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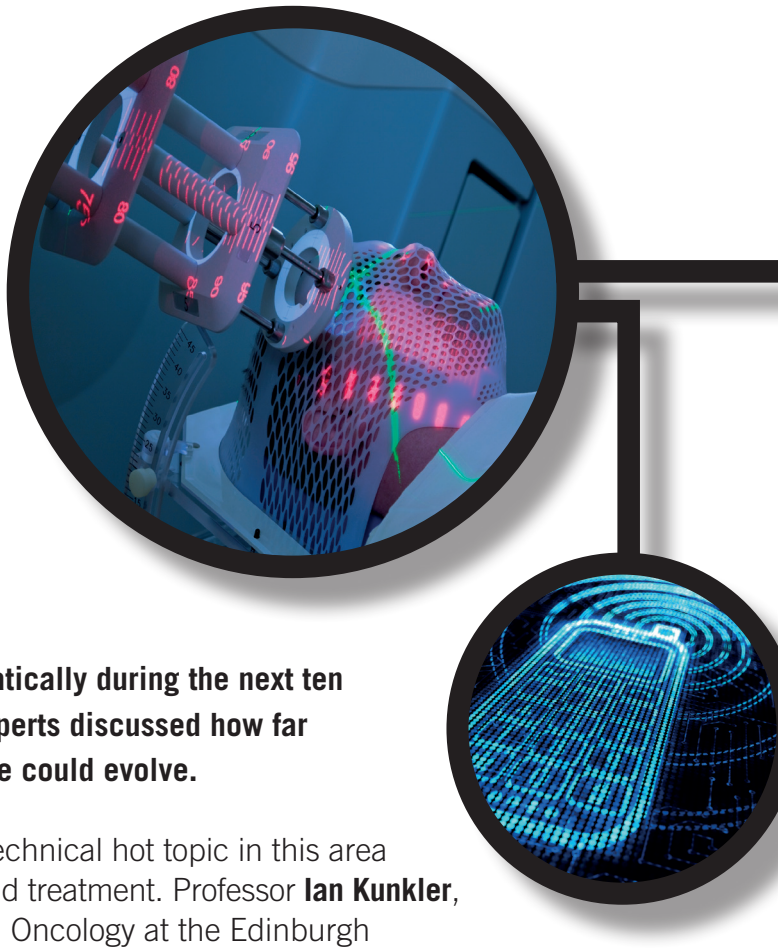
The Royal Society of Medicine

The Future of Medicine



Key insights and resources taken from the IET Healthcare Technologies Technical and Professional Network and Royal Society of Medicine **The Future of Medicine** seminar in May 2015

It is predicted that medical practices will change dramatically during the next ten years. At an IET and RSM event in May 2015, sector experts discussed how far technology has developed and in what ways patient care could evolve.

Cancer treatment has hit the news recently, and one technical hot topic in this area focuses on the use of radiology in regards to imaging and treatment. Professor **Ian Kunkler**, Consultant Clinical Oncologist and Professor in Clinical Oncology at the Edinburgh Cancer Research Centre, highlights work on precision tumour targeting.

“Key to the success of local radiation therapy is accurate delineation of the cancer from multimodal cross sectional imaging (CT, MRI, PET scanning) data. Specialist radiology and clinical oncologists must work closely together to ensure the radiation ooze is accurately targeted to the tumour.

The latest radiotherapy techniques include intensity modulated radiation therapy (IMRT). With this technology the fluence of the X-ray beam is dynamically modulated by multiple collimators. This allows the beam to be shaped to the contour of the cancer, while surrounding normal tissues are shielded, minimising the risk of acute and late toxicity”.

Professor **Luc Bidaut**, Chair of Translational Imaging and Head of the Clinical Research Imaging Facility (CRIF) at the University of Dundee, highlights developments around translational imaging, showing how merging images and data from different techniques can provide clinicians the ability to access complex information through interactive 3D representations.

“Imaging is always evolving. While the bigger modalities evolve relatively predictably by providing ever more capabilities within their core physical principles, hybrid instruments and relevant applications are still progressing and further justifying their complexity and costs.

“With the extension of - for example - tomosynthesis, an old technique that has been reactualised, 3D imaging is making strides in traditionally 2D applications such as mammography and standard

radiographs. Other modalities are also being created or progressing by providing extra information that have increasingly been demonstrated as relevant to the clinic or by evolving from bench instruments to clinical appliances.

"By combining 'imaging' (in a broad sense and through various sensors), other individual data, population knowledge and interventional delivery paradigms, we will get ever closer to precision medicine, focused on the individual patient but benefiting from the masses".

Data driven healthcare is a key topic for **Ken Sutherland**, President of Toshiba Medical Visualisation Systems. He highlights the benefits of combining a wide range of information to create a single, detailed data set that can be analysed.

"Data analytic techniques being used in other industries are now finding a place with healthcare. Web technologies that allow data to be mashed up from different sources are also useful as are new methods of data visualisation.

We are entering the age of data driven healthcare, where new value will be created by engineers and technologists who can work out how patient data can be harnessed to create effective new tools that improve patient outcomes."

Charles Lowe, from the Royal Society of Medicine, feels the overall impression is that a huge range of technologies are contributing to amazing advances in medicine.

"Clearly medicine in ten years time will be very different from today. [But] the role of the doctor in 2025 will perhaps, as Professor Rachel McKendry stated, depend on whether the information provided by technologies is accepted and responded to appropriately by the vast majority of clinicians".

Watch the talks

Technology and the Role of The Doctor - The Present, Professor Ian Kunkler
www.theiet.org/fom1

Implantable Devices for improving Cancer Treatment Impact Project, Professor Alan Murray
www.theiet.org/fom2

Real-time Monitoring, Dr David Clifton
www.theiet.org/fom3

Magnetoencephalography (MEG) signal analysis, Professor Joachim Gross
www.theiet.org/fom4

For more go to: www.iet.tv

Links to presentations

Technology and The Role of The Doctor - The Present, Professor Ian Kunkler
www.theiet.org/fom5

Implantable Devices for improving Cancer Treatment Impact Project, Professor Alan Murray
www.theiet.org/fom6

Real-time Monitoring, Dr David Clifton
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