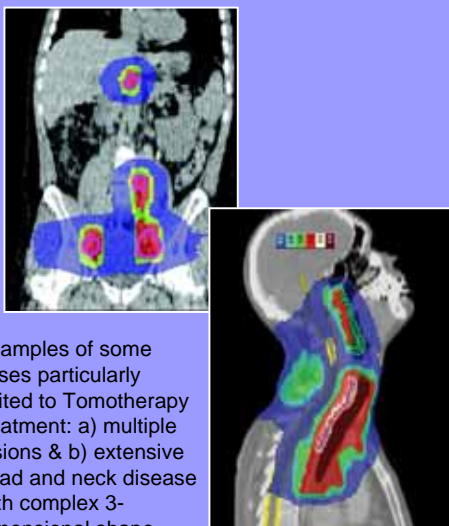


Tomotherapy – a new form of radiotherapy



Radiotherapy is used in the treatment of cancer to deliver high dose radiation to tumours whilst minimising the dose to surrounding normal tissues.

The Trust has just installed the first Tomotherapy Unit to be used in the NHS which combines the use of two advanced radiotherapy techniques with the aim of maximising the treatment potential for the patient.

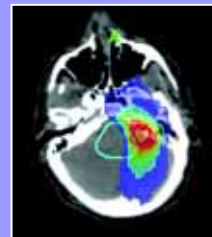


Examples of some cases particularly suited to Tomotherapy treatment: a) multiple lesions & b) extensive head and neck disease with complex 3-dimensional shape

Two technologies are combined in Tomotherapy:

One – image-guided radiotherapy (IGRT) for imaging the tumour each day before treatment

Two – intensity modulated radiotherapy (IMRT) to treat complex tumour shapes



Intensity-modulated radiotherapy plan. The high dose contours conform closely to the target shape whilst sparing the normal tissues.

What is intensity modulated radiotherapy (IMRT)?

- uses complex computer planning to improve conformation of dose to the shape of the target, especially intricate 3-dimensional shapes
- leads to reduced side-effects and/or increased treatment doses to the tumour

What are the benefits of Tomotherapy IMRT?

- may give superior conformation in complex cases compared to conventional treatment machines (linear accelerators)
- can treat longer tumour volumes and multiple lesions
- delivery may be more efficient for some tumour sites, reducing treatment times

What is Image-guided radiotherapy (IGRT)?

- uses images taken at the time of treatment to correct for positioning uncertainties and accurately direct the treatment
- should allow a reduction in the size of the safety margin around the tumour
- may lead to reduced side-effects and/or increased treatment doses to the tumour

What are the benefits of Tomotherapy IGRT?

- CT scan for IGRT in the treatment position before each daily treatment
- allows direct imaging of both bony anatomy and the soft tissue tumour

Research Programme

The combination of IGRT and IMRT will revolutionise radiotherapy and the new unit presents Addenbrooke's with a unique opportunity within the UK to research and develop the use of this technology.

The project will evaluate the role of IGRT and investigate the potential benefits for patients of combining this with IMRT including:

- reduced normal tissue toxicity, which will reduce side-effects
- dose escalation, which will improve tumour control and cure

The research will be conducted by a multi-disciplinary team in the departments of Oncology and Medical Physics.