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## MR Linac in place

Date:

03 July 2017

The MR Linac machine is now in place at The Royal Marsden's site in Sutton



The machine is owned and developed by The Royal Marsden and the ICR in collaboration with Elekta. Using a series of test objects and precise measurement devices, the system has been thoroughly characterised and is now in use.

We are among a select group of international centres to own and develop the pioneering MR Linac technology, thanks to a £10 million grant from the Medical Research Council. The grant was announced by Chancellor of the Exchequer George Osborne as part of an investment in UK science of more than £230 million by the Medical Research Council. The MR Linac combines two technologies – an MR scanner and linear accelerator – to precisely locate tumours, tailor the shape of X-ray beams in real time and accurately deliver doses of radiation to moving tumours.

The location of tumours and organs within the body changes from day to day or even constantly. For example, a tumour in the lung will move up and down as a person breathes, and a tumour in the prostate might move from day to day depending on what the person has eaten and how full their bowel is. Constant monitoring of the patient during treatment will enable the most precise targeting of the tumour and help avoid healthy tissue. This is key to

refining radiotherapy for the future and is what the MR Linac promises.

### **What is a MR Linac?**

The MR Linac is a machine combining an MRI scanner and a linear accelerator to precisely locate tumours, tailor the shape of X-ray beams in real time, and accurately deliver doses of radiation to moving tumours.

### **What makes it different to current treatment?**

Patients may have an MRI before starting radiotherapy treatment. The radiotherapy is carried out on a Linac machine. Combining the two technologies is a major challenge for physicists because the radiation treatment is affected by the strong magnetic fields.

### **How will the MR Linac improve treatment for patients?**

The MR Linac will allow us to constantly image the tumour during radiotherapy and allow us to adapt the treatment in real time. This would be a truly new practice and we would be entering into a new era of personalised radiotherapy.

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